CCU Manual (English)

Pd_CM_003. Version A.3

Contents

1   Introduction

This document is a guide for service technicians to configure the charging station via the web based interface. The Charge Controller Unit (CCU) is responsible for vehicle communication, back end communication and several other services related to electrical vehicle charging. Appropriate technical knowledge and certification for work with electrical installations and maintenance work is required to prevent danger to persons or property.

1.1   Connecting the CCU

If you are using a Windows machine to configure the CCU, and it is the first time you connect to the CCU, then please follow the provided instruction to set up the driver correctly.

1. Power up the board.

2. Attach the mini-B USB connector to the CCU board, see Figure 1.1.

3. Open your preferred web browser and enter **192.168.7.2** in the URL bar and press enter.

Figure 1.1: USB connector connected to the CCU.

1.2 Overview

The first page after you connected to the system are the sign in page. Some parts of the configurations interface are explained below.
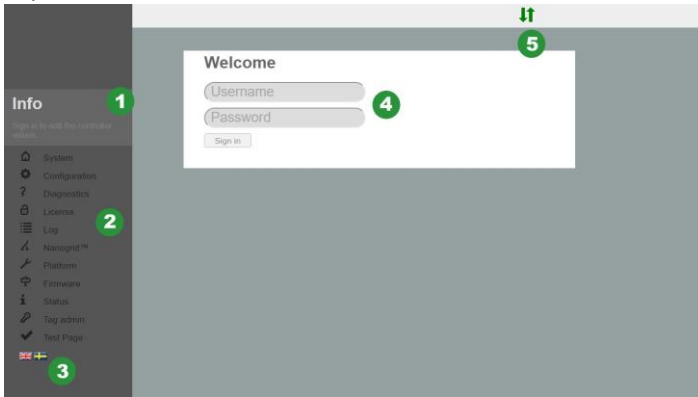

Figure 1.2: Sign in page.

1. Information box that shows some help text about every page you navigate to. Click the box to expand the text.

2. The navigation menu, grayed out when you are not signed in.

3. Click the flag to select the preferred language.

4. Input field to sign in. Username: **ccu** and password: **ccu**.

5. Connection status. Shows if the browser has a connection to the system. Green arrows indicates that the controller is connected. Flashing red arrow indicates that the browser trying to reconnect to the system.

2   System

After successfully signed in this is the first page you encounter. It gives an overview of the system e.g. serial number, firmware version and hardware version. Some more parts of the system has also appeared and are explained below the figure.
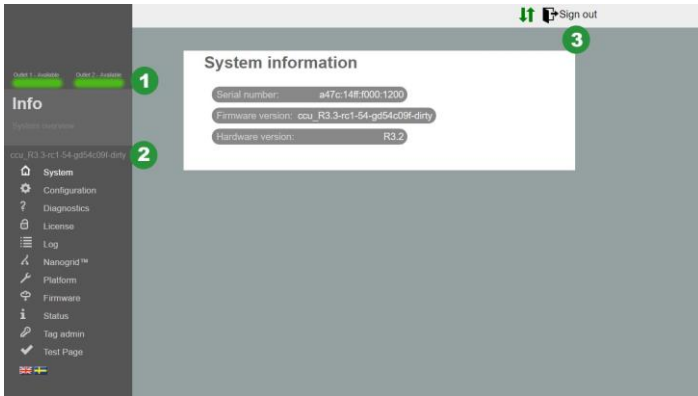

Figure 2.1: System overview.

1. The outlet states. Gives a visual representation of the state of the outlet.

2. Firmware version.

3. Sign out button. Will terminate the current session. All unsaved changes will be lost.

3   Configuration

3.1   File

The "File"-tab under configuration is used to either import or export an external configuration file. The manufacturer may prepare a configuration file that can be imported here, but it is also common that this configuration is performed in the field by a service technician. The configuration on the system may also be erased. After a file is imported or the configuration is erased, a reset of the software is needed. A pop up message will remind you to perform the reset.

