Robotina d.o.o.
OIC Hrpelje 38
SI-6240 Kozina
Slovenia

1. Software

To run RDC Charger application it is required:

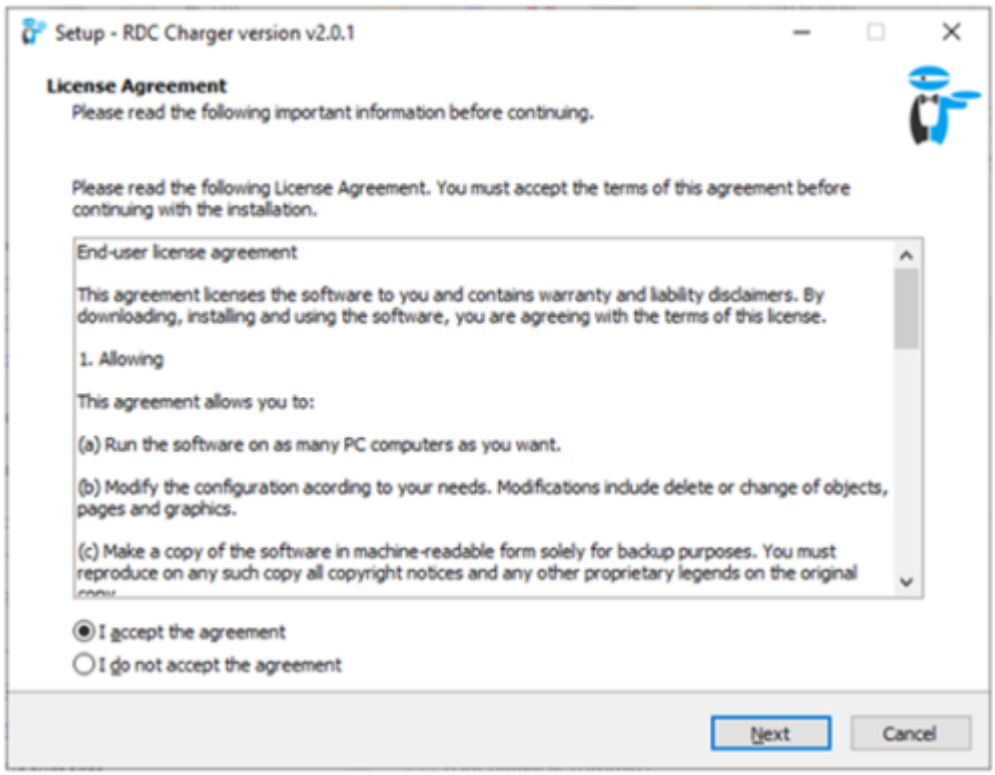
- to establish connection between charger and router by UTP cable
- to connect charger to the power supply
- download and install latest version of application for RDC Charger *

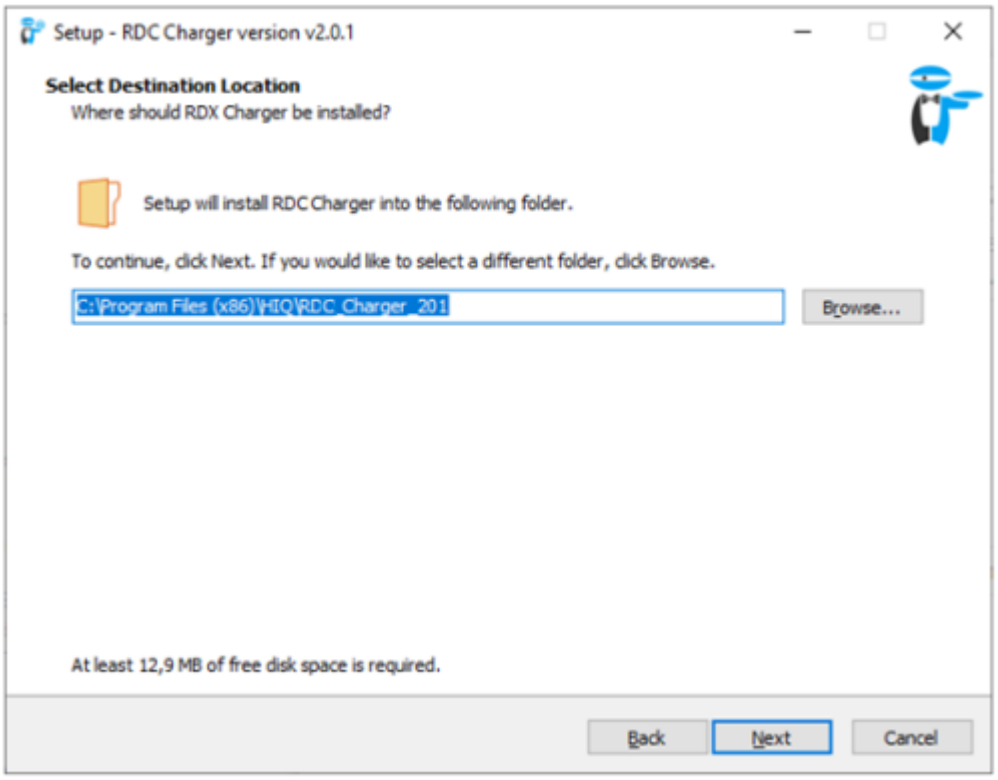
Once RDC Charger is configured, it does not require further connection to internet or configurator for normal operation !

*Latest version of RDC Charger (EVSE) can be found under Downloads map.

1.1. Installation

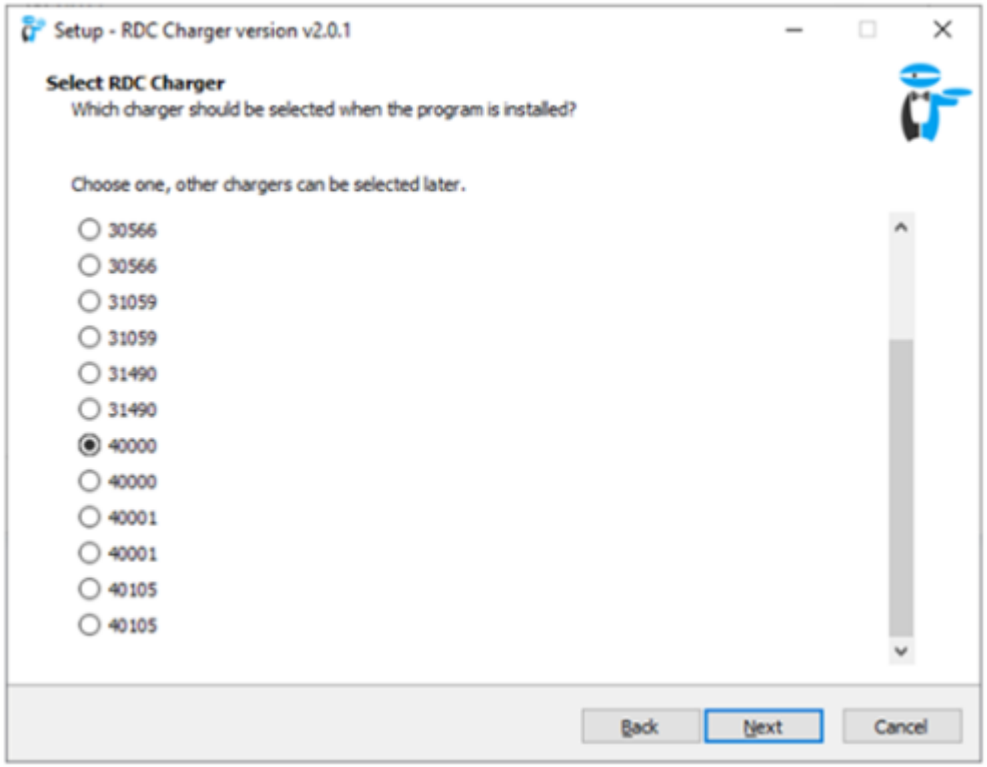
- run rdc_charger .exe file from Downloads
- select default or desired folder

