Manual

B4000+

authentic organ modeller

FERROFISH
advanced audio applications

V3.0

IMPORTANT SAFETY INSTRUCTIONS

Safety symbols used in this manual:

This symbol alerts that there are important maintainance
and operating instructions in the literature.

This symbol warns the user of uninsulated potentially dangerous voltage inside the unit
that can cause an electric shock.

This symbol warns the user that the output connectors of the power supply contain
voltages that can cause dangerous potentially lethal shocks.

o   **Read** and **follow** this Instructions
o   **Keep** this instructions
o   **Heed** all warnings.

1. Do not use this device near water.
2. Clean only with a dry cloth. Do not spray liquid cleaner onto the faceplate or into the ventilation slots. This may damage the front panel or cause a dangerous condition.
3. Only install in accordance with the instructions of the manufacturer.
4. Don't install or operate near heat sources as stoves, radiators or other devices that produce heat.
5. NEVER defeat the safety purpose of the grounding plug type. When the provided plug doesn't fit into the outlet, please consult a qualified electrician for further help.
6. Use power adaptors and accessories specified by the manufacturer only.
7. Protect the power cord from being pinched or walked on.
8. Unplug this device during lightning storms or when not in use for longer periods of time.
9. Refer all servicing to qualified service personnel only. Servicing is required when the device has been damaged in any way, such as when liquids have been spilled of objects have been fallen into the device or the device has been dropped. Also, when the device does no longer work normally or has been exposed to rain or moisture.
10. This unit generated heat when operated normally. Operate in a well-ventilated environment with at least 1RU space between any other peripheral equipment.
11. This product in combination with headphones or other external amplifiers and speakers may produce sound levels that could lead to a permanent hearing loss. Do not operate at higher or uncomfortable volume levels for a longer time. If you are experiencing ringing in your ears, a loss of high frequency sound information or other hearing loss, contact an audiologist immediately.
12. WARNING: To reduce the risk of an electric shock or fire, do not expose the device to rain or moisture.
13. This power supply of this audio device may cause electronic interference to surrounding objects. If you find that this or any surrounding unit is malfunctioning, try resetting the device, relocating it or a install a powerline conditioner by an electrician.
14. Always use a stand, 19" rack or table designed for the use of pro audio equipment. In a permanent installation make sure that damage or even injury will not result from the mounting of the device or from cables pulling on the device. When using a cart, use caution when moving the device inside the cart to avoid injury from tipping-over.

Introduction

Thank you for choosing the B4000+. We trust that you will have just as much fun with your B4000+ as we had developing this unique and characterful organ. Please read the manual thoroughly in order to take full advantage of the many features the B4000+ has to offer.

The B4000+ is a drawbar organ in the tradition of the fabulous Hammond B3™. All features of the glorious ancestor have been modeled with the highest accuracy: 91 tonewheels, full polyphony, keyclicks and percussion, scanner vibrato, overdrive, the rotating Leslie™ speaker, and many more!

Scope of delivery

- B4000+
- Power supply
- Manual
- USB cable (optional)
- Rubberfeet (optional)

Quick start

Attach your B4000+ to the power supply and connect it to the power outlet. Press and hold the **On** key to power the B4000+.

Connect the loudspeakers to the **Audio OUT** jack, or your headphones to the **Phones** jack.

Attach your MIDI keyboard to **MIDI IN-A** using a DIN cable. You can play the upper register (manual) via MIDI channel 1. The lower register is on MIDI channel 2, and the pedal register on MIDI channel 3. In order to attach another MIDI keyboard for the lower register easily, use the **MIDI IN-B** jack. Here channel 1 is set to the lower register.

To load a preset, press the **Preset** key, and select the desired preset with knob A.

To get a first impression of the sound capabilities, start the demosong by pressing the **Demo** key long.

If you have any questions or problems, please contact us via email (info@ferrofish.de) first, before sending the unit in. Our support team will be happy to assist you!

Operation

Operating the B4000+ is very easy thanks to the TFT display. However, all functions of the B4000+ can be controlled directly at the device. More than 80 parameters influence the sound. Have fun playing with them!

To keep track of things, we grouped the functions as follows:

GENERATOR

Here the sound is generated and mixed. Adjust the global sound parameters by pressing **Sound** and **Percussion**. By selecting **Tone** you mix the registers and also the external input.

