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# Serial API Guide

SLICE-DHV Dual-channel High-Voltage Amplifier

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Revision 01



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## 1. Purpose

This document describes the Application Programming Interface (API) for controlling and communicating with the Vescent SLICE-DHV 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-DHV. This API is compatible with the software configuration listed below.

**SC Firmware:** SC 1.96

**DHV Firmware:** DHV 1.25

## 3. Serial Configuration

Communication with the SLICE-DHV 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-DHV Command List

Commands are categorized by the functional groups listed below.

### Functional Groups

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## Global SLICE Commands

<b>#SCBKLT?</b>	Returns the touch screen backlight setting
<i>Parameters:</i> None	<i>Example:</i> #SCBKLT? #SCBKLT? 5
<b>#SCBKLT</b>	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
<b>#SCVOL?</b>	Returns the touch screen and rotary knob audio feedback volume level
<i>Parameters:</i> None	<i>Example:</i> #SCVOL? #SCVOL? 5
<b>#SCVOL</b>	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
<b>*RST</b>	SCPI Compatible Device Reset Command Restarts the device in an OFF state
<i>Parameters:</i> [none]	<i>Example:</i> *RST Resetting System
<b>*IDN?</b>	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-DHV, 006543, S- V1.196, HV-V1.25
<b>_FACTORY</b>	Tells ICE2 board to restore factory default settings NOTE: There is no return value from this function. The SLICE-DHV will restart to complete the restoration.
<i>Parameters:</i> Slot number	<i>Example:</i> _FACTORY 1

<b>SAVE</b>	Saves the board's current settings into EEPROM. Unsaved changes will be lost when the board is powered off. Returns SUCCESS or FAIL.
<i>Parameters:</i> None	<i>Example:</i> Save Success

## General Commands

<b>CONTROL?</b>	Returns the enumerated modulation mode for Channel. Where: 0 = Gain = 1 V/V; Range = +/- 10V OFF 1 = Gain = 20 V/V; Range = 0-200 OFF 2 = Gain = 1 V/V; Range = +/- 10V ON 3 = Gain = 20 V/V; Range = 0-200 ON
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> Control? 1 0
<b>CONTROL</b>	Sets the enumerated modulation mode for Channel. Where: 0 = Gain = 1 V/V; Range = +/- 10V OFF 1 = Gain = 20 V/V; Range = 0-200 OFF 2 = Gain = 1 V/V; Range = +/- 10V ON 3 = Gain = 20 V/V; Range = 0-200 ON Returns CONTROL?
<i>Parameters:</i> [Int] CHANNEL [Int] MODE	<i>Example:</i> Control 1 2 2
<b>DCBIASV?</b>	Returns the DC Bias Voltage in Volts for Channel
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> DCBiasv? 1 150.000000
<b>DCBIASV</b>	Sets the DC Bias Voltage in Volts for Channel Returns DCBIASV? If a value that is negative or above the Voltage Limit (see below) is attempted, the return value will be the boundary exceeded.
<i>Parameters:</i> [Int] CHANNEL [Float] Voltage	<i>Example:</i> DCBiasv 1 125.0 125.00000
<b>RANGEV?</b>	Returns the Range Voltage in Volts for Channel
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> Rangev? 2 10.000000
<b>RANGEV</b>	Sets the Range Voltage in Volts for Channel Returns RANGEV?
<i>Parameters:</i> [Int] CHANNEL [Float] Voltage	<i>Example:</i> Rangev 2 15.0 15.000000
<b>VLIM?</b>	Returns the Output Voltage Limit in Volts for Channel
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> Vlim? 1 180.000000

<b>VLIM</b>	Sets the Output Voltage Limit in Volts for Channel Returns VLIM?
<i>Parameters:</i> [Int] CHANNEL [Float] Voltage	<i>Example:</i> Vlim 2 180.0 180.000000
<b>SWEEPRT?</b>	Returns the Sweep Rate in Hz for Channel
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> Sweeprt? 2 7.3
<b>SWEEPRT</b>	Sets the Sweep Rate in Hz for Channel Returns SWEEPRT?
<i>Parameters:</i> [Int] CHANNEL [Float] Rate	<i>Example:</i> Sweeprt 2 8.2 8.200000
<b>SWEEPMD?</b>	Reads the current Sweep mode for Channel Where: 0 = OFF 1 = ON 2 = TUNE
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> Sweepmd? 1 0
<b>SWEEPMD</b>	Sets the current Sweep mode for Channel Where: 0 = OFF 1 = ON 2 = TUNE Returns SWEEPMD?
<i>Parameters:</i> [Int] CHANNEL [Int] Mode	<i>Example:</i> Sweepmd 1 1 1
<b>OUTVOLT?</b>	Reads the HV Output Voltage in Volts for Channel
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> Outvolt? 2 59.971371
<b>HWTEMP?</b>	Reads the temperature [C] of the SLICE-DHV hardware for Channel
<i>Parameters:</i> [Int] CHANNEL	<i>Example:</i> HWTEMP? 1 43.258

