Production Supporting Systems in Factories

ระบบสนับสนุนการผลิตในโรงงานอุตสาหกรรม

Smart Sensors

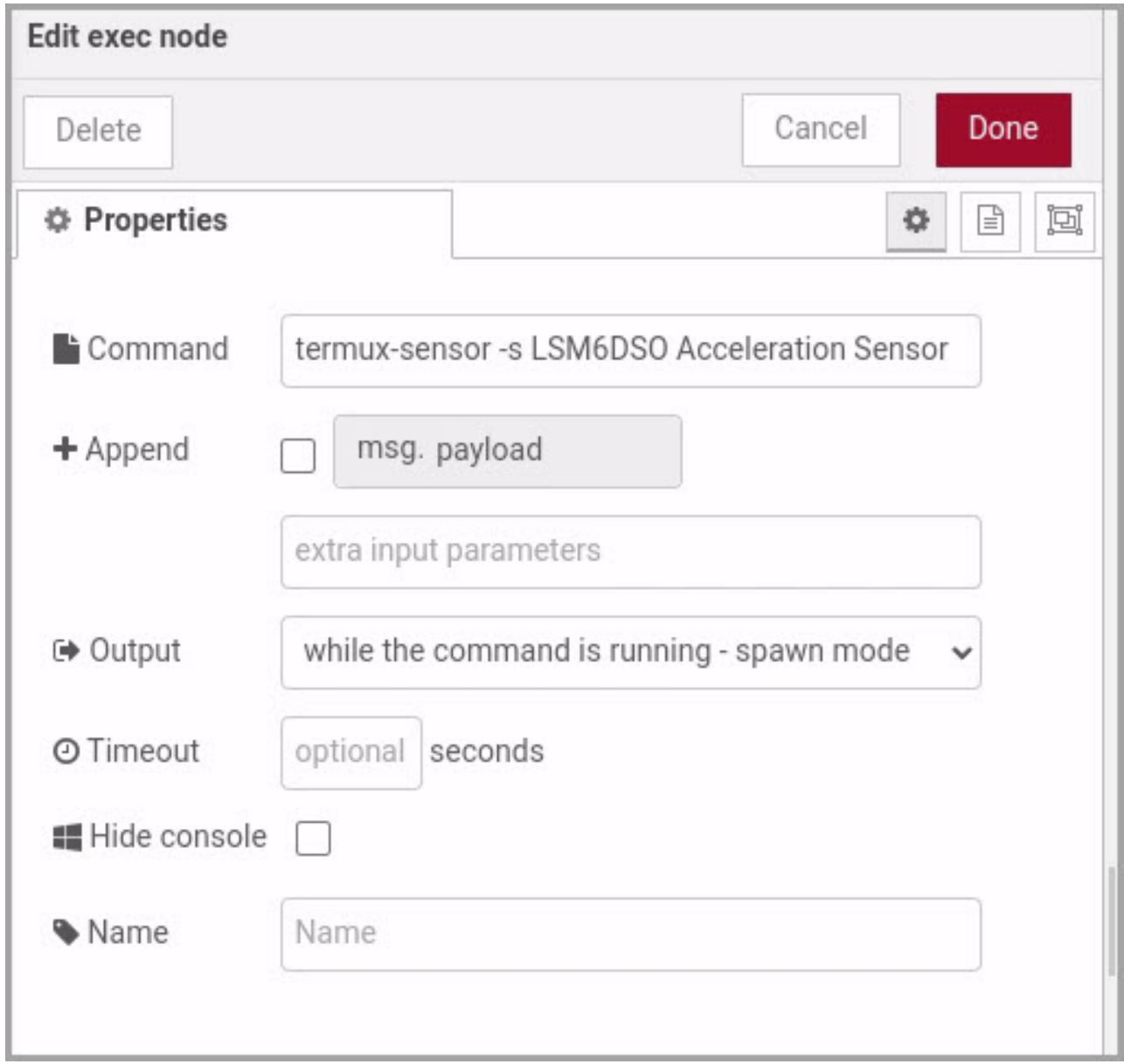
Smart sensors

- A smart sensor is a device that
  - takes input from the physical environment
  - perform predefined functions upon detection of specific input
  - then process data before passing it on.
- Your mobile phone running `Node-Red` can be programmed to be very **smart** sensors.

