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# qoqo qasm Documentation

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qoqo\_qasm is the QASM interface to HQS Quantum Simulation's qoqo package.



## QOQO QASM DOCUMENTATION

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*qoqo\_qasm*

QASM interface and backend for qoqo.

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### 1.1 qoqo\_qasm

QASM interface and backend for qoqo.

Translates qoqo operations and circuits to QASM operations via the interface, and Create a Qasm file with QasmBackend.

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*qasm\_call\_operation*(operation, ...)

Translate a qoqo operation to QASM text

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*qasm\_call\_circuit*(circuit, ...)

Translate the qoqo circuit into QASM output

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*QasmBackend*

Backend to qoqo that produces QASM output which can be imported.

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#### 1.1.1 qoqo\_qasm.qasm\_call\_operation

`qoqo_qasm.qasm_call_operation(operation, qubit_register_name, qasm_version)`

Translate a qoqo operation to QASM text

##### Parameters

- **operation** – The qoqo operation that is translated
- **qubit\_register\_name** (*str*) – The name of the quantum register

##### Returns

The translated operation

##### Return type

`str`

##### Raises

- **TypeError** – Operation conversion error
- **ValueError** – Operation not in QASM backend

### 1.1.2 qoqo\_qasm.qasm\_call\_circuit

`qoqo_qasm.qasm_call_circuit(circuit, qubit_register_name, qasm_version)`

Translate the qoqo circuit into QASM output

The qoqo\_qasm interface iterates through the qoqo circuit and translates each qoqo operation to QASM output (strings).

#### Parameters

- **circuit** (*Circuit*) – The qoqo circuit that is translated
- **qubit\_register\_name** (*str*) – The name of the quantum register

#### Returns

The translated circuit

#### Return type

List[str]

#### Raises

- **TypeError** – Circuit conversion error
- **ValueError** – Operation not in QASM backend

### 1.1.3 qoqo\_qasm.QasmBackend

**class** qoqo\_qasm.QasmBackend

Backend to qoqo that produces QASM output which can be imported.

This backend takes a qoqo circuit to be run on a certain device and returns a QASM file containing the translated circuit. The circuit itself is translated using the qoqo\_qasm interface. In this backend, the initialization sets up the relevant parameters and the run function calls the QASM interface and writes the QASM file, which is saved to be used by the user on whatever platform they see fit. QASM input is widely supported on various quantum computing platforms.

`__init__()`

#### Methods

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<code>__init__()</code>	
<code>circuit_to_qasm_file(circuit, folder_name, ...)</code>	Translates a Circuit to a QASM file.
<code>circuit_to_qasm_str(circuit)</code>	Translates a Circuit to a valid QASM string.

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`__new__(**kwargs)`

**circuit\_to\_qasm\_file**(*circuit, folder\_name, filename, overwrite*)

Translates a Circuit to a QASM file.

#### Parameters

- **circuit** – The Circuit that is translated
- **folder\_name** – The name of the folder that is prepended to all filenames.
- **filename** – The name of the file the QASM text is saved to.



- **overwrite** – Whether to overwrite file if it already exists.

#### Returns

The qasm file was correctly written

#### Return type

Ok()

#### Raises

- **TypeError** – Circuit conversion error
- **ValueError** – Operation not in QASM backend

#### **circuit\_to\_qasm\_str**(*circuit*)

Translates a Circuit to a valid QASM string.

#### Parameters

**circuit** – The Circuit items that is translated

#### Returns

The valid QASM string

#### Return type

str

#### Raises

- **TypeError** – Circuit conversion error
- **ValueError** – Operation not in QASM backend

## Functions

<i>qasm_call_circuit</i> (circuit, ...)	Translate the qoqo circuit into QASM output
<i>qasm_call_operation</i> (operation, ...)	Translate a qoqo operation to QASM text

## Classes

<i>QasmBackend</i>	Backend to qoqo that produces QASM output which can be imported.
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#### **class** qoqo\_qasm.QasmBackend

Backend to qoqo that produces QASM output which can be imported.

This backend takes a qoqo circuit to be run on a certain device and returns a QASM file containing the translated circuit. The circuit itself is translated using the qoqo\_qasm interface. In this backend, the initialization sets up the relevant parameters and the run function calls the QASM interface and writes the QASM file, which is saved to be used by the user on whatever platform they see fit. QASM input is widely supported on various quantum computing platforms.

**\_\_new\_\_**(\*\*kwargs)

**circuit\_to\_qasm\_file**(*circuit*, *folder\_name*, *filename*, *overwrite*)

Translates a Circuit to a QASM file.

#### Parameters

- **circuit** – The Circuit that is translated
- **folder\_name** – The name of the folder that is prepended to all filenames.
- **filename** – The name of the file the QASM text is saved to.
- **overwrite** – Whether to overwrite file if it already exists.

**Returns**

The qasm file was correctly written

**Return type**

Ok()

**Raises**

- **TypeError** – Circuit conversion error
- **ValueError** – Operation not in QASM backend

**circuit\_to\_qasm\_str**(*circuit*)

Translates a Circuit to a valid QASM string.

**Parameters**

**circuit** – The Circuit items that is translated

**Returns**

The valid QASM string

**Return type**

str

**Raises**

- **TypeError** – Circuit conversion error
- **ValueError** – Operation not in QASM backend

**qoqo\_qasm.qasm\_call\_circuit**(*circuit*, *qubit\_register\_name*, *qasm\_version*)

Translate the qoqo circuit into QASM output

The qoqo\_qasm interface iterates through the qoqo circuit and translates each qoqo operation to QASM output (strings).

**Parameters**

- **circuit** (*Circuit*) – The qoqo circuit that is translated
- **qubit\_register\_name** (*str*) – The name of the quantum register

**Returns**

The translated circuit

**Return type**

List[str]

**Raises**

- **TypeError** – Circuit conversion error
- **ValueError** – Operation not in QASM backend

**qoqo\_qasm.qasm\_call\_operation**(*operation*, *qubit\_register\_name*, *qasm\_version*)

Translate a qoqo operation to QASM text

**Parameters**

- **operation** – The qoqo operation that is translated
- **qubit\_register\_name** (*str*) – The name of the quantum register

**Returns**

The translated operation

**Return type**

str

**Raises**

- **TypeError** – Operation conversion error
- **ValueError** – Operation not in QASM backend



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