Integration with a ZigBee protocol

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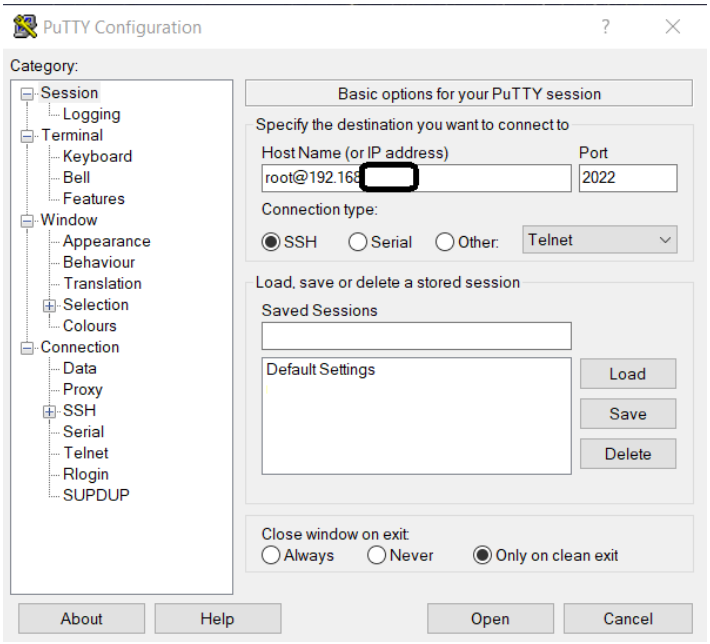
Introduction

Integration of devices that support the ZigBee protocol with the Ampio system is possible, for example, by connecting a gateway to the M-SERV-s module. Using Node-RED is a prerequisite to establishing a connection. This guide presents the example of ZBDongle-E from Sonoff with a dedicated antena as a gateway.

Gateway connection

In order to connect the gateway, disconnect M-SERV-s from its power supply, connect the gateway device and power up the server again. After a couple of minutes, activate an SSH connection via a www interface (more guidelines available in M-SERV server configuration). Log in onto the *root* account on the server with the password you have created e.g. through the *putty* application.



Searching for the gateway port

After entering the password, search for devices with the following command:

```
dmesg | grep tty
```

The gateway will most probably be added as *ttyACM0*.

Configuration for server images from version number 400 onwards

Installation

Enter read and write mode

```
/opt/ampio/bin/rw
```

go to the folder where you can make changes

```
cd /root
```

update the list of available packages

```
sudo apt-get update
```

install the pnpm package

```
npm install -g pnpm@10.4.1
```

install git

```
sudo apt install git
```

create a folder

```
sudo mkdir /root/zigbee2mqtt
```

change folder permissions

```
sudo chown -R root:root /root/zigbee2mqtt
```

clone the zigbee2mqtt repository

```
git clone --depth 1 https://github.com/Koenkk/zigbee2mqtt.git /root/zigbee2mqtt
```

go to the folder

```
cd /root/zigbee2mqtt
```

install dedicated dependencies

```
pnpm i --frozen-lockfile
```

start building the package

```
pnpm run build
```

copy the contents of the example into your configuration file

```
cp /root/zigbee2mqtt/data/configuration.example.yaml /root/zigbee2mqtt/data/configuration.yaml
```

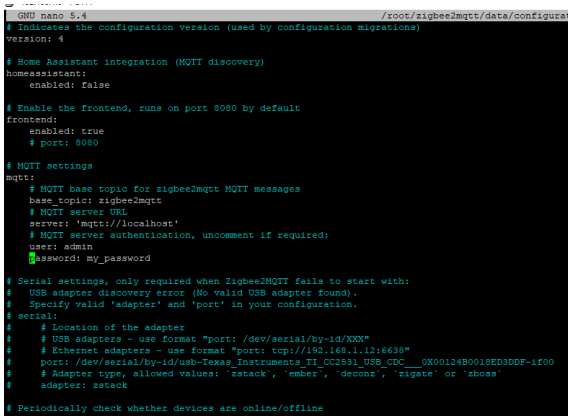
Modifying the configuration file

Open the file for editing

```
nano /root/zigbee2mqtt/data/configuration.yaml
```

Set the *server* field to *mqtt://localhost*.

