Cluster Series Mainframe
# Synchronized Qubit Control / Readout - 19" Rack System

Description

Qblox Cluster is the scalable 19" rack system that can be configured with a combination of modules that can control and readout qubits over a wide frequency range (DC to 18.5 GHz).

All the modules in the system act as one solid system through the use of our proprietary SYNQ and LINQ backplane system protocols. Both protocols contribute to more stable and reliable qubit setups needed for quantum computing.

The SYNQ protocol ensures fully deterministic timing of all outgoing signals by creating a synchronized start and establishes fixed timing relations between all the modules in the Cluster.

The LINQ protocol facilitates low-latency feedback with an arbitrary control flow by distributing the measurement outcomes to all modules within 364 ns.
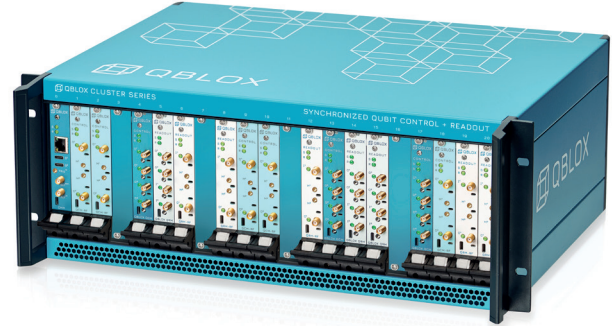

Features

- Hosting up to 20 modules per Cluster in a 4 U chassis.

- Setup can scale and adapt along with the experimental needs.

- Up to 80 baseband channels or 40 RF channels per Cluster.

- SYNQ starts modules synchronously <<1 ns.

- LINQ distributes measurement outcomes in <364 ns.

- Agile scalability to 100s of qubits.

The SYNQ protocol extends to multiple Clusters by daisy chaining them with SYNQ interconnects

SYNQ + LINQ Protocols
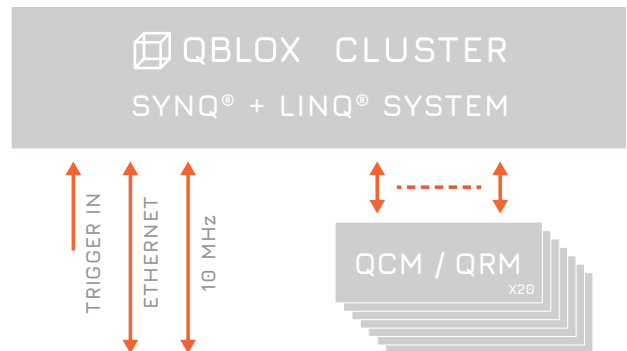
Specifications Cluster - 19" / 4 U rack

Number of module slots	20		Ethernet data rate	1 GBit/s
Power Supply	110-230 V / 50-60 Hz		Mounting Type	19" Rack mount
Power supply max. load	1.1 kW		Height	4 U
Clocking reference (internal or external)	10 MHz		Dimensions	482 x 474 x 176 mm³
Clock reference connector (in or out)	SMA		Weight (empty rack)	9,35 kg
Number of SYNQ ports	2 x USB-C			
Data connection to host pc	Ethernet			
Driver/API	SCPI / Python / QCoDeS			