Neutron-4

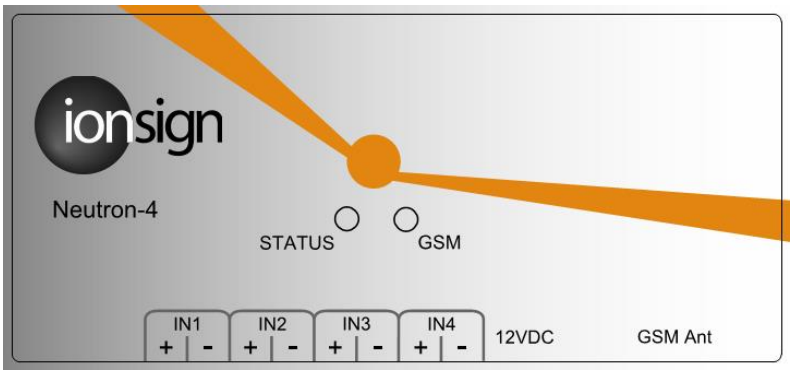
1 General

Neutron-4 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. See picture 1.



Picture 1: Device front panel.

4. Set power on which STATUS LED indicates by fast blinking.
5. Device starts to search GSM network and GSM LED start to blink fast. When network connection is established GSM LED blinks slowly and STATUS LED is solid.
   If STATUS LED continues blinking after network connection is established then signal is weak. In this case GSM antenna should be placed better.
6. Send SETTINGS command to the device. After that the device starts to operate. Received command is indicated by STATUS LED which is turned off. Connection to server is indicated by solid green STATUS LED. If STATUS LED is not turning to green then SETTINGS command validity should be verified.

3 The functionality of device LEDs

Multicoloured STATUS LED:

Solid red
The device has no settings. Give valid settings with SETTINGS command by text message.

Solid green
The device has valid settings and connection to server is established.

Turned off
The device has settings but connection to server is not established. Check that the command is given correctly and give SETTINGS command again if necessary.

Blinking green or red
The device has a weak GSM signal or it's not in the GSM network.

Orange blink
The device has received one pulse from input.

Red colour GSM LED:

Blinks fast
The device is searching GSM network.

Blinks slowly
The device is in GSM network.

4 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 connection. Maximum length is 19 characters.
Input count parameter is determined the number of connected meters in device. Range is 1-4.
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 4, transmission delay is 1 minute and server path is /neutrondata/.

```
SETTINGS 101 services.ionsign.fi 80 internet 4 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.

5 Neutron-4 specifications

- Inputs: 4 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. 2,5mm DC socket.
- Current consumption: 70 mA (peak 250 mA).
- Real-time clock: 4 days backup.
- Size: WxHxD 125 x 51 x 25 mm (Flanged ABS plastic enclosure).
- Protection class: IP20.
- Operating temperature: -25°C...+50°C.
- RH: 5% - 95% non-condensing.
- Data storage capacity: 30 days for each hour for each input channels.
- Data communication: Integrated 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.

6 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.