EFFECTS

After the generator the effects are added to the sound. **Rotor** adjusts the Rotor effect (simulation of rotating speakers similar to the Leslie™). Under **FX** you find more effects: Chorus/Vibrato, Reverb and Compressor.

SYSTEM

Here you can load presets (**Preset** key), also save them (press the **Store** key long), and also display the overview screen (**Play** key). To configure the B4000+, please press and hold the **Setup** key for an extended duration.

REGISTER

Using the three keys **Pedal**, **Lower**, **Upper** let you choose which register is attached to the drawbars. The actual setting is shown in the upper part of the display.

By long pressing one of these keys you can copy the drawbar positions in the corresponding register. By double-clicking the key the register properties can be set.

First select the function by pressing the appropriate key, then change the parameters by turning the knobs A-F. The assignment of these knobs can be found on the B4000+ printing, or alternatively are labelled on the TFT.

The most important functions are accessible directly by pressing the appropriate keys. Less used functions (red printing) are called by long pressing the key.
Some functions have more than one page. Press the key again to get to the other pages.

Sound

When pressing this key the six most important sound
parameters of the emulation are shown:

EMULATION FEATURE

Click

On a Hammond B3™, the mechanical triggering of the sound
by the keyboard creates a noticeable, rather 'spitty' click.
While this side effect was initially regarded as undesirable, it
became accepted in time as a characteristic part of the
Hammond sound and eventually came to be pretty popular!
The 'Click' control allows you to control the volume of this
characteristic sound element.

EMULATION FEATURE

Crunch

This non-technical term refers to a type of additive distortion
which occurs in a Hammond-B3™ organ's drawbars. The
'Crunch' control lets you control the intensity of the drawbar
distortion.

EMULATION FEATURE

Drive

This knob controls the amount of overdrive, which has been faithfully digitally modelled.

EMULATION FEATURE

Condition

As time passes, the condition of the tonewheels of a Hammond organ tends to degrade, which affects the sound quality and tuning integrity. With this control you magically alter the condition of the tonewheels from brand new ('NEW') to 'needs repair' ('REPAIR').

EMULATION FEATURE

Leakage

On some organs you hear quiet overtones in the background when keys are played, even when all drawbars are in zero position. This is caused by internal overlapping within the drawbar circuitry of old Hammond B3^{TM}. organs. By adjusting the 'Leakage' control you simulate this phenomenon and adjust its intensity.

EMULATION FEATURE

Tuning

This setting controls the B4000's master tuning +/- one tone divided in 128 single steps.

Percussion

As with a Hammond-B3™ organ, the percussion effect is available only on the upper register and sounds only when a detached fingering style is used. If you play legato style (i.e. with overlapping notes), only the first note played triggers the percussion.

EMULATION FEATURE

On/Off

Enables / disables the percussion.

EMULATION FEATURE

Level

Controls the overall level of the percussion.

EMULATION FEATURE

Harmonic

This controller changes the pitch of the percussion. The pitches correspond to those of the drawbars.

Percussion

Attack

Controls the duration of the percussion. Since this feature isn't available on the original, set this value to minimum for the original sound.

Decay

With this controller you set the decay time of the sound. In the minimum position, the sound stops immediately as soon as you release the key, while towards the maximum it decays slowly after the key is released.

Tone

Here you mix the registers and external input:

Pedal - Lower - Upper

Adjust the volume of the corresponding register.

Input

You can feed an external signal into the **Audio IN** jack. This signal can either be fed directly to the mix or via the effects section. Adjust the volume of the input signal with this knob.

In case you don't need this input, please set the volume to minimum to avoid noise coming in from the unused (open) input jack.

The routing of the external input is set by pressing the **Tone** key again.

Treble - Bass

Set treble and bass of the B4000+ here.

external Input

When pressing the **Tone** key a second time, this screen will be shown. Here you see the chain of the sound generator and the effects. The external input signal can be inserted at arbitrary points. This way the signal is inserted before a specific effect, or can also be fed as dry signal to the output, or a combination of both.

Note that **Audio IN** is a 6.3mm (¼") stereo jack socket.. In order to feed in an external signal here, you usually need a Y-split cable as follows:

A 6.3mm stereo jack plug connected to two 6.3mm mono jack plugs or cinch plugs

Rotor

This screen controls the motion of the rotating speaker (Leslie^{TM}). When you press the **Rotor** key again, the Horn and then the Bass screen is shown. Here you adjust the speed of the Rotor, and also control break and acceleration.

EMULATION FEATURE

On / Off

Enables / disables the rotor.