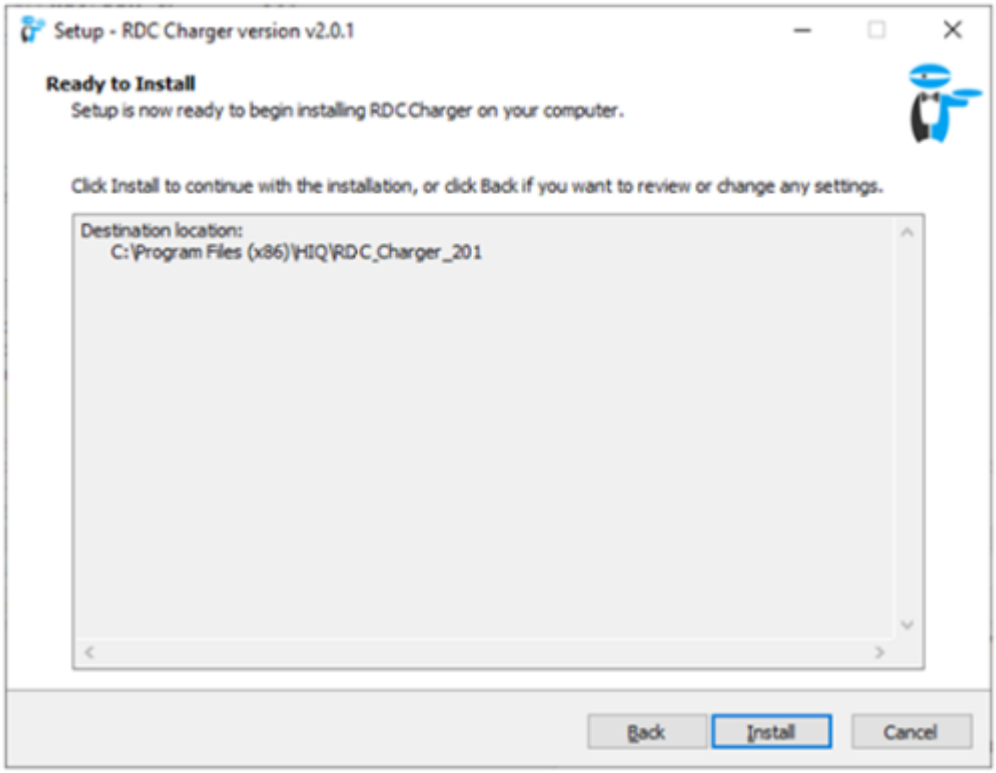




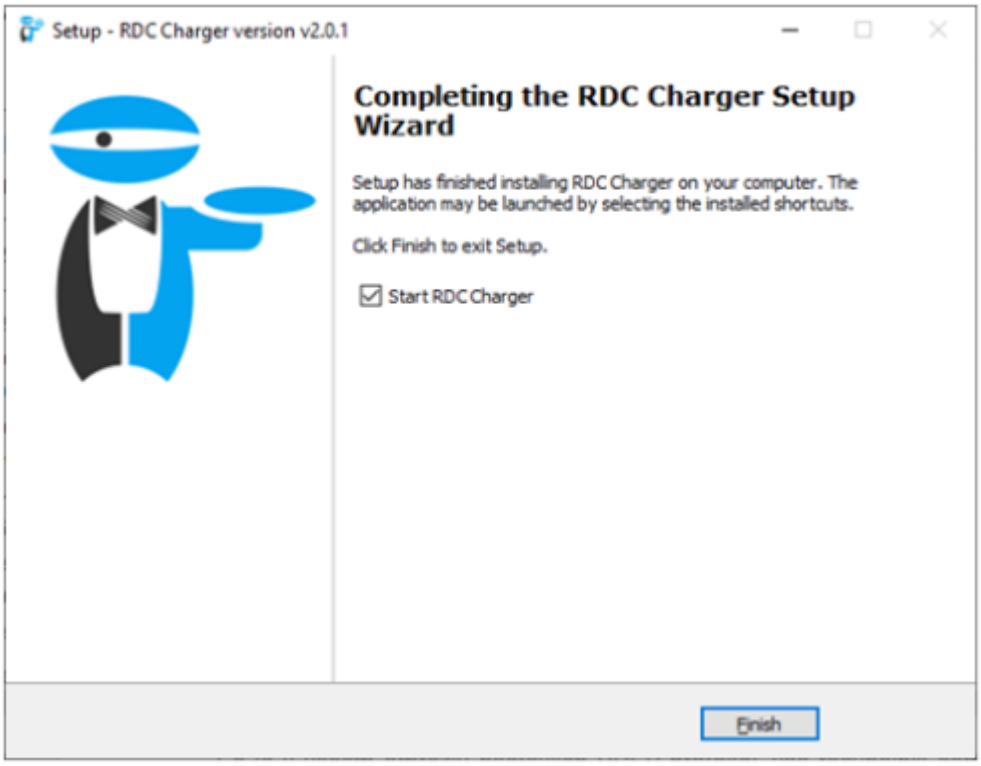
- select charger serial number (SN), visible on sticker *
- run install

*if does not appear a window with SN or it is not listed it means that application at this moment did not recognize charger. Continue with installation and select SN on application later.



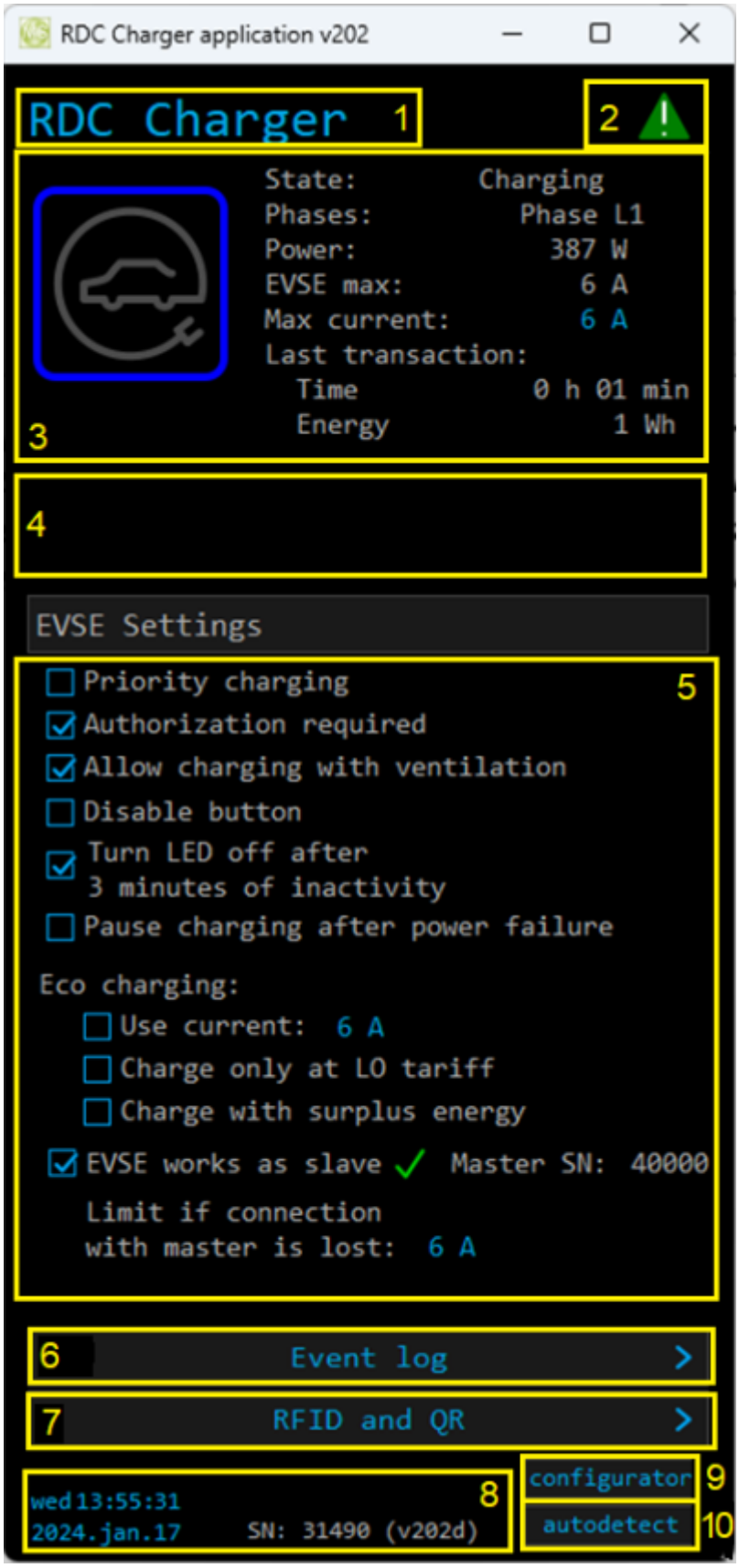


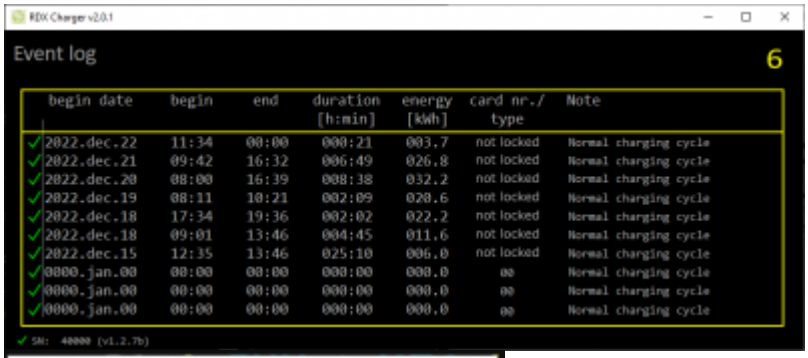
Installation is successful!

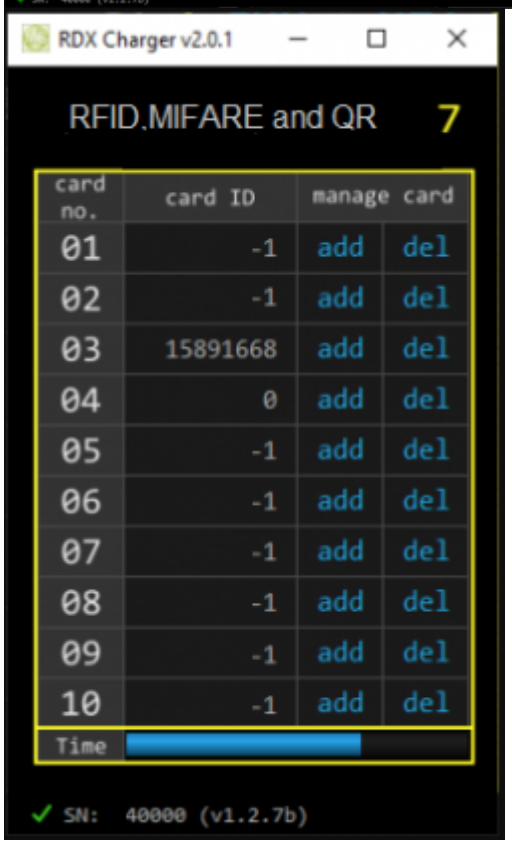


1.2. EVSE overview

Parameters in blue colour are editable.


RDC Charger application v202
RDC Charger 1
2
State: Charging
Phases: Phase L1
Power: 387 W
EVSE max: 6 A
Max current: 6 A
Last transaction:
Time 0 h 01 min
Energy 1 Wh
3
4
EVSE Settings
Priority charging
Authorization required
Allow charging with ventilation
Disable button
Turn LED off after
3 minutes of inactivity
Pause charging after power failure
5
Eco charging:
Use current: 6 A
Charge only at LO tariff
Charge with surplus energy
EVSE works as slave
Master SN: 40000
Limit if connection
with master is lost: 6 A
6 Event log
7 RFID and QR
wed 13:55:31
2024.jan.17
SN: 31490 (v202d)
8
configurator
9
autodetect
10





1. EVSE Name	
Name of EVSE - default is RDC Charger.	
2. DLM sign	
	Yellow status when DLM is enabled and active. Green status when enabled and not active. None if DLM is not set.
3. Data from ongoing charging session	
EV charging icon with LED light	Different LED light colour is presenting charger state, while icon acts as a button. Short press toggle enable/pause charging, long press for priority charging and error reset.
State	EVSE status: Communication error; Unknown; Available; Preparing (authorization done, waiting for vehicle to be connected) or (EV connected, authorization required); Charging; SuspendedEV(Paused by EV); SuspendedEVSE(Paused by EVSE); Finishing; Fauled(error); Unpausing; Unavailable; No EVSE response; Available, Authorisation required; Stopping; Starting; Suspended by DLM; Reserved; Reserved, preparing(EV connected, authorization required); Charging ended or suspended by EV
Phases - number of used phases while charging	3 phases, Phase L1, Phase L2, Phase L3, Unknown phase, 2 phases.