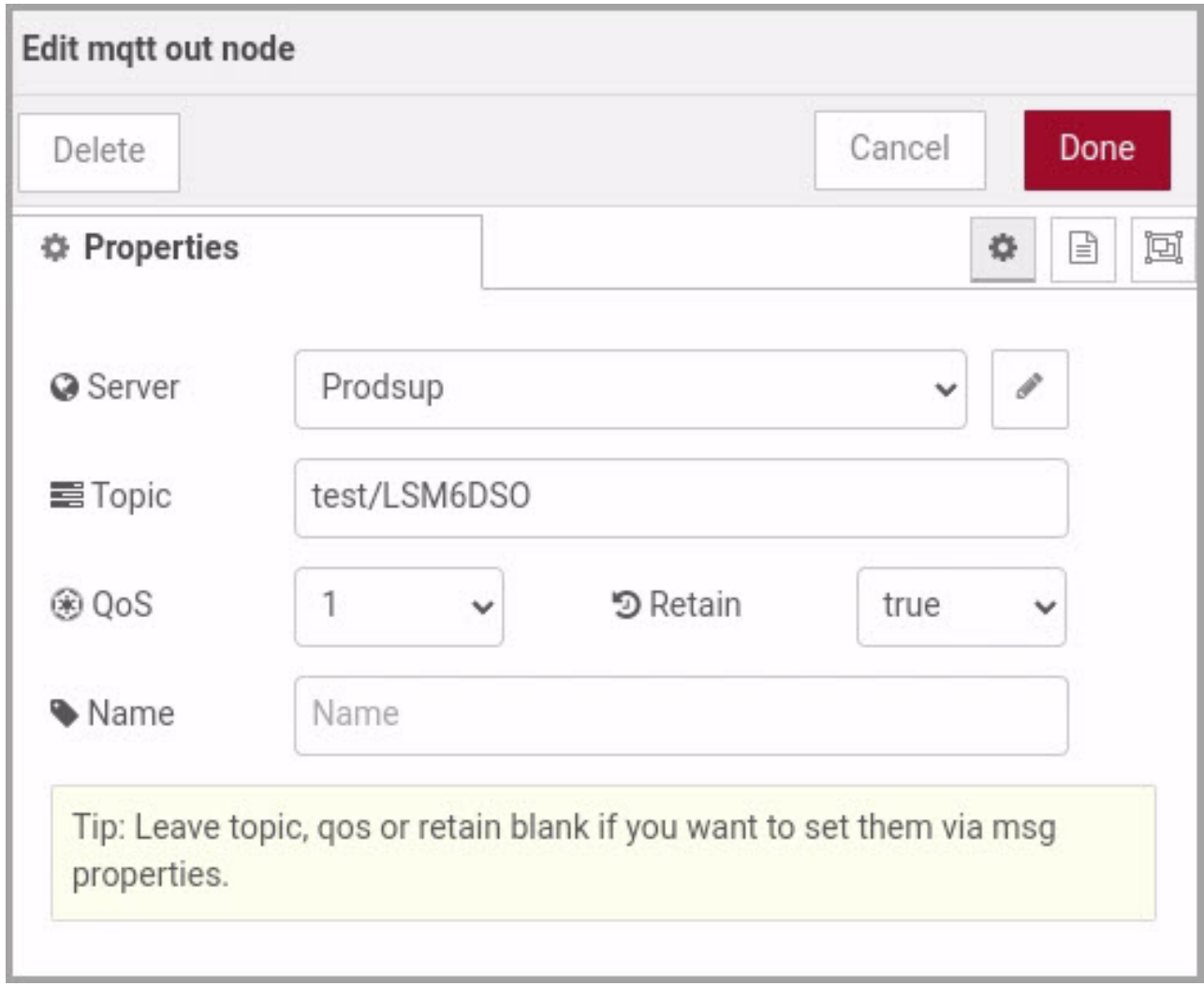
Module 4-1: Mobile sensors

- Use `Node-Red` from a mobile phone.
- Flow
  - `inject`, `exec`, `debug`, `mqtt out`

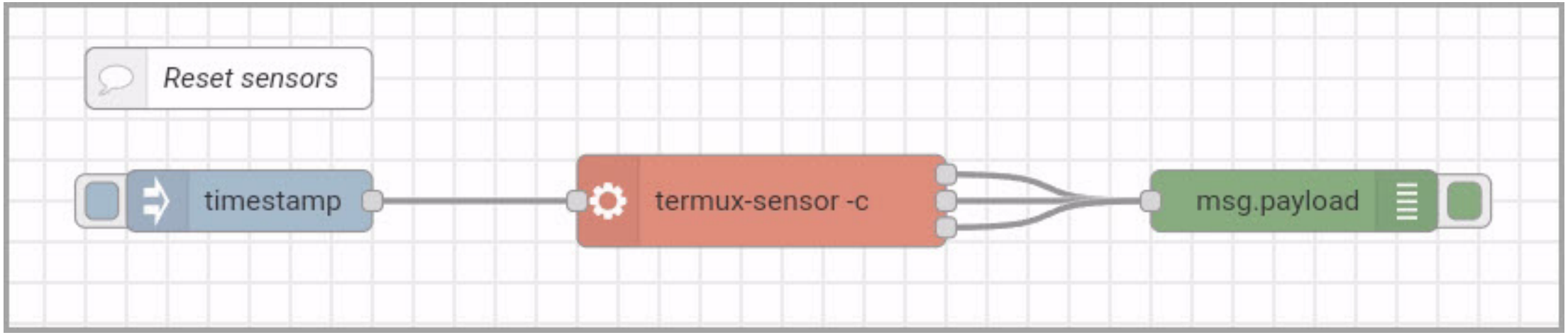
- `exec` node
  - `Command` : `termux-sensor -s LSM6DSO Acceleration Sensor`
    - *Your sensor name will be different.*
  - `Output` : `while the command is running ....`



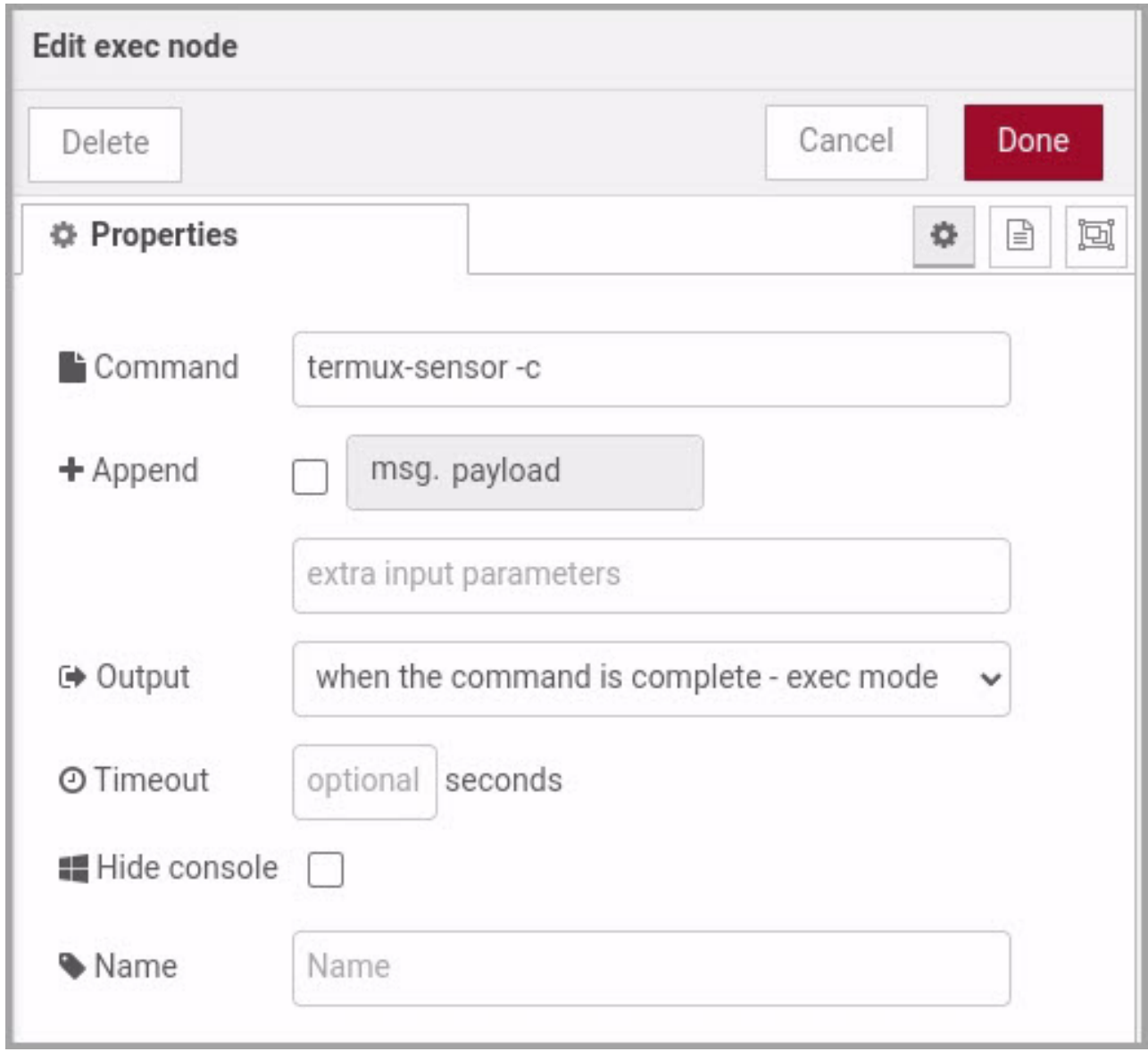
- `mqtt out` node
  - `Server` : Create new server similar to M3-1
  - `Topic` : `test/LSM6DSO`
    - *Your topic will be different.*
  - `QoS` : `1`



