NATURELA
ELECTRONICS

13 ANA FELIXOVA
9020 VARNA, BULGARIA
WWW.NATURELA-BG.COM

+359 52 504 506
+359 52 504 507
office@naturela-bg.com

GLC
CERTIFIED
ISO 9001

Monitoring Software for NPBC-V3M-1
# User Manual

Contents:

1. Introduction:

The software **NPBC_Monitor.exe** is designed for remote monitoring and control of the pellet burner controller NPBC-V3M-1. With this software you can easily monitor the performance and the current state of your burner, as well as to edit all the parameters needed to adjust the controller to a particular burner. Connect the controller to a computer, by using a suitable serial cable. Important advantages of the monitoring software:

- displays charts with the pellet consumption for the last 24 hours;
- displays a chart with the change-overs between the power levels of the burner's work;
- an option to export in text files the information about the burner's state every time it changes;
- each text file's name contains the date and time of the last record in it, which allows the user to monitor and compare the burner's performance for longer past periods.

2. Requirements:

To work this software properly, you need a computer working on Windows OS (XP/Vista/7) with a serial interface RS-232. Also, you need a cable to connect NPBC-V3M-1 to the computer.
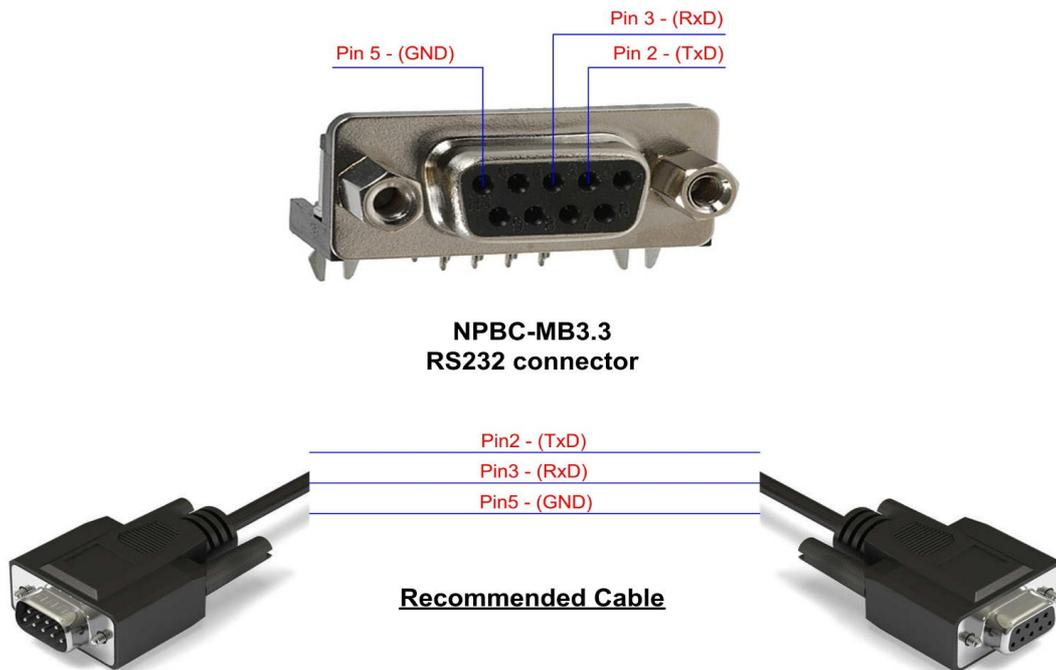
Connection scheme for NPBC-V3M with PC

The controller should be connected both to the supply voltage and to the computer. One of the procedures requires the controller to be turned off from the power supply and then back on again. It will be easier, if you provide a power switch near the workplace.

3. Installing the software:

Make a directory on your computer (for example C:\NPBC-V3M_Monitor) and save the archive file there. Extract the files from the archive.

Check the number of your serial interface (COM port). If it is different than COM1, open the file **NPBC_Monitor.ini**, find the line **COM_PORT=COM1** and change the number 1 with the correct number. Save the file. Now you can run the program NPBC_Monitor.exe. To make it easier you can make a shortcut to the program on your desktop.

4. Connecting the devices:

Connect the controller to the computer by using a suitable cable. If your computer does not have a serial interface RS-232, you can use a USB-to-RS232 cable.

Connect the controller to the power supply and switch it on.

5. Updating the controller's software:

It is recommended to update the software of the Executive module first and then software of the Control module.