   The configuration requires knowledge about appropriate backend settings, communication interfaces and other site related information.
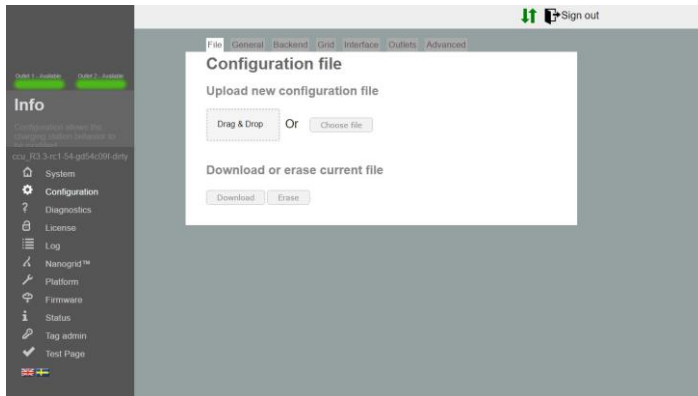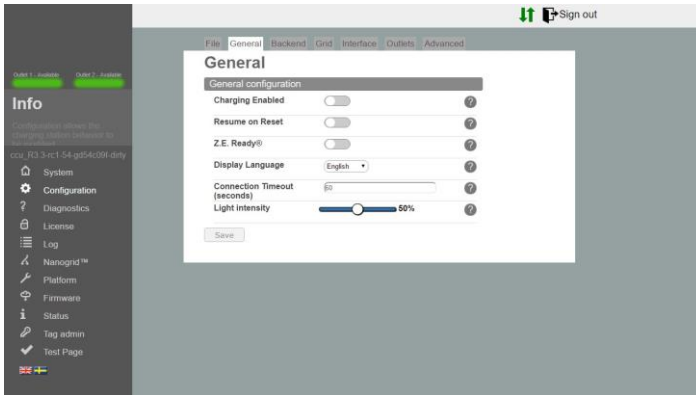

Figure 3.1: Configuration file tab.

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3.2 General

Figure 3.2: Configuration general tab.

Charging Enabled Allows charging. Backend connection will not be affected.

Resume on Reset Enabling this option will allow charging without authorization for a short period after the station has been reset (e.g after a power outage). If Z.E Ready® is enabled this is required behaviour and this option will be ignored.

Z.E. Ready® Enabling this option will make the station be Z.E. Ready® compliant. This will typically make no difference but under adverse conditions the station will disallow charging rather than operate outside the parameters required to be Z.E. Ready® compliant.

> Example: Z.E. Ready® requires that a station offers at least 13A of current, should less be available charging will not commence even though 10A of current might be available.

OLED Language OLED language to use on the charging station (where applicable). NOTE: This does not change the language of the configuration interface.

Connection Timeout Sets the maximum period between showing an RFID-card and the connection of the cable, or vice-versa.

Light intensity Maximum intensity of the charging station LEDs. 100% is full brightness.
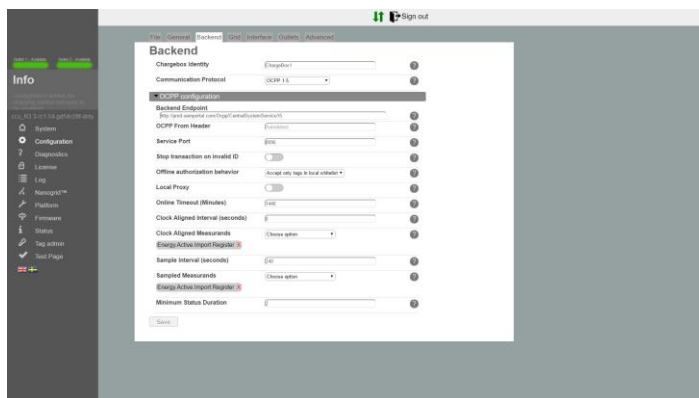
3.3 Backend

Figure 3.3: Configuration backend tab.

Chargebox Identity Unique name to be use in communication with the configured backend. The name is caseinsensitive and if the selected protocol is OCPP 1.5 the name should not exceed 20 characters.

Communication Protocol Communication protocol to be used in communication with the backend.

Backend Endpoint URL to the backend endpoint.