- Resetting sensors

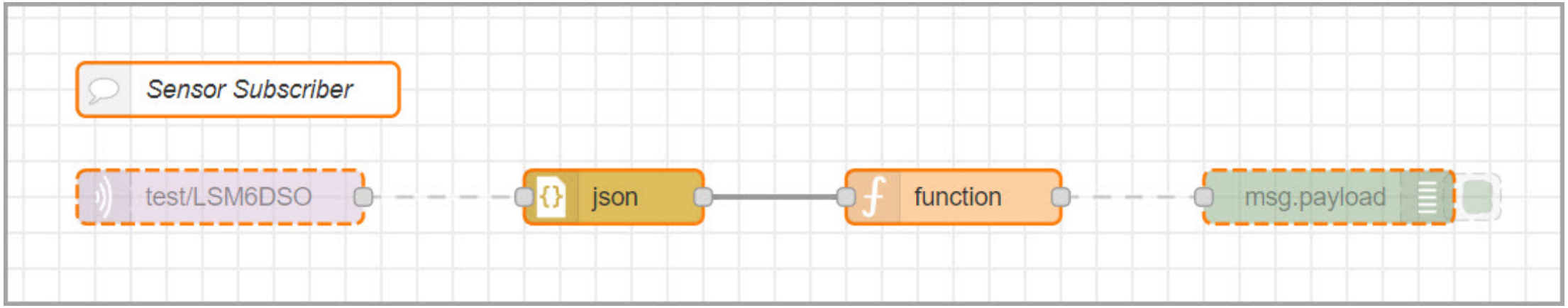


- `exec` node
  - `Command` : `termux-sensor -c`
  - `Output` : `when the command is complete ...`

