D16 MIDI Implementation

D16(version2.0) MIDI Implementation (2000.07.24)

1.Transmitted Data

1-1.Channel Messages

Status	Second	Third	Description
1011 nnnn (Bn)	0ccc cccc (cc)	0vvv vvvv (vv)	Control Change *1
1100 nnnn (Cn)	0ppp pppp (pp)		Program Change *2

Notes *1: Control Change is different from standard way.
For MixerControl; Transmitted when ControlChange is enabled in [SYSTEM]"MIDI."

[!] MIDI MixerControl Messages (Bn ID vv)

ID	message	parameter	value
7	Bn 07 vv	Fader	0-127
8	Bn 08 vv	Pair switch(1-2,3-4,5-6,7-8)	0=Independent, 1=Pair
10	Bn 0A vv	Pan	0-127 (64=center)
12	Bn 0C vv	EffSend1	0-100
13	Bn 0D vv	EffSend2	0-100
14	Bn 0E vv	AuxSend	0-100
16	Bn 10 vv	EQ Low	0-60 (30=Flat)
19	Bn 13 vv	EQ Mid	0-60 (30=Flat)
20	Bn 14 vv	EQ MidFc	0-48
25	Bn 19 vv	EQ Hi	0-60 (30=Flat)
68	Bn 44 vv	Input EQ Low	0-60 (30=Flat)
71	Bn 47 vv	Input EQ Mid	0-60 (30=Flat)
72	Bn 48 vv	Input EQ MidFc	0-48
77	Bn 4D vv	Input EQ Hi	0-60 (30=Flat)
80	Bn 50 vv	SubIn Level	0-100
81	Bn 51 vv	SubIn Balance	0-127 (64=center)
82	Bn 52 vv	SubIn Mono	0=Stereo, 1=Monaural
83	Bn 53 vv	SubIn Mute	0=Mute Off, 1=Mute On
86	Bn 56 vv	MstEff1 RetLev *1-1	0-100
87	Bn 57 vv	MstEff1 RetBal *1-1	0-127 (64=center)
88	Bn 58 vv	MstEff2 RetLev *1-1	0-100
89	Bn 59 vv	MstEff2 RetBal *1-1	0-127 (64=center)
94	Bn 5E vv	Pair control(Eq/Send/Aux/Pan) *1-1	b7-4:--- b3: Pan (0=Pair Off, 1=Pair On) b2: Eq (0=Pair Off, 1=Pair On) b1: Send (0=Pair Off, 1=Pair On) b0: Aux (0=Pair Off, 1=Pair On)
95	Bn 5F vv	Master fader *1-1	0-127

Notes *1-1: Common of all channels.
Not recognized but by Global Channel.

*2: Transmitted when ProgramChange is enabled in [SYSTEM]"MIDI."
Transmitted when ...
"SceneNumber" is changed in the [SCENE]"ReadDel"tab page.
A scene is registered by pressing the [STORE] key and [SCENE] key.
"SceneRead" is "On" and the scene changed during playback/recording.
Program Change #000-099 correspond to Scene Number 001-100.

1-2.Universal System Exclusive Messages

1-2-1.MIDI Machine Control *1

Status	Description
1111 0000 (F0)	Universal System Exclusive
0111 1111 (7F)	Real Time Header
00aa aaaa (aa)	DeviceID (0-127)
0000 0110 (06)	Machine Control Command(mcc)sub-ID
0bbb bbbb (bb)	
:	Command String *2
:	
1111 0111 (F7)	End-of-Exclusive

Notes *1: Transmitted when "MMC Mode:Transmit" is selected in [SYSTEM]"MMC."
Not transmitted in [SCRUB],[Wave],[Song]"PrgPlay",[Input]"Tuner",
and in operation at [SYSTEM]"DiskUtil"tab page.

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[!] MMC Transmitted Messages
 STOP          [01]    F0 7F dv 06 01 F7      ;dv(DeviceID) = 00-7F
 PLAY          [02]    F0 7F dv 06 02 F7
 DEFFERD PLAY  [03]    F0 7F dv 06 03 F7
 RECORD STROBE [06]    F0 7F dv 06 06 F7
 RECORD EXIT   [07]    F0 7F dv 06 07 F7
 LOCATE        [44]    F0 7F dv 06 44 06 01 hr mn sc fr ff F7
                      ;hr : hour(0-23), type                  *1-1
                      ;mn : minute(0-59)
                      ;sc : second(0-59)
                      ;fr : frame(0-29)
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Notes *1-1: hr = 0yyzzzzz
zzzzz = hour(0-23),
yy = type(Only 11 = MIDI Time Code 30 non-drop frame, is enabled.)

*2: <Command String> ::= <Command> | <Command String><Command>
Number of bytes in a Command String field must not exceed 48.