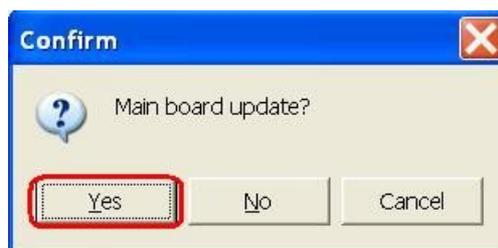### 5.1. Updating the software of the Executive module:

Double-click on the message on the line **SWver**, which should indicate the current version of the Executive module:
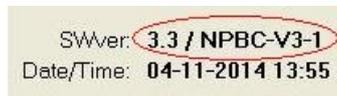
You will see the following Confirmation window:

Click on the button **OK.** The next message lets you choose the module for software update:
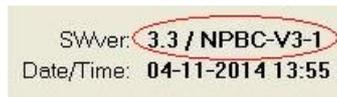
Click on **Yes**. The software update requires some time, so don't worry if it takes a few minutes. While updating the software of the **Executive module,** its green **LED** blinks slower, which indicates the process.

5.2. Updating the software of the Control module:

Double-click on the message on the line **SWver**, which should indicate the current version of the Executive module:
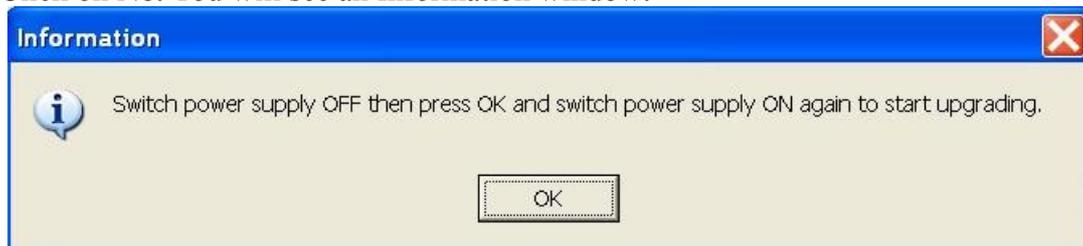

You will see the following Confirmation window:

Click on the button **OK.** The next message lets you choose the module for software update:

Click on **No**. You will see an Information window:

Follow the instructions from the message. While changing the software, a message **Upgrading** appears on the display. This process lasts a little bit longer than the software update of the Executive module. After the update is completed, the controller restarts. You might have to check, if it remembers all the previous settings, and if they have been changed, you will have to make them again.
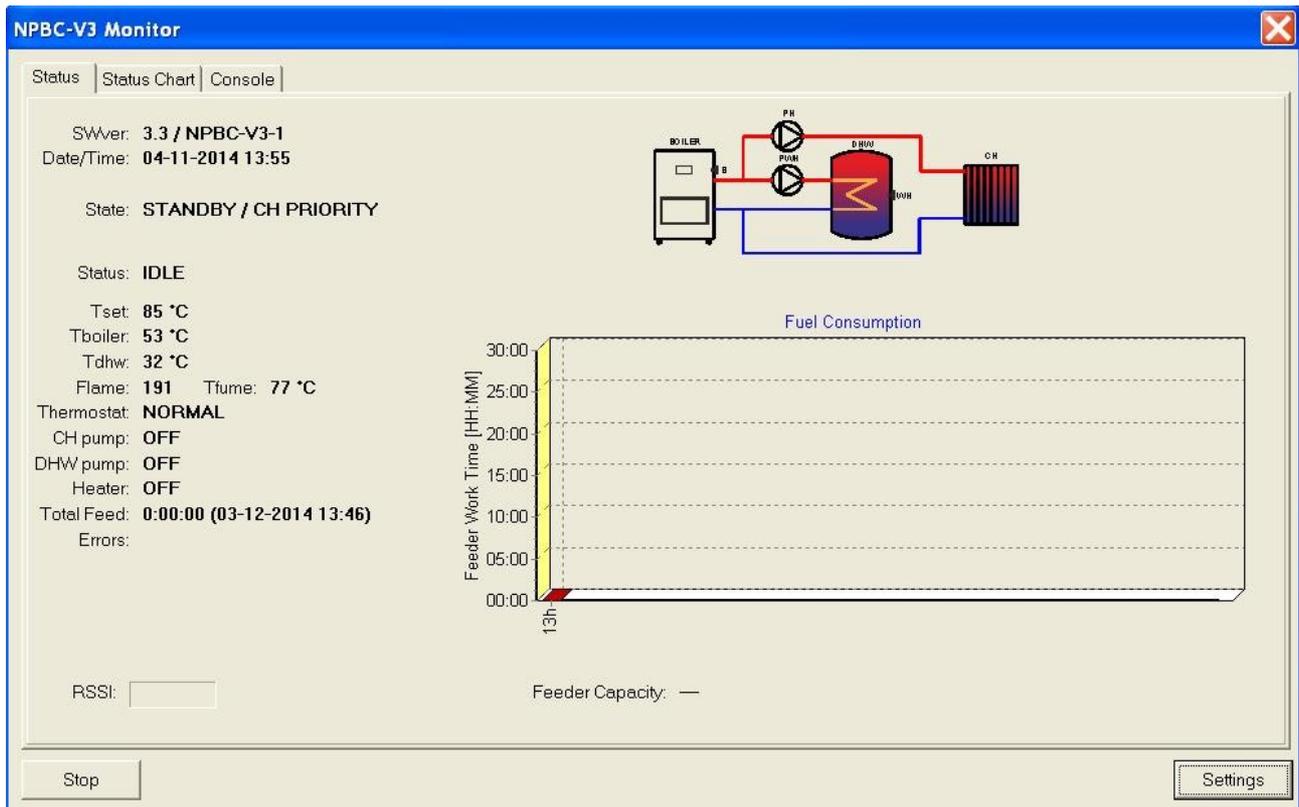
It is recommended not to turn off the power supply to the controller while the programs are being uploaded!

