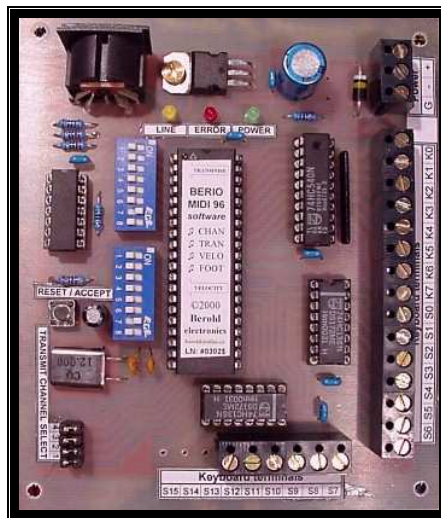


Intelligent MIDI interface

BERIO MIDI 64 and 96

Description, installation instructions and user manual.

Berio MIDI are microcomputer systems, which are able to connect your keyboard or another musical instrument with musical electronic system equipped with MIDI interface. Keyboard (or another instrument) performance may be e.g. recorded by PC, merged with performance of other "MIDI signal source" (e.g. MIDI sequencer, duplicate keyboard, foot-keyboard), etc.



Technical characteristics:

- ◆ **Input data** - input data for Berio MIDI modules are signal from contacts of keyboard keys or whatever keypad providing contact of your choice. Berio system is able to serve 64 or 96 keypad contacts, depending on the type of module. Keyboard state is scanned in time multiplex way. This means that keyboard with 64 keys may be connected to Berio system via 16 wires and keyboard with 96 keys may be connected to Berio module via 20 wires only. But it's necessary to connect one cheap small diode under each keypad. Diode and keypad wiring is described on diode matrices diagram below (see supplement). All wires on Berio system board are terminated by screw-connector.
- ◆ **Output data** - as output data standard MIDI signal is generated. System board is equipped with standard 5-pin DIN connector MIDI OUT, which may be connected via standard MIDI cable to a personal computer or electronic keyboard with MIDI IN input. Standard MIDI cable schematic is drawn below (see supplement).
- ◆ **MIDI channel setting** - system is able to transmit MIDI data on any MIDI channel. It's useful especially when device receiving generated MIDI signal has other voice assigned to individual channels. For example, Yamaha instruments have usually MIDI channel No.1 assigned to solo

voice, MIDI channel No.13 is assigned to accompaniment voice, channel No.16 to drums etc. MIDI channel setting is provided through four jumpers placed on system board. Modified jumpers setting is accepted every time system is restarted or powered up. Which jumpers may be present for individual MIDI channels is described in table (see supplement).

- ◆ **Transposition setting** - system is able to transpose all generated MIDI data. Transposition may be performed over entire range of audible tones, or more precisely over all tones supported by MIDI protocol. Transposition value is selected by seven miniature DIP switches located on system board. DIP's setting is accepted by system every time the system is restarted or powered up. Meaning of DIP settings is described in table (see supplement).
- ◆ **Velocity setting** - system is able to generate MIDI signal with any velocity, identical for all keys on keyboard. This feature is useful especially when generated data are merged with other data in real time. It is possible to make one keyboard sound stronger or softer compared to another keyboard, hand-keyboard compared to pedal-keyboard (foot keyboard) etc. Key velocity selection is provided by 7 miniature DIP switches placed on system board. DIP settings are described in table (see supplement).
- ◆ **Indication LEDs** - system is equipped with three LED diodes:
 - Green LED Power indicates that power supply of proper polarity is present.
 - Red LED Error indicates any critical error due to which the system can't generate MIDI data. When system action is proper, this LED flashes for a short time only after system reset or power up. Exception to this rule is "Demo mode", which is described in detail in relevant paragraph.
 - Yellow LED Line - indicates data flow on MIDI line. It's useful when some communication problems are being located, esp. during system installation and testing. LED Line shortly flashes after system reset or power up.
- ◆ **Reset/Accept button** - Berio MIDI system is equipped with reset / accept push button. This button may be used for acceptance of new DIP switches or jumpers setting (MIDI channel, transposition, velocity). In normal action, this button needn't be used - acceptance is provided automatically after power-up.
- ◆ **Power supply** - system board is powered by DC voltage between 8 and 18 Volts. Supply current is approx. 50 mA, voltage polarity must be respected. Regular power supply adapter for 230V/50Hz may be used (no special requirements).
- ◆ **Input digital filtering** - for better performance, the Input digital filtering unit is implemented in the system. This unit should eliminate the surges on keypad contacts. Keyboard state is read periodically in approx. one-millisecond intervals. State of every keypad must be repeatedly read as unchanged. Only then a MIDI message can be sent on MIDI line.

