



UPSTools

- User and installation manual -

PowerSources

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SUPPORT AND LIABILITY STATEMENT

The manufacturer does not accept liability for loss of data, productivity, equipment or any other associated damage or cost (direct or indirect) due to the failure of UPSTools or related equipment.

A tremendous amount of effort has gone into making UPSTools as easy to use as possible. However, should the user find that additional information or help is necessary, he/she should contact the local distributor/dealer who has access to the support centre.

It should be noted that technical support is not intended for general questions regarding the operating system.

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INTRODUCTION

UPSTools is a utility program for the configuration and monitoring of UPSs that support GPSE1 and SENTR1 protocol (code PRTK: GPSE1... and SENTR1....). Connection to the UPS is possible locally via USB or RS232 serial port or remotely using a modem (for monitoring only). Versions for Windows (2000, XP, 2003 and Vista), Linux x86, Solaris (8, 9 and 10) and Mac OS X (10.4 or above) are available.

INSTALLATION FROM CD-ROM

On Windows systems, open the file "UPSTools-x.x.x.exe" in the "Windows" folder and follow the instructions.

On Linux systems, open the file "install-x.x.x.sh" in the "Linux" folder and follow the instructions.

On Solaris systems, open the "install-x.x.x.bin" file in the "Solaris" folder and follow the instructions.

On Mac systems, open the "UPSTools-x.x.x.dmg" disk image in the "MacOSX" folder and then copy the application to the "Applications" folder.

INSTALLATION FROM INTERNET

Download and install UPSTools installation file for your operating system. If the installation program shows that a Java Virtual Machine is not present (version 6 or higher is required), proceed with the installation as follows:

if you own the CD-ROM run the installation program contained in the "JavaVM" folder; otherwise download "Java software" from the website <http://www.java.com>.

On Mac system the Java Virtual Machine is distributed by Apple from this site:

<http://www.apple.com/support/downloads/>.

UNINSTALLING

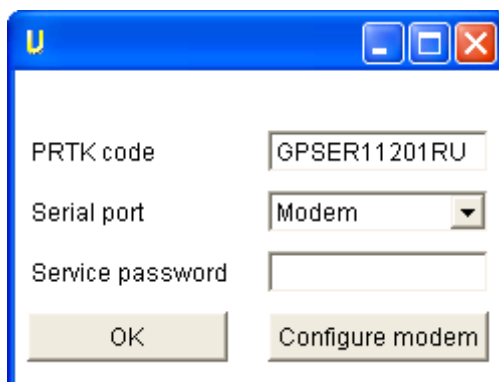
For Windows systems run the "Installation applications" program from the Control panel, select UPSTools and click on "Remove".

For Linux and Solaris systems run the "Uninstall" program in the directory "UPSTools/UninstallerData".

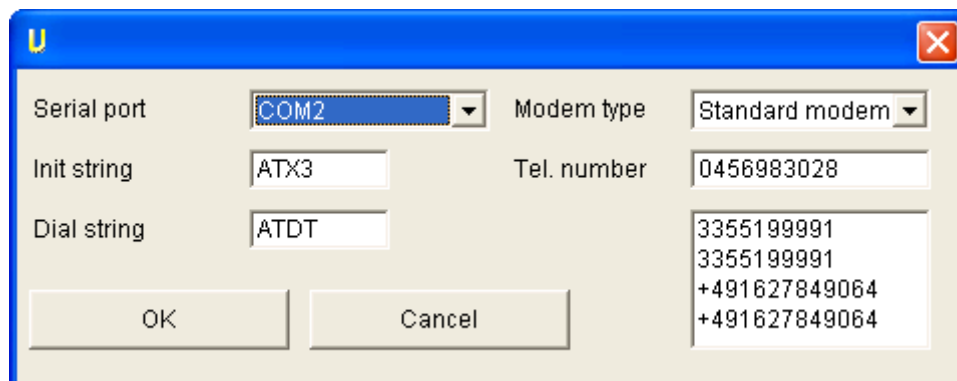
OPERATION

To enable serial communication, the UPS must first be connected to an USB or RS232 serial communication port on the computer by means of the cable supplied with the UPS. Once connected, the UPSTools program can be run. On Linux and Solaris systems execute the command "runUPSTools".

UPSTools



When the program starts up, select the serial port of the computer that the UPS is connected to. If enabled, the user can insert the *Service password* for configuring teleservice, clearing the history log file, executing commands and for in-depth monitoring of UPS status.

