

## Communication with Digitool via LAN

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**Note: This document is intended for programmers experienced with Ethernet control of hardware devices. For most customers, the Digitool software GUI and RS-485 serial controls provide the necessary control of the product.**

This document will describe the command structure that must be implemented when communicating with the Digitool over ethernet.

**NOTE: Although this document describes in detail how each digitool external command is created, the digitool external control GUI displays each of these commands at the bottom of the window as it is sent. This allows individual commands to be easily discerned. It can also be used to verify the accuracy of commands you create.**

The Digitool can receive commands transmitted on a LAN, provided a TCP client connection has been established. This communication occurs on port 6667. In addition, a Digitool that is present on a network will send out a UDP "health packet" on port 3334 every ten seconds. This packet contains the name of the unit and the unit type (MX32, MX16, or Live), and is broadcast to IP address 239.0.0.10. This feature can be used for discovery when an IP address has been assigned to the unit via DHCP.

While Peavey does not currently provide software for client side connection, freeware that implements this functionality can easily be obtained. One such program is Hercules:

[http://www.hw-group.com/products/hercules/index\\_en.html](http://www.hw-group.com/products/hercules/index_en.html)

All Digitool commands have an associated code of varying length, followed by a payload. The payload must be terminated by hex value 25, which is the terminating byte in all cases. There are two basic types of commands; audio commands and control commands.

### Audio Commands

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Audio commands are always 17 bytes in length and have a fixed structure. All audio commands begin with the hex sequence 0x53, 0x00. This sequence is immediately followed by four 16-bit words, one word specifying the channel, one word indicating the target, one for the parameter, and a word for the value. The least significant byte in each word must be sent first. Following the four 16-bit words are bytes of value 0x00. The entire command is then terminated by 0x25. An example audio command is as follows (values are in hexadecimal):

```
53 00 02 00 04 00 04 00 E8 03 00 00 00 00 00 00 25
```

Reading from left to right, this audio command applies to channel 2, target 4, parameter 4, value 3E8. Parameter 4 of target 4 is the gate decay, so this command sets the gate decay for channel 2 to 1000mS. On the following pages, tables are given describing the targets, parameters, and values for all possible audio commands.

**note:** some of the values for these commands use the 8.8 fixed point format. In this format, the first 8 bits are whole number values and the second 8 bits are fractional values. For example, the 8.8 value 0F80 corresponds to a value of 15.5. The value 8010 corresponds to the value -0.0625.

### Command Template

Fill in Channel, Target, Parameter and Value from the command descriptions below.

53 00 Channel (xx00) Target (xxxx) Code (xxxx) Value (xxxx) 00 00 00 00 00 00 25

Target: 0000

Hardware

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Parameter	Code	Value Range	Min	Max	Increment
Source Select	000F	0000 / 0001	Mic/Line	AES L	
Input Polarity	000B	0000 / 0001	normal	reverse	
Output Polarity	000D	0000 / 0001	normal	reverse	

Target: 0001

Input Generator

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Parameter	Code	Value Range	Min	Max	Increment
Level	0000	8100 - 0000	-127.0 dB	0.0dB	0080 (.5dB - 8.8 format)
Waveform	000C	0000 - 0002	Sine	White	Sine, Pink, White
Frequency	0001	000A - 4E20	10 Hz	20 kHz	10 - 999 by 1 Hz 1000-9999, 10 Hz 10k - 20k, 100 Hz

Bypass            000B    0000 / 0001        bypass    active

Target: 0002  
Input Filter 1

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<u>Parameter</u>	<u>Code</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
Filter Type	000A	0000 - 000B	LPF-12	Horn EQ	0 = LPF-12 1 = HPF-12 2 = PEQ 3 = Allpass-1 4 = Allpass-2 5 = LPF-6 6 = HPF-6 7 = Lo shelf 8 = Hi shelf 9 = Bandpass 10 = Bandstop 11 = Horn EQ
Bandwidth/Q	0002	004C - 0300	0.3	3.0	001A (0.1- 8.8 format)
Level	0000	EC00 - 0F00	-20 dB	15 dB	0080 (.5dB - 8.8format)
Frequency	0001	000A - 4E20	10 Hz	20 kHz	10 - 999 by 1 Hz 1000-9999, 10 Hz 10k - 20k, 100 Hz
Bypass	000B	0000 / 0001	bypass	active	

