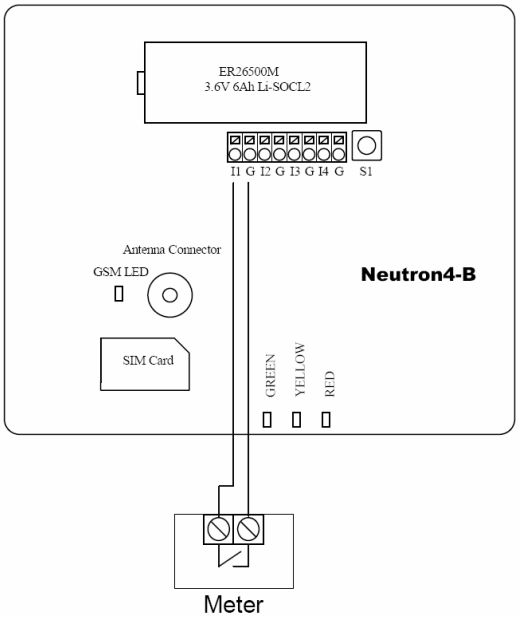
Quick Guide

Neutron4-B Remote Pulse Collector

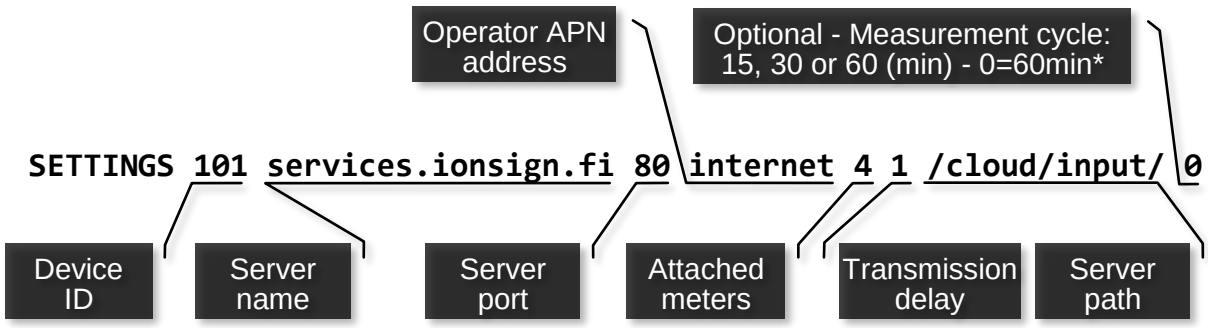


For example JAMAK 2x(2+1)x0,5mm2 instrumentation cable can be used between the meter and Neutron4-B. The relay output of a single meter is connected to Neutron4-B as shown above.

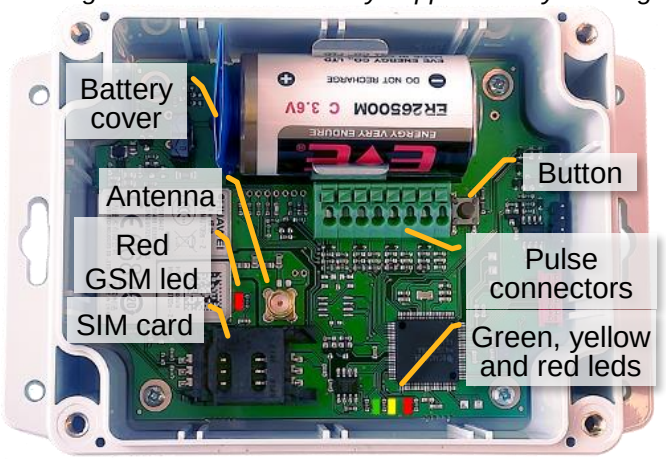
Introducing Neutron4-B:

1. Insert SIM card to its slot, PIN query disabled.
2. Connect the measuring device(s) and antenna to the device.
3. Insert the battery or remove the factory installed battery cover. The red led lights up for 10 seconds.
4. Enter the installation mode by pressing the button inside the device. The device wakes up for five minutes to receive SMS messages. The red GSM led blinks twice at a time when GSM network search is active, and once when a GSM connection is established.
5. Send the SETTINGS command to the device as an SMS. When the command is received, the yellow led starts blinking and the device starts to establish a server connection. The yellow led remains lit when the device is in operation.

When installation mode times out, all leds are switched off. This is normal.



** Setting "0" for servers that only support hourly data. Ignoring parameter sets 60 minute cycle.*



*The above example command sets device **101** to start collecting **hourly** pulse data and send it to server **services.ionsign.fi**, path **/cloud/input/** and port **80**, using **internet** as APN. Device 101 has **4** inputs and data is sent **one minute** after 24 readings have been collected. In this case, with hourly data, at 00:01.*

User and Installation Guide

Neutron4-B Remote Pulse Collector

1 General

Neutron4-B is a battery operated, grid independent pulse concentrator designed for collecting and reporting pulses from pulsed consumption meters, e.g. gas or water meters. The device stores the pulse data and sends them to a server in batches of 24 readings.

During normal operation the leds and the GSM module are switched off. They are only switched on automatically for the regular data transmission and manually in the installation mode.

