OB-Xd 4 Virtual Synthesizer

User Manual · Version 4.0



Introduction

OB-Xd 4 is a polyphonic synthesizer modelled on the Oberheim OB-X8. Its engine was matched to measurements of a real unit: the oscillators, the four filter types, the envelopes, the LFOs, portamento and the per-voice differences between the eight voices were recorded on the hardware and compared sample by sample. The envelopes, LFO and portamento follow the arithmetic of the OB-X8 firmware. The panel follows the layout of the OB-X8, with its second parameter page, and programs use the same parameters and value ranges as the unit.

Because OB-Xd 4 behaves like the OB-X8 in most respects, this manual is short. It walks through the panel section by section and describes what OB-Xd 4 adds or does differently. For the details of synthesis and programming, please read the Oberheim OB-X8 User's Guide, available from Oberheim's website.

Programs made with OB-Xd 3 still load and play with the OB-Xd 3 engine, called Legacy in this manual. See Engine Types.

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Differences from the OB-X8

- **MENU** and **GLOBAL** open the main menu of the plugin instead of the unit's global settings.
- **MIDI learn** on every control from a right-click menu. Programs can also be played from MPE controllers.
- **Presets and banks** are stored as .fxb banks of 128 programs and .fxp presets. A disk mode browses single presets in folders.
- **Arp clock**: the arpeggiator can follow the host tempo in note values.
- **Legacy engine**: OB-Xd 3 programs keep their own filter, envelopes and LFO.
- **OB-X8 link**: OB-Xd 4 can connect directly to a hardware OB-X8 over its own MIDI port. Edits travel both ways, program changes follow, and the six banks can be backed up, restored and kept in sync.

Installation and Activation

Formats

OB-Xd 4 runs on macOS as AU, VST3 and AAX plugins and as a standalone application, on Windows as VST3 and AAX plugins and as a standalone application, and on Linux as VST3 and LV2 plugins and as a standalone application. In the standalone version, Audio/MIDI Settings at the top of the main menu chooses the audio device and the MIDI inputs.

Activation

After purchase you receive a serial number from discoDSP. Open the main menu (the MENU key, or GLOBAL in the programmer) and choose Register. Activation needs an internet connection once. OB-Xd 3 serials do not unlock OB-Xd 4.

Until it is registered, OB-Xd 4 runs as the free version:

- for non-commercial use only,
- oversampling stays off,
- bounces and exports made with the OB-Xd 4 engine get a short noise burst at regular intervals,
- AAX and LV2 bounces are disabled. Realtime playback works normally.

Buy and Register appear at the bottom of the main menu while the plugin is not registered.

Files and folders

Banks, presets, MIDI mappings and settings are kept in an OB-Xd 4 folder:

- macOS: Library > Application Support > discoDSP > OB-Xd 4 (in your user folder)
- Windows and Linux: Documents > discoDSP > OB-Xd 4

Banks are in the Banks subfolder, single presets in Presets, MIDI mapping files in MIDI, MPE controller profiles in MPE and themes in Themes. Banks downloaded from a linked OB-X8 go to Banks > Hardware. File > Reset Preset and the MANUAL key load Default.fxp from the Presets folder.

Working with the Panel

Drag a knob up or down to turn it. Double-click a knob to return it to its default value. Keys switch on and off with a click. Some keys have two LEDs and step through their settings with each click; the LEDs show the current setting. The selectors on Page 2 open a list when clicked.

While you move or hover over a control, the program display shows its name and value. When you let go, the display returns to the program after a moment. The display shows EDITED after the current program has been changed.

Control menu and MIDI learn

Right-click any control (Control-click on a Mac) to open its menu:

- **MIDI Learn**: choose it, then move a knob or slider on your controller. The control is now assigned to that CC.
- **Clear MIDI Mapping**: removes the assignment. The menu shows the CC number.

MIDI > Show CC Mappings prints the assigned CC number next to every control on the panel. Click anywhere to hide them again.

