ACCESS SERVICE TOOL
USER MANUAL

MICROPOWER GROUP™
POWERFUL SOLUTIONS PARTNER

Safety precautions

Read the instructions. The manual contains important safety and operating instructions. Always keep this manual nearby the product.

Read and understand this instruction, the battery instruction provided by your battery manufacturer, and your employer's safety practice, before using, installing, or servicing the product.

Only qualified personnel should install, use or service this product.

Applies to the European market, EN standard: This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

Applies to markets outside Europe, IEC standard: This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

Description

In the Access system, battery chargers and Battery Monitoring Units (BMU) communicates wirelessly in networks.

The units collect internal data about charging and discharging cycles, alarm and other events and instant log information. In order to have a flexible, user friendly way of reading out and analyzing all this data the Access Service Tool was created.

The Access Service Tool is a PC application that runs on the Microsoft Windows platform. The application enables read out of cycles, alarms and events, instant log and also configuration of units in the Access system.

The Access Service Tool main task is to read out data from chargers and BMU and present the data in tables and diagrams. This data is then available for export to Microsoft Excel compatible files where further analysis can be done.

Requirements

A PC and the Access USB gateway are required to run the Access Service Tool. Functions and menus in the Access Service Tool are dependent on the part number and user level of the Access USB Gateway.

NOTE

Do not plug in the Access USB Gateway prior to the installation below.

System requirements

- Microsoft Windows XP, Vista, 7, 8, 10
- 100 MB available HDD space
- USB port
- Screen resolution 1024x768 or higher

Access USB Gateway

The Access USB Gateway acts as an interface between the Access Service Tool and the Access radio network. The Access Service Tool cannot be run without the Access USB Gateway connected to the computer.

Gateway Generation 2

Gateway Generation 1

Order

The Access Service Tool has the following part numbers:

User level	Micropower P/N
2	902108-002
2	902108-102 (FCC markets only)
3	902108-003
4	902108-004

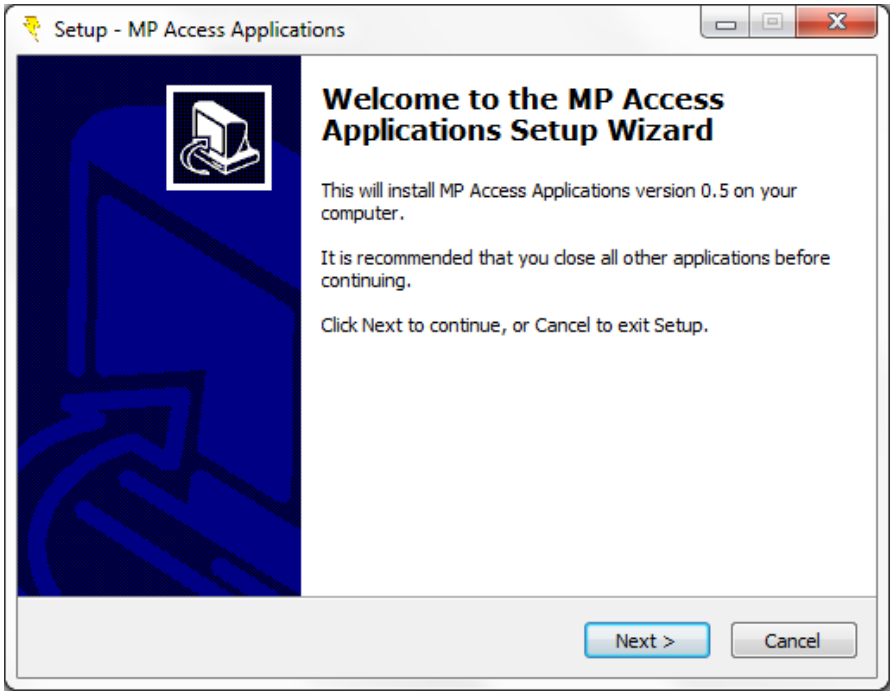
In the package the following items are included:

Item	Micropower P/N
USB gateway with gateway application (116-10-003)	3313001
Information flyer	6518043
USB stick with installation files	11611004

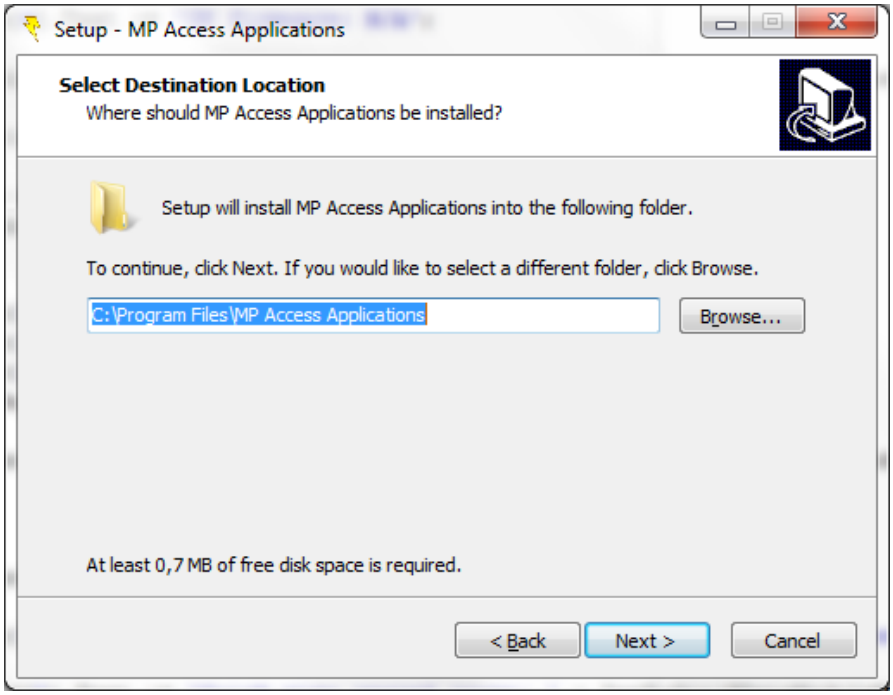
Installation

Do not plug in the Access USB Gateway prior to the installation below. To install the Access Service Tool run the executable file on the CD or USB stick. Access applications consist of Access Service Tool and Access - BBC View, for viewing best battery choice system status.

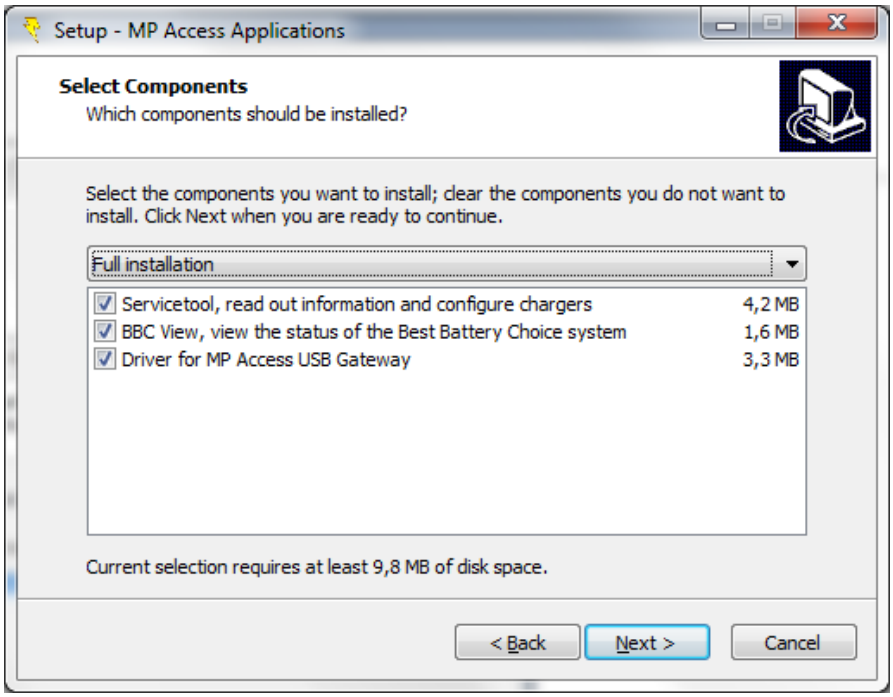
The following screen appears:



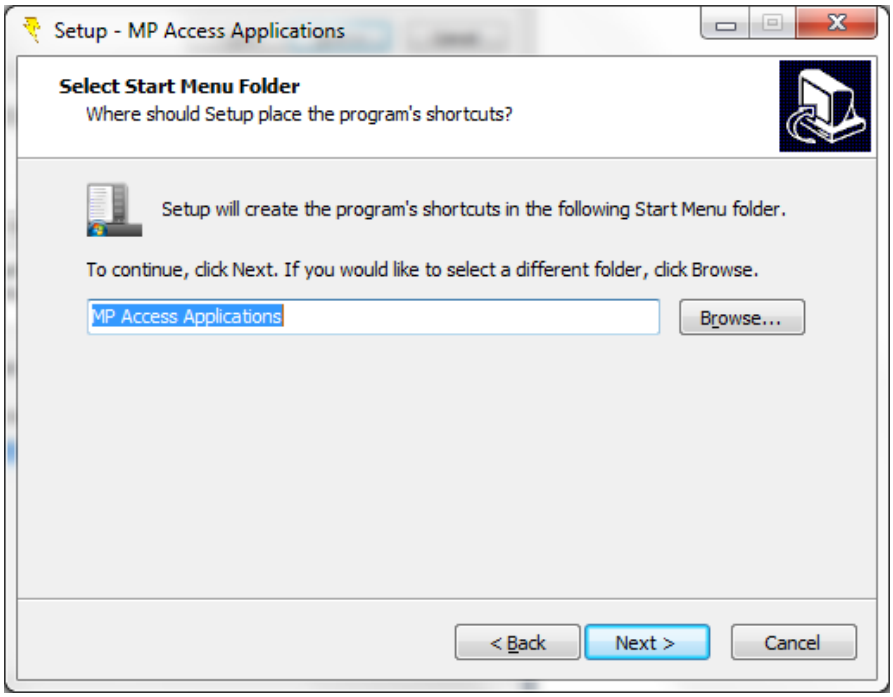
Click **Next**



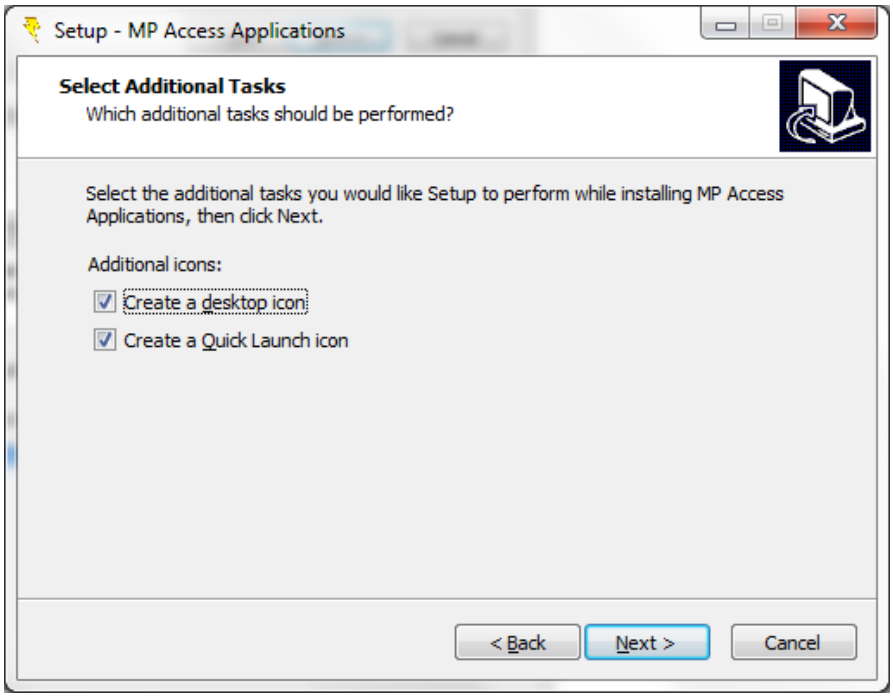
The default installation program folder is selected automatically.
To change this location click **Browse**… and select the folder of choice. Click **Next**.



Select the components to install and click **Next**.

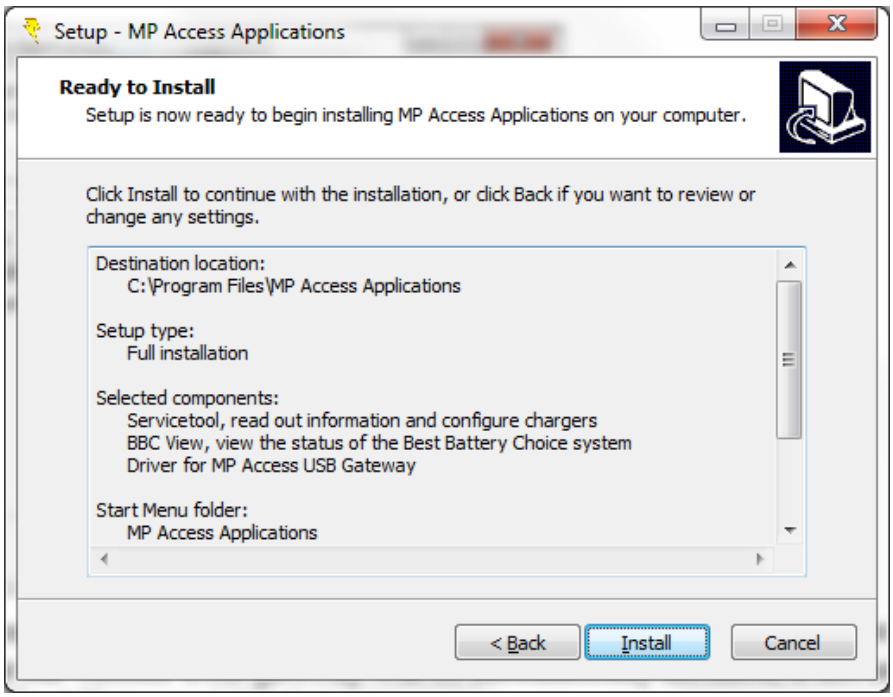


By default the installation will create shortcuts in the start menu folder named Access Service Tool. To change folder click **Browse**… or type the preferred designation directly.



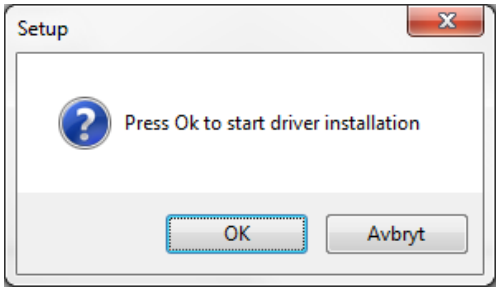
Select additional tasks. If the computer is connected to the Internet and Windows update the drivers for the Access USB gateway will be automatically installed, if not select the Install driver for Access USB Gateway.

Click **Next**.



Click **Install**. Files will now be copied to the specified location and shortcuts created.

If the Driver for Access USB Gateway component was selected in previous menu the following message will appear:



When clicking **Ok** the driver installation program is executed as a separate application.

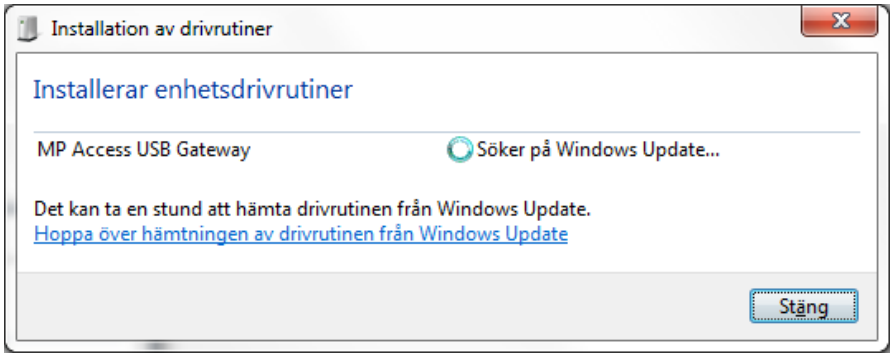
Click **Finish**.

Access USB Gateway initialization

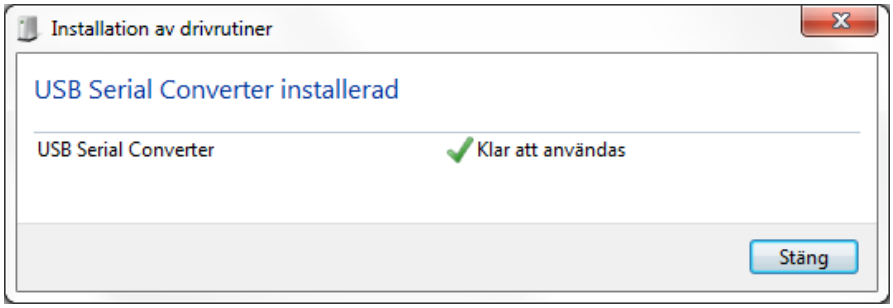
Plug the Access USB Gateway into the computer.

