MIDI-CI Profile for Drawbar Organs

Drawbar Organ Single Channel Profile

Ⓜ **MIDI**®

PREFACE

MIDI Association Document M2-121-UM
MIDI-CI Profile for Drawbar Organs

The MIDI-CI specification and the Common Rules for MIDI-CI Profiles define how Devices with similar applications or of a similar Device type can negotiate to use a common set of MIDI messages, called a MIDI-CI Profile, or simply a Profile.

Devices which implement a Profile have a high level of interoperability with each other. Profiles are a beneficial component in enabling intelligent auto-configuration.

A Profile is a defined set of rules for how a MIDI receiver Device implementing the Profile shall respond to a chosen set of MIDI messages, to achieve a particular purpose or to suit a particular application. In addition to defining response to MIDI messages, a Profile may optionally also define other Device functionality requirements. This definition also then implies MIDI implementation of a sender or in some cases may require a defined MIDI implementation of a sender.

This MIDI-CI Profile Specification defines a set of messages to control parameters of many Devices with drawbar organ capabilities.

For details of MIDI-CI Profile Negotiation mechanisms which are necessary to implement these Profile specifications, please read the MIDI-CI and Common Rules for MIDI-CI Profiles specifications.

Version History

Table 1 Version History

Publication Date	Version	Changes
2024-01-24	1.0.2	Initial release

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Figures

Tables

1   References

1.1   Normative References

[MA01]   ***Complete MIDI 1.0 Detailed Specification***, Document Version 96.1, Third Edition, Association of Musical Electronics Industry, *http://www.amei.or.jp/*, and The MIDI Association, *https://www.midi.org/*

[MA02]   ***M2-100-U MIDI 2.0 Specification Overview***, Version 1.1, Association of Musical Electronics Industry, *http://www.amei.or.jp/*, and The MIDI Association, *https://www.midi.org/*

[MA03]   ***M2-101-UM MIDI Capability Inquiry (MIDI-CI)***, Version 1.2, Association of Musical Electronics Industry, *http://www.amei.or.jp/*, and The MIDI Association, *https://www.midi.org/*

[MA04]   ***M2-102-U Common Rules for MIDI-CI Profiles***, Version 1.1, Association of Musical Electronics Industry, *http://www.amei.or.jp/*, and The MIDI Association, *https://www.midi.org/*

[MA05]   ***M2-103-UM Common Rules for Property Exchange***, Version 1.1, Association of Musical Electronics Industry, *http://www.amei.or.jp/*, and The MIDI Association, *https://www.midi.org/*

[MA06]   ***M2-104-UM Universal MIDI Packet (UMP) Format and MIDI 2.0 Protocol***, Version 1.1, Association of Musical Electronics Industry, *http://www.amei.or.jp/*, and The MIDI Association, *https://www.midi.org/*

[MA07]   ***M2-115-U MIDI 2.0 Bit Scaling and Resolution***, Version 1.0.1, Association of Musical Electronics Industry, *http://www.amei.or.jp/*, and The MIDI Association, *https://www.midi.org/*

[MA08]   ***M2-122-UM MIDI-CI Profile Specification for Rotary Speaker*** Version 1.0, Association of Musical Electronics Industry, *http://www.amei.or.jp/*, and The MIDI Association, *https://www.midi.org/*

1.2   Terminology

1.2.1   Definitions

100-Cent Unit: A unit of measure for musical intervals, corresponding to one-twelfth of an octave measured logarithmically. This term is preferred over "semitone" which may refer to various intervals.

AMEI: Association of Musical Electronics Industry. Authority for MIDI Specifications in Japan.

Device: An entity, whether hardware or software, which can send and/or receive MIDI messages.

Group: A field in the UMP Format addressing every UMP Format MIDI message (and every UMP comprising any given MIDI message) to one of 16 Groups. See the M2-104-UM Universal MIDI Packet (UMP) Format and MIDI 2.0 Protocol specification *[MA06]*.

HCU: See 100-Cent-Unit.

Initiator: One of two MIDI-CI Devices with a bidirectional communication between them. Initiator has the management role of setting and negotiating parameters for interoperability between the two Devices. The primary goal of Initiator is usually (but not strictly required to be) configuring two Devices for subsequent communication from Initiator as MIDI transmitter to Responder as MIDI receiver. The role of Initiator and Responder may alternate between the two MIDI-CI Devices. Either MIDI-CI Device may initiate a MIDI Transaction (act as Initiator) at any time. Also see Responder.

