

# BelgianSmartMeter2Domoticz



# Goal

- Integrate Belgian Sagemcom S211 smart meter in domoticz
- Understand P1 port
- Limited budget
  - Hardware cost only
  - No subscription cost

# Credits

Code from: <https://github.com/jantenhove/P1-Meter-ESP8266>

Instructions from:

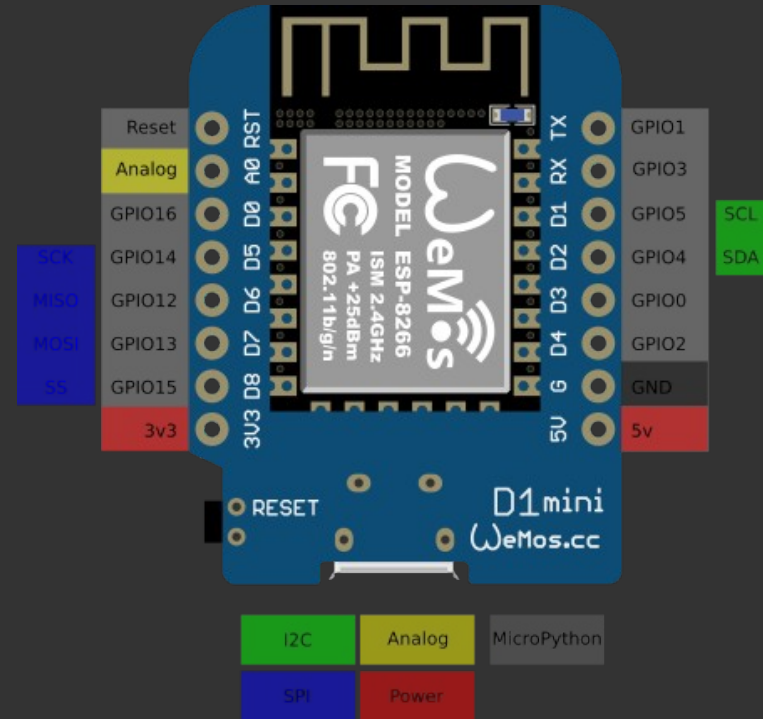
<http://domoticx.com/p1-poort-slimme-meter-data-naar-domoticz-esp8266/>

<https://www.fluvius.be/sites/fluvius/files/2020-01/dmk-demo-v2.1-rtc.pdf>

# Hardware

## LOLIN Wemos D1 Mini

- 5V
- Wireless
- ESP8266 architecture
- Cheap



# Get up and running 1 of 2

- Download & install arduino IDE  
<https://www.arduino.cc/en/main/software>
- Add ESP8266 boards support to Arduino IDE
  - File > Preferences > Additional Boards Manager URL:  
[http://arduino.esp8266.com/stable/package\\_esp8266com\\_index.json](http://arduino.esp8266.com/stable/package_esp8266com_index.json)
  - Tools > Boards > Boards Manager:  
install ESP8266 boards
- Install the ESP8266 SoftSerial library from Arduino IDE
  - Sketch > Include Library > Manage Libraries  
*I installed AltSoftSerial library from Paul Stoffregen*
- Add CRC16.h to a new folder you call CRC16 in your Arduino/Libraries folder.  
E.g. for Linux in `/home/yourusername/Arduino/libraries/CRC16/CRC16.h`
- Add `BelgianSmartMeterToDomoticz.ino` to `arduino/BelgianSmartMeterToDomoticz/` folder

# Get up and running 2 of 2

- Configure the sketch to connect to your network

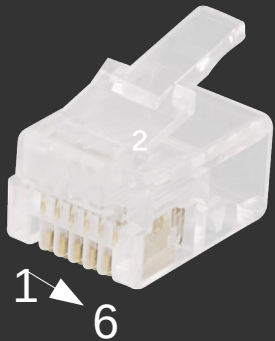
```
//===Change values from here===  
  
const char* ssid = "MyWirelessAccessPoint";  
const char* password = "MyWirelessPassWord";  
const char* hostName = "Smart_Meter";  
const char* domoticzIP = "192.168.1.4";  
const int domoticzPort = 8080;  
const int domoticzGasIdx = 181;  
const int domoticzEnergyIdx = 183;  
const bool outputOnSerial = true;  
//===Change values to here===
```

# Testing the setup > Serial monitor

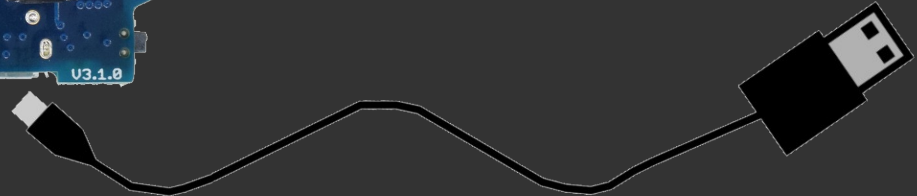
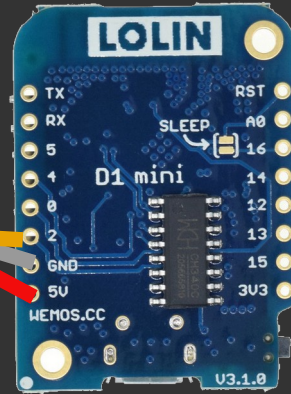


I think if you would power the D1 Mini from both the GPIO pins and through USB, you would see magic smoke.