Target: 0004  
Input Gate

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<u>Parameter</u>	<u>Code</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
Attack	0003	0001 - 03E8	1 mS	1000 mS	1 - 9mS by 1mS 10-90, 10 mS 100 - 900, 100 mS

Decay	0004	0001 - 03E8	1 mS	1000 mS	1 - 9mS by 1mS 10-90, 10 mS 100 - 900, 100 mS
Threshold	0005	8100 - 0000	-127 dB	0.0 dB	0080 (.5dB - 8.8 format)
Floor	0006	8100 - FD00	-127 dB	-3.0 dB	0080 (.5dB - 8.8 format)
Mode	000B	0000 - 0005	bypass	automix4	0 = bypass 1 = normal mode 2-5 = automix 1-4
Hold	000E	0001 - 03E8	1 mS	1000 mS	1 - 9mS by 1mS 10-90, 10 mS 100 - 900, 100 mS
Priority 1 Master	000F	0001			
Priority 1 Slave(s)	0010	0000 / 0001	Bypass	On	
Priority 2 Master	0011	0001			
Priority 2 Slave(s)	0012	0000 / 0001	Bypass	On	
Priority 3 Master	0013	0001			
Priority 3 Slave(s)	0014	0000 / 0001	Bypass	On	
Priority 4 Master	0015	0001			
Priority 4 Slave(s)	0016	0000 / 0001	Bypass	On	

Targets: 0005 - 0008  
Input Filters 2 - 5

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See listing for Input Filter 1

Target: 0009  
Input Compressor/Limiter

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<u>Parameter</u>	<u>Code</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
Gain	0000	0000 - 1800	0 dB	24 dB	0080 (.5dB - 8.8format)
Attack	0003	0001 - 03E8	1 mS	1000 mS	1 - 9mS by 1mS 10-90, 10 mS 100 - 900, 100 mS
Decay	0004	0001 - 03E8	1 mS	1000 mS	1 - 9mS by 1mS 10-90, 10 mS 100 - 900, 100 mS
Threshold	0005	8100 - 0000	-127 dB	0.0 dB	0080 (.5dB - 8.8 format)
Ratio	0007	0100 - 1400	1	20	0080 (.5 - 8.8 format)
Bypass	000B	0000 / 0001	bypass	active	

Target: 000A  
Input Delay

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<u>Parameter</u>	<u>Code</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
Coarse Time	0008	0000 - 09C3	0 mS	2499 mS	0001 (1 mS)
Fine Time	0009	0000 - 0031	0 mS	~1 mS	0001 (.0208mS)

Target: 000B  
Level to Matrix

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<u>Parameter</u>	<u>Code</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
Level	0000	8100 - 0F00	-127 dB	15.0 dB	0080 (.5dB - 8.8 format)
Mute	001B	0000 / 8000	active	muted	

Targets: 000C - 0013

Matrix Assignments for Outputs 1 – 8

Targets: 008C - 0093

Matrix Assignments for Outputs 9 – 16

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<u>Parameter</u>	<u>Code</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
Level	0000	8100 - 0300	-127 dB	15.0 dB	0080 (.5dB - 8.8 format)
Mute	001B	0000 / 8000	active	muted	

Target: 0014

Matrix Output Level

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See listing for Level to Matrix

Target: 0015

Output Generator

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See listing for Input Generator

Targets: 0017 - 001D

Output Filters 1 - 7

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See listing for Input Filter 1

Target: 001E

## Output Compressor/Limiter

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See listing for Input Compressor/Limiter