Power	Charging power of EV.
EVSE max	Momentanely the maximum allowable charging current
Max current	Allowed max charging current.
Last session	Time - duration of charging session, Energy - consumed energy of charging session.
4. Error message(s)	
Possible errors are: CP positive voltage; CP negative voltage; RCD sensor trip; Overvoltage; Undervoltage; Charge with ventilation; PS reading error (EVSE); Current is higher than allowed; RCD sensor malfunction; Internal temperature is too high; PS reading error (grid); Can not lock; Can not unlock; Socket temperature is too high; Unavailable; Other error **Note**: for resolving errors please see table below.	
5. EVSE settings	
Priority charging	Utilize all available power to charge as fast as possible ignoring economy charging.
Locked	Disable unauthorized use of EVSE, authorization is possible with RFID tags or by cloud application.
Allow charging with ventilation	Allow/deny charging if EV requests ventilation.
Disable button	Disable functionality of button on housing.
Turn LED off after 3 minutes of inactivity	LED light is turned off after 3 minutes.
Eco charging	**Use current**: set desired current for charging. **Charge only at LO tarriff**: charging possible at low tariff only. Note: LO tarriff must be set. **Charge with surplus energy**: dynamically charge EV if there is surplus energy
EVSE works as slave	EVSE is a slave to master (Modbus TCP communication) EVSE with its serial number-SN. Green tick if communication is OK, red X for lost communication.
Limit if connection with master is lost	In case of lost communication, use set charging current.
6. Event log	
Shows last 10 charging session.	
begin & end time	Begin date, hour and end of charging session.
duration	Duration of charging session [h:min].
energy	Consumed energy in session.
card nr./type	Card ID used for charging session. If note “not locked” card ID is not used/needed.
note	Status message about charging session (normal or some error).
7. RFID, MIFARE and QR	
Add or delete RFID/MIFARE tag or QR code, for managing authorized access to EVSE.	
Card no. & card ID	Supported up to 10 RFID/MIFARE/QR tags/cards.
Manage card	Press Add for new card or delete existing one.
Time	60 seconds time frame for adding new card.
8. Time & date and SW version	
Time and date with software version release.	
9. configurator	
Runs Configurator	
10. autodetect	

Click to find EVSE in local network

1.3. Error table

RDC Charger recovers error automatically. To delete error by yourself long press button on charger housing or on application. **Charging is stopped while error is active. If red light still flashes, please read table bellow.**

Error	Possible causes	Possible solution
CP positive voltage CP negative voltage	Measured voltage on CP pin is out of range.	Check your charging cable and plug. Reconnect your EV. If error still appears, please contact your EVSE service.
RCD sensor trip	DC current leak detected.	Please try to connect another EV, if error still appears, please contact your EVSE service. Otherwise, please contact an authorized car service department.
RCD sensor malfunction	RCD sensor is damaged or not connected.	Please contact your EVSE service.
Undervoltage Overvoltage	Supply voltage is out of range.	Please contact your EVSE installer.
Charge with ventilation	EV requests charging with ventilation and “Charging with ventilation” is not enabled on configurator	Enable “Allow charging with ventilation” if charged EV is located in ventilated area.
PS reading error	No communication with internal power sensor.	Please contact your EVSE service.
Current is higher than allowed	Vehicle draws more power than allowed.	Please try to charge another EV, if error still appears, please contact your EVSE service. Otherwise, please contact an authorized car service department.
Internal temperature is too high	Temperature inside of charger is too high.	Make sure charger is not exposed to direct sunlight. Please contact your EVSE installer.

2. HEMS Configurator

2.1. home

Basic system overview.



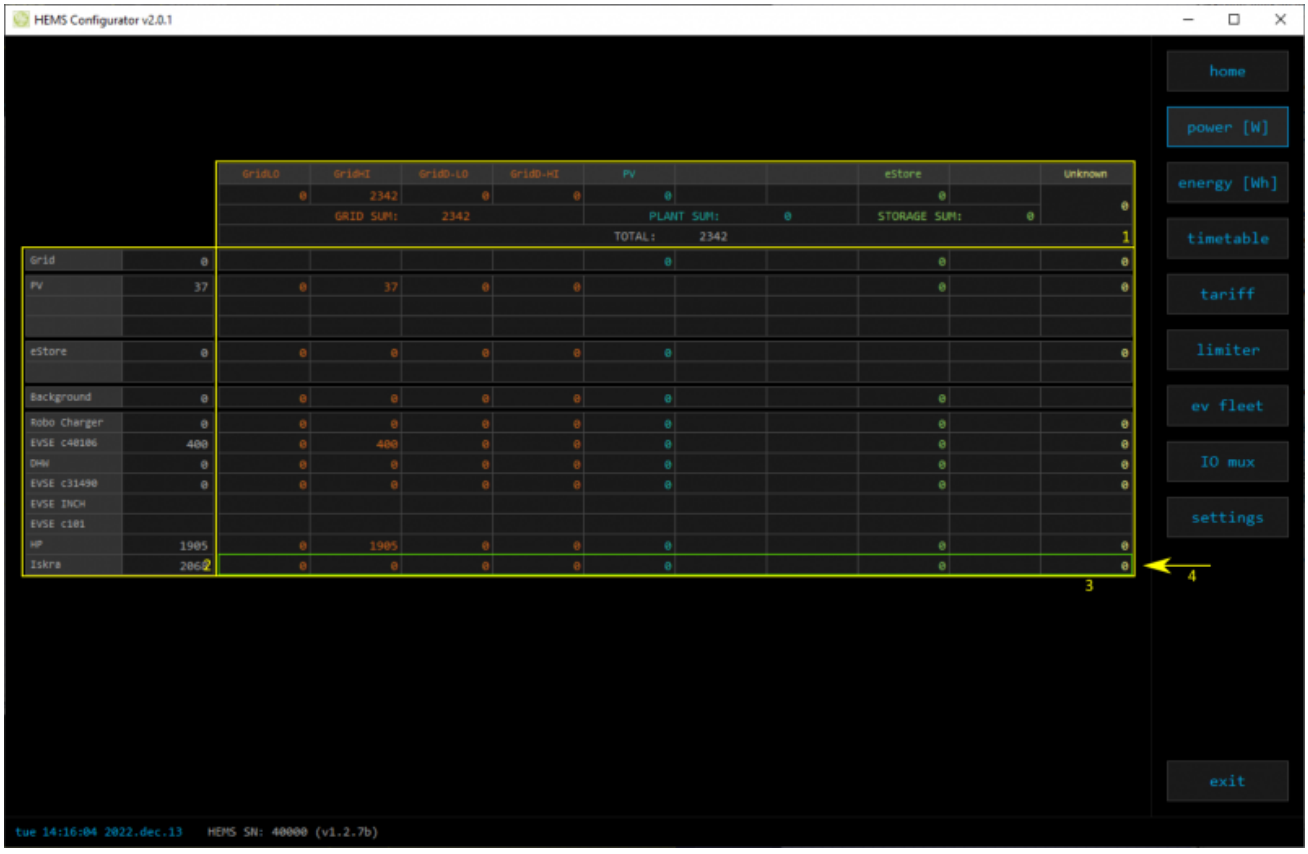
1. Grid		
›	From grid	Tariff (LO, HI, D-LO, D-HI) and power from grid in W
		Imported energy by tariff in Wh
‹	To grid	Power exported to grid in W
		Exported energy in Wh
2. Plants		
‹	Produced	Produced power in W and energy in Wh
›	Consumed	Consumed power in W and energy in Wh
3. Storage systems		
‹	Sourced	Power in W and energy in Wh sourced from storage (battery)
›	Stored	Power in W and energy in Wh stored (to battery)
bargraph and %[1]	SOC	Battery State Of Charge
4. Consumers		
›	Consumed	Consumed power in W and energy in Wh
[]	Status	Output status for managed consumers
click	Toggle	Click in frame toggles managed consumers output
5. Unknown source		
›	Sourced	Power in W and energy in Wh from unknown source
! Accumulate also all differences caused by power sensor inaccuracy		
6. Other consumers		
›	Consumed	Consumed power in W and energy in Wh by other (not measured) consumers
7. Page navigation		
	home	Home screen

	power [W]	Power screen
	energy [Wh]	Energy screen
	timetable	Timetable screen
	tariff	Tariff screen
	dlm	Limiterscreen
	ev fleet	EV fleet screen
	IO mux	IO mux screen
	settings	Settings screen
8. Exit		
	exit	Close appliction