EMULATION FEATURE

Slow / Brake / Fast

Change the rotor speed between slow, brake, and fast.

The speed of the rotor can also be switched using an external sustain pedal. You can set the direction of the switch, and many other options in the **Settings**.

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Rotor

Modwheel / Aftertouch

When enabled, you're able to switch the rotor between slow and fast by using the modwheel and aftertouch (if supported by the keyboard). So, if you press the key harder (aftertouch) or turning the modwheel, the rotor switches between slow, brake, and fast.

The MIDI threshold for modwheel and aftertouch can be adjusted in the **Settings**.

Spread

Widen the stereo image by adjusting the 'Spread' control, emulating the effect of adjusting the positions of two microphones.

Balance

The 'Balance' control adjusts the volume balance of the bass speaker and treble speaker microphones. Turn the control fully to the left in order to hear only the bass speaker, turn it fully right and you will hear only the HF-horn. In the center position, the volume of the two speakers is equal.

Distance

Allows you to adjust the virtual distance between microphones and speakers.

Horn / Bass

After pressing **Rotor** again, the Horn- and then the Bass-screen is shown.

These controls are used to adjust various rotor settings. Many rotary speaker systems used a speaker for bass frequencies and a horn for treble signals, which rotated at different speeds. This rich, complex sound is faithfully reproduced and fully programmable in the B4000+.

EMULATION FEATURE

Slow

Controls the rotary speakers' slow rotation speed when the 'ROTOR' switch is set to the 'Slow' position.

EMULATION FEATURE

Fast

Controls the rotary speakers' fast rotation speed when the 'ROTOR' switch is set to the 'Fast' position.

EMULATION FEATURE

Accel

Controls the acceleration when switching from 'Slow' to 'Fast'.

EMULATION FEATURE

Brake

Controls the braking when switching from 'Fast' to 'Slow'.

EMULATION FEATURE

Tone

The bass speaker and horn each have a tone control. By adjusting these you change the overall tone color and resonance of the rotor effect.

Chorus / Vibrato

More effects are implemented in the B4000+, which you
control using the **FX** key: Chorus/Vibrato, Reverb and
Compressor

Vibrato Lower On/Off - Vibrato Upper On/Off

This effect can be switched on for the upper and lower register
seperately.

EMULATION FEATURE

Data Wheel

The data wheel controls the strength of the vibrato and chorus
effects. The 'V-1', 'V-2' and 'V-3' settings introduce
increasing strengths of vibrato, while selecting 'C-1', 'C-2' or
'C-3' adds incremental amounts of chorus. Position 'C-3' is
mainly used for jazz or rock sounds.

Reverb

With this screen you can switch on and adjust the reverb effect.

ADDITIONAL FEATURE

On/Off

Enables / Disables the reverb.

ADDITIONAL FEATURE

Dry/Wet

Sets the mix between the original (dry) and the reverb sound (wet).

ADDITIONAL FEATURE

Size

Sets the size of the room.

ADDITIONAL FEATURE

Time

Sets the amount of reverb that is fed back in the reverb loop.

ADDITIONAL FEATURE

Damp

Sets the frequency of the lowpass filter for the reverb feedback.

Compressor

Since you're able to play up to 250 voices on the B4000+, the dynamics of this device is very high. The compressor is used to get a stronger and more consistent sound. Press **FX** three times to get to the compressor screen.

ADDITIONAL FEATURE

On / Off

Enables / Disables the compressor

ADDITIONAL FEATURE

Gain, Amp.

Sets the strength of the compressor.

Presets

Press the **Preset** key to view and load a preset.

Select a preset by using knob A, and the bank by knob B.

To find a preset of a specific category, set the category filter with knob C.

Bank 1 is used for the 128 factory presets, which can not be overwritten. The banks 2-16 are intended to store user presets.

By long pressing the **Store** key you store a preset. Select the location by using knob A and B, and then press **Preset** again to execute. The name of the stored presets are "user 0001" etc. The names and categories of own presets can be renamed by using the provided computer software.

Play

Use this key when playing live. Here you have an overview of the drawbars, and you can adjust the volume by using knobs A and B.

Knob A controls the volume of the B4000+ simulation. If you enabled the tube-amplifier emulation, you will hear tube-distortion when turning up this volume. Knob B just sets the output volume at the jacks.

The presence of MIDI input signals is always shown on the very top of the TFT display. The small triangles show MIDI signals for **MIDI IN-A**, **MIDI IN-B**, and USB.

