
Serial API Guide

SLICE-DCC Dual Current Controller

Revision 03



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1. Purpose

This document describes the Application Programming Interface (API) for controlling and communicating with the Vescent SLICE-DCC USB interface. This document provides command formats, parameter types, and functional descriptions of API commands.

2. Scope

This document applies to USB communication with SLICE-DCC. This API is compatible with the software configuration listed below.

SC Firmware: SC 1.109

DCC Firmware: DCC 1.72

3. Serial Configuration

Communication with the SLICE-DCC via the rear panel USB interface is performed by using ASCII-based serial commands issued from an external computer via PC terminal programs such as Putty or Tera Term. Serial port settings should be as follows:

Data Bits 8

Parity None

Stop Bits 1

Flow Control None

A Baud Rate between 9600 and 115200 is recommended for initial setup and troubleshooting.

4. Command Structure

The USB API uses ASCII-based commands with the following format:

[command name] [parameter] [parameter] [parameter]

The command name string is followed by 0 to 3 space-delimited parameter strings. Command names are case-insensitive. Commands must be terminated with a Carriage Return character.

5. SLICE-DCC Command List

Commands are categorized by the functional groups listed below.

Functional Groups

Global SLICE Commands	2	Analog Output Commands	11
General Commands	4	Trigger Commands.....	13
Photodiode Setup Parameters.....	7	Error Commands.....	15
Analog Input Commands.....	8		

Global SLICE Commands

#SCBKLT?	Returns the touch screen backlight setting
<i>Parameters:</i> None	<i>Example:</i> #SCBKLT? #SCBKLT? 5
#SCBKLT	Sets the touch screen backlight setting to the level given as a parameter
<i>Parameters:</i> [INT] level (0 - 20)	<i>Example:</i> #SCBKLT 3 #SCBKLT 3
#SCVOL?	Returns the touch screen and rotary knob audio feedback volume level
<i>Parameters:</i> None	<i>Example:</i> #SCVOL? #SCVOL? 5
#SCVOL	Sets the touch screen and rotary knob audio feedback volume to the level given as a parameter
<i>Parameters:</i> [INT] level (0 - 20)	<i>Example:</i> #SCVOL 8 #SCVOL 8
*RST	SCPI Compatible Device Reset Command Restarts the device in an OFF state
<i>Parameters:</i> [none]	<i>Example:</i> *RST Resetting System
*IDN?	SCPI Compatible Device Information Query Returns: Manufacturer Model Serial Number System Controller Firmware version ICE2 Board Firmware Versions
<i>Parameters:</i> [none]	<i>Example:</i> *IDN? Vescent Photonics, SLICE-DCC, 006543, S-V1.109, CC-V1.72
_FACTORY	Tells ICE2 board to restore factory default settings NOTE: There is no return value from this function. Power Cycle the SLICE-DCC to complete the restoration.
<i>Parameters:</i> Slot number	<i>Example:</i> _FACTORY 1

SAVE	Saves the board's current settings into EEPROM. Unsaved changes will be lost when the board is powered off. Returns SUCCESS or FAIL. NOTE: The SAVE command is only necessary when changing parameters via the API. Parameters changed through the Touch Screen are saved automatically.
<i>Parameters:</i> None	<i>Example:</i> Save Success

