

PX-S1100/PX-S3100 MIDI Implementation

CASIO COMPUTER CO., LTD.

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Part I

Overview

1 Product Configuration as a MIDI Device

As a MIDI device, this Instrument consists of the System Section, Sound Generator Section, and Performance Controller Section described below. Each of these sections can send and receive specific MIDI Messages in accordance with its function.

1.1 System Section

The System Section manages the Instrument status and user data.

1.2 Performance Controller Section

The Performance Controller Section performs keyboard play and controller operations, and generates performance messages. Basically, generated performance messages are sent to external destinations while also being transmitted to the Sound Generator Section. The channel number of the sent channel message is in accordance with the Instrument's MIDI setting. For details about the MIDI setting, see the Instrument's User's Guide.

1.3 Sound Generator Section

The Sound Generator Section mainly performs receive of performance information and sound source setting information. It consists of a common part that does not depend on the channel and a musical instrument part that is independent of each channel.

1.3.1 Sound Generator Common Block

The common block consists of system effects, master control, etc. These can be controlled by effect function, or general universal system exclusive messages.

1.3.2 Instrument Part Block

The instrument part section is divided into A, B, C group for every 16 parts, and it consists of a total of 48 parts. The settings of each part can be changed using channel messages. Of these, only the C group can be controlled by external channel messages.

The functions assigned to each part are shown below.

| Port | Part number | MIDI Receive Ch | MIDI Transmit ch | Assigned Function | Details |
|------|-------------|-----------------|------------------|---------------------|-----------------|
| A | 01 | - | 1-16 | Upper1/Arpeggiator* | - |
| A | 02 | - | 1-16 | Upper2 | - |
| A | 03 | - | 1-16 | Lower1 | - |
| A | 04 | - | - | - | - |
| A | 05 | - | 1-16 | Auto Harmonize* | - |
| A | 06 | - | 6 | - | - |
| A | 07 | - | 7 | - | - |
| A | 08 | - | 8 | Metronome** | - |
| A | 09 | - | 9 | Accomp* | Percussion |
| A | 10 | - | 10 | Accomp* | Drum/Metronome* |
| A | 11 | - | 11 | Accomp* | Bass |
| A | 12 | - | 12 | Accomp* | Chord1 |
| A | 13 | - | 13 | Accomp* | Chord2 |
| A | 14 | - | 14 | Accomp* | Chord3 |
| A | 15 | - | 15 | Accomp* | Chord4 |
| A | 16 | - | 16 | Accomp* | Chord5 |

| Port | Part number | MIDI Receive Ch | MIDI Transmit Ch | Assigned Function | Details |
|------|-------------|-----------------|------------------|------------------------|----------------------------------|
| B | 17 | - | - | Auto Play/Recorder | System Track Upper1/Arpeggiator* |
| B | 18 | - | - | Auto Play/Recorder | System Track Upper2 |
| B | 19 | - | - | Auto Play/Recorder | System Track Lower1 |
| B | 20 | - | - | - | - |
| B | 21 | - | - | Auto Play/Recorder* | System Track Auto Harmonize* |
| B | 22 | - | - | - | - |
| B | 23 | - | - | - | - |
| B | 24 | - | - | Pre count | - |
| B | 25 | - | - | - | - |
| B | 26 | - | - | - | - |
| B | 27 | - | - | - | - |
| B | 28 | - | - | - | - |
| B | 29 | - | - | - | - |
| B | 30 | - | - | - | - |
| B | 31 | - | - | - | - |
| B | 32 | - | - | - | - |

| Port | Part number | MIDI Receive Ch | MIDI Transmit Ch | Assigned Function | Details |
|------|-------------|-----------------|------------------|--------------------------|-----------------------|
| C | 33 | 1 | - | MIDI/Auto Play/Recorder | Recorder Solo Track1 |
| C | 34 | 2 | - | MIDI/Auto Play/Recorder* | Recorder Solo Track2* |
| C | 35 | 3 | - | MIDI/Auto Play | - |
| C | 36 | 4 | - | MIDI/Auto Play | - |
| C | 37 | 5 | - | MIDI/Auto Play | - |
| C | 38 | 6 | - | MIDI/Auto Play | - |
| C | 39 | 7 | - | MIDI/Auto Play | - |
| C | 40 | 8 | - | MIDI/Auto Play | - |
| C | 41 | 9 | - | MIDI/Auto Play | - |
| C | 42 | 10 | - | MIDI/Auto Play | - |
| C | 43 | 11 | - | MIDI/Auto Play | - |
| C | 44 | 12 | - | MIDI/Auto Play | - |
| C | 45 | 13 | - | MIDI/Auto Play | - |
| C | 46 | 14 | - | MIDI/Auto Play | - |
| C | 47 | 15 | - | MIDI/Auto Play | - |
| C | 48 | 16 | - | MIDI/Auto Play | - |

Note: * = PX-S3100 only. ** = PX-S1100 only.