Window size and appearance

The main menu's Appearance > Size submenu sets the window size from 0.75x to 2x; sizes that do not fit the screen are left out. Full Screen scales the window to the width of the screen. Preset Navigation puts – and + keys in place of GLOBAL and WRITE: they step to the previous and next program. Small Popup uses a smaller font in the menus.

The Panel

The panel has two pages, as on the OB-X8. Page 1 holds the controls you play with. PAGE 2 in the programmer switches the upper part of the panel to the second parameter page; press it again to return. The keyboard and programmer sections stay the same on both pages. Most controls work as on the unit, so the descriptions below are brief.

Top row



- **Master Vol**: output level of OB-Xd 4. It is not stored with the program.
- **Menu**: opens the main menu.
- **Chord**: chord memory. With HOLD on (Menu > Hold or a sustain pedal) and CHORD on, the latched notes are stored as a chord. Each key then plays the whole chord transposed, with low C (C2, note 36) playing it as held. CHORD works only while HOLD is on and switches off with it, as on the unit. Key Limit and Hold Mode are on Page 2.
- **Unison**: stacks voices on one note. The number of voices and the key priority are on Page 2.
- **Mode**: switches the RATE knob and the four keys to its right between the modulation controls (Mod, left LED) and the arpeggiator (Arp, right LED).
- **Rate**: in Mod mode the vibrato rate, in Arp mode the arpeggiator rate. The LED next to it blinks with the vibrato LFO or the arpeggiator steps.
- **Depth**: vibrato depth. The mod wheel adds to it.
- **Arpeggiate**: switches the arpeggiator on.
- **Transpose Down and Up**: transpose the program one octave down or up. With both off the program plays at its own pitch. In Arp mode they shift the arpeggio an octave down or up instead (Arp Transpose Octave on Page 2).
- **Portamento**: glide time. Mode, destination and the other glide settings are on Page 2.
- **Osc 2 Detune**: fine tuning of oscillator 2.
- **Vintage**: adds the voice-to-voice differences of an older unit in pitch and cutoff, as the OB-X8's Vintage knob.
- **Vol/Balance**: the program volume. With Split or Double on it sets the balance between the lower and upper program.

In Mod mode the four keys are:

- **Osc 1 and Osc 2**: send the vibrato to oscillator 1, oscillator 2 or both.
- **Osc 2 Only**: pitch bend moves oscillator 2 only.
- **Amount**: pitch bend range of 2 semitones when off. When lit, the bend range is the Page 2 Bend Lever Amount (12 semitones by default).

In Arp mode they are:

- **Hold**: the notes latched by HOLD are arpeggiated.
- **Kbd**: the keys you hold down are arpeggiated.
- **Down and Up**: the direction. The arpeggiator plays the keys in the order they were pressed. Up plays that order forward, Down backward, both forward and back. With both off the notes play in random order.

Arp Transpose on Page 2 shifts the arpeggio by an octave and can step it through up to five intervals, as on the OB-X8. See the Page 2 top row.

The arpeggiator rate runs from about 0.14 to 30 steps per second. With Programs > Arp Sync to Host Tempo ticked, the RATE knob picks a note value from 1/1 to 1/32 triplet instead, and the steps follow the host tempo and position.

Modulation



The LFO has three wave keys and two destination columns, each with its own depth.

- **Rate**: LFO rate.
- **Sine, Square and S/H**: the LFO waves, one at a time. Pressing Sine and Square together gives a rising saw, Square and S/H together a falling saw: click the second key within 150 ms of the first, or Shift-click it.
- **Depth 1**: modulation depth into the first destination column: Osc 1, Osc 2 and Filter.
- **Depth 2**: modulation depth into the second destination column: PWM 1, PWM 2 and Volume.

The LFO type on Page 2 chooses between the OB-X/Xa and OB-8 LFO laws, and Page 2 also holds trigger, key tracking and the delay and attack of the two modulation depths.

