

# Connections

Required connections are:

- DC 9V, 300 mA, center positive. This adapter is supplied with the DecaBox.
- MIDI In & Out on standard DIN-5 circular jacks
- RS-232 cable, DB9-M on at least one end. RS-232 baud rate is 38,400 8N1 (8 data bits, no parity, 1 stop bit).

The DecaBox has three LEDs, one on each of the user interface pushbuttons. For this firmware build, the left LED flickers when data passes (in either direction) across the RS-232 port. The right LED likewise flashes in the presence of MIDI data, either in or out. In general, these two LEDs will appear to illuminate simultaneously. However, in our firmware they are controlled by a parallel set of functions.

In this firmware build, the three pushbuttons on the front panel have no specific function.

## **Buffering: MIDI vs RS-232**

MIDI data is sent and received at 31,250 bits per second. On the serial side, our baud rate is 38,400, which is approximately a 20% difference. For this reason, MIDI data may be sent to RS-232 equipment *at line speed*. DecaBox can process incoming MIDI transparently and without any delay. However, the reverse is not true. DecaBox contains an internal 128 byte buffer which stores incoming serial data and queues it for MIDI transmission. For short messages containing only tens of bytes, the system will send out the MIDI data as quickly as possible. Large, tightly spaced blocks of serial data may cause internal buffer overruns and data loss. For this reason, it's best to transmit a few tens of bytes at a time, then pause to allow the queue to clear.

For reference, a three-byte MIDI message such as 'note on' or 'note off' takes ~ 1 mS to transmit on the MIDI port.

The RS-232 connection on the DecaBox is identical to that of a standard PC or USB / serial adapter:

- Pin 2 Data Receive
- Pin 3 Data Transmit
- Pin 5 Ground

If the DecaBox is connected to a PC for testing or troubleshooting, a null modem cable is *required*. Pins 2 and 3 must swap to allow proper communication between two devices with identical serial pinouts.

Pinouts and connections to other equipment may vary; consult user manuals for best results.

The DecaBox USB port is used for firmware updates *only*. It neither transmits nor receives MIDI or serial data.

---

Revision #2

Created Tue, Oct 29, 2019 6:53 PM by ESINC

Updated Tue, Oct 29, 2019 7:11 PM by ESINC