Inquiry: A message sent by an Initiator to begin a Transaction.

MA: MIDI Association. Authority for MIDI specifications worldwide except Japan. See also MMA.

MIDI 1.0 Protocol: Version 1.0 of the MIDI Protocol as originally specified in *[MA01]* and extended by MA and AMEI with numerous additional MIDI message definitions and Recommended Practices. The native format for the MIDI 1.0 Protocol is a byte stream, but it has been adapted for many different transports. MIDI 1.0 messages can be carried in UMP packets. The UMP format for the MIDI 1.0 Protocol is defined in the M2-104-UM Universal MIDI Packet (UMP) Format and MIDI 2.0 Protocol specification *[MA06]*.

MIDI 1.0 Specification: Complete MIDI 1.0 Detailed Specification, Document Version 96.1, Third Edition *[MA01]*.

MIDI 2.0: The MIDI environment that encompasses all of MIDI 1.0, MIDI-CI, Universal MIDI Packet (UMP), MIDI 2.0 Protocol, MIDI 2.0 messages, and other extensions to MIDI as described in AMEI and MA specifications.

MIDI 2.0 Protocol: Version 2.0 of the MIDI Protocol. The native format for MIDI 2.0 Protocol messages is UMP as defined in M2-104-UM Universal MIDI Packet (UMP) Format and MIDI 2.0 Protocol specification *[MA06]*.

MIDI-CI: MIDI Capability Inquiry *[MA03]*, a specification published by The MIDI Association and AMEI.

MIDI-CI Device: A Device that has the ability to act as a Responder that replies to inquiries received from an Initiator. The ability to act as an Initiator is recommended but optional.

MIDI-CI Transaction: A Transaction using a set of MIDI-CI messages that includes an Inquiry sent by an Initiator and a reply to the Inquiry returned by the Responder. The Responder's reply to an Inquiry might be a single message that satisfies the Inquiry, a set of multiple messages that satisfy the Inquiry, or an error message. See also Transaction.

MIDI Transport: A hardware or software MIDI connection used by a Device to transmit and/or receive MIDI messages to and/or from another Device.

MMA: MIDI Manufacturers Association, a California nonprofit 501(c)6 trade organization, and the legal entity name of the MIDI Association.

MUID (MIDI Unique Identifier): A 28-bit random number generated by a Device used to uniquely identify the Device in MIDI-CI messages sent to or from that Device.

Profile: An MA/AMEI specification that includes a set of MIDI messages and defined responses to those messages. A Profile is controlled by MIDI-CI Profile Negotiation Transactions. A Profile may have a defined minimum set of mandatory messages and features, along with some optional or recommended messages and features. See the MIDI-CI specification *[MA03]* and the Common Rules for MIDI-CI Profiles *[MA04]*.

Protocol: There are two defined MIDI Protocols: the MIDI 1.0 Protocol and the MIDI 2.0 Protocol, each with a data structure that defines the semantics for MIDI messages. See *[MA01]* and *[MA06]*.

Responder: One of two MIDI-CI Devices with a bidirectional communication between them. The Responder is the Device that receives an Inquiry message from an Initiator Device as part of a MIDI-CI Transaction and acts based on negotiation messages managed by the Initiator Device. Also see Initiator.

Transaction: An exchange of MIDI messages between two MIDI Devices with a bidirectional connection. All the MIDI messages in a single Transaction are associated and work together to accomplish one function. The simplest Transaction generally consists of an inquiry sent by one MIDI Device and an associated reply returned by a second MIDI Device. A Transaction may also consist of an inquiry from one MIDI Device and several associated replies from a second MIDI Device. A Transaction may be a more complex set of message exchanges, started by an initial inquiry from one MIDI Device and multiple, associated replies exchanged between the first MIDI Device and a second MIDI Device. Also see MIDI-CI Transaction.

UMP: Universal MIDI Packet, see *[MA06]*.

UMP Format: Data format for fields and messages in the Universal MIDI Packet, see *[MA06]*.