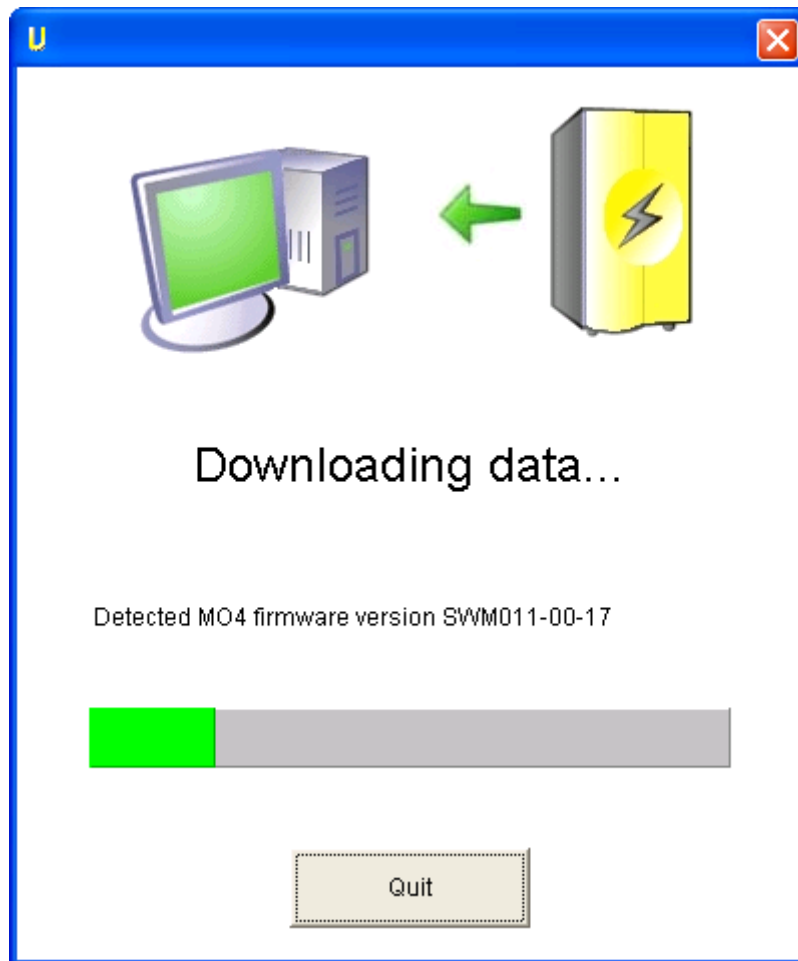


For communication via modem select "Modem" from the list of serial ports and click on "Configure modem" to enter the configuration data: serial port the modem is connected to, initialization command, call command and telephone number of the UPS; the program automatically suggests the last telephone number entered and allows selection of the four previous numbers.

Click on "OK" to save the current configuration as the default configuration.

It is also possible to connect to the UPS via mobile phone; at present the program is only able to handle some Nokia models (see document "*Compatibility list*").

To activate communication via mobile phone select "Modem type: Nokia phone".



Once the settings of the first display are confirmed, communication with the UPS can begin.

A progress bar indicates the state of progress of the communication.

If an error message is displayed, stop the program and carry out the following checks:

- a) check that the parameters have been entered correctly;
- b) check that the selected communication port is free (not occupied by other programs);
- c) check that the UPS and the modem (in the case of communication via modem) are switched on.
- d) check the connections between the PC and the UPS

MENUS

The "File" menu comprises three main sections:

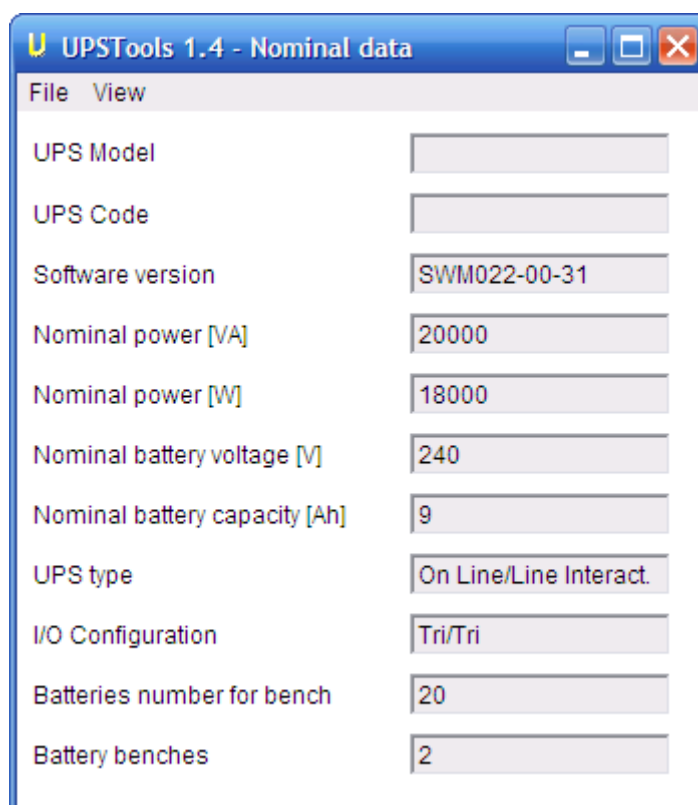
1. Communication management→ "Connection": used to establish communication with a UPS; "Disconnection": interrupts the current communication; "Update": executes a full interrogation of the UPS status to update the displayed data;
2. Data management→ "Open" and "Save": used to load and save the UPS configuration data from/onto file, useful for example to copy the configuration of one UPS onto another or to create a backup copy of the configuration; "Export" is used to have a textual representation of the current configuration.
3. Send data and exit→ "Send", "Send & Exit": send and activate the current configuration on the UPS.

