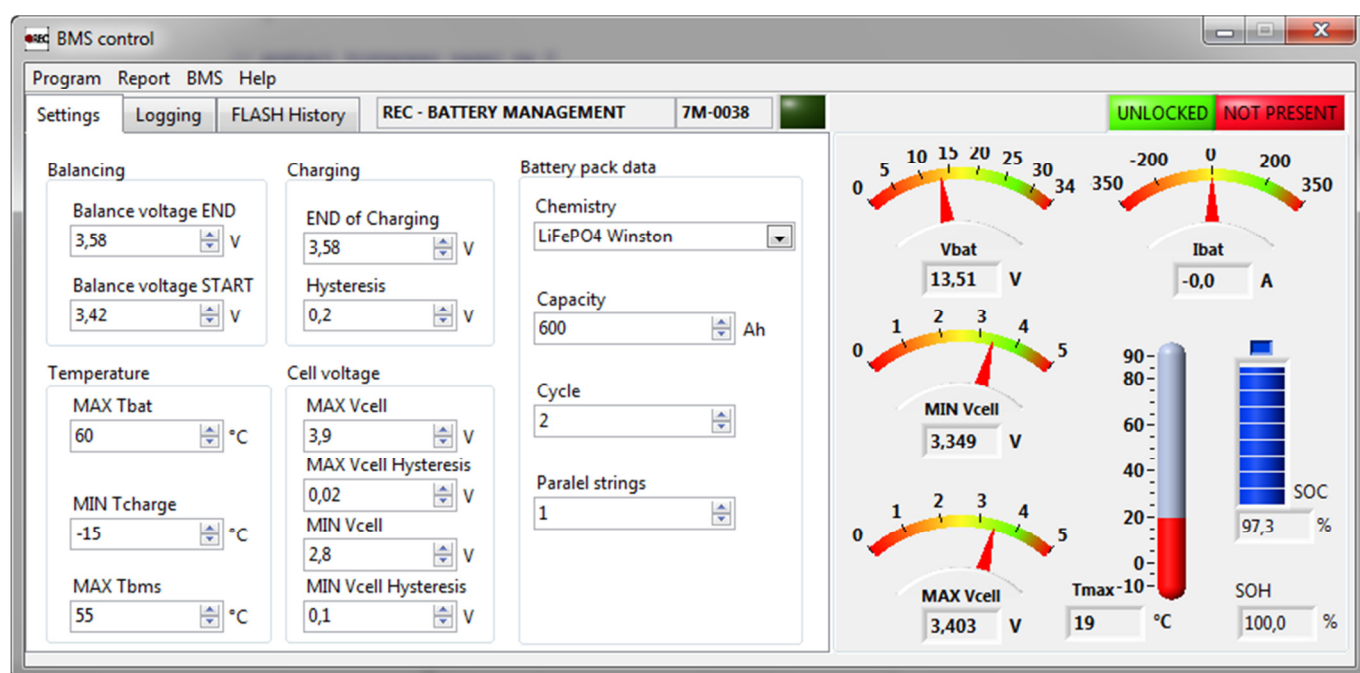


BMS MASTER CONTROL

USER MANUAL

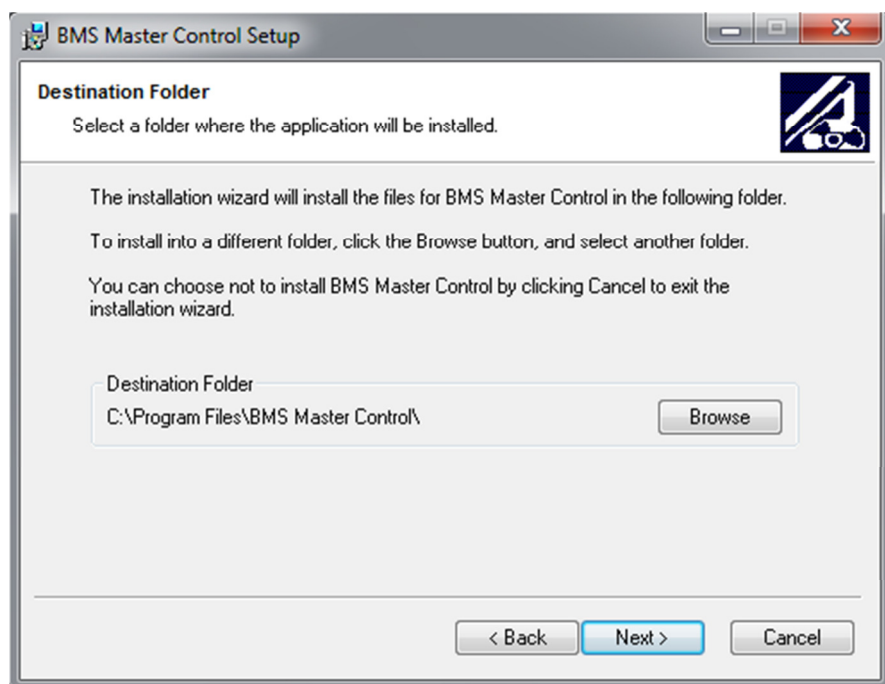


Installing the BMS Control Software

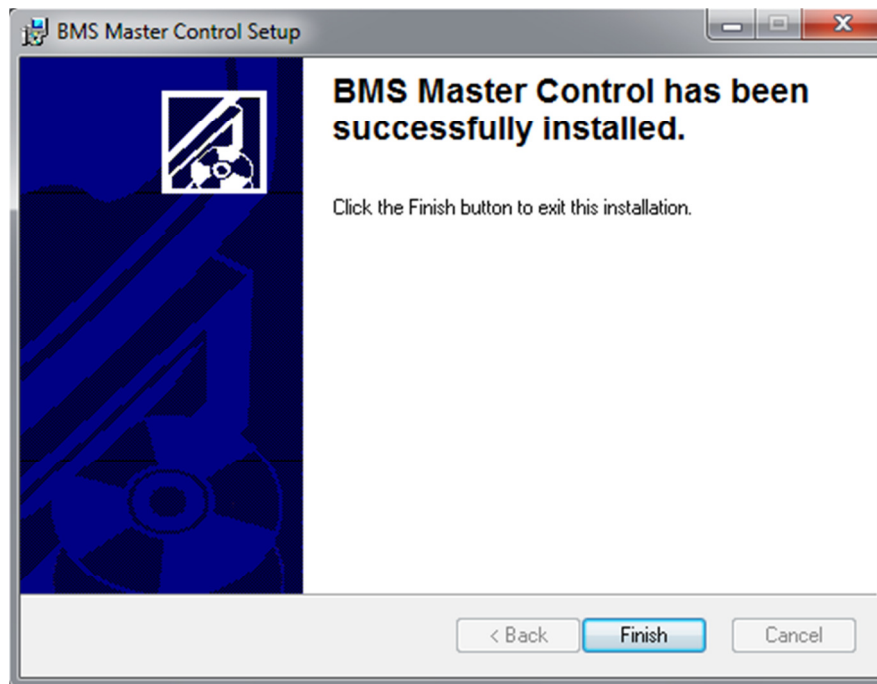
Run the Setup.exe application in the Installer folder on your Setup CD. Click “Next” at the **Welcome to the BMS Master Control Installation Wizard**.



Choose the Destination folder where the application will be installed.