- ◆ ***Absolute polyphony*** - Berio MIDI system does not restrict polyphony in any way. It means that if, in theory, all keys on keyboard are pressed simultaneously, all corresponding data will be sent on MIDI line.
- ◆ ***Demonstration song*** - if three lowest keypads are pressed during start up or system reset, Berio module plays short demonstration song. While it plays, red LED *Error* comes on. When demo song has finished, LED Error is goes off and system begins normal operation.
- ◆ ***Diode matrix*** - diode matrix must be implemented near keyboard contacts. Matrix wiring is shown in schematic (see supplement).
- ◆ ***Damper / Sustain pedal (foot switch)*** - a pedal (foot switch) can be connected to system Berio MIDI, interpreted as Damper / Sustain. This pedal is connected via keyboard diode matrix as the highest keypad (alternative function of highest keypad).
- ◆ ***ESD protection*** - system is based on high speed CMOS technology. Protection against damages due to electrostatic discharges is assured by integrated clamp diodes on all terminals for keyboard.
- ◆ ***Generated code compatibility*** - MIDI code generated by Berio MIDI system is compatible with any device made by the following manufacturers:

360 Systems, Ad Lib, ADA, Adams-Smith, ADB, Akai, AKG Acoustics, Alesis, Allen & Heath Brenell, Allen Organ Co., AMEK Systems & Controls, Aphex, Apple Computer, ART, Artisyn, Audio Architecture, Audio Veritrieb, Audiomatica, Avab Electronik, Axxes, Baldwin, Berold electronics, Blue Sky Logic, Bontempi/Farfisa, Breakaway Technologies, Broderbund Software, BSS Audio, CAE, Cannon Research Corporation, Casio, Clarity, Clavia Digital Instruments, CTI Audio, DDA, Digidesign, Digigram, Digital Music Corporation, DOD Electronics, Dr.Bohm/Musician International, Dream, Dynacord, Elka, E-mu Systems, Encore Electronics, Ensoniq, ETA Lighting, Euphonix, Eventide, F.B.T. Electronica, Fender, Forefront Technology, Fostex, Fujitsu Electric, Gallien Krueger, Garfield Electronics, Grey Matter, GT Electronics/Groove Tubes, Gulbrandsen, Harmony Systems, Hinton Instruments, Hohner, Hoshino Gakki, Hotz Instruments Technologies, IBM, IDP, InterMIDI, Intone, Inventronics, IOTA Systems, IVL Technologies, J L Cooper, Japan Victor, Jellinghaus, JEN, Jim Marshall Products, Kamiya, KAT, Kawai, Kenton Electronics, Key Concepts, KMX, Korg, KTI, Kurzweil, Lake Butler Sound Company, Larking Audio, Lexicon, Lone Wolf, Lowrey, Marquis Musi, Matsushita Communication Industrial, Matsushita Electric, Meisoshia, Micon Audio Electronics, Microsoft, MIDITEMP, Midori Electronics, Moog Music, Moridaira, Music Quest, Musonix, New England Digital, Nishin Onpa, NSI Corporation, Oberheim, Opcode, Orban, Palm Tree Instruments, Passac, Passport Designs, Peavey Electronics, Perfect Fretworks, PianoDisc, PPG, Quasimidi, Rane Corporation, Real World Design, Richmond Sound Design, RJMG/Niche, Rocktron Corp., Rogers Instrument Corp., Roland, S&S Research, Sequential Circuits, SIEL, Solid State Logic, Solton, Sony, Soundcraft Electronics, Soundtracs, Southern Music Systems, Southworth, Spatial Sound/Anadi Inc, Spectrum Design & Development, Stepp, Strand Lighting, Studer-Editech, Suzuki Musical Instrument Mfg., Synthaxe, TC Electronic, TEAC, The Software Toolworks, Trident, Twister, Uptown, Voce, Voyce Music, Voyetra/Octave Plateau, Waldorf Electronics, Warner New Media, Waveframe, Wersi, Yamaha, Yes Technology, Zero 88 Lighting, Zeta Systems a Zoom.