Driver installation with Windows

If the computer is connected to the Internet and Windows update, the following screen is shown:



The driver is installed automatically and after a while the device is ready to use.



Driver installation without Windows update

The computer will detect a new hardware and start the hardware installation guide.

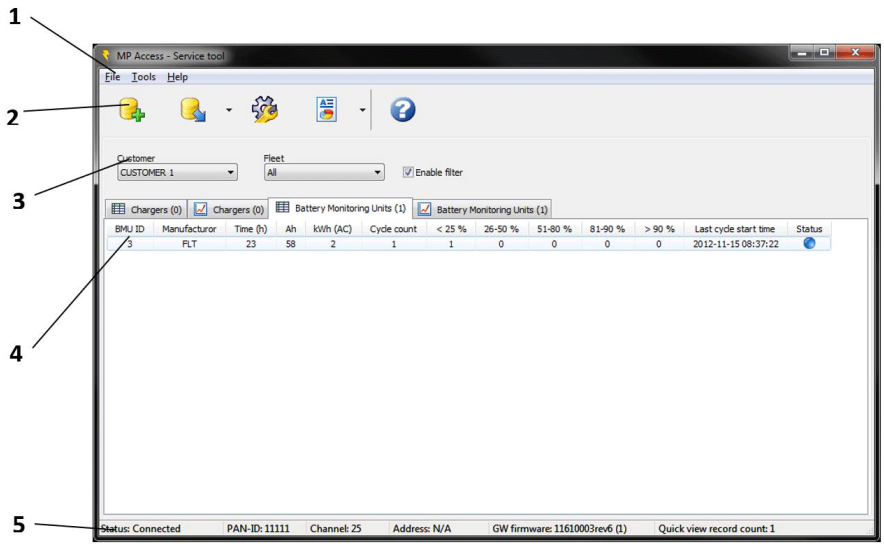
Select install driver automatically. If the driver is not found go to the Drivers folder in the installation folder and double click on USBgatewaydriver.exe. When the driver installation is completed, remove and insert the USB gateway again.

Startup

At startup of the Access Service Tool the application is loaded and a connection to the Access USB gateway is initiated.
If the Access Service Tool encounters any problems messages will be shown with instructions how to proceed.

The Access Service Tool

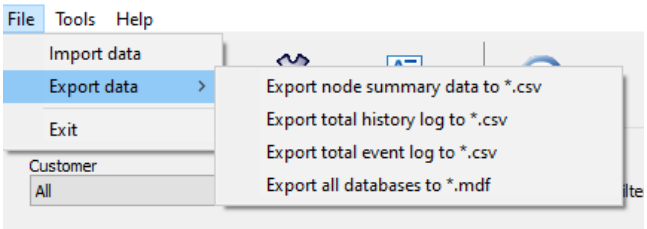
Main window

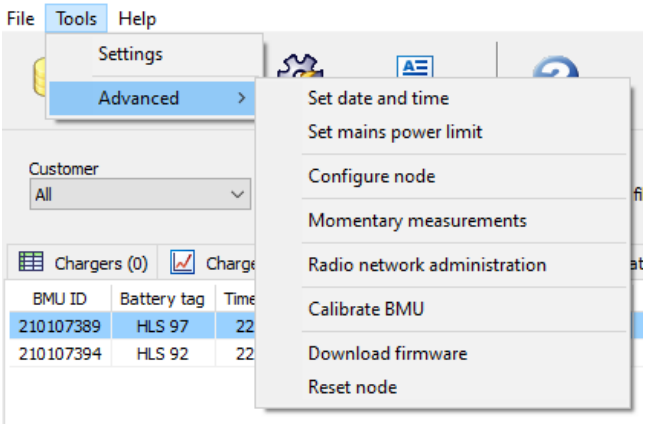


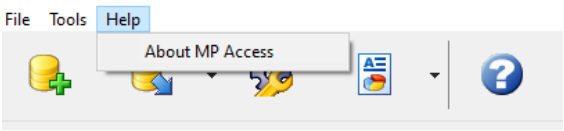
NOTE

The Access Service Tool can have different appearance depending on the user level. The following screen shows user level 2.

1. Menu bar



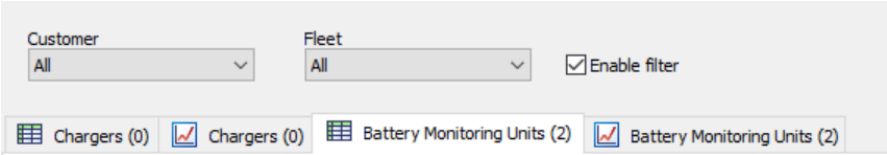




2. Toolbar

	Import data.
	Export data. Action set by using the arrow down on the right part of the button.
	Open the Settings window.
	View/Generate reports. Select report to generate with the arrow down on the right part of the button.
	Open the window for viewing application and version information about the Access Service Tool.

3. Quick view filter



In this area the data in the Quick view can be filtered. The filter options are:

Customer	Show only data related to the selected Customer.
Fleet	Show only data related to the selected Fleet.
Enable filters	This checkbox is automatically checked if any filter option is selected. To turn off the filter but keep the filter options, uncheck this checkbox.

4. Quick view

In the Quick view area a summary of all read out charger and BMU data is shown. When charger data is imported the Quick view is updated with new or edited information.

NOTE

If the statistics are cleared in the charger, the cycle count, time, Ah etc. are also cleared and will show 0. Charge start time and latest cycle time will however show the first and last cycle stored in the database.

A double click on the Quick view area opens up the window Charger details, where all readout data from the selected charger can be viewed and exported.

A right-click on the Quick view area opens a menu where Import data and Charger details windows can be accessed or Remove selected charger from database selected.

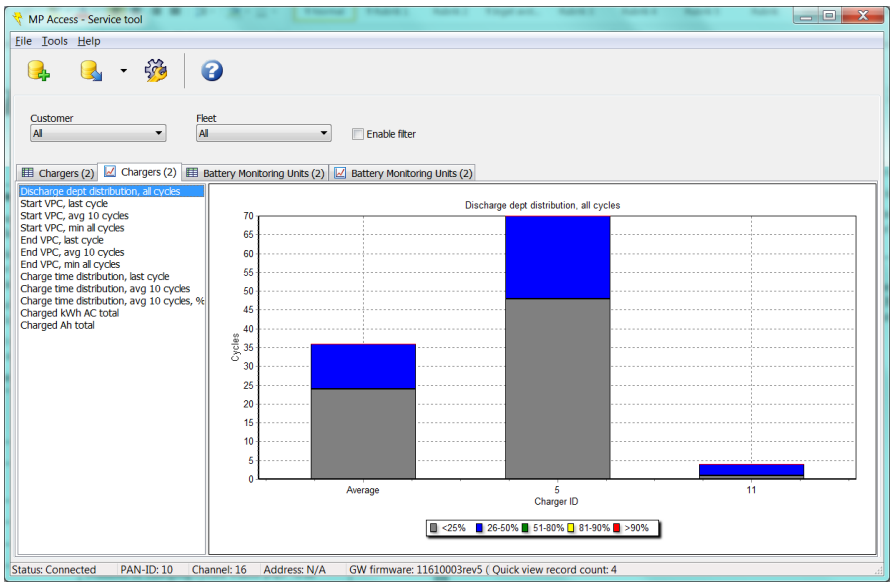
The following data is present in Quick view, Charger:

Charger ID	Charger identifier. Configurable via the charger menu system.
Charger model	The power unit description.
Time (h)	Total active charging time. This time is only calculated when the power unit is active.
Ah	Total ampere hours charged.
kWh (AC)	Total energy drained from mains supply.
Cycle count	Total number of charging cycles in charger.
2-25 %	Number of charging cycles where 2-25 % of battery capacity have been charged in the main charging phase.
26-50 %	See above.
51-80 %	See above.
81-90 %	See above.
> 90 %	See above
First cycle start time	Start time of the first charging cycle.
Last cycle start time	Start time of the latest charging cycle.
Status	The status indicates the momentary charger status at last Import data and copies the appearance of the status indicators on the charger panel. 0 Grey – the charger is in idle mode, waiting for a battery to be connected. 1. Yellow – a battery charge is ongoing. 2. Green – a battery charge is ready. 3. Red – an alarm is active in the charger. When the mouse pointer enters the status field a status window is shown. See below for description.

In order to more easily comprehend all the information it is possible to choose the tab Chargers (second from the left) for a more graphical representation of the data.

Here the data is presented in various graphs and the user can select the parameter of interest in the menu to the left. In the diagram it is possible to zoom by making a rectangle left to right over the area which should be enlarged. In order to zoom out, just make a rectangle right to left instead.

In the diagrams all present chargers for the specified customer are included. The graph to the left shows the average values based on the data for the other chargers.



In the menu to the left it is possible to select:

Charged capacity distribution all cycles	Presents the distribution in number of cycles between how many percent of the battery capacity that was charged during main charging phase.
Cycle capacity usage, 10 cycles	Shows the distribution in number of cycles between different types of charging cycles. The types are defined as follow: Deep discharge: Charged Ah main > 80 % Incomplete charge: Charged Ah main < 80 % and Charge ready flag set to false. Normal charge: Charged Ah main < 80 % and Charge ready flag set to true.
Start VPC, last cycle	Shows the starting voltage/cell for the latest charging cycle.
Start VPC, avg 10 cycles	Shows the average value for the starting voltage/cell based on the 10 latest cycles.
Start VPC, min all cycles	Presents the minimum value for starting voltage/cell among the cycles which are available for the present chargers.
End VPC, last cycle	Shows the ending voltage/cell for the latest charging cycle.
End VPC, avg 10 cycles	Shows the average ending voltage/ cell based on the 10 latest cycles.
End VPC, min all cycles	Shows the lowest value for ending voltage/cell among the cycles which are available for the present chargers.
Charge time distribution, last cycle	Presents the distribution in hours between time spent in active charge and resting charge for the latest cycle.
Charge time distribution, avg 10 cycles	Shows the average value in hours for the distribution between time spent in active charge and resting charge based on the 10 latest cycles.
Charge time distribution, avg 10 cycles %	Presents the average value in % for the distribution between time spent in active charge and resting charge based on the 10 latest cycles.
Charged kWh AC total	Presents the total number of charged kWh.
Charged Ah total	Presents the total number of charged Ah.
Operational quality, 10 cycles	Present the operational quality. 67-100 % = Green = good, 33-66 % = yellow = moderate, 0-32 % = red = bad. See report section for further information about the operational quality parameter.

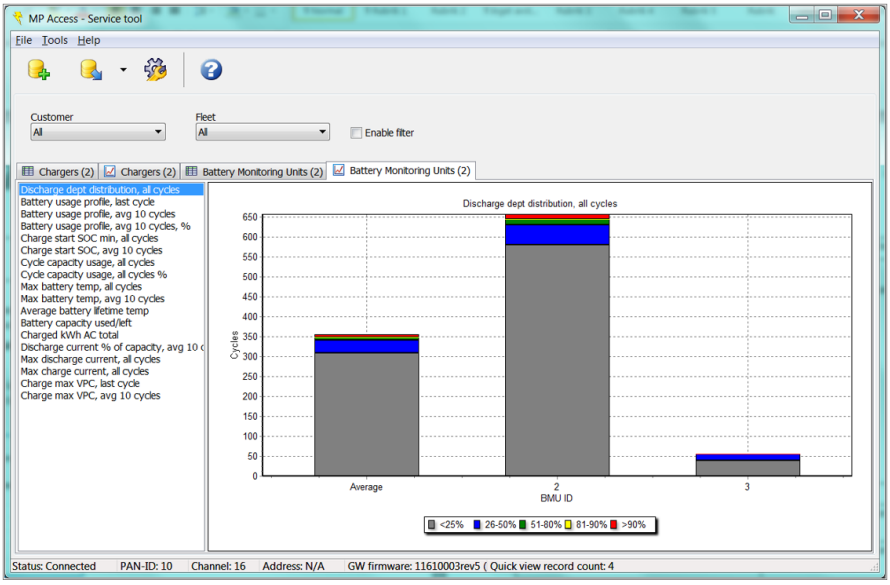
For the corresponding information from the BMU choose the tab Battery monitoring units (second from the right). A double click on the Quick view area opens up the BMU details window, where all read out data from the selected BMU can be viewed and exported.

A right-click on the Quick view area opens a menu where Import data and BMU details windows can be accessed or Remove selected BMU from database selected.

The following data is present in Quick view, BMU:

BMU ID	BMU identifier. Configurable via Advanced - Configure node in the Access Service Tool.
Manufacturer	BMU manufacturer described with 8 ASCII characters.
Time (h)	Total active time, both charging and discharging.
Ah	Total ampere hours discharged.
kWh (AC)	Total energy drained from mains supply calculated as charged Wh/charging efficiency.
Cycle count	Total number of cycles (charging and discharging) in the BMU.
≤ 25 %	Number of cycles where ≤ 25 % of the battery capacity have been discharged. In order for the cycle to be counted at least 1Ah must have been discharged from the battery.
26-50 %	See above.
51-80 %	See above.
> 90 %	See above.
First cycle start time	Start time of the first cycle
Last cycle start time	Start time of the last cycle
Status	The status indicates the momentary BMU status at last Import data. 0 - 1. Yellow – a battery charge is ongoing. 2. - 3. Red – an alarm is active in the BMU. 4. Blue – a battery discharge is ongoing. When the mouse pointer enters the status field a status window is shown. See below for description.

For the BMU it is also possible to get the data presented with a more graphical approach by choosing the tab Battery monitoring unit (furthest to the right). The data is here presented via informative graphs and the user can zoom in by making a rectangle left to right over the area of interest. In order to return to default scale it is possible to make a rectangle right to left instead.

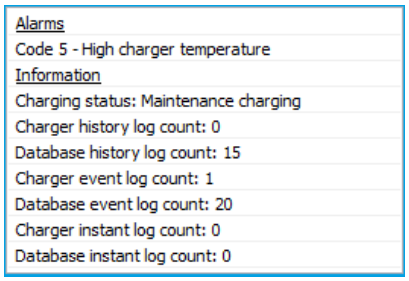


In the menu to the left it is possible to select:

Discharged capacity distribution	Presents the distribution in number of cycles between how many percent of the battery capacity that was discharged during usage of the battery.
Battery usage profile, last cycle	Shows the distribution in hours between charge active/resting and discharge active/resting for the latest cycle.
Battery usage profile, avg 10 cycles	Presents the average value in hours for the distribution between charge active/ resting and discharge active/resting based on the 10 latest cycles.
Battery usage profile, avg 10 cycles %	Shows the average value in % for the distribution between charge active/resting and discharge active/resting based on the 10 latest cycles.
Charge start SOC min, all cycles	Presents the lowest starting value for SOC (state of charge) among the cycles which are available for the present BMUs. Note that SOC represents the quotient (in percent) between the current number of Ah in the battery and the marked battery capacity.
Charge start SOC, avg 10 cycles	Shows the average starting value for SOC based on the 10 latest cycles.
Cycle capacity usage, all cycles	Shows the distribution in number of cycles between different types of charging cycles. The types are defined as follow: Deep discharge: Charge start SOC < 20 %. Incomplete charge: Charge start SOC ≥ 20 % and Charge end SOC < 99 %. Normal charge: Charge start SOC ≥ 20 % and Charge end SOC ≥ 99 %.
Cycle capacity usage, all cycles %	Presents the distribution in % between different types of charging cycles.
Max battery temp, all cycles	Shows the highest measured battery temperature among all available cycles for the present BMU:s.
Max battery temp, avg 10 cycles	Presents the average value for maximum battery temperature based on the 10 latest cycles.
Average battery lifetime temp	Shows the average value for battery temperature based on the lifetime for the battery. Calculated since latest Clear statistics.
Battery capacity used/left	Shows the distribution between how much of the battery capacity that has been used and how much that is left.
Charged kWh AC total	Present how many kWh that has been charged to the battery.
Discharge current % of capacity, avg 10 cycles	Shows the average distribution between how many Ah that has been discharged, with different discharging currents in relation to battery capacity, based on the 10 latest cycles.
Max discharge current, all cycles	Shows the highest measured discharge current among the cycles which are available for the presents BMU:s.
Max charge current, all cycles	Shows the highest measured charge current among the cycles which are available for the presents BMU:s.
Charge max VPC, last cycle	Shows the highest value for voltage/ cell for the latest cycle.
Charge max VPC, avg 10 cycles	Presents the average value for maximum voltage/cell based on the 10 latest cycles.
Operational quality, 10 cycles	Present the operational quality. 67-100 % = Green = good 33-66 % = Yellow = moderate 0-32 % = Red = bad See section *Report* for further information about the operational quality parameter.