You have now successfully installed the software. Click the “Finish” button to exit the installation.

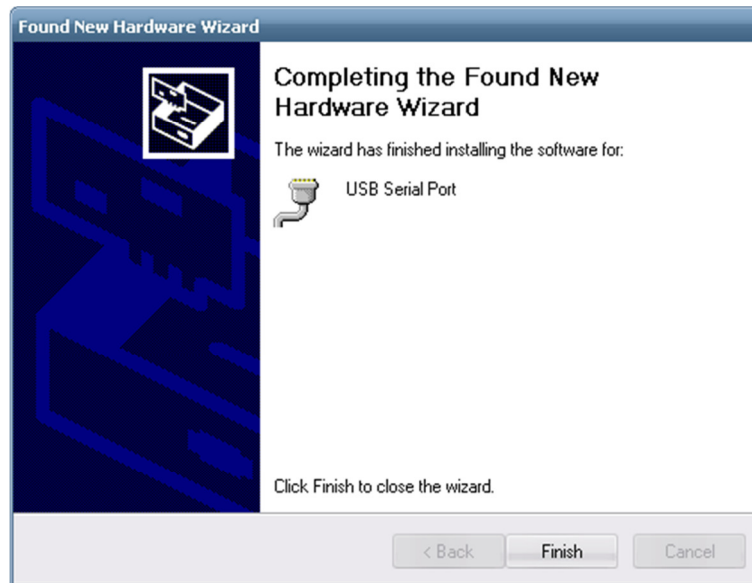


Setting communication with BMS

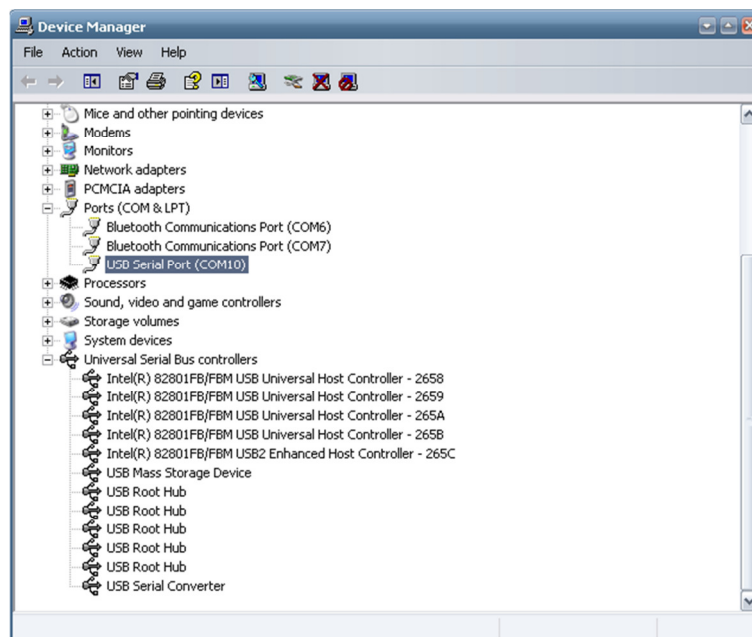
When the RS-485 communication cable is inserted in the USB for the first time in Windows XP and older, the device is not recognized. The **Found New Hardware Wizard** pop-up window appears. Choose "Install the software automatically" option and click Next.