General Commands

CONTROL?	Returns the enumerated operating mode for Channel. Where: 0 = Constant Current mode OFF 1 = Constant Power mode OFF 2 = Constant Current mode ON 3 = Constant Power mode ON
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> CONTROL? 1 0
CONTROL	Sets the enumerated operating mode for Channel. Where: 0 = Constant Current mode OFF 1 = Constant Power mode OFF 2 = Constant Current mode ON 3 = Constant Power mode ON Returns CONTROL?
<i>Parameters:</i> [Int] CHANNEL [Int] MODE	<i>Example:</i> CONTROL 1 2 2
CURRSET?	Returns the Constant Current mode Current Setpoint in Amps for Channel
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> Currset? 1 0.422800
CURRSET	Sets the Constant Current mode Current Setpoint in Amps for Channel Returns CURRSET? If a value that is negative or above the Current Limit (see below) is attempted, the return value will be the boundary exceeded.
<i>Parameters:</i> [Int] CHANNEL [Float] Current	<i>Example:</i> Currset 1 0.288 0.288000
MAXCURR?	Returns the Setpoint Current Limit in Amps for Channel
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> Maxcurr? 2 0.400000
MAXCURR	Sets the Setpoint Current Limit in Amps for Channel Returns MAXCURR?
<i>Parameters:</i> [Int] CHANNEL [Float] Current	<i>Example:</i> Maxcurr 2 0.350 0.350000

CURRENT?	Returns the Measured Current Output in mA for Channel
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> Current? 1 255.6
POWER?	Reads the measured Optical Power input in mW for Channel
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> Power? 2 7.3
CVOLT?	Reads the measured Compliance Voltage in Volts for Channel
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> Cvolt? 1 4.335
ATEMP?	Reads the ambient temperature [C] of the SLICE-DCC for Channel
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> ATEMP? 1 32.258
HWTEMP?	Reads the temperature [C] of the SLICE-DCC hardware for Channel
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> HWTEMP? 1 43.258
PWRMAX?	Reads the maximum power [W] available for the SLICE-DCC when configured with the user's settings
<i>Parameters:</i> None	<i>Example:</i> Pwrmax? 41.5
MODCURR?	Reads the modulation current [mA] for Channel
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> MODCURR? 1 10.3
LIMITS?	Reads Minimum and Maximum Limits for the model [mA] Where: Param 0 = Minimum Param 1 = Maximum
<i>Parameters:</i> [Int] Param	<i>Example:</i> LIMITS? 1 500.0000000

INTERLK?	Reads the status of the Interlock Return Values: ON = Interlock circuit closed. SLICE-DCC operational OFF = Interlock circuit open. SLICE-DCC operation disabled NOTE: Use ERROR 1 128 and ERROR 2 128 to clear the error bits associated with the Interlock Circuit Open State.
<i>Parameters:</i> None	<i>Example:</i> Interlk? ON

Photodiode Setup Parameters

GAIN?	Reads the Constant Power mode Gain setting in dB for Channel
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> Gain? 2 30.000000
GAIN	Sets the Constant Power mode Gain setting in dB for Channel Returns GAIN?
<i>Parameters:</i> [Int] CHANNEL [Float] Gain	<i>Example:</i> Gain 2 25 25.000000
RESPVTY?	Reads the Constant Power mode Detector Response setting in A/W for Channel
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> Respvtty? 2 0.0035
RESPVTY	Sets the Constant Power mode Detector Response setting in A/W for Channel Returns RESPVTY?
<i>Parameters:</i> [Int] CHANNEL [Float] Responsivity	<i>Example:</i> Respvtty 2 0.001325 0.001325
POL?	Reads the Constant Power mode Optical Power polarity setting for Channel Return Values: ON = Negative Polarity OFF = Positive Polarity (Default)
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> Pol? 2 OFF
Polarity	Sets the Constant Power mode Optical Power polarity setting for Channel
<i>Parameters:</i> [Int] CHANNEL [Int] Value 0 = Positive 1 = Negative	<i>Example:</i> Polarity 2 1 ON