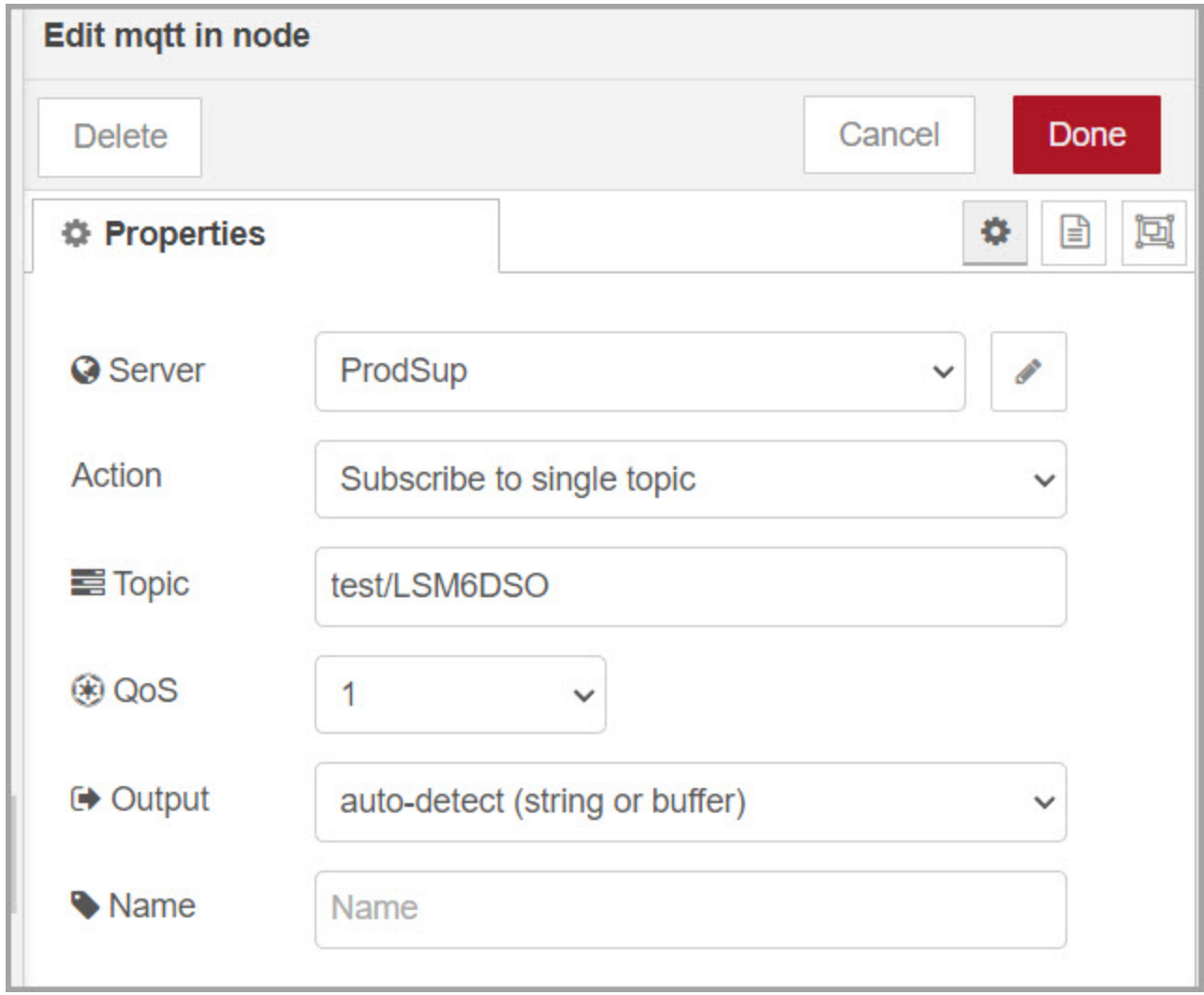


Module 4-2: Sensor Subscriber

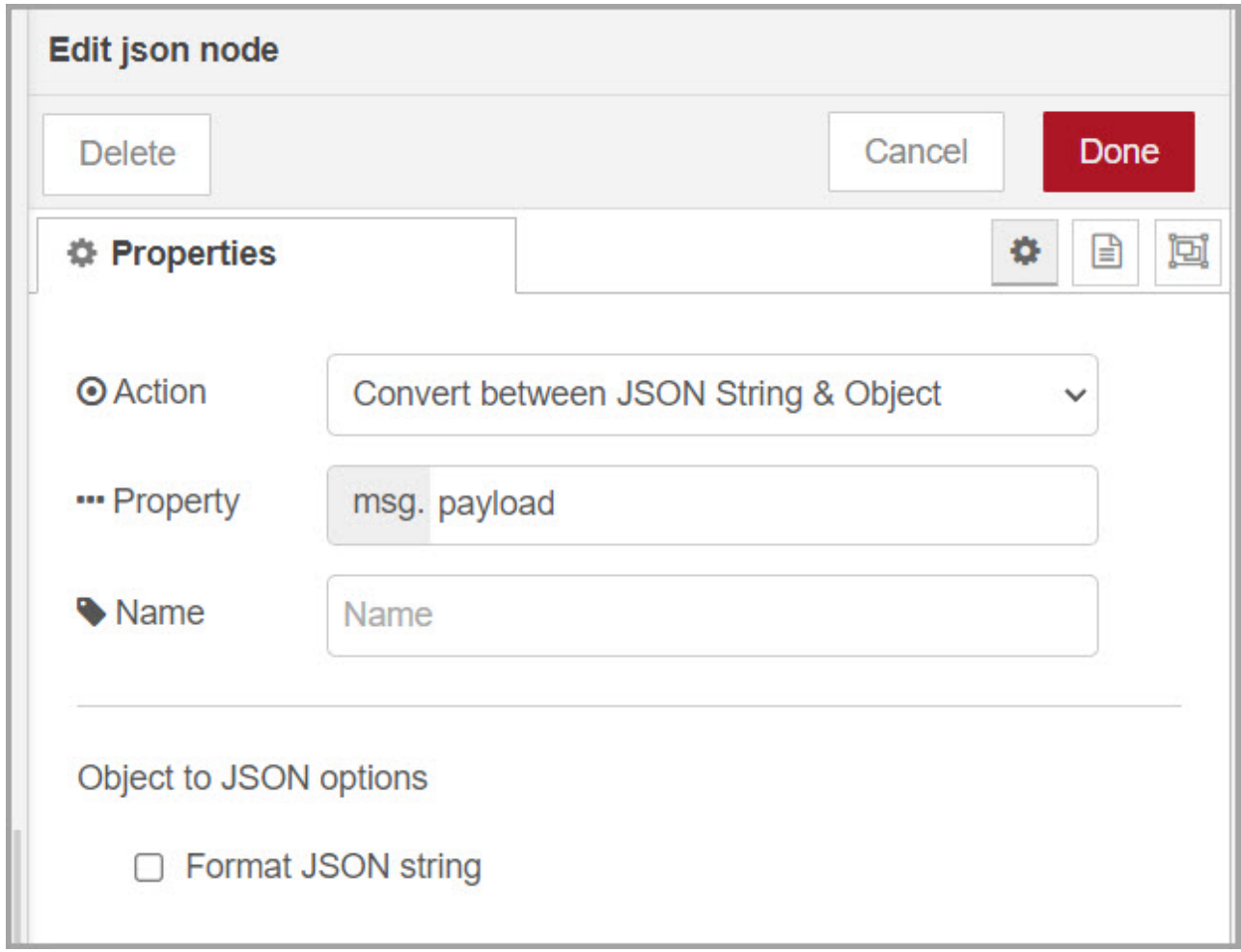
- Use `Node-Red` from your computer
- Flow
  - `mqtt in`, `json`, `function`, `debug`



