

dLive MIDI Over TCP/IP Protocol

Firmware V1.9

i This protocol is for use with dLive systems loaded with firmware version V1.9 and later.

TCP/IP control is available via any **Network** port on the dLive Surface or MixRack. Messages are sent using the MIDI format, as described in this document.

All MIDI message **numbers** shown in this specification are hexadecimal. Refer to the end of this specification for a table of values for each of the parameters listed here. All variables are shown in **green**.

Clients should be configured to use either:

Without encryption - Rendezvous port TCP **51325**.

With TLS/SSL encryption - Rendezvous port TCP **51327**.

MIDI Controllable Functions and Parameters:

• Fader levels	NRPN	<i>Input, Mix master, FX send, FX return, DCA</i>
• Mutes	Note On	<i>Input, Mix master, FX send, FX return, DCA, Mute Groups</i>
• Send levels	SysEx	<i>Aux, FX and Matrix sends</i>
• DCA assign	NRPN	
• Input to Main assign	NRPN	
• Preamp - Gain	Pitchbend	
• Preamp - Pad, 48V	SysEx	
• Name & Colour	SysEx	
• Scene Recall	Program Change	
• PEQ control	NRPN	
• HPF control	NRPN	
• MIDI transport	MIDI Machine Control (MMC)	

Authentication

When the TLS/SSL socket is opened, the first data sent to the dLive should be the following message:

UserProfile, UserPassword

Where UserProfile = **00** to **1F**

If the username and password match, then the unit will respond with the six characters "AuthOK", otherwise the connection will be dropped.

MIDI Running Status

dLive uses MIDI running status. This maximises MIDI transmission efficiency by allowing a MIDI message to be sent without its Status byte if the previous transmitted message had the same Status.

For example, turning Mute on for Inputs 1, 2 and 3 on MIDI channel 12:

Without running status – Full message string **9B, 00, 7F, 9B, 01, 7F, 9B, 02, 7F**

With running status – Shorter message string **9B, 00, 7F, 01, 7F, 02, 7F**

The omitted bytes will be shown below in square brackets (eg [9N]).

MIDI channel number

N

MIDI channel 1 to 12 = **0** to **B**

In order to extend the range of audio channels that can be controlled by MIDI messages the dLive MIDI protocol uses a range of MIDI channels to select between audio channel types. The base MIDI channel **N** is the lowest channel of the range selected in **Utility / Control / MIDI**. The audio channel type is selected by offsetting the MIDI channel used in the message and the audio channel number is selected using the note number, as detailed in 'Channel Selection' below.

Preamp control, Scene recall and MIDI transport use the base MIDI channel **N**.

Channel Selection

CH (refer to table)

Channels are selected using the channel number and note number as follows:

Inputs 1 to 128: **N** = **N**, **CH** = **00** to **7F**

Mono Groups 1 to 62: **N** = **N + 1**, **CH** = **00** to **3D**

Stereo Groups 1 to 31: **N** = **N + 1**, **CH** = **40** to **5E**

Mono Aux 1 to 62: **N** = **N + 2**, **CH** = **00** to **3D**

Stereo Aux 1 to 31: **N** = **N + 2**, **CH** = **40** to **5E**

Mono Matrix 1 to 62: **N** = **N + 3**, **CH** = **00** to **3D**

Stereo Matrix 1 to 31: **N** = **N + 3**, **CH** = **40** to **5E**

Mono FX Send 1 to 16: **N** = **N + 4**, **CH** = **00** to **0F**

Stereo FX Send 1 to 16: **N** = **N + 4**, **CH** = **10** to **1F**

FX Return 1 to 16: **N** = **N + 4**, **CH** = **20** to **2F**

Mains 1 to 6: **N** = **N + 4**, **CH** = **30** to **35**

DCA 1 to 24: **N** = **N + 4**, **CH** = **36** to **4D**

Mute Group 1 to 8: **N** = **N + 4**, **CH** = **4E** to **55**

SysEx Header

SysEx Header

This applies to all SysEx messages described later in this specification

F0, 00, 00, 1A, 50, 10, MV, mV

Where MV = 01 (Major version)

mV = 00 (Minor version)

Mute ON

NOTE ON with velocity > 40 followed by NOTE OFF

9N, CH, 7F, [9N], CH, 00

Mute OFF

NOTE ON with velocity < 40 followed by NOTE OFF

9N, CH, 3F, [9N], CH, 00

Received Mute messages

Velocity 00 and NOTE OFF messages are ignored

Velocity 01 to 3F = Mute OFF

Velocity 40 to 7F = Mute ON

Get Mute Status

SysEx message

SysEx Header, 0N, 05, 09, CH, F7

The unit will then transmit the appropriate Channel Mute ON or OFF message.

