

MUSICAL INSTRUMENT DIGITAL INTERFACE (MIDI)

“MIDI data is simply a series of number values, from 0 to 255, that allow control events to be universally understood by different hardware and software.”

– Peter Kirn, *Real World Digital Audio*

Reading

- Hass, 1. MIDI Overview and History & 2. MIDI Hardware, Introduction to Computer Music, from *Introduction to Computer Music* (Hass 2021)
- Kirn, How MIDI Models Performances; Adding Expressivity; Programs & Banks (GM) & System Messages, from *Real World Digital Audio* (Kirn 2006)

Terms & Concepts

<p>Note Messages Note-on/note-off pair - Note-on command - Note-off command Note number (0-127) Key velocity (0 & 1-127) Channel number (Max: 1-16)</p> <p>Channel Messages Aftertouch - Polyphonic - Channel Control change (CC) - Continuous (#0-#63, 0-127) - Switch (#64-#127, 0 or 127) Pitch bend - Course - Fine Program change - Bank - Program number</p> <p>System Messages System common System real-time System-exclusive (SYSEX)</p> <p>Adding Expressivity Pitch-bend wheel Modulation wheel Sustain pedal Expression pedal</p>	<p>Devices Synthesizer (Hardware) Virtual Instrument (Software) Controller keyboard Alternative controller Broadcast channel Polyphony</p> <p>Data Bit Baud rate (bits per second) Byte (8 bits) - Data byte (0-127) - Status byte Powers of 2 - $2^8 = 256$ values (0-255) - $2^7 = 128$ values (0-127) Numeric notation - Binary - Decimal - Hexadecimal MIDI bus MIDI data format MIDI data rate (31.25 kilobaud) MIDI event MSB/LSB Pulse per quarter (PPQ)</p> <p>Standard MIDI File (SMF) - Type 0 - Type 1</p>	<p>Control Change (CC) # #1 - Modulation wheel #7 - Volume #10 - Pan #64 - Sustain pedal #120 - All sound off #123 - All notes off</p> <p>Hardware Interconnection MIDI Ports: IN/OUT/THRU 5-pin DIN connector MIDI interface (2x2, 4x4, etc.) Master controller/slave Daisy chain</p> <p>Standards The MIDI Association (TMA) General MIDI (GM) - GM Instrument Library - GM Perc. Key Map - GM1, GM2 & GML - MIDI 2.0</p> <p>OpenSound Control (OSC)</p> <p>Synchronization MIDI Clock, MMC, MTC, SMPTE, etc.</p>
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See also

MUSC 336 > Learning MIDI

References

- Hass, Jeffrey. 2021. *Introduction to Computer Music*. Available online at:
https://cmtxt.indiana.edu/MIDI/chapter3_MIDI.php.
- Kirn, Peter. 2006. *Real World Digital Audio*. Berkeley: Peachpit Press.