2 Timbre Type Specific Operation

The sound source operation performed for a sound generator instrument receive message may depend on the value of the Timbre Type (see “About the Timbre Type” in “8 Program Change”) of each part’s operation mode. For details, see the explanation for each message.

3 Controlling Send/Receive of MIDI Messages in Each Instrument Part

Send and receive of MIDI messages for each instrument part can be controlled by global Instrument MIDI settings and Instrument-specific system exclusive messages. See the Instrument’s User’s Guide for details.

4 Conditions that Disable Message Send and Receive

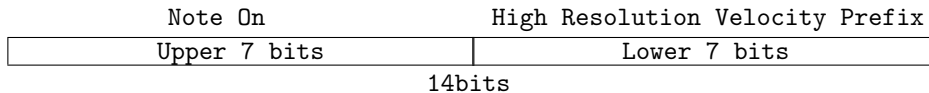
The main conditions when MIDI message send and receive are disabled by the Instrument are those described below.

- While the instrument is accessing flash memory.
- While “Wait” or “Bye” are displayed on the LCD screen. (PX-S3100)

Part II

Channel Message

Instrument Note On Velocity Resolution The upper seven bits of the 14-bit resolution correspond to the Note On message, while the lower seven bits correspond to the High Resolution Velocity Prefix message.



The initial default value for the lower 7 bits is 00H. Receipt of a High Resolution Prefix message causes the lower seven bits to be set, but note on is not performed.

Receipt of a Note On message causes the upper seven bits to be set with note on performed with 14-bit resolution Velocity.

The High Resolution Velocity Prefix message corresponds the message immediately following the Note On message, and the lower seven bits are cleared to 00H immediately following note on by the Note On message. 7-bit resolution note on using only the Note On message also continues to be supported.

For details about each message, see "6 Note On" and "7.20 High Resolution Velocity Prefix".

5 Note Off

Format

Message Format: 8nH kkH vvH
9nH kkH 00H(receive only)

n: MIDI Channel Number
kk: Key Number
vv: Velocity(Transmit:40H, Receive:Ignored)

Transmit Sent when something is played on the keyboard or when play is performed using the Arpeggiator, etc. The key number changes in accordance with on the Transpose function and Octave Shift function.

Receive Receipt stops a note being sounded by a note on message.

6 Note On

Message Format: 9nH kkH vvH

n: MIDI Channel Number
kk: Key Number
vv: Velocity

Transmit Sent when something is played on the keyboard or when play is performed using the Arpeggiator, etc. The key number changes in accordance with on the Transpose function and Octave Shift function.

Receive Receipt sounds a note of the corresponding instrument part.

When a High Resolution Velocity Prefix message is received immediately prior to the Note On message and the lower seven bits of the 14-bit Velocity are set, the 14-bit resolution note on is performed.

For information about the relationship between the Note On message and High Resolution Velocity Prefix message, see "Instrument Velocity Resolution" at the beginning of part II.

7 Control Change

Message Format: BnH ccH vvH

n: MIDI Channel Number
cc: Control Number
vv: Value

For details about messages, see each section of this manual that covers them.

7.1 Bank Select (00H,20H)

Message Format: BnH 00H mmH (MSB)
BnH 20H llH (LSB)

n: MIDI Channel Number
mm: MSB Value(Note1)
ll: LSB Value(Transmit:00H, Receive:Ignored)

Note1: For details about the relationship between the MSB value and the tone, see the Tone List that comes with the Instrument.

Transmit Sent when a tone setup number is selected.

Receive Receipt causes a change in the tone bank number stored in Instrument memory, but the tone is not actually changed until a Program Change message is received. For details, see "8 Program Change".

7.2 Modulation (01H)

Message Format: BnH 01H vvH

n: MIDI Channel Number
vv: Value

Transmit Sent when the knob is operated by setting. (PX-S3100)

Receive Receipt adds, to the tone being sounded, modulation of a depth specified by the value. In the case of a tone that already has modulation applied, receipt of this message increases the modulation depth. The modulation effect differs according to the tone being used.

7.3 Portamento Time(05H)

Message Format: BnH 05H vvH

n: MIDI Channel Number
vv: Value

Transmit Sent when the knob is operated by setting. (PX-S3100)

Receive Receipt changes the portamento application time.

7.4 Data Entry (06H,26H)

Message Format: BnH 06H mmH (MSB)
BnH 26H 11H (LSB)

n: MIDI Channel Number
mm: MSB Value
11: LSB Value

Transmit Sent when there is a change to the parameter assigned to RPN.

Receive Receipt changes the parameter assigned to RPN.

7.5 Volume (07H)

Message Format: BnH 07H vvH

n: MIDI Channel Number
vv: Value

Transmit Sent when part volume is used.