1-2-2.MTC Full Messages *1

Status	Second	Third	Description
1111 0000 (F0)	0111 1111 (7F)	dv 01 01 hr mn sc fr F7 *2	MTC Full Message

Notes *1: When "MMC Mode:Transmit" is selected, locate message is transmitted by MMC Message.
When "MMC Mode:Off" and "MIDISync Mode: MTCMstr" are selected, locate message
is transmitted by MTC Full Message.

*2: dv : DeviceID = 7F
hr = 0yyzzzzz : zzzzz = hour(0-23),
yy = type (Only 11 = MIDI Time Code 30 non-drop frame, is enabled.)
mn : minute(0-59)
sc : second(0-59)
fr : frame(0-29)

1-3.System Common Messages

Status	Second	Third	Description
1111 0001 (F1)	0000 xxxx (0x)		MTC Quarter Frame (fr(L)) *1
1111 0001 (F1)	0001 xxxx (1x)		MTC Quarter Frame (fr(H)) *1
1111 0001 (F1)	0010 xxxx (2x)		MTC Quarter Frame (sc(L)) *1
1111 0001 (F1)	0011 xxxx (3x)		MTC Quarter Frame (sc(H)) *1
1111 0001 (F1)	0100 xxxx (4x)		MTC Quarter Frame (mn(L)) *1
1111 0001 (F1)	0101 xxxx (5x)		MTC Quarter Frame (mn(H)) *1

1111 0001 (F1)	0110 xxxx (6x)		MTC Quarter Frame (hr(L)) *1
1111 0001 (F1)	0111 xxxx (7x)		MTC Quarter Frame (hr(H)) *1
1111 0010 (F2)	0sss ssss (ss)	0ttt tttt (tt)	Song Position Pointer *2

Notes *1: Only MTC30NDF(MIDI Time Code 30 non-drop frame) is transmitted when "MIDISync Mode:MTC Mstr" is selected in [SYSTEM]"Sync."

*2: Transmitted when "MIDISync Mode:ClockMstr" is selected in [SYSTEM]"Sync."

1-4.System Real time Messages *1

Status	Description
1111 1000 (F8)	Timing Clock
1111 1010 (FA)	Start
1111 1011 (FB)	Continue
1111 1100 (FC)	Stop

Notes *1: Transmitted when "MIDISync Mode:ClockMstr" is selected in [SYSTEM]"Sync."

2.Recognized Receive Data

Not received in [SCRUB],[Wave],[Song]"PrgPlay",[Input]"Tuner", and in operation at [SYSTEM]"DiskUtil" tab page.

2-1.Channel Messages

Status	Second	Third	Description
1001 nnnn (9n)	0kkk kkkk (kk)	---- ---- *2	Note On (note) *1
1001 nnnn (9n)	---- ---- *2	0vvv vvvv (vv)	Note On (velocity) *1
1011 nnnn (Bn)	0ccc cccc (cc)	0vvv vvvv (vv)	Control Change (0-119) *1,*4
1100 nnnn (Cn)	0ppp pppp (pp)		Program Change *3
1101 nnnn (Dn)	0vvv vvvv (vv)		Channel Pressure (After Touch) *1
1110 nnnn (En)	0hhh hhhh (hh)	---- ---- *2	Bender Change *1

Notes *1: For EffectControl; Received when selected in [SYSTEM]"Control" and insertion effect that will be controlled is selected in "CtrlChg:Ass."

*2: Not recognized at all.

*3: Received when ProgramChange is enabled in [SYSTEM]"MIDI" and when "SceneRead" is "Off." Program Change #000-099 correspond to Scene Number 001-100.

*4: Control Change is different from standard way.
For MixerControl; Received when ControlChange is enabled in [SYSTEM]"MIDI."

[!] MIDI MixerControl Messages (Bn ID vv)

ID	message	parameter	value
7	Bn 07 vv	Fader	0-127
8	Bn 08 vv	Pair switch(1-2,3-4,5-6,7-8)	0=Independent, 1=Pair
10	Bn 0A vv	Pan	0-127 (64=center)
12	Bn 0C vv	EffSend1	0-100
13	Bn 0D vv	EffSend2	0-100
14	Bn 0E vv	AuxSend	0-100
16	Bn 10 vv	EQ Low	0-60 (30=Flat)
19	Bn 13 vv	EQ Mid	0-60 (30=Flat)
20	Bn 14 vv	EQ MidFc	0-48
25	Bn 19 vv	EQ Hi	0-60 (30=Flat)
68	Bn 44 vv	Input EQ Low	0-60 (30=Flat)
71	Bn 47 vv	Input EQ Mid	0-60 (30=Flat)
72	Bn 48 vv	Input EQ MidFc	0-48
77	Bn 4D vv	Input EQ Hi	0-60 (30=Flat)
80	Bn 50 vv	SubIn Level	0-100
81	Bn 51 vv	SubIn Balance	0-127 (64=center)