MIDI systems of other manufacturers are probably compatible too, but this compatibility is not guaranteed.

- ◆ ***Installation recommendations*** - wire length between keypad contact and Berio MIDI system board should be as short as possible. The wires must not be grounded, connected to power supply

or connected to each other. If number of installed keypads is lower than nominal module number of keypads, the keypads should be wired in direction from the lowest to highest keypad, while some highest keypads remains unconnected.

◆ **Module versions and mechanical data:**

- **BERIO MIDI 64** serves up to 64 keypads
 - Dimensions: 107 mm x 125 mm x 25 mm (4.22" x 4.93" x 1")
 - Weight: 100 g (3.57 ounce)
- **BERIO MIDI 96** serves up to 96 keypads
 - Dimensions: 107 mm x 125 mm x 25 mm (4.22" x 4.93" x 1")
 - Weight: 110 g (3.93 ounce)

◆ **Manufactured system standard features:**

- Berio MIDI 64 or Berio MIDI 96 system board
- powered by DC voltage 8 to 18 V (or by AC voltage 230V/50Hz)
- transmission channel select option
- transposition select option
- velocity is fixed (middle level)
- sustain pedal option.

Other system configurations can be manufactured (minimum of 5 pcs).

◆ **Guarantee:** 2 years (24 months)

© 1998 - 2013 Berold electronics
e-mail: berio@akordeoncentrum.cz
<http://www.beriomidi.info/>

Orders are accepted by
Accordion Center Jiri Koucky
<http://www.akordeoncentrum.cz/>

Fricova 75
251 65 Ondrejov u Prahy
Czech republic, E.U.

Order via e-mail: berio@akordeoncentrum.cz.

Business identification number: 125 27 921.

Reception and dispensation of commissions at any time upon agreement.

Commissions may be sent via post too.

Technical questions will be answered at berio@akordeoncentrum.cz.

Supplement:

MIDI Channel Jumpers Position Table

Channel number	Jumper presence:			
	No. 1	No. 2	No. 3	No. 4
1	yes	yes	yes	yes
2	no	yes	yes	yes
3	yes	no	yes	yes
4	no	no	yes	yes
5	yes	yes	no	yes
6	no	yes	no	yes
7	yes	no	no	yes
8	no	no	no	yes
9	yes	yes	yes	no
10	no	yes	yes	no
11	yes	no	yes	no
12	no	no	yes	no
13	yes	yes	no	no
14	no	yes	no	no
15	yes	no	no	no
16	no	no	no	no

Example:

If you want to transmit MIDI signal on channel No. 9, apply jumper caps on positions 1, 2 and 3. Do not apply jumper cap on position 4.

Standard MIDI cable wiring:



červená = red; černá = black; stínění = shielding, konektor = connector

Transposition and Velocity DIP Switch Settings

Chosen transposition	DIP switch positions:							Chosen velocity
	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	
C ₃	OFF	OFF	OFF	OFF	OFF	OFF	OFF	silence
C ₃ #	ON	OFF	OFF	OFF	OFF	OFF	OFF	p p p
D ₃	OFF	ON	OFF	OFF	OFF	OFF	OFF	
D ₃ #	ON	ON	OFF	OFF	OFF	OFF	OFF	
E ₃	OFF	OFF	ON	OFF	OFF	OFF	OFF	
F ₃	ON	OFF	ON	OFF	OFF	OFF	OFF	
F ₃ #	OFF	ON	ON	OFF	OFF	OFF	OFF	
G ₃	ON	ON	ON	OFF	OFF	OFF	OFF	
G ₃ #	OFF	OFF	OFF	ON	OFF	OFF	OFF	
A ₃	ON	OFF	OFF	ON	OFF	OFF	OFF	
A ₃ #	OFF	ON	OFF	ON	OFF	OFF	OFF	
H ₃	ON	ON	OFF	ON	OFF	OFF	OFF	
C ₂	OFF	OFF	ON	ON	OFF	OFF	OFF	
C ₂ #	ON	OFF	ON	ON	OFF	OFF	OFF	
D ₂	OFF	ON	ON	ON	OFF	OFF	OFF	
D ₂ #	ON	ON	ON	ON	OFF	OFF	OFF	
E ₂	OFF	OFF	OFF	OFF	ON	OFF	OFF	
F ₂	ON	OFF	OFF	OFF	ON	OFF	OFF	
F ₂ #	OFF	ON	OFF	OFF	ON	OFF	OFF	
G ₂	ON	ON	OFF	OFF	ON	OFF	OFF	
G ₂ #	OFF	OFF	ON	OFF	ON	OFF	OFF	
A ₂	ON	OFF	ON	OFF	ON	OFF	OFF	
A ₂ #	OFF	ON	ON	OFF	ON	OFF	OFF	
H ₂	ON	ON	ON	OFF	ON	OFF	OFF	
C ₁	OFF	OFF	OFF	ON	ON	OFF	OFF	
C ₁ #	ON	OFF	OFF	ON	ON	OFF	OFF	
D ₁	OFF	ON	OFF	ON	ON	OFF	OFF	
D ₁ #	ON	ON	OFF	ON	ON	OFF	OFF	
E ₁	OFF	OFF	ON	ON	ON	OFF	OFF	
F ₁	ON	OFF	ON	ON	ON	OFF	OFF	
F ₁ #	OFF	ON	ON	ON	ON	OFF	OFF	
G ₁	ON	ON	ON	ON	ON	OFF	OFF	
G ₁ #	OFF	OFF	OFF	OFF	OFF	ON	OFF	
A ₁	ON	OFF	OFF	OFF	OFF	ON	OFF	
A ₁ #	OFF	ON	OFF	OFF	OFF	ON	OFF	
H ₁	ON	ON	OFF	OFF	OFF	ON	OFF	
C	OFF	OFF	ON	OFF	OFF	ON	OFF	
C#	ON	OFF	ON	OFF	OFF	ON	OFF	
D	OFF	ON	ON	OFF	OFF	ON	OFF	
D#	ON	ON	ON	OFF	OFF	ON	OFF	
E	OFF	OFF	OFF	ON	OFF	ON	OFF	
F	ON	OFF	OFF	ON	OFF	ON	OFF	
F#	OFF	ON	OFF	ON	OFF	ON	OFF	
G	ON	ON	OFF	ON	OFF	ON	OFF	
G#	OFF	OFF	ON	ON	OFF	ON	OFF	
A	ON	OFF	ON	ON	OFF	ON	OFF	
A#	OFF	ON	ON	ON	OFF	ON	OFF	
H	ON	ON	ON	ON	OFF	ON	OFF	
c	OFF	OFF	OFF	OFF	ON	ON	OFF	
c#	ON	OFF	OFF	OFF	ON	ON	OFF	
d	OFF	ON	OFF	OFF	ON	ON	OFF	
d#	ON	ON	OFF	OFF	ON	ON	OFF	