[1] only for eStore

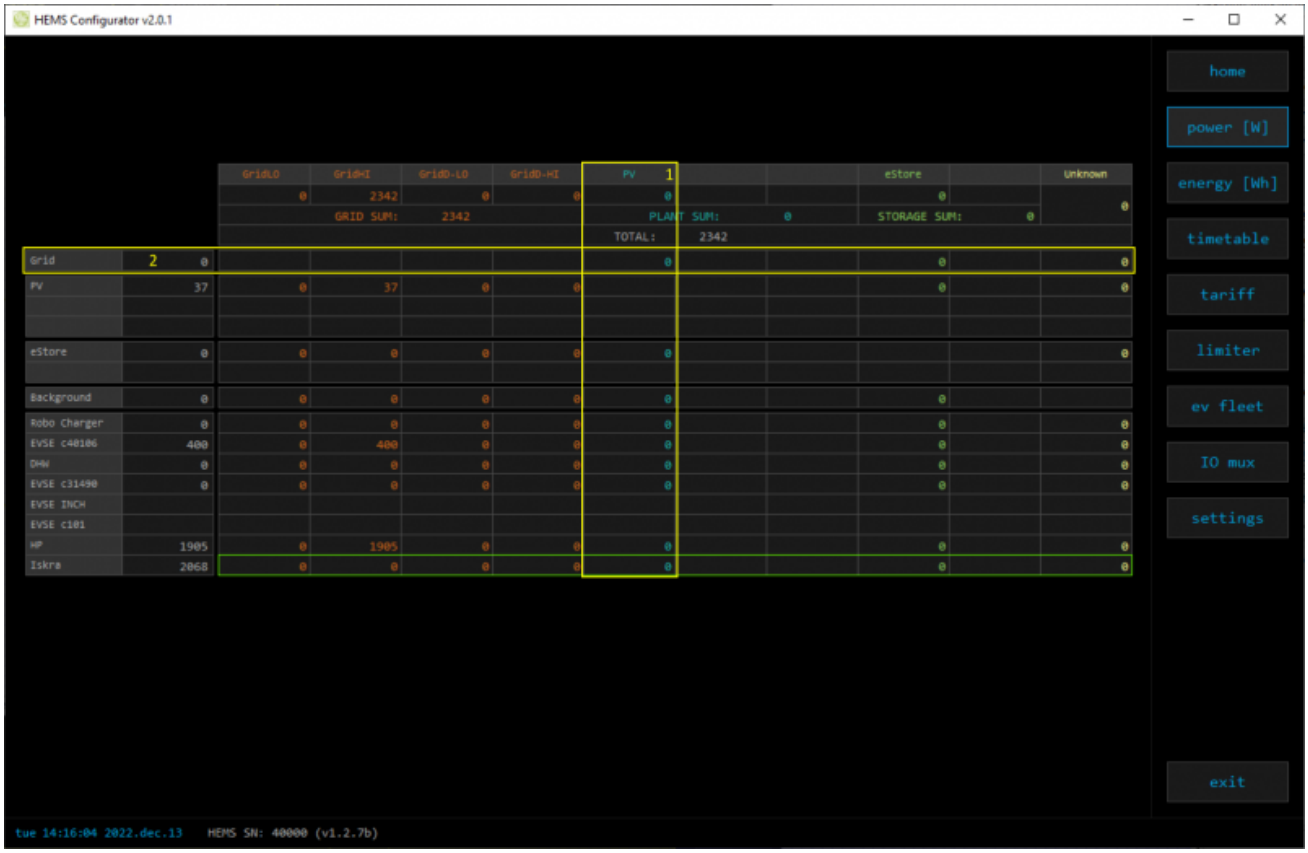
2.2. power

Overview of current power distribution by source / consumer.



1. Sourced power
Sourced power for each source
Sums per source type
Total of all sourced power
2. Consumed power
Power for each consumer
3. Power distribution

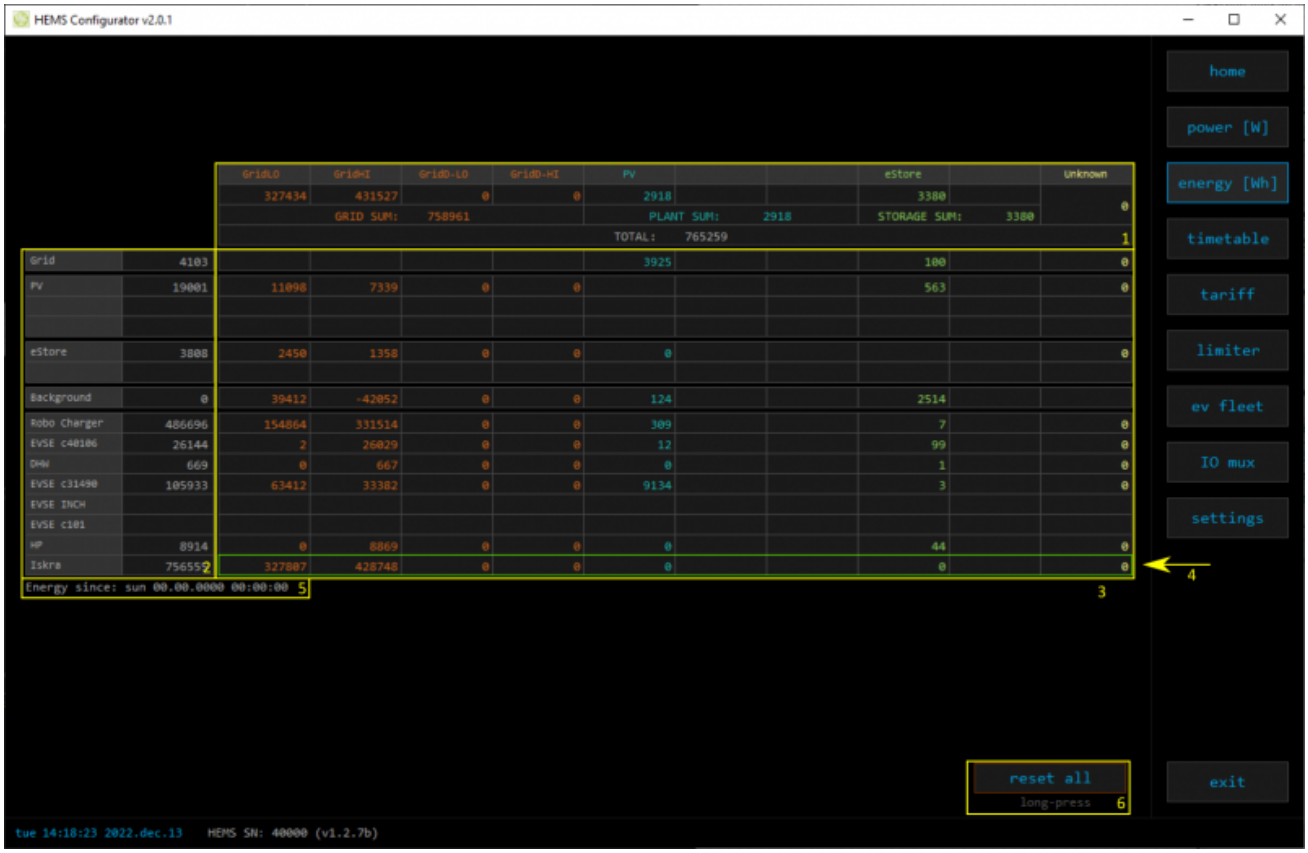
Partial distributed power
4. Submeter (Green outline)
Power meter is not part of internal circuit



1. Sourced power distribution
How sourced power is consumed by each consumer
2. Consumed power distribution
Who sources consumed power

2.3. energy

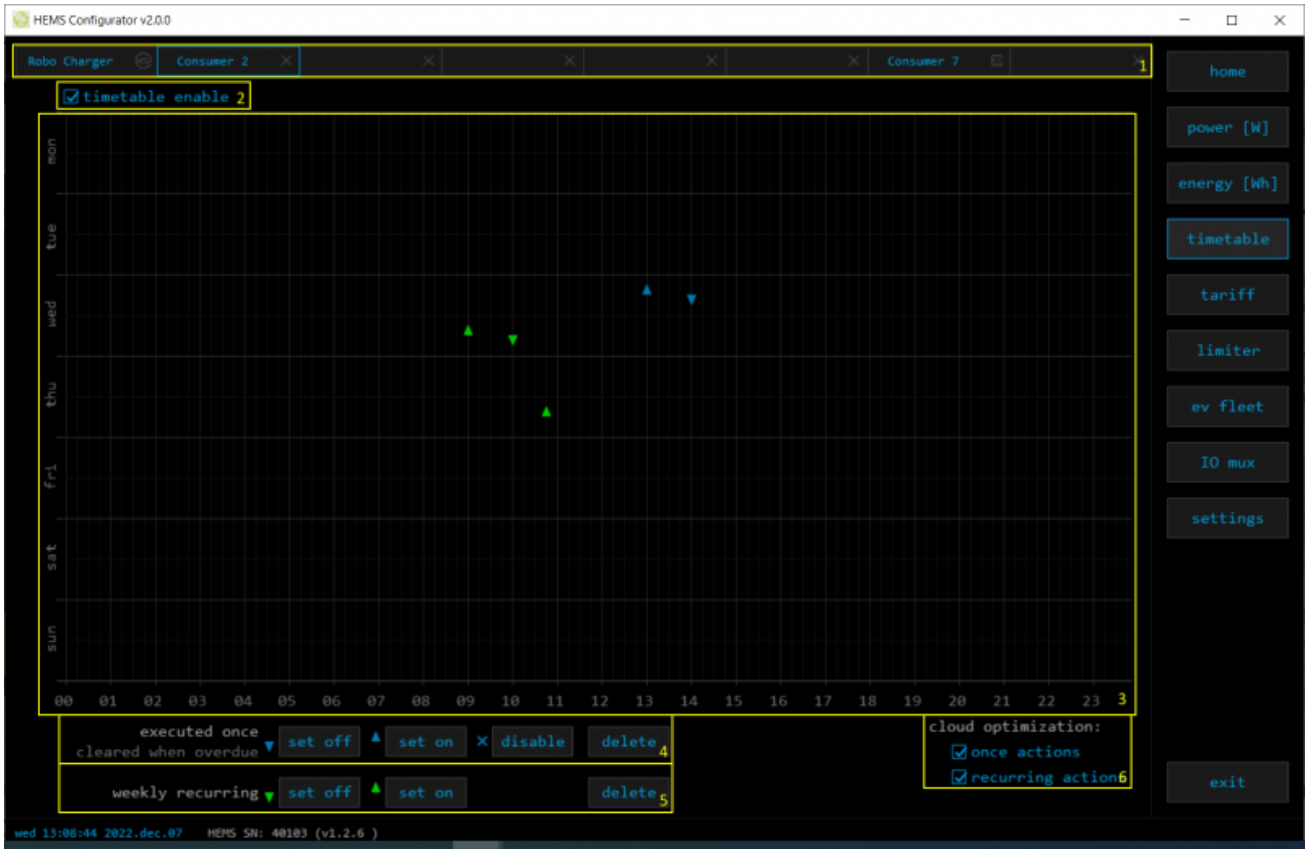
Energy overview of a given time distributed by sources / consumers.