Analog Input Commands

MODEA?	Returns the Analog Input A channel and input mode Note: Both the Channel and Mode are contained in the returned value. $\text{Return_Value} / 256 = \text{channel_number}$ $\text{Return_Value} - (\text{channel_number} * 256) = \text{mode}$ Mode values: Back Panel Modulation Input = 0 Front Panel Modulation Input = 258 (Channel 1 uses Input A)
<i>Parameters:</i> [NONE]	<i>Example:</i> <pre>MODEA? 258</pre>
MODEA	Sets the Analog Input A channel and input mode Note: Both the Channel and Mode are contained in the returned value. $\text{Return_Value} / 256 = \text{channel_number}$ $\text{Return_Value} - (\text{channel_number} * 256) = \text{mode}$ Mode values: Back Panel Modulation Input = 0 Front Panel Modulation Input = 2 (Channel 1 uses Input A) Returns MODEA? (Returns 256 when parameter is 0)
<i>Parameters:</i> [INT]MODE MASK	<i>Example:</i> <pre>MODEA 2 258</pre>
MODEB?	Returns the Analog Input B channel and input mode Note: Both the Channel and Mode are contained in the returned value. $\text{Return_Value} / 256 = \text{channel_number}$ $\text{Return_Value} - (\text{channel_number} * 256) = \text{mode}$ Mode values: Back Panel Modulation Input = 0 Front Panel Modulation Input = 2 (Channel 2 uses Input B)
<i>Parameters:</i> [NONE]	<i>Example:</i> <pre>MODEB? 514</pre>

MODEB	Sets the Analog Input B channel and input mode Note: Both the Channel and Mode are contained in the returned value. $\text{Return_Value} / 256 = \text{channel_number}$ $\text{Return_Value} - (\text{channel_number} * 256) = \text{mode}$ Mode values: Back Panel Modulation Input = 0 Front Panel Modulation Input = 2 (Channel 2 uses Input B) Returns MODEB? (Returns 512 when parameter is 0)
<i>Parameters:</i> [INT]MODE MASK	<i>Example:</i> <pre>MODEB 2 514</pre>
AMODSEL?	Reads the Analog Modulation source for Channel Return Values: 0 = Modulation Input SMA connector on back panel (Default Setting) 1 = External Analog Input on front panel Channel 1 uses A input Channel 2 uses B input
<i>Parameters:</i> [Int] Channel	<i>Example:</i> <pre>Amodsel? 1 1</pre>
AMODSEL	Sets the Analog Modulation source for Channel Parameter Values: 0 = Modulation Input SMA connector on back panel (Default Setting) 1 = External Analog Input on front panel Channel 1 uses A input Channel 2 uses B input Returns AMODSEL?
<i>Parameters:</i> [Int] CHANNEL [Int] Value	<i>Example:</i> <pre>Amodsel 1 1 1</pre>

AOUTSEL?	Reads the Analog Modulation source for Channel Return Values: 0 = Analog Output Off 1 = Measured Output Current on Analog Output 1 for channel 1, 2 for channel 2 2 = Optical Power on Analog Output Optical Power from Optical Power input SMA connector on back panel
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> Aoutsel? 1 1
AOUTSEL	Sets the Analog Modulation source for Channel Returns AOUTSEL? Parameter Values: 0 = Analog Output Off 1 = Measured Output Current on Analog Output Analog Output1 for channel 1 Analog Output 2 for channel 2 2 = Optical Power on Analog Output Optical Power from Optical Power input SMA connector on back panel Analog Output1 for channel 1 Analog Output 2 for channel 2
<i>Parameters:</i> [Int] CHANNEL [Int] Value	<i>Example:</i> Aoutsel 1 1 1

Analog Output Commands

MODE1?	Returns the Analog Output 1 channel and output mode Note: Both the Channel and Mode are contained in the returned value. $\text{Return_Value} / 256 = \text{channel_number}$ $\text{Return_Value} - (\text{channel_number} * 256) = \text{mode}$ Mode values: Front Panel Output Off = 0 Front Panel Output Laser Current Sense Voltage = 1 (Channel 1 uses Output 1)
<i>Parameters:</i> [NONE]	<i>Example:</i> <pre>MODE1? 256</pre>
MODE1	Sets the Analog Output 1 channel and output mode Note: Both the Channel and Mode are contained in the returned value. $\text{Return_Value} / 256 = \text{channel_number}$ $\text{Return_Value} - (\text{channel_number} * 256) = \text{mode}$ Mode values: Front Panel Output Off = 0 Front Panel Output Laser Current Sense Voltage = 1 (Channel 1 uses Output 1) Returns MODE1?
<i>Parameters:</i> [INT] MODE MASK	<i>Example:</i> <pre>MODE1 1 257</pre>
MODE2?	Returns the Analog Output 2 channel and output mode Note: Both the Channel and Mode are contained in the returned value. $\text{Return_Value} / 256 = \text{channel_number}$ $\text{Return_Value} - (\text{channel_number} * 256) = \text{mode}$ Mode values: Front Panel Output Off = 0 Front Panel Output Laser Current Sense Voltage = 1 (Channel 2 uses Output 2)
<i>Parameters:</i> [NONE]	<i>Example:</i> <pre>MODE2? 512</pre>

