

USER MANUAL

for

BBS64 rev.A – MIDI keyboard controller
inputs active low, semitone transpose, channel change, external power
firmware version 2

Overview

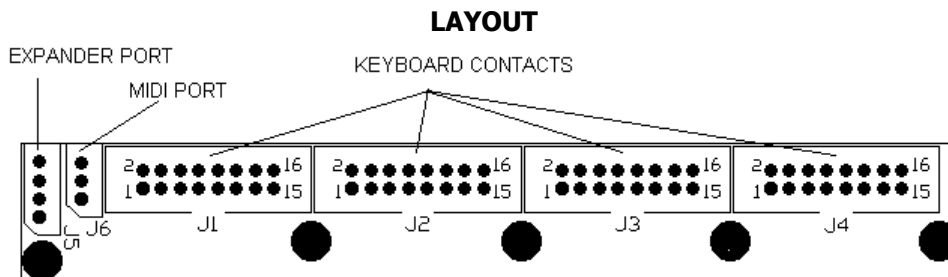
This model scans 61 keys contacts and sends appropriate MIDI notes. It cannot translate the velocity (or dynamics) of the hit key into MIDI data, this parameter is always set to maximum (127). If 61 keys is not enough, you can connect one "expander" that take care of additional keyboards. There are expander models available for 16 up to 128 keys.

Features

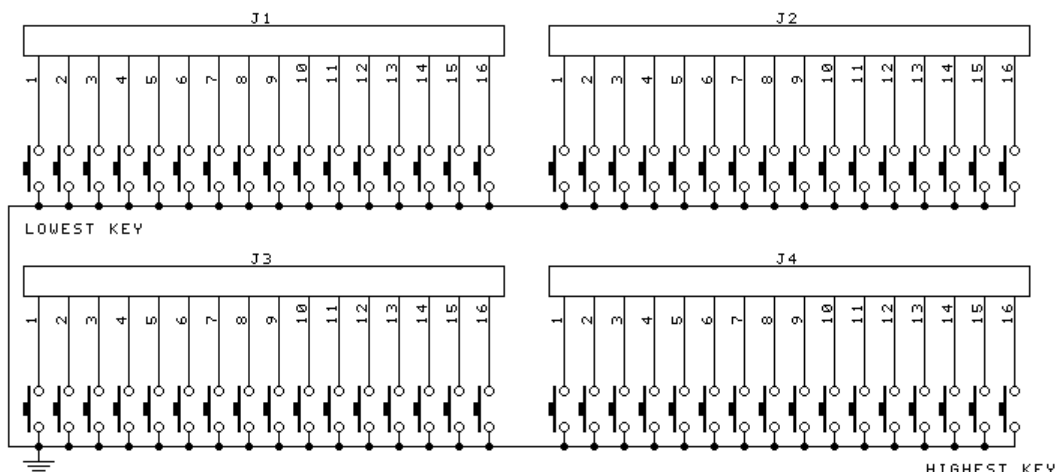
- single buss bar topology, no diode matrix needed
- expandability by additional board with up to 128 contacts
- independent transposition for all keyboards in steps of 1 semitone
- MIDI channel set separately for each keyboard
- all settings stored in non volatile memory, meaning they remain after disconnecting power
- the board can be used with DC power supply (5V DC, max 2mA) or without any external power supply if connected to PC sound card GamePort by special cable.

Connecting keyboard

Keyboard is connected to four 16-pin connectors - J1, J2, J3 and J4 shown below. Each of them covers 16 keys. The key contacts can have one common buss bar (with GND at the bar), or it can be driven from logic IC outputs. 0V at an input means "key pressed", +5V at an input means "key released".



Keyboard should be connected to four 16-pin headers according to the following diagram. Best is to use 4 IDC connectors and 16-wire flat computer grade cable. Each cable connects with 16 consecutive keys. 3 Last keys are used for special functions, like transpose and channel change.



Special functions

There can be numerous features ordered, but standard set is just transposition and channel change. To activate any special function, short appropriate pin to ground for some time (small fraction of a second but noticeable). This delay is introduced to eliminate any spurious contact de-bouncing, or accidental button hit.

Transposition

Each usage of transposition buttons makes the last played keyboard (meaning the one covered by this board itself, and any optional keyboards connected with expander module) to shift in one semitone steps. Transposition by 1 semitone up is achieved by applying GND to pin 15 in header J4, while 1 semitone down – to pin 16 in J4. There are only 2 “buttons”, and they affect last played keyboard. So if you want to change e.g. transposition of optional expander keyboard, play any note at it, and then press one of the transpose buttons to get desired shift. To reset transposition to default state (C, 65.4Hz, MIDI note 36), activate “transpose up” and “transpose down” simultaneously.

MIDI Channel

Channel of each keyboard can be set independently. Applying GND to pin 14 of J4 increments the MIDI channel used by last played keyboard. After reaching channel 16 it goes back to channel 1. There is only 1 “button”, and it affects last played keyboard.

Power supply

Recommended power supply is 5V DC. It is possible to run this board even from as low voltage as 3V battery, but its operation is not guaranteed then. Normal current consumption doesn't exceed 1mA. Make sure to use proper polarity of power supply. Blue wire should go to GND (0V), while red one to +5V DC. Connecting power in reverse will cause permanent damage to the board, and will not be covered by guarantee.

Expanders

BBS64 controller board scans only 61 note keys, but it can be expanded by additional controller. Depending on their size, the whole system can cover up to 3 keyboards or 189 keys over single MIDI socket. Currently there are various sizes available from 16 to 128 keys, the last one has those 128 keys split in 2 keyboards. Go to www.sowa.synth.net/midi for details