6. Settings:

The monitoring software allows you to make all the settings you need through your computer, instead of the controller's Control module.

6.1. Main screen options:

On the main screen of the program, you can make some general settings:

Line	Message	Setting
SWver	Software version of the controller or HWid error if it is not compatible with the monitoring program.	Double-click on the message to update the software of the controller.
Date/Time	Shows the date and time in format: dd-mm-yyyy 23:59.	Double-click on the message. If the time is not set, the program gets the computer's system time and date.
State	The current work mode of the burner: **Standby** mode is indicated by a 'Standby' message, **Auto** mode is indicated by a message with the current installation with major priority and **Programme** mode is indicated by the same message as Auto,	Double-click on the message. Two combo boxes and OK and Cancel buttons appear. Choose the work mode for the burner from the top combo box and the

	but with a time interval below it.	installation with major priority from the bottom.	
Status	The current state of the burner: Extinction, Ignition, Cleaning, Burning, Suspend, etc.	—	
Tset	Set temperature of the boiler	Double-click on the message to change the set temperature.	
Tboiler	Current temperature of the boiler	—	
Tdhw	Current temperature of the water heater	—	
Flame	Current light level, measured by the IR photo sensor	—	
Tfume	Temperature of the exhaust gases in the vent	—	
Thermostat	Normal/Stop	—	
CH pump	On/Off	—	
DHW pump	On/Off	—	
Heater	On/Off	—	
Total feed	The total fuel consumption by this moment since the time in the brackets, based on the feeder capacity.	Double-click on the message to reset it.	
Errors	All the error message, which the controller might display on its screen, appear here, too.	—	
Feeder Capacity	Fuel consumption per hour	Double-click on the message to enter the correct fuel consumption per hour corresponding to your burner.	
RSSI	Progress bar, showing the strength of the signal when using a radio interface.	—	

6.2. Parameters settings

Before entering the parameter setting, the burner must be in State: STANDBY and Status: IDLE STANDBY, otherwise you wouldn't be able to save the changes. If it is currently working, change its work mode to Standby and wait until it is completely extinguished. Enter the parameters settings, by pressing the Settings button on the bottom right corner of the main window.