1. Sourced energy
Sourced energy for each source
Sums per source type
Total of all sourced energy
2. Consumed energy
Energy for each consumer
3. Energy distribution
Partial distributed energy
4. Submeter (Green outline)
Power meter is not part of internal circuit
5. Energy since
Date and time since energy is recorded
6. Reset all
Long-press to reset all energy counters

2.4. timetable

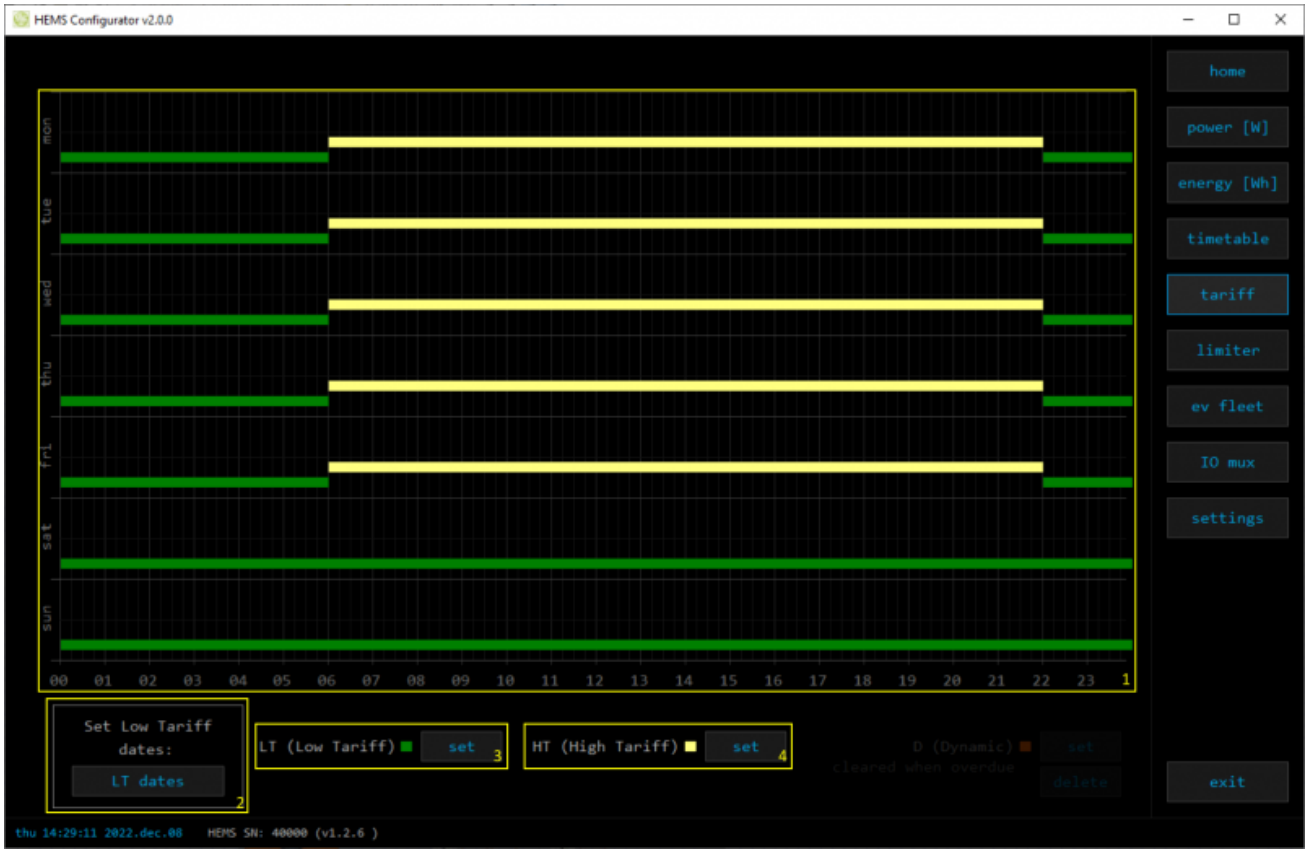
Weekly timetable for managed consumers.



1. Managed load menu
Switch between managed loads
2. Enable checkbox
When un-checked timetable is not executed
3. Events grid
Events displayed in weekly grid (15 min resolution)
Click to select time and set event by clicking buttons below
4. Once actions (top priority timetable actions)
Actions are executed and then automatically cleared.
“Disable” action will just disable recurring action.
5. Recurring actions (low priority actions)
Actions are executed each week.
6. Cloud optimization
When enabled (checked) cloud optimization is enabled.

2.5. tariff

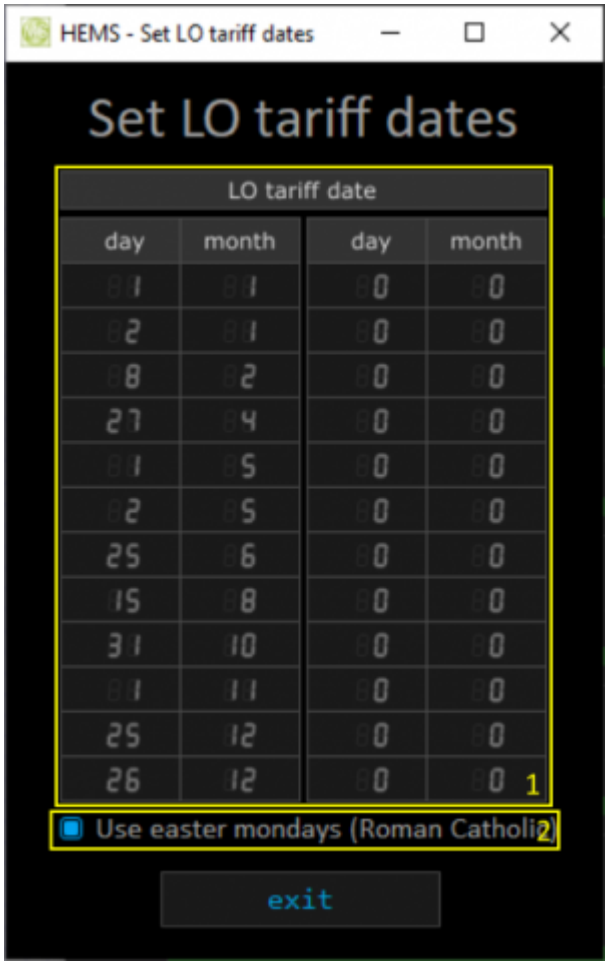
Weekly tariff timetable for grid energy per tariff distribution.



1. Tariff grid
Graphical weekly timetable with tariffs.
Click to select term, click-and-drag to select multiple terms.
2. Low tariff dates
Set low tariff dates for holidays.
3. Low tariff
Set low tariff for selected terms.
4. High tariff
Set high tariff for selected terms.

2.6. lo tariff dates

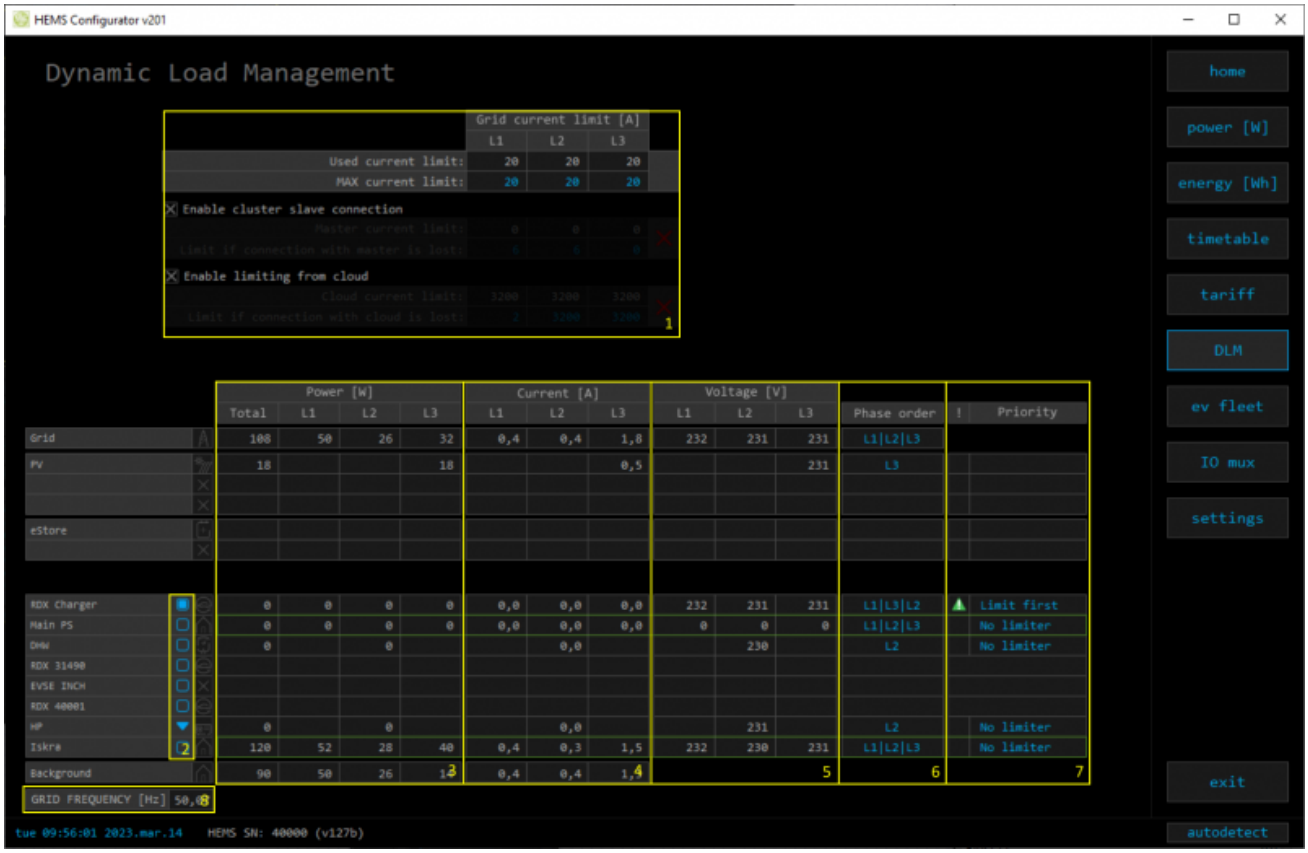
Holiday dates when tariff is low



1. Date table
Up to 24 days when tariff is low on holiday
2. Use easter mondays
Use preprogrammed roman-catholic easter monday holidays