Receive Receipt changes the part volume.

7.6 Pan (0AH)

Message Format: BnH 0AH vvH

n: MIDI Channel Number
vv: Value(Note1)

Note1: For information about the relationship between setting values and send/receive values, see "13.4 Pan Setting Value Table" in "IV Setting Values and Send/Receive Values".

Transmit Sent When MIDI setting of Accomp Out set to ON and when automatic accompaniment is used. (PX-S3100)

Receive Receipt changes the pan of the corresponding part.

7.7 Expression (0BH)

Message Format: BnH 0BH vvH

n: MIDI Channel Number
vv: Value

Transmit Sent when the pedal is operated by setting. (PX-S3100)

Sent when MIDI setting of Accomp Out set to ON and when automatic accompaniment is used. (PX-S3100)

Receive Receipt changes the Expression value.

7.8 Damper Pedal (Sustain) (40H)

Message Format: BnH 40H vvH

n: MIDI Channel Number
vv: Value

Transmit Sent when a pedal that has a sustain function is operated.

Receive Receipt performs an operation equivalent to a sustain pedal operation.

Timbre Type Specific Operation This operation differs in accordance with the Timbre Type (see “About the Timbre Type” in “8 Program Change”) setting.

- Timbre Type: Melody,Hex Layer
Sustain off/on control is performed in accordance with the value of the received message. For information about the relationship between setting values and send/receive values, see “13.1 Off/On Setting Value Table” in “IV Setting Values and Send/Receive Values”.

- Timbre Type: Piano
Continuous control of the following is performed in accordance with the value of the received message.

- Piano note decay rate

For information about the relationship between setting values and send/receive values, see “13.2 Sustain Pedal Setting Value Table” in “IV Setting Values and Send/Receive Values.”

- Timbre Type: LM (Linear Morphing) Piano
Continuous control of the following is performed in accordance with the value of the received message.

- Piano note decay rate
- Resonance characteristics and decay rate of Damper Resonance effect resonance note

see “13.2 Sustain Pedal Setting Value Table” in “IV Setting Values and Send/Receive Values.”

- Timbre Type: Drum

The received message does not affect sound source operation.

7.9 Portamento On/Off(41H)

Message Format: BnH 41H vvH

n: MIDI Channel Number
vv: Value (Note1)

Note1: For information about the relationship between setting values and send/receive values, see the “13.1 Off/On Setting Value Table” in “IV Setting Values and Send/Receive Values” of this document.

Transmit Sent when the knob is operated by setting. (PX-S3100)

Receive Receipt changes the portamento on/off setting.

7.10 Sostenuto (42H)

Message Format: BnH 42H vvH

n: MIDI Channel Number
vv: Value (Note1)

Note1: For information about the relationship between setting values and send/receive values, see the “13.1 Off/On Setting Value Table” in “IV Setting Values and Send/Receive Values” of this document.

Transmit Sent when a pedal that has a sostenuto function is operated.

Receive Receipt performs an operation equivalent to a sostenuto pedal operation.

7.11 Soft Pedal (43H)

Message Format: BnH 43H vvH

n: MIDI Channel Number
vv: Value (Note1)

Note1: For information about the relationship between setting values and send/receive values, see the “13.1 Off/On Setting Value Table” in “IV Setting Values and Send/Receive Values” of this document.

Transmit Sent when a pedal that has a soft function is operated.

Receive Receipt performs an operation equivalent to a soft pedal operation.

7.12 Filter Resonance(47H)

Message Format: BnH 47H vvH

n: MIDI Channel Number
vv: Value

Transmit Sent when the knob is operated by setting. (PX-S3100)

Sent when MIDI setting of Accomp Out set to ON and when automatic accompaniment is used. (PX-S3100)

Receive Receipt changes the filter resonance intensity.

7.13 Release Time (48H)

Message Format: BnH 48H vvH

n: MIDI Channel Number
vv: Value (Note1)

Note1: For information about the relationship between setting values and send/receive values, see the “13.3 -64 - 0 - +63 Setting Value Table” in “IV Setting Values and Send/Receive Values” of this document.

Transmit Sent when the knob is operated by setting. (PX-S3100)

Sent when MIDI setting of Accomp Out set to ON and when automatic accompaniment is used. (PX-S3100)

Receive Receipt makes a relative change in the time it takes for a note to decay to zero after a key is released.

7.14 Attack Time (49H)

Message Format: BnH 49H vvH

n: MIDI Channel Number
vv: Value (Note1)

Note1: For information about the relationship between setting values and send/receive values, see the “13.3 -64 - 0 - +63 Setting Value Table” in “IV Setting Values and Send/Receive Values” of this document.