Chosen transposition	DIP switch positions:							Chosen velocity
	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	
e	OFF	OFF	ON	OFF	ON	ON	OFF	
f	ON	OFF	ON	OFF	ON	ON	OFF	
f#	OFF	ON	ON	OFF	ON	ON	OFF	
g	ON	ON	ON	OFF	ON	ON	OFF	
g#	OFF	OFF	OFF	ON	ON	ON	OFF	
a	ON	OFF	OFF	ON	ON	ON	OFF	
a#	OFF	ON	OFF	ON	ON	ON	OFF	
h	ON	ON	OFF	ON	ON	ON	OFF	
c ¹	OFF	OFF	ON	ON	ON	ON	OFF	
c ¹ #	ON	OFF	ON	ON	ON	ON	OFF	
d ¹	OFF	ON	ON	ON	ON	ON	OFF	
d ¹ #	ON	ON	ON	ON	ON	ON	OFF	
e ¹	OFF	OFF	OFF	OFF	OFF	OFF	ON	f - forte
f ¹	ON	OFF	OFF	OFF	OFF	OFF	ON	
f ¹ #	OFF	ON	OFF	OFF	OFF	OFF	ON	
g ¹	ON	ON	OFF	OFF	OFF	OFF	ON	
g ¹ #	OFF	OFF	ON	OFF	OFF	OFF	ON	
a ¹	ON	OFF	ON	OFF	OFF	OFF	ON	
a ¹ #	OFF	ON	ON	OFF	OFF	OFF	ON	
h ¹	ON	ON	ON	OFF	OFF	OFF	ON	
c ²	OFF	OFF	OFF	ON	OFF	OFF	ON	
c ² #	ON	OFF	OFF	ON	OFF	OFF	ON	
d ²	OFF	ON	OFF	ON	OFF	OFF	ON	
d ² #	ON	ON	OFF	ON	OFF	OFF	ON	
e ²	OFF	OFF	ON	ON	OFF	OFF	ON	
f ²	ON	OFF	ON	ON	OFF	OFF	ON	
f ² #	OFF	ON	ON	ON	OFF	OFF	ON	
g ²	ON	ON	ON	ON	OFF	OFF	ON	
g ² #	OFF	OFF	OFF	OFF	ON	OFF	ON	
a ²	ON	OFF	OFF	OFF	ON	OFF	ON	
a ² #	OFF	ON	OFF	OFF	ON	OFF	ON	
h ²	ON	ON	OFF	OFF	ON	OFF	ON	
c ³	OFF	OFF	ON	OFF	ON	OFF	ON	
c ³ #	ON	OFF	ON	OFF	ON	OFF	ON	
d ³	OFF	ON	ON	OFF	ON	OFF	ON	
d ³ #	ON	ON	ON	OFF	ON	OFF	ON	
e ³	OFF	OFF	OFF	ON	ON	OFF	ON	
f ³	ON	OFF	OFF	ON	ON	OFF	ON	
f ³ #	OFF	ON	OFF	ON	ON	OFF	ON	
g ³	ON	ON	OFF	ON	ON	OFF	ON	
g ³ #	OFF	OFF	ON	ON	ON	OFF	ON	
a ³	ON	OFF	ON	ON	ON	OFF	ON	
a ³ #	OFF	ON	ON	ON	ON	OFF	ON	
h ³	ON	ON	ON	ON	ON	OFF	ON	
c ⁴	OFF	OFF	OFF	OFF	OFF	ON	ON	
c ⁴ #	ON	OFF	OFF	OFF	OFF	ON	ON	
d ⁴	OFF	ON	OFF	OFF	OFF	ON	ON	
d ⁴ #	ON	ON	OFF	OFF	OFF	ON	ON	
e ⁴	OFF	OFF	ON	OFF	OFF	ON	ON	
f ⁴	ON	OFF	ON	OFF	OFF	ON	ON	
f ⁴ #	OFF	ON	ON	OFF	OFF	ON	ON	
g ⁴	ON	ON	ON	OFF	OFF	ON	ON	
g ⁴ #	OFF	OFF	OFF	ON	OFF	ON	ON	
a ⁴	ON	OFF	OFF	ON	OFF	ON	ON	