Fader Level

NRPN with parameter ID 17

Fader value LV -inf to +10dB = 00 to 7F (refer to table)

Select channel	Parameter	Set fader value
BN, 63, CH,	[BN], 62, 17,	[BN], 06, LV

Get Fader Level

SysEx message

SysEx Header, 0N, 05, 0B, 17, CH, F7

The unit will then transmit the appropriate Fader Level message.

Channel Assignment to Main Mix ON

NRPN with parameter ID 18

ON value = 40 to 7F

Select channel	Parameter	Set ON
BN, 63, CH,	[BN], 62, 18,	[BN], 06, 7F

Channel Assignment to Main Mix OFF

NRPN with parameter ID 18

OFF value = 00 to 3F

Select channel	Parameter	Set OFF
BN, 63, CH,	[BN], 62, 18,	[BN], 06, 3F

Get Channel Assignment to Main Mix

SysEx message

SysEx Header, 0N, 05, 0B, 18, CH, F7

The unit will then transmit the appropriate Channel Assignment to Main Mix message.

AUX / FX / Matrix Send Level

SysEx message

Where SndN and SndCH are the MIDI channel and note number for the channel to be sent to.

Send value LV -inf to +10dB = 00 to 7F

Message:

SysEx Header, 0N, 0D, CH, SndN, SndCH, LV, F7

Get:

SysEx Header, 0N, 05, 0F, 0D, CH, SndN, SndCH, F7

Input to Group / Aux ON

SysEx message

Where **SndN** and **SndCH** are the MIDI channel and note number for the channel to be sent to.

V On value = 40 to 7F

Message:

SysEx Header, 0N, 0E, CH, SndN, SndCH, V, F7

Get:

SysEx Header, 0N, 05, 0F, 0E, CH, SndN, SndCH, F7

DCA Assignment ON

NRPN with parameter ID 40

ON value **DB** for DCA 1 to 24 = 40 to 57

Select channel	Parameter	Set ON
BN, 63, CH,	[BN], 62, 40,	[BN], 06, DB

DCA Assignment OFF

NRPN with parameter ID 40

OFF value **DA** for DCA 1 to 24 = 00 to 17

Select channel	Parameter	Set OFF
BN, 63, CH,	[BN], 62, 40,	[BN], 06, DA

Mute Group Assignment ON

NRPN with parameter ID 40

ON value **DB** for Mute Group 1 to 8 = 58 to 5F

Select channel	Parameter	Set ON
BN, 63, CH,	[BN], 62, 40,	[BN], 06, DB

Mute Group Assignment OFF

NRPN with parameter ID 40

OFF value **DA** for Mute Group 1 to 8 = 18 to 1F

Select channel	Parameter	Set OFF
BN, 63, CH,	[BN], 62, 40,	[BN], 06, DA

Socket Preamp numbers (refer to table)

Mixrack sockets 1-64 **MP** = 00 to 3F

Mixrack DX 1/2 1-32 **MP** = 40 to 5F

Mixrack DX 3/4 1-32 **MP** = 60 to 7F

Set Socket Preamp Gain

Pitchbend message

Gain value **GV** min to max = 00 to 7F (refer to table)

EN, MP, GV

Get Socket Preamp Gain

SysEx message

SysEx Header, 0N, 05, 0B, 19, CH, F7

The unit will then transmit the appropriate Socket Preamp Gain message.

Set Socket Preamp Pad

SysEx message

SysEx Header, 0N, 09, MP, Pad, F7 where Pad OFF= 00 to 3F, ON = 40 to 7F

Get Socket Preamp Pad

SysEx message

SysEx Header, 0N, 07, MP, F7

The unit will then transmit the following message:

Reply... **SysEx Header**, 0N, 08, MP, Pad, F7 where Pad OFF= 00, ON = 7F

Set Socket Preamp 48V

SysEx message

SysEx Header, 0N, 0C, MP, 48V, F7 where 48V OFF = 00 to 3F, ON = 40 to 7F

Get Socket Preamp 48V

SysEx Header, 0N, 0A, MP, F7

The unit will then transmit the following message:

SysEx Header, 0N, 0B, MP, 48V, F7 where 48V OFF = 00, ON = 7F

Set Channel Name

SysEx message

SysEx Header, 0N, 03, CH, Name, F7

where **Name** = Hex ASCII String

Get Channel Name

SysEx message

SysEx Header, 0N, 01, CH, F7

The unit will then transmit the following message:

