ARF/XRF Agile RF Synthesizer + AOM Driver

The MOGLabs ARF/XRF agile RF synthesizer provides two channels of agile RF frequency synthesis with high-power output drivers. Each channel spans a frequency range of 20 to 400 MHz with output power up to +36dBm (4 W). The two channels can be controlled via front panel knobs to adjust frequency and power, or via computer interface. Two external analogue inputs are provided for each channel, to allow FM/AM/PM at up to 10 MHz bandwidth, and PID servo feedback is built-in for laser noise-eating or frequency locking.

The computer interface (10/100 Ethernet and USB) allows full control of all parameters, advanced table sequence control, and monitoring. Ultrafast digital outputs can be individually controlled in synchronisation with the table sequences.

Features

- Two RF channels, independent or synchronised
- High output power: up to +36dBm per channel
- Wide frequency range: 20-400MHz
- High modulation bandwidth up to 10 MHz (AM, FM, ϕ)
- RF power output monitoring and protection
- External digital inputs for fast on/off, trigger
- 16 high-speed digital IO (table sequence control)
- Autonomous execution of complicated frequency/power/phase sequences
- External sync clock input
- Three analogue outputs
- Robust open- and short-circuit protection
- Ethernet and USB interfaces

Applications

- AOM driver
- Noise eater or laser frequency lock
- Diamond NV quantum control
- Laser cooling, trapping, spectroscopy
- Bose-Einstein condensation
- Quantum optics: squeezed light
- Electromagnetic transparency, slow light
- Time and frequency standards

Agile Frequency Synthesizer/AOM Driver

Specifications ARF/XRF

RF characteristics		
RF output power	ARF421, XRF421: 0 to +36 dBm ARF021, XRF021: 0 to +16 dBm	14-bit resolution
Frequency	20 to 400 MHz, 32-bit resolution (0.23Hz steps)	
Frequency stability	±1 ppm (0 to 50°C)	
Phase	0 to 360°, 16-bit resolution	
Absolute phase noise	– 115dBc/Hz @ 10kHz, – 113dBc/Hz @ 1kHz, – 105dBc/Hz @ 100Hz	
Signal to noise	> 80dBc @ 30dBm	
Intermodulation and spurious	< – 80dBc	
Crosstalk between channels	< – 70dBc (off), < – 50dBc (on)	
RF 'off' level	< – 70dBm	
External clock	5 MHz to 1 GHz	
Analogue input/output		
Number	2 inputs and 2 outputs per RF channel	
Function	FM, AM, ϕ or analogue sampling for DSP applications	
Sensitivity	± 1V, 7th order anti-alias filter 12-bit resolution, 65MHz sampling rate	
Modulation bandwidth	10 MHz first parameter, 1 MHz second parameter	
DAC	3 channels, ± 2.5 V, 14-bit, 1MHz bandwidth	
Digital input/output		
RF on/off	Software control, front-panel buttons, hardwired TTL	
Trigger input	Per channel, start/retrigger by edge or level	
Shutter output	Per channel TTL output	
High speed digital IO	16 TTL input/output, user-controllable and via table mode (advanced)	
Computer interface		
Ethernet	10/100 TP, RJ45	
USB	USB2, plug type USB-A	
Table mode	Up to 8k programming points per channel	
Table timing resolution	ARF: 1 µs, XRF: 16 ns	
Dimensions and power		
Dimensions	250x79 x292mm (WxHxD), 2kg	
Power input	95 – 264 Vac, 47 to 63Hz, 1A	
Power consumption	ARF421, XRF421: 55W ARF021, XRF021: 25-35W	

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