## Analog Input Commands

<b>MODEA?</b>	<p>Returns the Analog Input A channel and input mode  Note: Both the Channel and Mode are contained in the returned value.  <math>\text{Return\_Value} / 256 = \text{channel\_number}</math>  <math>\text{Return\_Value} - (\text{channel\_number} * 256) = \text{mode}</math>  0 = Modulation input for Channel 1 taken from rear panel modulation SMA connector  257 = Modulation input for Channel 1 taken from front panel input A BNC connector  (Channel 1 uses Input A)</p>
<i>Parameters:</i> None	<i>Example:</i> Modea? 257
<b>MODEA</b>	<p>Sets the front panel Analog Input A function  Where:  <math>\text{Return\_Value} / 256 = \text{channel\_number}</math>  <math>\text{Return\_Value} - (\text{channel\_number} * 256) = \text{mode}</math>  0 = Modulation input for Channel 1 taken from rear panel modulation SMA connector  1 = Modulation input for Channel 1 taken from front panel input A BNC connector  Returns MODEA? (256 returned when 0 is the Mode parameter)</p>
<i>Parameters:</i> [Int] Mode	<i>Example:</i> Modea 1 257
<b>MODEB?</b>	<p>Returns the Analog Input B channel and input mode  Note: Both the Channel and Mode are contained in the returned value.  <math>\text{Return\_Value} / 256 = \text{channel\_number}</math>  <math>\text{Return\_Value} - (\text{channel\_number} * 256) = \text{mode}</math>  Mode values:  0 = Modulation input for Channel 2 taken from rear panel modulation SMA connector  513 = Modulation input for Channel 2 taken from front panel input B BNC connector  (Channel 2 uses Input B)</p>
<i>Parameters:</i> None	<i>Example:</i> Modeb? 513

<p><b>MODEB</b></p>	<p>Sets the Analog Input B channel and input mode  Note: Both the Channel and Mode are contained in the returned value.  <math>\text{Return\_Value} / 256 = \text{channel\_number}</math>  <math>\text{Return\_Value} - (\text{channel\_number} * 256) = \text{mode}</math>  Mode values:  0 = Modulation input for Channel 2 taken from rear panel modulation SMA connector  1 = Modulation input for Channel 2 taken from front panel input B BNC connector  Returns MODEB? (512 returned when 0 is the Mode parameter)</p>
<p><i>Parameters:</i>  [Int] Mode</p>	<p><i>Example:</i>  Modeb 1  513</p>



## Analog Output Commands

<p><b>MODE1?</b></p>	<p>Returns the Analog Output 1 channel and output mode  Note: Both the Channel and Mode are contained in the returned value.  <math>\text{Return\_Value} / 256 = \text{channel\_number}</math>  <math>\text{Return\_Value} - (\text{channel\_number} * 256) = \text{mode}</math>  Mode values:  0 = No signal on Output 1 BNC connector  257 = HV Voltage / 20 output on Output 1 BNC connector</p>
<p><i>Parameters:</i> None</p>	<p><i>Example:</i> Mode1? 257</p>
<p><b>MODE1</b></p>	<p>Sets the Analog Output 1 channel and output mode  Note: Both the Channel and Mode are contained in the returned value.  <math>\text{Return\_Value} / 256 = \text{channel\_number}</math>  <math>\text{Return\_Value} - (\text{channel\_number} * 256) = \text{mode}</math>  Mode values:  0 = No signal on Output 1 BNC connector  1 = HV Voltage / 20 output on Output 1 BNC connector  Returns MODE1? (256 returned when 0 is the Mode parameter)</p>
<p><i>Parameters:</i> [Int] Mode</p>	<p><i>Example:</i> Mode1 1 257</p>
<p><b>MODE2?</b></p>	<p>Returns the Analog Output 2 channel and output mode  Note: Both the Channel and Mode are contained in the returned value.  <math>\text{Return\_Value} / 256 = \text{channel\_number}</math>  <math>\text{Return\_Value} - (\text{channel\_number} * 256) = \text{mode}</math>  Mode values:  0 = No signal on Output 2 BNC connector  513 = HV Voltage / 20 output on Output 2 BNC connector  (Channel 2 uses Output 2)</p>
<p><i>Parameters:</i> None</p>	<p><i>Example:</i> Mode2? 513</p>