Windows completes the Found New Hardware Wizard by clicking the "Finish" button.



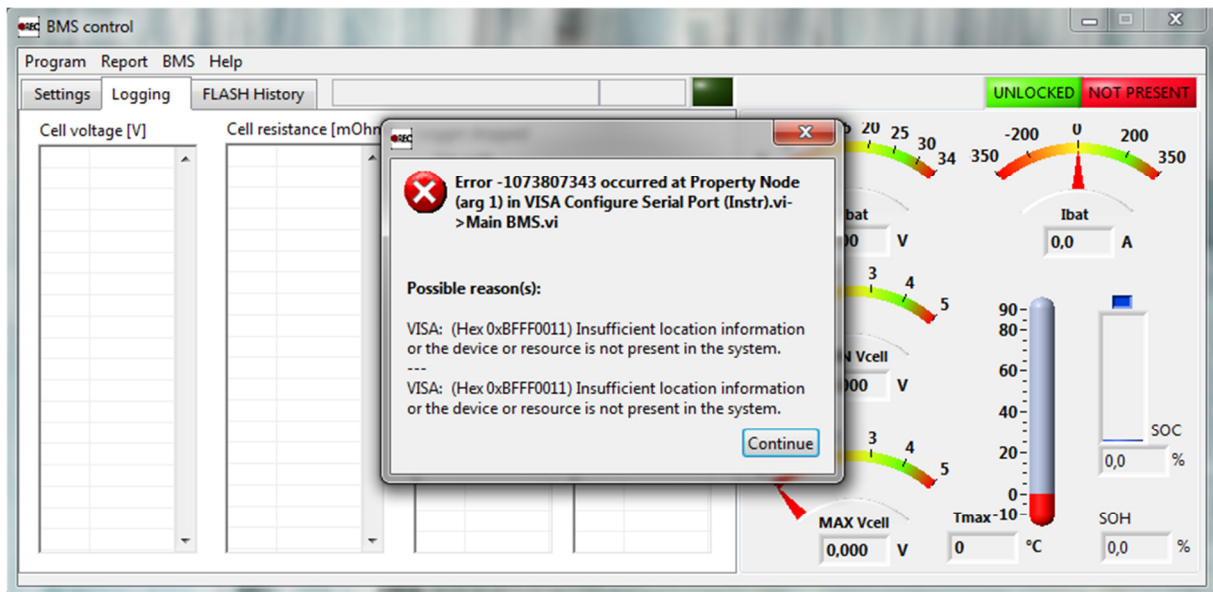
The RS-485 cable behaves as virtual com port (VCP). A number is assigned to the VCP in the Control panel/System/Device Manager under Ports (COM & LPT). This port number is used to set the communication parameters in the **Set communication properties** window of the BMS Control software.



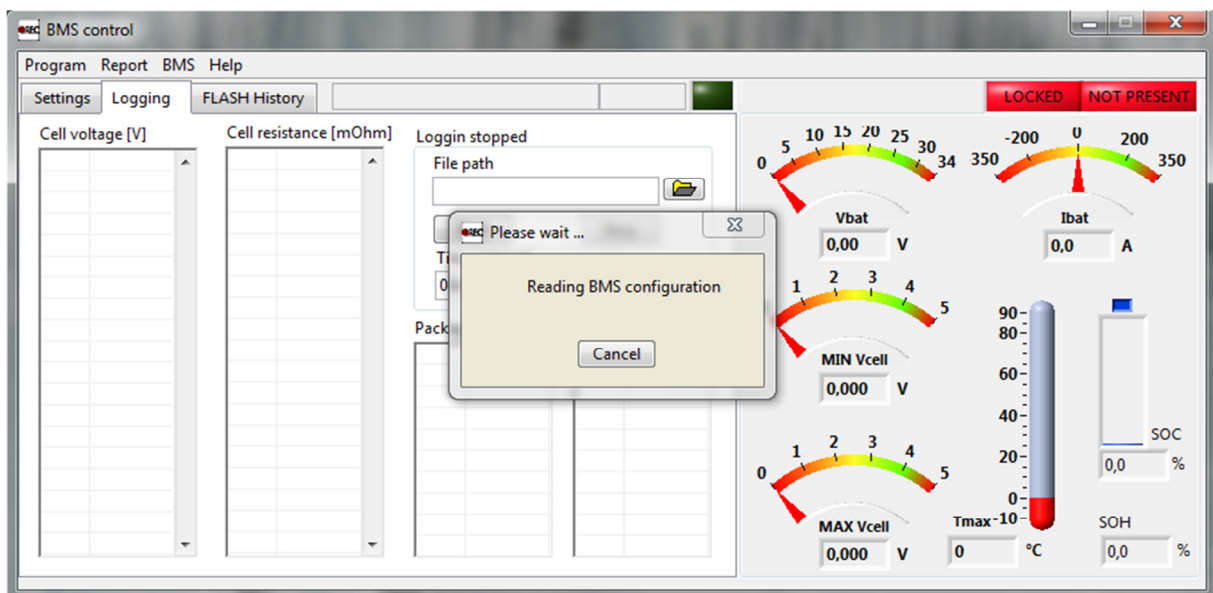
Drivers can also be found on the FTDI web site: <http://www.ftdichip.com/Drivers/VCP.htm>