OCPP From Header If left blank the system will automatically detect its IP address and transmit it in communications with the backend. In some cases the detected IP is not globally reachable. E.g when station is behind

a NAT device. In these cases the detected IP address may be overridden by setting this setting manually.

Service Port Port at which the system will expose its web service to the backend. Default is 8095. Do not change this unless you know what you are doing.

Stop Transaction on Invalid ID If set the system will abort a running transaction if the backend indicates that the transaction was started with an invalid tag. E.g the transaction may have been started offline with a cached tag that has since been removed.

Offline Authorization Behavior Behavior for authorization when the system is offline and has no connection to the backend.

Local Proxy The system will act as a backend and forward received messages to its own backend. Useful for cases where only one WAN uplink is available.

Online Timeout Sets the period until the system will reboot to attempt to re-establish communication with the backend. 0 to disable. (Minutes)

Clock Aligned Interval Interval at which clock aligned meter values will be sent. (Seconds) E.g an interval of 3600 will mean hourly meter value transmission at 0:00, 1:00, 2:00.

Clock Aligned Measurands Measurands to report at the specified clock aligned data interval.

Sample Interval Interval at which specified measurands will be sampled and transmitted during an active transaction. (Seconds)

Sampled Measurands Measurands to report at the specified sampled data interval.

Minimum Status Duration Status changes below the minimum duration will not be reported to the backend.
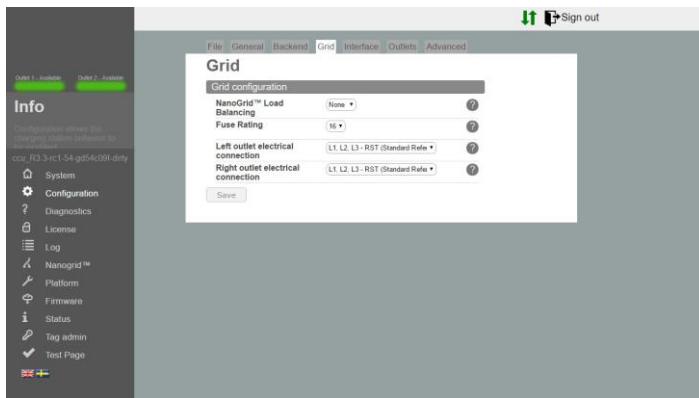
3.4 Grid

Figure 3.4: Configuration grid tab.

NanoGrid™ Load Balancing Select applicable type for NanoGrid™ installations. May require additional configuration and/or hardware.

Fuse Rating Maximum fuse current rating for the charging station.

Left Outlet Electrical Connection Electrical grid connection description. Incorrect configuration may result in incorrect operation of the charging station.

Right Outlet Electrical Connection Electrical grid connection description. Incorrect configuration may result in incorrect operation of the charging station.

3.5 Interface

Select which network connection type you want to use on
the station. The supported interfaces for Internet access are:

- Ethernet

- WiFi (IP from DHCP or static)

- 3G modem. Two variants named WWAN modem and
  3G modem. 3G modem is PPP-based while WWAN is
  based on virtual Ethernet interface. We recommended
  using WWAN.

Figure 3.5: Configuration interface tab.

Ethernet

1. Select wired connection.

2. Select manual and specify a unique private IP address and correct netmask.

3. Use default settings: Speed: 100 MBit Autonegotiation=true Duplex=true (Full duplex).

WiFi

1. Select "WiFi connection"

2. Select DHCP and leave IP address and netmask empty. In case of static IP specify IP and netmask.

3. Use the following settings:

   • Mode: Client

   • SSID: *Network name

   • Passphrase: *password

Modem

Choose either modem(PPP) or modem(WWAN) which suits you best.

1. Set RAT to 'Automatic' to let the modem decide if 2G or 3G shall be used depending on network conditions.It is also possible to force using 3G or 2G.

