

Setting up NanodeRF to send to emoncms.

1. To emoncms.org

a. Register at emoncms.org and obtain an APIkey. Use the "NanodeRF_multinode" sketch. Put it in here in the Nanode sketch:

```
// 3) Set to your account write apikey
char apikey[] = "YOURAPIKEY";
```

b. Invent a MAC address for your NanodeRF. It must be unique within your LAN. Put it in here in the Nanode sketch:

```
// ethernet interface mac address, must be unique on the LAN
static byte mymac[] = { 0x42,0x31,0x42,0x21,0x30,0x31 };
```

c. Check these values in the NanodeRF:

```
// 1) Set this to the domain name of your hosted emoncms - leave blank if posting to
IP address
char website[] PROGMEM = "emoncms.org";
```

```
// or if your posting to a static IP server:
static byte hisip[] = { 192,168,1,10 };
```

```
// change to true if you would like the sketch to use hisip
boolean use_hisip = false;
```

```
// 2) If your emoncms install is in a subdirectory add details here i.e "/emoncms3"
char basedir[] = "";
```

d. Plug in an Ethernet cable to your router, compile and upload the sketch. On the serial port you should see (with possibly a few long waits in between while it times out and retries):

```
[webClient]
```

```
~ wait ~
```

```
DHCP status: 0
```

```
DHCP failed
```

```
Data sent: /api/post.json?
```

```
apikey=39623397b3126c1afc2ddf1ea98bc5a2&json={rf_fail:1}
```

```
Time request sent
```

```
~ wait ~
```

```
DHCP status: 1
```

```
IP: 192.168.1.64
```

```
GW: 192.168.1.254
```

```
DNS: 8.8.8.8
```

```
DNS status: 1
```

```
SRV: 213.138.101.177
```

```
Data sent: /api/post.json?
```

```
apikey=39623397b3126c1afc2ddf1ea98bc5a2&node=10&csv=0,31,3,36,0,28
```

```
Time request sent
```

```
Time: t15,53,13
```

```
Data sent: /api/post.json?
```

apikey=39623397b3126c1afc2ddf1ea98bc5a2&node=10&csv=0,32,0,39,0,31
OK recieved
Data sent: /api/post.json?
apikey=39623397b3126c1afc2ddf1ea98bc5a2&node=10&csv=-1,29,1,24,0,34
OK recieved
Data sent: /api/post.json?
apikey=39623397b3126c1afc2ddf1ea98bc5a2&node=10&csv=2,30,0,39,1,35
OK recieved
Data sent: /api/post.json?
apikey=39623397b3126c1afc2ddf1ea98bc5a2&node=10&csv=0,34,0,23,1,34
OK received

[etc]

Explanation:

First, the NanodeRF requests an IP address from your router. If successful "DHCP status: 1", it gets one "IP: 192.168.1.64" which will depend on what your router allocated. "GW: 192.168.1.254" will also depend on your router's settings. "DNS: 8.8.8.8" meant it went to Google's Domain Name Service to get the IP address of emoncms.org, it was successful "DNS status: 1" and the IP address it got back was "SRV: 213.138.101.177"

Then, when you look at Inputs at emoncms.org, you should have and be able to click on Node 10 and it will expand to show four inputs named 1-4 (depending on the sketch you're using in the emonTx), and if you click [log] you'll see a graph of the data.

It also got back from the server the current time: "Time: t15,53,13".

2. To a local server:

The server can be WAMP, LAMP or MAMP. Install it according to the provider's instructions, and any special notes here [link to emcms installation].

To set up emoncms, you must inhabit two worlds – the website and the host machine's world, and you must be clear in your mind which one you are operating in.

Fire up your browser and go to "localhost". You are on a website now. You should see the Wamp home page and phpmyadmin, which is under "Tools". Run phpmyadmin (click it). Click "Databases" in the top banner. In the next screen, think of a name for your database (I used "emondata" – make a note of what you call it) and put that in appropriate box and click "Create".

Then set emoncms up as a user: click on Privileges in the top banner, click on Add a new user, then invent a User name for it, enter "localhost" as the host, and give it a password then click Create the user. Note the user name & password. When it returns to the previous screen, you need to give the new user ALL PRIVILEGES in the database you just created. So click Edit privileges against the new user's name, scroll down to "Database-specific privileges" and select the database from the drop-down list. On the next screen click Check all, then Go to apply them.

