

# SLICE-OPL

## Offset Phase Lock Servo

The SLICE-OPL Offset Phase Lock Servo is designed to precisely control and quickly adjust the frequency detuning between a master and a follower laser.



*SLICE-OPL Offset Phase Lock Servo*

The SLICE-OPL forms a complete offset lock system when combined with the D2-250 Heterodyne Module and D2-260 Beat Note Detector. The D2-250 overlaps the free-space master and follower lasers to generate the optical beat note. It then launches the beat note into a fiber for delivery to the D2-260 where it is down-converted to the RF and then delivered to the SLICE-OPL for processing.

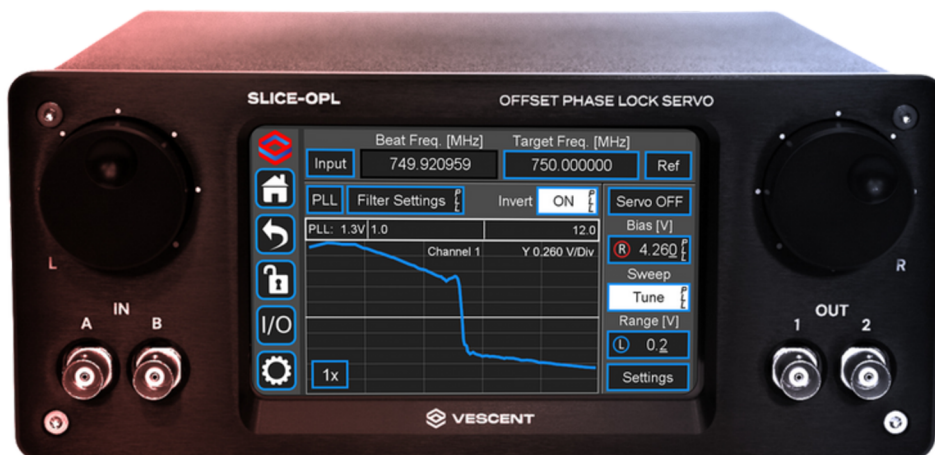
The SLICE-OPL is also designed for stabilizing frequency combs. With the ability to process beat notes as small as 10 MHz, the SLICE-OPL will tightly lock  $f_{\text{CEO}}$  and  $f_{\text{opt}}$  or  $f_{\text{rep}}$  of the RUBRIComb™ series of frequency combs as well as third-party combs.

The SLICE-OPL has a built-in touchscreen GUI with the ability to display and manipulate the error signal and engage the lock. No oscilloscope is required to initiate and monitor the lock.



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*SLICE-OPL Touchscreen GUI*



*SLICE-OPL Back Panel*

### Features

- Offset Phase Locks from 10 MHz to 9.5 GHz
- Integrated display removes need for dedicated oscilloscope
- Phase frequency discriminator enables wide capture range and easy locking
- User-adjustable servo parameters
- Internal ramp generator
- Fast frequency jumps with feed-forward

### Applications

- Precisely control follower laser frequency while remaining referenced to the leader laser
- Frequency comb stabilization
- Atomic laser cooling and trapping
- Rydberg, Raman, and sideband spectroscopy
- Quantum gates



# SLICE-OPL Specifications

Parameter	Value
<b>General</b>	
Number of Channels	1
Input/Output Impedance	50 $\Omega$
Output Voltage Range	$\pm 10$ V
Front Panel Input Voltage Limit	$\pm 10$ V
<b>Beat Signal</b>	
Min. Best Signal Power	-10 dBm
Max. Best Signal Power	10 dBm
Min. Offset Frequency	10 MHz
Max. Offset Frequency	9.5 GHz
<b>Reference Frequency</b>	
Min. Reference Power	-10 dBm
Max. Reference Power	10 dBm
Min. Reference Frequency	10 MHz
Max. Reference Frequency	300 MHz
<b>Loop Filter</b>	
Loop Filter Transfer Function	Proportional-Integral-Derivative
Proportional Gain	100+ dB Dynamic Range
PI Corner Values	50, 100, 200, 500, 1k, 2k, 5k, 10k, 20k, 50k, 100k, 200k, 500k, 1M, 2M, 5M Hz
PD Corner Values	150, 300, 600, 1.5k, 3k, 6k, 15k, 30k, 60k, 150k, 300k, 600k, 1.5M, 3M, 6M Hz
Open-Loop Bandwidth	>8 MHz
<b>Input Voltage</b>	
Input Line Voltage	100-240 VAC
Frequency	50-60 Hz
Phase	1 phase
User-Serviceable Fuse	T 2.0 A L 250V



# SLICE-OPL Specifications Continued...

Parameter	Value
<b>Environmental</b>	
Operating Temperature	>15 and <30 °C
Humidity	<60%
Dew Point	<15 °C