Transmit Sent when the knob is operated by setting. (PX-S3100)

Sent when MIDI setting of Accomp Out set to ON and when automatic accompaniment is used. (PX-S3100)

Receive Receipt makes a relative change in the time it takes for a note to rise to its maximum level.

7.15 Filter Cutoff Frequency (4AH)

Message Format: BnH 4AH vvH

n: MIDI Channel Number
vv: Value (Note1)

Note1: For information about the relationship between setting values and send/receive values, see the “13.3 -64 - 0 - +63 Setting Value Table” in “IV Setting Values and Send/Receive Values” of this document.

Transmit Sent when the knob is operated by setting. (PX-S3100)

Sent when MIDI setting of Accomp Out set to ON and when automatic accompaniment is used. (PX-S3100)

Receive Receipt changes the filter cutoff frequency.

7.16 Vibrato Rate (4CH)

Message Format: BnH 4CH vvH

n: MIDI Channel Number
vv: Value (Note1)

Note1: For information about the relationship between setting values and send/receive values, see the “13.3 -64 - 0 - +63 Setting Value Table” in “IV Setting Values and Send/Receive Values” of this document.

Transmit Sent when the knob is operated by setting. (PX-S3100)

Receive Receipt changes the note vibrato rate.

7.17 Vibrato Depth (4DH)

Message Format: BnH 4DH vvH

n: MIDI Channel Number
vv: Value (Note1)

Note1: For information about the relationship between setting values and send/receive values, see the “13.3 -64 - 0 - +63 Setting Value Table” in “IV Setting Values and Send/Receive Values” of this document.

Transmit Sent when the knob is operated by setting. (PX-S3100)

Receive Receipt changes the depth of pitch modulation.

7.18 Vibrato Delay (4EH)

Message Format: BnH 4EH vvH

n: MIDI Channel Number
vv: Value (Note1)

Note1: For information about the relationship between setting values and send/receive values, see the “13.3 -64 - 0 - +63 Setting Value Table” in “IV Setting Values and Send/Receive Values” of this document.

Transmit Sent when the knob is operated by setting. (PX-S3100)

Receive Receipt changes the time it takes until note vibrato starts.

7.19 Portamento Control(54H)

Message Format: BnH 54H vvH

n: MIDI Channel Number
vv: Source Key Number

Receive Receipt of this message first stores the Source Note Number for the next note. When the next Note On is received, the portamento effect is applied to the note using this Source Note Number as the pitch start point and the Note On event key number as the end point. If there already is a note being sounded by Source Note Number at this time, the new note on is not performed and the portamento effect is applied to the pitch of the note being sounded. That is to say that legato play is performed.

7.20 High Resolution Velocity Prefix (58H)

Message Format: BnH 58H vvH

n: MIDI Channel Number
vv: Value

Transmit When Hi-Reso Velocity MIDI Out of this unit's MIDI setting is On, sends the lower seven bits of 14-bit Velocity when a key is pressed or released.

Receive Receipt is handled, in combination with the following Note On/Off message, as the lower seven bits of 14-bit Velocity. (Note1)

For information about the relationship between the Note On/Off message and High Resolution Velocity Prefix message, see "Instrument Velocity Resolution" at the beginning of part II.

7.21 Reverb Send Level (5BH)

Message Format: BnH 5BH vvH

n: MIDI Channel Number
vv: Value

Transmit Sent when GM tone is selected.

Sent when the knob or pedal is operated by setting. (PX-S3100)

Sent when MIDI setting of Accompaniment Out set to ON and when automatic accompaniment is used. (PX-S3100)

Transmit Sent when the knob or pedal is operated by setting. (PX-S3100)

Receive Receipt changes the reverb send of the corresponding part.

7.22 Chorus Send Level (5DH)

Message Format: BnH 5DH vvH

n: MIDI Channel Number
vv: Value

Transmit Sent when GM tone is selected.

Sent when the knob or pedal is operated by setting. (PX-S3100)

Sent when MIDI setting of Accompaniment Out set to ON and when automatic accompaniment is used. (PX-S3100)

Receive Receipt changes the chorus send of the corresponding part.

7.23 Delay Send Level (5EH)

Message Format: BnH 5EH vvH

n: MIDI Channel Number
vv: Value

Transmit Sent when GM tone is selected.

Sent when the knob or pedal is operated by setting. (PX-S3100)

Sent when MIDI setting of Accompaniment Out set to ON and when automatic accompaniment is used. (PX-S3100)

Receive Receipt changes the delay send of the corresponding part.

7.24 RPN (Registered Parameter Number) LSB/MSB (64H,65H)

Message Format: BnH 64H 11H (LSB)
BnH 65H mmH (MSB)

n: MIDI Channel Number
11: LSB Value
mm: MSB Value

7.24.1 Pitch Bend Sensitivity

Message Format: BnH 64H 00H
BnH 65H 00H
BnH 06H mmH
BnH 26H 11H

n: MIDI Channel Number
mm: MSB Value(00H - 18H)
11: LSB Value(Transmit:00H, Receive:Ignored)

Transmit Sent when Pitch Bend Range is changed.

