

GetCircuitCompacted

```
SetDirectory @ NotebookDirectory[];  
Import["../Link/QuESTlink.m"];
```

Doc

? GetCircuitCompacted

Symbol

GetCircuitCompacted[circuit] returns {out, map} where out is an equivalent circuit but which targets only the lowest possible qubits, and map is a list of rules to restore the original qubits.

This is useful for computing the smallest-form matrix of gates which otherwise target large-index qubits, via CalcCircuitMatrix @ First @ GetCircuitCompacted @ gate.

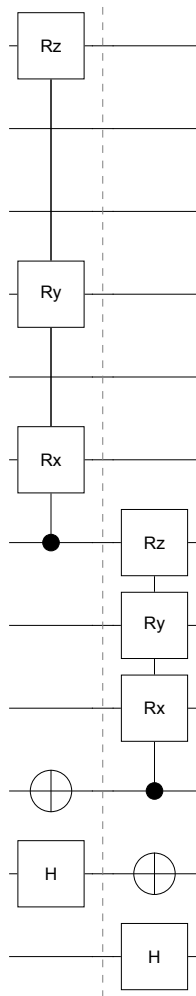
The original circuit is restored by RetargetCircuit[out, map].



Tests

```
in = Circuit[X2 H1 C5[R[ $\pi$ , X6 Y8 Z11]]];
{out, map} = GetCircuitCompacted @ in;
DrawCircuit @ {in, out}
```

```
in === RetargetCircuit[out, map]
```



True

```
GetCircuitCompacted @ G[x]
```

```
{{G[x]}, {}}
```

CalcCircuitMatrix @ X₃

```
{ {0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0},
  {0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0},
  {0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0},
  {0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0},
  {0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0},
  {0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0},
  {0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1},
  {1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0},
  {0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0},
  {0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0},
  {0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0},
  {0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0},
  {0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0},
  {0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0},
  {0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0}}
```

CalcCircuitMatrix @ First @ GetCircuitCompacted @ X₃

```
{{0, 1}, {1, 0}}
```

Errors

GetCircuitCompacted[eh]

 **GetCircuitCompacted**: Invalid arguments. See ?GetCircuitCompacted

\$Failed