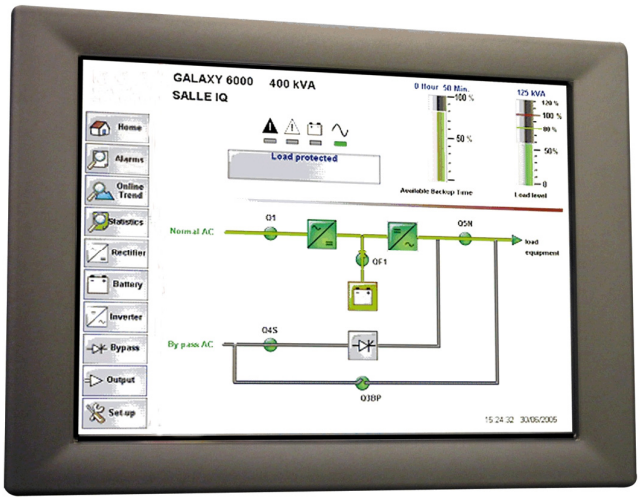
MGE™ Galaxy™ 6000

50, 60 Hz
250 - 600 kVA



Remote Vision

User Manual

Unitary UPS
Modular UPS
UPS in parallel with NS
Frequency Converters
"Normal-Standby" cubicle

by Schneider Electric

Contents

Introduction

General

"MGE™ Galaxy™ 6000" high power Uninterruptible Power Supplies (UPS) can be fitted with an optional graphical, touch-sensitive colour Human Machine Interface.

This interface, intuitive and quick to get to grips with, integrates the following in its standard version:

- ***Data acquisition*** function via an RS485 / Jbus interface
- ***Active block diagram*** of UPS installation operation (converter state, operating mechanisms and energy flows)
- ***Measurement table*** (voltages, currents, powers, etc.)
- ***Control functions*** (start/stop, battery test, etc.)
- ***Alarms and events*** display
- ***Alarms log*** management
- ***Events statistics***
- ***Trend curves*** (voltage, current, power)
- ***Textual information*** entered by the customer or after-sales service

The graphical interface allows:

- easy and secure equipment control (checking correct operation, operational help)
- intervention times to be reduced and thus inverter output availability to be increased (alarm memory, intervention logging)
- the electrical environment to be monitored (statistics)
- investments to be anticipated (trend curves)

Use

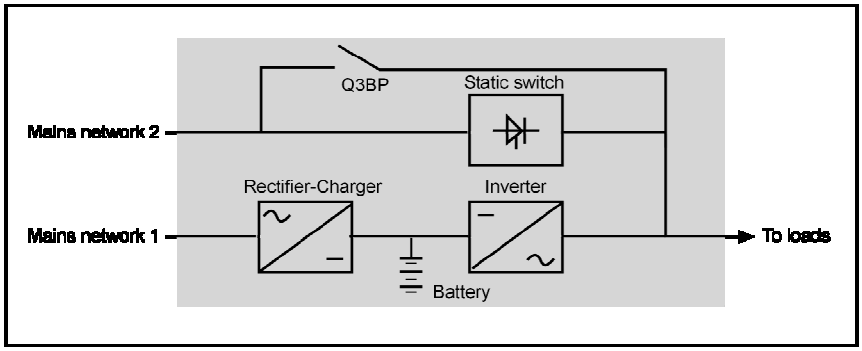
- The back-lit screen automatically switches-off if inactive for 3 minutes. Simply touching the screen lightly reactivates the display.
- Touching an acquisition field automatically displays the virtual keyboard.

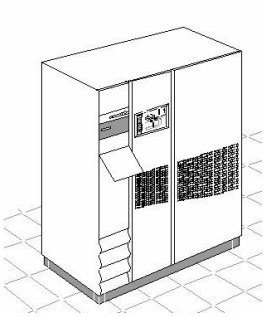
❒ Operator profiles

- Electrical department staff (equipment management)
- Site manager (consumption and redundancy monitoring)
- After-sales service technicians (periodic maintenance and breakdowns)
- Security service staff in the event of a major alarm (interface with on-call APC staff, level 1 interventions)