MODE2	Sets the Analog Output 2 channel and output mode Note: Both the Channel and Mode are contained in the returned value. $\text{Return_Value} / 256 = \text{channel_number}$ $\text{Return_Value} - (\text{channel_number} * 256) = \text{mode}$ Mode values: Front Panel Output Off = 0 Front Panel Output Laser Current Sense Voltage = 1 (Channel 2 uses Output 2) Returns MODE2?
<i>Parameters:</i> [INT]MODE MASK	<i>Example:</i> <pre>MODE2 1 513</pre>

Trigger Commands

TRIGIN?	Reads the function of the External Input Trigger signal for Channel Return Values: 0 = Trigger input disabled 1 = Trigger input high Enables Channel Trigger input low Disables Channel 2 = Trigger input high latches Channel in a Disabled State 32768 = Trigger input inverted and disabled 32769 = Trigger input low Enables Channel Trigger input high Disables Channel 32770 = Trigger input low latches Channel in a Disabled State
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> Trigin? 1 1
TRIGIN	Sets the function of the External Input Trigger signal for Channel Parameter Values: 0 = Trigger input disabled 1 = Trigger input high Enables Channel Trigger input low Disables Channel 2 = Trigger input high latches Channel in a Disabled State 32768 = Trigger input inverted and disabled 32769 = Trigger input low Enables Channel Trigger input high Disables Channel 32770 = Trigger input low latches Channel in a Disabled State Returns TRIGIN?
<i>Parameters:</i> [Int] CHANNEL [Int] Value	<i>Example:</i> Trigin? 1 1 1

TRIGOUT?	Reads the function of the External Output Trigger signal for Channel Return Values: 0 = Trigger output disabled 1 = Trigger Output goes high when the Interlock Circuit is opened. 32768 = Trigger output inverted and disabled 32769 = Trigger output goes low when the Interlock Circuit is opened.
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> <pre>Trigout? 1 1 1</pre>
TRIGOUT	Sets the function of the External Output Trigger signal for Channel Parameter Values: 0 = Trigger output disabled 1 = Trigger output goes high when the Interlock Circuit is opened. 32768 = Trigger output inverted and disabled 32769 = Trigger output goes low when the Interlock Circuit is opened. Returns TRIGOUT?
<i>Parameters:</i> [Int] CHANNEL [Int] Value	<i>Example:</i> <pre>Trigout? 1 1 1</pre>

Error Commands

ERROR?	Reads the Error codes for Channel Return Values: 49152 = No Errors 49153 = Open Circuit / Over Voltage (Possible Disconnected Load) 49184 = Hardware Temperature Limit Exceeded 49280 = Interlock Circuit Open 49408 = Device total power limit exceeded
<i>Parameters:</i> [Int] Channel	<i>Example:</i> <pre>Error? 1 49152</pre>
ERROR	Clears an Error code for Channel Note: use this command to clear an error code obtained from the ERROR? command. This command will not clear an error message on the SLICE-DCC touch screen. Values to clear error codes: 1 Clears error code 49153 32 Clears error code 49184 128 Clears error code 49280 256 Clears error code 49408 Returns the Error code resulting from clearing the error
<i>Parameters:</i> [Int] Channel [Int] Code	<i>Example:</i> <pre>Error 1 128 49152</pre>