Sent when calling Registration. (PX-S3100)

Receive Receipt changes Bend Range of the corresponding part.

7.24.2 Channel Fine Tuning

Message Format: BnH 64H 01H
 BnH 65H 00H
 BnH 06H mmH
 BnH 26H 11H

n: MIDI Channel Number
mm: MSB Value
ll: LSB Value

Transmit Sent when the knob is operated by setting. (PX-S3100)
 Sent when calling Registration. (PX-S3100)

Receive Receipt changes the fine tuning of the corresponding part.

7.24.3 Channel Coarse Tuning

Message Format: BnH 64H 02H
 BnH 65H 00H
 BnH 06H mmH
 BnH 26H 11H

n: MIDI Channel Number
mm: MSB Value(28H - 58H)
ll: LSB Value(Transmit:00H, Receive:Ignored)

Transmit Sent when calling Registration. (PX-S3100)

Receive Receipt changes the coarse tune of the corresponding part. Does not affect sound source operation when the Timbre Type (see “About the Timbre Type” in “8 Program Change”) is Drum.

7.24.4 RPN Null

Message Format: BnH 64H 7FH
 BnH 65H 7FH

n: MIDI Channel Number

Transmit Sent when an operation to send RPN messages is performed.

Receive Receipt de-selects RPN.

7.25 All Sound Off (78H)

Message Format: BnH 78H 00H

n: MIDI Channel Number

Transmit Sent when MIDI send related settings are changed.

Receive Receipt stops all voices that are sounding.

7.26 Reset All Controllers (79H)

Message Format: BnH 79H 00H

n: MIDI Channel Number

Transmit Sent when MIDI send related settings are changed.

Receive Receipt initializes each performance controller.

7.27 All Notes Off (7BH)

Message Format: BnH 7BH 00H

n: MIDI Channel Number

Receive Receipt releases (key release) all voices that are sounding.

7.28 Omni Mode Off (All Notes Off) (7CH)

Message Format: BnH 7CH 00H

n: MIDI Channel Number

Receive Receipt performs the same operation as when All Notes Off is received.

7.29 Omni Mode On (All Notes Off) (7DH)

Message Format: BnH 7DH 00H

n: MIDI Channel Number

Receive Receipt performs the same operation as when All Notes Off is received.

7.30 Mono Mode On (Poly Mode Off) (All Notes Off) (7EH)

Message Format: BnH 7EH 00H

n: MIDI Channel Number

Receive Receipt performs the same operation as when All Notes Off is received.

7.31 Poly Mode On (Mono Mode Off) (All Notes Off) (7FH)

Message Format: BnH 7FH 00H

n: MIDI Channel Number

Receive Receipt performs the same operation as when All Notes Off is received.

8 Program Change

Message Format: CnH ppH

n: MIDI Channel Number
pp: Program Number (Note1)

Note1: For details about the relationship between the program number and the tone, see the Tone List that comes with the Instrument.

Transmit Sent when a tone number is selected.

Receive Receipt changes the ton of the corresponding part. The selected tone is determined by the program value of this message and the Bank Select message value received prior to this message.

About the Timbre Type Tones that are selected by each Instrument part have an attribute that depends on the sound source operation type. This attribute is called the “timbre type,” which is one of the types described below.

- Melody

This timbre type optimizes for normal melody tones. The damper pedal performs on/off operations.

- Piano

This Timbre Type is for piano tones. The decay rate of the voice being sounded is seamlessly altered in accordance with the depressed amount of damper pedal. The method for producing sound in response to the note messages also is different from that of the melody Timbre Type, and operation is optimized for piano.

- LMPiano

This Timbre Type is for Linear Morphing piano tones. The decay rate of the voice being sounded and Damper Resonance effect characteristics are seamlessly altered in accordance with the depressed amount of damper pedal. The method for producing sound in response to the note messages also is different from that of the melody Timbre Type, and operation is optimized for piano.

- Drum

This setting optimizes for drum sounds. The damper pedal does not function. The Damper Pedal (Sustain), Channel Coarse Tune, and Master Coarse Tune messages are ignored if they are received.

9 Channel Pressure (Aftertouch)

Message Format: DnH vvH

n: MIDI Channel Number
vv: Value

Receive Receipt adds, to the tone being sounded, modulation of a depth specified by the value. In the case of a tone that already has modulation applied, receipt of this message increases the modulation depth. The modulation effect differs according to the tone being used.

