MIDI Basics

1. What's MIDI?

MIDI is an acronym that stands for Musical Instrument Digital Interface, a technology that allows electronic musical instruments to communicate with each other, by sending and receiving performance information.

Just what do we mean by "performance information"? Let's consider what happens when a pianist performs.

The pianist presses a key on a piano or presses a pedal. These actions are instances of "performance information" and reflect how the pianist played the instrument. MIDI is used to capture and express this information electronically. When you strongly play middle C on a MIDI keyboard, MIDI indicates the key number as 60, and the strength of playing as 120, for example. In this way, MIDI precisely describes your performance information in digital form.

This performance information—MIDI data—can be transmitted between MIDI-compatible musical instruments, or saved as a file for later playback. No matter what instrument or computer you use, the MIDI data will reproduce the original performance exactly the same. (Keep in mind that the actual sound of the performance may differ from instrument to instrument— for example, the acoustic piano sound on one instrument may sound more full and rich than on another—but the basic performance will be identical.)

The MIDI data saved as a file can easily be changed. For example, you can change an incorrectly played note to the correct one, change the song tempo, transpose the song to a desired key, etc. This feature of MIDI is very effective for creating a song or practicing with a musical instrument.

2. What You Can Do With MIDI

By connecting multiple MIDI devices (musical instruments and/or computer) with a cable, the MIDI data can be transmitted and received. For example, if you record your keyboard performance as a MIDI data, the recorded data can be transmitted to another instrument (or computer) and played back on it. You can even edit that data on the computer. You can also buy MIDI data (computer files) of your favorite songs from Internet websites (such as yamahamusicsoft.com) and listen to the data by playing it back on your instrument or computer.

Generally, MIDI cable is used for connecting an instrument to another instrument, and USB cable is used for connecting instruments to a computer. For details, refer to the owner's manual of your instrument.

> **✍ NOTE**
>
> MIDI data has the following advantages over audio data:
> • The data size is much smaller than audio data such as mp3, wav, etc.
> • The data can be effectively and easily edited.

(Example 1) **Using one keyboard to control a second, connected keyboard**

MIDI instrument   MIDI transmit

MIDI OUT   MIDI IN
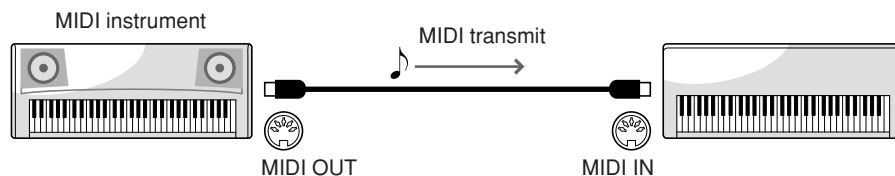
(Example 2) **Recording your keyboard performance to computer and editing the data**

Edited data can be played back on the keyboard again.

MIDI instrument   USB cable   Computer
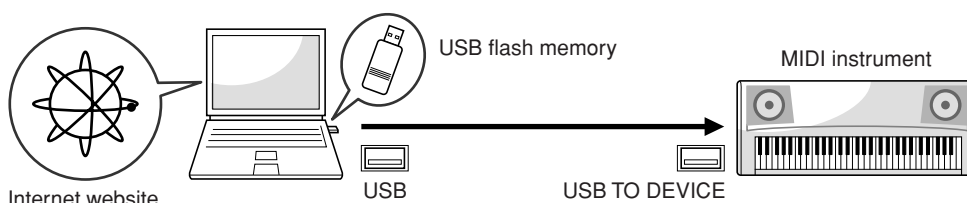
USB TO HOST   USB
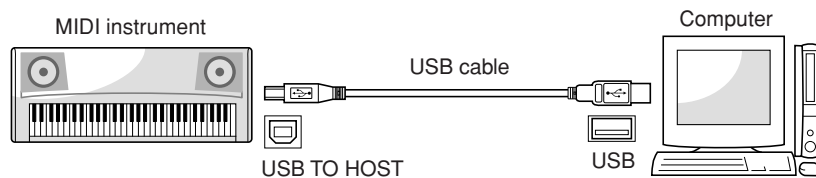
> **✍ NOTE**
>
> Proper sequencer software must be installed to the computer in order to edit MIDI data.

(Example 3) **Playing back MIDI data which you have bought from an Internet website on your instrument**

The MIDI data can be loaded to your instrument via USB flash memory.

Internet website   USB   USB flash memory   MIDI instrument

USB TO DEVICE

> **✍ NOTE**
>
> In order to connect USB flash memory, your instrument must have a USB TO DEVICE terminal.

3. MIDI Channels

MIDI performance data is assigned to one of sixteen MIDI channels. Using these channels, 1–16, the performance data for sixteen different instrument parts can be simultaneously sent over one cable.

For example, when you play a song on your keyboard, the song contains many parts—right-hand part, left-hand part, rhythm part, bass part, etc. On most instruments, different MIDI channels are assigned automatically to each part. When this MIDI song is transmitted to another instrument via a MIDI cable, each part is transmitted simultaneously, yet over separate channels.

Part (track) of your instrument	MIDI Transmit Channel		MIDI Receive Channel	Track of instrument receiving MIDI data
Right-hand part	Ch. 1	→	Ch. 1	Track 1
Left-hand part	Ch. 2	→	Ch. 2	Track 2
:	:		:	:
Rhythm 1 part	Ch. 9	→	Ch. 9	Track 9
Rhythm 2 part	Ch. 10	→	Ch. 10	Track 10
Bass part	Ch. 11	→	Ch. 11	Track 11
:	:		:	:
:	Ch. 16	→	Ch. 16	Track 16

MIDI instrument — MIDI transmit — MIDI cable — MIDI sequencer — MIDI OUT — MIDI IN
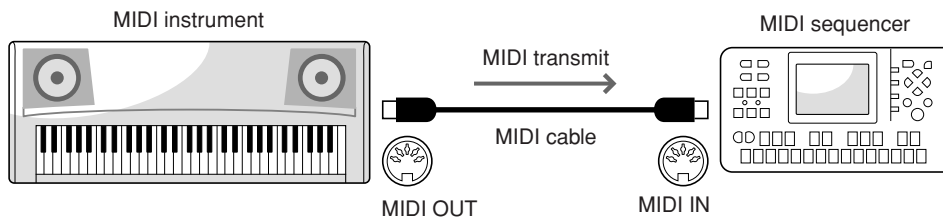
4. MIDI Messages

MIDI data (messages) can be divided into two groups: Channel messages and System messages. The following explanation shows an example of MIDI messages. For more details about MIDI messages—for example, when you want to edit the recorded MIDI data—please refer to any of the fine MIDI guidebooks that are commercially available.

■ Channel Messages

When you perform on a MIDI instrument, the following messages are generated.

Channel Message Examples

Instrument Operation	Messages
Playing the keyboard	Note On/Off (When the key was played/released) Note Number (Which key was played) Velocity (How strong the key was played)
Selecting a Voice	Program Change
Changing the volume, pressing Sustain Pedal, etc.	Control Change
Moving the Pitch Bend Wheel	Pitch Bend
Pressing the key down after the note is played	After Touch

■ System Messages

This is data that is used in common by the entire MIDI system. These include System Exclusive Messages for transferring data unique to each instrument manufacturer and Realtime Messages for controlling the MIDI devices.

✎ *NOTE*

The messages transmitted/received by your instrument are shown in the MIDI Data Format and MIDI Implementation Chart included in your instrument.