The commands are not enabled in remote connection.

The "View" menu is used to open the various display windows. Only the display windows related to the available function on the UPS will be shown.

WARNING! None of the settings performed or loaded from disk will be effective on the UPS until the "Send" or "Send & Exit" command is executed. Some screens contains a "Send" button to enable the changes for the showed screen.

VIEW: NOMINAL DATA



Parameter	Value
UPS Model	
UPS Code	
Software version	SWM022-00-31
Nominal power [VA]	20000
Nominal power [W]	18000
Nominal battery voltage [V]	240
Nominal battery capacity [Ah]	9
UPS type	On Line/Line Interact.
I/O Configuration	Tri/Tri
Batteries number for bench	20
Battery benches	2

The "Nominal data" view shows the UPS data: model, identification code, firmware version, nominal power, nominal voltage and battery capacity, the type of operation, input/output configuration, the number of batteries per bank and the number of banks (positive and negative or positive).

VIEW: BATTERY EXPANSION

Set		Actual
Internal battery [Ah]	9	9
External battery [Ah]	0	0
Total		9

Set		Actual
Internal charger [A]	6.0	6.0
External charger [A]	0.0	0.0
Total		6.0

Threshold for auto-on

☐ 11.0V
☐ 11.3V
☐ 11.6V
☐ 11.8V
☒ 12.0V

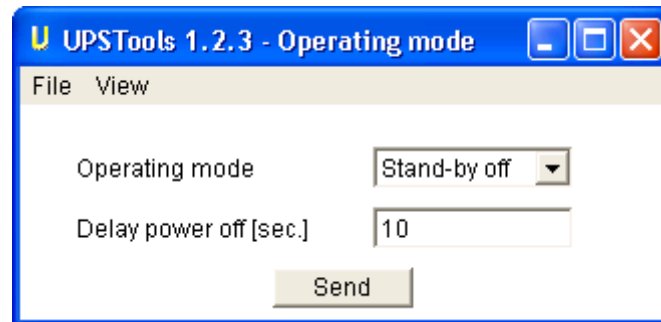
Send

The "Battery expansion" view is used to configure the UPS after a Battery Box or a Battery Charger has been added.

Enter the battery voltage indicated on the data plate of the Battery Box. A check on the voltage entered has been implemented to avoid errors: if it is not correct the warning light at the side will be red and the program will not allow the configuration to be completed. If the warning light is green enter the value of the Battery Charger and/or enter the Ah value indicated on the data plate of the Battery Box plus those of the UPS and of other Battery Boxes, if present (for example: by adding a 14 Ah Battery Box to a 7 Ah UPS, the value to be inserted becomes 21 Ah in total).

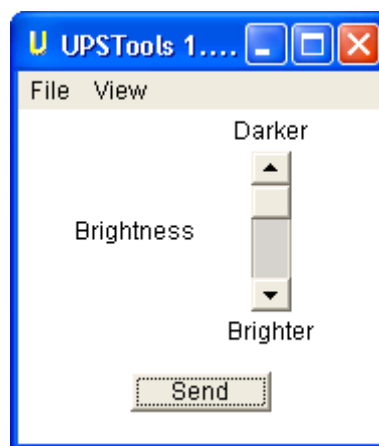
The battery voltage level for autorestart can also be selected.