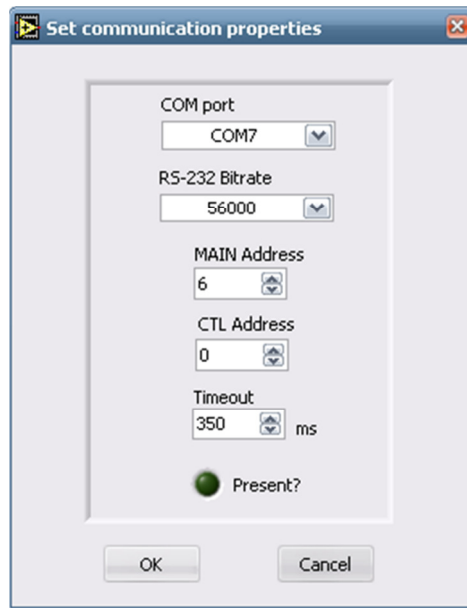
BMS MASTER CONTROL MANUAL

You can now run the BMS Control software. If this is the first time you have been running the program, the VCP has not been set yet and the Error 1073807346 occurs. You must follow the procedure described below. Click the “Continue” button.



The BMS is not connected to the BMS Control software, the sign **NOT PRESENT** is turned on and **Reading BMS configuration** window pops out. Click the “Cancel” button and open **Set communication properties** in the Program menu.





Select the COM port number that was assigned by VCP and set the parameters as they are listed in Table 1:

Table 1: RS-485 Communication properties.

Parameter	Settings
Baudrate	56 000
MAIN Address	BMS Address (See BMS PIN Configuration) or 16 for Master
CTL Address	0 or 16 for Slave Units
Timeout	350 ms

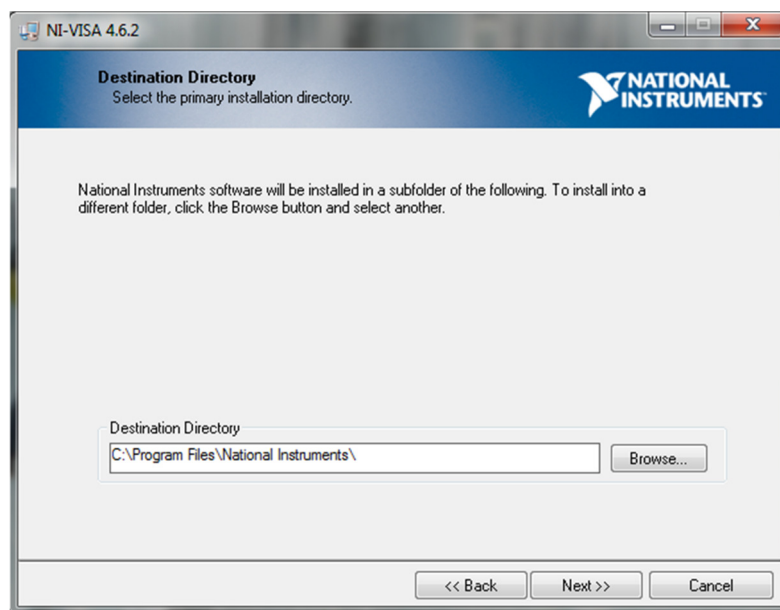
When the communication properties are set properly, the **Present?** Light turns green. To confirm the settings, press “OK”.

If you are using Windows 7 Premium Home Edition, the BMS communicate software is unable to detect the dedicated RS-485 cable on COM port. Extra drivers should be installed. Run Visa426Full.zip file on your installation CD and wait until it extracts to a temporary location on your computer.