SysEx Header, 0N, 02, CH, Name, F7

where **Name** = Hex ASCII String

Set Channel Colour

SysEx message

SysEx Header, 0N, 06, CH, Col, F7

where **Col** = 00 to 07 (refer to table)

Get Channel Colour

SysEx Header, 0N, 04, CH, F7

The unit will then transmit the following message:

SysEx Header, 0N, 05, CH, Col, F7 where **Col** = 00 to 07 (refer to table)

Scene Recall

Bank and **Program Change** message

To recall one of the 500 Scenes (4 banks)

Also transmits this message when a Scene is recalled from the dLive screen

For Scene 1 to 128

Scene **SS** 1 to 128 = 00 to 7F

(refer to table)

Select bank **Recall Scene**

BN, 00, 00, CN, SS

For Scene 129 to 256

Scene **SS** 129 to 256 = 00 to 7F

(refer to table)

Select bank **Recall Scene**

BN, 00, 01, CN, SS

For Scene 257 to 384

Scene **SS** 257 to 384 = 00 to 7F

(refer to table)

Select bank **Recall Scene**

BN, 00, 02, CN, SS

For Scene 385 to 500

Scene **SS** 385 to 500 = 00 to 73

(refer to table)

Select bank **Recall Scene**

BN, 00, 03, CN, SS

Parametric EQ

NRPN with **parameter ID** between 1A and 29 depending on function and band (see table)

Select channel **Parameter** **Set Value**

BN, 63, CH, [BN], 62, nn, [BN], 06, vv

nn Parameter ID:

	Type	Frequency	Width	Gain
Band 0	1A	1B	1C	1D
Band 1	1E	1F	20	21
Band 2	22	23	24	25
Band 3	26	27	28	29

vv For Type

From table:

Type	Vv (dec)	Vv (hex)	Notes
Shelf	0	00	Only use on bands 0 and 3
LF Shelf	1	01	Only use on band 0
HF Shelf	2	02	Only use on band 3
L Pass	3	03	Only use on band 3
H Pass	4	04	Only use on band 0

vv For Frequency

For frequencies between 20Hz and 20kHz

$$Vv = \text{INT}(127 * ((4608 * \text{LOG10}(\text{FREQUENCY}/4) / \text{LOG10}(2)) - 10699) / 45922)$$

eg.

Frequency	Vv (dec)	Vv (hex)
20Hz	0	00
50Hz	16	10
100Hz	29	1D
500Hz	59	3B
1kHz	71	47
10kHz	114	72
20kHz	127	7F

vv For Gain

For gains from -15dB to +15dB

$$Vv = (\text{GAIN} + 15) * 126 / 30$$

eg.

Gain	Vv (dec)	Vv (hex)
-15dB	0	00
-10dB	21	15
-5db	42	2A
0dB	63	3F
5db	84	54
10db	105	69
15db	126	7E

vv For Width

From table:

Width	Vv (dec)	Vv (hex)
1.5	0	00
1.4	1	01
1.3	2	02

1.2	3	03
1.1	4	04
1	5	05
0.95	6	06
0.9	7	07
0.85	8	08
0.8	9	09
3/4	10	0A
0.7	11	0B
2/3	12	0C
0.6	13	0D
0.55	14	0E
0.5	15	0F
0.45	16	10
0.4	17	11
1/3	18	12
0.3	19	13
1/4	20	14
0.2	21	15
1/6	22	16
0.13	23	17
1/9	24	18

Get Parametric EQ

SysEx message

SysEx Header, 0N, 05, 0B, nn, CH, F7

The unit will then transmit the appropriate Parametric EQ message.

HPF Frequency

NRPN with parameter ID **30**

Select channel	Parameter	Set Value
BN, 63, CH,	[BN], 62, 30,	[BN], 06, vv

vv = INT(127*((4608 * LOG10(FREQUENCY / 4) / LOG10(2)) - 10699) / 41314)

Get HPF Frequency

SysEx message

SysEx Header, 0N, 05, 0B, 30, CH, F7

The unit will then transmit the appropriate HPF Frequency message.

Set HPF On/Off

NRPN with parameter ID **31**

Select channel	Parameter	Set Value
BN, 63, CH,	[BN], 62, 31,	[BN], 06, HPF

where **HPF** OFF= **00** to **3F**, ON = **40** to **7F**

Get HPF On/Off

SysEx message

SysEx Header, 0N, 05, 0B, 31, CH, F7

The unit will then transmit the appropriate HPF On/Off message.