VIEW: OPERATING MODE



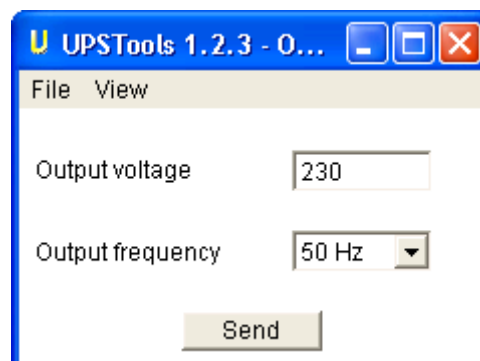
The "Operating mode" view is used to configure the operating mode from those supported. For "Stand-by off" mode, the delay time in seconds for shutdown after mains power is restored can be configured.

VIEW: DISPLAY



The "Display" view is used to change the brightness of the LCD display in order to reduce the energy usage or to improve its visibility. This screen is visible only if the UPS supports this function.

VIEW: OUTPUT CONFIGURATION



The "Output configuration" is used to configure the UPS voltage (between 220 and 240 Volt) and frequency parameters.

VIEW: CONFIGURATION

UPSTools 1.4 - Configuration

File View

☒ Autorestart [sec] 5 Batt. low time [min] 3

☐ Auto power off Buzzer mode Normal

☒ Autonomy limitation [sec] 300 Freq. tolerance [±%] 5%

☒ Automatic battery test [h] 40 Pw-share off Never

☒ Maximum load [%] 103 Pw-share off [sec.] 0

Bypass mode Enabled high sens.

Minimum bypass threshold [V] 180

Maximum bypass threshold [V] 264

Eco mode sensibility Normal

Minimum eco mode threshold [V] 200

Maximum eco mode threshold [V] 253

Send Default

The "Configuration" view can be used to set some of the UPS operating parameters.

- **Autorestart:** if during operation from battery the UPS switches off automatically due to end of backup time, a remote shutdown or auto power off command, with this function enabled the UPS automatically starts up when the mains power supply is restored, while it remains in stand-by if the function is disabled. (Default→ENABLED). It is also possible to set the number of seconds of waiting between mains restore and autorestart in order to avoid sudden autorestart (Default→5 sec).
- **Auto power off:** if during operation from battery the percentage of the load powered by the UPS goes below the 5% threshold (load off or disconnected), the UPS automatically switches off after 40 seconds if the function is enabled, while it continues to operate normally from the battery if the function is disabled. (Default→DISABLED)
- **Limited backup time:** allows (if enabled) to specify a maximum time in seconds of operation from battery; once this time has passed, the UPS automatically shuts down even if the battery backup time has not finished; times from 1 to 65534 seconds can be set. (Default→DISABLED)
- **Automatic battery test:** if this function is enabled, a battery test is run automatically (Default→ENABLED) every fixed period of UPS operation. (Default→40 h)
- **Maximum load:** the user can set a percent load threshold after which the UPS signals a fault for maximum load (Default→ENABLED) (Default→103 %)
- **End of discharge prealarm time:** minimum threshold (in minutes) of residual backup time after which the UPS activates the end of discharge prealarm signal. (Default→3 MINUTES)
- **Buzzer:** used to set buzzer operation. (Default→QUIET)
Normal: sounds in all cases where required (see UPS manual);

Quiet: different from normal operation only for the notice of operation from bypass, which is silenced for the first 3 seconds; this is so that brief bypass interventions caused by switching on the various loads connected to the UPS are not signalled.