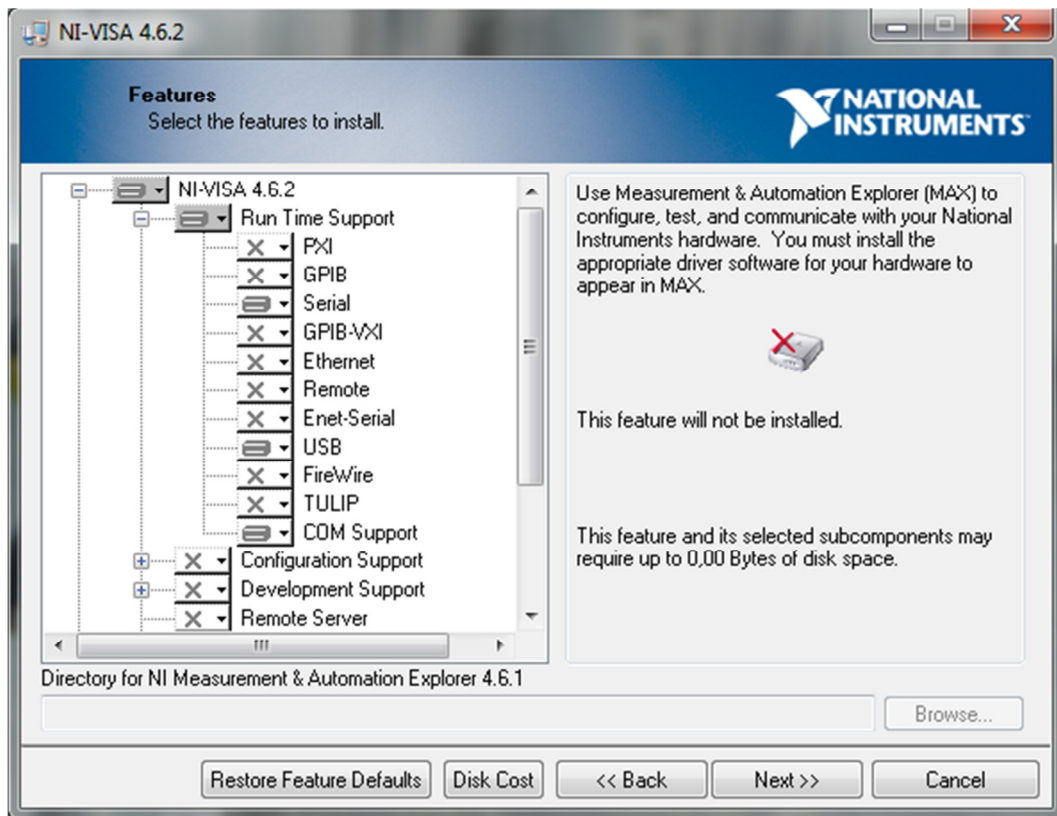
Continue the installation by selecting “Next”.



Select the location for National Instruments VISA Drivers.



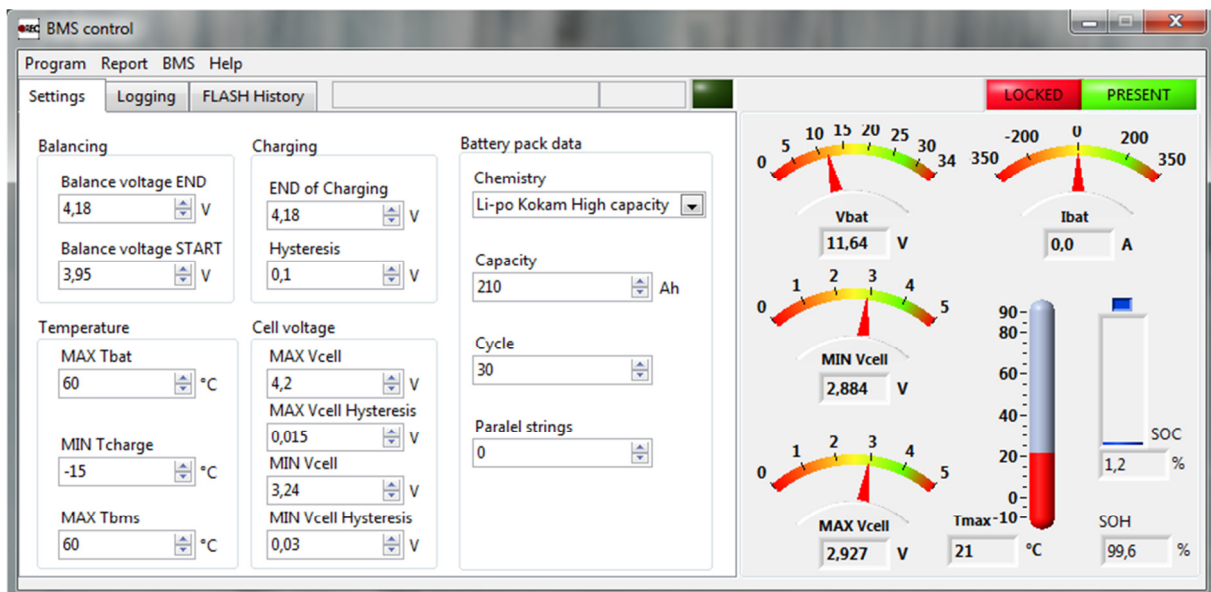
For the RS485 Cable to work, only Serial, USB and COM Support Drivers under “Run Time Support” should be chosen.



Restart the computer when the VISA drivers are installed.

