Digital Offset Phase Locker (DOPLR)

Summary: The Digital Offset Phase Locker (DOPLR) is an easy-to-use benchtop instrument for stabilizing voltage-tunable RF signals. The DOPLR has been designed specifically for the locking of laser heterodyne beat signals, though other electronic signals such as those from voltage-controlled oscillators (VCOs) can also be used. An example use case is stabilizing a frequency comb's carrier—envelope offset frequency obtained using Octave's Comb Offset Stabilization Module (COSMO) in conjunction with the user's mode-locked laser.

The DOPLR uses a Field-Programmable Gate Array (FPGA) module to implement multi-channel digital phase locking capabilities in a convenient and easy-to-use device. There is no software to install. Setup is as easy as powering on and optimizing your loop filter settings. Physical knobs and buttons on the front panel aim to make adjusting the most common settings as user friendly as possible. Several different display modes are available including: electronic spectrum analyzer, phase noise analyzer, loop filter visualizer, and a frequency counter with real-time Allan deviation calculation. Noisy input signals can be locked easily without frequency division or highly optimized gain settings!

Key Features:

Tactile interface!

Plug-and-Play

PI²D Control

>2 MHz BW

Programming API

Free software updates

Additional Features:

- At-a-glance lock status indicators
- Two independent I/O channels with auxiliary slow-feedback outputs
- Zero-deadtime frequency-counter with real-time Overlapping Allan Deviation (OADEV)
- Flexible Internal/External Clock (5/10/100 MHz)
- Easily export data to front-panel USB drive
- HDMI monitor output on rear panel for external display connection
- Open-source software inspired by JD Deschenes' Frequency-Comb-DPLL project
- New capabilities added through free updates

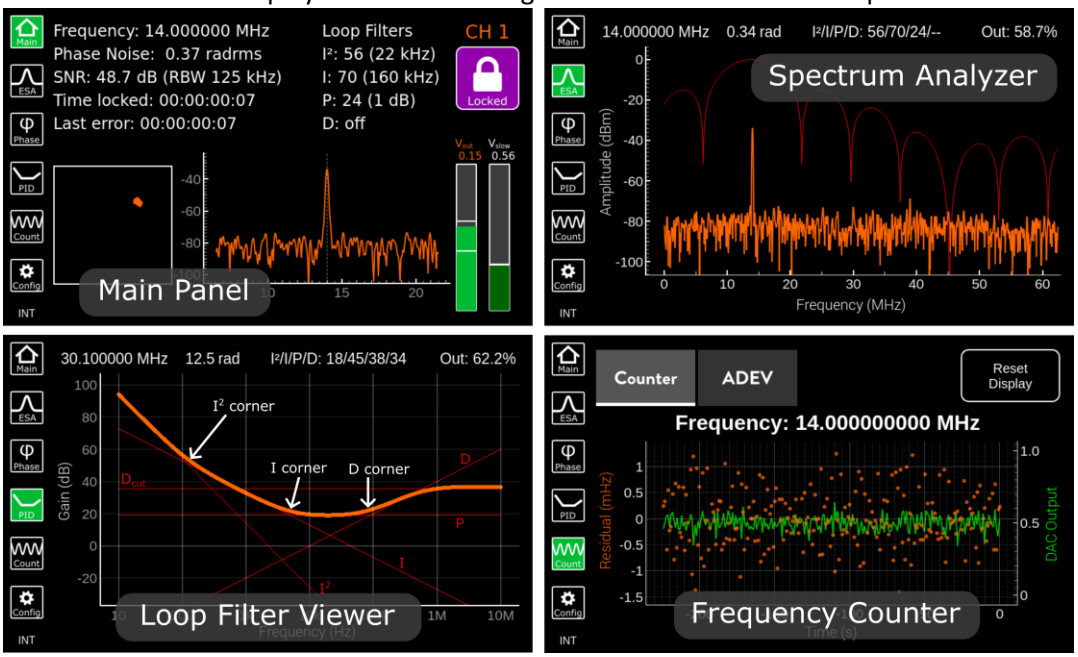
info@octavephotonics.com • OCTAVEPHOTONICS.COM
325 W South Boulder Rd Suite B1 • Louisville, CO 80027

Device Characteristics

Power supply voltage	100-240 VAC
Typical operating current draw	180 mA @ 120 VAC
Input voltage range	±1 V (10 dBm, 50 Ω) (Internal DC block supports <25 V static offsets)
Input frequency range	100 kHz to 60 MHz
Fast output voltage range	-1 V to +1 V
Slow output voltage range	0 V to +5 V
Bandwidth (30 deg phase roll off)	>2 MHz (fast) <1 kHz (slow)
External clock source	5/10/100 MHz 0-13 dBm LVCMOS or sine wave
Channel-to-channel crosstalk	-50 dB or lower
Power connector style	IEC 320-C14
Serial comms connector style	USB Type B
External monitor connector style	HDMI
Case dimensions (W x H x D)	310 x 110 x 155 mm

Software Interface:

Intuitive on-screen display of status and diagnostic information for each panel.



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