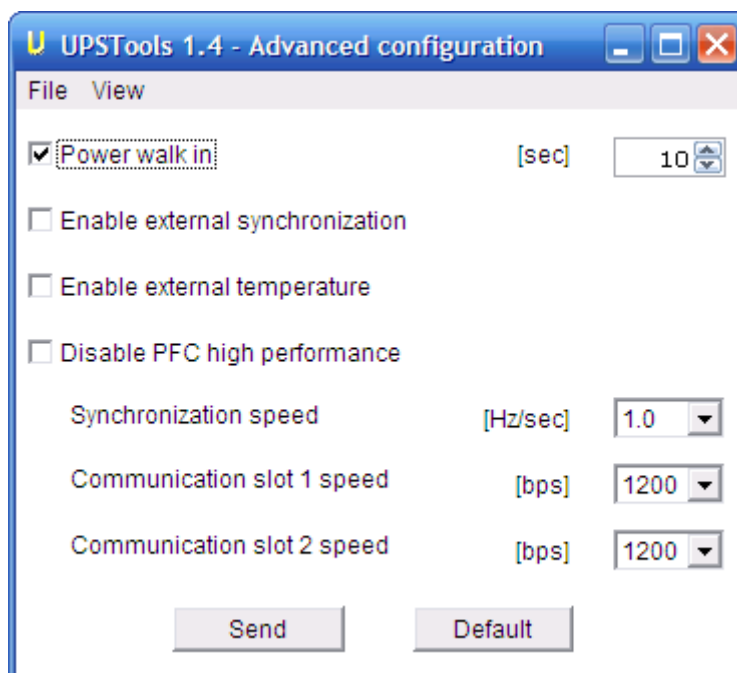
- **Link frequency tolerance:** percent value that defines the frequency range where the UPS is allowed to synchronize the output's sine curve with the input's. (Default→5 %)
 - **Power share:** defines the event that triggers the output power share off function. When this event occurs the secondary power will be disconnected after the delay defined on the next option. (Default→DISABLED)
 - **Delay power share:** delay for disconnecting the secondary power output. (Default→DISABLED)
 - **Bypass:** allow to set the bypass operating mode:
 - Enabled high sens: enabled with high intervention sensibility (Default)
 - Enabled low sens: enabled with low intervention sensibility
 - Disabled w/link: the bypass is disabled but the synchronization of the output's frequency with the input's is active
 - Disabled w/o link: both bypass and frequency synchronization are disabled
 - Connected in stand-by: if the function is enabled, the UPS in stand-by continues to power the load connected at the output via the bypass line; if the function is disabled, the output is completely disconnected in the stand-by state.
- WARNING!** If the function is enabled and the on/off switch located at the back of the UPS is in the on position, the UPS output is still powered.
- **Low bypass threshold:** minimum threshold for the voltage range accepted for switching onto the bypass line; values from 180V to 200V can be set in steps of 1V (see also "Sensitivity" option described above). (Default →180V)
 - **High bypass threshold:** maximum threshold for the voltage range accepted for switching onto the bypass line; values from 250V to 264V can be set in steps of 1V (see also "Sensitivity" option described above). (Default →264V)
 - **Sensitivity:** in on-line operation this can be used to modify the voltage range accepted for switching onto the bypass line (only for UTM2 machines); in line-interactive operation it is used to modify the sensitivity with which the UPS switches to the inverter. (Default→NORMAL)
 - Low: $(Low\ bypass\ threshold -5V) \leq range \leq (High\ bypass\ threshold +5V)$
 - Normal: $(Low\ bypass\ threshold) \leq range \leq (High\ bypass\ threshold)$
 - High: $(Low\ bypass\ threshold +5V) \leq range \leq (High\ bypass\ threshold -5V)$

The values of "Low bypass threshold" and "High bypass threshold" can also be set by the user (see "Low bypass threshold" and "High bypass threshold" options described below).
 - **Low eco threshold:** minimum threshold for the voltage range accepted for normal operating in eco mode; out from this range the UPS switches on inverter. Values from 180V to 220V can be set in steps of 1V (see also "Sensitivity" option described above). (Default →200V)
 - **High eco threshold:** maximum threshold for the voltage range accepted for normal operating in eco mode; out from this range the UPS switches on inverter. Values from 240V to 264V can be set in steps of 1V (see also "Sensitivity" option described above). (Default →253V)
 - **Function mode:** allows to choose the function mode with various threshold. In particular with the "Customer range" mode is possible to manually set the thresholds.
 - **Negative output contact logic:** allows to invert the contact logic on the RS232 port. When selected the contact are normally closed.

Click on the "Default" button to restore the factory configuration.

NOTE: some of these options may not appear in the display if they are not supported by the UPS model connected at the time.

VIEW: ADVANCED CONFIGURATION



The "Advanced configuration" view can be used to set some of the UPS operating parameters.

- **Power walk in:** enables the mode for gradual return to mains power and sets the duration of the gradual return to mains power (Default→DISABLED) (Default→10 sec)
- **Enable external synchronization:** when enabled, the external input becomes the source of synchronization for the inverter output (Default→DISABLED)
- **Enable external temperature:** when enabled, a reading of the external temperature probe is performed (Default→DISABLED)
- **Synchronization speed:** selects the speed of synchronization between the inverter and the bypass line (Default→1 Hz/sec)
- **Communication slot 1 speed:** Set the speed of the Communication slot 1. When set to 9600, the PRTK code becomes GPSE196... (Default→1200)
- **Communication slot 2 speed:** Set the speed of the Communication slot 2. When set to 9600, the PRTK code becomes GPSE196... (Default→1200)

VIEW: EXTERNAL INPUT/OUTPUT (ONLY WITH SERVICE PASSWORD)

UPSTools 1.2.3 - External in/out

File View

Input mode: No function

Delay time: 80 ms

PnP function: Enabled

Autorestart: Disabled

Output 1 mode: Inverter locked

Output 2 mode: Battery low

Send Default

From the "External Input/Output" view is possible to change the configuration of the communication port when used as contact port; or the configuration of the REMOTE port if present.