Oscillators



- **Frequency 1 and 2**: pitch of each oscillator.
- **Pulse Width**: width of the pulse wave of both oscillators. Page 2 sets each oscillator's width separately.
- **Saw and Pulse**: the waves of each oscillator. With both off the oscillator plays a triangle.
- **Mod**: two LEDs that step through off, X-Mod (left), F-Env (right) and both. X-Mod lets oscillator 2 modulate the frequency of oscillator 1. F-Env sends the filter envelope to the pitch of oscillator 2; the filter MODULATION knob sets how far, up to 12 semitones.
- **Sync**: oscillator 1 is synced to oscillator 2.

Filter

- **Frequency**: cutoff.
- **Resonance**: emphasis around the cutoff.
- **Modulation**: filter envelope amount.
- **Type**: steps through the filter types X (OB-X 2-pole, left LED), Xa (OB-Xa 2-pole, right LED) and Xa4 (OB-Xa 4-pole, both LEDs). The SEM high pass, band pass and notch and the Modified OB-Xa 4-pole are chosen on Page 2; with a SEM type both LEDs are off and TYPE returns to X.
- **Osc 1, Osc 2 and Noise**: mixer on/off keys. The levels are on Page 2.
- **Kbd**: filter key tracking on or off. The amount is on Page 2.

Envelopes



The upper row is the filter envelope, the lower row the volume envelope, each with Attack, Decay, Sustain and Release. Page 2 sets the envelope type (OB-X/Xa or OB-8), which changes the shape and timing of the filter envelope as on the OB-X8.

Keyboard



- **Split**: the keyboard is split. The current program plays below the split point and the upper program above it.
- **Double**: the current program and the upper program play together.
- **Lower and Upper**: with Split or Double on, choose which of the two programs the panel shows and edits. The lit key marks the layer being edited. Edit Lower and Edit Upper in Menu > Split / Double do the same.

Menu > Split / Double holds the settings of both modes. They are stored with the lower program:

Item	What it does
Off, Split, Double	The keyboard mode, the same as the SPLIT and DOUBLE keys.
Edit Lower, Edit Upper	Which of the two programs the panel shows and edits.
Upper Program	The program of the current bank that plays the upper layer.
Split Point	The lowest key of the upper layer. Set from Next Key takes the next key you play.
Lower Transpose, Upper Transpose	Transposes a layer by up to three octaves.
Lower Detune	Detunes the lower layer by up to 50 cents.
Balance	The volume balance between the two layers.
Voice Allocation	4 + 4 (OB-X8) gives each layer four voices, as on the unit. Program Voice Counts lets each program use its own number of voices.

Programmer

A bank holds 128 programs in 16 groups of 8, as on the OB-X8.

- **Manual**: resets the current program to the default sound (Default.fxp in the Presets folder). It asks first; Shift-click or right-click resets at once.
- **Page 2**: switches to the second parameter page.
- **Bank knob**: steps through the banks in the Banks folder. Drag it or use the mouse wheel. In disk mode it steps through the preset folders.
- **Display**: shows the bank name, the group, the program name and EDITED. Click the bank name to choose a bank from a list, click the program name to choose a program.
- **Group knob**: steps through the 16 groups of 8 programs.
- **1 to 8**: select a program in the current group.
- **Global**: opens the main menu.
- **Write**: saves the current program into the bank and saves the bank file. It asks first; Shift-click or right-click saves at once.

On Page 2 the programmer changes two keys:

- **New** (in place of MANUAL): creates a new program and asks for its name. Shift-click or right-click names it Default without asking.
- **Disk** (in place of WRITE): switches between the bank and disk mode. In disk mode the presets in a folder of the Presets folder take the place of a bank, and the BANK knob steps through the folders. File > Search Presets finds presets by name.

Key combinations

As on the OB-X8, holding a key and playing a note sets a value; the note does not sound. Hold the key down with the mouse while you play, or Alt-click the key to keep it held (the display shows HOLDING) and Alt-click it again to let go; a held key lets go by itself after 5 seconds without use. The keyboard's low C (C0 on the unit) is MIDI note 36, C2 is note 60.