	Parameter	Description
Cleaning on Start	Fan	Active time (in seconds) of the main fan for cleaning the burner before ignition
	Cleaner	Active time (in seconds) of the additional fan for cleaning the burner before ignition
Cleaning on Stop	Fan	Active time (in seconds) of the main fan for cleaning the burner after extinction
	Cleaner	Active time (in seconds) of the additional fan for cleaning the burner after extinction
Cleaning on BBAlarm	Fan	Active time (in seconds) of the main fan for cleaning the burner when BBAlarm occurs
	Cleaner	Active time (in seconds) of the additional fan for cleaning the burner when BBAlarm occurs
Auto Cleaning	After burning for	Cycle for the automatic cleaning procedures.
Ignition	Retries	Number of attempts to ignite the pellets
	Initial Feed	Active time (in seconds) of the screw motor for the initial pellet loading.
	Heater	Active time (in seconds) of the heater without a fan.
	Fan1	First power level of the fan. Set the duration (in minutes) for the fan to work along with the heater and its speed (in percents).
	Fan2	Second power level of the fan. Set the duration (in minutes) for the fan to work along with the heater and its speed (in percents).
	Fan, column 3	Speed of the exhaust fan
Initial Burning	Duration	Duration (in seconds) of the initial burning process without feeding new pellets
	Fan speed, column 1	Speed of the fan during this process
	Fan speed, column 2	Speed of the exhaust fan during this process
Burning Startup	P1	Time (in seconds) for the burner to work on first power level after ignition
	P2	Time (in seconds) for the burner to work on second power level after ignition
Power Modulation	P3 (High)	The highest power level of the burner. **dT** is the temperature difference between the set temperature for the boiler and its actual temperature. **Feed** is the time (in seconds, multiplied by 0,1) for loading pellets. If the number in column **Feed** is 50, it means 5 seconds. **Cycle** is the frequency (in seconds) of loading the pellets. **Fan Speed** is the fan's power level in

|		
		percents. The 5th column is the speed of the exhaust fan while the burner is working on this power level.
	P2 (Mid)	Mid power level of the burner
	P1 (Low)	The lowest power level of the burner
	P0 (Suspend)	Power level for just maintaining the fire.
	Max Time @ Suspend	Maximum time for maintaining the fire.
	Max Overheating	Limit of overheating after which the burner turns off even if the Max Time @ Suspend hasn't run out yet.
Intermediate cleaning	Cycle	Active time of the fuel auger between two intermediate cleanings (in seconds)
	Duration	Duration of the cleaning process (in seconds)
	Fan Speed, col. 1	Speed of the main fan
	Fan Speed, col. 2	Speed of the exhaust fan
	Fan	If checked, the main fan will work in this procedures
	Cleaner Motor	If checked, the FC output will be supplied during the intermediate cleaning procedures.
Burning Shutdown	P3	For smooth extinction of the fire, set the time for the burner (in seconds) to work on its highest power level before switching to the lower one.
	P2	Time for the burner (in seconds) to work on its middle power level before switching to the lowest one.
	P1	Time for the burner (in seconds) to work on its lowest power before switching to Suspend mode.
Hardware	Burner Feeder	Check, if your burner has a Burner Feeder
	Cleaner Motor	Check, if your burner has a Cleaner Motor
	Delay	If checked, after every cleaning procedure, where the FC output has been supplied with power, there will be a delay before loading a new portion of pellets. The delay is equal to the active time of the FC output.
	Thermostat NO	Check for Normally Opened thermostat or uncheck for Normally Closed
Add-ons	CH pump	Check, if you have a Central Heating installation pump
	DHW pump	Check, if you have a pump for the hot water installation
	Thermostat	Check, if you have a Thermostat
Burner Feeder	Duty	The internal auger motor active time in percents, depending on the active time of the feed screw motor (Feed in section Power Modulation) + the additional constant time.

Photo Sensor	Ignition	If the level of illumination is higher than the first parameter in this setting for longer than the set time (second parameter) in seconds, then the ignition is successful.
	Extinction	If the level of illumination is lower than the first parameter in this setting for longer than the set time (second parameter) in seconds, then the extinction is successful.
CH Settings	Min Temp	The minimum required temperature for the Central Heating installation pump to turn on
	Hysteresis	The CH pump works for as long as the temperature of the water in the boiler is higher or equal to (Min Temp - Hysteresis)
DHW Settings	Set Temp	The minimum required temperature for the Hot Water installation pump to turn on.
	Hysteresis	The DHW pump works for as long as the temperature in the boiler is higher or equal to (Set Temp – Hysteresis)
Language	Language	Choose between English, Spanish, Portuguese, Dutch or Bulgarian language for the controller's menus
Set temperature	Max	The maximum temperature that can be set on Tset on the main window.
Safety Settings	Active	Put a check sign to activate this option (if the burner has a pt100 high temperature sensor, mounted in the vent)
	Warning	Set the value, required for a warning message, that the temperature of the exhaust gases in the vent is too high
	Alarm	Set the critical value, when an alarm message turns off the burner, because of too high temperature of the exhaust gases in the vent

If you have favorite settings, you can save them, by the button **Save** and if they change (because of future updating the software or else), you can load them, by the button **Load**.