Chosen transposition	DIP switch positions:							Chosen velocity
	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	
a ⁴ #	OFF	ON	OFF	ON	OFF	ON	ON	
h ⁴	ON	ON	OFF	ON	OFF	ON	ON	
c ⁵	OFF	OFF	ON	ON	OFF	ON	ON	
c ⁵ #	ON	OFF	ON	ON	OFF	ON	ON	
d ⁵	OFF	ON	ON	ON	OFF	ON	ON	
d ⁵ #	ON	ON	ON	ON	OFF	ON	ON	
e ⁵	OFF	OFF	OFF	OFF	ON	ON	ON	
f ⁵	ON	OFF	OFF	OFF	ON	ON	ON	
f ⁵ #	OFF	ON	OFF	OFF	ON	ON	ON	
g ⁵	ON	ON	OFF	OFF	ON	ON	ON	
g ⁵ #	OFF	OFF	ON	OFF	ON	ON	ON	
a ⁵	ON	OFF	ON	OFF	ON	ON	ON	
a ⁵ #	OFF	ON	ON	OFF	ON	ON	ON	
h ⁵	ON	ON	ON	OFF	ON	ON	ON	
c ⁶	OFF	OFF	OFF	ON	ON	ON	ON	
c ⁶ #	ON	OFF	OFF	ON	ON	ON	ON	
d ⁶	OFF	ON	OFF	ON	ON	ON	ON	
d ⁶ #	ON	ON	OFF	ON	ON	ON	ON	
e ⁶	OFF	OFF	ON	ON	ON	ON	ON	
f ⁶	ON	OFF	ON	ON	ON	ON	ON	
f ⁶ #	OFF	ON	ON	ON	ON	ON	ON	
g ⁶	ON	ON	ON	ON	ON	ON	ON	fff

Transposition = tone of the lowest key on keyboard.

Example of transposition setting: If the lowest key should be C2, set "TRANSPPOSE" DIP's Nos. 1, 2, 5, 6 and 7 OFF and DIP's Nos. 3 a 4 ON.

Example of velocity setting: If the velocity should be "forte", set "VELOCITY" DIP's Nos. 1 - 6 OFF and DIP No. 7 ON.

DIP No. 8 in each set (TRANSPPOSE and VELOCITY) is not wired and its setting does not have any effect.

Velocity terminology:

- ppp = piano pianissimo
- f = forte
- fff = forte fortissimo

Positions of other dynamic designations cannot be determined precisely as matching dynamics with individual transmitted codes is handled by the device receiving MIDI signal. Generally, every position stated in the Table has greater dynamics than the previous one. Logarithmic table is recommended. Specific velocity values should be found in manual of the device receiving MIDI signal.

Notes:

- a¹ = "international pitch"
- c¹ = "middle C" in MIDI terminology

Should a tone corresponding with pressed keypad (depending on transposition used) be higher than g6, it will be interpreted as C3, C3#, D3 etc.
 Example: using transposition g6, the second lowest key will be interpreted as C3, the third as C3# etc.

MIDI Implementation Chart

Function...	Transmitted	Recognized	Remarks
Basic Default	1 - 16	x	determined by jumpers
Channel : Changed	1 - 16	x	
Demo	1	x	
Note Number	0 - 127	x	
Velocity : Note ON	0 - 127	x	determined by DIP
Note OFF	0 - 127	x	determined by DIP
After Key's	x	x	
Touch Ch's	x	x	
Pitch Bender	x	x	
1	o *1	x	Modulation Wheel (MSB)
2	o *1	x	Breath controller (MSB)
7	o *1	x	Volume (MSB)
11	o *1	x	Expression (MSB)
64	o *2	x	Damper/Sustain pedal
65	o *2	x	Portamento
Control 66	o *2	x	Sostenuto pedal
67	o *2	x	Soft pedal
68	o *2	x	Legato pedal
Change 69	o *2	x	Soft 2 pedal
120	x	x	All sounds off
121	x	x	Reset all controllers
123	x	x	All notes off
Program Change	x	x	
System Exclusive	x	x	
Common Song pos.	x	x	
: Song sel.	x	x	
Tune req.	x	x	
System : Clock	x	x	
Real time : Reset	x	x	
Active sense	x	x	

Note:

*1 - Berio WIND in certain implementation only.
 *2 - Version with pedal enhancement only.

x : No
 o : Yes