If you want to see serial monitor output whilst testing, I advise creating a second RJ11/12 cable



- 1. Not Connected
- 2. 5V\*\*
- 3. Ground\*\*
- 4. Not Connected
- 5. RxD\*
- 6. Not Connected



# Example Serial console output

```
/FLU5\632470339_T  
0-0:96.1.4(50213)  
0-0:96.1.1(3153414731313030303838303136)  
0-0:1.0.0(200912060615S)  
1-0:1.8.1(001210.105*kWh)  
1-0:1.8.2(002703.013*kWh)  
1-0:2.8.1(001750.611*kWh)  
1-0:2.8.2(000507.828*kWh)  
0-0:96.14.0(0002)  
1-0:1.7.0(01.850*kW)  
1-0:2.7.0(00.000*kW)  
1-0:32.7.0(232.3*V)  
1-0:31.7.0(008*A)  
0-0:96.3.10(1)  
0-0:17.0.0(999.9*kW)  
1-0:31.4.0(999*A)  
0-0:96.13.0()  
0-1:24.1.0(003)  
0-1:96.1.1(37464C4F32313139313134373932)  
0-1:24.4.0(1)  
0-1:24.2.3(200912060501S)(00866.794*m3)  
!8CA4
```

VALID CRC FOUND!

```
[HTTP] GET... URL: http://192.168.1.4:8080/json.htm?type=command&param=udevice&idx=183&nvalue=0&svalue=1210105;2703013;1750611;507828;1850;0  
[HTTP] GET... code: 200
```



# Example Serial console output

```
/FLU5\632470339_T  
0-0:96.1.4(50213)  
0-0:96.1.1(3153414731313030303838303136)  
0-0:1.0.0(200912060615S)  
1-0:1.8.1(001210.105*kWh)  
1-0:1.8.2(002703.013*kWh)  
1-0:2.8.1(001750.611*kWh)  
1-0:2.8.2(000507.828*kWh)  
0-0:96.14.0(0002)  
1-0:1.7.0(01.850*kW)  
1-0:2.7.0(00.000*kW)  
1-0:32.7.0(232.3*V)  
1-0:31.7.0(008*A)  
0-0:96.3.10(1)  
0-0:17.0.0(999.9*kW)  
1-0:31.4.0(999*A)  
0-0:96.13.0()  
0-1:24.1.0(003)  
0-1:96.1.1(37464C4F32313139313134373932)  
0-1:24.4.0(1)  
0-1:24.2.3(200912060501S)(00866.794*m3)  
!8CA4
```

Example telegram

Always starts with a /

Always ends with line starting with !

Cyclic redundancy check done on the message

Not all information sent to Domoticz

VALID CRC FOUND!

[HTTP] GET... URL: http://192.168.1.4:8080/json.htm?type=command&param=udevice&idx=183&nvalue=0&svalue=1210105;2703013;1750611;507828;1850;0

[HTTP] GET... code: 200

# Message labels and values

## Opbouw van het telegram (P1): Detail

### Versie informatie

Verwijzing naar de standaard

Let op: in NL een andere identificatiecode

### Serienummer (E)

ASCII gecodeerd

### Interne tijd (E)

Gecodeerd volgens YY/MM/DD/HH/MM/SS

S = zomertijd, W = wintertijd

### Ogenblikkelijke spanning / Fase (E)

32.7.0 = fase 1

52.7.0 = fase 2

72.7.0 = fase 3

Let op: bij monofasige meter enkel 32.7.0

### Ogenblikkelijke stroom / Fase (E)

31.7.0 = fase 1

51.7.0 = fase 2

71.7.0 = fase 3

Let op: bij monofasige meter enkel 31.7.0

### Vrij tekstveld

Mogelijk om tekst te versturen vanuit fluvius (toekomstig gebruik)

/FLU5\253769484\_A

```
0-0:96.1.4(50213)|
0-0:96.1.1(3153414733313030303132373532)
0-0:1.0.0(191001090345S)
1-0:1.8.1(000003.806*kWh)
1-0:1.8.2(000005.918*kWh)
1-0:2.8.1(000000.000*kWh)
1-0:2.8.2(000000.207*kWh)
0-0:96.14.0(0001)
1-0:1.7.0(00.000*kW)
1-0:2.7.0(00.000*kW)
1-0:32.7.0(233.0*V)
1-0:52.7.0(230.7*V)
1-0:72.7.0(233.2*V)
1-0:31.7.0(000*A)
1-0:51.7.0(000*A)
1-0:71.7.0(000*A)
0-0:96.3.10(1)
0-0:17.0.0(999.9*kW)
1-0:31.4.0(999*A)
0-0:96.13.0()
0-1:24.1.0(003)
0-1:96.1.1(37464C4F32313139303333373432)
0-1:24.4.0(1)
0-1:24.2.3(191001090338S)(00000.000*m3)
!4801
```



### Tellerstanden (E)

1.8.1 = Afname in dagtarief

1.8.2 = Afname in nachttarief

2.8.1 = Injectie in dagtarief

2.8.2 = Injectie in nachttarief

### Tarief indicator (E)

Welk tarief is momenteel van toepassing

1 = dag, 2 = nacht

Let op: in NL is 1 = nacht, 2 = dag!