UMP MIDI 1.0 Device: any Device that sends or receives MIDI 1.0 Protocol messages using the UMP *[MA06]*. Such Devices may use UMP Message Types that extend the functionality beyond Non-UMP MIDI 1.0 Systems.

Universal MIDI Packet (UMP): The Universal MIDI Packet is a data container which defines the data format for all MIDI 1.0 Protocol messages and all MIDI 2.0 Protocol messages. UMP is intended to be universally applicable, i.e., technically suitable for use in any transport where MA/AMEI elects to officially support UMP. For detailed definition see M2-104-UM Universal MIDI Packet (UMP) Format and MIDI 2.0 Protocol specification *[MA06]*.

1.2.2   Reserved Words and Specification Conformance

In this document, the following words are used solely to distinguish what is required to conform to this specification, what is recommended but not required for conformance, and what is permitted but not required for conformance:

Table 2 Words Relating to Specification Conformance

Word	Reserved For	Relation to Specification Conformance
shall	Statements of requirement	**Mandatory** A conformant implementation conforms to all 'shall' statements.
should	Statements of recommendation	**Recommended but not mandatory** An implementation that does not conform to some or all 'should' statements is still conformant, providing all 'shall' statements are conformed to.
may	Statements of permission	**Optional** An implementation that does not conform to some or all 'may' statements is still conformant, providing that all 'shall' statements are conformed to.

By contrast, in this document, the following words are never used for specification conformance statements; they are used solely for descriptive and explanatory purposes:

Table 3 Words Not Relating to Specification Conformance

Word	Reserved For	Relation to Specification Conformance
must	Statements of unavoidability	Describes an action to be taken that, while not required (or at least not directly required) by this specification, is unavoidable. Not used for statements of conformance requirement (see 'shall' above).
will	Statements of fact	Describes a condition that as a question of fact is necessarily going to be true, or an action that as a question of fact is necessarily going to occur, but not as a requirement (or at least not as a direct requirement) of this specification. Not used for statements of conformance requirements (see 'shall' above).
can	Statements of capability	Describes a condition or action that a system element is capable of possessing or taking. Not used for statements of conformance permission (see 'may' above).
might	Statements of possibility	Describes a condition or action that a system element is capable of electing to possess or take. Not used for statements of conformance permission (see 'may' above).

1.3   Protocol and Data Format Conventions

1.3.1   MIDI 1.0 Protocol and MIDI 2.0 Protocol

This document describes the use of messages in the MIDI 2.0 Protocol. However, Devices which conform to the Profiles in this specification may implement either the MIDI 2.0 Protocol or the MIDI 1.0 Protocol. For a comparison of the 2 Protocols and for mechanisms to select a Protocol see the M2-104-UM Universal MIDI Packet (UMP) Format and MIDI 2.0 Protocol specification *[MA06]*.

1.3.2   Registered Controllers (RCs) and Registered Parameter Numbers (RPNs)

This document describes the use of RC messages in the MIDI 2.0 Protocol. These translate directly to RPN messages in the MIDI 1.0 Protocol. Devices which conform to the Profiles in this specification may implement the MIDI 2.0 Protocol with RC messages or the MIDI 1.0 Protocol with RPN messages. Scaling of values between RCs and RPNs is addressed in Section 1.3.3.

1.3.3   Resolution and Bit Scaling

In this document, values are expressed according to the ranges and resolutions defined in fields of the MIDI 2.0 Protocol. Any MIDI 1.0 Protocol Device or system that is using this Profile must scale the values to suit the Device or system. For example, a 32-bit value of a Registered Controller might be scaled to a 14-bit value or a 7-bit value in the corresponding Registered Parameter Number.

Scaling methods are defined in the M2-115-UM MIDI 2.0 Bit Scaling and Resolution specification *[MA07]*.

2 Introduction

2.1 Executive Summary

This MIDI-CI Profile specification defines a selected set of MIDI messages which are recommended to be used by all drawbar organs to control the features which are common to most drawbar organs.

This specification defines Device requirements and MIDI implementation of conforming Devices.

2.2 Background

This specification relies on mechanisms defined by the MIDI-CI (Capabilities Inquiry) specification. MIDI-CI allows Devices to communicate their capabilities to each other. Devices can use that capabilities information to self-configure their MIDI connections and related settings. Profiles are a beneficial component in enabling intelligent auto-configuration between two MIDI-CI Devices.

