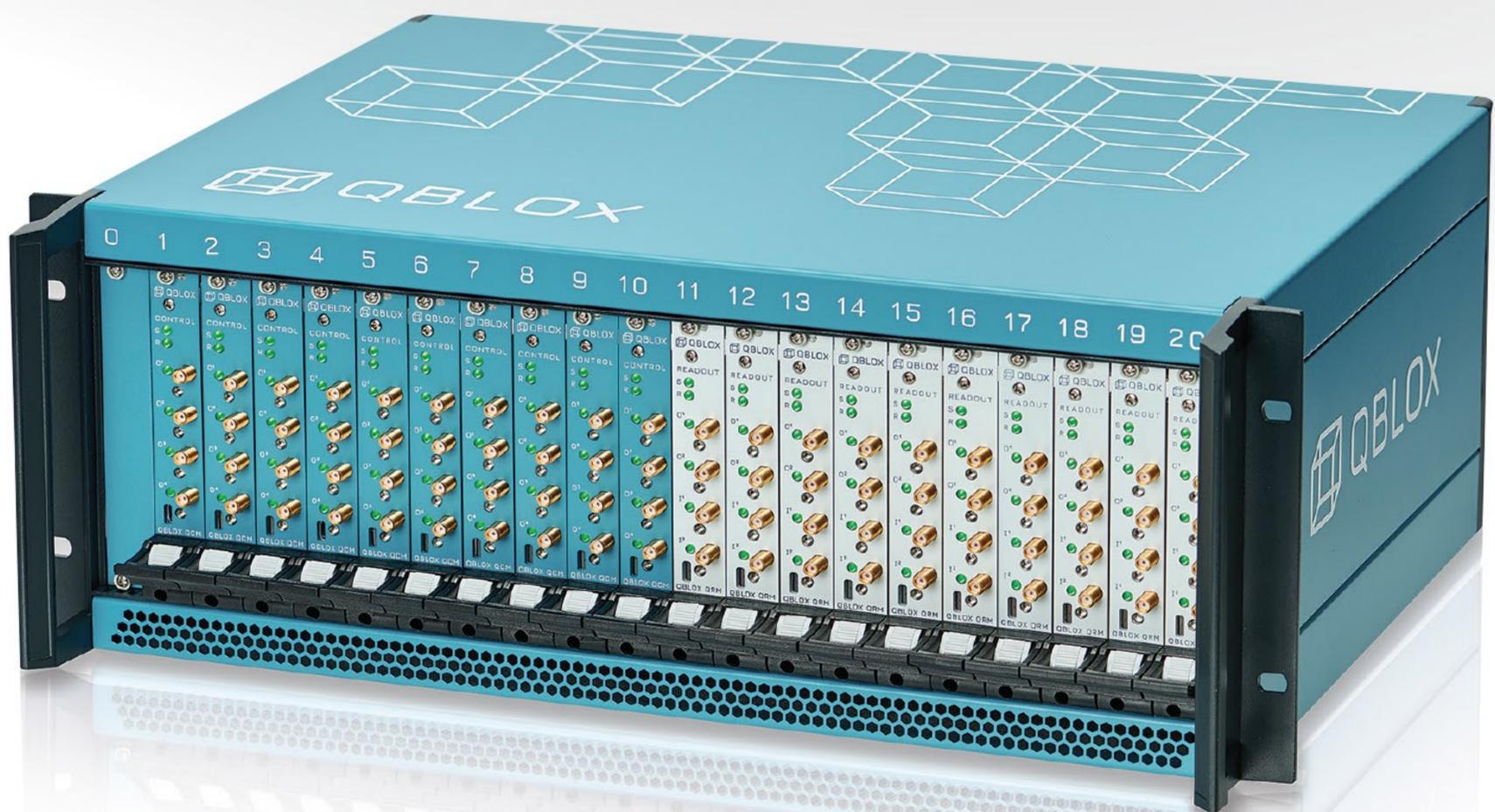




MASTER YOUR QUANTUM PROCESSOR!