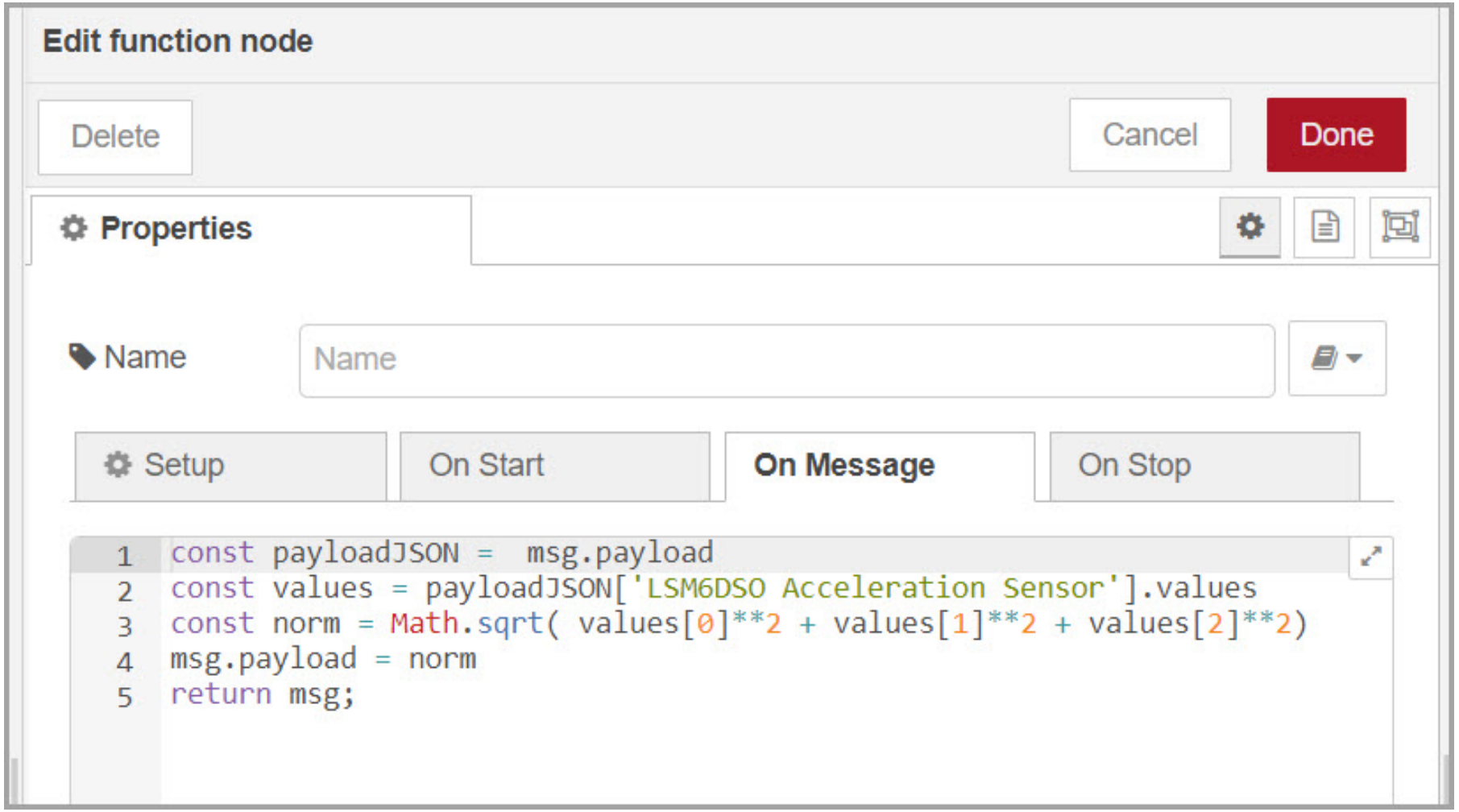
- `mqtt in` node
  - `Topic` : `test/LSM6DSO`
  - `QoS` : `1`



- `json` node
  - No need to adjust anything.



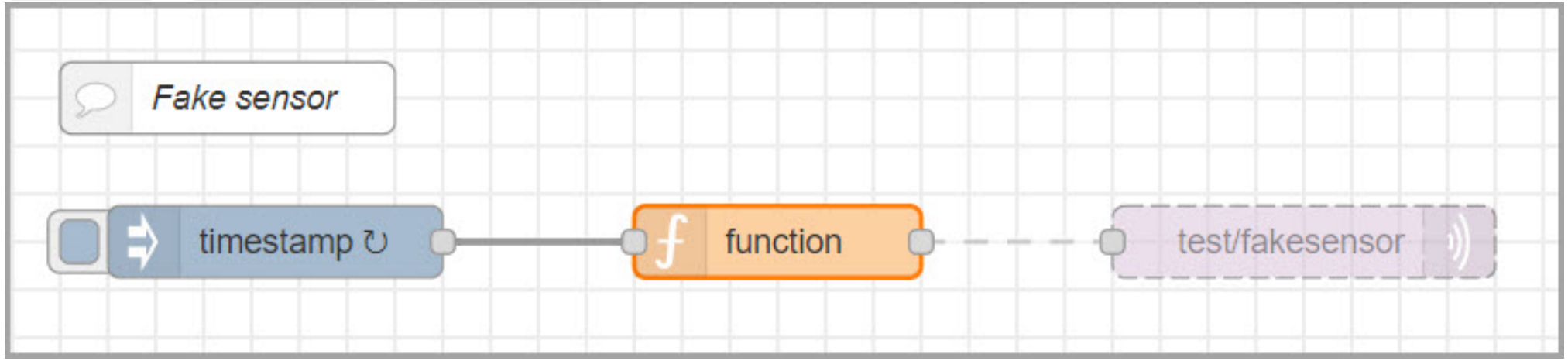
- `function` node (code on the next page)



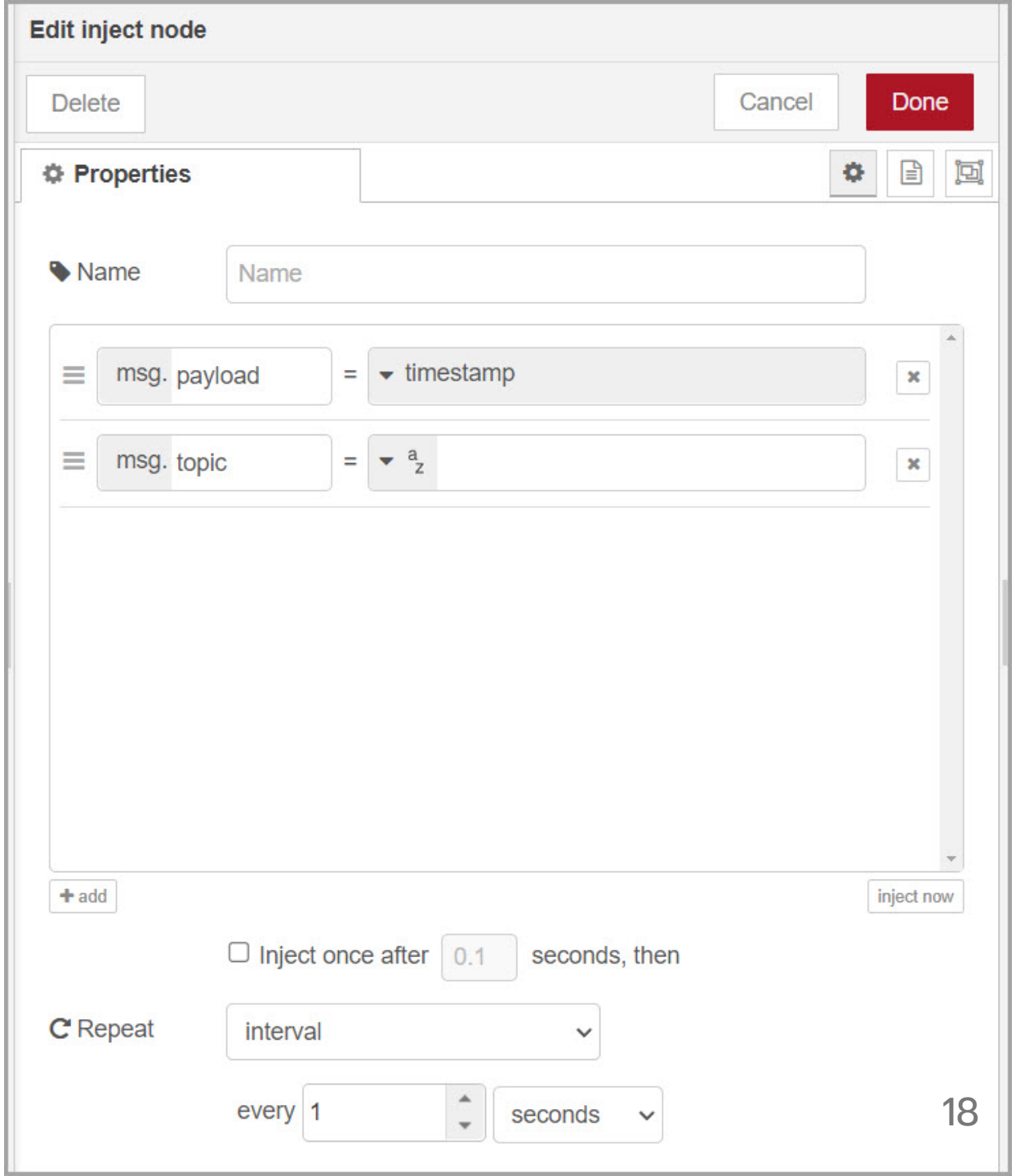
```
const payloadJSON = msg.payload;
const values = payloadJSON['LSM6DSO Acceleration Sensor'].values;
const norm = Math.sqrt(values[0] ** 2 + values[1] ** 2 + values[2] ** 2);
msg.payload = norm;
return msg;
```