MQTT connection fields according to your server settings, *user* is usually *admin* and the relevant password (login details as for the *mqtt* blocks in Node-RED). Remember to remove the # character indicating a line comment.



After the change, save and close the configuration file. In putty this is done via *Ctrl+x*, then *y* and *Enter*.

First run

Type the command

```
pnpm start
```

Configuration for images older than 400

Creating and configuring a folder

Create a folder:

```
sudo mkdir /ampio/rw/zigbee2mqtt
```

Grant permissions:

```
sudo chown -R ${USER}: /ampio/rw/zigbee2mqtt
```

Cloning of the zigbee2mqtt repository

```
git clone --depth 1 https://github.com/Koenkk/zigbee2mqtt.git /ampio/rw/zigbee2mqtt
```

Installing content

Change the current folder:

```
cd /ampio/rw/zigbee2mqtt
```

and install:

```
npm ci
```

Modification of the configuration file

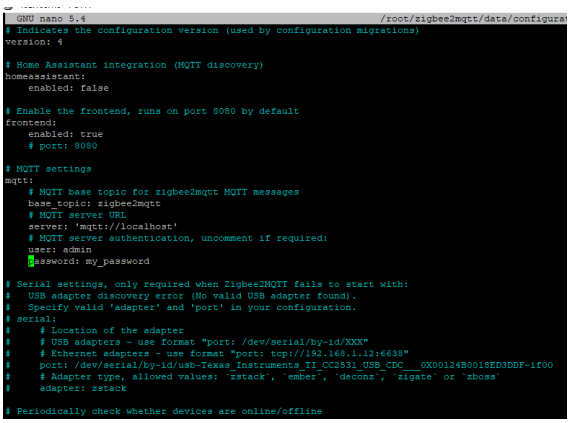
Open the file to be edited

```
nano /ampio/rw/zigbee2mqtt/data/configuration.yaml
```

Set the *server* field to *mqtt://localhost*.

The *port* field should be completed with information obtained in the previous step e.g., */dev/ttyACM0*.

MQTT connection field should be filled with your server settings, *user* set to *admin* and the correct password should be provided (login details are the same as for the *mqtt* blocks in Node-RED).



Once the changes are introduced, close the configuration file. You can do that in putty by clicking *Ctrl+x*, then *y* and *Enter* at the end.

First launch

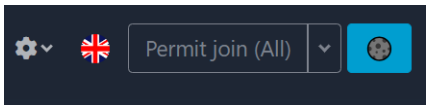
Enter the following command:

```
npm start
```

Adding a slave device

The device added in this guide is the SNZB-02 temperature and humidity sensor from Sonoff. Instructions for the devices are available on the respective manufacturers' websites. For the sensor described, the button on its case must be held down for 5 seconds to add it.

The Zigbee interface is available in the browser at IP_SERVER:8080 (e.g. 192.168.1.6:8080). Once in the interface, you can manually add further devices via the *Permit join* option.

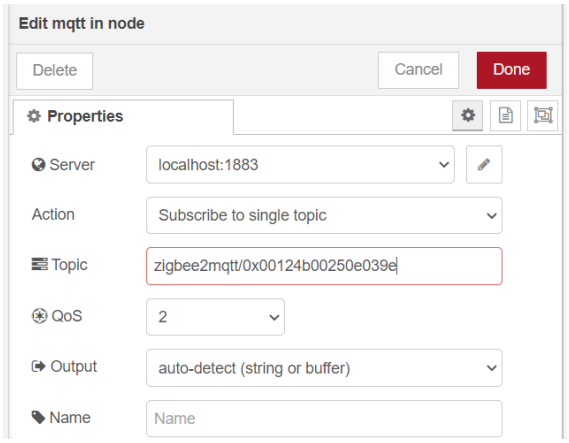


Once correctly added, the slave device will appear in the list.

At the end of the set-up, the addition of everything can still be stopped prematurely.