BMS settings setup:

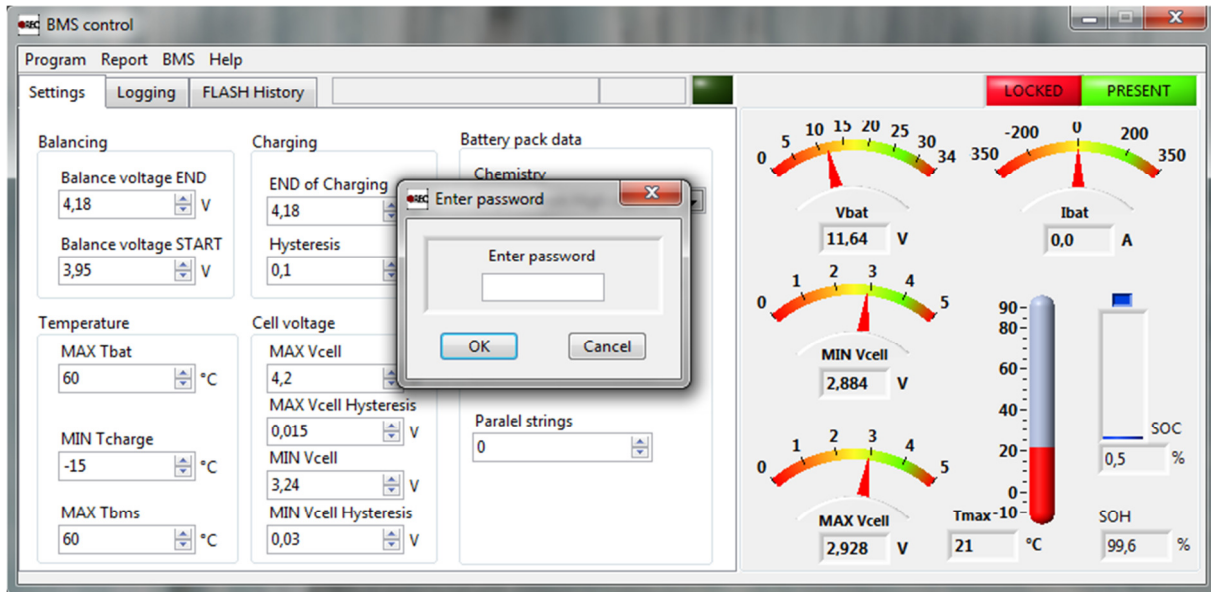
When BMS and BMS Master Control software on the PC are properly connected, the program downloads all system parameters the Settings tab.



BMS MASTER CONTROL MANUAL

If you want to change the settings of your BMS, the BMS has to be unlocked first. To unlock the device select the tag Locked from BMS menu (Ctrl+L) or click the red “LOCKED” button in the top-right corner of the window.

The window **Enter password** appears. The password is written as a serial number on the BMS you have purchased.



Once you unlock the BMS, you get a permission to change the original settings on the device. The sign in the right top corner **LOCKED** should change to **UNLOCKED**.

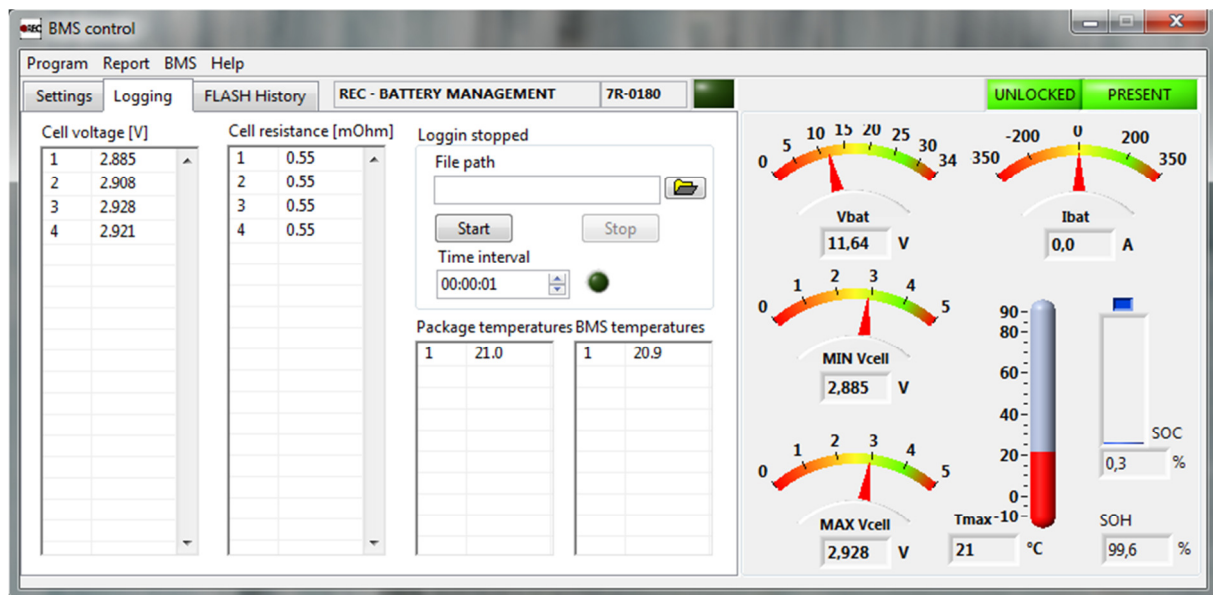
Table 2: BMS Parameter description.