Target: 001F  
Output Delay

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See listing for Input Delay

Target: 001E  
Crossover

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Parameter	Code	Value Range	Min	Max	Increment
Lo Corner Freq	0012	000A - 4E20	10 Hz	20 kHz	10 - 999 by 1 Hz 1000-9999, 10 Hz 10k - 20k, 100 Hz
Hi Corner Freq	0013	000A - 4E20	10 Hz	20 kHz	10 - 999 by 1 Hz 1000-9999, 10 Hz 10k - 20k, 100 Hz
Align Lo	0010	0000 - 0008	Btrworth 6	Bessel 24	0=Butterworth 6 1=Butterworth 12 2=Butterworth 18 3=Butterworth 24 4=LnkwitzRiley12 5=LnkwitzRiley24 6=Bessel 12 7=Bessel 18 8=Bessel 24
Align Hi	0011	0000 - 0008	Btrworth 6	Bessel 24	0=Butterworth 6 1=Butterworth 12 2=Butterworth 18 3=Butterworth 24

4=LnkwitzRiley12  
5=LnkwitzRiley24  
6=Bessel 12  
7=Bessel 18  
8=Bessel 24

## Control Commands

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If the first two bytes of the hex input sequence are anything other than 0x53, 0x00, the command is interpreted as a control command. These commands vary in length and are identified by unique hex sequences. In addition, control commands can be interpreted as ASCII codes. An example command is given below:

`COPYIN 2 5%`

This ASCII sequence copies all of the parameters from input 2 to input 5. The equivalent hexadecimal code for this command is:

`43 4f 50 59 49 4e 20 32 20 35 25`

Note that the `COPYIN` command is followed by two data values, separated by spaces. When a control command has one or more associated data fields, these spaces must be preset for the command to be correctly interpreted.

Not all control commands have associated data. Consider the command to Lock the unit, which is simply (in ASCII):

`LOCK%`

In the following pages, the various control commands will be described in detail.

**Note: Unlike the audio command values, which were all presented in hexadecimal format, all values in the control command tables should be interpreted as ASCII values.**

### **Command Template**

Replace Command with the command string, and Data1 and Data2 with appropriate corresponding values (if present for the command). Remember to include the spaces and terminate with %.

Command% OR

Command Data1% OR

Command Data1 Data2%

Command: CHANGEPASS  
Change Password

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<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
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1 - New password	0000 - 9999			
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Command: CLEARMATRIX  
Clear the Audio Routing Matrix

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No associated data

Command: COPYIN  
Copy Input Channel in Data Field 1 to Input Channel in Data Field 2

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<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
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1 - Input to Copy	1 - 8	Input 1	Input 8	
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2 - Input to Paste    1 - 8                    Input 1    Input 8

Command: COPYOUT

Copy Output Channel in Data Field 1 to Output Channel in Data Field 2

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<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
1 - Output to Copy	1 - 8	Output 1	Output 8	
2 - Output to Paste	1 - 8	Output 1	Output 8	

Command: CV x ENA

(where x = a CV target number between 1 and 8)

Enable CV controller x

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<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
1 - Enable	0 / 1	Disable	Enable	

Command: CV x LMN

(where x = a CV target number between 1 and 8)

Adjust Minimum Level for CV x

---

<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
1 - Minimum Level	-254 - 6	-127.0 dB	3.0 dB	1 (0.5 dB)

(**note:** because the increment is 0.5 dB, and whole numbers are transmitted, the value in dB will be half what is sent)

Command: CV x LMX

(where x = a CV target number between 1 and 8)

Adjust Maximum Level for CV x

---

<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
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1 - Maximum Level    -254 - 6        -127.0 dB    3.0 dB    1 (0.5 dB)  
 (note: because the increment is 0.5 dB, and whole numbers are transmitted, the value in dB will be half what is sent)

Command: CV x MSK  
 (where x = a CV target number between 1 and 8)  
 Enable/Disable CV control for Channel indicated in Data Field 1

<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
1 - Channel number	1 - 8			
2 - Enable	0 / 1	Disable	Enable	

Command: CV x TGT  
 (where x = a CV target number between 1 and 8)  
 Select CV controller target