4.1 Chargers

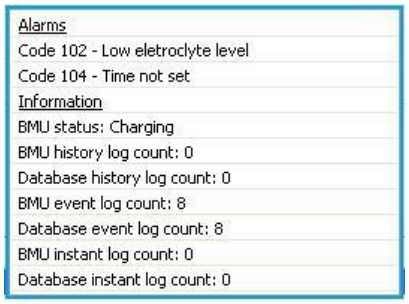
The status window below is an example of how it can look when an alarm is active (red status indicator) and the charger is in maintenance charging phase.



Alarm	Description
Code 5 – High charger temperature	The alarm/s active in the charger at last Import data.
Information	**Description**
Charging status	The present charging status.
Charger history log count	Number of history logs available in the charger. A lower number of logs in *Charger history log count* than in *Database history log count* indicates that the statistics has been cleared in the charger.
Database history log count	Number of history logs available in the database. A lower number of logs in *Database history* log count than in *Charger history log count* indicates that not all data in the charger has been imported.
Charger event log count	See description above, but for event log.
Database event log count	See description above, but for event log.
Charger instant log count	See description above, but for instant log.
Database instant log count	See description above, but for instant log.

4.2 Battery Monitoring Units

The status window below is an example when two alarms are active (red status indicator) and the BMU status is charging.



Alarms	Description
Code 102 - Low electrolyte level	The alarm active in the BMU at last Import data.
Code 104 - Time not set	The alarm active in the BMU at last Import data.
Information	**Description**
BMU Status	The current BMU status.
BMU history log count	Number of history logs available for the BMU. A lower number of logs in BMU history log count than in Database history log count indicate that the statistics has been cleared for the BMU.
Database history log count	Number of history logs available in the database. A lower number of logs in Database history log count than in BMU history log count indicate that not all data from the BMU has been imported.
BMU event log count	See description above, but for event log.
Database event log count	See description above, but for event log.
BMU instant log count	See description above, but for instant log.
Database instant log count	See description above, but for instant log.

4.3 Remove charger or BMU

With a right-click in the Quick view area the menu item *Remove selected charger from database* is shown. This function removes the selected charger from Quick view and all files related to this charger. For removing a BMU from the database follow the same procedure in the BMU tab.

NOTE

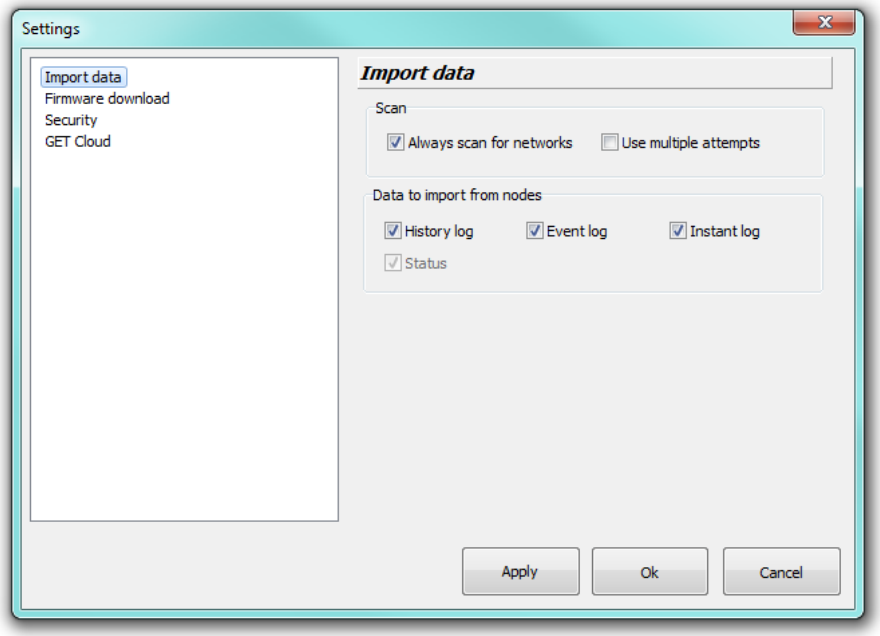
This action cannot be undone.

5. Status

The status bar shows information about the current application state.

Status	The status of the connection to the USB gateway, Connected or Disconnected
PAN-ID	The identifier of the Private Area Network currently connected to. The PAN-ID changes when scanning and joining other networks.
Channel	The channel of the network currently connected to.
Address	The radio network address of the USB gateway. The network address is updated each time the Access Service Tool is restarted.
GW firmware	Firmware in the USB gateway, [type]rev[version].
Quick view record count	Number of records in the Quick view database. This indicates number of chargers the Access Service Tool has interacted with.

Settings



In this window functions and appearance can be adjusted. All settings are stored in the file Settings.cfg in the Access Service Tool installation folder.

By clicking **Apply** all settings are stored but the Settings window is kept open. If **Ok** is clicked instead, all settings are stored and the Settings window is closed. **Cancel** is used to cancel all changes done in the Settings window and closes the window.

NOTE

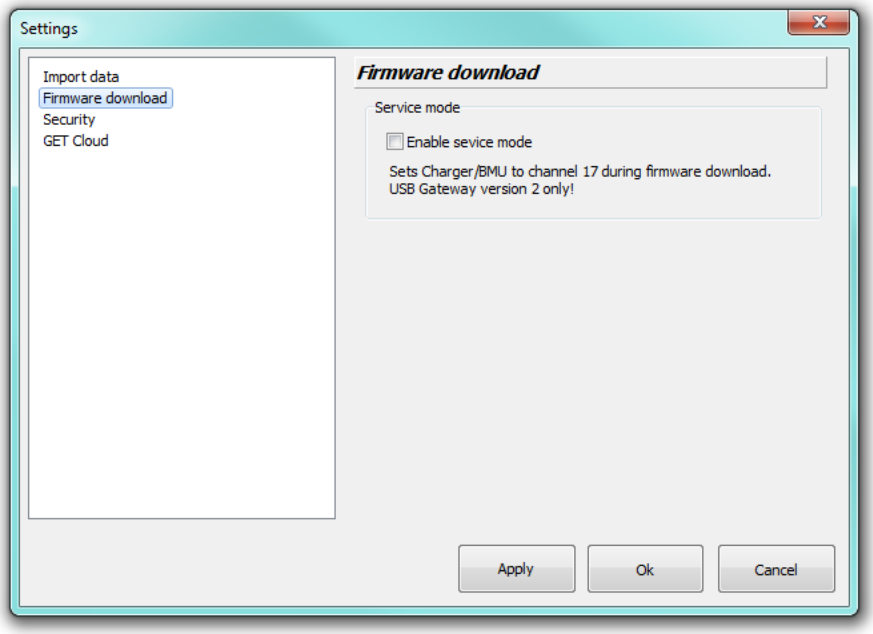
*Changes saved by **Apply** cannot be undone with **Cancel**.*

Import data

Always scan for networks	If this checkbox is checked the Access Service Tool will always scan for available networks, even if an existing connection is present. Use this setting if several networks are within range and being accessed. If this checkbox is unchecked and a connection to a network is established no other network can be accessed. To access other network restart the Access Service Tool or check this checkbox.
Use multiple attempts	If this checkbox is checked the Access Service Tool will attempt to read out information multiple times, instead of a single time if the checkbox is unchecked. Use this if nodes are scattered and hard to get hold of during scan.
History log	Import History logs when clicking **Import**.
Event log	Import Event logs when clicking **Import**.
Instant log	Import Instant logs when clicking **Import**.
Status	Import Status logs when clicking **Import**. This setting cannot be disabled.

Firmware download

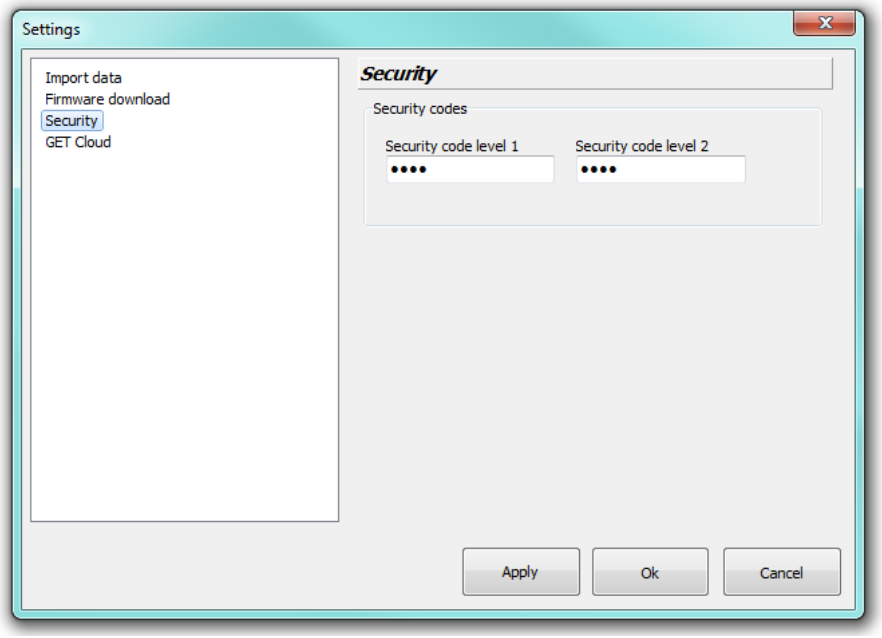
Change network during firmware download in high traffic networks.



A network with many chargers/BMU consists of a lot of data traffic that can increase the download time. To prevent this, the charger/BMU is set to its own network during download and will be restored when completed.

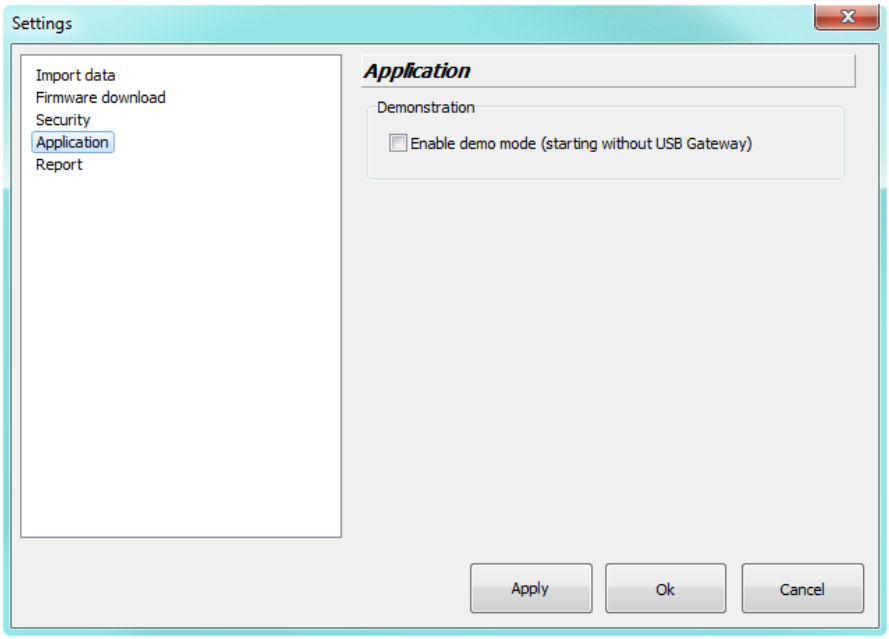
Security

In this window it is possible to edit the level 1 and 2 security codes.



If the security codes are entered in this window the user will not be asked to enter them again when trying to read or write configuration to the charger or BMU.

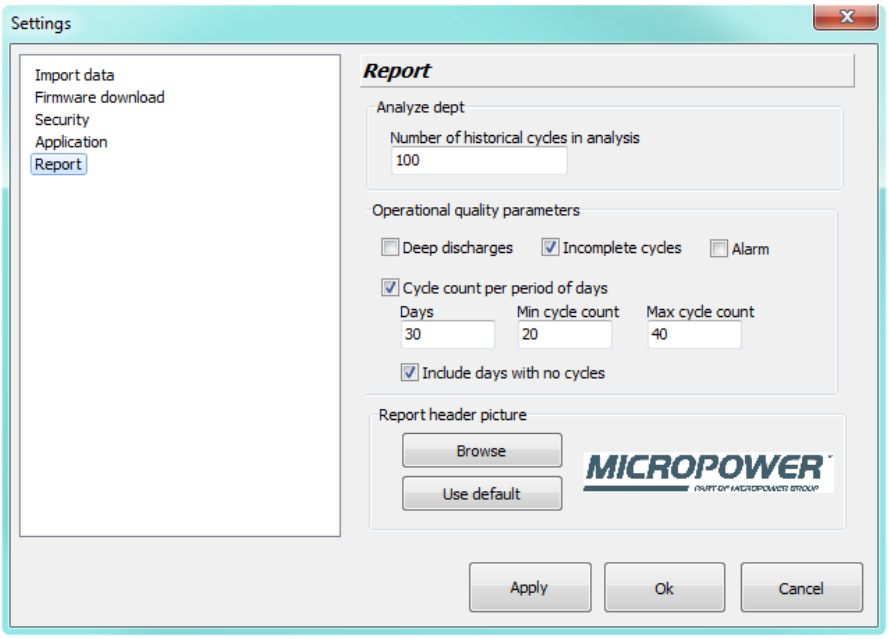
Application



In this window it is possible to enable Demo mode. After selecting Demo mode the application has to be restarted.

Demo mode enables start of Access Service Tool without Access USB Gateway. A demo database will be used.

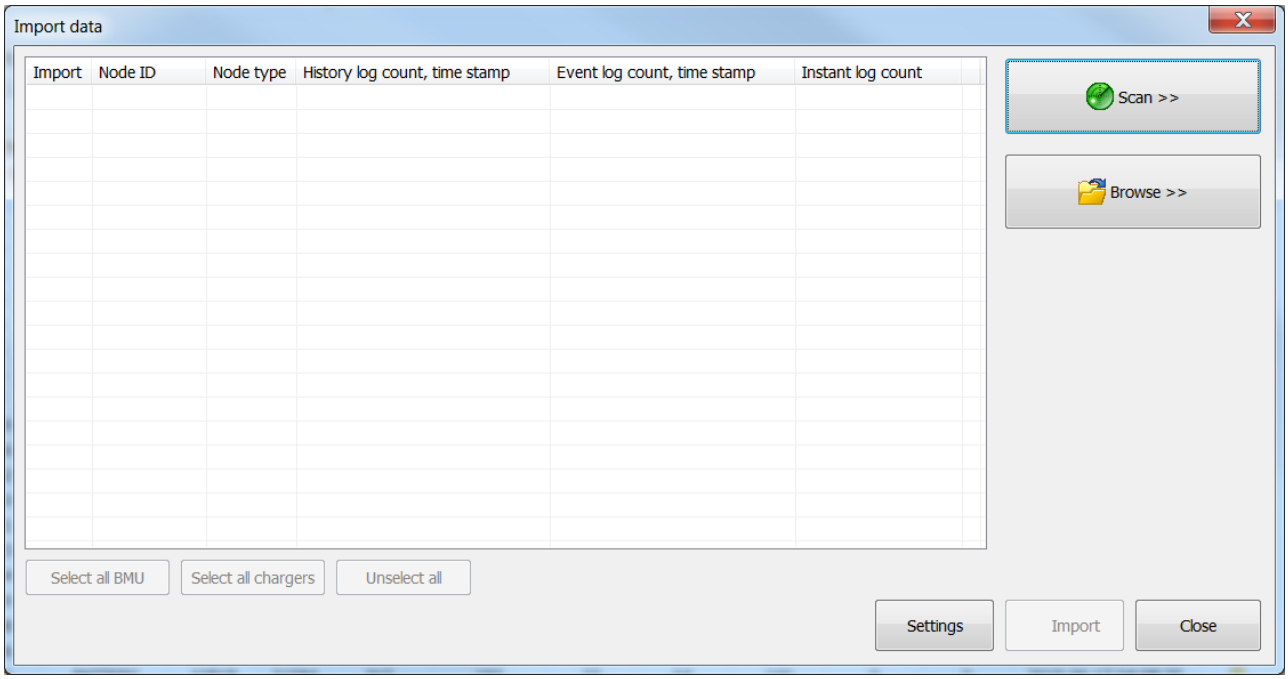
Report



Number of historical cycles to include in analysis	The number of cycles in the history log that should be included in analyzing and reporting. If the actual node have equal or less than this number all cycles for that node will be included.
Deep discharges	If checked cycles with SOC < 20 % at start of charging (BMU) or Charged Ah main > 80 % (Charger) will be included in calculation of the operational quality.
Incomplete cycles	If checked cycles with SOC < 99 % at end of charging (BMU) or Charge ready=true (Charger) will be included in calculation of the operational quality.
Alarm	If checked alarms will be included in calculation of the operational quality.
Cycle count per period of days	If checked number of cycles within Days period will be calculated and if below Min cycle count or above Max cycle count operational quality is reduced.
Days	Number of days for the period to analyze.
Min cycle count	Minimum threshold cycle count level for the operational quality calculation. Set to 0 to turn off minimum in operational quality calculation.
Max cycle count	Maximum threshold cycle count level for the operational quality calculation. Set to 1000 to turn off maximum in operational quality calculation.
Include days with no cycles	If checked also days with no cycles generated will be included in the calculation. Days with no cycles will have cycle count 0.
Report header picture/Browse	Click to browse for a picture to use as a header in the reports.
Use default	Click to return to the default Micropower logo in report header.