7. Monitoring:

7.1. Fuel Consumption:

The chart on the main window shows the fuel consumption for the last 24 hours or since it has been reset (if it was sooner). The newest information appears on the left side of the chart:
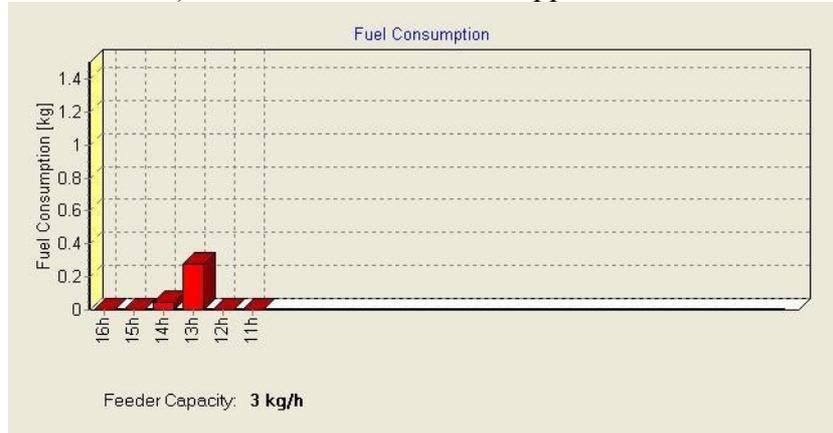

The graphics' range depends on the parameter Feeder Capacity below it and on the parameter MAX_DUTY in the configuration file NPBC_Monitor.ini. The formula for the maximum value for the consumed pellets per hour that the graphics displays is:

Fuel Consumption Max = Feeder Capacity * MAX_DUTY / 100

7.2. Status Chart:

Click on the tab Status Chart on the top left side of the window, next to the tab Status. The following chart appears:
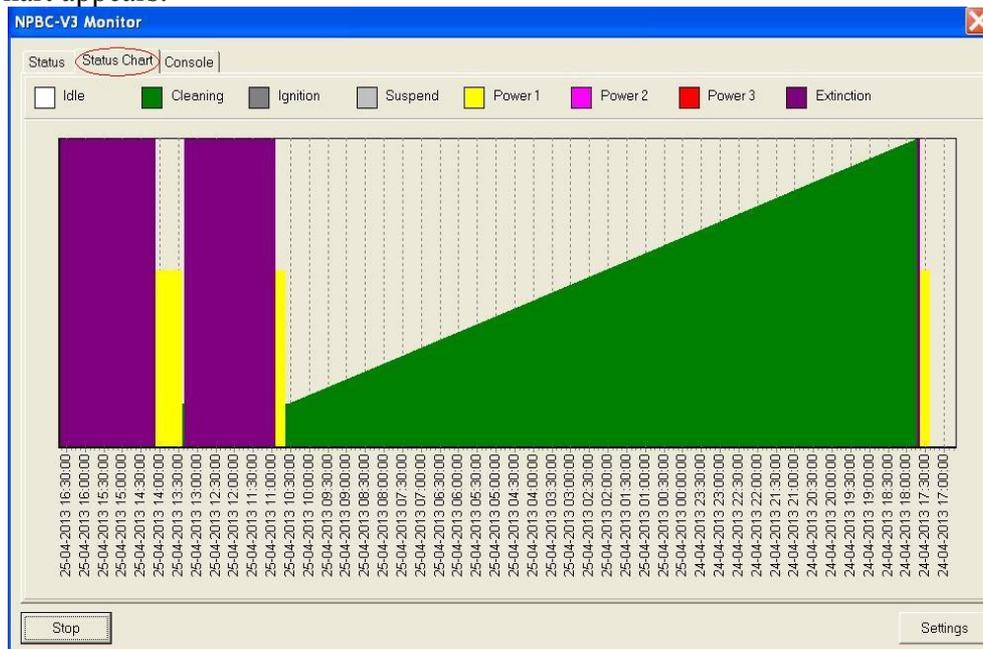
The newest information about the current state of the burner is on the left side of the chart.