2 Indicator lights

The device saves battery power by switching the leds on only;

- when a battery has been installed, for 10 seconds (no pulse indication)
- when installation mode has been entered by pressing the button
- when performing the daily data transmission

Yellow led is OFF	The device has no settings. Send a SETTINGS command as an SMS
Yellow led is ON	The device has settings and is in operation
Yellow led blinks	The device has settings and is starting communication to the server
Green led is OFF	The device is not in the GSM network
Green led is ON	The device is in the GSM network
Green led blinks	The device has poor GSM signal strength
Red GSM led blinks twice at a time	The device is looking for a GSM network
Red GSM led blinks	The device is in the GSM network
Red Pulse led toggles	The device registered an incoming pulse

3 Commands

The device is controlled with SMS messages sent to the SIM card's number. Except for the STATUS command, the device doesn't send replies. In the messages, commands and parameters are separated by one space character (␣ in examples).

The device only receives SMS messages in the installation mode, at other times the GSM module only has power when it's sending data. Installation mode can only be activated locally with the button. There are ways to secure message delivery also remotely, contact ionSign when this becomes relevant.

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

With the SETTINGS command all required settings are given and collecting and sending of pulse data is started.
Device identifier is a unique device ID. Range is 1-1000000.
Server address is the IP address of the server. Also a domain name server name can be used. Maximum length is 50 characters.
Server port is the port number where the server application waits for transmissions.
APN is the Access Point Name of your operator for the GPRS/3G connection. Maximum length is 30 characters.
Input count is the number of connected meters. Range is 1-4.
Transmission delay helps to avoid a large number of devices sending pulse data to the server at the same time. Range is 0-1000 minutes. With value zero (0) the data is sent immediately when 24 readings have been collected.
Server path is the path in the server where data is saved. Maximum length is 50 characters.
Step defines the length of the measurement cycle. Can be omitted, defaults to zero (0). See STEP command for more instructions.

STEP␣*<Time>*

If only the measurement cycle needs to be changed from the one set using the SETTINGS command, the STEP command is used. The ***Time*** parameter defines the cycle length in minutes. Values: 0, 15, 30 or 60 minutes.
0: Hourly data, for servers only supporting hourly data.
15: Quarterly data collection and sending.
30: Half-hourly data collection and sending.
60: Hourly data collection and sending.

STATUS

To the STATUS command, the device replies with an SMS of general status information. STATUS command has no parameters.

Status information includes the following:

- Device settings validity: [Yes | No].
  (Also device ID, if the device has valid settings).
- Data sending to server initialized: [Yes | No].
- Most recent device IP connection initialized: [Yes | No].
- Most recent TCP/IP connection to server: [Yes | No].
- Most recent server reply to device data: [No | Success | Error].
- GSM operator name.
- GSM signal strength: [dBm value | Unknown].

Signal strength -113 dBm indicates a value of -113 dBm or less. Signal strength -51 dBm indicates a value of -51 dBm or greater.

4 Failure recovery

For GSM network failures, the device has a built-in local buffer for keeping collected data stored for later transmission. The buffer capacity is 3 years for hourly data, 1,5 years for half-hourly data and 9 months for quarterly data. When the GSM network resumes service, all buffered data is sent to the server without any need for user intervention. If the GSM signal strength is weak and the device often needs to buffer data, battery life will be shorter than expected.

5 Neutron4-B technical specifications

- Inputs: 4 inputs for pulses.
- Replaceable battery. With the factory installed battery, expected battery life is roughly 10 years. Battery: 3,6V 6Ah min 1500mA peak current. Compatible types e.g. SAFT LSH14, ULTRALIFE ER26500M and EVE ER26500M.
- Real-time clock.
- Size: WxHxD 145 x 90 x 55 mm (flanged PC plastic enclosure).
- Protection class: IP65.
- Operating temperature: -25 °C...+55 °C.
- RH: 5 % - 95 % non-condensing.
- Local data storage capacity, for each input channel:
  - 3 years for hourly data
  - 1,5 years for half-hourly data
  - 9 months for quarterly data
- Data communication: Integrated GSM/GPRS module. Conforming the following directives and standards:
  - R&TTE Directive 1999/5/EC (Radio Equipment & Telecommunications terminal Equipment)
  - 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 grants a warranty of two (2) years for all delivered devices and software services. The warranty starts on the date of the delivery and it covers material and manufacturing defects. The warranty does not cover defects caused by improper use or installation nor does it cover defects caused by factors out of ionSign's control. These would be for instance grid malfunction or service changes of network operators services. ionSign delivers a new device to replace the defected one, without cost. Alternatively, ionSign may repair the defected device. The defected device must be returned to ionSign, if required, at ionSign's cost. The warranty does not cover dismantling, installation, and introduction costs and the like. ionSign warrants that the provided software essentially manage with their designed tasks, at the time of delivery. All significant software defects are covered by the warranty. The defects will be resolved without unnecessary delay. The resolution may be an instruction to circumvent the defect. If the delivery includes third party products or services, these are only covered by the applicable warranty provided by that third party. Title to the delivered goods transfers to the client, when the invoiced price is paid in full. All immaterial rights related to devices and services remain the property of ionSign. If the service was a design assignment, the client assumes the right to use and further develop the assignment results. ionSign is eligible to use the client's name as a reference in its marketing. ionSign is not eligible to disclose the order details without prior consent. In case of a force majeure, preventing to act according to the purchase agreement, the affected party will start immediate negotiations to assess the effects of the obstacle on the scope and schedule of the purchase agreement. ionSign appropriately backs up client's data residing on its servers. In spite of this, ionSign assumes no responsibility of possible damage due to loss of data. ionSign assumes no responsibility of direct or indirect damage to property or people, nor work or travel expenses, caused by using its services or devices, unless due to gross negligence. ionSign's financial liability is always limited to the value of the delivered goods and services, unless otherwise inflicted by the Finnish law.

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