10 Pitch Bend

Message Format: EnH llH mmH

n: MIDI Channel Number
ll: Value LSB
mm: Value MSB

Transmit Sent when the pitch bend wheel is operated. (PX-S3100)

Sent when MIDI setting of Accomp Out set to ON and when automatic accompaniment is used. (PX-S3100)

Receive Receipt changes the pitch of the currently sounding note. The range of the pitch change depends on the Pitch Bend Range value setting.

Part III

System Message

11 Active Sensing

Message Format: FEH

Transmit Sent periodically.

Receive Once this message is received, the Active Sensing mode is entered. If no MIDI message is received for a specified amount of time, voices being sounded by this Instrument's sound source are released, the controller is reset, and the Active Sensing mode is exited.

12 System Exclusive Message

Message Format: FOH iiH 7FH...F7H

ii: ID Number

The Instrument sends and receives standard universal system exclusive messages, and system exclusive messages that have Instrument-specific formats (CASIO General System Exclusive).

ID Number The ID numbers handed by this Instrument are shown below.

| ID Number | ID Name |
|-----------|---------|
|-----------|---------|

| | |
|-----|------------------------|
| 44H | Casio Computer Co. Ltd |
|-----|------------------------|

| | |
|-----|--|
| 7EH | Non Real Time System Exclusive Message |
|-----|--|

| | |
|-----|------------------------------------|
| 7FH | Real Time System Exclusive Message |
|-----|------------------------------------|

12.1 Universal Real Time System Exclusive Message

Message Format: FOH 7FH 7FH...F7H

12.1.1 Master Volume

Message Format: FOH 7FH 7FH 04H 01H 11H mmH F7H

11: LSB Value(Receive:Ignored)

mm: MSB Value

Transmit Sent when the pedal is operated by setting. (PX-S3100)

Receive Receipt changes the Song Volume.

12.1.2 Master Fine Tuning

Message Format: FOH 7FH 7FH 04H 03H 11H mmH F7H

11: LSB Value(Note1)

mm: MSB Value(Note1)

Note1: For information about the relationship between setting values and send/receive values, see “13.5 Fine Tuning Setting Value Table” in “IV Setting Values and Send/Receive Values” of this document.

Transmit This message is sent when the tuning setting is changed.

Receive Receipt changes the tuning setting.

12.1.3 Master Coarse Tuning

Message Format: F0H 7FH 7FH 04H 04H 11H mmH F7H

11: LSB Value(Transmit:00H,Receive:Ignored)
mm: MSB Value(28H - 58H)

Receive Receipt changes the Patch Master Coarse Tune parameter.

12.1.4 Reverb Type

Message Format: F0H 7FH 7FH 04H 05H 01H 01H 01H 01H 01H 00H vvH F7H

vv: Value(Note1)

Note1: For information about the relationship between setting values and send/receive values, see “13.6 Reverb Type Setting Value Table” in “IV Setting Values and Send/Receive Values” of this document.

Transmit Sent when Hall Simulator/Reverb Type is changed.

Receive Receipt changes the reverb type.

12.1.5 Reverb Time

Message Format: F0H 7FH 7FH 04H 05H 01H 01H 01H 01H 01H 01H vvH F7H

vv: Value

Receive Receipt changes the Reverb duration.

12.1.6 Chorus Type

Message Format: F0H 7FH 7FH 04H 05H 01H 01H 01H 01H 02H 00H vvH F7H

vv: Value(Note1)

Note1: For information about the relationship between setting values and send/receive values, see “13.7 Chorus Type Setting Value Table” in “IV Setting Values and Send/Receive Values” of this document.

Transmit Sent when Chorus Type is changed.

Receive Receipt changes the chorus type.

12.1.7 Modulation Rate

Message Format: FOH 7FH 7FH 04H 05H 01H 01H 01H 01H 02H 01H vvH F7H
vv: Value

Receive Receipt changes the Chorus Rate.

12.1.8 Modulation Depth

Message Format: FOH 7FH 7FH 04H 05H 01H 01H 01H 01H 02H 02H vvH F7H
vv: Value

Receive Receipt changes the chorus level setting.

12.1.9 Send To Reverb

Message Format: FOH 7FH 7FH 04H 05H 01H 01H 01H 01H 02H 04H vvH F7H
vv: Value

Receive Receipt changes the Chorus Sent To Reverb setting.

12.2 Universal Non Real Time System Exclusive Message

Message Format: FOH 7EH 7FH...F7H

12.2.1 GM System On

Message Format: FOH 7EH 7FH 09H 01H F7H

Receive Receipt puts the sound source into a GM sound source mode.

12.2.2 GM System Off

Message Format: FOH 7EH 7FH 09H 02H F7H

Receive Receipt changes the sound source setting to the Instrument presetting.

12.2.3 GM2 System On

Message Format: FOH 7EH 7FH 09H 03H F7H

Receive Though the Instrument does not support GM2, receipt of the GM2 System On message has the same result as receipt of the GM System On message.

