

## Commissioning of the device:

A computer is needed for commissioning with disabled network connections.

### Powering up for configuration

- Turn on the computer.
- Connect the GMU491 device to the computer with a network cable, directly or via router.
- Connect the GMU491 to a power supply. POWER led lights up.



### Connecting to user interface of the device

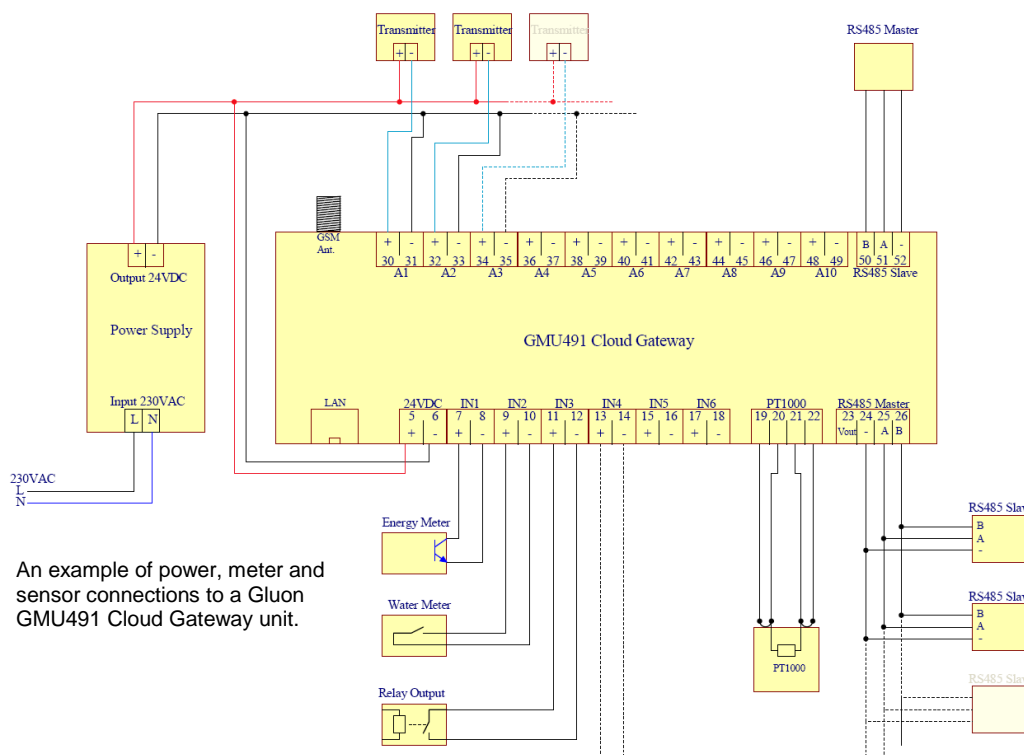
By default, GMU491 uses DHCP, so it can be connected to an existing network. Although it may be difficult to resolve the assigned IP, so for the configuration, it is recommended to connect the device and the PC as a separate network, as instructed above. When a DHCP server is missing, the GMU491 activates its dedicated DHCP domain and creates a network. The assigned device IP is 192.168.1.100.

A browser is used to connect the GMU491. In the address line, write the device IP 192.168.1.100. For login, the factory pre-set username is "admin" and password is "gmu". The connection needs to be made within 5 minutes from power-up, else the DHCP domain ceases to connect. In this case, restart GMU491.

### Settings and finishing

Enter the required device settings, context instructions are in the interface sidebar. Make sure to save all changes. Then log out, disconnect the GMU491 from the power supply and the computer.

Make necessary connections as mentioned in picture below, connect LAN and/or insert SIM card (with disabled PIN code query). When powered up, the device starts to collect and transmit data to the server, according to the settings given.



### 1 General

The Gluon GMU491 Cloud Gateway is designed to collect and transfer measurement data to a wide variety of bespoke and commercial cloud services. Data can be read from the unit's inputs (analog, digital/pulse, PT1000) and Modbus fieldbus devices. After initial setup, the unit collects and transmits data spontaneously, without separate queries.

The on-board Linux computer enables edge computing: local computing of measured data, transmitting data directly to commercial cloud services and running bespoke local applications for various purposes.

The server connection may be established via Ethernet/LAN and GSM/3G networks. While only the other may be used, using both provides redundancy in data delivery. Data may also be read from the Modbus slave port of the unit.