Hold, then press	Sets
CHORD + a key	Chord Key Limit: the highest key that plays the chord.
CHORD (Alt-click) + HOLD	Chord Hold Mode: Key Only or Infinite.
SPLIT + a key	The split point.
AMOUNT + a key from C0 to C1	Bend Lever Amount: C0 a quarter step, C1 one octave. Mod mode only.
UNISON + a key from C0 to C5	Portamento bend: half the interval to C2. C0 bends up one octave.
LOWER + a key	Lower Transpose upward from low C. Split or Double on.
UPPER + a key	Upper Transpose around C2: low C is two octaves down, high C three octaves up. Split or Double on.
LOWER (Alt-click) + OSC 2 DETUNE	Lower Detune instead of the Osc 2 detune. Split or Double on.
MODE and ARPEGGIATE (Alt-click both) + up to five keys	Arp Transpose 1 to 5 in order, upward from C0.

Page 2



Page 2 holds the settings of the OB-X8's second parameter page. The knobs work as on Page 1; the selectors show their value and open a list when clicked. All Page 2 settings are stored with the program.

Top row



Control	What it does
A, B, C, D	The group letters of the original OB synthesizers: each selects one group of 8 among four groups. Clicking the lit letter moves on to the next four groups (5-8, 9-12, 13-16); away from groups 1-4 the lit LED blinks.
Bend Lever Amount	Pitch bend range while AMOUNT is lit: 1/4 (a quarter step) or 1 to 12 semitones.
MIDI #74 Osc 2, MIDI #74 Filter	Amounts from 0 to 127, stored with the program and exchanged with a linked OB-X8. On the unit tested they did not change how CC 74 plays outside MPE, so in OB-Xd 4 they do not change the sound either. CC 74 opens the filter from the FREQUENCY knob, about one semitone per step, as the OB-X8 does; CC 74 at 0 leaves the cutoff at the knob.
Arp Transpose Octave	Down, Off or Up: the arpeggio plays one octave lower or higher.
Arp Transpose Select	0 to 5: how many transpose steps the arpeggio cycles through. At 0 the pattern plays untransposed. With a higher setting the pattern plays once as held, then once for each step in turn.
Arp Transpose 1 to 5	The interval of each step, shown as a note over C0: C0 plays the pattern as held, D0 two semitones higher, C1 one octave higher, up to C10.
Chord Key Limit	Keys above this note play normally while chord memory is on.
Chord Hold Mode	Key Only or Infinite.
Portamento Mode	Normal / Linear, Exponential, Equal Time, or Bend Up (from 0.5 to 12 semitones below) and Bend Down (from 0.5 to 19.5 semitones above).
Portamento Dest	Osc 1, Osc 2 or both.
Portamento Match	All voices glide at the same rate. Off gives each voice a slightly different rate, as on the unit.
Portamento Quantz	The glide moves in semitone steps.
Portamento Legato	Glide only in Unison while a key is held; other notes jump.

Pan Mode	How the voices are placed in the stereo field: 4L4R, PingPong, Splayed, Spread or Mono.
Pan Width	Full, Half or Quarter.

Modulation



Control	What it does
LFO Trigger Point	The phase at which the LFO starts when it is triggered.
Type	The LFO laws of the OB-X/Xa or the OB-8.
Keyboard Trig	Each note restarts the LFO.
Keybd Track	The LFO rate follows the highest held key.
Sample/Hold In	The source of the S/H wave: Noise or the vibrato LFO. With the vibrato LFO the S/H follows the vibrato wave: the saws step at twice the vibrato rate, the square holds one level, S/H and Noise give random steps.
Shift Voice 5-8	Voices 5 to 8 run their LFO 90 or 180 degrees after voices 1 to 4. Works with Keyboard Trig and Keybd Track off.
Volume Dest	The VOLUME destination modulates the voice volume, or the level of Osc 1 or Osc 2. On an oscillator the LFO adds to its level, up to about twice the full level.
Vibrato Wave	Triangle, Square, Saw Up, Sample and Hold, Saw Down or Noise.
Mod 1 and Mod 2 Delay Time	Time before Depth 1 or Depth 2 starts after a note.
Mod 1 and Mod 2 Attack Time	Time the depth takes to reach its full value.
Env Type	Normal: the depth is 0 during the delay, then rises to full over the attack (modulation that fades in). Inverted: the depth starts at full and falls to 0 over the attack, or stops when the delay ends if the attack is 0. Mod 1 shapes Depth 1 (Osc 1, Osc 2, Filter), Mod 2 shapes Depth 2 (PWM 1, PWM 2, Volume).
Quantize	Mod 1: the pitch modulation moves in semitone steps, the filter modulation in steps too. Mod 2: the pulse width and volume modulation move in steps; with the OB-X/Xa LFO type the volume modulation turns into on and off.
Osc 1 Invert	Mod 1: the LFO moves the pitch of oscillator 1 opposite to oscillator 2. Mod 2: the same for the pulse width.