12.3 CASIO General System Exclusive

Message Format: FOH 7FH 44H...F7H

This instrument sends the following dedicated message for communication with CASIO application. It can only be used with CASIO apps.

12.3.1 Operation Lock

Message Format: FOH 44H 7EH 7EH 7FH 0FH 01H 78H 06H 01H 00H 01H 00H vvH 00H F7H
vv: Value

Transmit Sent when the operation lock setting is changed.

12.3.2 Current Mode

Message Format: FOH 44H 7EH 7EH 7FH 0FH 01H 08H 00H 01H 00H 01H 00H vvH 00H F7H
vv: Value

Transmit Sent when the instrument mode is changed.

12.3.3 MIDI Recorder State

Message Format: FOH 44H 7EH 7EH 7FH 0FH 01H 25H 00H 01H 02H 01H 00H vvH 00H 00H
00H 00H F7H
vv: Value

Transmit Sent when the MIDI recorder status is changed.

12.3.4 Demo Play/Stop

Message Format: FOH 44H 7EH 7EH 7FH 0FH 01H 3AH 00H 01H 00H 01H 00H vvH 00H F7H
vv: Value

Transmit Sent when the demo plays/stops.

12.3.5 Hall Simulator On/Off

Message Format: FOH 44H 7EH 7EH 7FH 0FH 01H 52H 03H 01H 00H 01H 00H vvH 00H F7H
vv: Value

Transmit Sent when the hall simulator On/Off is changed.

12.3.6 Surround On/Off

Message Format: FOH 44H 7EH 7EH 7FH 0FH 01H 58H 00H 01H 00H 01H 00H vvH 00H F7H
vv: Value

Transmit Sent when the surround On/Off is changed.

Part IV

Setting Values and Send/ Receive Values

13 Setting Value Tables

13.1 Off/On Setting Value Table

| Transmit Value | Receive Value | Parameter |
|----------------|---------------|-----------|
| 00H | 00H - 3FH | Off |
| 7FH | 40H - 7FH | On |

13.2 Sustain Pedal Setting Value Table

| Transmit Value | Receive Value | Parameter |
|----------------|---------------|--------------|
| - | 00H | Off |
| : | : | (continuous) |
| - | 7FH | Full |

13.3 -64 - 0 - +63 Setting Value Table

| Transmit Value | Receive Value | Parameter |
|----------------|---------------|-----------|
| 00H | 00H | -64 |
| : | : | : |
| 40H | 40H | 0 |
| : | : | : |
| 7FH | 7FH | +63 |

13.4 Pan Setting Value Table

| Transmit Value | Receive Value | Parameter |
|----------------|---------------|-----------|
| 00H | 00H | Left |
| : | : | : |
| 40H | 40H | Center |
| : | : | : |
| 7FH | 7FH | Right |

13.5 Fine Tuning Setting Value Table

| Transmit Value | Receive Value | Parameter |
|----------------|-------------------------|-----------|
| (LSB, MSB) | | |
| (43H, 00H) | (00H, 00H) - (5FH, 00H) | 415.5 Hz |
| (65H, 00H) | (60H, 00H) - (7FH, 00H) | 415.6 Hz |
| (07H, 01H) | (00H, 01H) - (1FH, 01H) | 415.7 Hz |
| (29H, 01H) | (20H, 01H) - (3FH, 01H) | 415.8 Hz |
| : | : | : |
| (40H, 3FH) | (30H, 3FH) - (4FH, 3FH) | 439.8 Hz |
| (60H, 3FH) | (50H, 3FH) - (6FH, 3FH) | 439.9 Hz |
| (00H, 40H) | (70H, 3FH) - (1FH, 40H) | 440.0 Hz |
| (20H, 40H) | (20H, 40H) - (3FH, 40H) | 440.1 Hz |
| (40H, 40H) | (40H, 40H) - (5FH, 40H) | 440.2 Hz |
| : | : | : |
| (54H, 7EH) | (50H, 7EH) - (6FH, 7EH) | 465.6 Hz |
| (73H, 7EH) | (70H, 7EH) - (0FH, 7FH) | 465.7 Hz |
| (11H, 7FH) | (10H, 7FH) - (2FH, 7FH) | 465.8 Hz |
| (30H, 7FH) | (30H, 7FH) - (7FH, 7FH) | 465.9 Hz |

13.6 Reverb Type Setting Value Table

| Transmit Value | Receive Value | Parameter |
|----------------|---------------|-------------|
| - | 00H | Small Room |
| - | 01H | Medium Room |
| - | 02H | Large Room |
| - | 03H | Medium Hall |
| - | 04H | Large Hall |
| - | 08H | Plate |

13.7 Chorus Type Setting Value Table

| Transmit Value | Receive Value | Parameter |
|----------------|---------------|-----------|
| - | 00H | Chorus1 |
| - | 01H | Chorus2 |
| - | 02H | Chorus3 |
| - | 03H | Chorus4 |
| - | 04H | FB Chorus |
| - | 05H | Flanger |

Part V

MIDI Implementation Notation

14 Value Notation

14.1 Hexadecimal Notation

MIDI implementation sometimes requires that data be expressed in hexadecimal format. Hexadecimal values are indicated by the letter “H” after the value. The hexadecimal equivalents of decimal values 10 through 15 are expressed as the letters A through F.