Move into the machine's world and copy emoncms into a directory where it will appear in Localhost (Wampserver calls it the "www directory")

When you've copied emoncms in the machine's world, you'll find you have (in the website world) on your Wamp home page (localhost) a website called something like

openenergymonitor-emoncms3. It's that which you click on to run emoncms (but don't do that yet).

N.B. Remember to put your server "online".

Next tell emoncms how to log in to the database. In the machine's world, in that directory: Do this by creating settings.php: copy default.settings.php and rename to settings.php. Edit it and set the \$username, \$password, \$server and \$database to the values you set in phpmyadmin (\$server will be "localhost").

In the website world, run emoncms and register yourself as a user and obtain an APIkey (you need not be the user that you set up in phpmyadmin).

Set up the NanodeRF to send the data. Use the 'static IP' sketch:

a. Invent a MAC address for your NanodeRF. It must be unique within your LAN. Put it in here in the Nanode sketch:

```
// ethernet interface mac address, must be unique on the LAN
static byte mymac[] = { 0x42,0x31,0x42,0x21,0x30,0x31 };
```

b. Check your router's admin pages and find the IP address that it has allocated to the machine that your server is running on. Make the router use this IP address always (static) - check the router documentation for how to do this.

Edit the NanodeRF sketch:

c. set website[] to blank as you don't have a domain name (it is not "localhost"):

```
// 1) Set this to the domain name of your hosted emoncms - leave blank if posting to
IP address
char website[] PROGMEM = "";
```

d. Tell the NanodeRF your server's IP address. Enter the IP address you found from your router here:

```
// or if your posting to a static IP server:
static byte hisip[] = { 192,168,1,10 };
```

e. Instruct the Nanode to use it:

```
// change to true if you would like the sketch to use hisip
boolean use_hisip = true;
```

f. Instruct the Nanode to use a static IP for itself too:

```
boolean use_staticIP = true;
```

g. Invent an IP address within the range used by your router, but not used by any device on your local network:

```
static byte myip[] = { 192,168,1,66 };
```

h. Set your router's Gateway address (your router's admin pages will tell you this):

```
static byte gwip[] = { 192,168,1,254 };
```

i. Tell the Nanode the sub-directory where you installed emoncms (this will be the name you clicked on to run it)

```
// 2) If your emoncms install is in a subdirectory add details here i.e "/emoncms3"
char basedir[] = "/emoncms-master";
```

j. Give the Nanode the APIkey:

```
// 3) Set to your account write apikey  
char apikey[] = "YOURAPIKEY";
```

k. Plug in an Ethernet cable to your router, compile and upload the sketch. On the serial port you should see

(with possibly a wait while it times out and retries):

```
[webClient]  
IP: 192.168.1.66  
Gateway: 192.168.1.254  
Server: 192.168.1.69  
Data sent: /emoncms-dev/input/post.json?  
apikey=a8bfc828b48860ca24e23cf824718cc5&json={rf_fail:1}  
OK recieved  
Data sent: /emoncms-dev/input/post.json?  
apikey=a8bfc828b48860ca24e23cf824718cc5&node=10&csv=0,36,2,33,1,36  
OK recieved  
Time request sent  
Time: t16,34,58  
Data sent: /emoncms-dev/input/post.json?  
apikey=a8bfc828b48860ca24e23cf824718cc5&node=10&csv=0,32,0,43,0,37  
OK recieved  
Data sent: /emoncms-dev/input/post.json?  
apikey=a8bfc828b48860ca24e23cf824718cc5&node=10&csv=0,34,0,36,-1,31  
OK received
```

[etc]

Explanation:

IP: 192.168.1.66

This is the content of myip[] It will appear in your Router's list against the MAC that you allocated to the NanodeRF

Gateway: 192.168.1.254

The Gateway address of your router - will depend on your router's settings.

Server: 192.168.1.69

The IP address of your server (or the machine that the server is running on, as allocated by your router)

```
Data sent: /emoncms-dev/input/post.json?  
apikey=a8bfc828b48860ca24e23cf824718cc5&json={rf_fail:1}  
OK received
```

The data sent by the NanodeRF, and an acknowledgement by emoncms.

Then, when you look at Inputs at emoncms.org, you should have and be able to click on Node 10 and it will expand to show four inputs named 1-4 (depending on the sketch you're using in the emonTx), and if you click [log] you'll see a graph of

the data.

It also gets back from the server the present time: "Time: t15,53,13".