82	Bn 52 vv	SubIn Mono	0=Stereo, 1=Monaural
83	Bn 53 vv	SubIn Mute	0=Mute Off, 1=Mute On
86	Bn 56 vv	MstEff1 RetLev *4-1	0-100
87	Bn 57 vv	MstEff1 RetBal *4-1	0-127 (64=center)
88	Bn 58 vv	MstEff2 RetLev *4-1	0-100
89	Bn 59 vv	MstEff2 RetBal *4-1	0-127 (64=center)
94	Bn 5E vv	Pair control(Eq/Send/Aux/Pan) *4-1	b7-4:--- b3: Pan (0=Pair Off, 1=Pair On) b2: Eq (0=Pair Off, 1=Pair On) b1: Send (0=Pair Off, 1=Pair On) b0: Aux (0=Pair Off, 1=Pair On)
95	Bn 5F vv	Master fader *4-1	0-127

Notes *4-1: Common of all channels.
Not recognized but by Global Channel.

2-2.Universal System Exclusive Messages

2-2-1.MIDI Machine Control *1

Status	Description
1111 0000 (F0)	Universal System Exclusive
0111 1111 (7F)	Real Time Header
00aa aaaa (aa)	DeviceID (0-127)
0000 0110 (06)	Machine Control Command(mcc)sub-ID
0bbb bbbb (bb)	
:	Command String *2
:	
1111 0111 (F7)	End-of-Exclusive

Notes *1: Received when "MMC Mode:Receive" is selected in [SYSTEM]"MMC."
*2: <Command String> ::= <Command> | <Command String><Command>
Number of bytes in a Command String field must not exceed 48.

2-2-2.MTC Full Messages *1

Status	Second	Third	Description
1111 0000 (F0)	0111 1111 (7F)	dv 01 01 hr mn sc fr F7 *2	MTC Full Message

Notes *1: MTC Full Message is enabled when "MMC Mode:Off" and "MIDI SyncMode:MTCSlave" are selected.
*2: dv : DeviceID = 7F
hr = 0yyzzzzz : zzzzz = hour(0-23)
yy = type (Only 11 = MIDI Time Code 30 non-drop frame, is enabled.)
mn : minute(0-59)
sc : second(0-59)
fr : frame(0-29)

2-3.System Common Messages *1

Status	Second	Description
1111 0001 (F1)	0000 xxxx (0x)	MTC Quarter Frame (fr(L))
1111 0001 (F1)	0001 xxxx (1x)	MTC Quarter Frame (fr(H))
1111 0001 (F1)	0010 xxxx (2x)	MTC Quarter Frame (sc(L))
1111 0001 (F1)	0011 xxxx (3x)	MTC Quarter Frame (sc(H))
1111 0001 (F1)	0100 xxxx (4x)	MTC Quarter Frame (mn(L))
1111 0001 (F1)	0101 xxxx (5x)	MTC Quarter Frame (mn(H))
1111 0001 (F1)	0110 xxxx (6x)	MTC Quarter Frame (hr(L))
1111 0001 (F1)	0111 xxxx (7x)	MTC Quarter Frame (hr(H))

Notes *1: Only MTC30NDF(MIDI Time Code 30 non-drop frame) is received when "MIDISync Mode:MTC Slave" is selected in [SYSTEM]"Sync."

[!] MTC RecvErrorLevel(in [SYSTEM] "Sync")
Treated as synchronization error when ...
Level 0 : No Check.
1 : more than 1000msec out.
2 : more than 500msec out.
3 : more than 300msec out.
4 : more than 100msec out.
5 : more than 50msec out.
6 : more than 40msec out.
7 : more than 30msec out.
8 : more than 20msec out.
9 : more than 10msec out.

2-4.System Real time Messages *1

Status	Description
1111 1000 (F8)	Timing Clock
1111 1010 (FA)	Start
1111 1100 (FC)	Stop

Notes *1: Received when "SelectRecTempoTrackType:MIDIClock" is selected in [TEMPO/RHYTHM]"TmpTrk" to record the tempo track.

3.MIDI Machine Control Commands

Communication between the D16version2.0(Controlled Device) and a Controller is in the "open loop" mode only.
The D16version2.0 accepts commands from MIDI IN port but does not send any response to MIDI OUT.

Available Commands
(MCS=Motion Control State,MCP=Motion Control Process)

HEX	Commands
01	STOP(MCS)
03	DEFFERD
04	PLAY(MCS)
05	FAST
06	FORWARD(MCS)
07	REWIND(MCS)
08	RECORD STROBE
09	RECORD EXIT
0D	RECORD PAUSE
40	PAUSE(MCS)
44	MMC RESET
4C	WRITE
	LOCATE(MCP)
	MOVE

Available Information Fields

HEX	Information Field Name
01	SELECTED TIME CODE
08	GP0/LOCATE POINT

D16version2.0 Signature (The D16version2.00 never transmits this message.)
01 00 00 00
0C
7B 47 00 00 00 00 00 00 00
11 20
02
02 02