Import data

The Import data window is used to read information from chargers and batteries in the radio network or from a file.



Scan

When clicking **Scan**, the Access Service Tool scans for available networks and nodes. Basic information is read out and presented in the list view to the left.

Description of the information in the Import data list view:

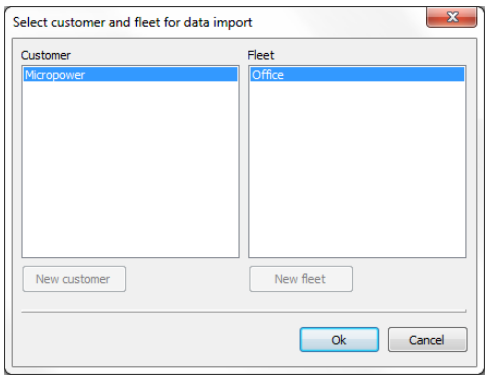
Import	If this checkbox is checked, data for the node will be imported when clicking **Import**.
Node ID	Identifier of the node, can be configured in the charger menu system or by the Configure node function. After the node ID the node address is shown within parenthesis.
Node type	Description of the node, possible types are: • Charger • BMU • PC
History log count, time stamp	Number of available history logs in the node and time stamp of the latest cycle. In parenthesis, the number of history logs left to import is shown.
Event log count, time stamp	See above but for event logs.
Instant log count	Number of available *Instant logs* in the node. In parenthesis, the numbers of *Instant logs* left to import is shown.

Browse

Browse for a Micropower data file, *.gdf. Instead of scanning the network for nodes data previously exported from another Access Service Tool can be imported. Select the *.gdf file, select nodes to import and click **Import**.

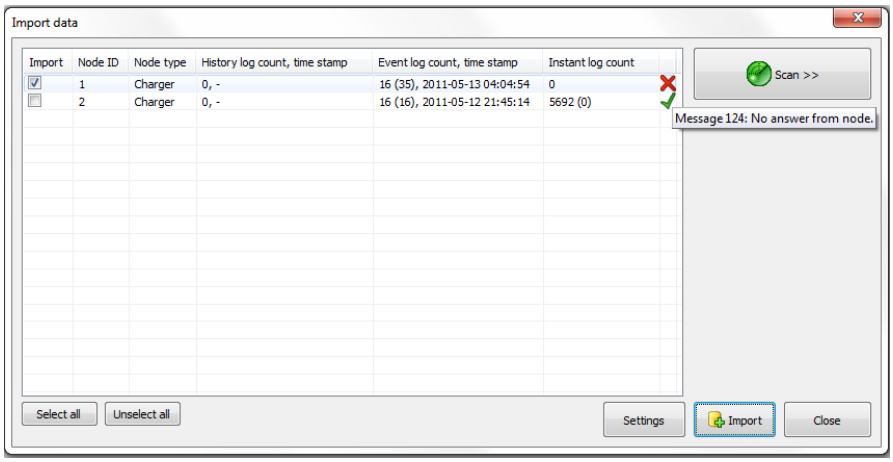
Import

The **Import** button initiates a read out of data from the selected nodes in the list view. After *Customer* and *Fleet* for the batteries/chargers have been entered, data is read out and stored in the database.



If data from any of the nodes in the list view previously have been imported, the *Customer* and *Fleet* entered for those will be selected and it is just to click **Ok**. If data has not been read out previously, *Customer* and *Fleet* must be entered prior to clicking **Ok**.

If the import of data was successful a green checkmark will appear in the right part of the list view. If the import of data wasn't successful a red cross will appear instead. By pointing with the mouse on the red cross the cause of the failed import can be read.



The imported data is stored to database and can be viewed in the Charger details or BMU details window.

More information can be found in the tutorial *Import data*.

Charger details

In the Charger details window all details about the selected charger can be viewed and exported.

The menu bar or a double or right-click on the Quick view can be used to access the Charger details window.

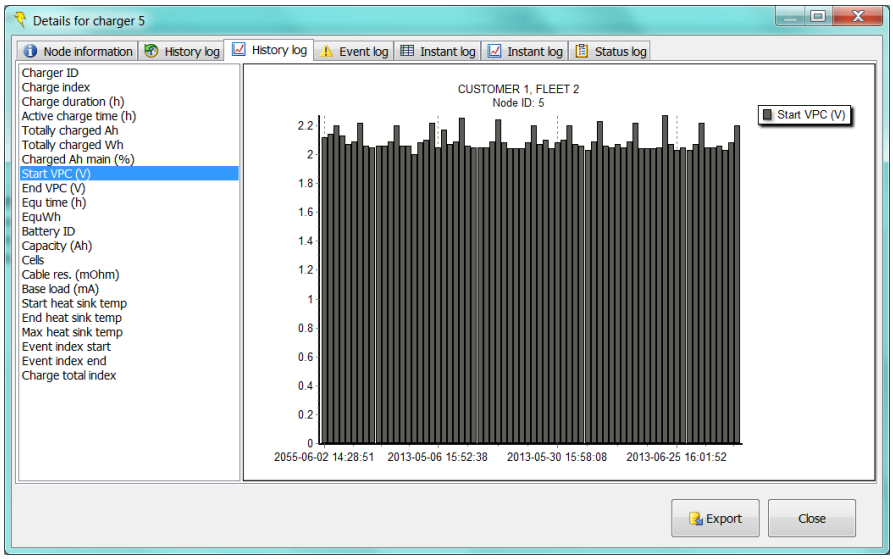
Node overview

The tab Node overview contains chart for analysis of the individual charger. See corresponding information about parameters in the section *4. Quick view*. Click to select or unselect a specific parameter.

History log

The tabs History log shows information about all historical charging cycles.

The History log can store approximately 1800 logs in a cyclic buffer, i.e. when the memory is full new logs are replacing the oldest. The data from the history log can be viewed either in a table or chart format depending on which of the two tabs that is selected. If the chart format is selected the following menu will be shown. Click to select or unselect a specific parameter.



In the menu to the left it is possible to select:

Charger ID	Charger identifier.
Charge index	Displays the index for different charging cycles in the history log since the last clearing of statistics.
Charge duration (h)	Shows the duration of different charging cycles in the history log.
Charge active time (h)	Displays the amount of time the charger has spent in active charging state for the different charging cycles in the history log.
Charge resting time (h)	The resting time is calculated as the difference between Charge duration and Charge active time for the different charging cycles in the history log.
Totally charged Ah	Shows the total number of charged Ah for the different charging cycles in the history log.
Totally charged Wh	Shows the total number of charged Wh for the different charging cycles in the history log.
Charged Ah main (%)	Displays number of charged Ah during the main charging phase.
Start VPC (V)	Shows the starting voltage/cell for the different charging cycles in the history log.
End VPC (V)	Shows the ending voltage/cell for the different charging cycles in the history log.
Equ time (h)	Displays the amount of time the charger has spent in the phase Equalize charge for the different charging cycles in the history log.
Equ Wh	Shows the number of Wh charged during the phase Equalize charge.
Battery ID	Battery identifier.
Capacity (Ah)	Shows the battery capacity.
Cells	Displays the number of cells in the battery.
Cable res (mOhm)	Shows the selected cable resistance for the different charging cycles in the history log.
Base load (mA)	Shows the selected base load for the different charging cycles in the history log.
Start heat sink temp	Displays the starting heat sink temperature for the different charging cycles in the history log.
End heat sink temp	Displays the ending heat sink temperature for the different charging cycles in the history log.
Max heat sink temp	Shows the maximum heat sink temperature for the different charging cycles in the history log.
Event index start	Displays the event index count when the charging cycle was started.
Event index end	Displays the event index count when the charging cycle was ended.
Charge total index	Displays the index for different charging cycles in the history log since the charger was manufactured.

Event log

In the Event log information about alarms, charger start-up and other events can be read.

The Event log can store approximately 6000 logs in a cyclic buffer, i.e. when the memory is full new logs are replacing the oldest.

Instant log

The Instant log stores information measured momentarily with a, in the charger, specified interval from 1 to 65535 seconds. The Instant log can store approximately 6000 logs in a cyclic buffer, i.e. when the memory is full new logs are replacing the oldest. With an interval of 15 seconds 24 hours can be logged.

The Instant log can be viewed in both table and chart format depending on which of the tabs that is selected.

Status log

Status logs are read out as momentary parameters from the charger when an Import data is performed.

Export

The **Export** button triggers an export of the data in the selected tab. The data is saved to specified location in .csv (comma separated values) format. .csv files can be opened and edited in Microsoft Excel.

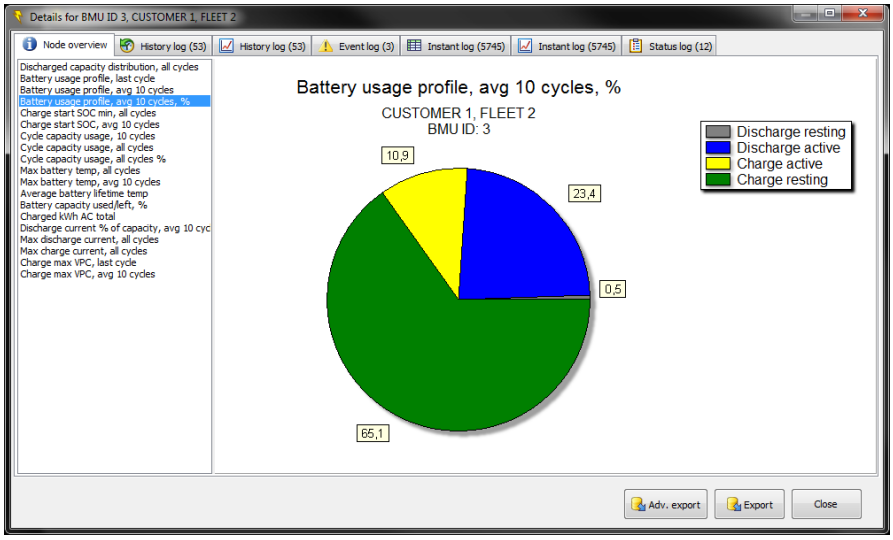
BMU details

In the BMU details window all details about the selected BMU can be viewed and exported.

The menu bar or a double or right-click on the Quick view can be used to access the BMU details window.

Node overview

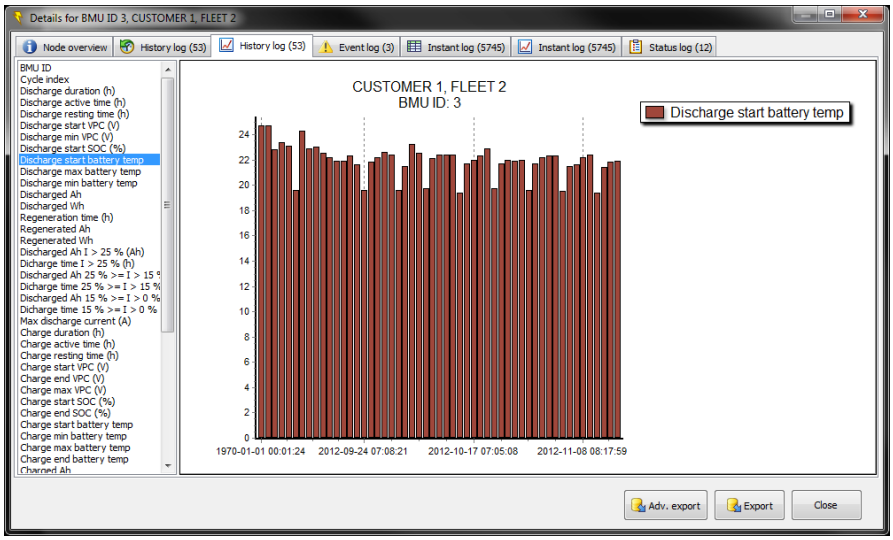
The tab Node overview contains chart for analysis of the individual charger. See corresponding information about parameters in the chapter *4. Quick view*. Click to select or unselect a specific parameter.



History log

The tabs History log shows information about all historical charging cycles.

The data from the history log can be viewed either in a table or chart format depending on which of the two tabs that is selected. If the chart format is selected the following menu will be shown. To zoom just make a rectangle from left to right over the area that should be enlarged. In order to return to default scale it is possible to make a rectangle right to left instead. Click to select or unselect a specific parameter.



In the menu to the left it is possible to select:

BMU ID	BMU identifier
Cycle index	Displays the index for different charging/discharging cycles in the history log since the last clearing of statistics.
Discharge duration (h)	Shows the duration of different discharging cycles in the history log
Discharge active time (h)	Displays the amount of time the battery has been actively discharged, i.e. the discharge current < -250 mA, for the different discharging cycles in the history log.
Discharge resting time (h)	The resting time is calculated as the difference between Discharge duration and Discharge active time for the different discharging cycles in the history log.
Discharge start VPC (V)	Shows the starting voltage/cell for the different discharging cycles in the history log.
Discharge min VPC (V)	Shows the minimum voltage/cell for the different discharging cycles in the history log.
Discharge start SOC (%)	Shows the starting SOC for the different discharging cycles in the history log.
Discharge start battery temp	Displays the starting battery temperature for the different discharging cycles in the history log.
Discharge max battery temp	Displays the maximum battery temperature for the different discharging cycles in the history log.
Discharge min battery temp	Displays the minimum battery temperature for the different discharging cycles in the history log.
Discharged Ah	Shows how many Ah that has been discharged for the different discharging cycles in the history log.
Discharged Wh	Shows how many Wh that has been discharged for the different discharging cycles in the history log.
Regeneration time (h)	Displays the amount of time that energy has been regenerated to the battery during the discharge cycle.
Regenerated Ah	Shows how many Ah that has been regenerated to the battery during the discharge cycle.
Regenerated Wh	Shows how many Wh that has been regenerated to the battery during the discharge cycle.
Discharged Ah I > 25 % (Ah)	Displays how many Ah that was discharged from the battery when the discharge current was more than 25 % of the battery capacity.
Discharge time I > 25 % (h)	Displays the amount of time the battery was discharged when the discharge current was more than 25 % of the battery capacity.
Discharged Ah 25 % ≥ I > 15 %	See above.
Discharge time 25 % ≥ I > 15 %	See above.
Discharged Ah 15 % ≥ I > 0 %	See above.
Discharge time 15 % ≥ I > 0 %	See above.
Average discharge current (A)	Shows the average discharge current for the different discharge cycles in the history log.
Max discharge current (A)	Shows the maximum discharge current for the different discharge cycles in the history log.

Charge duration (h)	Shows the duration of different charging cycles in the history log.
Charge active time (h)	Displays the amount of time the battery has been actively charged, i.e. the charging current > 250mA, for the different charging cycles in the history log.
Charge resting time (h)	The resting time is calculated as the difference between Charge duration and Charge active time for the different charging cycles in the history log.
Charge start VPC (V)	Shows the starting voltage/cell for the different charging cycles in the history log.
Charge end VPC (V)	Shows the ending voltage/cell for the different discharging cycles in the history log.
Charge max VPC (V)	Shows the maximum voltage/cell for the different charging cycles in the history log.
Charge start SOC (%)	Shows the starting SOC for the different charging cycles in the history log.
Charge end SOC (%)	Shows the ending voltage/cell for the different charging cycles in the history log.
Charge start battery temp	Displays the starting battery temperature for the different charging cycles in the history log.
Charge min battery temp	Displays the minimum battery temperature for the different charging cycles in the history log.
Charge max battery temp	Displays the maximum battery temperature for the different charging cycles in the history log.
Charge end battery temp	Displays the ending battery temperature for the different charging cycles in the history log.
Charged Ah	Shows how many Ah that has been charged for the different charging cycles in the history log.
Charged Wh	Shows how many Wh that has been discharged for the different charging cycles in the history log.
Charged Ah I > 25 % (Ah)	Displays how many Ah that was charged to the battery when the charge current was more than 25 % of the battery capacity.
Charge time I > 25 % (h)	Displays the amount of time the battery was charged when the charge current was more than 25 % of the battery capacity.
Charged Ah 25 % ≤ I < 15 % (Ah)	See above.
Charge time 25 % ≤ I < 15 % (h)	See above.
Charged Ah 15 % ≤ I < 0% (Ah)	See above.
Charge time 15 % ≤ I < 0 % (h)	See above.
Average charging current (A)	Shows the average charging current for the different charge cycles in the history log.
Max charging current (A)	Shows the maximum charge current for the different charge cycles in the history log.
Equalize time (h)	Displays the amount of time the charger has spent in the phase Equalize charge for the different charging cycles in the history log.
Equalize Ah	Displays the number of Ah charged during the phase Equalize charge.
Equalize Wh	Shows the number of Wh charged during the phase Equalize charge.
Capacity (Ah)	Shows the capacity of the battery
Cable res (mOhm)	Shows the selected cable resistance for the different charging cycles in the history log.
Cells	Displays the number of cells in the battery.
Base load (mA)	Shows the selected base load for the different charging cycles in the history log.
Total cycle index	Displays the index for different charging cycles in the history log since the charger was manufactured.