<p><b>MODE2</b></p>	<p>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:  0 = No signal on Output 2 BNC connector  1 = HV Voltage / 20 output on Output 2 BNC connector  Returns MODE2? (512 returned when 0 is the parameter)</p>
<p><i>Parameters:</i>  [Int] Mode</p>	<p><i>Example:</i>  Mode2 1  513</p>
<p><b>OPMODE?</b></p>	<p>Returns the Output Mode for Channel  Mode values:  0 = Current Limited  1 = Full Bandwidth</p>
<p><i>Parameters:</i>  [Int] Channel</p>	<p><i>Example:</i>  Opmode? 1  1</p>
<p><b>OPMODE</b></p>	<p>Sets the the Output Mode for Channel  Mode values:  0 = Current Limited  1 = Full Bandwidth  Returns OPMODE?</p>
<p><i>Parameters:</i>  [Int] Channel  [Int] Mode</p>	<p><i>Example:</i>  Opmode 1 1  1</p>

## Trigger Commands

<b>TRIGIN?</b>	<p>Reads the selected Trigger In function for Channel</p> <p>Return Values:</p> <p>0 = Trigger input disabled</p> <p>1 = Trigger input high Enables Channel Trigger input low Disables Channel</p> <p>2 = Trigger input high latches Channel in a Disabled State</p> <p>32768 = Trigger input inverted and disabled</p> <p>32769 = Trigger input low Enables Channel Trigger input high Disables Channel</p> <p>32770 = Trigger input low latches Channel in a Disabled State</p>
<p><i>Parameters:</i></p> <p>[Int] Channel</p>	<p><i>Example:</i></p> <p>Trigin? 1</p> <p>1</p>
<b>TRIGIN</b>	<p>Sets the selected Trigger In function for Channel</p> <p>Parameter Values:</p> <p>0 = Trigger input disabled</p> <p>1 = Trigger input high Enables Channel Trigger input low Disables Channel</p> <p>2 = Trigger input high latches Channel in a Disabled State</p> <p>32768 = Trigger input inverted and disabled</p> <p>32769 = Trigger input low Enables Channel Trigger input high Disables Channel</p> <p>32770 = Trigger input low latches Channel in a Disabled State</p> <p>NOTE: Inverting the input trigger for one channel inverts it for the other channel.</p> <p>Returns TRIGIN?</p>
<p><i>Parameters:</i></p> <p>[Int] Channel</p> <p>[Int] Selection</p>	<p><i>Example:</i></p> <p>Trigin 2 1</p> <p>1</p>

<b>TRIGOUT?</b>	<p>Reads the selected Trigger Out function for Channel</p> <p>Return Values:</p> <p>0 = No Output Trigger function for Channel</p> <p>1 = Sweep Signal from Channel is routed to the Output Trigger producing a square wave at the Sweep Frequency.</p> <p>32768 = Trigger output inverted and disabled</p> <p>32769 = Sweep Signal from Channel is routed to the Output Trigger producing an inverted square wave at the Sweep Frequency.</p>
<p><i>Parameters:</i></p> <p>[Int] Channel</p>	<p><i>Example:</i></p> <p>Trigout? 1</p> <p>1</p>
<b>TRIGOUT</b>	<p>Sets the selected Trigger Out function for Channel</p> <p>Parameter Values:</p> <p>0 = No Output Trigger function for Channel</p> <p>1 = Sweep Signal from Channel is routed to the Output Trigger producing a square wave at the Sweep Frequency.</p> <p>32768 = Trigger output inverted and disabled</p> <p>32769 = Sweep Signal from Channel is routed to the Output Trigger producing an inverted square wave at the Sweep Frequency.</p> <p>NOTE: Inverting the output trigger for one channel inverts it for the other channel.</p> <p>NOTE: Selecting the Sweep Signal for a channel de selects it for the other channel.</p> <p>Returns TRIGOUT?</p>
<p><i>Parameters:</i></p> <p>[Int] Channel</p> <p>[Int] Selection</p>	<p><i>Example:</i></p> <p>Trigout 2 1</p> <p>1</p>

## Error Commands

<b>ERROR?</b>	Reads the Error codes for Channel Return Values: 49152 = No error Others TO BE DETERMINED
<i>Parameters:</i> [Int] Channel	<i>Example:</i> Error? 1 49152
<b>ERROR</b>	Clears an Error code for Channel Note: use this command to clear an error code obtained from the ERROR? Command. Values to clear error codes: 49152 = No error Others TO BE DETERMINED Returns the Error code resulting from clearing the error
<i>Parameters:</i> [Int] Channel [Int] Code	<i>Example:</i> Error 1 49152 49152