Parameter	Description
Balance Voltage END	Sets the balancing voltage above which the individual cell is balanced 100%.
Balance Voltage START	Sets the average battery pack voltage above which the BMS performs the balancing while charging. Special balancing algorithm is used to determine which cells have to be balanced until the Balance Voltage END is reached.
END of Charging	Sets the end of charge voltage of the individual cell.
Hysteresis	Sets the Charging hysteresis of individual cell.
MAX Tbat	Battery pack is disconnected from the system, if the T_{BAT} temperature is higher than the MAX Tbat. MAX Tbat hysteresis is set to 2°C.
MIN Tcharge	Charging is not allowed under this T_{BAT} . MIN Tcharge hysteresis is set to 2°C.
MAX Tbms	Sets the maximum allowable temperature of the BMS T_{BMS} due to the passive balancing. The BMS Tmax hysteresis is set to 5°C. The balancing and charging is stopped until the temperature does not drop under the set value.
MAX Vcell	The highest allowed voltage of the individual cell.

MAX Vcell Hysteresis	The highest allowed voltage of the individual cell voltage hysteresis.
MIN Vcell	The lowest allowed voltage of the individual cell.
MIN Vcell Hysteresis	The lowest allowed voltage of the individual cell voltage hysteresis.
Chemistry	Cell chemistry.
Capacity	Battery capacity (Single string).
Cycle	Number of effective battery cycles.
Parallel Strings	Number of parallel strings in the battery pack.

Data logging:

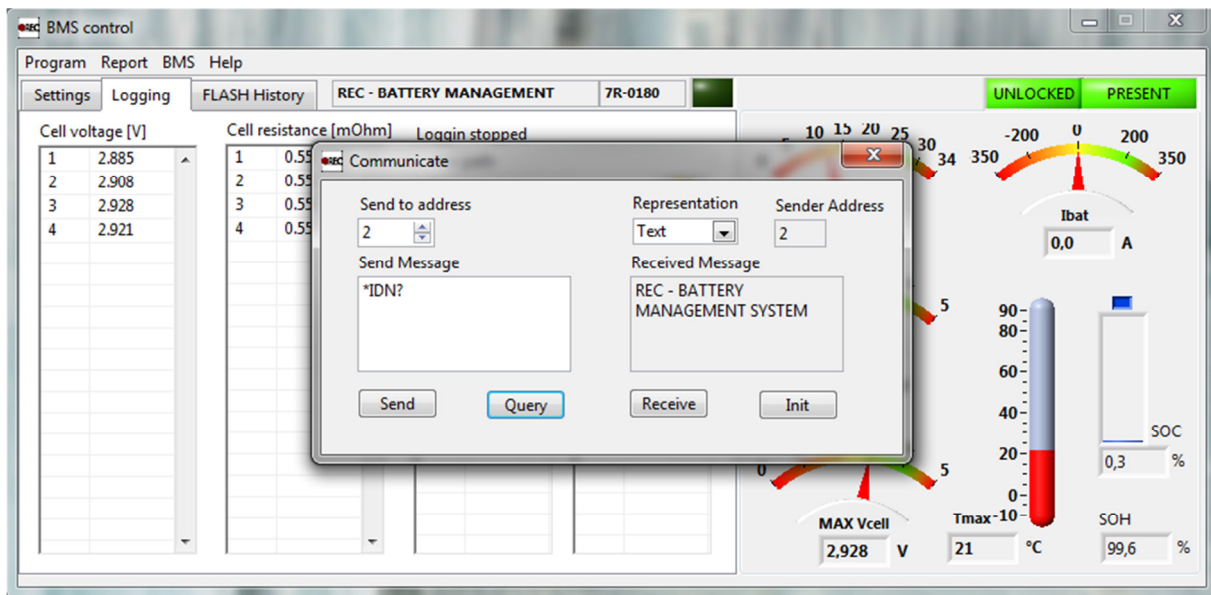
All parameters of the BMS can constantly be monitored on the right side of the screen. To see the individual cell voltage, Cell resistance, package and BMS temperature the Logging window should be chosen. To record and save the data you collect during an operation (charging, testing, etc.) choose the **File** and set the **Time interval** you want BMS to save. When the Time interval is set to 00:00:00 the software logs the data with its maximum achievable speed. By pressing the “Start” button you start the logging, to stop recording, just press the button “Stop”.