<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
1 - Target value	0 - 25			0 = matrix in x - out 1 1 = matrix in x - out 2 2 = matrix in x - out 3 3 = matrix in x - out 4 4 = matrix in x - out 5 5 = matrix in x - out 6 6 = matrix in x - out 7 7 = matrix in x - out 8 8 = matrix in 1 - out x 9 = matrix in 2 - out x 10 = matrix in 3 - out x 11 = matrix in 4 - out x 12 = matrix in 5 - out x 13 = matrix in 6 - out x 14 = matrix in 7 - out x 15 = matrix in 8 - out x 16 = matrix stereo in x - out 1,2

- 17 = matrix stereo in x - out 3,4
- 18 = matrix stereo in x - out 5,6
- 19 = matrix stereo in x - out 7,8
- 20 = matrix in 1,2 - stereo out x
- 21 = matrix in 3,4 - stereo out x
- 22 = matrix in 5,6 - stereo out x
- 23 = matrix in 7,8 - stereo out x
- 24 = input x
- 25 = output x

**(note:** x in increment table represents channel(s) selected for CV control)

Command: CV x TYP  
 (where x = a CV target number between 1 and 8)  
 Select CV controller type

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<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
1 - CV type	0 / 1	Level	Mute	

Command: ID  
 Assign a name to the Digitool

---

<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
1 - Unit Name	0 - 10 ASCII chars			

Command: INPUTNAME  
 Assign a name to the Input selected in Data Field 1

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<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
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- 1 - Input Channel     1 - 8
- 2 - Input Name        0 - 8 ASCII chars

Command: LOADP  
 Load Preset number indicated in Data Field 1

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<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
1 - Preset Number	1 - 8	Preset 1	Preset 8	

Command: LOCK  
 Lock unit at current security level

---

No associated data

Command: MAXOUTLEVEL  
 Set Maximum Output Level of channel indicated in Data Field 1 to value specified in Data Field 2

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<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
1 - Channel	1 - 8			
2 - Max Output Level	-24 - 24	-24 dB	24 dB	1 dB

Command: OUTPUTNAME  
 Assign a name to the Output selected in Data Field 1

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<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
1 - Output Channel	1 - 8			
2 - Output Name	0 - 8 ASCII chars			

Command: PASSWORD

Send Password indicated in Data Field 1

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<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
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1 - Current password	0000 - 9999			
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(**note:** If a unit is locked, sending a valid password will allow access. If unit is already unlocked, this command has no effect)

Command: PHANTOMPOW

Enable Phantom Power for selected channel

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<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
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1 - Input Channel	1 - 8			
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2 - Enable	0 / 1	Off	On	
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Command: PNAME

Assign a name to Preset selected in Data Field 1

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<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
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1 - Preset Number	1 - 8			
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2 - Preset Name	0 - 4 ASCII chars			
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Command: P SERIAL

Enable recall from Serial Control of Preset indicated in Data Field 1

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<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
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1 - Preset Number	1 - 8			
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2 - Enable                      0 / 1                      Off                      On

Command: SAVEP  
Save Preset number indicated in Data Field 1

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<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
1 - Preset Number	1 - 8	Preset 1	Preset 8	

Command: SC x ENA  
(where x = a Serial Control target number between 1 and 8)  
Enable SC controller x

---

<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
1 - Enable	0 / 1	Disable	Enable	

Command: SC x LMN  
(where x = a Serial Control target number between 1 and 8)  
Adjust Minimum Level for SC x

---

<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
1 - Minimum Level	-254 - 6	-127.0 dB	3.0 dB	1 (0.5 dB)

(**note:** because the increment is 0.5 dB, and whole numbers are transmitted, the absolute value in dB will be half what is sent.)