Profiles define specific implementations of a set of MIDI messages chosen to suit a particular instrument, Device type, or to accomplish a particular task. Two Devices that conform to the same Profile will generally have greater interoperability between them than Devices using MIDI without Profiles. Profiles increase interoperability and ease of use while lowering the need for manual configuration of Devices by users.

This specification defines data for specific fields in several MIDI-CI Profile Configuration messages. The entire message is not always shown in this specification. The format of the messages and further, critical information required for implementing this Device Profile is found in the *[MA03]* MIDI Capability Inquiry (MIDI-CI) and *[MA04]* Common Rules for MIDI-CI Profiles specifications.

3 Drawbar Organ Implementations

This specification is intended to define specific features and control messages for a musical instrument that is a drawbar organ or a musical instrument that emulates the behavior of a single manual drawbar organ.

The basic model and functions are patterned after a Hammond* B3 organ, while many other variations of drawbar organ can be represented by this Profile. Properties of this Profile are features that are commonly found on many drawbar organ instruments or emulators from a wide range of manufacturers.

3.1 Sound Engine

The sound engine of a Device that implements the Drawbar Organ Profile shall provide the sound of 9 adjustable drawbars per voice.

An original drawbar organ had full polyphony and developers should take into account the demands of having 9 adjustable drawbars per voice and typical playing style.

The Drawbar Organ Profile does not define a specific synthesis type for producing a drawbar organ sound. The Drawbar Organ Profile does not define the tone quality or style of the sound. Various organ types with different sounds may use the Drawbar Organ Profile.

3.1.1 Rotary Speaker Profile

The Drawbar Organ Profile recommends support for the Rotating Speaker Profile that is patterned after a Leslie* rotating speaker (See *[MA08] MIDI-CI Profile Specification for Rotary Speaker*) if the Rotary Speaker function is built into the Drawbar Organ Profile Device. It is usually most convenient to support the Rotating Speaker Profile.

Note: Hammond and Leslie are trademarks of SUZUKI MUSICAL INST.MFG.CO., LTD. Used with permission.

4 MIDI-CI Functions

This section defines functions which operate on the Channel of the Drawbar Organ Profile.

4.1 MIDI-CI Profile Configuration

This section defines the response to Profile Configuration messages including the Drawbar Organ Profile Identification.

MIDI-CI Profile Configuration Messages identify and control each Profile uniquely using several fields in MIDI-CI Profile Configuration messages. The Profile identifiers for this Drawbar Organ Profile are as follows:

Table 4 Five Bytes Profile ID

Profile ID Byte 1	0x7E (Standard Defined Profile)
Profile ID Byte 2	0x20 (Drawbar Organ Profile Number MSB)
Profile ID Byte 3	0x01 (Drawbar Organ Profile Number LSB)
Profile ID Byte 4	0x01 (Drawbar Organ Profile Version)
Profile ID Byte 5	0xXX (Drawbar Organ Profile Level)

Drawbar Organ Profile Level:

- 0x00 Some implementation but does not comply with minimum requirements
- 0x01 Meets the minimum requirements
- 0x02 Implements some extended/optional features
- 0x03-0x7E Reserved
- 0x7F Highest level of Profile support (Same as 0x02 in this Profile)

4.2 Discovering Optional Features Supported: Profile Details Inquiry

The Initiator may discover which optional features of the Drawbar Organ Profile are supported using MIDI-CI Profile Details Inquiry Transactions. See MIDI Capability Inquiry (MIDI-CI) *[MA03]*, and the Common Rules for Profiles *[MA04]*.

4.2.1 Initiator Sends a MIDI-CI Profile Details Inquiry Message

The Initiator may ask the Responder for a bitmap report of the optional features supported by the Responder. This inquiry is made using a Profile Details Inquiry message with the Inquiry Target set to 0x01 (Profile Optional Features Supported).

4.2.2 Responder Sends a MIDI-CI Reply to Profile Details Inquiry Message

When a Responder receives a Profile Details Inquiry message with the Inquiry Target set to 0x01, the Responder shall report a bitmap declaring the optional features supported by the Responder. This report is made using a Reply to Profile Details Inquiry message.