Different MGE™ Galaxy™ 6000 systems

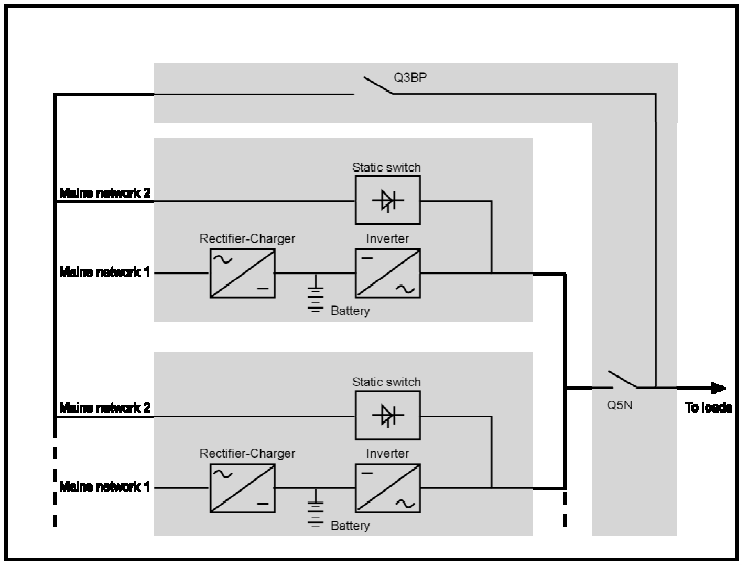
Single unitary or modular UPS

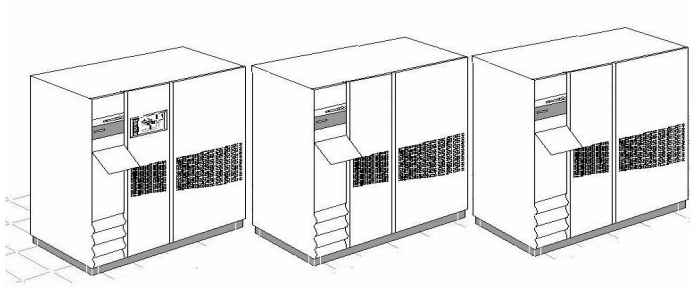




Modular UPS with external By-pass for maintenance

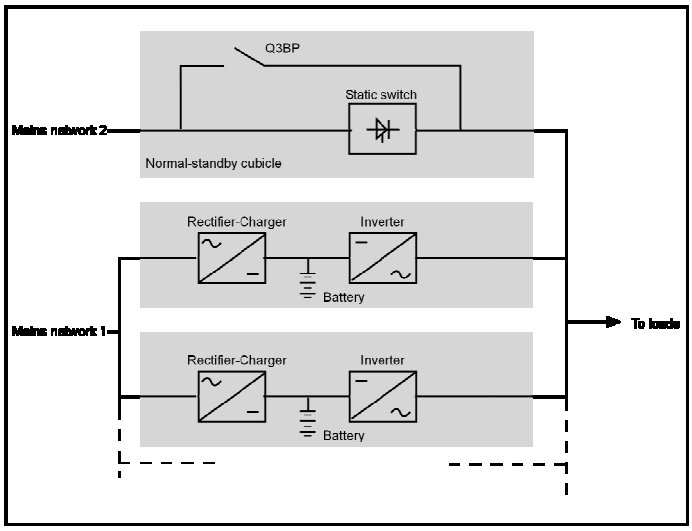
(4 identical rectifier-inverter power chains can be connected in parallel.)

