

QCM-RF / 2-18.5 GHz Qubit Control Module | Cluster Series 19" Rack Mounted

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Description

The QCM-RF is the ideal RF signal generator specifically designed for the control of quantum devices. The unlevelled noise performance and high spurious-free-dynamic range makes it ideal for high-fidelity single- and two-qubit gates.

The QCM-RF has 2 RF output channels with two independent internal up-conversion stages to directly output signals over a wide frequency range from 2 GHz to 18.5 GHz. With its internal calibration capabilities, it removes the need for any external mixer calibration equipment and inconvenient disconnections from the experiment.

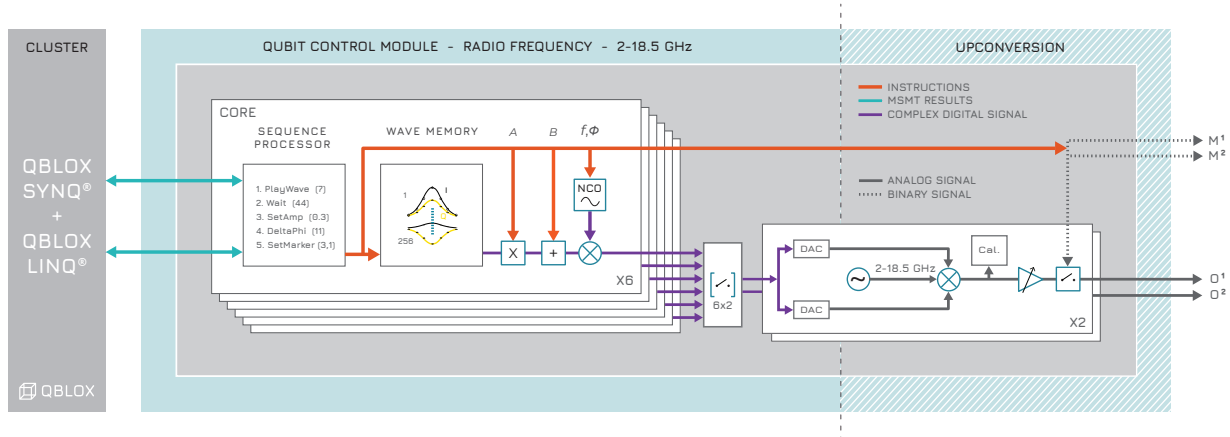
The module incorporates 6 sequence processors for flexible multiplexed driving and tracking of up to 6 qubits that can span a 750 MHz band without compromising on its state-of-the-art spurious-free dynamic range of 55 dB (typical).

Both output channels have their own local oscillator to allow fully independent operation of each channel.



Features

- Advanced distributed sequence processing.
- Multiplexed control of up to 6 qubits per module.
- Synchronized to all other modules with SYNQ protocol.
- Real-time control of amplitude, offset and modulation phase (virtual Z-gates).
- LINQ allows for low-latency interaction with all other modules.
- Sequencer instructions allow constructing arbitrarily long (modulated) signals.
- Integrated calibration protocols for upconversion stages.
- External instrument triggering via 2 marker outputs.



Specifications QCM-RF

Frequency range (-3 dB)	2 - 18.5 GHz	Output switch signal suppression	>60 dB
Analog output channels	2	Ethernet data rate	1 Gbit/s
Analog bandwidth (-3dB)	750 MHz	Driver/API	SCPI / Python / QCoDeS
DAC sample rate	1 GS/s (for I and Q)	Max. power consumption (via Cluster)	48 W
DAC resolution (vertical)	16 bit (for I and Q)	Input/Output connector type	SMA
Binary output markers	2 (3.3V LVTTTL)	Marker connector type	SMP
Max. output power (into 50 Ohm)	-40 to +5 dBm (settable)	Dimensions single module	269 x 130 x 20 mm ³
Spurious-free dynamic range	55 dB (typical)	Weight	0.303 kg
Phase noise (@3 GHz, 10 kHz offset)	-115 dBc/Hz		
Frequency resolution	0.25 Hz (IF), 1 Hz (LO)		