Event log

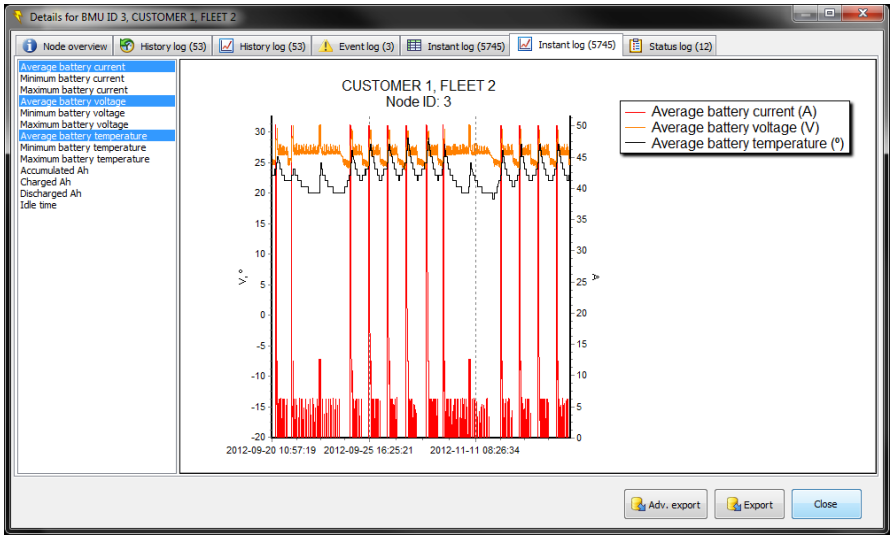
In the Event log information about alarms, charger start-up and other events can be read.

The Event log can store approximately 6000 logs in a cyclic buffer, i.e. when the memory is full new logs are replacing the oldest.

Instant log

The Instant log stores momentary information from the battery with a sample period editable via the menu Configure node in the Access Service Tool. The data can be viewed either in a table or in a chart format. If the chart format is selected the following menu is shown.

Click to select or unselect a specific parameter.



BMU ID	BMU identifier
Index	Displays the index for the different instant logs.
Average current (A)	Average current since previous log.
Min current (A)	Minimum current since previous log.
Max current (A)	Maximum current since previous log.
Average battery voltage (A)	Average battery voltage since previous log.
Min battery voltage (V)	Minimum battery voltage since previous log.
Max battery voltage (A)	Maximum battery voltage since previous log.
Average battery temp (°)	Average battery temperature since previous log.
Minimum battery temp (°)	Minimum battery temperature since previous log.
Maximum battery temp (°)	Maximum battery temperature since previous log.
Accumulated Ah (Ah)	The sum of charge and discharge current within the zoomed area in the graph.
Charged Ah (Ah)	The sum of charge current within the zoomed area in the graph.
Discharged Ah (Ah)	The sum of discharge current within the zoomed area in the graph.
Idle time (minutes)	The sum of resting periods that are 5 minutes or longer.
Average center voltage (V)	Average center voltage sine previous log. ***NOTE*** *This value is only available in BMU 2.*
SOC (%)	State of charge at log store occasion. ***NOTE*** *This value is only available in BMU 2.*

Status log

Status logs are read out as momentary parameters from the charger when an Import data is performed.

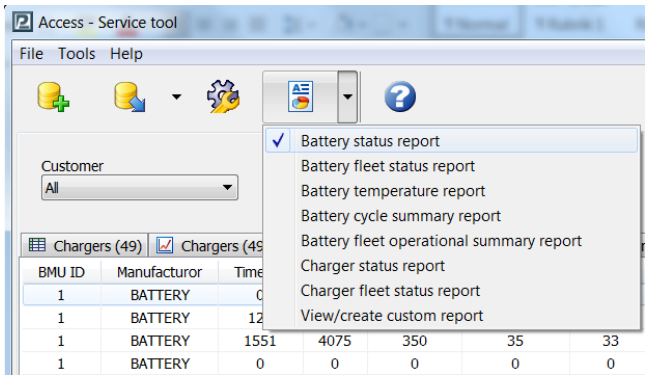
Export

The **Export** button triggers an export of the data in the selected tab. The data is saved to specified location in .csv (comma separated values) format. .csv files can be opened and edited in Microsoft Excel.

View/generate reports

Based on the selected *Customer*, *Fleet* and Charger or BMU a report can be automatically generated. A custom report can also be created where diagrams and comments are added.

To generate a report, select *Customer* and *Fleet* in the Quick view filter and click the View/generate reports-image button. There are different reports available.



Charger status report

This report includes status information about the, in Quick view, selected charger. Reported information is:

Charger ID	The set identifier of the charger.
Charger Model	Power unit description.
Charging mode	Actual charging mode, i.e. from which source the charging parameters are collected.
Charging curve	In charger set charging curve.
Cell count	In charger set cell count.
Capacity	In charger set battery capacity.
Cable resistance	In charger set cable resistance.
Base load	In charger set base load.
Data import date	Date and time for import of data from charger.
Operating time	Total time in active charging.
Charged Ah	Totally charged Ah.
Consumed mains energy total	Totally consumed energy from mains supply.
Operational quality	Indicator 0-100 % on quality of historical cycles. The formula is: (Total number of analyzed cycles – Number of deep discharge cycles*2 – Number of incomplete cycles*1 – Number of cycles with alarm*1)/ Total number of analyzed cycles.
First cycle start time	Time and date of the first historical cycle to analyze.
Last cycle start time	Time and date of the last historical cycle to analyze.
Max cycle count	Maximum cycle count over the set period of days from first to last cycle in analyze.
Min cycle count	Minimum cycle count over the set period of days from first to last cycle in analyze.
Avg cycle count	Average cycle count over the set period of days from first to last cycle in analyze.
Charge start VPC, avg	Average start VPC of all the analyzed cycles.
Charge start VPC, min	Minimum start VPC of all the analyzed cycles.
Charge end VPC, avg	Average end VPC of all the analyzed cycles.
Charge end VPC, min	Minimum end VPC of all the analyzed cycles.
Number of alarms	Total number of alarms.

Charger fleet status report

This report includes status information about the, in Quick view, selected charger fleet. Reported information is:

Customer	Customer name, entered at import of data.
Fleet	Fleet name, entered at import of data.
Charger count	Number of charger in the fleet.
Data import date	Date and time for import of data from charger.
Operating time, avg	Average operating time for of all chargers in the fleet.
Charged capacity total	The sum of charged capacity of all chargers in the fleet.
Consumed mains energy total	The sum of all chargers totally consumed energy from mains supply.
Operational quality, avg	Indicator 0-100 % on the average quality of historical cycles of all chargers in the fleet. The formula is: (Total number of analyzed cycles – Number of deep discharge cycles2 – Number of incomplete cycles1 – Number of cycles with alarm1)/ Total number of analyzed cycles.
Bad	Chargers with Bad operational quality
Moderate	Chargers with Moderate operational quality
Good	Charger with Good operational quality
Max period cycle count	Maximum cycle count over the set period of days from first to last cycle in analyze.
Min period cycle count	Minimum cycle count over the set period of days from first to last cycle in analyze.
Avg period cycle count	Average cycle count over the set period of days from first to last cycle in analyze.
Charge start VPC, avg	Average start VPC of all the analyzed cycles and all chargers in the fleet.
Charge start VPC, min	Minimum start VPC of all the analyzed cycles all chargers in the fleet.
Charge end VPC, avg	Average end VPC of all the analyzed cycles and all chargers in the fleet.
Charge end VPC, min	Minimum end VPC of all the analyzed cycles and all chargers in the fleet.
Number of alarms	Total number of alarms.

Battery status report

This report includes status information about the, in Quick view, selected BMU. Reported information is:

BMU ID	The set identifier of the BMU.
Battery tag	The set alphanumeric description of the battery.
Battery capacity	BMU set battery capacity.
Battery cell count	BMU set cell count.
Data import date	Date and time for import of data from BMU.
Used capacity	Total discharged capacity.
Capacity left	Capacity left in the battery. Calculated as set Available capacity – Used capacity.
Operating time	Total time in charge or discharge.
Operating time left	Calculated days left of battery use based on the last 10 cycles. The calculation is according to: Capacity left / (Average of the Discharged Ah / Discharge time factor of the 10 last discharge/charge cycles).
Charged capacity total	Overall total Ah charged
Consumed mains energy total	Totally consumed energy from mains supply. Calculated by using the Charging efficiency parameter in the BMU.
Average lifetime battery temperature	Average battery temperature since start of operation.
Operational quality	Indicator 0-100 % on the average quality of historical cycles of all chargers in the fleet. The formula is: (Total number of analyzed cycles – Number of deep discharge cycles 2 – Number of incomplete cycles 1 – Number of cycles with alarm 1) / Total number of analyzed cycles.
First cycle start time	Time and date of the first historical cycle to analyze.
Max cycle count	Maximum cycle count over the set period of days from first to last cycle in analyze.
Min cycle count	Minimum cycle count over the set period of days from first to last cycle in analyze.
Avg cycle count	Average cycle count over the set period of days from first to last cycle in analyze.
Charge start SOC, avg	The average start SOC of all analyzed cycles.
Charge start SOC, min	Minimum charge start SOC of all analyzed cycles.
Charge end SOC, incomplete, avg	The average of charge end SOC of cycles where charge end SOC is < 99 %.
Charge start VPC, avg	The average start VPC of all analyzed cycles.
Charge start VPC, min	The minimum start VPC of all analyzed cycles.
Charge max VPC, avg	Maximum charge VPC of all analyzed cycles.
Max battery temperature	Maximum battery temperature of all analyzed cycles.
Min battery temperature	Minimum battery temperature of all analyzed cycles.
Max charging current	Maximum charging current of all analyzed cycles
Max discharge current	Maximum discharge current of all analyzed cycles.
Number of alarms	Total number of alarms.

Battery fleet status report

This report includes status information about the, in Quick view, selected BMU fleet. Reported information is:

Customer	Customer name, entered at import of data.
Fleet	Fleet name, entered at import of data.
BMU Count	Number of BMU:s in the fleet.
BMU ID	The id of the BMU:s included in the fleet.
Data import date	Date and time for import of data from charger.
Used capacity, avg	Average discharged capacity of all the BMU in the fleet.
Capacity left, avg	Average capacity left in the battery of all the BMU in the fleet. Calculated as set Available capacity – Used capacity.
Operating time, avg	Average total time in charge or discharge of all the BMU in the fleet.
Operating time left, avg	Average calculated days left of battery use of all the BMU in the fleet, based on the last 10 cycles. The calculation is according to: Ah left / (Average of the Discharged Ah / Discharge time factor of the 10 last discharge/charge cycles).
Charged capacity total	The sum of the overall total Ah charged for each BMU in the fleet.
Consumed mains energy total	Totally consumed energy from mains supply for each BMU in the fleet. Calculated by using the Charging efficiency parameter in the BMU.
Average lifetime battery temperature	Average battery temperature since start of operation of all the BMU in the fleet.
Operational quality, avg	Indicator 0-100 % on the average quality of historical cycles of all chargers in the fleet. The formula is: (Total number of analyzed cycles – Number of deep discharge cycles*2 – Number of incomplete cycles*1 – Number of cycles with alarm*1 – Number of cycles above max or below min threshold within period*1)/ Total number of analyzed cycles.
Bad	BMU with Bad operational quality
Moderate	BMU with Moderate operational quality
Good	BMU with Good operational quality
Max period cycle count	Maximum cycle count over the set period of days from first to last cycle in analyze.
Min period cycle count	Minimum cycle count over the set period of days from first to last cycle in analyze.
Avg period cycle count	Average cycle count over the set period of days from first to last cycle in analyze.
Charge start SOC, avg	The average start SOC of all analyzed cycles of all BMU in the fleet.
Charge start SOC, min	Minimum charge start SOC of all analyzed cycles of all BMU in the fleet.
Charge end SOC, incomplete, avg	The average of charge end SOC of cycles where charge end SOC is <99% of all BMU in the fleet.
Charge start VPC, avg	The average start VPC of all analyzed cycles of all BMU in the fleet.
Charge start VPC, min	The minimum start VPC of all analyzed cycles of all BMU in the fleet.
Charge max VPC, avg	Maximum charge VPC of all analyzed cycles of all BMU in the fleet.
Max battery temperature	Maximum battery temperature of all analyzed cycles of all BMU in the fleet.
Min battery temperature	Minimum battery temperature of all analyzed cycles of all BMU in the fleet.
Max charging current	Maximum charging current of all analyzed cycles of all BMU in the fleet.
Max discharge current	Maximum discharge current of all analyzed cycles of all BMU in the fleet.
Number of alarms	Total number of alarms of all the BMU in the fleet.

Battery temperature report

This report includes temperature information about the, in Quick view, selected BMU. Reported information is:

BMU ID	The set identifier of the BMU.
Battery tag	The set alphanumeric description of the battery.
Battery capacity	BMU set battery capacity.
Battery cell count	BMU set cell count.
Data import date	Date and time for import of data from BMU.
First cycle start time	Date and time for first cycle in analyze.
Last cycle start time	Date and time for last cycle in analyze.
Average lifetime battery temperature	Average temperature of the battery since start of operation.
Max charge battery temperature	Maximum battery temperature during charging.
Min charge battery temperature	Minimum battery temperature during charging.
Max discharge battery temperature	Maximum battery temperature during discharge.
Min discharge battery temperature	Minimum battery temperature during discharge.
Charge start battery temperature, avg.	Average battery temperature at start of charging.
Charge end battery temperature, avg.	Average battery temperature at end of charging.
Discharge start battery temperature, avg.	Average battery temperature at start of discharging.

Battery cycle summary report

This report includes cycle summary information about the, in Quick view, selected BMU. Reported information is:

BMU ID	The set identifier of the BMU.
Battery tag	The set alphanumeric description of the battery.
Battery capacity	BMU set battery capacity.
Battery cell count	BMU set cell count.
Data import date	Date and time for import of data from BMU.
Total cycle count	Total number of cycles included in the report.
Date	Date and time of cycle.
State	Discharge or charge state.
Active/resting (h)	Active: Time when current is higher or lower than idle threshold. Resting: Time when current is idle.
Ah	Ah discharged or charged.
VPC (V)	Start: Volt per cell at start of the state. Min: Minimum volt per cell during the state. Max: Maximum volt per cell during the state. End: Volt per cell at end of state.
Battery temp (°)	Start: Battery temperature at start of the state. Min: Minimum battery temperature during the state. Max: Maximum battery temperature during the state. End: Batter temperature at end of state.
Max current (A)	Maximum current during the state.
Start SOC (%)	State of charge at start of the state.
End SOC (%)	State of charge at end of the state.

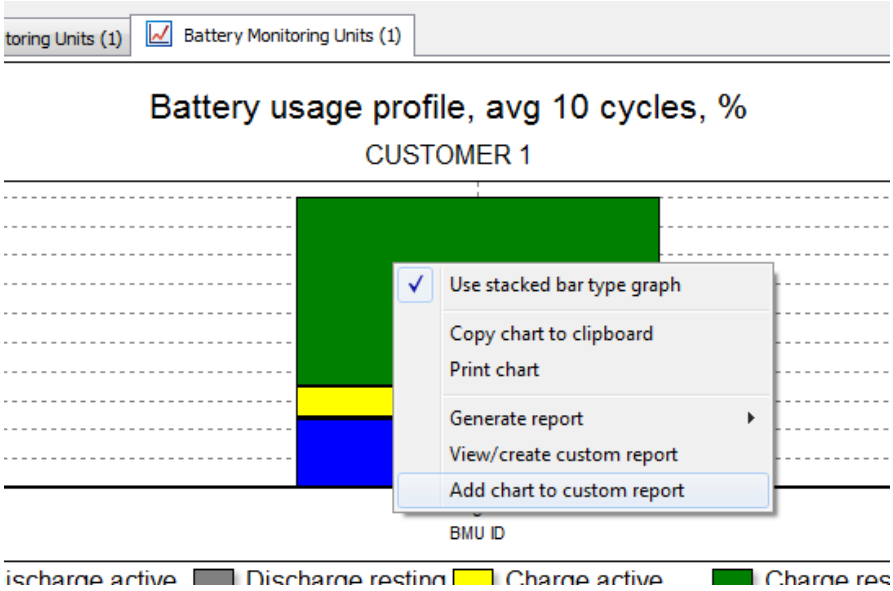
Battery fleet operational summary

This report includes fleet operational information about the, in Quick view, shown BMU/BMU:s. The summary is made on the in settings configured number of cycles, starting from the last cycle.