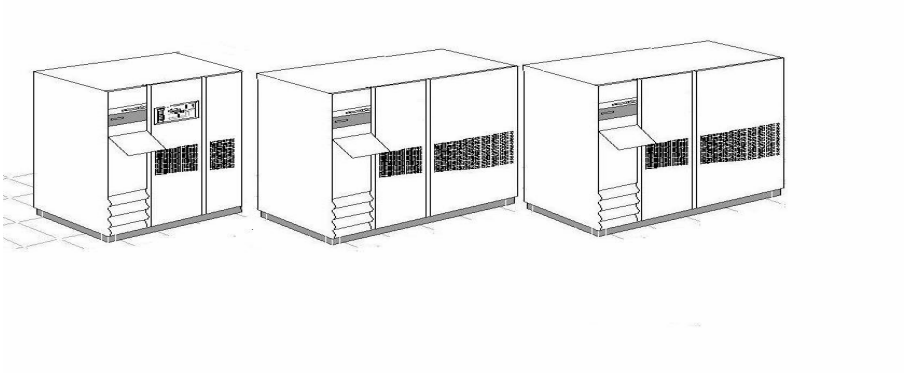




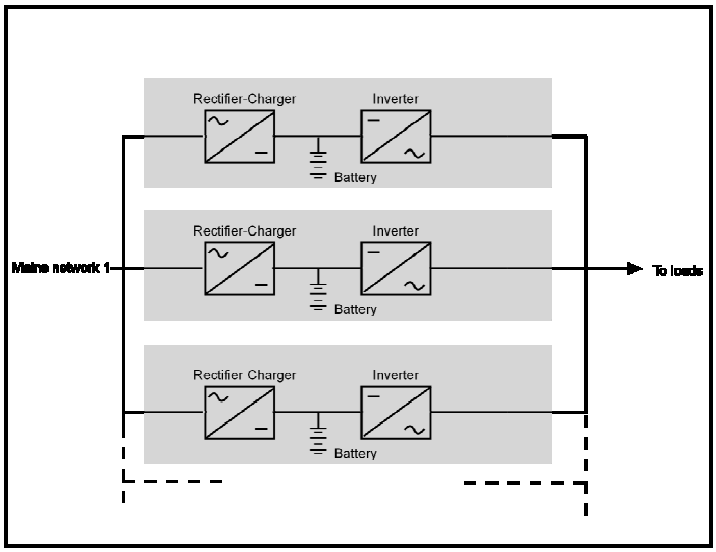
Parallel UPS with NS

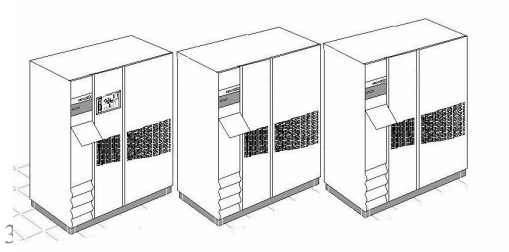
(6 identical rectifier-inverter power chains can be connected in parallel.)





