



QRF Quad RF Synthesizer + AOM Driver



The MOGLabs QRF is a quad-channel RF synthesizer that offers the flexibility of computer-controlled DDS generation at an economical per-channel price. It offers a range of functionality for common AOM tasks such as adjustable frequency shifting, low bandwidth modulation, intensity stabilisation, and pulse generation. Optional integrated power amplifiers enable most AOMs to be driven directly without the need for external amplification.

The channels are inherently phase synchronous, simplifying phase mod-demod experiments such as IQ-measurement. Each channel has a separate modulation input and can be configured independently. Furthermore, hardware TTL switching permits rapid pulse generation with extremely low jitter.

An integrated display interface simplifies operating the device, and it can be fully computer-controlled over Ethernet or USB using a human-readable control language. Full software suite, including examples in Python, MATLAB and LabVIEW provided.

Features

- Four RF channels
- High output power: up to +33dBm per channel
- Wide frequency range: 10 - 200MHz
- Analog modulation (AM, FM, PM, PID)
- External TTL inputs for fast pulse generation
- Autonomous execution of complicated frequency/power/phase sequences
- Robust open- and short-circuit protection
- Ethernet and USB interfaces

Applications

- AOM driver
- Intensity stabilisation
- Diamond NV quantum control
- Laser cooling, trapping, spectroscopy
- Bose-Einstein condensation
- Quantum optics: squeezed light
- Electromagnetic transparency, slow light
- Time and frequency standards

Quad RF Synthesizer/AOM Driver

Specifications QRF

RF characteristics

RF output power	QRF241: 0 to +33 dBm QRF041: 0 to +12 dBm	10-bit amplitude resolution
Frequency range	10 to 200 MHz, 0.12Hz steps	
Frequency stability	±25 ppm (0 to 50°C)	
Phase	0 to 360°, 14-bit resolution	
Absolute phase noise	< -100 dBc/Hz (1 kHz)	
Signal to noise	TBC	
Intermodulation and spurious	TBC	
Crosstalk between channels	< -50dBc	
RF 'off' level	< -70dBm	
External clock	25 MHz or 500 MHz	

Analogue input/output

Number	1 input per RF channel	
Function	FM, AM, PM, PID, independently configurable per channel	
Sensitivity	± 1V, anti-alias filter at 100kHz, 12-bit resolution	
Modulation bandwidth (3 dB)	70 kHz	
Input latency	< 5 µs	

Digital input/output

RF on/off	Software control, front-panel buttons, hardwired TTL	
TTL input	1 per channel, for on/off control or table trigger	
TTL response time	< 40ns	

Computer interface

Ethernet	10/100 TP, RJ45	
USB	USB2, plug type USB-A	
Table mode	Up to 4 channels simultaneously (independently or synchronised)	
Table memory (non-volatile)	8k entries per channel (frequency, amplitude, phase and duration)	
Table timing resolution	10 µs	

Dimensions and power

Dimensions	216 x 80 x 292 mm (W x H x D)	
Power	TBC	



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