Command: SC x LMX  
(where x = a Serial Control target number between 1 and 8)  
Adjust Maximum Level for SC x

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<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
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1 - Maximum Level	-254 - 6	-127.0 dB	3.0 dB	1 (0.5 dB)
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(**note:** because the increment is 0.5 dB, and whole numbers are transmitted, the value in dB will be half what is sent)

Command: SC x MSK

(where x = a Serial Control target number between 1 and 8)

Enable/Disable SC control for Channel indicated in Data Field 1

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<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
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1 - Channel number	1 - 8			
2 - Enable	0 / 1	Disable	Enable	

Command: SC x TGT

(where x = a Serial Control target number between 1 and 8)

Select SC controller target

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<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
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1 - Target value	0 - 25			
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0 = matrix in x - out 1  
1 = matrix in x - out 2  
2 = matrix in x - out 3  
3 = matrix in x - out 4  
4 = matrix in x - out 5  
5 = matrix in x - out 6  
6 = matrix in x - out 7  
7 = matrix in x - out 8  
8 = matrix in 1 - out x  
9 = matrix in 2 - out x  
10 = matrix in 3 - out x  
11 = matrix in 4 - out x  
12 = matrix in 5 - out x  
13 = matrix in 6 - out x  
14 = matrix in 7 - out x  
15 = matrix in 8 - out x  
16 = matrix stereo in x -  
out 1,2

- 17 = matrix stereo in x - out 3,4
- 18 = matrix stereo in x - out 5,6
- 19 = matrix stereo in x - out 7,8
- 20 = matrix in 1,2 - stereo out x
- 21 = matrix in 3,4 - stereo out x
- 22 = matrix in 5,6 - stereo out x
- 23 = matrix in 7,8 - stereo out x
- 24 = input x
- 25 = output x

**(note:** x in increment table represents channel(s) selected for CV control)

Command: SC x TYP

(where x = a Serial Control target number between 1 and 8)

Select SC controller type

---

<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
1 - SC type	0 - 2	Level	Level/Mute	0 = Level 1 = Mute 2 = Level/Mute

Command: SECURITY

Select Security Level of Digitool

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<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
1 - Security Level	0 - 4	Off	local edit, mute	0 = Off 1 = local edit only 2 = local edit, remote 3 = local edit, remote, mute 4 = local edit, mute

Command: SENSITIVITY

Set Input Sensitivity of channel indicated in Data Field 1 to value specified in Data Field 2

---

<u>Data Field #</u>	<u>Value Range</u>	<u>Min</u>	<u>Max</u>	<u>Increment</u>
1 - Channel	1 - 8			
2 - Sensitivity	-24 - 24	-24 dB	24 dB	1 dB

Command: UPDATE

This command returns levels for inputs, outputs, and compressors, as well as gate status. In addition, any other changes that have occurred since the last update command are included in the returned payload. This includes any changes made via TCP client software.

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No associated data.

While no data is sent with this command, the following table describes the format of the data that is returned:

byte	data	description
1	0x00	dummy byte
2	0x00	dummy byte
3	0xxx	input level data for channels 1 and 2 (4 bits each, bits 0-3 ch1, bits 4-7 ch2)
4	0x01	
5	0xxx	input compressor levels for channels 1,2 (4 bits each, bits 0-3 ch1, bits 4-7 ch2)
6	0x02	
7	0xxx	input level data for channels 3 and 4 (4 bits each, bits 0-3 ch3, bits 4-7 ch4)
8	0x03	
9	0xxx	input compressor levels for channels 3,4 (4 bits each, bits 0-3 ch3, bits 4-7 ch4)
10	0x04	
11	0xxx	input levels 5,6
12	0x05	
13	0xxx	input compressor levels 5,6
14	0x06	

15	0xxx	input levels 7,8
16	0x07	
17	0xxx	input compressor levels 7,8
18	0x08	
19	0xxx	output levels 1,2
20	0x11	
21	0xxx	output compressor levels 1,2
22	0x12	
23	0xxx	output levels 3,4
24	0x13	
25	0xxx	output compressor levels 3,4
26	0x14	
27	0xxx	output levels 5,6
28	0x15	
29	0xxx	output compressor levels 5,6
30	0x16	
31	0xxx	output levels 7,8
32	0x17	
33	0xxx	output compressor levels 7,8
34	0x18	
35	0xxx	gate status for channels 1-8 (on/off)
36	0xfe	
37- 220		additional 32 byte messages indicating changes that have occurred since last update

**Revisions 7/30/2012:**

Added target range for Matrix Assignments to Outputs 9 – 16

Changed Value range for max value of +15 dB.