### 2 Settings

The device interface sidebar provides comprehensive and most up-to-date context instructions about device settings and features. This guide gives an overview of the main topics.

After logging in, the **Status tab** shows the current device status and possible error messages.

On the **Service tab**, the server(s) used to receive data from the GMU491 are configured. Enter the required settings for the selected service. At present, the following services are supported:

- ionSign Cloud
- Microsoft Azure
- Watson IoT
- Amazon Web Service
- SimpleJSON
- Save to SD Card
- LiveData

The required settings depend on the selected service. For example ionSign server requires the unit unique ID, server address, port and path.

Under **Naming**, the sent nodeid and sensorid parameter names and data types may be changed. Under **Configuration**, the timing of saving and sending measurements, as well as other service specific optional features may be configured.

On the **Device tab** the serial port settings for Modbus reading are set. Under Modbus master, fieldbus devices may be added or deleted for the GMU491 unit to monitor. Under **Device settings**, the time (NTP) server is configured, the login password may be changed, the measurements may be reset, and firmware updates may be acquired. Under **Connection**, device IP settings are made and the use of the GSM/3G connection may be toggled. Under **LoRaWAN Server**, the unit may be configured to act as a LoRaWAN server. Context help assists in every page in making the correct settings.

On the **Measurements tab** you can monitor the most recently sent measurement data and some calculated parameters based on the data.

### 3 Indication lights

The device has three indication lights: **POWER**, **GSM on** and **Sending**.

**POWER** LED is on when the unit has power supply.

**GSM on** LED indicates the status of the GSM/3G module. When the LED blinks twice with two second intervals, the module is searching for a GSM/3G network. When a network connection is established, it blinks once every two seconds. If the connection type is GPRS, the LED is on continuously. When the LED is off, the GSM/3G module has no power.

**Sending** indicates the status of data transmission. When the LED is on, the unit is communicating to the server.

### 4 Modbus master reading

In addition to the unit's own inputs, data collection may be supplemented by reading from meters and devices connected to the unit's Modbus master port, or from values written to the unit's Modbus slave registers. This data is sent to the server together with the values read from the unit's own inputs. Modbus master reading settings may be given either on the **Device tab** under **Device settings**, or via the unit's RS485 Modbus slave connection.

### 5 Redundancy and buffering

The unit has two separate data transmission networks available. It is recommended to use the TCP-IP network as the primary network and the GSM/3G network as the secondary. The opposite is also possible. When the primary network does not have service, the unit automatically switches over to use the secondary network. This secures unbroken data flow, if either of the networks has service.

If however both networks are out of service, or a secondary network is not configured, the unit automatically stores new data to a non-volatile buffer memory. The buffer has a capacity to store 13 000 measurement series, one measurement series including all of the unit's inputs and 251 Modbus registers. With a 15 minutes logging interval, the buffer stores measurements from all inputs and Modbus registers for 135 days. When the network service resumes, the unit flushes the buffer to the server and continues new data transmission automatically.

### 6 GMU491 technical specifications

- 6 open collector or relay inputs for digital inputs or pulse data.
- 10 current (4 - 20 mA) tai voltage (2 - 10 V) measuring inputs.
- PT1000 temperature measurement input.
- 2 RS485 connections (Modbus master and slave).
- Operating voltage: 12...24 VDC.
- Current consumption: 100 mA.
- Real-time clock with battery backup.
- Size: WxHxD: 156x90x52mm (9 module DIN enclosure).
- Protection class: IP20, enclosures available for higher IP.
- Operating temperature: (-25°C) 0°C...+50°C.
- Relative humidity: 5% - 95% non-condensing.
- Linux OS Debian 8.5 (Jessie).
- AM335x 1GHz ARM@ Cortex-A8 processor.
- 512 MB DDR3 RAM, 600 MB free flash memory.
- Pre-installed PostgreSQL database, lighttpd web server, SSH client/server
- Pre-installed communication modules for ionSign Cloud, commercial cloud services and local storage.
- Local non-volatile buffer on I/O card: 13000 measurement series (device inputs and 251 Modbus registers). With 15 minutes logging interval, the buffer keeps 135 days of measurement data.
- Data communication: LAN/TCP-IP and GSM/3G/GPRS. The GSM module complies with the following standards and directives:
  - 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

### 7 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 other-wise inflicted by the Finnish law.

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