Env->LFO Spd (Mod 2)	Depth 2 also raises the LFO rate, following the delay and attack of Mod 2. Inverted slows the LFO down instead.

Oscillators and Filter



Control	What it does
Osc 1 Level, Osc 2 Level, Noise Level	Mixer levels. The keys on Page 1 switch them on and off.
Osc 1 and Osc 2 Pulse Width	Pulse width of each oscillator.
Osc 2 Tri. XMod	Adds the triangle of oscillator 2 to the X-Mod source.
Osc Square Mode	OB-X/Xa or OB-8: the OB-8 mode plays the pulse wave 2.8 dB lower.
Filter Type	OB-X/SEM 2-pole low pass, SEM 2-pole high pass, band pass and notch, OB-Xa/8 2-pole and 4-pole low pass, and the Modified OB-Xa/8 4-pole low pass.
Filter Keybd Track	Amount of filter key tracking.
Envelope Type	OB-X/Xa or OB-8 envelopes.
Pedal Release Time	Release time of both envelopes while the sustain pedal is down, with Programs > Sustain Pedal Sets Release ticked.
Velocity	Off, Amp, Filter or Amp+Filter: which envelopes follow key velocity.
Velocity Amount	How much velocity changes them.

Voices



Control	What it does
Voice Detune Range	Random detune between the voices.

Unison Voices	1 to 8 voices stacked on a note in Unison.
Unison Key Mode	Low, High or Last Note priority, each with or without envelope retrigger.
Aftertouch	Off, LFO, Filter or LFO+Filter.
Aftertouch Amount	Depth of the aftertouch modulation.
Aftertouch To Vol	Aftertouch also raises the volume.

Engine Types

OB-Xd 4 has its own engine and, for programs made with OB-Xd 3, the Legacy engine. Each program stores which one it uses for the filter, the envelopes, the LFO and the oscillators. Programs made in OB-Xd 4 and programs loaded from an OB-X8 use the OB-X8 types.

Part	Types
Filter	OB-X 2-pole (with the SEM high pass, band pass and notch), OB-Xa 2-pole, OB-Xa 4-pole, Modified OB-Xa 4-pole, Legacy.
Envelopes	OB-X/Xa, OB-8, Legacy. The type changes the filter envelope; the volume envelope is the same for all types, as on the unit.
LFO	OB-X/Xa, OB-8, Legacy.
Oscillators	OB-X8 (voice detune, oscillator laws and free-running oscillators) or Legacy.

With Legacy, the controls work as in OB-Xd 3. Programs > Circuit Filter Mode switches the Legacy filter between its classic and circuit models; it does not change the OB-X8 filter types.

Oversampling

Programs > Oversampling chooses Use Program Settings, or locks every program to no oversampling, 2x or 4x. Use 4x for Bounce Only plays in realtime at the program setting and renders bounces at 4x. The OB-X8 filter types run at 4x or more at any setting, and the Modified OB-Xa 4-pole at 8x (4x above 50 kHz, 2x above 100 kHz host rate). The menu appears once OB-Xd 4 is registered.