MIDI Strips

Custom MIDI messages

Fader strips within the Banks can be assigned as MIDI Strips. There are 32 MIDI Strips available.

Each fader strip control can be assigned to transmit a custom MIDI message. This is used for controlling audio within a Digital Audio Workstation (DAW), a slave mixer, or parameters on external equipment such as effects devices. MIDI Strips can be named and coloured. They are stored within Scenes and can be made Safe from Scene recall.

The Template Shows load the following factory default messages for the MIDI Strip controls. These can be restored by recalling Scene 9 within the Template Show:

- Fader **B1, 00, <VAR>** to **B1, 1F, <VAR>**
- Rotary Gain **B2, 00, <VAR>** to **B2, 1F, <VAR>**
- Rotary Pan **B2, 20, <VAR>** to **B2, 3F, <VAR>**
- Rotary Custom 1 **B2, 40, <VAR>** to **B2, 5F, <VAR>**
- Rotary Custom 2 **B2, 60, <VAR>** to **B2, 7F, <VAR>**
- Rotary Custom 3 **B2, 40, <VAR>** to **B2, 5F, <VAR>**
- Rotary Custom 4 **B2, 60, <VAR>** to **B2, 7F, <VAR>**
- Mute key = **91, 00, <VAR>** to **91, 1F, <VAR>**
- Mix key = **91, 20, <VAR>** to **91, 3F, <VAR>**
- PAFL key = **91, 40, <VAR>** to **91, 5F, <VAR>**

Where **<VAR>** is the value determined by the position of the control.

i The **Sel** key is not included as this is required to select this Processing screen for configuring the MIDI Strip.

i By default, **Rotary Custom 3** uses the same values as **Rotary Custom 1** and **Rotary Custom 4** uses the same values as **Rotary Custom 2**

ALLEN&HEATH

dLive MIDI TCP/IP Reference Table - v1.90

Scene Number	SS	Bank 1	Bank 2	Bank 3	Bank 4	Hex
1	129	257	385	00		
2	130	258	386	01		
3	131	259	387	02		
4	132	260	388	03		
5	133	261	389	04		
6	134	262	390	05		
7	135	263	391	06		
8	136	264	392	07		
9	137	265	393	08		
10	138	266	394	09		
11	139	267	395	0A		
12	140	268	396	0B		
13	141	269	397	0C		
14	142	270	398	0D		
15	143	271	399	0E		
16	144	272	400	0F		
17	145	273	401	10		
18	146	274	402	11		
19	147	275	403	12		
20	148	276	404	13		
21	149	277	405	14		
22	150	278	406	15		
23	151	279	407	16		
24	152	280	408	17		
25	153	281	409	18		
26	154	282	410	19		
27	155	283	411	1A		
28	156	284	412	1B		
29	157	285	413	1C		
30	158	286	414	1D		
31	159	287	415	1E		
32	160	288	416	1F		
33	161	289	417	20		
34	162	290	418	21		
35	163	291	419	22		
36	164	292	420	23		
37	165	293	421	24		
38	166	294	422	25		
39	167	295	423	26		
40	168	296	424	27		
41	169	297	425	28		
42	170	298	426	29		
43	171	299	427	2A		
44	172	300	428	2B		
45	173	301	429	2C		
46	174	302	430	2D		
47	175	303	431	2E		
48	176	304	432	2F		
49	177	305	433	30		
50	178	306	434	31		
51	179	307	435	32		
52	180	308	436	33		
53	181	309	437	34		
54	182	310	438	35		
55	183	311	439	36		
56	184	312	440	37		
57	185	313	441	38		
58	186	314	442	39		
59	187	315	443	3A		
60	188	316	444	3B		
61	189	317	445	3C		
62	190	318	446	3D		
63	191	319	447	3E		
64	192	320	448	3F		

