



QRF Quad RF Synthesizer + AOM Driver



The Santec 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 +33 dBm per channel
- Wide frequency range: 10 – 200 MHz
- 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 (2026)

RF characteristics

RF output power	-0 dBm to +36 dBm, 10-bit amplitude resolution
Frequency range	-10 MHz to 200 MHz
Frequency stability	±25 ppm (0 to 50°C)
Phase	-0° to 360°, 14-bit resolution
Absolute phase noise	< -110 dBc/Hz @ 1 kHz
Signal to noise	< -95 dBc @ 30 dBm
Intermodulation and spurious	< -50 dBc
Crosstalk between channels	< -50 dBc
RF 'off' level	< -70 dBm
External clock	25 MHz or 500 MHz

Analogue input/output

Number	1 input per RF channel (4 total)
Function	FM, AM, PM, PID, independently configurable per channel
Sensitivity	± 1V, anti-alias filter at 100kHz, 12-bit resolution
Modulation bandwidth (3 dB)	100 kHz with 2 nd order anti-alias
Input latency	< 5 µs

Digital input/output

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

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	5 µs

Dimensions and power

Dimensions, weight	250 x 79 x 292 mm (W x H x D), 2 kg
Power	30 W (041); 55 W (241)



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