Drawbar Organ Profiles Optional Features Supported

Target Data is 0x01 = Get Optional Features Supported. The Inquiry Target Data field is a 1-byte bitmap of optional features. The bitmap may be expanded in future revisions of this specification.

```
0  D6        ..,...,...        D0
```

Figure 1 Bitmap Format

Each bit represents whether the feature is supported or not.

Table 5 Bitmap of Optional Features Supported

Byte	Bitmap Data	Message Supported	Description
Byte 1	D0	CC#67	Supports Soft Pedal = Volume Normal/Soft Tab
	D1	RC 0x40 0x39 RC 0x40 0x3A	Supports both Vibrato/Chorus parameters
	D2	RC 0x40 0x3B RC 0x40 0x3C RC 0x40 0x3D RC 0x40 0x3E	Supports all four Percussion parameters
	D3	RC 0x40 0x40	Amount of Key Click
	D4	RC 0x40 0x41	Amount of Crosstalk/Leakage
	D5-6	reserved	Reserved for Future Expansion
	D7	reserved	0 == status bit

5   Response to Required Channel Messages

A Device which conforms to the Drawbar Organ Profile shall implement the MIDI messages as defined in this Section.

5.1.1   Note On / Note Off

The Device shall sound notes for the key range from at least Note Number 36 (0x24) through 96 (0x60).

MIDI Note Number 69 (0x45) sounds as A=440Hz on the 8' drawbar as a default. This may optionally be changed by user settings, MIDI Tuning Standard, Channel Tuning Registered Controller 0x01 and Registered Controller 0x02, or other tuning mechanisms.

The Device shall not respond to Velocity in Note On / Note Off messages as a default. This may be overridden by user settings.

5.1.2   Registered Controllers

The Device shall respond to RPN / Registered Controllers as defined below.

Drawbars

The Device shall support nine drawbars as defined in the following table. The nine drawbars of each manual of the drawbar organ are controlled by RC messages.

Table 6 Drawbar Settings

Setting	Range	Discrete Value
Off/In/0	0x00000000 – 0x1C71C71B	0x0E38E38E
1	0x1C71C71C– 0x38E38E37	0x2AAAAAAB
2	0x38E38E38– 0x55555554	0x471C71C7
3	0x55555555– 0x71C71C70	0x638E38E4
4	0x71C71C71– 0x8E38E38C	0x80000000
5	0x8E38E38D – 0xAAAAAAA9	0x9C71C71D
6	0xAAAAAAAA – 0xC71C71C5	0xB8E38E39
7	0xC71C71C6- 0xE38E38E1	0xD5555556
Full/Out/8	0xE38E38E2 – 0xFFFFFFFF	0xF1C71C72

Senders: In this Profile drawbars have nine selectable settings for each drawbar. When switching settings, the Device should use the discrete value list above. Devices that have an ability to set the volume for each drawbar smoothly over the whole range may send values that are between the discrete values defined for each setting.

Receivers: All Receives shall support the full ranges of values as above. The Receiver may support fully continuous response or may implement 9 discrete settings in response to any value from within the 9 ranges.

Table 7 Registered Controllers Used for Drawbars

MIDI Message	Parameter
RC 0x40 0x30	16' Drawbar
RC 0x40 0x31	5-1/3' Drawbar
RC 0x40 0x32	8' Drawbar
RC 0x40 0x33	4' Drawbar
RC 0x40 0x34	2-2/3' Drawbar
RC 0x40 0x35	2' Drawbar
RC 0x40 0x36	1-3/5' Drawbar
RC 0x40 0x37	1-1/3' Drawbar
RC 0x40 0x38	1' Drawbar

Note: Implementation of a user interface is outside the scope of this Drawbar Organ Profile specification. On traditional drawbar organs, the sound level increases from off to maximum as a drawbar is pulled toward the player. But on a typical controller, a fader might respond in the opposite direction, increasing from off to maximum as the fader is pushed away from the player. Or a drawbar control may be assigned to a rotary knob. This specification allows any of these (and other) user interface implementations.

5.1.3 Control Change

The Device shall respond to Control Change messages as defined below.

5.1.3.1 Volume (CC#7)

A controller which is set by a main volume knob (or similar control mechanism). Regarding the curve of volume change messages, the square of the value is proportional to the volume.