Reported information is:

BMU ID	The set identifier of the BMU.
BMU tag	The set alphanumeric description of the battery.
Capacity (Ah)	BMU set battery capacity.
Cells	BMU set cell count.
Dish Ah	Total discharged Ah.
Charged Ah	Total charged Ah
Active disch (h).	Total time when current is lower than idle threshold during discharge.
Resting disch.(h)	Total time when current is idle during discharge.
Active charge (h).	Total time when current is higher than idle threshold during charge.
Resting charge.(h)	Total time when current is idle during charge.
Min VPC (V)	Minimum volt per cell.
Max VPC (V)	Maximum volt per cell.
Max temp (°C)	Maximum battery temperature.
Deep	Number of cycles where SOC is below 20 % at end of discharge.
Incomplete	Number of cycles where SOC is below 100 % at end of charge.
Normal	Number of cycles where SOC is higher than 20 % at end of discharge and 100 % and end of charge.
Alarms	Number of alarms.
Data import date	Date and time when data was imported from the BMU.

Custom report

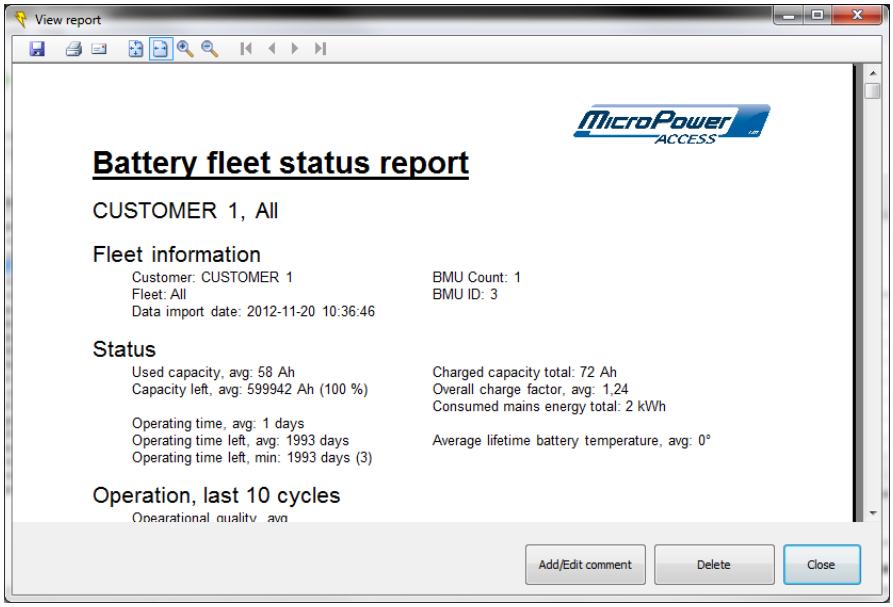


Select View/Create custom report to view the report with the added graph.

Report viewer

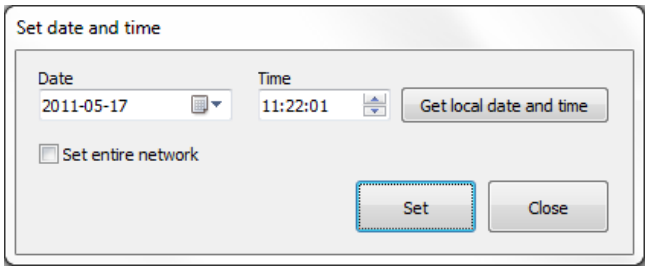
A generated report can be previewed, saved to pdf file, printed or sent as attachment in an email in the Report viewer.

By clicking the **Add/Edit comment** button a personal comment can be added to the report.



Set date and time

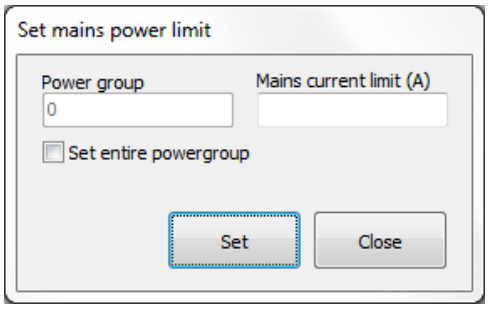
This window is used to set the date and time in one node or in a complete network.



Check the Set entire network to set the specified time in all nodes in the selected network. See the tutorial *Set date and time* for more information.

Set mains power limit

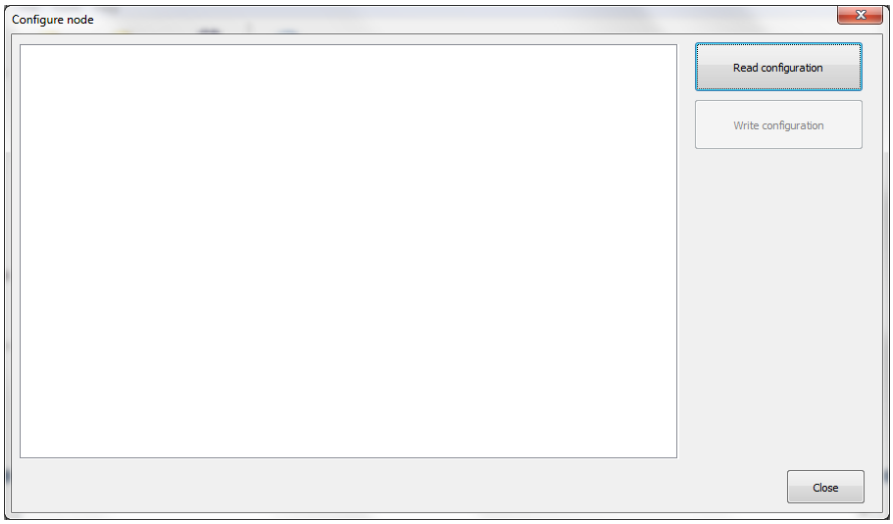
Main power limit limits the allowed power output from mains supply.



Power group	The Power group to set the mains power limit to. Only editable if the Set entire powergroup is checked.
Mains current limit	Current limit (AC) per phase of the mains supply.
Set entire powergroup	If checked the entire Powergroup is set at the same time. If not checked a node selection window will appear and only that node will be set.

Configure node

This window is used to configure a specific node in the network.



NOTE

A level 2 access code of the node to read from is required to gain access to these configurations. Before any parameters can be edited a Read configuration must be performed.

Read configuration

Read configuration scans for available networks and nodes and triggers a selection of the actual node to read configuration from.

Write configuration

Write configuration writes all parameters to the node that the parameters were read from during Read configuration.

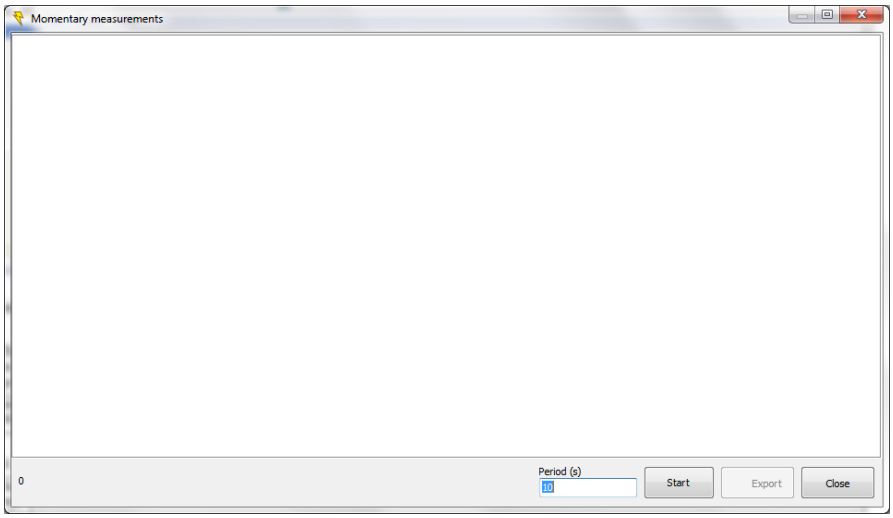
After a successful write, a confirming message appears.

Momentary measurements

The Momentary measurements window is used to read out momentary measurements online from the charger or BMU. The data can be viewed in table or chart format.

In the Chart tab different data can be viewed by right-clicking on the chart. By right-clicking, the chart can also be copied to clipboard.

See the tutorial *Momentary measurements* for more information.



Start

Initiates a selection of network and node and starts the momentary measurements.

Export

The **Export** button triggers an export of the data in table. The data is saved to specified location in .csv (comma separated values) format. .csv files can be opened and edited in Microsoft Excel. For more information see the tutorial *Export*.

Period	The period between each read out. Can be from 1 second up to 86400 seconds (24 hours).

For a charger the following parameters are being measured.

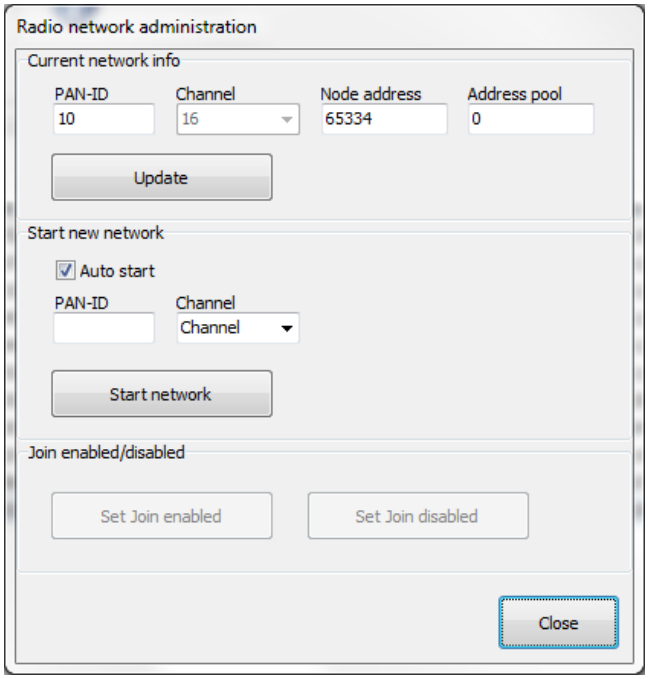
DC Voltage (V)	Actual battery charging voltage. If a Cable Ri is defined this voltage will be (measured charging voltage – Cable Ri*measured battery charging current).
DC Current (A)	Actual battery charging current. If a Base load is configured this charging current will be measured charging current – Base load.
Board temperature	Charger control board internal temperature.
Heat sink temperature	Charger heat sink temperature.
Timestamp	Timestamp when the data was read out from the charger.

For the BMU the following measurements are relevant.

Battery temperature	The internal temperature of the battery.
Battery voltage (V)	The internal battery voltage.
Battery current (A)	The internal battery current.
Battery center voltage (V)	The center voltage of the battery.
Electrolyte voltage (V)	The electrolyte voltage of the battery.
Battery SOC (%)	Remaining % of total capacity in battery.
Time stamp	Timestamp when the data was read out from the BMU.

Radio network administration

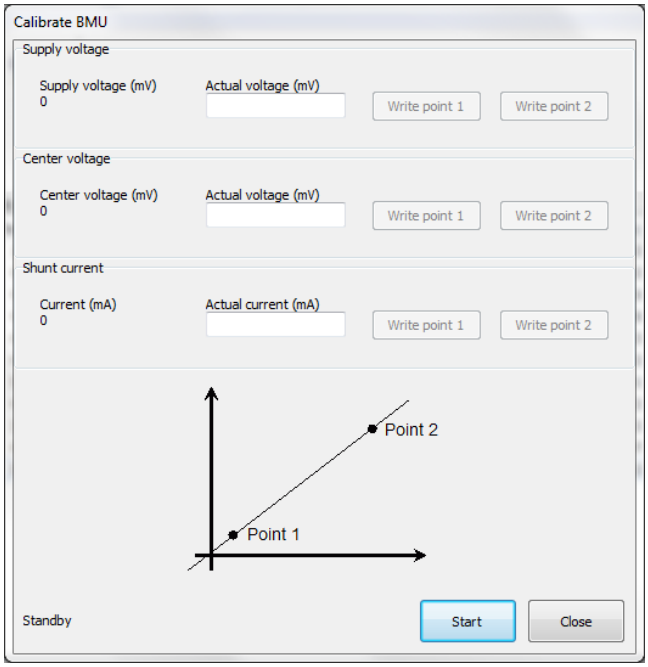
The Radio network administration window is used to configure the radio network. It is possible to start a new network and let other devices join it.



It is possible to specify which PAN-ID the network should have and also which channel the network should operate on. More information can be found in the tutorial *Radio network administration*.

Calibrate BMU

This window is used to calibrate the BMU for more accurate measurements. See the tutorial *Calibrate BMU* for more information. The values to the left are the values measured by the BMU and the values that are entered to the right (under Actual voltage etc) are the values given when measuring on the actual circuit.



Start

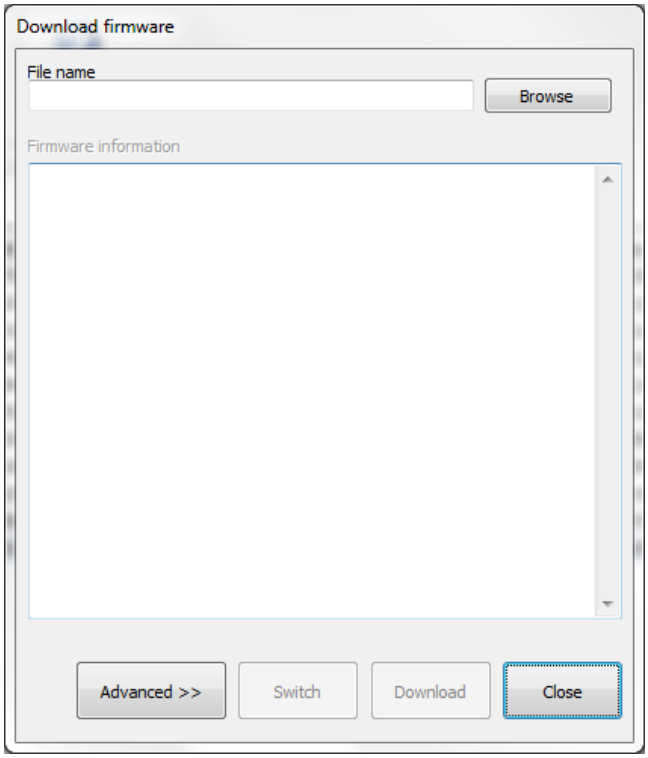
The button **Start** will initiate the calibration of the BMU.

Write point

The buttons **Write point 1** and **Write point 2** are used to make two samples of the voltage or current on the circuit which will be compared to the values given by the BMU.

Download firmware

This function makes it possible to download and update the firmware in a node. See the tutorial *Download firmware* for more information.



Browse

This button allows the user to search through the computer and select the file with the firmware which should be downloaded to the device.

The file should be of a Micropower firmware file, *.mff format.

Download

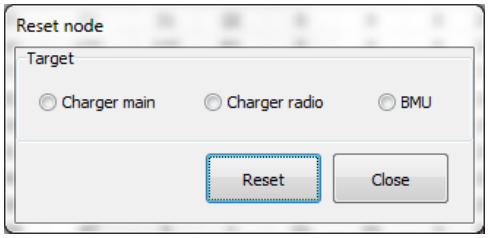
When the file with the firmware has been selected, the new firmware can be downloaded to the device by clicking the button **Download**.

Switch

After a successful download of the mff file a switch command must be sent to the node. The switch command initiates an exchange of the current firmware in the node.

Reset node

The reset node window allows the user to restart a specific node on the network. More information can be found in the tutorial *Reset node*.

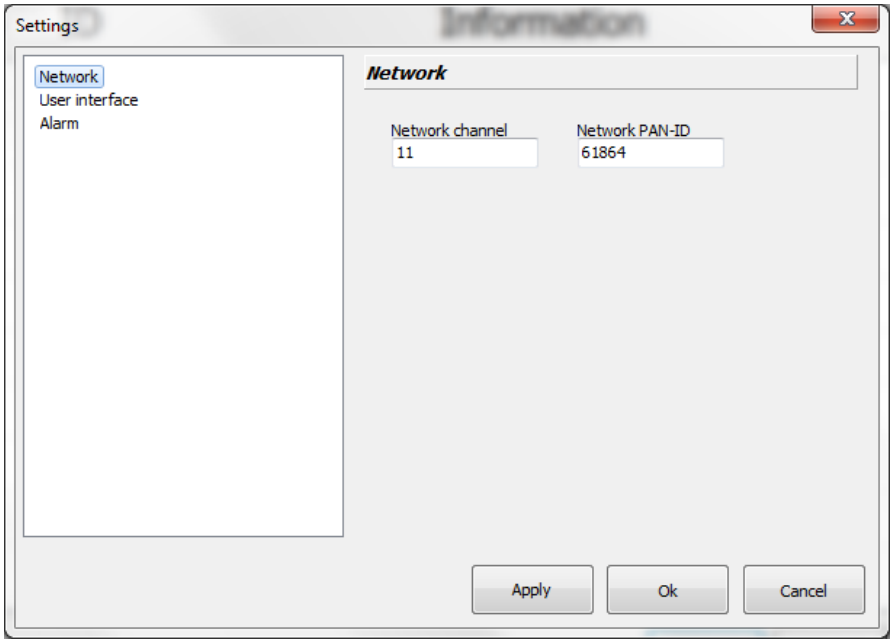


Access - BBC View

The Access - BBC view is an application included in the Access applications package. This application is used for monitoring the status of the Best Battery Choice system.