Pedal - Lower - Upper

Press one of these keys to connect the drawbars to the corresponding register. The active register is always shown in the top right border of the screen. To prevent accidental changing of the drawbar settings you also can disconnect the drawbars.

When pressing one of the keys long, you copy the current drawbar settings to the register. More features of this register are accessible by pressing the key twice ("double-click"):

ADDITIONAL FEATURE

Velocity On/Off

Unlike mechanical and most electronic organs, the B4000 can be played with dynamic key velocity and the envelope curve can be changed.

If the switch is set to the ON position, key velocity controls the volume of the notes.

ADDITIONAL FEATURE

Attack

This controls the attack time of the organ signal. When turned fully left (minimum position) the organ sounds immediately at full strength, while turning it fully right (maximum position) makes it fade in smoothly.

Release

This controls the decay time of the signal. When turned fully left (minimum position) the sounds stops immediately after you release a key. When turned fully right (maximum position) the note will go on sounding after you release the key.

Transient Delay On/Off

When pressing a keyboard key on the original Hammond-B3™ nine mechanical contacts are closing, corresponding to the drawbars. If you press the key slowly, these contacts don't close simultaneously, that's why you hear a "softer" sound. The B4000+ can simulate this behaviour, if you set this switch to On. In this case, the MIDI velocity, which gives the information about the speed of the keyboard pressing, controls the amount of the delay.

Settings

MIDI

To adjust the MIDI setting, press long the **Setup** key.

Here you select the channels for the three registers, adjust the octave position, and select keyboard splits, for playing more than one register on one keyboard.

To attach a second keyboard easily, there is an additional MIDI input. The default setting of the MIDI channels are as follows:

Register	*MIDI IN-A*	*MIDI IN-B*	*USB*
Upper	1*	2*	1
Lower	2*	1*	2
Pedal	3*	3*	3
Ctrl.	1*	2*	1

* default, adjustable

So, easiest is to set both keyboards to MIDI channel 1, and plug in the upper-register keyboard to **MIDI IN-A**, and the lower-register keyboard to **MIDI IN-B**.

MIDI controller messages are processed on the "Ctrl" MIDI channel. Usually this is the same channel as you use for the upper keyboard. So, with the upper keyboard you also can select the Preset, and send other controllers. If you don't want the B4000+ to react on these controller messages, set the "Ctrl" MIDI channel to off.

MIDI data is also transferred via USB. The MIDI channels on USB are fixed to channel 1 (upper register and controller), channel 2 (lower register) and channel 3 (pedal register). All incoming data from the MIDI plugs is transferred to the computer by USB, so you are able to record them on your sequencer.

The "Oct" line is used to transpose the registers by one octave up or down. With "Trp" you also can transpose all registers by half tone steps.

The Split-function is enabled automatically as soon as you select the same MIDI channels for two registers, for example, by selecting MIDI channel 1 for Upper and also Lower. Then the splitpoint is selected by the split-note.

Pressing **Setup** again allows you to change these settings step by step. After that further settings are shown.

Settings
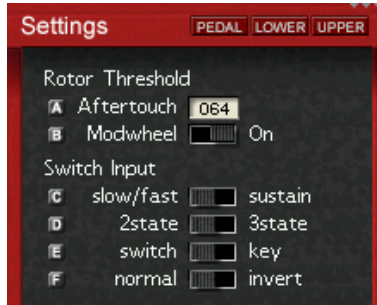
ADDITIONAL FEATURE

Aftertouch Threshold

You can also switch the speed of the rotor by using aftertouch. The higher the number the more you have to press the key on your keyboard to switch the rotor to fast speed.

ADDITIONAL FEATURE

Modwheel

If you like to control the Rotor using the Modwheel, set this switch to "On".

ADDITIONAL FEATURE

Switch: slow/fast ↔ sustain

This selects, if you use the switch input on the back of the B4000+ for controlling the Rotor, or for the Sustain function.

Switch: 2state ↔ 3state

2state switches (On-Off) are commercially available. However, since the Rotor has three positions, you can also connect a special switch with three positions, using a stereophone jack. This switch should connect *tip* with *sleeve*, and *ring* with *sleeve*.

Switch: switch ↔ key

Alternatively to a switch, you can also connect a momentary key. When using a key, every keypress advances the Rotor by one position.