2. Enter correct APN for selected operator. Information is coming with SIM-card subscription.

3. Leave username and password blank if no other instructions have been given.

Advanced networks

1. Enter primary and optionally secondary name server.

2. IP Gateway address is entered here

Keep Alive Ping

1. Enter IP address to the ping server used to maintain the connection.

2. Number of retries before connection is considered to be down.

3. Time out in seconds between each ping.
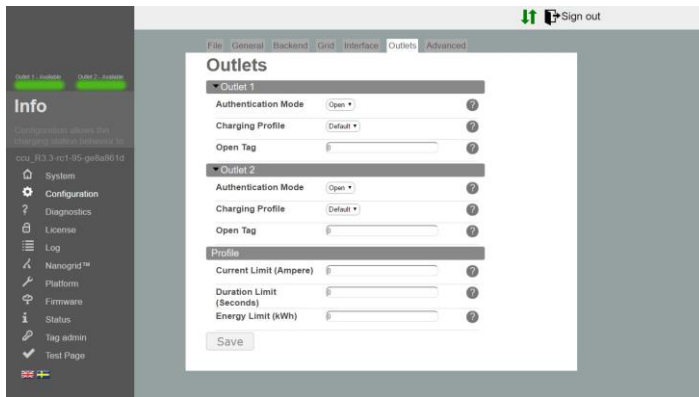
3.6 Outlets

Figure 3.6: Configuration outlet tab.

Outlet

Authentication Mode Open mode allows anyone to charge by simply connecting their electrical vehicle to the station. RFID mode requires that authentication with a valid RFID cards take place before any session will begin.

Charging Profile Charging profile sets limitations on duration, time, current etc. of any charging session occurring on the outlet.

Open Tag Open tag controls what tag is reported to the backend when transaction was started without a tag. Default is 0. Tag will be sent verbatim.

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Profile

Current Limit The current limit set a maximum limit of current that can be drawn from the outlet. Unit is Ampere. 0 to disable (fuse limit will still apply).

Duration Limit Duration Limit sets the maximum allowed time for a charging session. After the set time has elapsed the session will end. Unit is seconds. 0 to disable.

Energy Limit Energy Limit sets the maximum amount of energy allowed for a charging session. After the set amount of energy has been drawn the session will end. Unit is kilowatt hours. 0 to disable.

4   Diagnostics

A file containing logs and other diagnostic information can be downloaded by pressing "Download". This information can be sent to the manufacturer for further investigations.
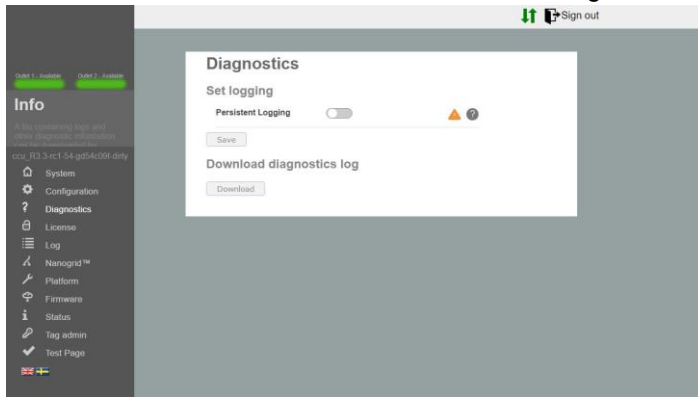

Figure 4.1: Diagnostics overview.

Persistent Logging This should only be enabled on explicit instruction to do so!

5   License

Some functionality on the station requires an appropriate software license. Please contact your vendor for more information. On this page you can upload a new license file or download present file and see what the current license cover.
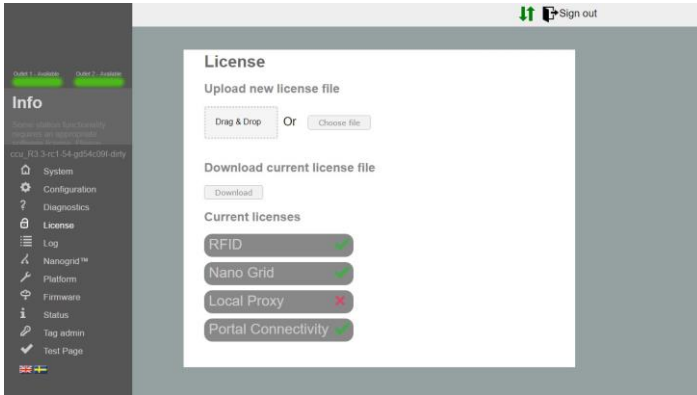
Figure 5.1: License overview.