2.7. Dynamic Load Management

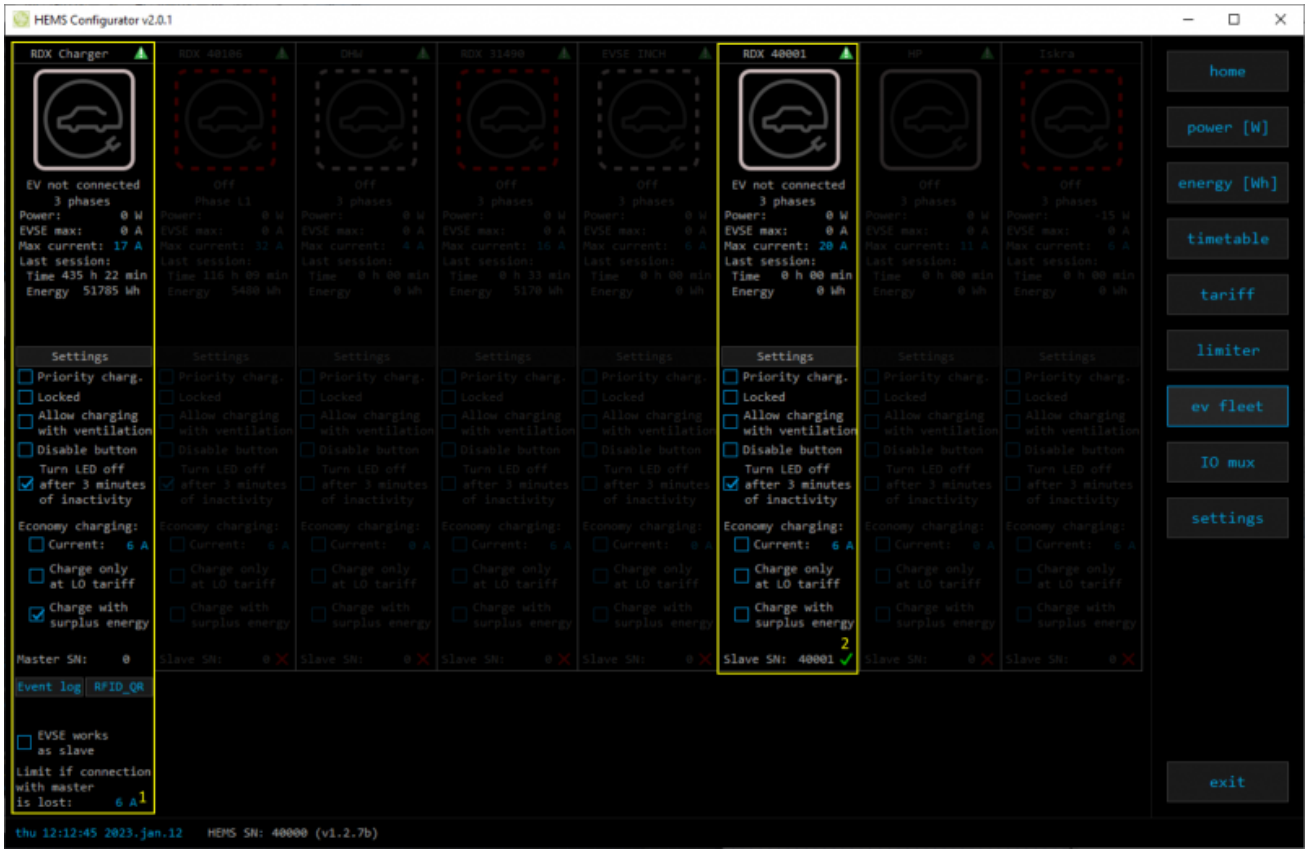
Overview and configuration of DLM



1. Grid Current limit	
MAX current limit	Current limit threshold for main grid fuse
Enable cluster slave connection	Current limit threshold if charger lost connection with master
Enable limiting from cloud	Current limit threshold if charger lost connection with cloud
2. Consumer management	
Turn consumers on or off	
3. Power	
Total power and power for each phase	
4. Current	
Current for each phase	
5. Voltage	
Voltage for each phase	
6. Phase order	
First set correct phase order for grid power sensor and then set for other power sensors/devices. **NOTE:** changing grid phase order will NOT apply to phase order of other connected devices!	
7. Status and priority	
✕ ✕	Yellow status when limiter is enabled and active. Green status when enabled and not active
Priority	Device priority group: no limiter, limit last (last to be limited), limit second, limit first (first to be limited)
8. Grid frequency	
Grid frequency measured on grid power meter sensor	

2.8. ev fleet

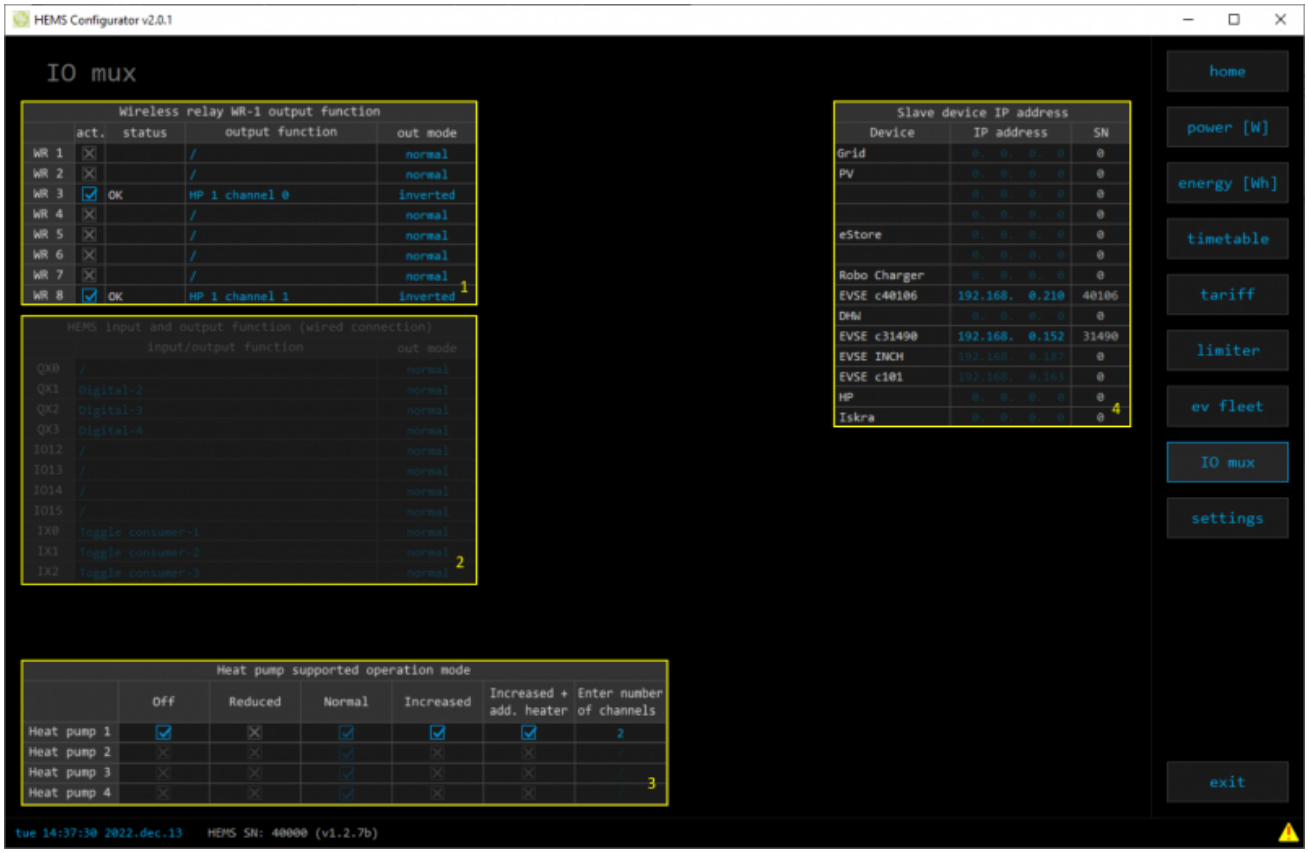
Overview and configuration of EVSE station. Up to 7 external EVSE supported.



1. EVSE - RDC Charger
RDC charger
2. Additional EVSE (charging station) linked to RDC charger
EVSE supports up to 7 charging stations. Settings are as for RDC Charger.
Slave SN: Serial number of slave charger Green tick → control of slave by master is allowed, Red X → control of slave by master is disabled.