- **Input mode:** allows to choose the function for the remote command (pin 7 or pin 4 of the RS-232 port):
 - No function: no function is performed
 - Remote on: turn UPS on
 - Remote off: turn UPS off
 - Remote on/off: turn UPS on or off
- **Delay time:** minimum duration of the impulse for the signal input mode (enabled high)
- **PnP function:** enables or disables the Plug and Play function
- **Autorestart:** enables or disables the autorestart after turning off the UPS (subordinate to autorestart defined on "Configuration" view)
- **Output 1 mode:** alarm type signalled by output 1 (pin 1 of the RS-232 port)
- **Output 2 mode:** alarm type signalled by output 2 (pin 8 of the RS-232 port)
- **Output 3 mode:** alarm type signalled by output 3

WARNING!: in order to avoid unwanted turning off/on of the UPS please enable Remote on/Remote off functions only if the device connected to the communication port of the UPS (PC o other) is capable of correctly handling the signal.

VIEW: HISTORICAL DATA

UPSTools 1.2.3 - Historical data			
Nr. battery working	65521	Total working time	461h 24m
Nr. bypass work	52	Total time on battery	165h 01m
Locks due to short circuit	0	Inverter work. time in L.I.	0h 36m
Locks due to overload	0	Reset	
Locks due to overtemp.	0		
Other locks	1	Reset	
Auxiliary power KO [cod. 03] -> 129h 06m		Reset	
Export			

The "Historical data" view shows the data from the UPS history log file; the display is divided into the following three sections:

1. **Events counters:** display of the number of times of operation from battery, of the number of times of operation from bypass and of the number of locking events that occurred, subdivided by type of alarm (short circuit, overload, overtemperature and other alarms).
The events counters file can be cleared by clicking on the corresponding **"Reset"** button, but only if the Service password has been entered.
2. **Clocks:** display of the time (hours/minutes) of total UPS operation (device switched on from the mains, from the battery, from bypass etc.), of battery operation and of operation from inverter with the UPS configured in Line-Interactive mode.
The events counters file can be cleared by clicking on the corresponding **"Reset"** button, but only if the Service password has been entered.
3. **Chronology of lock events:** display of the last lock events logged, with details of the cause for each one, the code and the time (with reference to the total operation clock) that it occurred. "+" and "-" symbols, if presents, refer to start and end of a condition, respectively.
The events counters file can be cleared by clicking on the corresponding **"Reset"** button, but only if the Service password has been entered.

Click on the **"Export"** button to create a text file ("history.txt") in the program installation directory, containing all the history log file data shown in the display.

VIEW: TELESERVICE (ONLY WITH SERVICE PASSWORD)

UPSTools 1.2.3 - Teleservice

File View

PIN code Modem Optional port

Telephone nr.	Event	Tel. 1	Tel. 2	Tel. 3	Logic
Telephone nr. 1	Lock	☒	☐	☐	AND
Telephone nr. 2	Alarm	☒	☐	☐	AND
Telephone nr. 3	Anomaly	☒	☐	☐	AND
Init modem string	On bypass	☒	☐	☐	AND
Call modem string	On battery	☒	☐	☐	AND
Wait time recall	Battery low	☒	☐	☐	AND
Number of recall					
Identif. number					

Modify PIN Please confirm PIN

☒ Enable command

☐ Mode recall

☐ Enable PIN

The “Teleservice” view allows the activation and configuration of the procedure for an automatic call via modem to a teleservice exchange that the UPS uses in the event of faults and alarms.

If a PIN code has been previously set, the operator must key in the security code to be enabled to change the data.

- **Modem:** selects the communication port of the UPS the modem is connected to:
 - Not installed – modem not present, teleservice function disabled;
 - Optional port – the modem is connected to the optional port (expansion slot board).
 - Comm port 1 – the modem is connected to the Communication slot 1.
 - Comm port 2 – the modem is connected to the Communication slot 2.
- **Telephone no. 1,2,3:** three telephone numbers the UPS can communicate with;
- **Initialization command:** specifies the modem command or sequence of commands (without AT suffix) for the initialization of the modem (refer to the modem manual). For example: “&A0”. The commands indicated in this parameter are sent by the UPS to the modem preceded by the sequence with the prefix “ATE0V0X0S0=1”;
- **Call command:** specifies the modem command or sequence of commands (without AT suffix) to activate the call (refer to the modem manual). For example: “DT”, “DP”. The commands indicated in this parameter are sent by the UPS to the modem preceded by the sequence with the prefix “AT”.