6   Log

When you click on "Start log" the application tries to establish a connection to the stations logging function. When you're done debugging click "Stop log" to close the connection. Check the box "Auto scroll" if you want the log window to automatic scroll on update.
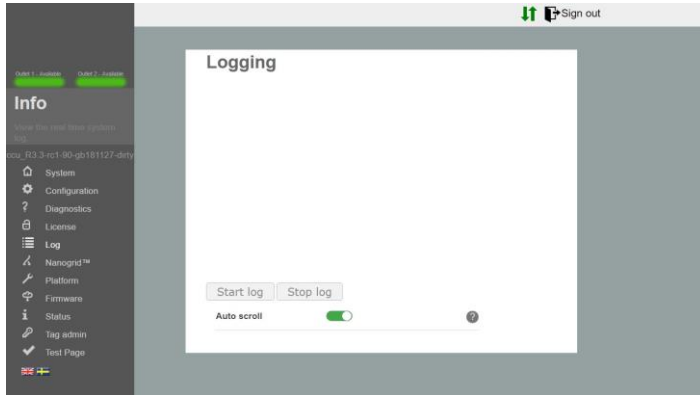
Figure 6.1: Log overview.

7 NanoGrid™

7.1 Server

NanoGrid™ allows the charging station to adapt charging to local grid conditions. For advanced configuration please contact the manufacturer.

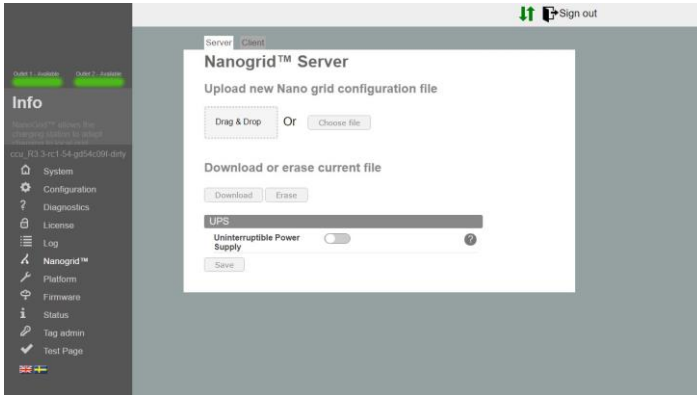On this page you can upload new NanoGrid configuration or download current file.

Figure 7.1: Overview of NanoGrid server tab.

Uninterruptible Power Supply Detect if the site is running on UPS battery power. Do not activate unless you know what you are doing.
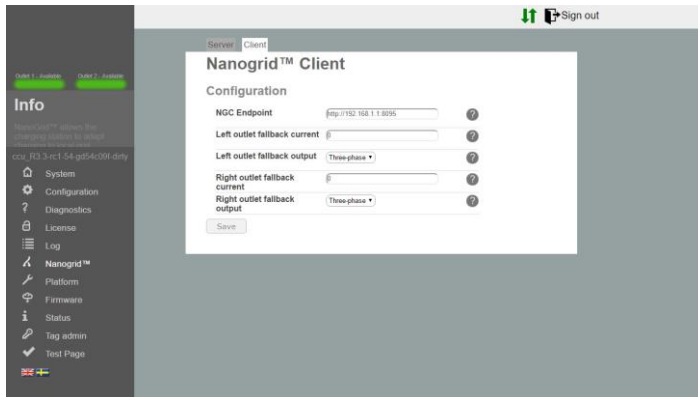
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7.2 Client

Figure 7.2: Overview of NanoGrid client tab.

NGC Endpoint Endpoint to the NanoGrid controller. Leave blank for auto-detection.

Outlet fallback current Current to assign the outlet in case of lost NanoGrid communication.

Outlet fallback output Phase(s) to assign the outlet in case of lost NanoGrid communication (only applicable for phase-shifting units).

8 Platform

8.1 File

The platform configuration describes the physical properties of the charging station. I.e: fuse rating, connected peripherals, etc.