The application executes in full screen mode and connects automatically to defined network. To exit full screen mode it is possible to either click **Esc** or right-click and choose *Exit fullscreen mode*. See the tutorial *Access - BBC view* for more information.

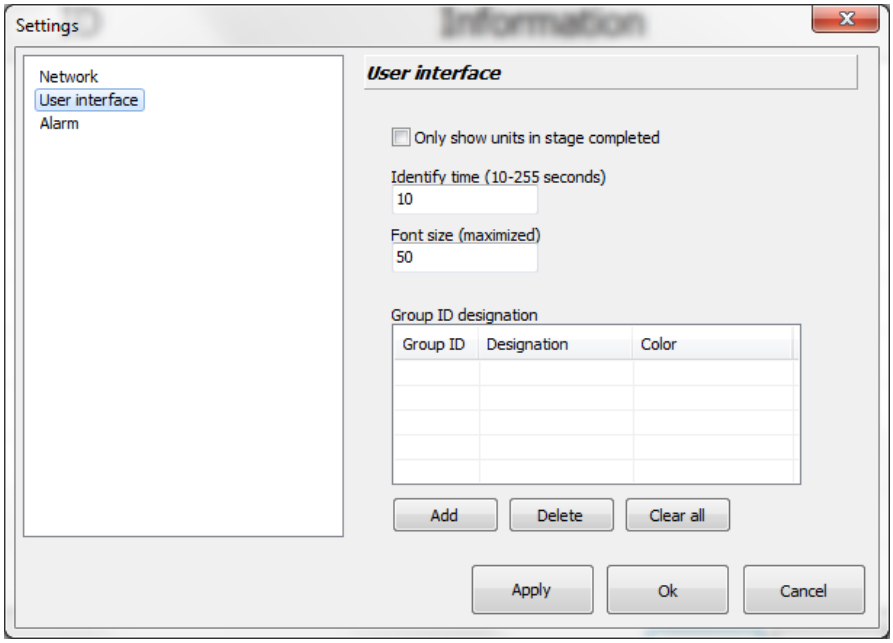
Settings



Network

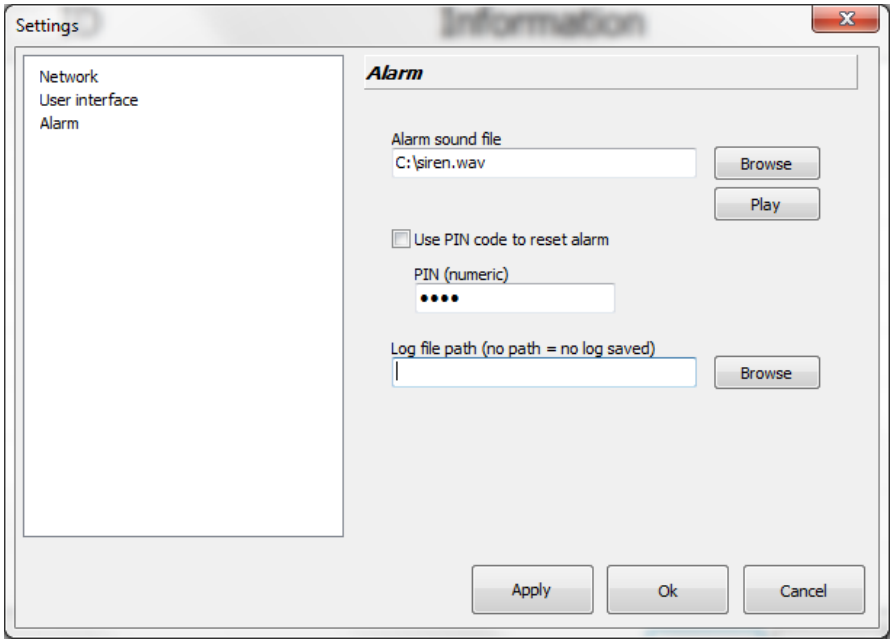
Network channel	Defines the Channel of the network to connect to at startup of application. Please see Radio menu in charger for the actual Channel.
Network PAN-ID	Defines the PAN-ID to connect. Please see Radio menu in charger for the actual PAN-ID.

User interface



Only show units in stage completed	If this checkbox is checked only those units that reports charging phase completed will be shown in the Access - BBC view. Otherwise the unit that is BBC within the group will be shown in the Access - BBC view no matter the charging phase.
Identify time	Defines how long time the status indicators on the charger panel will flash, either when clicking in the main window, when pressing the space bar or when right-clicking and choosing Identify node in the Access - BBC view.
Font size (maximized)	With this parameter the size of the font in maximized position can be changed.
Group ID designation	With this setting different group ID:s can be configured with more suitable designations. Click **Add** to add a new group id to the list and **Delete**/**Clear all** to remove. The specified Group ID designation will replace the Group ID in the Access - BBC view.

Alarm



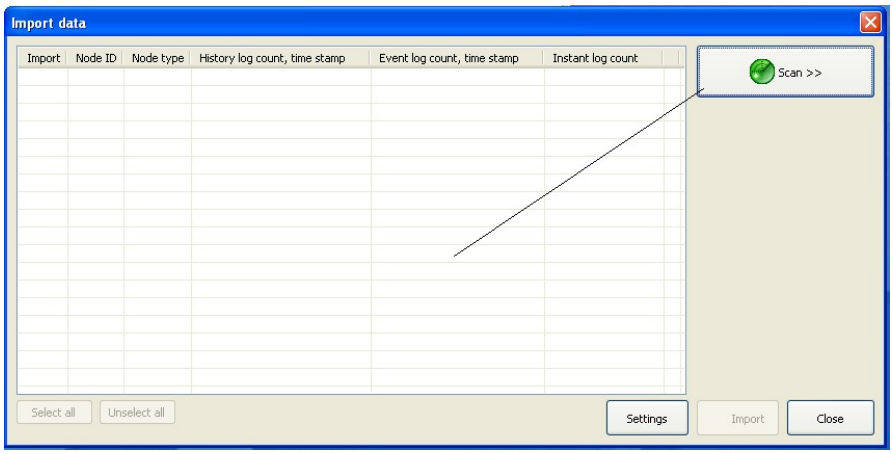
Alarm sound file	The sound file to play when a non BBC battery is picked. Should be of *.wav type. The alarm sound will play until a correct PIN code is entered or when **Ok** is clicked.
Use PIN code to reset alarm	If checked the configured PIN code must be entered to turn off alarm.
PIN code (numeric)	Numeric PIN to be entered to turn off alarm if checkbox Use PIN code to reset alarm is checked.
Log file path	File path to a log file of *.csv type. If a file path is entered logs with date and time and charged ID will stored.

Tutorials

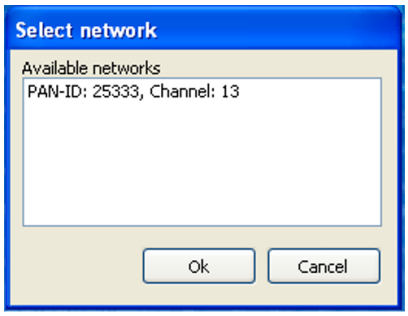
Import data

This tutorial will show how to import and read data from chargers or BMUs in a radio network.

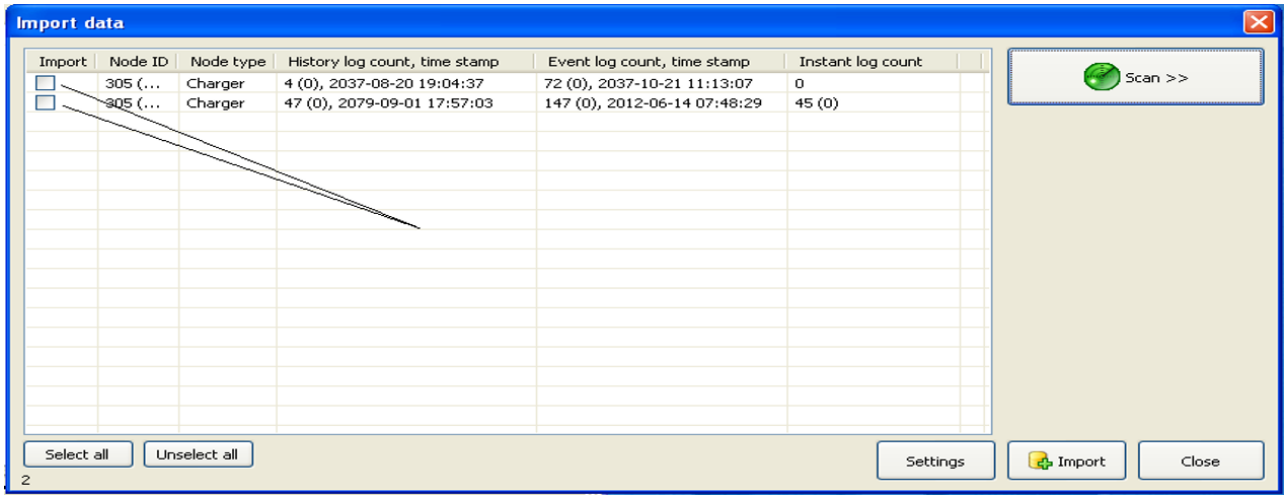
1. Make sure there are a radio network up and running within range.
2. Start Access Service Tool.
3. In the menu bar, click **Import data**.
4. Click **Scan**. This will start a scan for available radio networks within hearing distance.



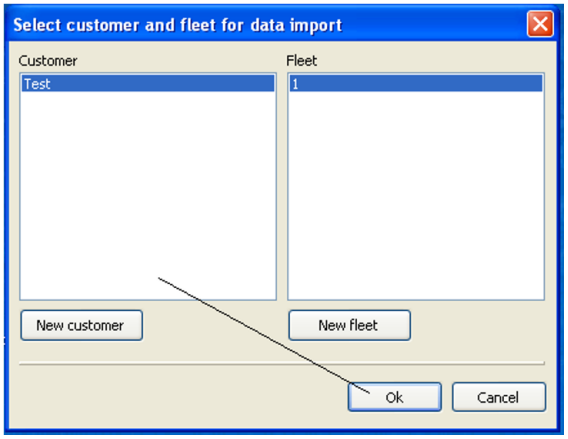
5. Select network and click **Ok**.



6. Select which nodes to include in *Import*, by marking the nodes in the leftmost column. By right-clicking a node in the list, Identify node can be activated. Identify node sends a request to the selected node to blink with the status indicators. To select what data to import, click **Settings**. For more information, see section *Settings*. When ready, click **Import**.



7. Select *Customer* and *Fleet* by choosing **New customer** respectively **New fleet**. Click **Ok**.



8. Click **Ok** to confirm.
9. The import is now done and the data is available in databases. A green checkmark will appear if the import was successful. For more information, see section *Import*.

Set date and time

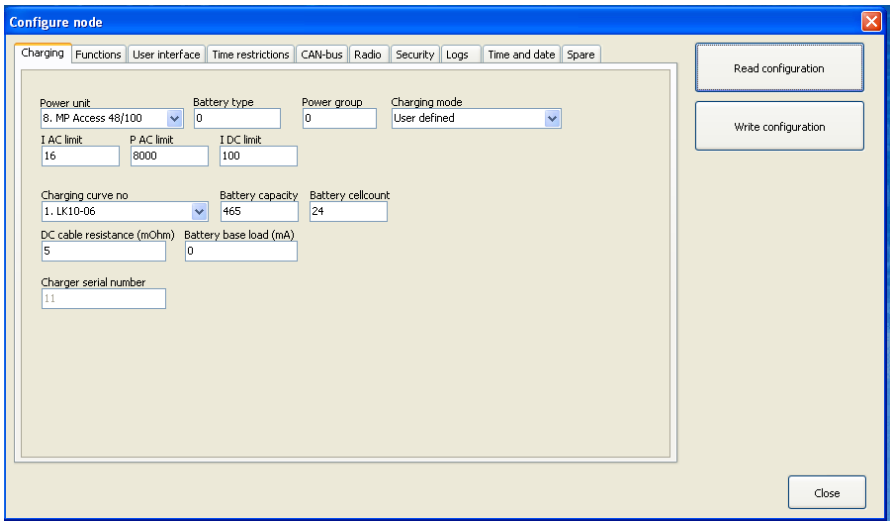
1. In the menu bar, click **Tools** and select **Advanced** - **Set date and time**.
2. Set date and time:
   - either manually, by choosing the date and time,
   - or automatically, by clicking **Get local date and time**. This will set the date and time according to the local computer.

   By selecting *Set entire network*, date and time can be set for all devices on the radio network at the same time.

3. To confirm, click **Set**.

Configure node

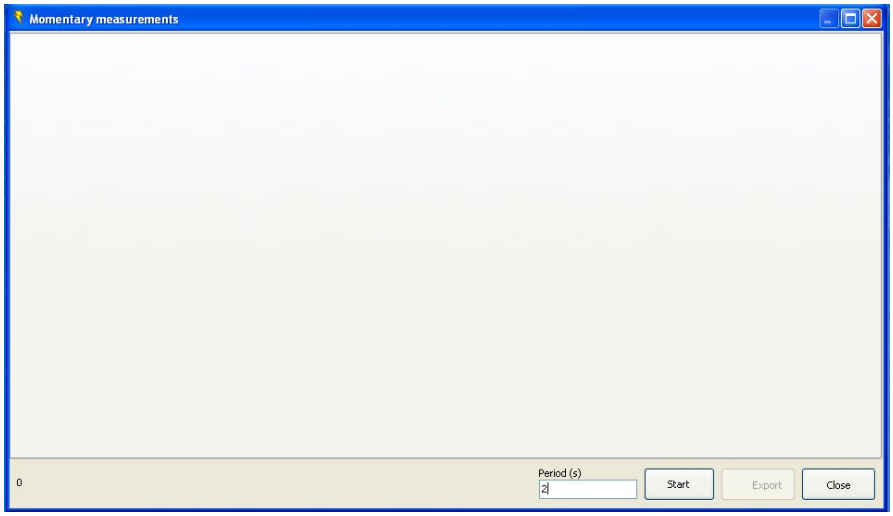
1. In the menu bar, click **Tools** and select **Advanced** - **Configure node**.
2. Click **Read configuration** and enter the level 2 access PIN-code.
3. In the window **Configure node** there are several different options possible to change.



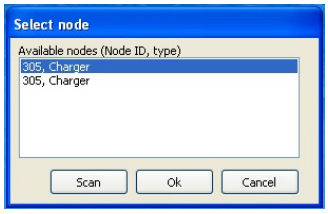
4. Edit the desired parameter and click **Write configuration** to configure the node with the new parameters.

Momentary measurements

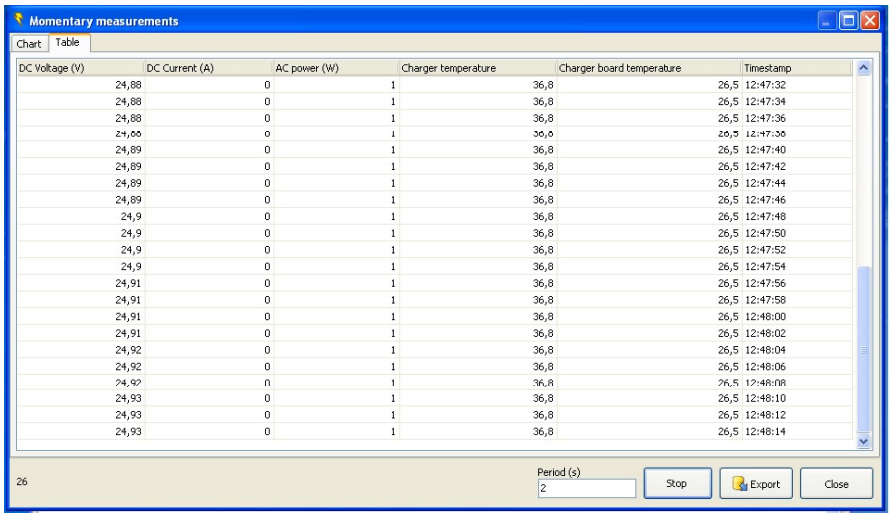
1. In the menu bar, click **Tools** and select **Advanced** - **Momentary measurements**.
2. Select the period to sample with the data and click **Start**.