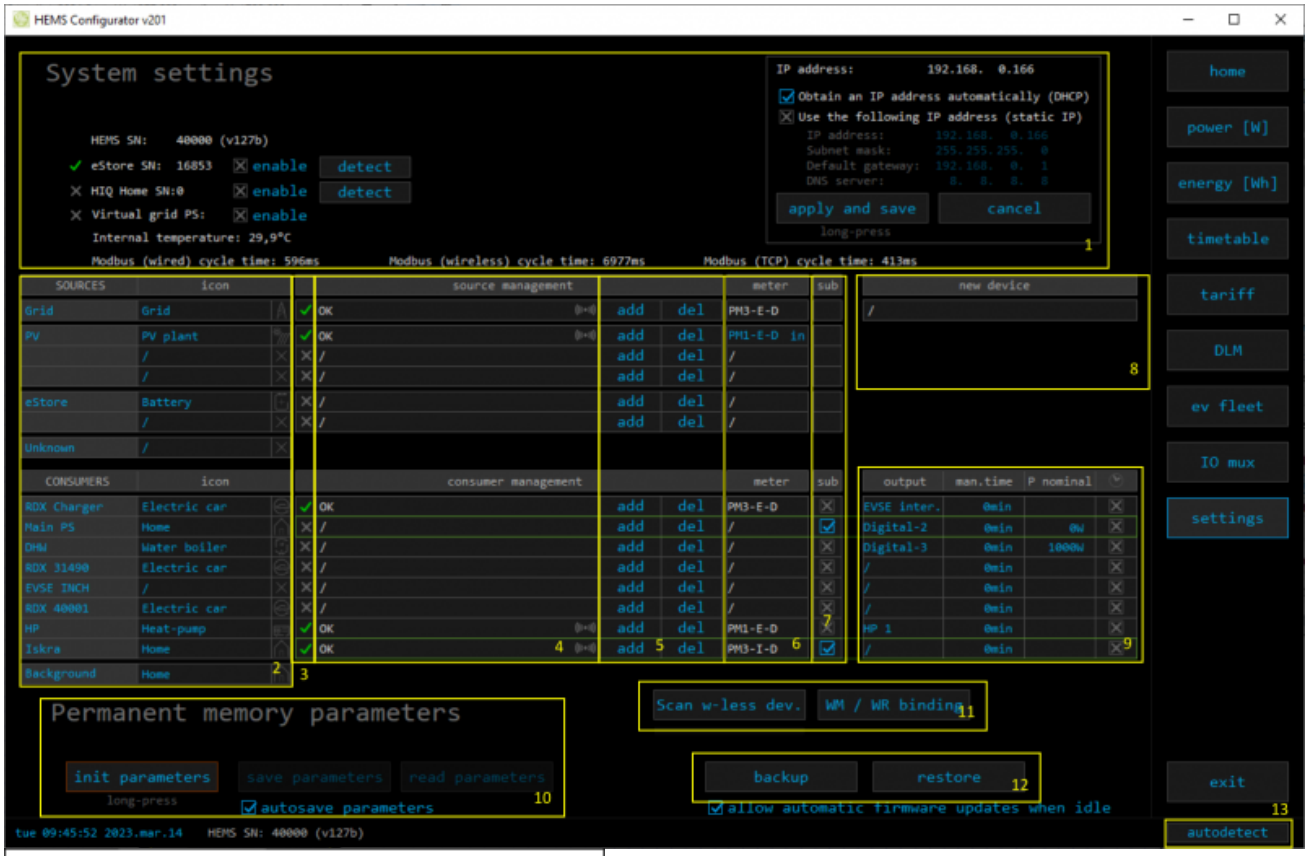
2.9. io mux

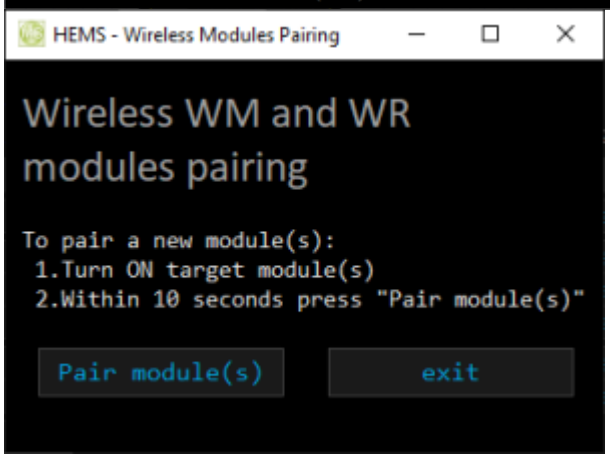
Overview and configuration of input/output ports IO mux



1. Wireless relay WR-1 output function
In the left column are WR modules WR-1 (max 8) with corresponding status (active + communication status). To each WR could be assigned HEMS function (e.g. digital, linker reset, router reset, heat pump channel etc) with output mode (normal or inverted).
2. HEMS input and output function (wired connection) - not for EVSE available
In the left column are MC controller ports to which could be assigned MC-230 functions (digital, linker reset, router reset, etc) with output mode (normal or inverted).
Default settings are for e.g. QX0 → digital 1 while digital 1 is defined for consumer 1 on settings page. Change to define new function role to QX0 port e.g. for linker reset
Enable consumer at input IX0,IX1 or IX2 means that dedicated consumer will be managed (ON/OFF) by input signal on IX0,IX1 or IX2. For example, if thermostat signal is wired to IXO port and “Enable consumer 1” to IX0, while thermostat is active, consumer 1 is active and otherwise.
Limitations: one temperature sensor is allowed, one consumer could be managed by one input only.
3. Heat pump supported operation mode
To control Heat pump by EVSE, define supported operation(control) mode based on heat pump specification. E.g. SGRHP supports external control by two channels (Off, Normal, Increased and Increased + additional heater) thus select them in table to enable functionality. **Note**: Before selecting modes, heat pump must be defined in setting page!
4. Slave device IP address
For device (PV inverter or external EVSE) define its IP address.

2.10. settings





1. System settings		
eStore	c.....	eStore serial number (automatically detected or can be entered manually).
	[] enable	When selected EVSE will obtain necessary data (power, voltage...) directly from battery storage system, no need to additional power sensor.
	[detect]	eStore address is cleared and new eStore can be detected.
HIQ Home	c.....	HIQ Home serial number (automatically detected or can be entered manually).
	[] enable	When checked HEMS will read Grid power and energy from HIQ Home (so there is no need to duplicate power-sensor).
	[detect]	HIQ Home address is cleared so new can be detected.

Virtual grid PS	[] enable	Select if system is without main grid power meter. Energy, power and currents are calculated from other power meters.
Internal temperature	Temperature inside of EVSE	
Modbus (wired) cycle time	Cumulative reading time of all wired power sensor in ms	
Modbus (wireless) cycle time	Cumulative reading time of all wireless connected power sensor in ms	
Modbus (TCP) cycle time	Cumulative reading time of all TCP connected devices in ms	
IP address	IP address of EVSE	
DHCP	Select for DHCP to obtain an IP address automatically → apply and save to confirm.	
Static IP	Set static IP to EVSE → apply and save to confirm.	
Note: If static IP settings are wrong, we won't be able to access RDC Charger any more!!! Restart EVSE with jumper between IX1-GND to return RDC Charger to DHCP settings.		
2. Sources and Consumers settings table		
SOURCES	Source name	
icon	Source icon	
3. Device status		
Status	Status OK, Warning, Error, Detected	
4. Device message		
source and consumer management	Source or consumer power sensor management	
	message	Messages related to source or consumer power sensor
		Power sensor is connected via WM-1 module
5. Device configuration		
Configuration	add	Associate new power sensor to source or consumer
	del	Disassociate power sensor from source or consumer & configure it as new power-sensor
6. Device type		
meter	Source or consumer power-sensor type	
configuration	in/ex	Power plant connection[1]
7. Submeter option		
sub	Check if this power meter or device is not part of internal circuit. Energy division for this device is ignored and outlined in green color.	
8. New device		
Detected new power sensor.		
9. Device output		
output	Select consumer output type	
man. time	Managed consumer manual override timer	
P nominal	Enter power for device in case where power sensor is not assigned to device.	
clock	Enable timetable	
10. Permanent memory parameters		
[init parameters]	Init all parameters to default values	

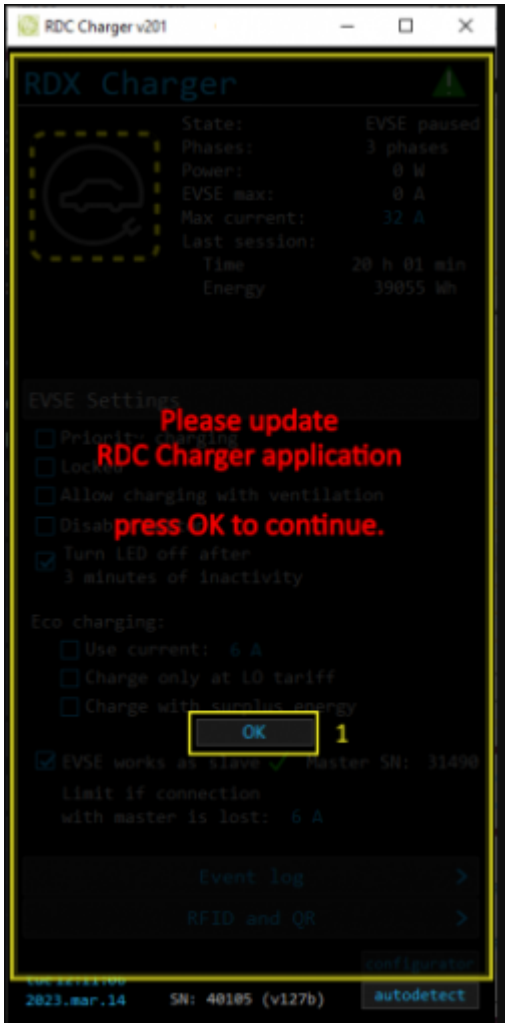
[save parameters]	Save all parameters to permanent memory
[read parameters]	Read all parameters from permanent memory
[] autosave parameters	Parameters will be automatically saved to permanent memory in 15 minutes after last parameter change
11. WM / WR settings	
Scan w-less dev.	Press to start scanning for power sensors wirelessly connected via WM-1 module as well as for WR-1 relay. Scanning is active for 5 minutes.
WM / WR pairing	Press to pair new WM-1 or/and WR-1.
12. Backup / Restore to PC	
[backup]	Backup all parameters to PC
[restore]	Restore all parameters from PC backup[2]
13. Autodetect	
[autodetect]	Click to find EVSE in local network.