On this page you can upload new platform configuration or download current file.
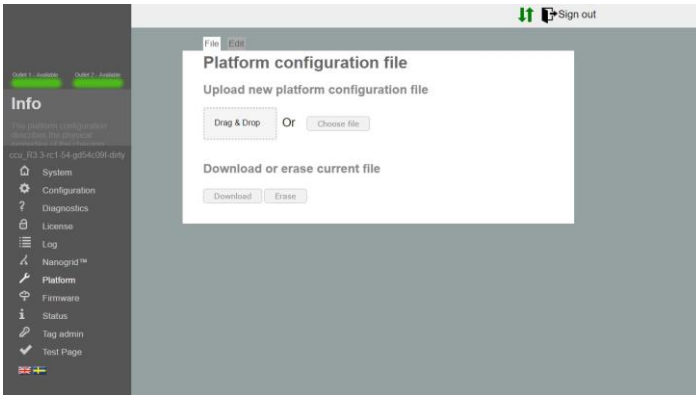

Figure 8.1: Platform file tab.

8.2 Edit

Here you can edit the current platform configuration.

Figure 8.2: Platform edit tab.

Nr. of RFID devices The number of RFID devices connected to the system. May be 0, 1 or 2.

RFID Format The RFID format of the RFID reader. Little or big endian. if unsure, choose little endian.

The RFID card reader type The type of RFID reader, this is denoted on the board. (RS485 / I2C).

The Display type The display type, this is denoted on the board. (None / OLED).

Number of outlets Amount of outlets physically present on the station. May be 0, 1 or 2.

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Outlet settings

Connector The physical connector type for the outlet.

Fuse The rating of the physical fuse associated with the outlet.

Phases The amount of phases connected to the outlet. May be 1 or 3 for Mennekes. 1 otherwise.

Dedicated Earthbreaker A separate RCCB (residual-current circuit breaker) is in use. If not set the presence of an RCBO (residual-current circuit breaker with overload protection) is assumed.

Energy Meter Type The type of metering mode the station uses, if unsure select MODBUS.

Fuse Reset Actuator Indicates the presence of an actuator connected to the fuse in such a way that the firmware can reset the fuse.

Lock Actuator Indicates the presence of an lock actuator that will lock any attached cable in place. Only applicable for Mennekes outlet connector.

Check Contactor The system will check that the contactor is in the expected state. Incorrect state will put the system in a faulty state.

Check Fuse Enable/disable the voltage measurements on the fuse port. If disabled system will not indicate error if voltage is not present (i.e fuse tripped).

Current Divisor Indicates the divisor to use for the current measurements, only trafo. Typically 100 or 1000.

Energy Divisor Indicates the divisor to use for the energy measurements, only for pulse. Typically 100 or 1000 for 100/1000 pulses per kWh.

9   Firmware

A firmware upgrade updates the firmware running on the charging station which may add additional features, resolve issues or improve performance.
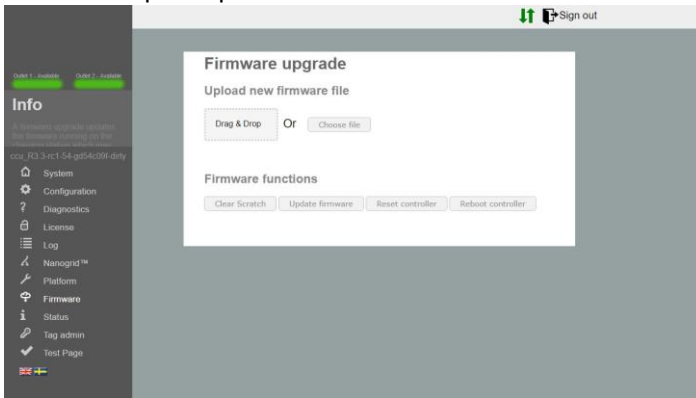

Figure 9.1: Overview of firmware.

Clear Scratch Clears the area which the controller temporary saves update files. This is done automatic when you upload a file.

Update firmware Updates the controller to the firmware you uploaded.

Reset controller This button resets the application on the controller.

Reboot controller This button reboots the controller.