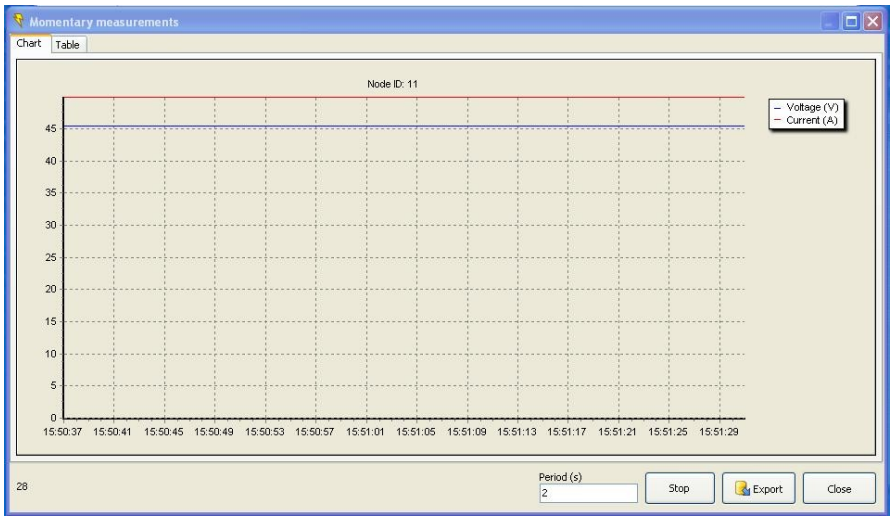
3. Select the node to make measurements on and click **Ok**.
4. To search for more nodes, click **Scan**.



5. The information can be viewed, either in chart form or in table form, as seen in the pictures:



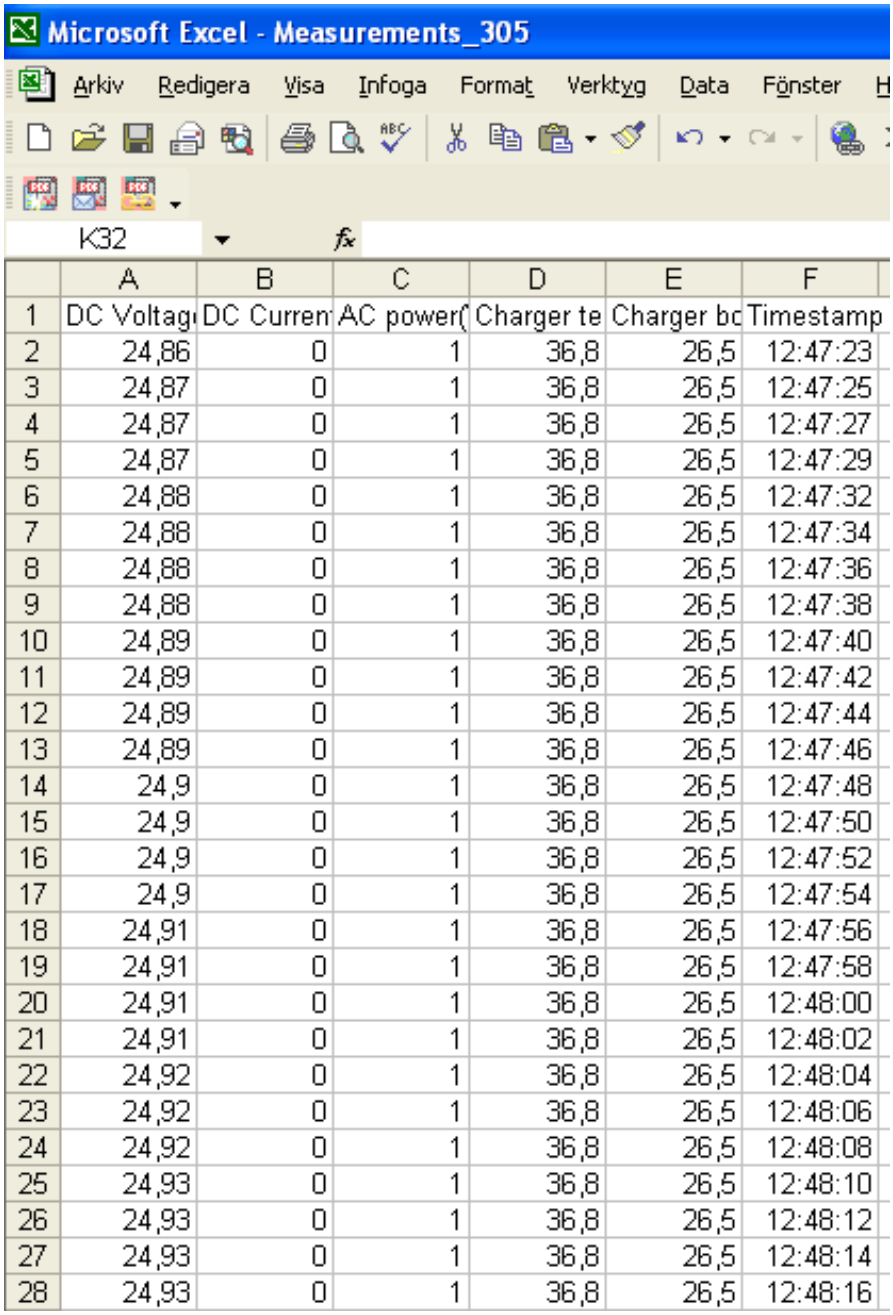
DC Voltage (V)	DC Current (A)	AC power (W)	Charger temperature	Charger board temperature	Timestamp
24,88	0	1	36,8	26,5	12:47:32
24,88	0	1	36,8	26,5	12:47:34
24,88	0	1	36,8	26,5	12:47:36
24,88	0	1	36,8	26,5	12:47:38
24,89	0	1	36,8	26,5	12:47:40
24,89	0	1	36,8	26,5	12:47:42
24,89	0	1	36,8	26,5	12:47:44
24,89	0	1	36,8	26,5	12:47:46
24,9	0	1	36,8	26,5	12:47:48
24,9	0	1	36,8	26,5	12:47:50
24,9	0	1	36,8	26,5	12:47:52
24,9	0	1	36,8	26,5	12:47:54
24,91	0	1	36,8	26,5	12:47:56
24,91	0	1	36,8	26,5	12:47:58
24,91	0	1	36,8	26,5	12:48:00
24,91	0	1	36,8	26,5	12:48:02
24,92	0	1	36,8	26,5	12:48:04
24,92	0	1	36,8	26,5	12:48:06
24,92	0	1	36,8	26,5	12:48:08
24,93	0	1	36,8	26,5	12:48:10
24,93	0	1	36,8	26,5	12:48:12
24,93	0	1	36,8	26,5	12:48:14


Momentary measurements
Chart
Table
Node ID: 11
Voltage (V)
Current (A)
45
40
35
30
25
20
15
10
5
0
15:50:37
15:50:41
15:50:45
15:50:49
15:50:53
15:50:57
15:51:01
15:51:05
15:51:09
15:51:13
15:51:17
15:51:21
15:51:25
15:51:29
28
Period (s)
2
Stop
Export
Close

Export

Data is saved in .csv format and therefore possible to be exported and analyzed in, for example, Microsoft Excel.

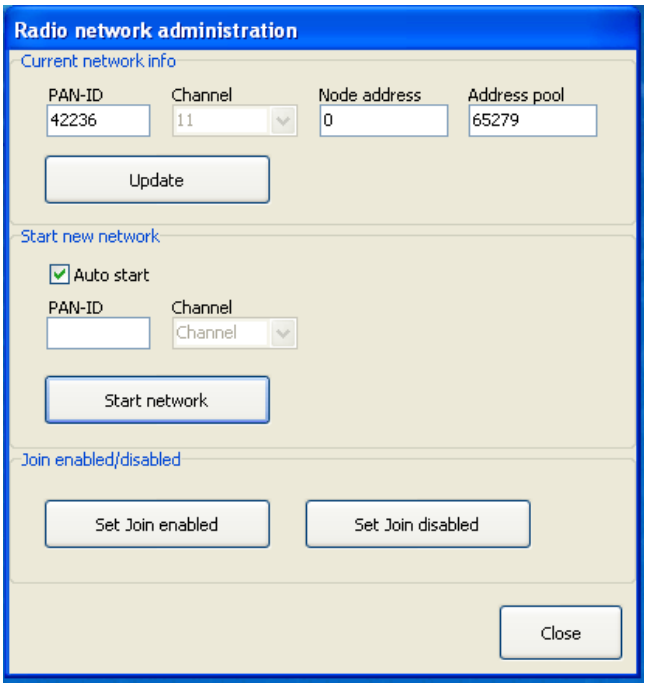
1. In the window **Momentary measurements**, click **Export**.
2. Select where to save the file and make sure the file extension is csv.
3. Open the file with Microsoft Excel.



	A	B	C	D	E	F
1	DC Voltag	DC Curren	AC power(	Charger te	Charger bc	Timestamp
2	24,86	0	1	36,8	26,5	12:47:23
3	24,87	0	1	36,8	26,5	12:47:25
4	24,87	0	1	36,8	26,5	12:47:27
5	24,87	0	1	36,8	26,5	12:47:29
6	24,88	0	1	36,8	26,5	12:47:32
7	24,88	0	1	36,8	26,5	12:47:34
8	24,88	0	1	36,8	26,5	12:47:36
9	24,88	0	1	36,8	26,5	12:47:38
10	24,89	0	1	36,8	26,5	12:47:40
11	24,89	0	1	36,8	26,5	12:47:42
12	24,89	0	1	36,8	26,5	12:47:44
13	24,89	0	1	36,8	26,5	12:47:46
14	24,9	0	1	36,8	26,5	12:47:48
15	24,9	0	1	36,8	26,5	12:47:50
16	24,9	0	1	36,8	26,5	12:47:52
17	24,9	0	1	36,8	26,5	12:47:54
18	24,91	0	1	36,8	26,5	12:47:56
19	24,91	0	1	36,8	26,5	12:47:58
20	24,91	0	1	36,8	26,5	12:48:00
21	24,91	0	1	36,8	26,5	12:48:02
22	24,92	0	1	36,8	26,5	12:48:04
23	24,92	0	1	36,8	26,5	12:48:06
24	24,92	0	1	36,8	26,5	12:48:08
25	24,93	0	1	36,8	26,5	12:48:10
26	24,93	0	1	36,8	26,5	12:48:12
27	24,93	0	1	36,8	26,5	12:48:14
28	24,93	0	1	36,8	26,5	12:48:16

Radio network administration

1. In the menu bar, click **Tools** and select **Advanced** - **Radio network administration**.
2. In the window **Radio network administration**, it is possible to view the current network information. It is also possible to start a new network:
   - either manually by selecting which *PAN-ID* the network should have and which *Channel* the network should operate on,
   - or automatically by marking the box *Auto start*.
3. When ready, click **Start network**.



NOTE

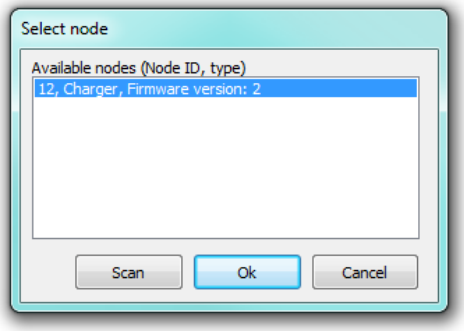
For making other devices able to connect to the network, click on ***Set Join enabled****.*

Calibrate BMU

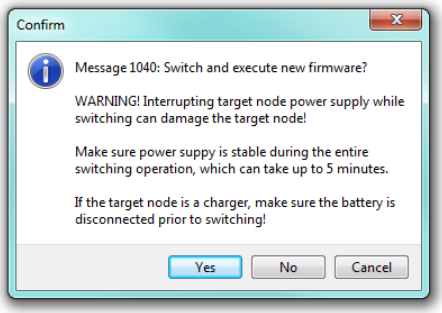
1. In the menu bar, click **Tools** and select **Advanced** - **Calibrate BMU**.
2. To scan and choose which BMU to calibrate, click **Start**.
3. Measure the voltage on the circuit with a multimeter and enter this value in the field *Actual voltage*, the first one at the top (Supply voltage). Click **Write point 1**.
4. Change the *Supply voltage* and measure on the circuit again. Enter the value and click **Write point 2**.
5. Repeat the same procedure for *Center voltage* and *Shunt current*.

Download firmware

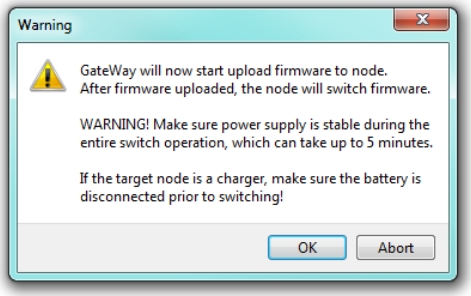
1. In the menu bar, click **Tools** and select **Advanced** - **Download firmware**.
2. Click **Browse** and select the wanted file with the firmware to download to the device.
3. Click **Download**.
4. Select the wanted node to download to. To confirm, click **Ok**.



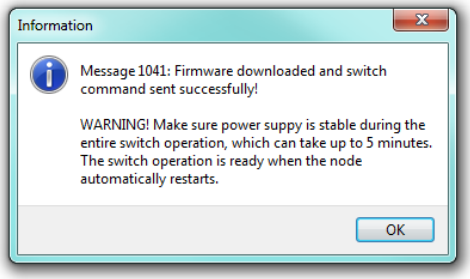
5. USB Gateway, generation 1: The firmware will now be downloaded to the device. But, before any firmware is executed, confirm *Switch and execute new firmware*, by clicking **Yes** in the dialogue box.



USB Gateway, generation 2: Click **Ok** and the firmware will now be downloaded to the device and switched automatically.



6. If the firmware was downloaded and switched successfully the following screen will be shown:

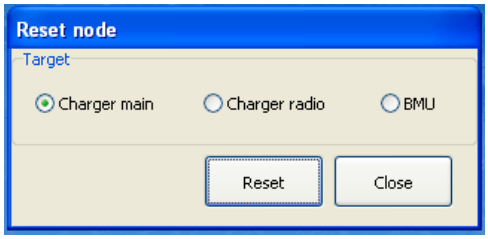


If the target node is a charger all LED:s are lit up and the display freezes, and the internal firmware switch starts. This takes between 3-10 minutes. Do not disconnect power supply during this operation. When the internal switch is completed the charger restarts automatically.

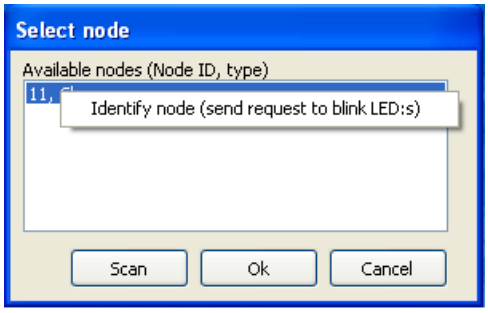
If the node is a BMU three indicators are lit up during the internal firmware update process. This takes approximately 15 seconds. Do not disconnect power supply during this operation. When the internal switch is completed the BMU restarts automatically.

Reset node

1. In the menu bar, click **Tools** and select **Advanced** - **Reset node**.
2. Select which node to reset and click **Reset**.



3. Select the node and click **Ok**. If uncertain of which node to choose it is possible to right-click and select *Identify node*.

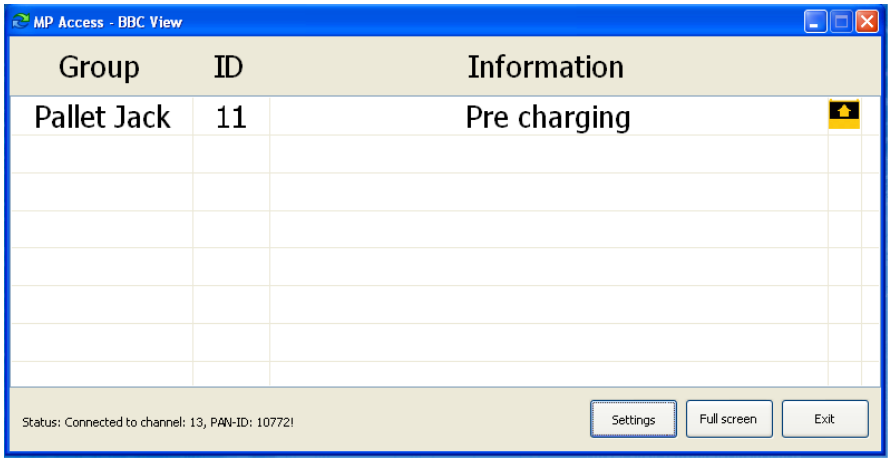


4. Click **Ok** again to confirm.

Access - BBC view

1. Start **Access - BBC View**. To exit fullscreen mode, right-click and select *Exit fullscreen mode* or click **Esc**.
2. Click **Settings**.
3. Under the tab **Network**, enter the *Network channel* and *Network PAN-ID* for the network. This information can be found under *Radio - Network info* on the charger. Also make sure the BBC function is enabled and Group IDs have been selected for each charger.
4. Click **User interface** to the left.
5. Click **Add** and enter a *Group ID*. Click **Ok**.
6. Write a designation for that group and click **Ok**.

7. Select a color and click **Ok**.
8. If another group should be entered simply click **Add** and repeat the procedure.
9. When ready click **Apply** and **Ok**.
10. Restart the program.
11. Information about the different groups can now be seen in the main window.



Contact information

Micropower Group AB
Idavägen 1, SE-352 46 Växjö, Sweden
Phone: +46 (0)470-727400
e-mail: *support@micropower.se*
www.micropower-group.com