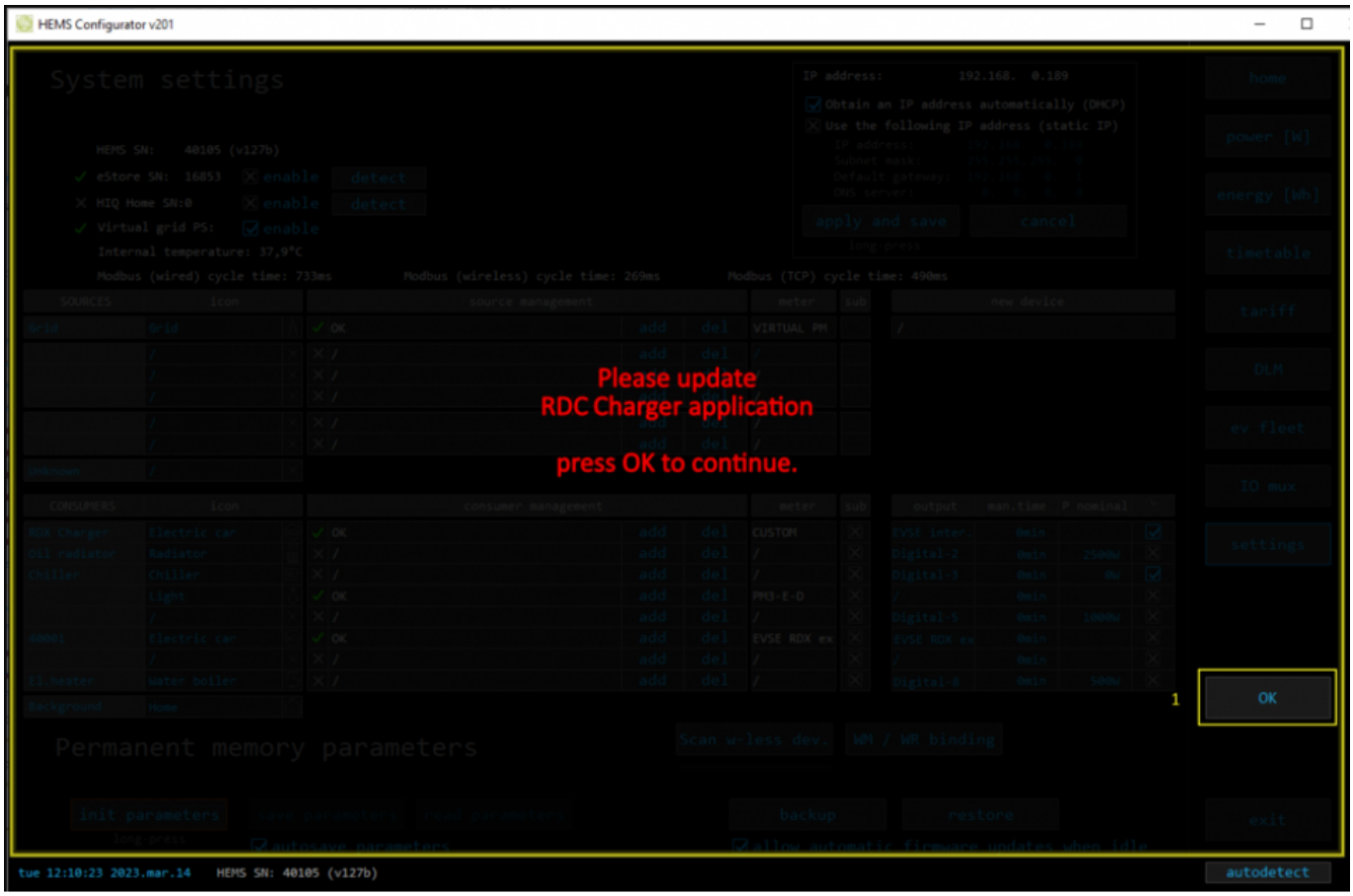
[1] only for the first power plant

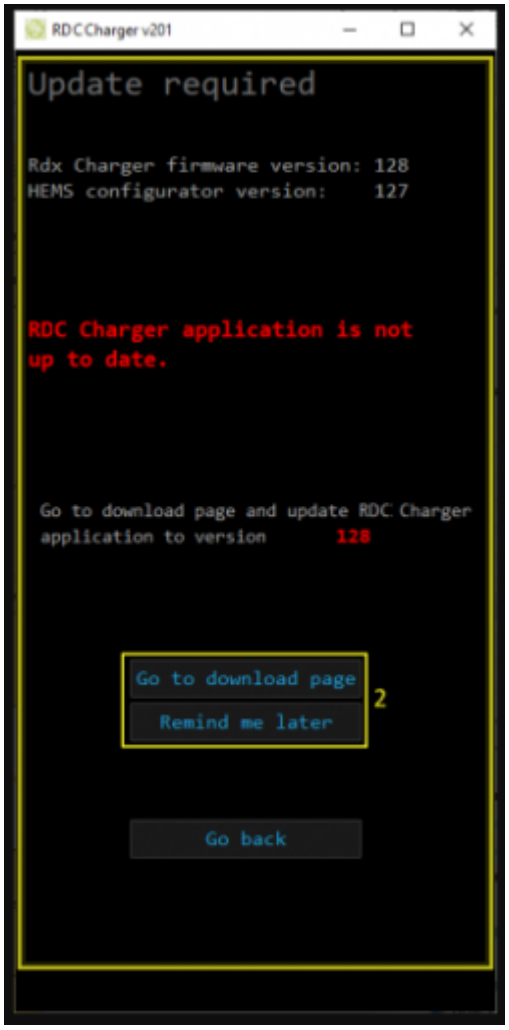
[2] older versions of backup files may be used. Any unsuccessfully backup or restored parameters will be displayed but operation will end successfully if you use **continue**.

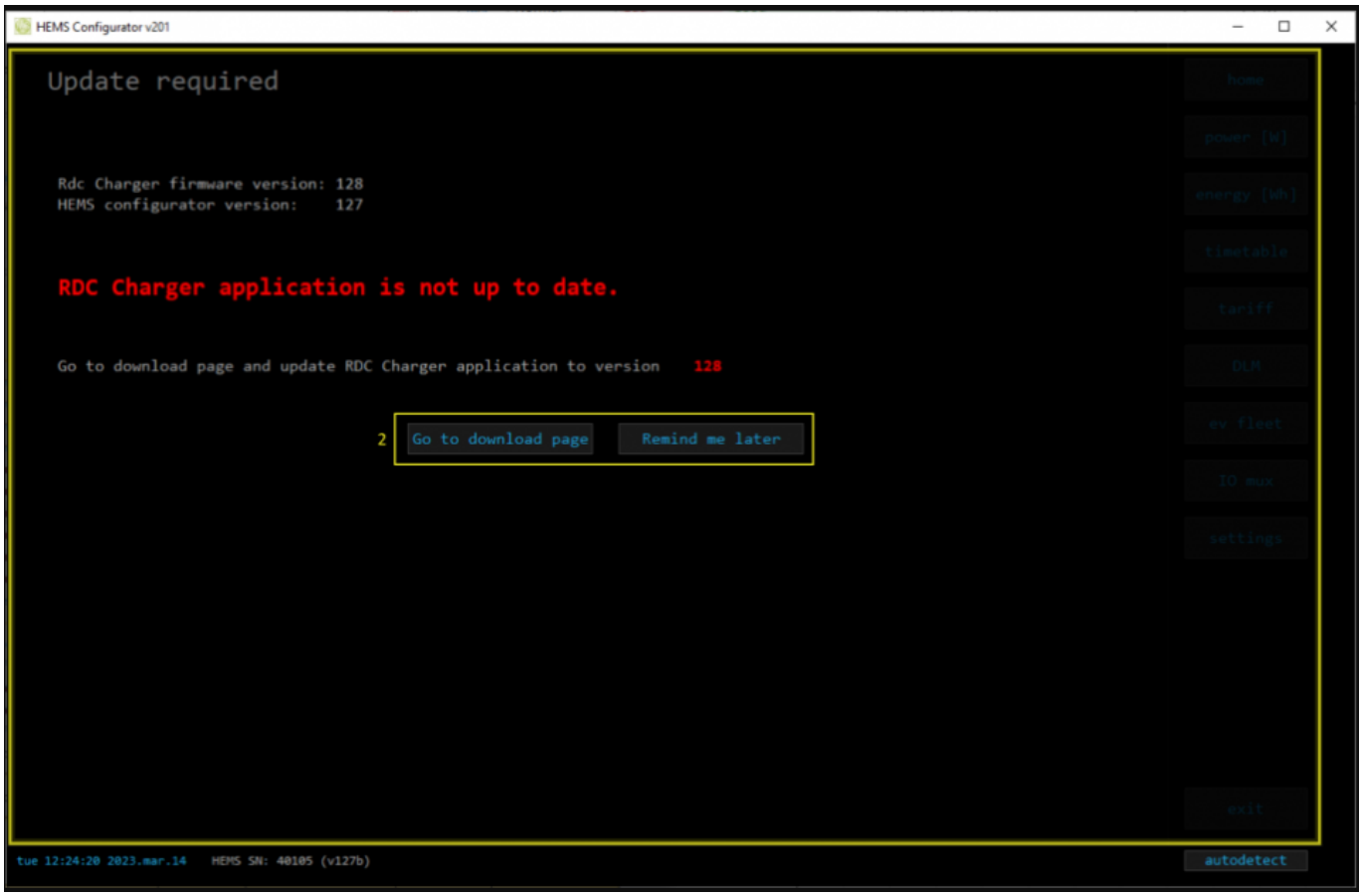
3. RDC Charger Update

RDC Charger application will detect update automatically.


RDC Charger v201
RDX Charger
State: EVSE paused
Phases: 3 phases
Power: 0 W
EVSE max: 0 A
Max current: 32 A
Last session:
Time 20 h 01 min
Energy 39055 Wh
EVSE Settings
Please update
RDC Charger application
press OK to continue.
Allow charging with ventilation
Turn LED off after
3 minutes of inactivity
Eco charging:
Use current: 6 A
Charge only at LO tariff
OK
1
Limit if connection
with master is lost: 6 A
Event log
RFID and QR
2023.mar.14
SN: 40105 (v127b)
autodetect


HEMS Configurator v201
System settings
HEMS SN: 40105 (v127b)
eStore SN: 16053
HIQ Home SN:0
Virtual grid PS:
Internal temperature: 37,9°C
Modbus (wired) cycle time: 733ms
Modbus (wireless) cycle time: 269ms
Modbus (TCP) cycle time: 490ms
IP address: 192.168. 0.189
Obtain an IP address automatically (DHCP)
Use the following IP address (static IP)
apply and save
cancel
Please update
RDC Charger application
press OK to continue.
1
OK
Permanent memory parameters
init parameters
backup
restore
exit
tue 12:10:23 2023.mar.14
HEMS SN: 40105 (v127b)
autodetect


RDC Charger v201
Update required
Rdx Charger firmware version: 128
HEMS configurator version: 127
RDC Charger application is not up to date.
Go to download page and update RDC Charger application to version 128
Go to download page
Remind me later
2
Go back


HEMS Configurator v201
Update required
Rdc Charger firmware version: 128
HEMS configurator version: 127
RDC Charger application is not up to date.
Go to download page and update RDC Charger application to version 128
2
Go to download page
Remind me later
home
power [W]
energy [Wh]
timetable
tariff
DLR
ev fleet
IO mux
settings
exit
tue 12:24:20 2023.mar.14
HEMS SN: 40105 (v127b)
autodetect

Procedure to update RDC Charger application is as follows:

- press OK and **make sure to follow** further instructions on page (1) (2)
- hit the button Go to download page (2) which will open internet browser on download page, download and install
- hit the button Remind me later to postpone update for 5 minutes