7.3. Console

Click on the tab Console on the top left side of the window, next to the tab Status Chart. You will see the following information:
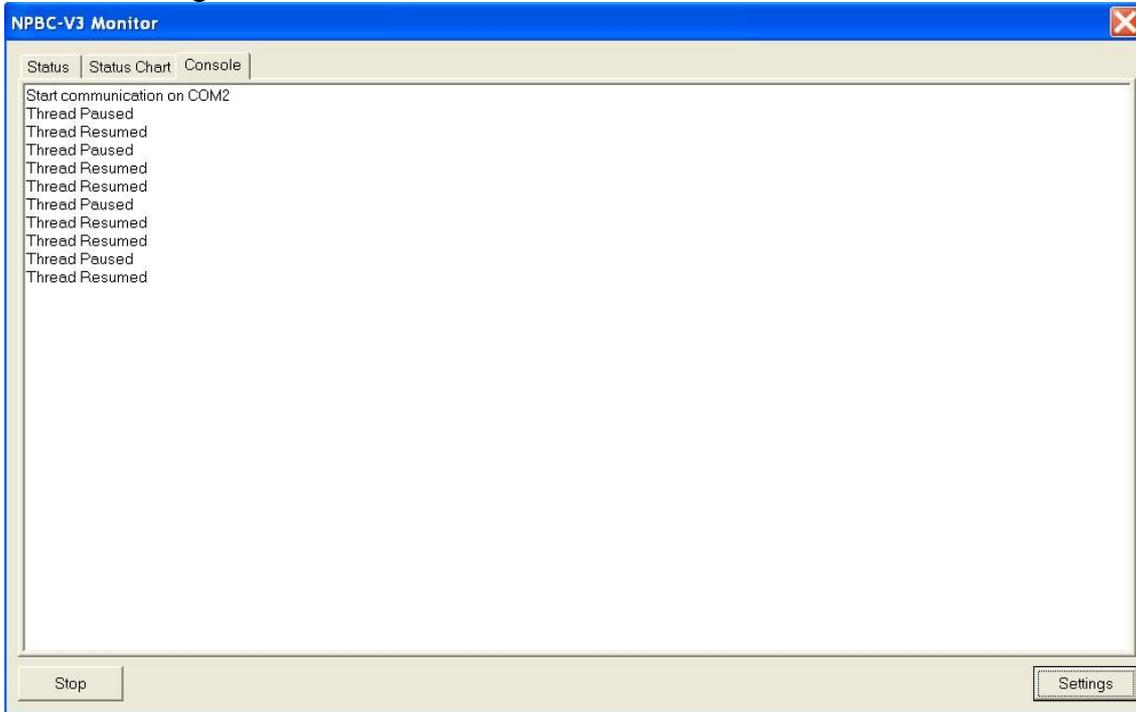
8. Export files:

The monitoring software has an option to save records about the burner's state in text files. You can find them in the same directory where the monitoring program is. The file **status.csv** contains the information about the current day. The software adds a record in it on every 5 seconds. Every day, when the date changes, the monitoring software saves this file in the following format: **status<YYYYMMDDHHmmSS>.csv**., where YYYYMMDDHHmmSS in the name are the date and the time when the last record in the file was made.

This option is not activated by default. Follow these steps to activate it:
1. Open the file NPBC_Monitor.ini.
2. Find the line COM_PORT=COM1. Add the following two lines after it (as on the picture):
   CSV_EXPORT=1
   CSV_EXPORT_ALL=1
3. Save the file NPBC_Monitor.ini and close it.
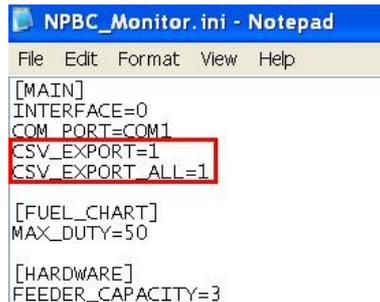
From now on, your software will start making records in the file status.csv. When you open the file, you will see a similar content:

The parameters that you see on the picture are as follows:
Computer's date and time
Controller's hardware version
Controller's software version
Controller's date and time
Burner's current work mode (Auto, Standby, Programme)
Burner's status (cleaning, ignition, idle, etc.)
Power level (if the burner is off, this parameter is skipped – as on the picture above)
Ignitor (on/off)
CH pump (on/off)
DHW pump (on/off)
Set temperature of the boiler
Boiler's current temperature
Temperature of the water heater
Thermostat (normal/stop)
Level of illumination
Total amount of used pellets in kg
Errors (if any)