### Ogenblikkelijke vermogens (E)

Wat zijn de ogenblikkelijke vermogens gemeten door de meter

1.7.0 = Ogenblikkelijke afname

2.7.0 = Ogenblikkelijke Injectie

### Afsluitstatus (E)

Is de klant aangesloten op het E-net?

1 = Ja; 0 = nee; 2 = klaar voor

herindienststelling (druk op de knop)

### Begrenzer instellingen (E)

Is er een begrenzer actief?

999(,9) = niet actief

Andere waarden = actief met deze waarde

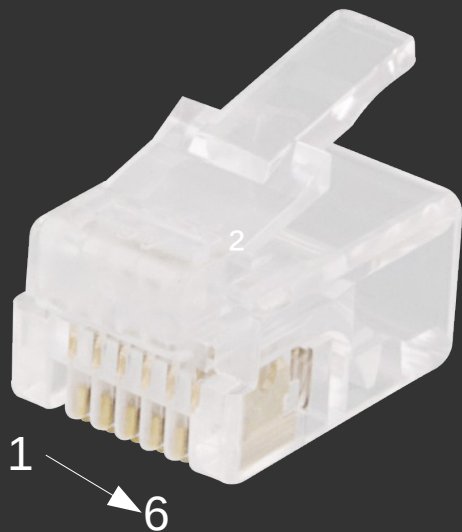
fluvius.

DMK - TTT RTC

23/01/2020 •

# Connecting to the P1 port over RJ12

*Powered over RJ12, not USB*



1. 5V\*\*\*
2. 5V\*\*
3. Ground\*\*
4. Not Connected
5. RxD\*
6. Ground\*\*\*

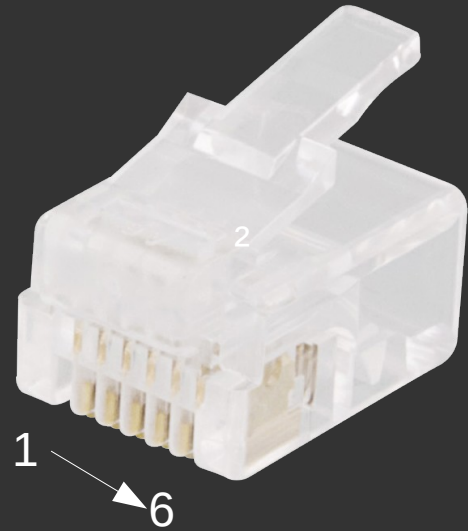
\* I used GPIO 2 on the D1 Mini

\*\* When closing this circuit with 5V, this signals the smart meter to start sending data over the RxD pin

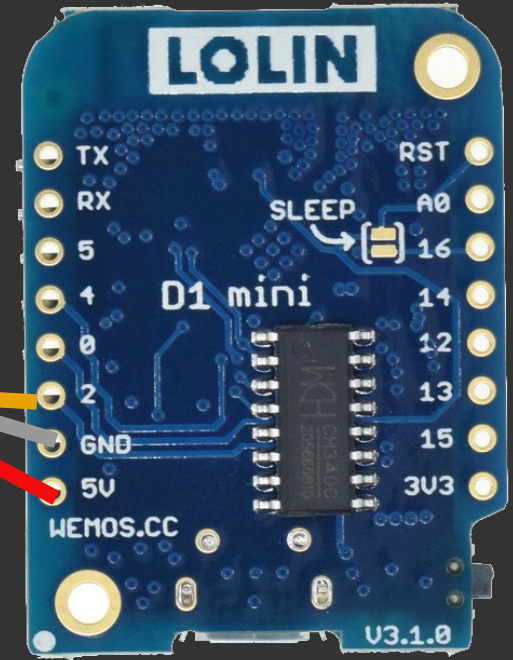
\*\*\* The Fluvius smart meter provides power over these pins, so you don't have to power the D1 Mini over a separate USB/power cable

# Connecting to the P1 port over RJ12

*Powered over RJ12, not USB*



1. 5V\*\*\*
2. 5V\*\*
3. Ground\*\*
4. Not Connected
5. RxD\*
6. Ground\*\*\*



# The arduino code

<https://github.com/Raeymeister/BelgianSmartMeter2Domoticz>

- Based on Jan Ten Hove's Github project
- Altered for belgian implementation of DSMR P1 V5.0.2
  - HI/LO production/consumption identification in the telegram is inverted BE vs NL
  - Gas identification is different BE vs NL
  - MAXLINELENGTH extended

# Conclusion

- €6 to get data from a Fluvius smart meter to Domoticz
- Thanks Jan ten Hove
- Links below
- Let me know what you think