- **Recall wait time:** specifies the number of seconds of waiting between one call and the next in the case of a recall attempt due to loss of connection (busy, no answer etc.);
- **Number of recalls:** specifies the maximum number of call attempts for each of the three telephone numbers in the case of loss of connection (busy, no answer etc.);
- **Identification number:** the UPS identification code. When a call is made to the teleservice exchange, the UPS sends the ID number to be recognized; data exchange only takes place if the UPS code is entered in the exchange's records.
- **Enter/Change PIN:** for security purposes a PIN code can be entered to change the teleservice configuration. It is repeated in order to avoid mistakes when keying in.
WARNING!: after the PIN code is sent to the UPS, teleservice data can only be changed if the correct security code is entered; if the operator forgets the code, the PIN can only be disabled by the manufacturers. The PIN should therefore only be entered if required for security purposes and it is in any case recommended to keep a copy of the code in a safe place.
- **Execution of commands:** if the function is enabled, the UPS accepts and executes the commands received remotely via modem (test, shutdown etc.); otherwise the execution of remote commands is disabled.

Table of events/telephone numbers: The first column shows the various events and the first line contains the three telephone numbers. The boxes can be set to select which telephone number to call in the various cases. If there is more than one per line, it is possible to select if all the selected numbers are to be called (AND logic) or one of them (OR logic).

VIEW: STATUS (ONLY WITH SERVICE PASSWORD)

UPSTools 1.2.3 - Status

File	View
Vbyp	232 V
Vout	224 V
Load	17 A%
Load	16 VA%
Load	20 W%
Load	2 A
Load	528 VA
Load	460 W
Vbat+	+13.61 Vdc
Vbat-	0 Vdc
Vbus+	+400 Vdc
Vbus-	-400 Vdc
Vin1	232 V
Vin2	(0) V
Vin3	(0) V
Temp	43 °C

01) Ups on
 02) Battery not working
 03) By-pass line good
 04) Line present
 05) Precharge switch closed
 06) Input switch closed
 07) Booster/PFC on
 08) Inverter off
 09) Inverter output synchronized
 10) By-pass switch on
 11) Output switch closed
 12) Charge-battery on
 13) Battery switch open

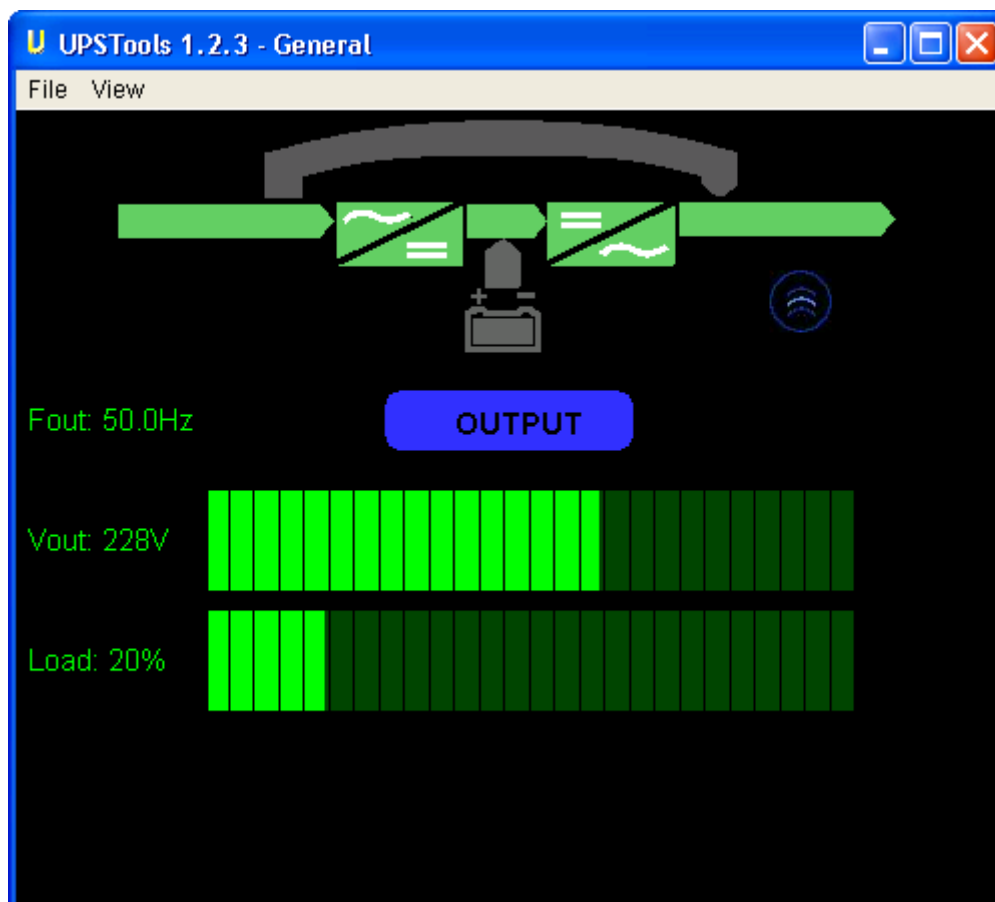
14) Battery inserted
 15) Battery voltage good (Btok=1)

 * NO ALARMS *

UPSTools
 communication
 in progress

The "Status" view shows the current status, updated in real time, until "Disconnection" is selected from the "File" menu. The last data detected are still shown after disconnection. The communication status can be checked at bottom left.