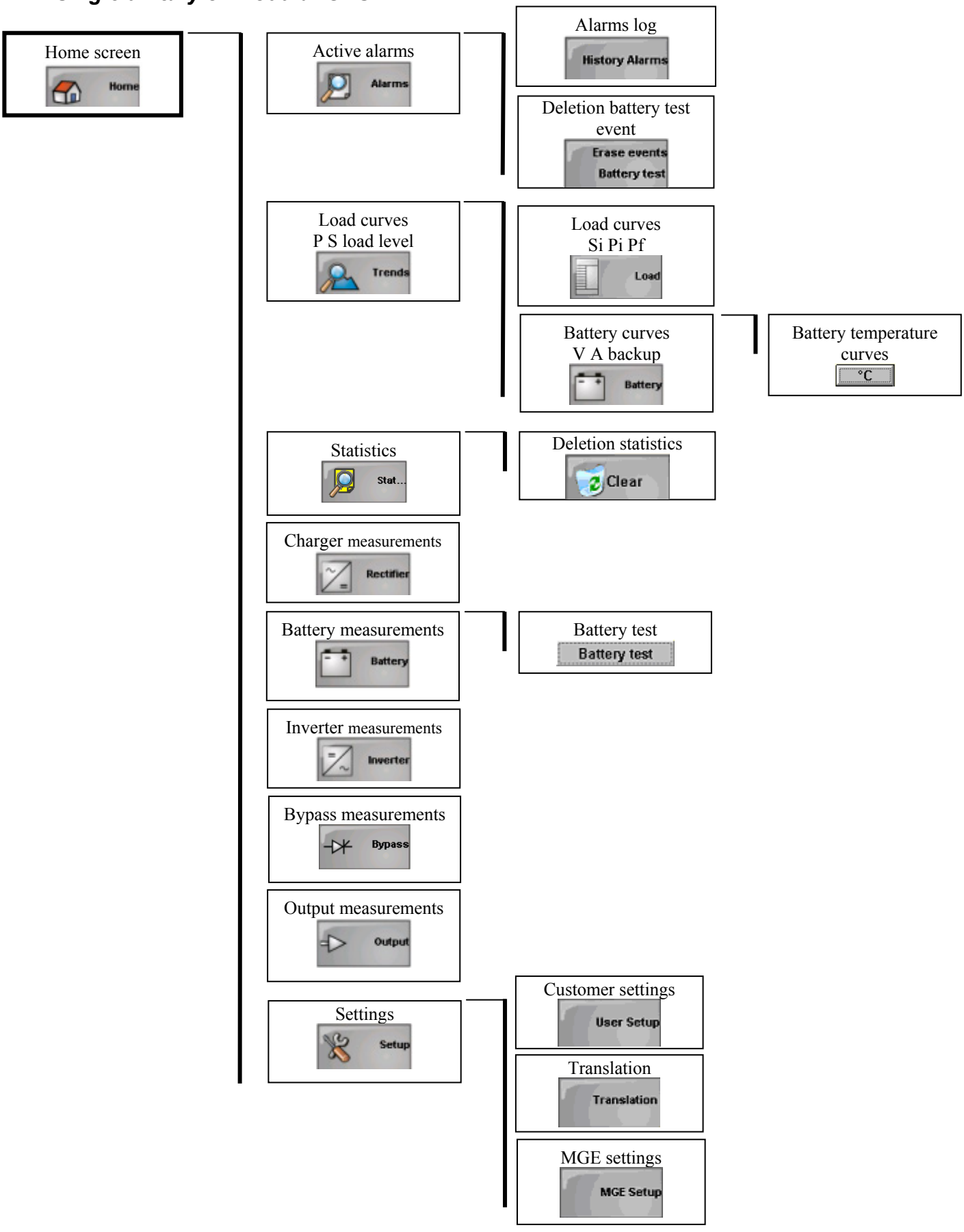
Parallel UPS without NS



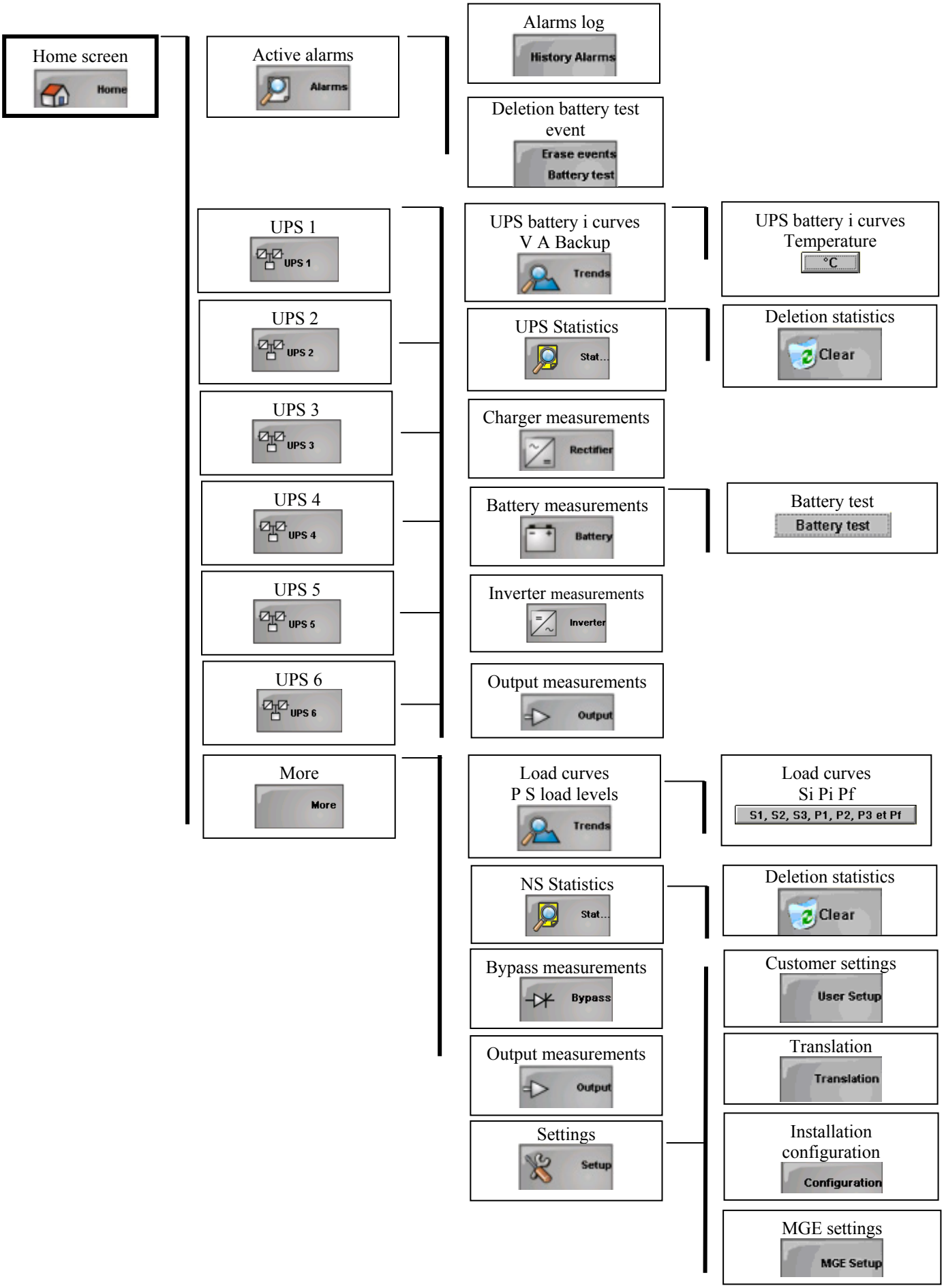