10   Status

The status page provides real time information about the charging station. E.g: active charging, attached hardware and outlet configuration.
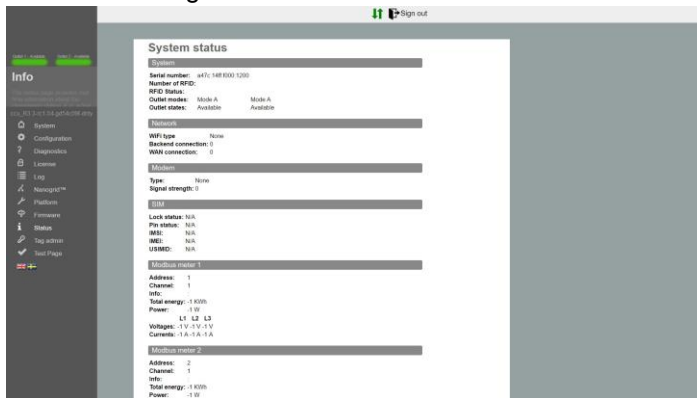

Figure 10.1: Overview of status.

11   Tag administration

RFID-tag administration can be performed locally from this configuration or remotely from the backend system. To add a tag just enter the number written on the RFID-tag. Most often is the tags in decimal form but some suppliers use hexadecimal form. In that case start the tag id with 0x. By clicking on the buttons under the input field you can changes if the tag is for the whole station or just one outlet.

You can also upload a list of tags, the format of this file must be one tag per row with a comma separated number

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which represent the outlet in a ".txt"-file.Eg. 0xF8DEBB00, 0.
(0: Station, 1: Outlet 1, 2: Outlet 2)

To add tag by scanning the click the switch "Programming mode". This sets the station in scannings mode and by scanning the tags on the RFID reader you add them to the local white list.
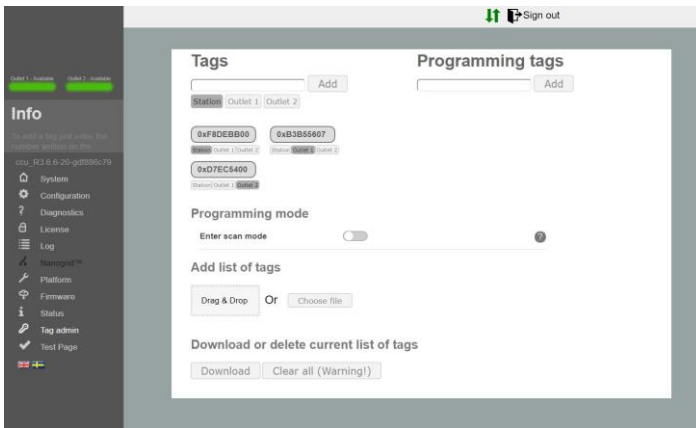

Figure 11.1: Overview of tag administration.

12 Hardware test

This page testes the hardware related functions on the system. Start the test and follow the instruction that's provided. When a test is running DO NOT reload the page or navigate away, some functions on the station is not active and can resolute in error. When a test is done the result will be saved and stored on the station. The previous test will also show on this page.
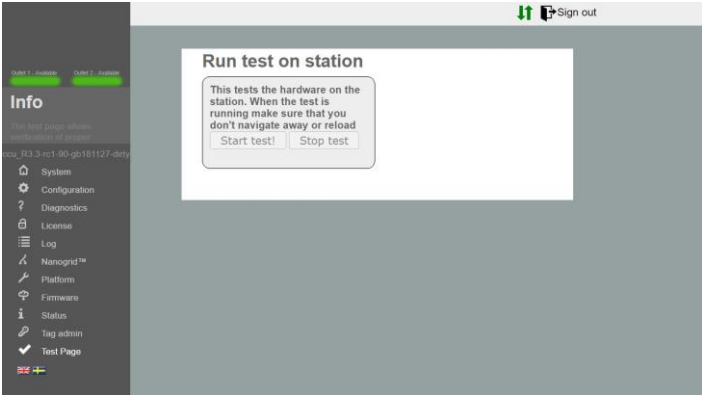
Figure 12.1: Test overview.