Table 8 Response to CC#7 Volume

CC#7	Amplitude
0xFFFFFFFF	0 dB
0xC1041041	-4.9 dB
0x80000000	-11.9 dB
0x40000000	-23.9 dB
0x20000000	-36.0 dB
0x00000000	-infinity

The formula used is: gain in dB = $40 * \log_{10}(\text{CC\#7}/\text{0xFFFFFFFF})$

The resulting volume is, however, also dependent on Expression (CC#11).

5.1.3.2 Expression (CC#11)

A controller which is set by an expression pedal (or similar control mechanism). Regarding the curve of volume change messages, the square of the value is proportional to the volume.

Table 9 Response to CC#11 Expression

CC#11	Amplitude
0xFFFFFFFF	0 dB
0xC1041041	-4.9 dB
0x80000000	-11.9 dB
0x40000000	-23.9 dB
0x20000000	-36.0 dB
0x00000000	-infinity

The formula used is: gain in dB = $40 * \log_{10}(CC\#11/0xFFFFFFFF)$

The resulting volume is, however, also dependent on Volume (CC#7).

> *Note: Some drawbar organs do not send the full range of Expression. Traditionally, a drawbar organ's expression pedal does not go all the way down to -infinity. Devices may choose the range of values sent and the range of values recognized.*

5.1.4 Channel Mode Messages

Devices running the Drawbar Organ Profile shall operate in Mode 3, Omni Off, Poly.

The following defines the response to Mode messages.

5.1.4.1 All Sound Off (CC#120)

Value: 0x00000000

When this message is received, all the Notes sounding shall be immediately released, and the sound is muted as quickly as possible without producing a click or other audible noise.

5.1.4.2 Reset All Controllers (CC#121)

Default Value: 0x00000000

When value is 0x00000000, this message shall reset the status of Control Change messages (except as noted below) to default values, Channel pressure to 0x00000000, and Pitch Bend to 0x80000000(center) on the specified Channel.

Program Change, Bank Select (0/32), Channel Volume (7), Pan (10), and Expression (11) shall not be reset.

5.1.4.3 All Notes Off (CC#123)

This message shall turn off all Notes sounding on the drawbar organ.

5.1.4.4 Omni Mode Off (CC#124)

This message shall turn off all Notes sounding on the drawbar organ. Messages shall not change the mode.

5.1.4.5   Omni Mode On (CC#125)

This message shall turn off all Notes sounding on the drawbar organ. Messages shall not change the mode.

5.1.4.6   Mono Mode On (CC#126)

This message shall turn off all Notes sounding on the drawbar organ. Messages shall not change the mode.

5.1.4.7   Poly Mode On (CC#127)

This message shall turn off all Notes sounding on the drawbar organ and switch the operation to Mode 3 (Omni Off, Poly).

6   Response to Optional Channel Messages

A Device which conforms to the Drawbar Organ Profile may implement the MIDI messages as defined in this Section.

6.1.1   Control Change

The Device may optionally respond to Control Change messages as defined below.

6.1.1.1   Hold1(Damper/Sustain) (CC#64)

Value: 0x00000000-0x7FFFFFFF = Off, 0x80000000-0xFFFFFFFF = On

Default Value: 0x00000000

6.1.1.2   Soft Pedal (CC#67)

Value: 0x00000000-0x7FFFFFFF = Off, 0x80000000-0xFFFFFFFF = Soft

Default Value: 0x00000000

Soft Pedal controls a drawbar organ's "Soft" tab/switch.

6.1.2   Registered Controllers (or RPN when in MIDI 1.0 Protocol)

Table 10 Registered Controllers Used for Optional Parameters

MIDI Message	Parameter
RC 0x40 0x39	Vibrato / Chorus Type
RC 0x40 0x3A	Vibrato / Chorus On / Off
RC 0x40 0x3B	Percussion Off/On
RC 0x40 0x3C	Percussion Normal/Soft
RC 0x40 0x3D	Percussion Slow/Fast
RC 0x40 0x3E	Percussion Type 2nd/3rd
RC 0x40 0x3F	Reserved
RC 0x40 0x40	Amount of Key Click
RC 0x40 0x41	Amount of Crosstalk/Leakage

