NEUTRON12-3G

1 General

Neutron12-3G is a general purpose pulse counter designed for collecting and reporting pulses from different kind of energy and consumption meters. Pulses are collected on an hourly basis and sent to server once per day.

2 Introduction

The device will be introduced as follows:

1. Disable PIN query from the SIM card for example with cell phone.
2. Open enclosure and insert the SIM card to the device.
3. Connect power supply, measuring device (or devices) and GSM antenna to the device as seen in picture 2.
4. Set power on which PWR LED indicates.
5. Within 15 seconds the device starts to search GSM network. This can be seen in 2G/3G LED as two fast red blinks in interval. With one red blink device indicates 2G network and one green blink 3G network. Signal LED turns to solid green when signal is good enough for transmission.
   If Signal LED is not on or it's blinking try to find a better place for antenna. Device measures GSM signal for five minutes. If a good place for antenna is not found in this time, power off the device and set powers back on. After this procedure the device starts to search network and measure GSM signal again.
6. Send SETTINGS command to the device. After that the device starts to operate. Received command and connection to server is indicated by solid orange Init LED. If Init LED is blinking the command is received but connection to server is not established.
7. The device blinks PWR LED when it receives pulses from measuring device (or devices). Every other turns the LED on and every other off.
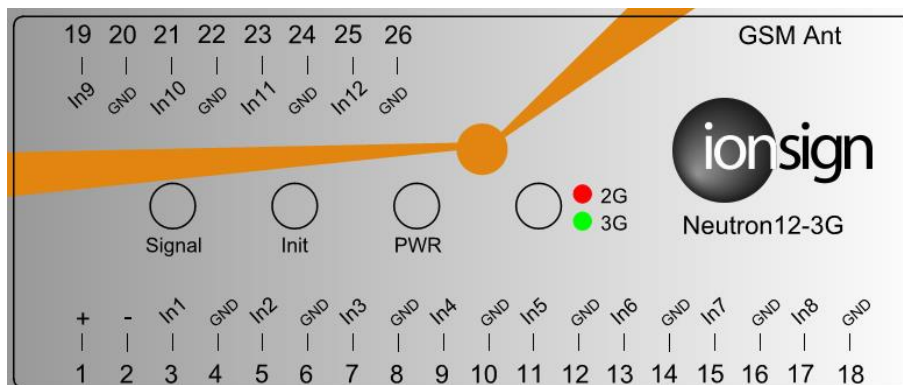
Picture 1: Device front panel.

3 Commands

The device is controlled with text message commands shown below. The device does not send any reply messages. Commands and parameters are separated by one space character.

SETTINGS␣*<Device identifier>*␣*<Server address>*␣*<Server port>*␣*<APN>*␣*<Input count>*␣*<Transmission delay>*␣*<Server path>*

With this command all required settings are given and pulse data counting is started.
Device identifier parameter is determined unique ID for each device. Range is 1-32765.
Server address parameter is determined IP address of the http server. Alternatively a domain name server name can be used. Maximum length is 30 characters.
Server port parameter is determined port number where server application waits for transmissions.
APN parameter is determined APN (Access Point Name) of GPRS/3G connection. Maximum length is 19 characters.
Input count parameter is determined the number of connected meters in device. Range is 1-12.
Transmission delay parameter is determined delay from midnight. This avoids unique devices to send pulse data to server at the same time. Range is 0-1000 minutes. With parameter value 0 the data is sent at midnight 00:00.
Server path parameter is determined path in server where data is saved.

Example command, where device identifier is 101, server address is services.ionsign.fi, server port is 80, APN is internet, input count 12, transmission delay is 1 minute and server path is /neutrondata/.

```
SETTINGS 101 services.ionsign.fi 80 internet 12 1 /neutrondata/
```

INTERVAL␣*<Time>*

With this command the device is set to send pulse data to server with defined interval. Server is defined with settings command.
Time parameter is determined time which triggers the data sending to server. Range is 0 or 60-65535 seconds. With parameter value 0 the data sending by interval is stopped.

SENDNOW
With this command the device sends incomplete pulse data to the server immediately. This command has no parameters.

FACTORY
With this command the device resets all its settings and pulse data. This command has no parameters.

4 Neutron12-3G specifications

- Inputs: 12 pulse inputs for open collector or relay outputs of meters. Open collector or relay output sourcing voltage 12 VDC, maximum sourcing current 5mA.
- Operating voltage: 11…13 VDC.
- Current consumption: 70 mA (peak 250 mA).
- Real-time clock: 4 days backup.
- Size: WxHxD 105 x 90 x 52 mm (6 module wide DIN rail enclosure).
- Protection class: IP20.
- Operating temperature: -25°C...+55°C.
- RH: 5% - 95% non-condensing.
- Data storage capacity: 30 days for each hour for each input channels.
- Data communication: Integrated 3G/GSM/GPRS module. Conforming the following directives and standards:

    - R&TTE Directive 1999/5/EC (Radio Equipment & Telecommunications terminal Equipments)
    - Low Voltage Directive 73/23/EEC and product safety Directive 89/336/EEC for conformity for EMC
    - GSM (Radio Spectrum). Standard: EN 301 511 and 3GPP 51.010-1
    - EMC (Electromagnetic Compatibility). Standards: EN 301 489-1 and EN 301 489-7
    - LVD (Low Voltage Directive) Standards: EN 60 950

- Antenna: External, SMA connector.