Scene Number	SS	Bank 1	Bank 2	Bank 3	Bank 4	Hex
65	193	321	449	40		
66	194	322	450	41		
67	195	323	451	42		
68	196	324	452	43		
69	197	325	453	44		
70	198	326	454	45		
71	199	327	455	46		
72	200	328	456	47		
73	201	329	457	48		
74	202	330	458	49		
75	203	331	459	4A		
76	204	332	460	4B		
77	205	333	461	4C		
78	206	334	462	4D		
79	207	335	463	4E		
80	208	336	464	4F		
81	209	337	465	50		
82	210	338	466	51		
83	211	339	467	52		
84	212	340	468	53		
85	213	341	469	54		
86	214	342	470	55		
87	215	343	471	56		
88	216	344	472	57		
89	217	345	473	58		
90	218	346	474	59		
91	219	347	475	5A		
92	220	348	476	5B		
93	221	349	477	5C		
94	222	350	478	5D		
95	223	351	479	5E		
96	224	352	480	5F		
97	225	353	481	60		
98	226	354	482	61		
99	227	355	483	62		
100	228	356	484	63		
101	229	357	485	64		
102	230	358	486	65		
103	231	359	487	66		
104	232	360	488	67		
105	233	361	489	68		
106	234	362	490	69		
107	235	363	491	6A		
108	236	364	492	6B		
109	237	365	493	6C		
110	238	366	494	6D		
111	239	367	495	6E		
112	240	368	496	6F		
113	241	369	497	70		
114	242	370	498	71		
115	243	371	499	72		
116	244	372	500	73		
117	245	373		74		
118	246	374		75		
119	247	375		76		
120	248	376		77		
121	249	377		78		
122	250	378		79		
123	251	379		7A		
124	252	380		7B		
125	253	381		7C		
126	254	382		7D		
127	255	383		7E		
128	256	384		7F		

Input Channel	CH	Hex	CH	Hex
1	00	33	20	
2	01	34	21	
3	02	35	22	
4	03	36	23	
5	04	37	24	
6	05	38	25	
7	06	39	26	
8	07	40	27	
9	08	41	28	
10	09	42	29	
11	0A	43	2A	
12	0B	44	2B	
13	0C	45	2C	
14	0D	46	2D	
15	0E	47	2E	
16	0F	48	2F	
17	10	49	30	
18	11	50	31	
19	12	51	32	
20	13	52	33	
21	14	53	34	
22	15	54	35	
23	16	55	36	
24	17	56	37	
25	18	57	38	
26	19	58	39	
27	1A	59	3A	
28	1B	60	3B	
29	1C	61	3C	
30	1D	62	3D	
31	1E	63	3E	
32	1F	64	3F	

Input Channel	CH	Hex	CH	Hex
65	40	97	60	
66	41	98	61	
67	42	99	62	
68	43	100	63	
69	44	101	64	
70	45	102	65	
71	46	103	66	
72	47	104	67	
73	48	105	68	
74	49	106	69	
75	4A	107	6A	
76	4B	108	6B	
77	4C	109	6C	
78	4D	110	6D	
79	4E	111	6E	
80	4F	112	6F	
81	50	113	70	
82	51	114	71	
83	52	115	72	
84	53	116	73	
85	54	117	74	
86	55	118	75	
87	56	119	76	
88	57	120	77	
89	58	121	78	
90	59	122	79	
91	5A	123	7A	
92	5B	124	7B	
93	5C	125	7C	
94	5D	126	7D	
95	5E	127	7E	
96	5F	128	7F	

Input Channel	CH	Hex	CH	Hex
1	00	33	20	
2	01	34	21	
3	02	35	22	
4	03	36	23	
5	04	37	24	
6	05	38	25	
7	06	39	26	
8	07	40	27	
9	08	41	28	
10	09	42	29	
11	0A	43	2A	
12	0B	44	2B	
13	0C	45	2C	
14	0D	46	2D	
15	0E	47	2E	
16	0F	48	2F	
17	10	49	30	
18	11	50	31	
19	12	51	32	
20	13	52	33	
21	14	53	34	
22	15	54	35	
23	16	55	36	
24	17	56	37	
25	18	57	38	
26	19	58	39	
27	1A	59	3A	
28	1B	60	3B	
29	1C	61	3C	
30	1D	62	3D	
31	1E	63	3E	
32	1F	64	3F	

Input Channel	CH	Hex	CH	Hex
65	40	97	60	
66	41	98	61	
67	42	99	62	
68	43	100	63	
69	44	101	64	
70	45	102	65	
71	46	103	66	
72	47	104	67	
73	48	105	68	
74	49	106	69	
75	4A	107	6A	
76	4B	108	6B	
77	4C	109	6C	
78	4D	110	6D	
79	4E	111	6E	
80	4F	112	6F	
81	50	113	70	
82	51	114	71	
83	52	115	72	
84	53	116	73	
85	54	117	74	
86	55	118	75	
87	56	119	76	
88	57	120	77	
89	58	121	78	
90	59	122	79	
91	5A	123	7A	
92	5B	124	7B	
93	5C	125	7C	
94	5D	126	7D	
95	5E	127	7E	
96	5F	128	7F	

Mono Group	CH	Hex	CH	Hex
1	00	33	20	
2	01	34	21	
3	02	35	22	
4	03	36	23	
5	04	37	24	
6	05	38	25	
7	06	39	26	
8	07	40	27	