Programs and Banks

A bank is an .fxb file of 128 programs in the Banks folder. Choose one with the BANK knob, by clicking the bank name on the display or in the Banks menu. Programs are saved into the bank with WRITE or File > Save Preset.

Importing and exporting

- **File > Import Preset and Import Bank** load OB-Xd presets (.fxp) and banks (.fxb), and OB-X8 programs and banks as SysEx (.syx). OB-X8 programs are converted to the OB-Xd 4 engine types.
- **File > Export Preset and Export Bank** save .fxp and .fxb files with every setting.
- **Export OB-X8 Preset (SysEx)** saves the current program for the unit's edit buffer, or for bank 1 to 6 at the current program number. **Export OB-X8 Bank (SysEx)** saves the bank for bank 1 to 6 of the unit.

You can also drop .fxp and .fxb files on the window.

Program settings

Item	What it does
Bank Presets	Lists the programs of the current bank.
Panning	Pan presets for the voice pan knobs of Legacy programs.
Analog Mode	Small per-voice differences in the filter, stored with the bank.
Persistent Voicing	The same voice tends to play the same note again, so each note keeps its voice's character.
Global Arp Settings	The arpeggiator settings stay the same when the program changes.
Arp Sync to Host Tempo	The arpeggiator rate picks note values that follow the host tempo. Off: the internal clock.
Sustain Pedal Sets Release	On by default, as the OB-X8's Normal (Release) pedal mode: with OB-X8 programs the sustain pedal sets both release times to Pedal Release Time instead of holding the notes. Off holds the notes (the unit's Note On mode). Legacy programs always hold.
Circuit Filter Mode	The circuit model of the Legacy filter.

Main Menu Reference

Menu	Contents
File	Reset, Rename and Save Preset, Search Presets, Reload Preset. Import Preset and Import Bank (.fxp, .fxb, OB-X8 .syx), Export Preset (.fxp) and Export Bank (.fxb), Export OB-X8 Preset and Bank (SysEx). New, Rename, Reset and Delete Bank.
Programs	Bank Presets, Copy and Paste Preset, Copy and Paste Page 2 Settings, Oversampling, Panning, Analog Mode, Persistent Voicing, Global Arp Settings, Arp Sync to Host Tempo, Sustain Pedal Sets Release and Circuit Filter Mode.
Banks	All bank files in the Banks folder. While an OB-X8 is linked, the hardware banks come first.
MIDI	File (Save As, Rename, Delete, Import and Export of mapping files), MIDI Out, Channel, Show CC Mappings, Aftertouch, MPE Mode, MPE Preset, MPE Setup and the MIDI mapping files.
OB-X8	Shown when an OB-X8 is connected to the computer. See Connecting an OB-X8.
Hold	Latches the notes you play, like a held sustain pedal. Used by CHORD and the arpeggiator's HOLD key.
Split / Double	Keyboard mode and layer settings. See Keyboard.
Appearance	Window size from 0.75x to 2x, Theme, Preset Navigation and Small Popup.
Help	Open User Manual, Check Updates, the MTS-ESP status and the version number.

MIDI

The MIDI menu holds mapping files that assign CC numbers to the controls. Default and Custom come first, then the boards for hardware controllers and synths grouped by manufacturer. The Default mapping also receives the OB-X8's NRPN messages, so an OB-X8 can play and edit OB-Xd 4 from its own panel, Page 2 included.

- **MIDI Out**: sends the mapped CCs of the controls you move. Not available in AU and AAX.
- **Channel**: the receive channel, or Any (1-16).
- **Aftertouch**: with MPE off, sends channel aftertouch to Pulse Width, PW Offset (Osc 2), Cross Modulation, Osc 2 Detune, Cutoff, Pitch, Pan or Amp, with a depth from 5% to 100%.

Default CC map

The Default mapping file assigns these CC numbers. Some controls belong to the Legacy engine and do nothing on OB-X8 programs. CC 1 (mod wheel), CC 64 (sustain pedal) and CC 32 (bank select) work with every mapping file. CC 99, 98, 6 and 38 carry the OB-X8 NRPNs.