VIEW: GENERAL



The “General” view shows the status of the UPS in the form of a block diagram with the following logic blocks:

1. Input;
2. Rectifier;
3. Bypass;
4. Battery;
5. Inverter;
6. Output.

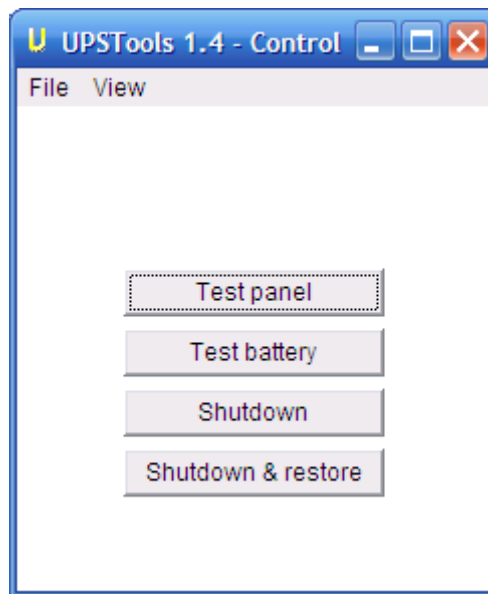
The colour of each block identifies its current status:

- Grey: inactive/off;
- Green: active and functioning correctly;
- Yellow: prealarm (e.g. Battery low);
- Red: fault/alarm.

It is possible to click on some of the blocks to get additional information on the selected block: by clicking on the output block, for example, the frequency, voltage and load of the output line can be displayed. Clicking outside the blocks area displays the list of the blocks that can be selected.

If the connection is active, the display data are updated in real time and the left icon flashes;

If the connection is deactivated (“Disconnection” from the “File” menu) the last data detected are still shown and the icon remains constantly on.

VIEW: CONTROL (ONLY WITH SERVICE PASSWORD)

The "Control" section allows commands to be sent to the UPS: control panel test, battery test, shutdown and shutdown with restart.

Some of these commands may not be supported, depending on the UPS model.

TROUBLESHOOTING

I can't install the UPSTools program.

The installation requires a Java Virtual Machine Ver.1.5 or higher.

If this is not present, the version on the attached CD-ROM can be installed, or it can be downloaded from the website <http://www.java.com>.

UPSTools starts up but doesn't connect to the UPS.

Carry out the following checks:

1. check that the parameters have been entered correctly;
2. check that the selected communication port is free (not occupied by other programs);
3. check that the UPS is switched on;
4. check the connections between the PC and the UPS;
5. in the case of communication via modem, check that the modem is switched on, connected to the line and correctly configured.

It should also be noted that the UPS communication port configured for use with a modem cannot be used for local serial connection and vice versa.

If Linux is used, ensure that you have root rights.

For connection via mobile phone or GSM modem, also check:

1. that the telephone/modem is not waiting for the PIN code;
2. that there is a signal;
3. that the SIM card is enabled for data in masked mode (consult your mobile phone service provider).

If there are no problems, the telephone will display the called number and the current call message.

After setting the new configuration the UPS keeps the old configuration.

To make configuration changes active, "Send" or "Send & Exit" must be selected from the "File" menu.

It is not however possible to send configuration data if connection is via modem or via mobile phone.

UPSTools connects but the message "Serial port error" is frequently received.

There are transmission errors on the line (line interference, weak signal, etc.), communication is interrupted or the UPS no longer responds to requests.

1. check the cables connecting the various devices;
2. in the case of communication via GSM modem or mobile phone, move to an area where the signal is stronger;
3. close the connection and reopen it.

I can't display the data in the "General" display.

Click outside the diagram (for example in the area at the bottom) and a list of the clickable areas will be displayed, with an arrow from the index to the clickable area. Click on the indicated point and the relative information will be displayed in the diagram. If an area is not indicated in the list, no further information is available.

I entered the security PIN but I've forgotten it.

The data set for teleservice management can no longer be modified.

The PIN can only be disabled in the factory.