Serial API Guide

SLICE-DCC Dual-channel Current Controller

Revision 01

VESCENT

14988 W. 6th Ave., Suite 700
Golden, CO 80401
www.vescent.com

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

#SCBKLT?	Returns the touch screen backlight setting
Parameters: None	*Example:* #SCBKLT? #SCBKLT? 5
#SCBKLT	Sets the touch screen backlight setting to the level given as a parameter
Parameters: [INT] level (0 – 20)	*Example:* #SCBKLT 3 #SCBKLT 3
#SCVOL?	Returns the touch screen and rotary knob audio feedback volume level
Parameters: None	*Example:* #SCVOL? #SCVOL? 5
#SCVOL	Sets the touch screen and rotary knob audio feedback volume to the level given as a parameter
Parameters: [INT] level (0 – 20)	*Example:* #SCVOL 8 #SCVOL 8
***RST**	SCPI Compatible Device Reset Command Restarts the device in an OFF state
Parameters: [none]	*Example:* *RST Resetting System
***IDN?**	SCPI Compatible Device Information Query Returns: Manufacturer Model Serial Number System Controller Firmware version ICE2 Board Firmware Versions
Parameters: [none]	*Example:* *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.
Parameters: Slot number	*Example:* _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.
Parameters: None	*Example:* 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
Parameters: [Int] CHANNEL	*Example:* 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?
Parameters: [Int] CHANNEL [Int] MODE	*Example:* CONTROL 1 2 2
CURRSET?	Returns the Constant Current mode Current Setpoint in Amps for Channel
Parameters: [Int] CHANNEL	*Example:* 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.
Parameters: [Int] CHANNEL [Float]Current	*Example:* Currset 1 0.288 0.288000
MAXCURR?	Returns the Setpoint Current Limit in Amps for Channel
Parameters: [Int] CHANNEL	*Example:* Maxcurr? 2 0.400000
MAXCURR	Sets the Setpoint Current Limit in Amps for Channel Returns MAXCURR?
Parameters: [Int] CHANNEL [Float] Current	*Example:* Maxcurr 2 0.350 0.350000

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

Photodiode Setup Parameters

GAIN?	Reads the Constant Power mode Gain setting in dB for Channel
Parameters: [Int] CHANNEL	*Example:* Gain? 2 30.000000
GAIN	Sets the Constant Power mode Gain setting in dB for Channel Returns GAIN?
Parameters: [Int] CHANNEL [Float] Gain	*Example:* Gain 2 25 25.000000
RESPVTY?	Reads the Constant Power mode Detector Response setting in A/W for Channel
Parameters: [Int] CHANNEL	*Example:* Respvty? 2 0.0035
RESPVTY	Sets the Constant Power mode Detector Response setting in A/W for Channel Returns RESPVTY?
Parameters: [Int] CHANNEL [Float] Responsivity	*Example:* Respvty 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)
Parameters: [Int] CHANNEL	*Example:* Pol? 2 OFF
Polarity	Sets the Constant Power mode Optical Power polarity setting for Channel
Parameters: [Int] CHANNEL [Int] Value 0 = Positive 1 = Negative	*Example:* 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. Return_Value / 256 = channel_number Return_Value - (channel_number * 256) = mode Mode values: Back Panel Modulation Input = 0 Front Panel Modulation Input = 258 (Channel 1 uses Input A)
Parameters: [NONE]	*Example:* MODEA? 258
MODEA	Sets the Analog Input A channel and input mode Note: Both the Channel and Mode are contained in the returned value. Return_Value / 256 = channel_number Return_Value - (channel_number * 256) = 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)
Parameters: [INT]MODE MASK	*Example:* MODEA 2 258
MODEB?	Returns the Analog Input B channel and input mode Note: Both the Channel and Mode are contained in the returned value. Return_Value / 256 = channel_number Return_Value - (channel_number * 256) = mode Mode values: Back Panel Modulation Input = 0 Front Panel Modulation Input = 2 (Channel 2 uses Input B)
Parameters: [NONE]	*Example:* MODEB? 514

MODEB	Sets the Analog Input B channel and input mode Note: Both the Channel and Mode are contained in the returned value. Return_Value / 256 = channel_number Return_Value - (channel_number * 256) = 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)
Parameters: [INT]MODE MASK	*Example:* MODEB 2 514
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
Parameters: [Int] Channel	*Example:* Amodsel? 1 1
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?
Parameters: [Int] CHANNEL [Int] Value	*Example:* Amodsel 1 1 1

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

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

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
Parameters: [Int] CHANNEL	*Example:* 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?
Parameters: [Int] CHANNEL [Int] Value	*Example:* Trigin? 1 1 1

TRIGOUT?	Sets the function of the External Input 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.
Parameters: [Int] CHANNEL	*Example:* Trigout? 1 1 1
TRIGOUT	Sets the function of the External Input 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?
Parameters: [Int] CHANNEL [Int] Value	*Example:* Trigout? 1 1 1

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

Parameters:
`[Int] Channel`
	Example:
	`Error? 1`
	`49152`

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

Parameters:
`[Int] Channel`
`[Int] Code`
	Example:
	`Error 1 128`
	`49152`