MIDI-CI Property Exchange ExternalSync Resource

Version 1.0
November 24, 2020

Document M2-112-UM
Published By:
Association of Musical Electronics Industry
http://www.amei.or.jp
and
The MIDI Association
https://www.midi.org

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PREFACE

Property Exchange is part of the MIDI-CI specifications first released in 2018. Property Exchange is a method for sending JSON over SysEx between two devices to get and set device properties. Each MIDI device is unique and provides an experience different from another device. Property Exchange allows you to discover and use almost any device in a consistent way. This document describes the Property Data for these Resources. For information on how to transmit and receive Property Data over SysEx please see the MIDI-CI [MMA02] and Common Rules for MIDI-CI Property Exchange [MMA03].

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1. Introduction

1.1 Background

Property Exchange is part of the MIDI Capability Inquiry (MIDI-CI) [MMA02] specification and MIDI 2.0. Property Exchange is a method for getting and setting various data, called Resources, between two Devices. Resources are exchanged inside two payload fields of System Exclusive Messages defined by MIDI-CI, the Header Data field and Property Data field. This document defines only the contents of the Header Data and Property Data fields. For information on how to transmit and receive these Resource payloads inside MIDI-CI System Exclusive messages, see the MIDI Capability Inquiry specification [MMA02] and Common Rules for MIDI-CI Property Exchange specification [MMA03].

This document defines the ExternalSync Resource. If a Property Exchange Device has a clock which is able to synchronize to external MIDI sync messages, then the Device should support the ExternalSync Resource.

1.2 Related Documents

[MMA01] ***The Complete MIDI 1.0 Detailed Specification, Document Version 96.1, Third Edition***, Association of Musical Electronics Industry, http://www.amei.or.jp/, and MIDI Manufacturers Association, https://www.midi.org/.

[MMA02] ***MIDI Capability Inquiry (MIDI-CI), Version 1.1***, Association of Musical Electronics Industry, http://www.amei.or.jp/, and MIDI Manufacturers Association, https://www.midi.org/.

[MMA03] ***Common Rules for MIDI-CI Property Exchange, Version 1.1***, Association of Musical Electronics Industry, http://www.amei.or.jp/, and MIDI Manufacturers Association, https://www.midi.org/.

1.3 Terminology

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

MIDI-CI: [MMA02] MIDI Capability Inquiry, a specification published by MMA and AMEI.

Property: A JSON key:value pair used by Property Exchange.

Property Data: A set of one or more Properties in a Device which are accessible by Property Exchange. Contained in the Property Data field of a MIDI-CI Property Exchange message.

Property Exchange: an AMEI/MMA specification which is the basis for this specification, in which one Device may access Property Data from another Device.

Property Exchange Device: A Device which implements Property Exchange.

Property Key: the key in a JSON key:value pair used by Property Exchange.

Property Value: the value in a JSON key:value pair used by Property Exchange.

Resource: A defined Property Data with an associated inquiry for accessing the Property Data.

Simple Property Resource: A Resource that defines only a single Property which includes only a Property Value, without the Property Key, in the Property Data.

1.4 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 1 Words Relating to Specification Conformance

Word	Reserved For	Relation to Spec 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 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 2 Words Not Relating to Specification Conformance

Word	Reserved For	Notes
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).

2. ExternalSync Resource

"ExternalSync" is a Simple Property Resource which can get or set whether a Device's clock will synchronize to external MIDI sync messages. If the Device's clock is synced to external MIDI sync messages, then it shall recognize and synchronize to the following System Real Time MIDI messages:

1. Timing Clock
2. Start
3. Continue
4. Stop

If a Device that declares it is responding to responding to external clock messages, then it may optionally respond to System Common Messages including Song Select and Song Position Pointer.

The Property Data declares whether the Device's clock will synchronize to external MIDI sync messages using a boolean.

2.1 Initiator Requests Data from a Responder Using an Inquiry: Get Property Data

An Initiator may request the "ExternalSync" Resource from a Responder using an Inquiry: Get Property Data message.

Initiator Sends Inquiry: Get Property Data Message

Header Data	`{"resource":"ExternalSync"}`
Property Data	*none*

Responder Sends Reply to Get Property Data Message

Header Data	`{"status":200}`
Property Data	`false`

2.2 Request using Inquiry: Set Property

An Initiator may send the Property Data to a Responder for the "ExternalSync" Resource using an Inquiry: Set Property Data message.

Initiator Sends Inquiry: Set Property Data Message

Header Data	`{"resource":"ExternalSync"}`
Property Data	`true`

Responder Sends Reply to Set Property Data Message

Header Data	`{"status":200}`
Property Data	*none*

2.3 "ResourceList" Integration for ExternalSync

When a Responder receives an Inquiry: Get Property message with ResourceList, the Responder shall send a Reply to Get Inquiry message with a list of all Resources it supports so the Initiator understands its availability and settings. For more information see the Common Rules for MIDI-CI Property Exchange [MMA03].

A Responder that supports the ExternalSync shall declare such support in its reply to a ResourceList inquiry.

Example minimal entry in ResourceList:

Property Data	`[`
	`  {"resource": "ExternalSync"}`
	`]`

Example full version with default settings:

Property Data	`[`
	`  {`
	`  "resource": "ExternalSync",`
	`  "canGet": true,`
	`  "canSet": "full",`
	`  "canSubscribe": false,`
	`  "requireResId": false,`
	`  "schema": {`
	`  "title": "External Timing Sync",`
	`  "type": "boolean",`
	`  "description": "Get or set whether the Device's clock will synchronize to external MIDI sync related System Real Time Messages"`
	`  }`
	`  }`
	`]`

Revision History

Date	Version	Changes
Nov. 18, 2020	1.0	Initial Version

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