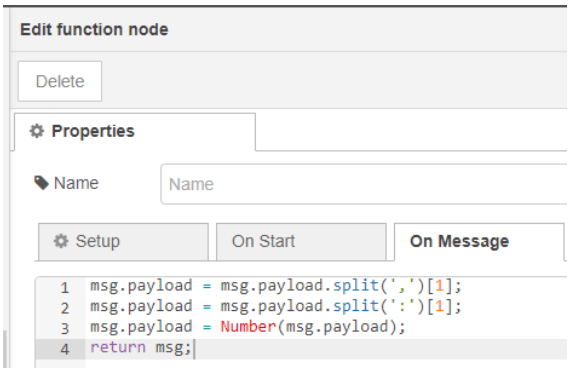
Configuration in Node-RED

A guide that describes the basics of Node-RED use in the Ampio system is available here: Integration of the Ampio system with Node-RED. After adding secondary devices, data from the MQTT Ampio can be received. Topic on which the device is broadcasting can be viewed in a terminal via an SSH connection. In this case, it is the main topic and ID of the added device: *zigbee2mqtt/0x00124b00250e039e*.



Data can be viewed after adding a *debug* node.

If you want to for example, read the value of humidity from a sensor, you will need to send the following information through the node *function*:



Different end devices can broadcast information in different ways, which is why it is worthwhile to view the data first in the *debug* window, before creating a function to send the information.

Automatic launching

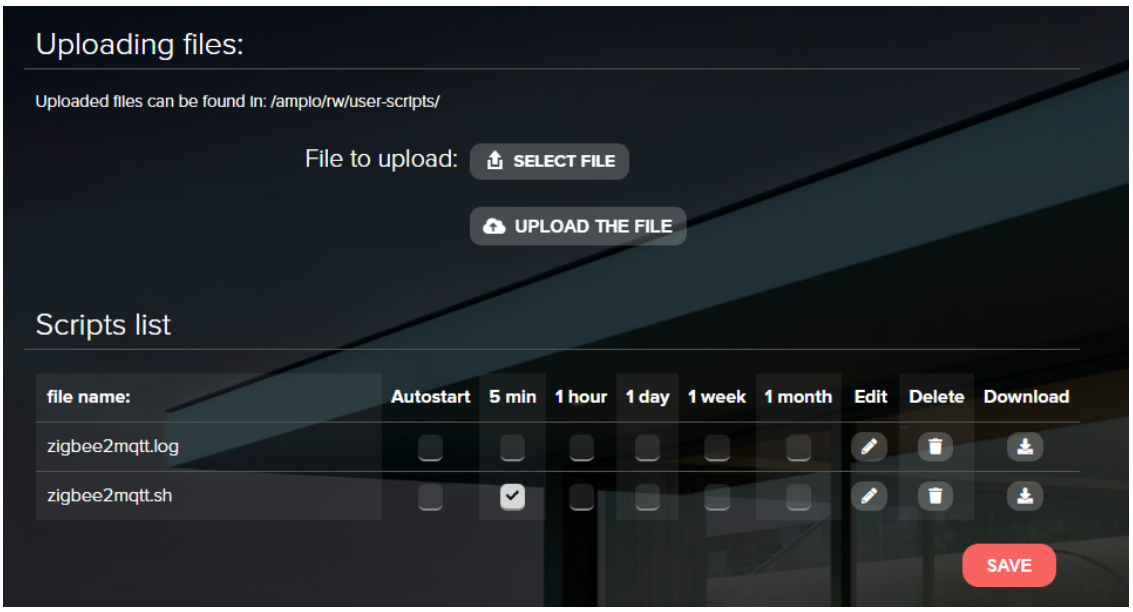
for server images from version number 400 onwards

Log in again via SSH, being in the root folder download and run the script with the command:

```
curl https://dist.ampio.pl/scripts/zigbee2mqtt400.sh | bash -s
```

for older images

For the application to launch automatically after a power supply reboot, a suitable script must be written. Open the *SYSTEM* tab in the www interface of M-SERV and go to *SCRIPTS*. Download the attached file *zigbee2mqtt.sh*. Upload it by clicking on *SELECT FILE*, and then *UPLOAD THE FILE*. Then, tick the *5 min* box next to the correct script and click *SAVE*.



Performance test

In order to confirm the correctness of configuration, reboot the server's power supply and, after a couple of minutes, check whether everything is working as intended in Node-RED, in the *debug* window, for instance.

If you went into *rw* mode during the configuration, at the end you should put the server back into read-only mode during the SSH connection:

```
/opt/ampio/bin/ro
```

Download file:

- zigbee2mqtt.sh