Service Instructions

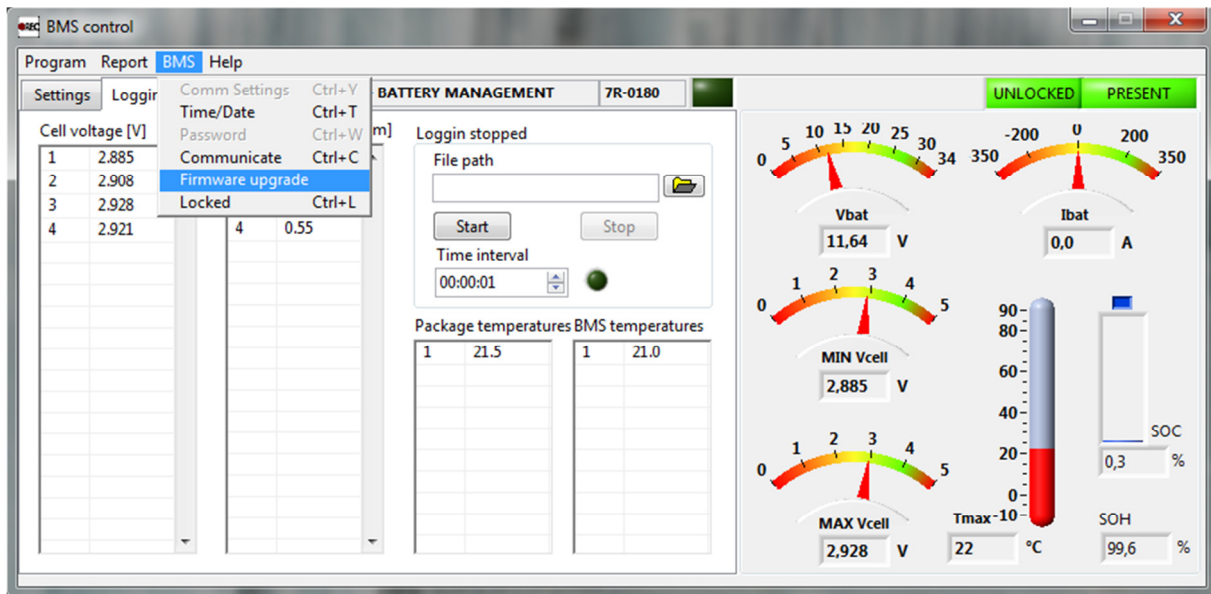
Additional Service Parameters are available in BMS tab under Communicate. Additional instructions and custom made parameter instructions are described in the individual BMS user manual.

A new window pops-up. BMS receiver address has to be filled-in first. Read and Write instruction are possible. When the parameter should be read from the BMS a question mark should follow 4-letter instruction (e.g. VMAX?). If the parameter should be changed a new parameter value should follow the instruction + a single space (e.g. VMAX 3.95). »Query« button answers with the parameter settings or confirms the new value with »SET«. If the Run time window appears, repeat the instruction. The BMS is busy with the measurement. »Send« is used in case when no respond is required.

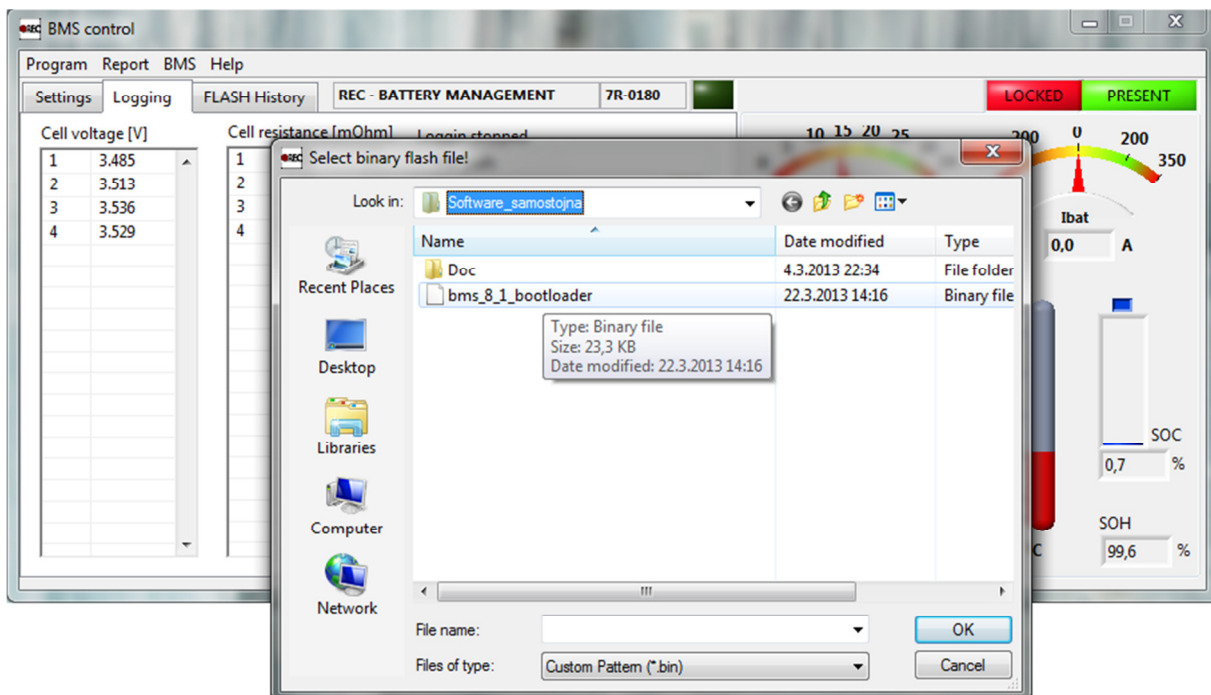


Firmware upgrade

BMS firmware can be upgraded with RS-485 Cable and BMS Master Control software. When the BMS is turned ON it waits for an instruction for firmware update for the first 0.5 s. Then it jumps to the normal mode of operation. When a firmware upgrade should be done a “Firmware upgrade” option should be chosen in the “BMS” menu.



A new firmware binary file should be selected from the “Select binary flash file” window.



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A new window pops-up with Bootloader status. BMS should be turned OFF and ON to start the new firmware upgrade. When the firmware is downloaded to the BMS, it should not be turned OFF! When the new firmware is updated the BMS restarts on its own.