CC	Control
14	Init: a value of 64 or more resets the current program to Default.fxp, as the MANUAL key does. Works while CC 14 is not assigned in the mapping file.
15	Voices
16	Unison
17	Octave
18	Oversampling
19	LFO Rate
20	Velocity to Amp
21	As Played Voice Allocation
22	LFO Depth 1
23	Portamento
24	Voice Detune
25	LFO Depth 2
26	Amp Envelope Shape
27	Filter Envelope Shape
28	Filter Falloff
29	Unison Voices
30	Level Difference
31	Bend to Osc 2
33	Tune
35	Legato Mode
36	Amp Decay
37	Amp Sustain
38	Filter Attack
39	Filter Decay
40	Filter Sustain
41	Filter Release

42	Filter Resonance
43	Osc 2 Detune
44	LFO Sine
45	LFO Square
46	LFO Sample and Hold
47	LFO to Osc 1
48	LFO to Osc 2
49	LFO to Filter
50	LFO to Osc 1 PW
51	LFO to Osc 2 PW
52	Osc 2 Sync
53	Cross Mod
54	Osc 1 Frequency
55	Osc 2 Frequency
56	Osc Pitch Quantize
57	Osc 1 Saw
58	Osc 1 Pulse
59	Osc 2 Saw
60	Osc 2 Pulse
61	Pulse Width
62	Brightness
63	Filter Envelope to Pitch
71	Master Volume
72	Amp Release
73	Amp Attack
74	Filter Frequency
75	Vibrato Rate
76	Velocity to Filter
77	Osc 1 Level
78	Osc 2 Level
79	LFO 2 to Osc 1 PW
80	LFO 2 to Osc 2 PW
81 to 88	Pan, voices 1 to 8
89	LFO 2 Rate
90	LFO 2 Sine
91	LFO 2 Square
92	LFO 2 Sample and Hold
93	LFO 2 Depth 1
94	LFO 2 Depth 2
95	LFO 2 to Osc 1
96	LFO 2 to Osc 2

97	LFO 2 to Filter
100	LFO 2 Tempo Sync
102	Noise Level
103	Filter Key Track
104	Filter Multimode
105	Filter Bandpass
106	Filter 4-Pole
107	Filter Modulation
108	Envelope Detune
109	Filter Detune
110	Portamento Detune
111	Economy Mode
112	LFO Tempo Sync
113	PW Envelope Amount
114	PW Envelope to Both Oscillators
115	Envelope to Pitch of Both Oscillators
116	Filter Envelope Invert
117	Osc 2 Pulse Width Offset
118	Bend Range
119	Self-Oscillation Push

MPE

Choose MIDI > MPE Mode for controllers that send each note on its own channel. Pitch bend (X), CC 74 (Y) and pressure (Z) then act per note.

- **MPE Preset**: profiles for common MPE controllers, Save As, Rename, Delete and Open MPE Folder.
- **MPE Setup**: the destination of X (pitch or pan) with its range of 2 to 48 semitones, the destinations of Y (pulse width, PW offset, cross modulation, Osc 2 detune, cutoff, pitch, pan) with their depth and rest position, and the destination of Z (amp, cutoff or pitch) with its depth.

Tuning

When an MTS-ESP master runs, it tunes OB-Xd 4. The Help menu shows whether MTS-ESP is connected and the name of the scale it sends.

Connecting an OB-X8

If you own an OB-X8, OB-Xd 4 can work as its editor and librarian. Connect the unit to the computer by USB. OB-Xd 4 looks for MIDI ports with OB-X8 in their name and talks to them directly, without going through the host's MIDI routing. The OB-X8 menu appears in the main menu once a unit is found.

Linking

Choose OB-X8 > Link to OB-X8. The menu entry shows the unit's OS version once the unit has answered. While linked:

- Edits made in OB-Xd 4 are sent to the unit as NRPN, and knobs turned on the unit move the controls in OB-Xd 4.
- Program changes can follow in both directions (see Send Program on Change and Follow Unit Program Changes below).
- A value that comes from the unit is never sent back to it, so there is no feedback loop.
- OB-Xd 4 talks to the unit on MIDI channel 1.