Switch: normal ↔ invert

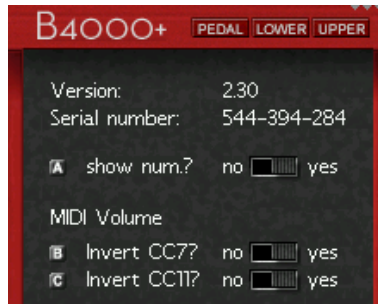This setting reverses the function of the switch plug.

Pedal

Press **Setup** again to adjust the range for the volume pedal. Please insert a pedal in the plug on the back of the B4000+.

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The minimum and maximum value can be set with the knobs A and B. The arrows show the actual position of the pedal. The pedal function can be inverted with knob C.

Version

Here you find the firmware version and the serial number of your B4000+. Please check our website for new firmware versions.

ADDITIONAL FEATURE

show Num.: no ↔ yes

Most settings of the B4000+ are shown as rotary potentiometer, but internally stored as MIDI values between 0 and 127. Sometimes it makes sense to see this MIDI value in addition to the potentiometer. Set this switch to „on" to display the numeric value.

ADDITIONAL FEATURE

invert CC7 / CC11:

MIDI Controllers 7 and 11 are used for volume and expression. Most MIDI pedals send 127...0 for loud...quiet. But there also exist pedals, which function is reversed. In this case set CC7 or CC11 to invert, so the pedal can be used as normal.

Additional functions

Demosong

Start the song by pressing the **Demo** key long.

Panic

No panic when a MIDI note gets stuck. Press the **Panic** key long to stop all playing or hanging notes.

On / Off

Press the **On** key long to switch the B4000+ off. If possible, please switch off the B4000+ using this key and not by removing the power supply. This way you're sure, that all settings are stored correctly.

USB port

The USB socket is ONLY intended for connection to a computer. Connected there, the B4000+ will register as a class compliant MIDI device. Connection to MIDI keyboards with an identical USB-B connector is NOT possible. Exceptions are keyboards or synthesizer workstations that have a USB-A connector with USB HOST functionality (e.g. Korg Kronos). For more information about the USB HOST functionality, please refer to the manual of your device.

If your MIDI keyboard only has a USB port, you need a "MIDI USB Host". These devices are available from your local music shop, for example from KENTON, and convert an USB signal to MIDI.
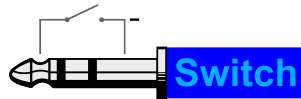
# Pinout of the jacks

Audio IN / OUT and Phones jacks

Note that the audio IN and OUT jacks are 6.3mm (¼") stereo jacks. Therefore, a Y-split cable is usually required for the connection (1 x stereo to 2 x mono).

Switch jack

Both a switch or a pushbutton can be used. If a half moon switch (3 positions) is used, the middle tap of the connector can be used as an additional contact:
TIP with ground closed: FAST
RING with ground closed: SLOW
open: BRAKE

Pedal jack
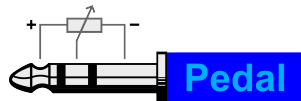
Use only expression pedals with the specified assignment. We recommend the FC-7 from Yamaha.

CE / FCC Compliance

This device was tested by a complies with the limits of the European Council Directive on the approximation of the laws of the member states relating to electromagnetic compatibility (RL2014/30/EU), as well as the legal regulations for electrical safety according to the Low Voltage Directive (RL2014/35/EU). Unauthorized modification of this product voids the validity of the CE declaration.

This device complies with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules.

RohS

This device has been soldered lead free and fulfills the requirements of the RohS directive.

Information about Disposal

According to the directive applicable in the EU states RL2012/19/EU (WEEE - Directive on Waste Electrical and Electronic Equipment), this product must be recycled after use. If no such option is available, the device can be returned free of charge to the manufacturer for recycling:

Ferrofish GmbH
Bruederstrasse 10
53545 Linz am Rhein
Germany

Trademarks

All trademarks are properties of their respective owners, and only used here for description.

Warranty

Each B4000+ is tested by us and all functions are checked extensively. Only high quality components are used, which enables us to give two years full warranty. As confirmation for the purchase date please keep the sales receipt.

In case of a defect please consult your dealer. Defects, which are caused by improper installation or use are not subject to the warranty. In this case the repair is with costs.

Compensation in any kind, i.e. of secondary damages is excluded. Any liability beyond the merchandise value of the B4000+ is excluded. General terms and conditions of Ferrofish GmbH apply.

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