5 Warranty

ionSign Oy agrees the warranty of two (2) years for Neutron devices. Warranty starts from the day when the customer has received the device and it concerns material and production defects. Warranty is not agreed for devices which are used or wired incorrectly. It is not also agreed for situations where defect is related to 3rd party actions. Things like this can be service changes by mobile network operator or changes in mobile network itself.

For devices which are broken during warranty time ionSign Oy delivers a new device for free. Alternatively device can be corrected. Broken device should be returned to supplier if required. The cost of delivery is paid by supplier. ionSign Oy is not responsible for indirect or implicit damage or possible work or travel expenses related to broken device. For warranty issues please contact to ionSign Oy by e-mail: ionsign@ionsign.fi or by tel: +358 (0)2 822 0097.
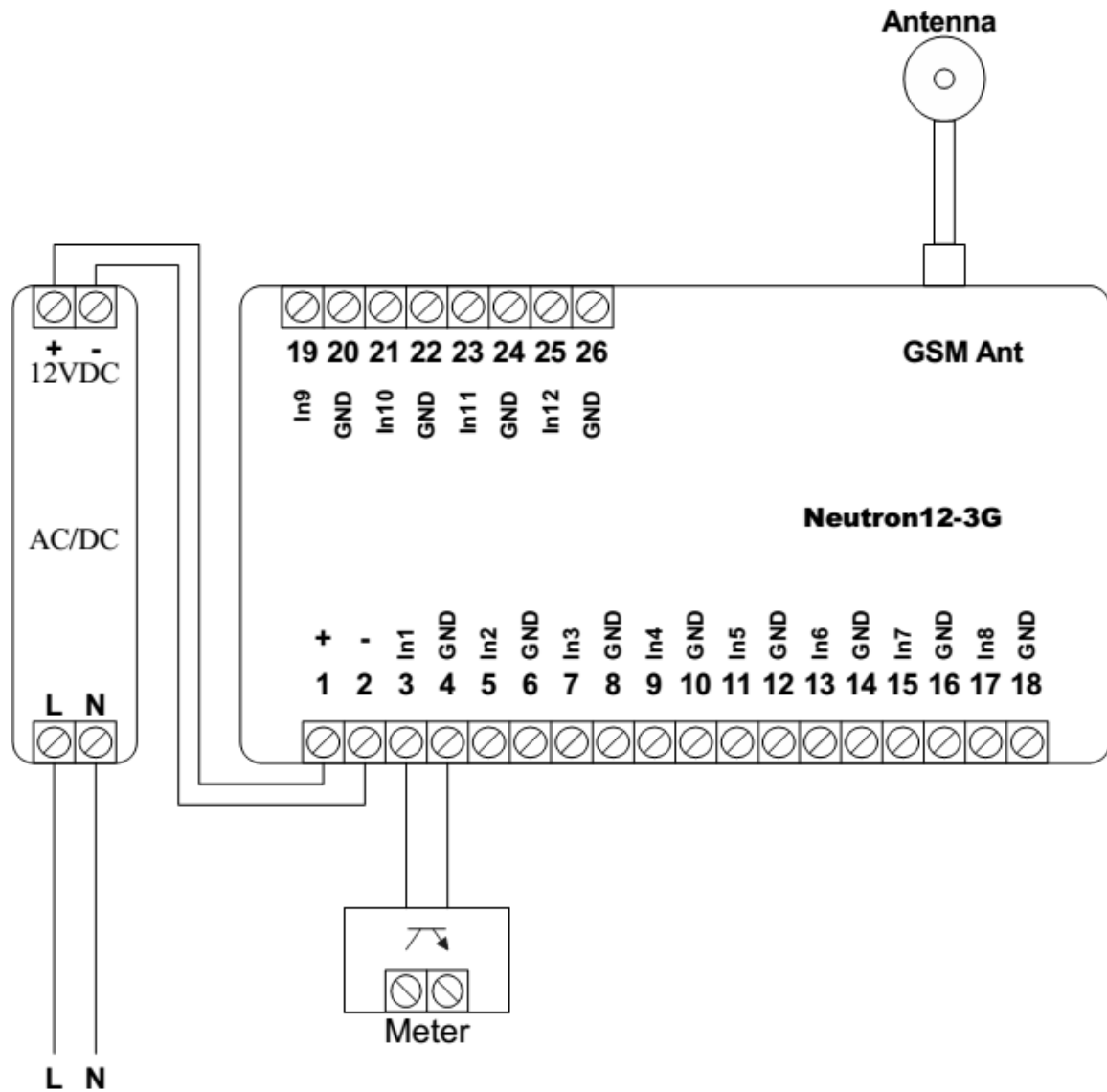
Picture 2: Neutron 12-3G circuit diagram.

For example JAMAK 2x(2+1)x0,5mm2 instrumentation cable can be used between metering device and Neutron device.

The open collector or relay output of single meter is connected to Neutron device as shown above.