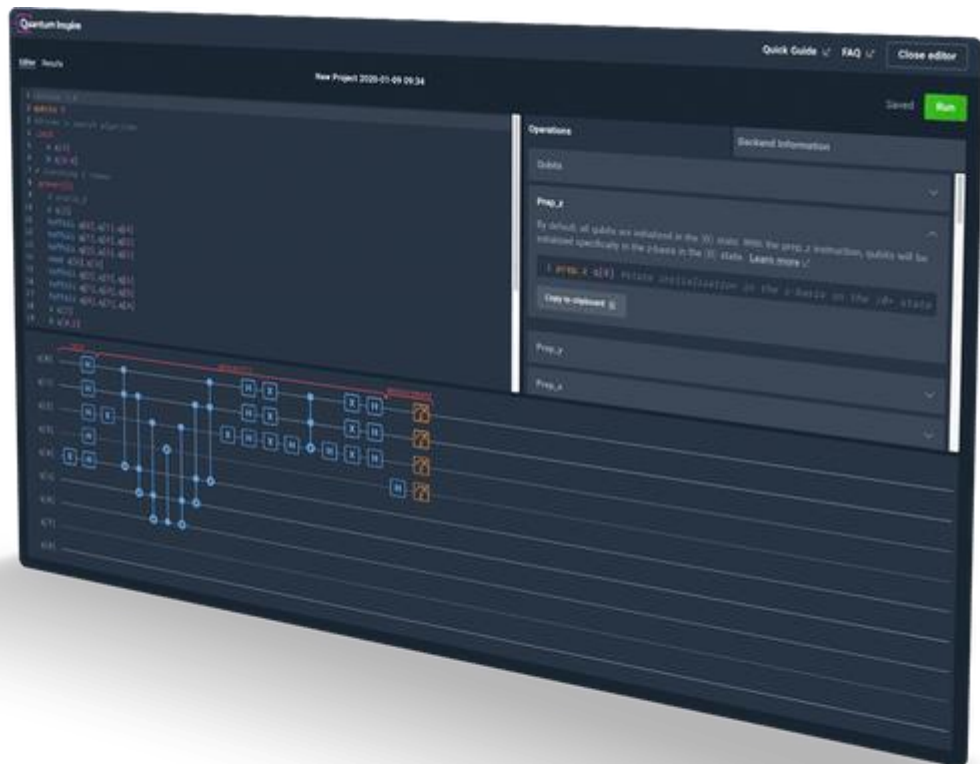

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# Quantum Inspire

## *Quick start guide V1.2*






Delft, January 2022

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## Quick start

Hi there and welcome to Quantum Inspire, the first quantum computing cloud platform in Europe and the first in the world hosting two different qubit technologies: transmon qubits based on superconducting circuits and spin qubits based on single-electron spin in Si quantum dots. We hope you will be enjoying your time on our systems.

[Quantum Inspire](#) comes with a wealth of background information to get you started. All information can be found online. This document is meant to show where to start reading.

Quantum Inspire starts at our [landing page](#). This links to pages with [technical information about our systems](#), [your own personal environment](#) to interact with quantum bits and a [knowledge base with an introduction to quantum computing](#), a [beginners guide](#) and an [advanced users guide](#).

Quantum Inspire uses [cQASM](#) as a programming language. Details on cQASM can be found on the knowledge base, including [a list of all operations](#) and on the [libQASM ReadTheDocs](#). NOTE: Quantum Inspire still uses cQASM1.0 and does not support control flow (except for binary-controlled operations, variables and expressions.)




Advanced users probably want to use either [our SDK](#) or a direct connection with [our API](#), to program in Python or to use the libraries available through Qiskit or ProjectQ to do more advanced programming. Do you know, that when you send in quantum circuits from Qiskit, using our SDK, Qiskit automatically maps your code to the chip topology? This may be handy if you do not care how this is done. However, if you want to have more control over gate decomposition and mapping, you may want to use the more advanced Qiskit functionality or [OpenQL](#), a compiler that was written especially for cQASM/libQASM.

When you program using your own IDE, it is easiest to [store your token locally](#), so authentication is swift and straightforward.

In order to determine the probability amplitude of the final state of your system, you would [run your circuit](#) many times on quantum hardware. These are called shots. You can determine how many shots should be executed, but you are limited by the capabilities of a specific compute backend. If you do not measure all qubits at the end, but are only interested in one or a few qubits, [Quantum Inspire automatically 'bins' your results](#). Make sure you understand how this works, in order to interpret your results in the correct way.

On emulator backends you normally require just one shot to determine the probability amplitudes of the final states! **Make sure that you only do one shot when your algorithm is deterministic.** I will repeat this to emphasize its importance: **Make sure that you only do one shot when your algorithm is deterministic.** Make sure you read the [section on optimization of simulations](#) carefully and take care of the differences when running a circuit through the web browser or the SDK and make sure you use the flags correctly. This can make the difference between a job taking less than a second or more than an hour!

Most links in the text above and other useful links can be found in the overview on the next page. Enjoy!!

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## Important links

[Quantum Inspire landing page](#)

[Background info on the Quantum Inspire compute backends](#)

[Spin-2 compute backend – Factsheet](#)

[Starmon-5 compute backend - Factsheet](#)

[Quantum Inspire Knowledge Base – Introduction to Quantum Computing](#)

[Quantum Inspire Knowledge Base – Quick guide](#)

[Quantum Inspire Knowledge Base – Advanced user guide](#)

[Important considerations when executing algorithms on hardware backends](#)

[Important considerations when executing algorithms on emulator backends](#)

[Quantum Inspire – SDK](#)

[Quantum Inspire – SDK ReadTheDocs](#)

[Quantum Inspire – SDK Examples ReadTheDocs](#)

[LibQASM-cQASM – ReadTheDocs](#)

[OpenQL - ReadTheDocs](#)