Module 4-3: Fake sensors

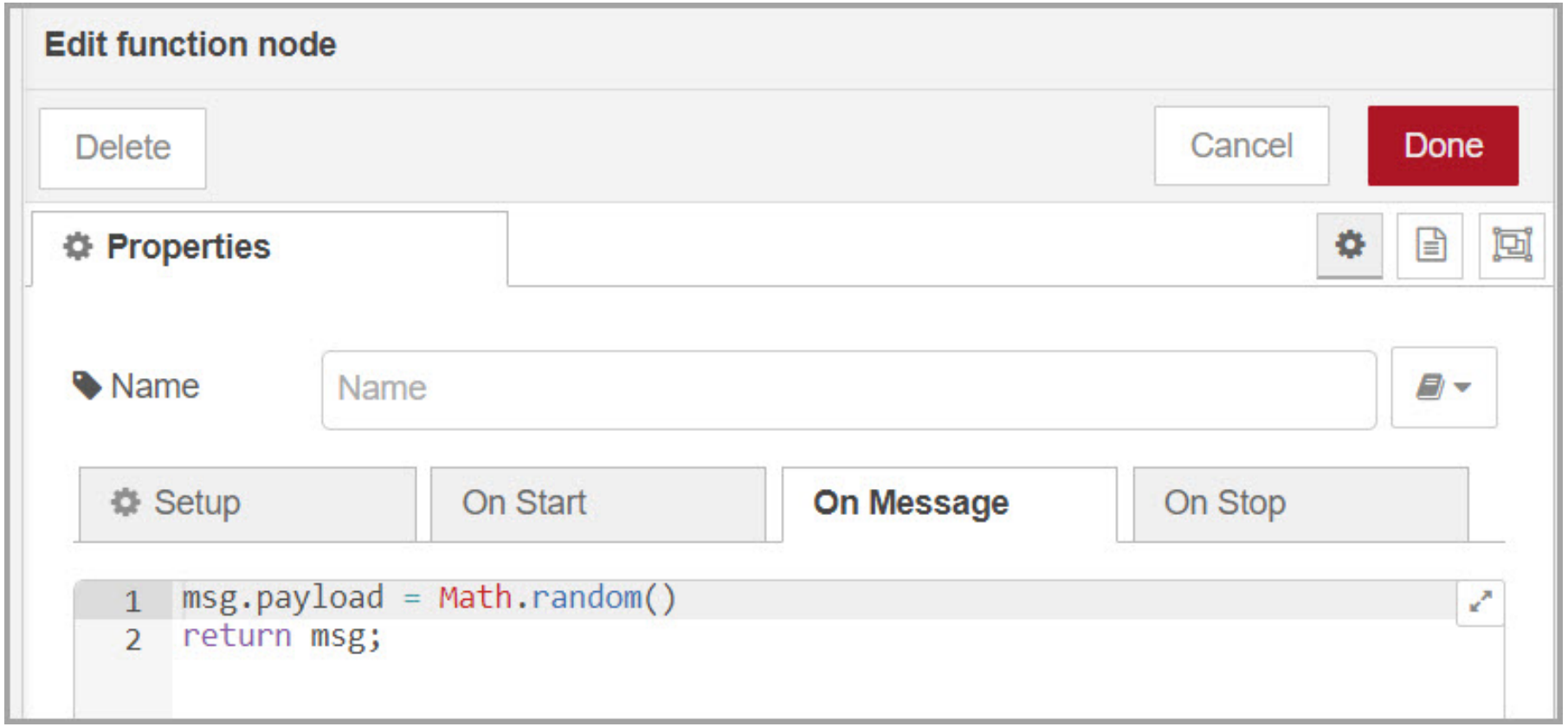
- If you cannot use a mobile phone to send sensor data, you can create a fake sensor data from `Node-Red` in your computer.
- Flow
  - `inject`, `function`, `mqtt out`