The table below shows the hexadecimal equivalents for decimal values 0 through 127, which are often used in MIDI messages.

| Decimal | Hexadecimal | Decimal | Hexadecimal | Decimal | Hexadecimal | Decimal | Hexadecimal |
|---------|-------------|---------|-------------|---------|-------------|---------|-------------|
| 0 | 00H | 32 | 20H | 64 | 40H | 96 | 60H |
| 1 | 01H | 33 | 21H | 65 | 41H | 97 | 61H |
| 2 | 02H | 34 | 22H | 66 | 42H | 98 | 62H |
| 3 | 03H | 35 | 23H | 67 | 43H | 99 | 63H |
| 4 | 04H | 36 | 24H | 68 | 44H | 100 | 64H |
| 5 | 05H | 37 | 25H | 69 | 45H | 101 | 65H |
| 6 | 06H | 38 | 26H | 70 | 46H | 102 | 66H |
| 7 | 07H | 39 | 27H | 71 | 47H | 103 | 67H |
| 8 | 08H | 40 | 28H | 72 | 48H | 104 | 68H |
| 9 | 09H | 41 | 29H | 73 | 49H | 105 | 69H |
| 10 | 0AH | 42 | 2AH | 74 | 4AH | 106 | 6AH |
| 11 | 0BH | 43 | 2BH | 75 | 4BH | 107 | 6BH |
| 12 | 0CH | 44 | 2CH | 76 | 4CH | 108 | 6CH |
| 13 | 0DH | 45 | 2DH | 77 | 4DH | 109 | 6DH |
| 14 | 0EH | 46 | 2EH | 78 | 4EH | 110 | 6EH |
| 15 | 0FH | 47 | 2FH | 79 | 4FH | 111 | 6FH |
| 16 | 10H | 48 | 30H | 80 | 50H | 112 | 70H |
| 17 | 11H | 49 | 31H | 81 | 51H | 113 | 71H |
| 18 | 12H | 50 | 32H | 82 | 52H | 114 | 72H |
| 19 | 13H | 51 | 33H | 83 | 53H | 115 | 73H |
| 20 | 14H | 52 | 34H | 84 | 54H | 116 | 74H |
| 21 | 15H | 53 | 35H | 85 | 55H | 117 | 75H |
| 22 | 16H | 54 | 36H | 86 | 56H | 118 | 76H |
| 23 | 17H | 55 | 37H | 87 | 57H | 119 | 77H |
| 24 | 18H | 56 | 38H | 88 | 58H | 120 | 78H |
| 25 | 19H | 57 | 39H | 89 | 59H | 121 | 79H |
| 26 | 1AH | 58 | 3AH | 90 | 5AH | 122 | 7AH |
| 27 | 1BH | 59 | 3BH | 91 | 5BH | 123 | 7BH |
| 28 | 1CH | 60 | 3CH | 92 | 5CH | 124 | 7CH |
| 29 | 1DH | 61 | 3DH | 93 | 5DH | 125 | 7DH |
| 30 | 1EH | 62 | 3EH | 94 | 5EH | 126 | 7EH |
| 31 | 1FH | 63 | 3FH | 95 | 5FH | 127 | 7FH |

14.2 Binary Notation

When a MIDI implementation data value is expressed in binary, the letter “B” (for “binary”) is affixed at the end of the value. The table below shows the binary equivalents for the decimal values 0 through 127, which are often used for settings.

| Decimal | Hexadecimal | Binary |
|---------|-------------|-----------|
| 0 | 00H | 0000000B |
| 1 | 01H | 0000001B |
| 2 | 02H | 0000010B |
| 3 | 03H | 0000011B |
| 4 | 04H | 0000100B |
| 5 | 05H | 0000101B |
| 6 | 06H | 0000110B |
| 7 | 07H | 0000111B |
| 8 | 08H | 0001000B |
| 9 | 09H | 0001001B |
| 10 | 0AH | 0001010B |
| 11 | 0BH | 0001011B |
| 12 | 0CH | 0001100B |
| 13 | 0DH | 0001101B |
| 14 | 0EH | 0001110B |
| 15 | 0FH | 0001111B |
| 16 | 10H | 00010000B |
| : | : | |
| 125 | 7DH | 01111101B |
| 126 | 7EH | 01111110B |
| 127 | 7FH | 01111111B |

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