Hardware banks

The first time you link, OB-Xd 4 offers to download the unit's six banks (OB-X8, OB-8, OB-Xa, OB-SX, OB-X and User) into Banks > Hardware. Sync Hardware Banks downloads them again later. Each bank is stored as an .fxb file with a raw .syx copy, which keeps the settings OB-Xd 4 cannot show.

While linked, the six hardware banks come first in the bank list, so MIDI bank select (CC 32) values 0 to 5 choose unit banks 1 to 6 as on the unit, and your own banks follow from 6. On a hardware bank, the BANK knob steps through the six hardware banks as on the unit, and selecting a program selects it on the unit. Changing banks on the unit loads the matching file. When you choose a bank that is not a hardware bank, OB-Xd 4 asks whether to unlink; if you stay linked, its programs are sent to the unit's edit buffer.

OB-X8 menu

Item	What it does
Link to OB-X8	Switches the link on or off.
Linked Bank	The unit bank (1 to 6) that the current OB-Xd 4 bank stands for.
Sync Hardware Banks…	Downloads the six unit banks into Banks > Hardware, replacing the files there.
Get Edit Buffer	Loads the sound currently playing on the unit into OB-Xd 4.
Send to Edit Buffer	Sends the current program to the unit for playing, without storing it.
Get Bank…	Replaces the 128 programs of the current bank with the linked unit bank. Save the bank afterwards to keep them.
Write Program to Bank…	Stores the current program in the linked bank of the unit, at the same program number.
Write Bank to Bank…	Stores all 128 programs of the current bank in the linked bank of the unit.
Cancel Transfer	Stops a transfer in progress.
Backup OB-X8…	Saves all programs of the unit into one .syx file.
Restore OB-X8…	Sends such a file back. Each program goes to the bank and number stored in the file.
Update OS…	Sends an OB-X8 OS file (OBX8_Main_*.syx) to the unit.
Send Edits as NRPN	Sends each edit to the unit while linked.

Send Program on Change	When you select a program in OB-Xd 4, the unit receives it.
Follow Unit Program Changes	Selects the matching program in OB-Xd 4 when you change programs on the unit.

> *Write Program, Write Bank and Restore overwrite the unit's programs, and OB-Xd 4 asks before it writes. Make a backup first.*

Updating the OS

Set the unit's Global MIDI SysEx Cable to USB. The OS takes a few minutes to send: keep the plugin open and do not play or move controls. The unit then shows Saving OS; do not turn it off until it asks for a restart. After the restart, Oberheim asks for Reset Globals, Clear Calibration and Full Calibration. Choose Cancel OS Update to stop; the unit keeps its old OS, and you can turn it off and on and send the OS again.

Credits

OB-Xd 4 is developed, programmed and designed by George Reales. The 4.x versions are built on the structure of the OB-Xd 3 codebase, co-developed with Vadim Filatov, with the DSP and the GUI fully rewritten and redesigned.

How it was measured

The OB-Xd 4 engine started from a real unit in the studio. Each part of the voice was captured from the unit's outputs at 24-bit and 192 kHz, starting every take from a plain init program, in about 60 capture sessions: filter sweeps for every filter type, resonance and saturation at many levels, envelope and LFO timings, portamento laws, oscillator shapes, and the tuning, pan and filter differences between the eight voices.

Where the OB-X8 computes something in its firmware (the envelopes, the LFOs, portamento, voice allocation and the arpeggiator), OB-Xd 4 follows the unit's own arithmetic, checked step by step against the captures. The analog parts (oscillators, the four filter circuits and the mixer) were modelled from circuit references and fitted to the recordings. A test harness compares OB-Xd 4 with the captures sample by sample, so each change could be measured instead of judged by ear alone.

Support

For questions, bug reports and license matters, contact discoDSP support at https://www.discodsp.com/contact/