



Qblox

Scheduler

An open-source, Python-based framework that converts complex quantum physics experiments into efficient code optimized for hardware execution with real-time pulse processing.



Focus on physics, not programming.

Qblox Scheduler allows you to concentrate exploring quantum phenomena across superconducting, spin, and optical qubits, their experimental design and quantum control, without being slowed down by software complexities.



Execute seamless quantum control.

Qblox Scheduler generates reliable, scalable code that aligns perfectly with Qblox hardware, whether you're working with few or many qubits. Perform qubit operations via running loops on the FPGA, precise timing control, and automated memory management.



Save time to accelerate research.

Qblox provides comprehensive documentation and an applications toolkit to quickly set up experiments, along with advanced features for measurement protocols. Use ready-to-run code and our expert support team to save time and reinvest in your next breakthrough experiment.

RAMSEY 2D SPECTROSCOPY

```
1 hw_agent = HardwareAgent(hw_config_path, quantum_device_configuration=device_path_yaml)
2 qubit = hw_agent.quantum_device.get_element("q0")
3 hw_agent.connect_clusters()
4
5 schedule = Schedule(name="Ramsey spectroscopy")
6
7 frequency_domain = linspace(start=5.0e9, stop=5.2e9, num=1000, dtype=DType.FREQUENCY)
8 int_time_domain = arange(start=10e-9, stop=110e-9, step=1e-9, dtype=DType.TIME)
9
10 with schedule.loop(frequency_domain) as freq:
11     schedule.add(SetClockFrequency(clock=f"{qubit.name}.01", clock_freq_new=freq))
12     with schedule.loop(int_time_domain) as delta_t:
13
14         schedule.add(Reset(qubit.name))
15         schedule.add(X90(qubit.name))
16         schedule.add(IdlePulse(delta_t))
17         schedule.add(X90(qubit.name))
18         schedule.add(
19             Measure(qubit.name, coords={"frequency": freq, r"$\delta T$": delta_t}),
20             rel_time=200e-9,
21         )
22
23 data = hw_agent.run(schedule)
```

#Hardware agent

Your companion for smooth operation

Hardware agent collects all necessary device and hardware configurations into a single package, serving as the sole point of contact between the user and the experimental setup. Hardware agent manages the hardware configurations, qubit parameters and connectivity to ensure seamless operation.

#Loops

Sweep over multi dimensions

Qblox Scheduler allows you to intuitively define parameters (frequency, amplitude, time) to be swept during the experiment, while handling the real-time and near-time aspects to perfectly optimize for Q1 sequencers in the Qblox Cluster.

#Schedules

Define experiments with streamlined UI/UX

With the Qblox Scheduler, you can design experiments using both gate-level and/or pulse-level instructions with precise timing, ensuring synchronization and determinism with the Q1 sequencers.

#Data acquisition

Unified and accessible results

A unified dataset is generated with user-defined axes based on physical parameters. The hardware and software handle the acquired data, giving you results with clearly defined coordinate axes and direct access to your experimental results.