- `inject` node
  - `Repeat` : every 1 second

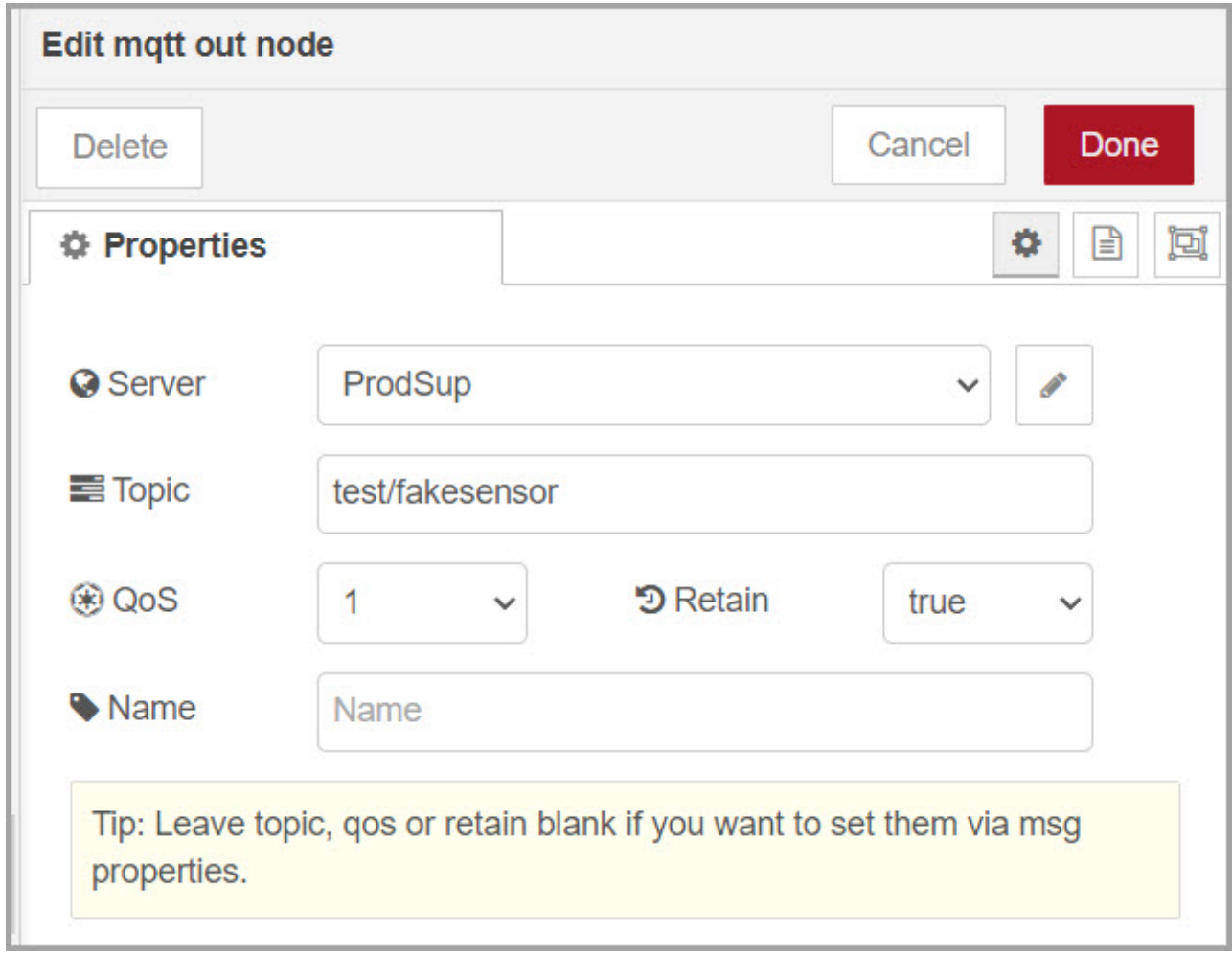


- `function` node

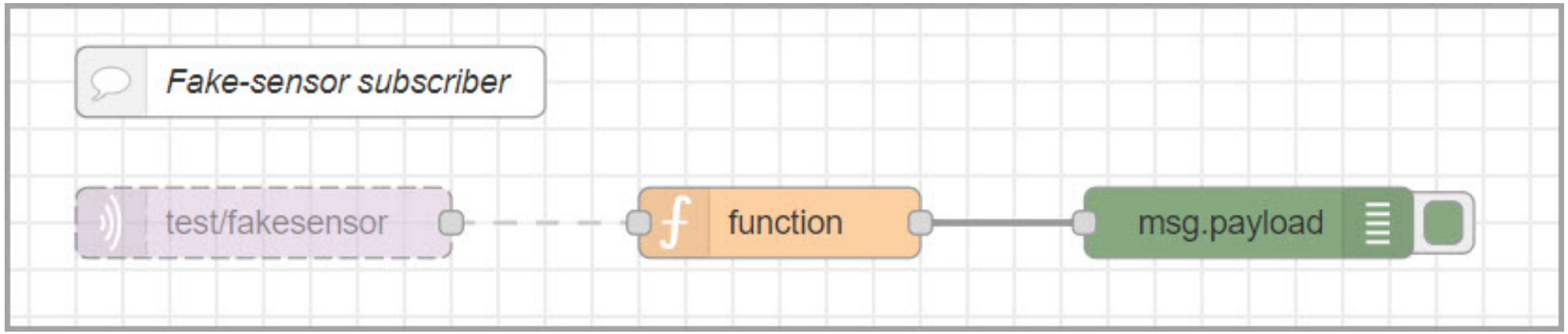


```
msg.payload = Math.random();
return msg;
```

