

The Digital Art: MIDI

–What It Is and What It Means To Electronic Artists

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MIDI stands for Musical Instrument Digital Interface. It is a new standard specification, drawn up by several prominent manufacturers of electronic musical instruments, for transferring information among electronic musical instruments and controlling computers. Whereas audio cables enable a musician to send sound material from one instrument to another, a MIDI network enables a musician to send musical commands and gestures among two or more MIDI-equipped devices. Thus, for instance, a performer may "play" two or more sound-producing devices (such as synthesizers) from a single keyboard, use one control panel to adjust the operation of several devices, synchronize a network of instruments with a "master clock", or use a personal computer to record, process, and play back keyboard performances, sequences, panel control settings, and so forth.

MIDI-equipped instruments have 5-pin DIN sockets that accept or deliver MIDI signals. To interconnect MIDI-equipped instruments, a musician simply uses a standard two-wire MIDI cable that plugs into the instruments' sockets. No special wiring or adjustments is required.

Technically, MIDI is a Digital, Serial, Bi-directional interface. The term "Digital" means that all information is represented as a stream of numbers. Thus, for instance, when a musician plays a keyboard of a MIDI-equipped instrument, numbers corresponding to the keys which he depresses are transmitted as the keys are depressed. The term "Serial" means that the numbers are transmitted one bit at a time, a feature that allows instrument builders to use simple, reliable connectors and cables. Under the MIDI specification, the rate of information transfer is about 30,000 bits per second. A complete command, consisting typically of about thirty bits, thus takes about a thousandth of a second to transmit. Finally, the term Bi-directional means that information may flow in both directions between two MIDI-equipped instruments. For instance, a keyboard instrument may be connected to a MIDI-equipped computer, and the computer used both to record and play back MIDI information.

Although MIDI was originally designed to interconnect keyboard-controlled electronic musical instruments, drum machines, and small personal computers, it may also be used to transmit a wide variety of control signals of the types that are used by experimental musicians, sculptors, dancers, and other artists who employ networks of electronic instruments. One feature of MIDI which is of considerable importance to all artists is the ability of an instrument builder to define his own applications codes as part of the standard MIDI protocol. Thus, for instance, the same personal computer that can record and playback a keyboard performance can also record and play back continuous sound changes, complex lighting commands, and robot movements.

Hardware for recording, processing, and playing back MIDI commands is generally inexpensive and widely available. With this equipment, artists who use electronic instruments for performance or for creation of environments are now able to coordinate the operation of a network of instruments with unprecedented ease and convenience. In my presentation, I demonstrate exactly what is required to adapt standard MIDI instruments and software to control complex sound changes, lighting, and mechanical movement. My illustrations will include a system with several touch sensitive controllers for use in an interactive environment.