6.1.2.1   RC 0x40 **0x39 Vibrato / Chorus Type**

Value Range: 0x00000000 to 0x2AAAAAA9 = V1

Value Range: 0x2AAAAAAA to 0x55555554 = C1

Value Range: 0x55555555 to 0x7FFFFFFF = V2

Value Range: 0x80000000 to 0xAAAAAAA9 = C2

Value Range: 0xAAAAAAAA to 0xD5555554 = V3

Value Range: 0xD5555555 to 0xFFFFFFFF = C3

6.1.2.2   RC 0x40 **0x3A Vibrato / Chorus Off/On**

Value: 0x00000000-0x7FFFFFFF = Off, 0x80000000-0xFFFFFFFF = On

Default Value: 0x00000000

6.1.2.3   RC 0x40 **0x3B Percussion Off/On**

Value: 0x00000000-0x7FFFFFFF = Off, 0x80000000-0xFFFFFFFF = On

6.1.2.4   RC 0x40 **0x3C Percussion Normal/Soft**

Value: 0x00000000-0x7FFFFFFF = Normal, 0x80000000-0xFFFFFFFF = Soft

6.1.2.5   RC 0x40 **0x3D Percussion Slow/Fast**

Value: 0x00000000-0x7FFFFFFF = Slow, 0x80000000-0xFFFFFFFF = Fast

6.1.2.6   RC 0x40 **0x3E Percussion Type 2nd/3rd**

Value: 0x00000000-0x7FFFFFFF = 2nd Harmonic, 0x80000000-0xFFFFFFFF = 3rd Harmonic

6.1.2.7   RC 0x40 **0x40 Amount of Key Click**

Value Range: 0x00000000-0xFFFFFFFF = None to Full

Default Value: 0x80000000

This parameter value usually sets the amount of Key Click noise that occurs at a Note On. The Device is free to decide if it wants to use the same parameter value to apply a relative amount of Key Click noise for Note Off events. The Device may also use its own proprietary controller to set the amount of Key Click noise for a Note Off.

6.1.2.8   RC 0x40 **0x41 Amount of Crosstalk/Leakage**

Value Range: 0x00000000-0xFFFFFFFF = None to Full

Default Value: 0x80000000

6.1.3   Poly Pressure

The Device should not respond to Poly Pressure by default. This may be overridden by user settings on the Device.

6.1.4   Channel Pressure

The Device should not respond to Channel Pressure as a default. This may be overridden by user settings on the Device.

6.1.5   Pitch Bend

Default Value: 0x80000000 (center)

Adjusts the Pitch up or down on the specified Channel. Default sensitivity (range) is +/- 2 HCU. 0x00000000 specifies maximum pitch bend down. 0xFFFFFFFF specifies maximum pitch bend up. Pitch Bend Sensitivity may be adjusted using RC 0x00 00.

Appendix A: Minimum Requirements

Note: This section is informational only. For normative requirements, refer to Section 1 to 6 of this specification.

All Devices which have the Drawbar Organ Profile enabled implement at least the following features in the manner defined by this Drawbar Organ Profile:

- Play Notes for Key Range from at least Note Number 36 (0x24) to 96 (0x60)
- MIDI Note Number 69 (0x45) sounds as A=440Hz on the 8' Drawbar
- Other controllers listed as "required" in the following table:

Table 11 MIDI Messages Summary

MIDI Message	Parameter	Requirement
Note On/Off		required
RC 0x40 0x30	16' Drawbar	required
RC 0x40 0x31	5-1/3' Drawbar	required
RC 0x40 0x32	8' Drawbar	required
RC 0x40 0x33	4' Drawbar	required
RC 0x40 0x34	2-2/3' Drawbar	required
RC 0x40 0x35	2' Drawbar	required
RC 0x40 0x36	1-3/5' Drawbar	required
RC 0x40 0x37	1-1/3' Drawbar	required
RC 0x40 0x38	1' Drawbar	required
CC#7	Volume	required
CC#11	Expression Pedal	required
CC#64	Sustain	optional
CC#67	Soft	optional
CC#120	All Sound Off	required
CC#121	Reset All Controllers	required
CC#122	All Notes Off	required
Pitch Bend	Pitch Bend	optional
Profile Specific Data	Discover Optional Features	optional