

D2-135

Offset Phase Lock Laser Servo

The D2-135 Offset Phase Lock Servo actively controls frequency detuning between a leader and a follower laser. Its high-bandwidth analog PID loop and precise phase-frequency detector enable the follower laser to quickly and accurately track the leader. When paired with the D2-250 Heterodyne Module and D2-260 Beat Note Detector, the D2-135 forms a complete offset lock system. The D2-250 combines the free-space leader and follower lasers to produce an optical beat note, then sends it via fiber to the D2-260. The D2-260's low-noise photodiode converts the optical signal into an RF signal, which the D2-135 servos.



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D2-135 Front Panel



D2-135 Back Panel

Features

- Offset Phase Locks from 250 MHz to 9.3 GHz
- Precisely control follower laser frequency while remaining referenced to the primary standard
- User-adjustable servo parameters
- Internal ramp generator
- Fast frequency jumps with feed-forward
- Offset frequency stability determined by reference stability



FREQUENCY COMBS | LASERS | CONTROLLERS

D2-135 Specifications

Parameter	Value
Input/Output	
Offset Frequency Range ¹	0.25 GHz to > 9.3 GHz
Beat-Note Input Connection	SMA
Beat-Note Input Range	-10 dBm to 10 dBm
Min Electronic Beat-Note S/N	>50 dB
Input/Output Impedance	50 Ω
Servo Output Range	± 10 V
Frequency Reference	
Source	Internal VCO or External input
Reference Signal Range ¹	30 MHz to 240 MHz
VCO drift	200 ppm/°C
PFD Noise	-213 dBc/Hz
External Reference Input Power	-10 dBm to +10 dBm
Loop Filter	
Proportional Gain Dynamic Range	76 dB
f_I (Integral/Prop. corner)	4,8,16,32,64,125,250,500 (kHz)
f_D (Proportional/diff. corner)	16,32,64,125,250,500,1000,off (kHz)
f_{HF} (high freq. cutoff pole)	0.25, 0.5,1,2,4,8,16,off (kHz)
Power Supply	
Voltage Input	+5 VDC, ± 15 VDC
Power Supply ¹	D2-005
Environmental	
Operating Temperature	>15 °C and <30 °C
Humidity	<60%
Dew Point	<15 °C

¹ Consider the SLICE-OPL if you need: a greater offset frequency range (10 MHz – 9.3 GHz), digital API control, greater reference frequency range (10 MHz – 300 MHz) and internal higher reference frequency stability, or internal AC power conditioning.