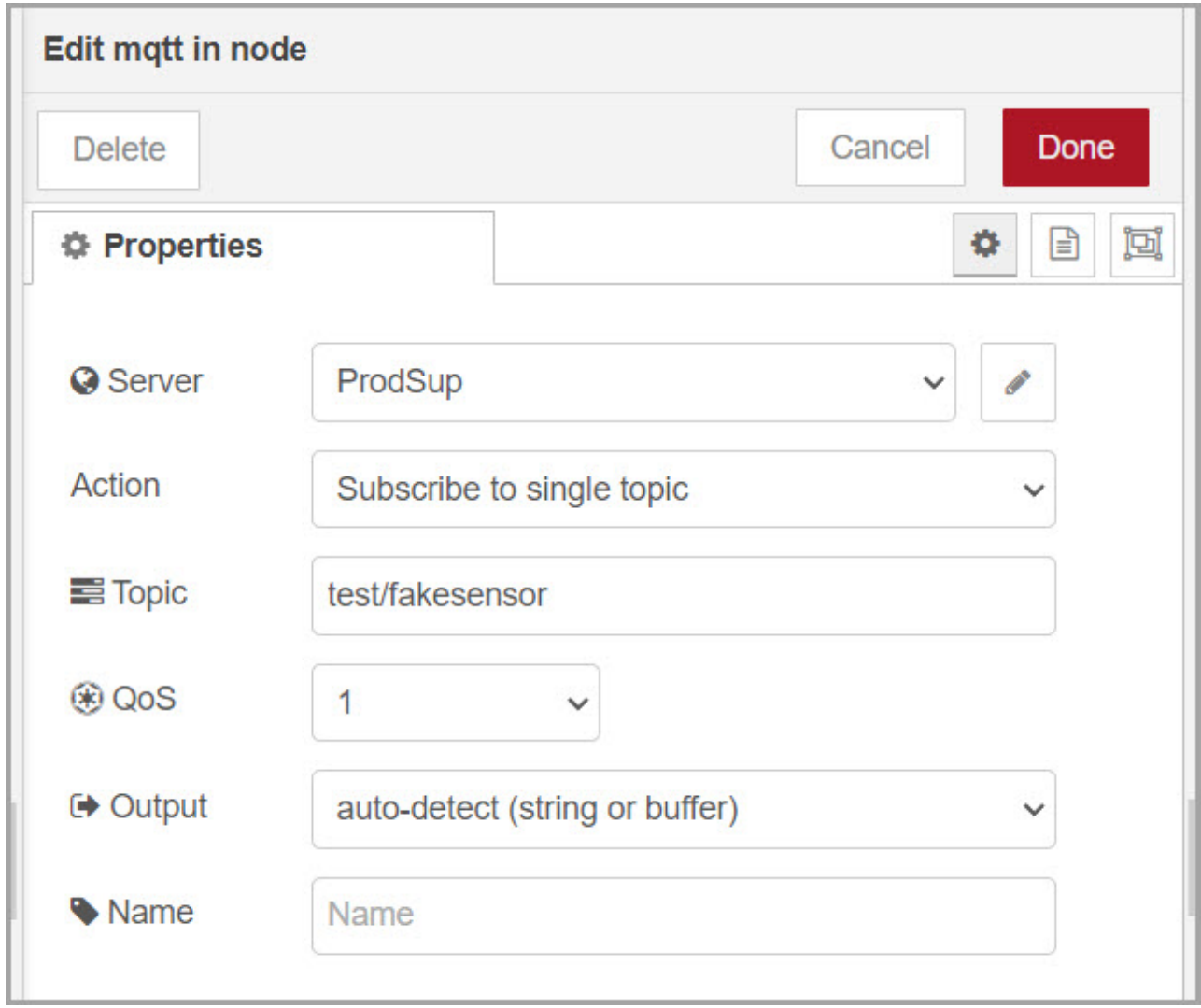
- `mqtt out` node
  - `Topic` : `test/fakesensor`
  - `QoS` : `1`



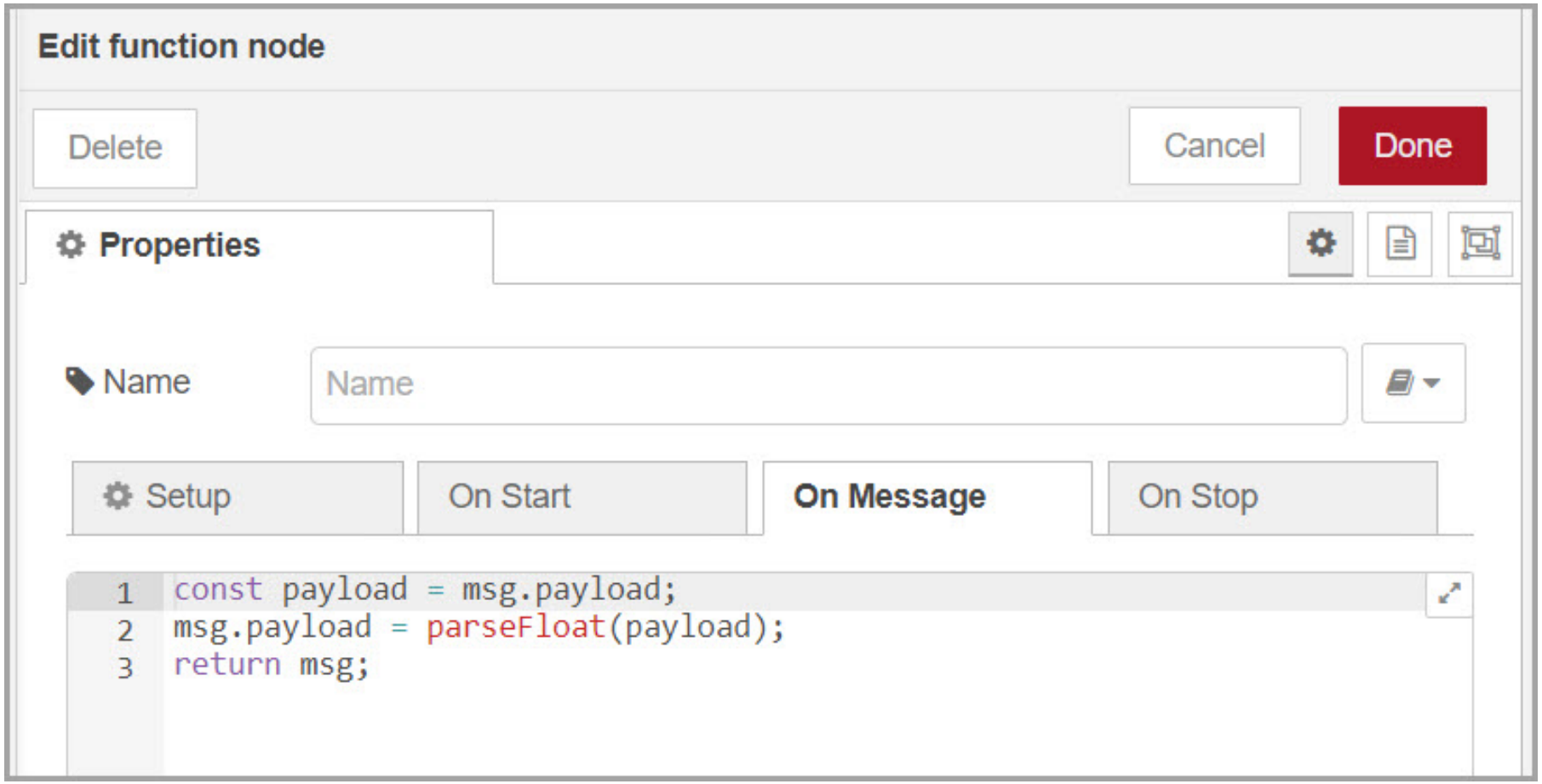
- Lastly, we can listen to the sensors.
- Flow
  - `mqtt in`, `function`, `debug`



- `mqtt in` node
  - `Topic` : `test/fakesensor`
  - `QoS` : `1`



- `function` node



```
const payload = msg.payload;
msg.payload = parseFloat(payload);
return msg;
```