CLUSTER

ULTRA LOW NOISE - MASSIVELY SCALABLE

CLUSTER QCM QUBIT CONTROL MODULE



Ideal for (multiplexed) single-qubit
and two-qubit gates

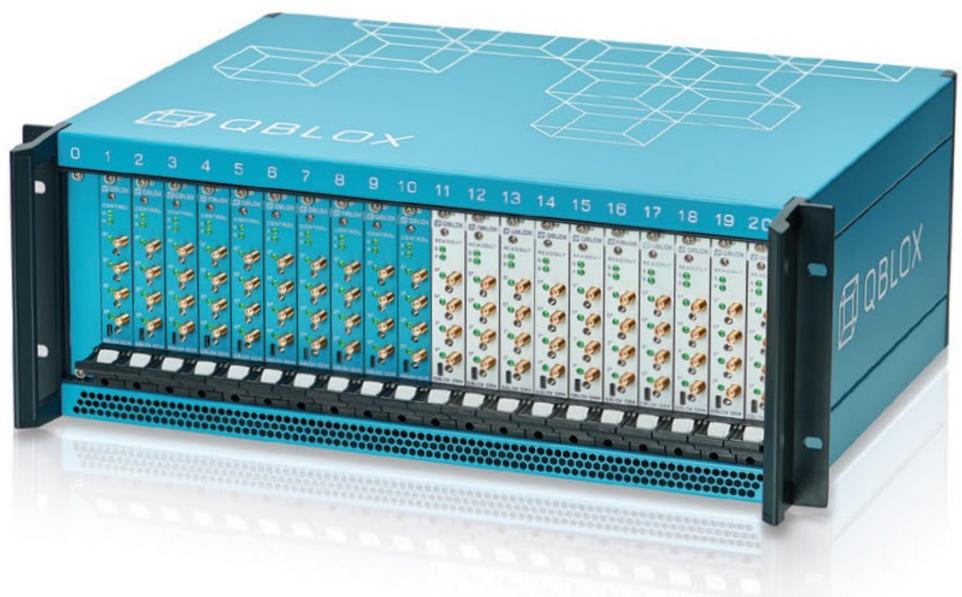
4 channels out
1 GSPS / 16 bit
5 Vpp output (50 Ω)

CLUSTER MASSIVELY SCALABLE

Ultralow noise and distortion adopted from Pulsar Qubit Control Module and Pulsar Qubit Readout Module

Advanced distributed sequence processing:
Multiplexed control and readout
Real-time modulation with mixer corrections
Parameterized gates: virtual Z-gates, amplitude

Proprietary backplane topology designed for:
- Flexible and low-latency feedback
- Compatible with surface-code QEC
- Fully deterministic timing



Up to 80 channels / 4 U

Experimental platform available including many experiments

Single-qubit characterizations
Randomized benchmarking (1Q and 2Q)



CLUSTER QRM QUBIT READOUT MODULE



Ideal for (multiplexed) qubit readout

2 channels in + 2 channels out
1 GSPS / 12 bit
0.1 to 1 Vpp input (50 Ω)

QCM specifications

DAC channels	4
DAC sample rate	1 GSPS
DAC resolution	16 bit
Analog bandwidth (-3 dB)	300 MHz
Trigger latency	<100 ns
Output range (in a 50 Ω load)	5 Vpp
Rise/fall time (10%-90%)	1.2 ns
THD (100 MHz, 1 Vpp in a 50 Ω load)	66 dB
Voltage noise density (at 1 MHz in a 50 Ω load)	14 nV/ $\sqrt{\text{Hz}}$
Voltage noise density (at 1 Hz in a 50 Ω load)	1.0 $\mu\text{V}/\sqrt{\text{Hz}}$
Gain stability	<50 ppm (18 to 24 °C)

QRM specifications

ADC channels	2
ADC sample rate	1 GSPS
ADC resolution	12 bit
ADC bandwidth (-3 dB)	300 MHz
Input range (in a 50 Ω load)	0.1 to 1 Vpp (controllable)
DAC channels	2
DAC sample rate	1 GSPS
DAC resolution	12 bit
DAC bandwidth (-3 dB)	300 MHz
Output range (in a 50 Ω load)	1 Vpp

Joined specifications

Single-sideband (de)modulation frequency range	± 450 MHz
(De)Modulation frequency resolution	0.25 Hz
Marker channels	4
Control interface for settings and waveform loading	Ethernet via backplane
Length	223 mm
Width	20 mm
Height	131 mm

QBLOX SPI SERIES

DC current and voltage sources



Isolated control,
filtered power supply



Up to 176 channels in 3U

QBLOX PULSAR SERIES

Ultralow noise - Easy to integrate



Qubit Control Module
4 channels out
1 GSPS / 16 bit

Qubit Readout Module
2 channels out + 2 channels in
1 GSPS / 12 bit



ENABLING THE QUANTUM REVOLUTION

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