Screen structure

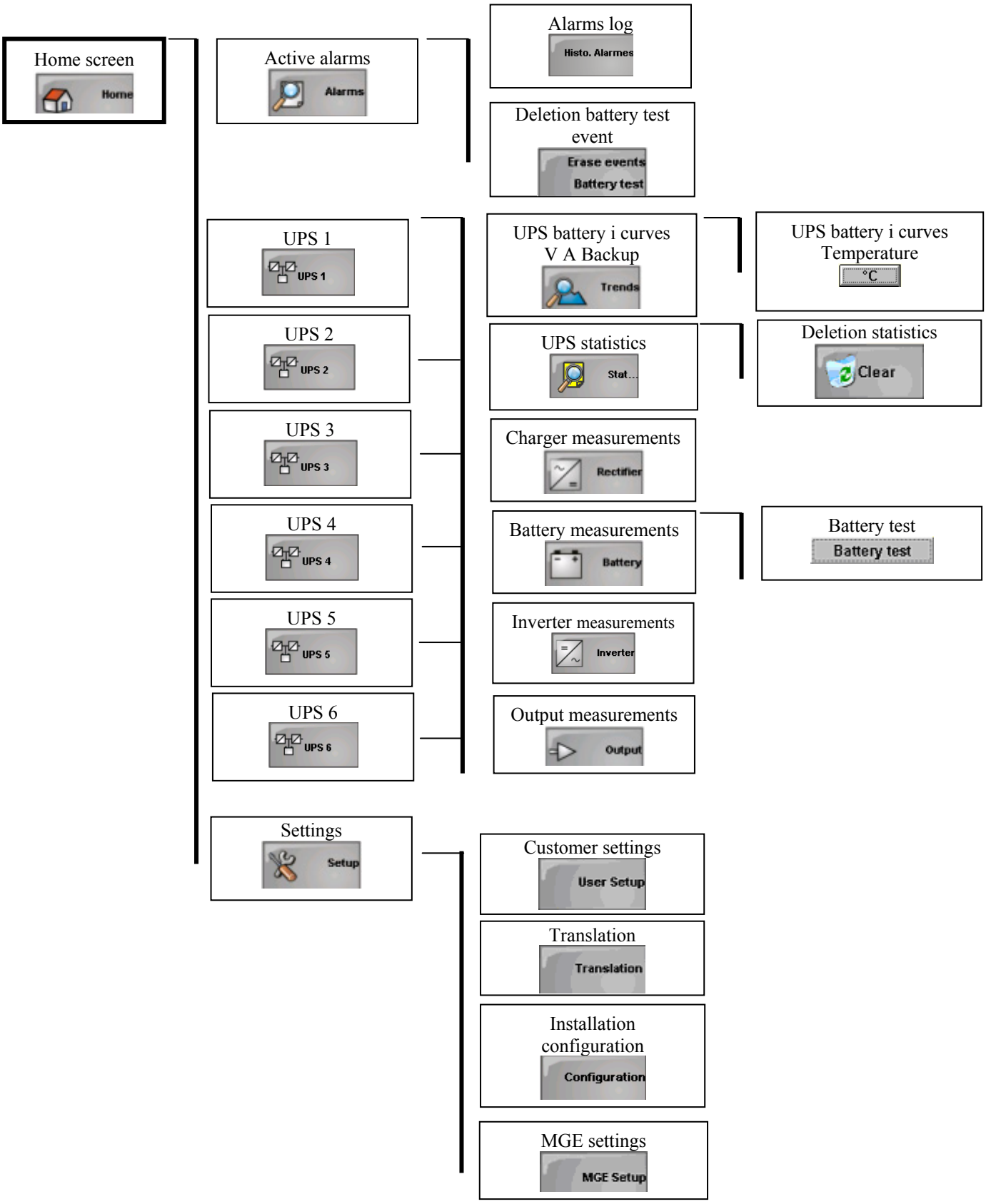
Single unitary or modular UPS



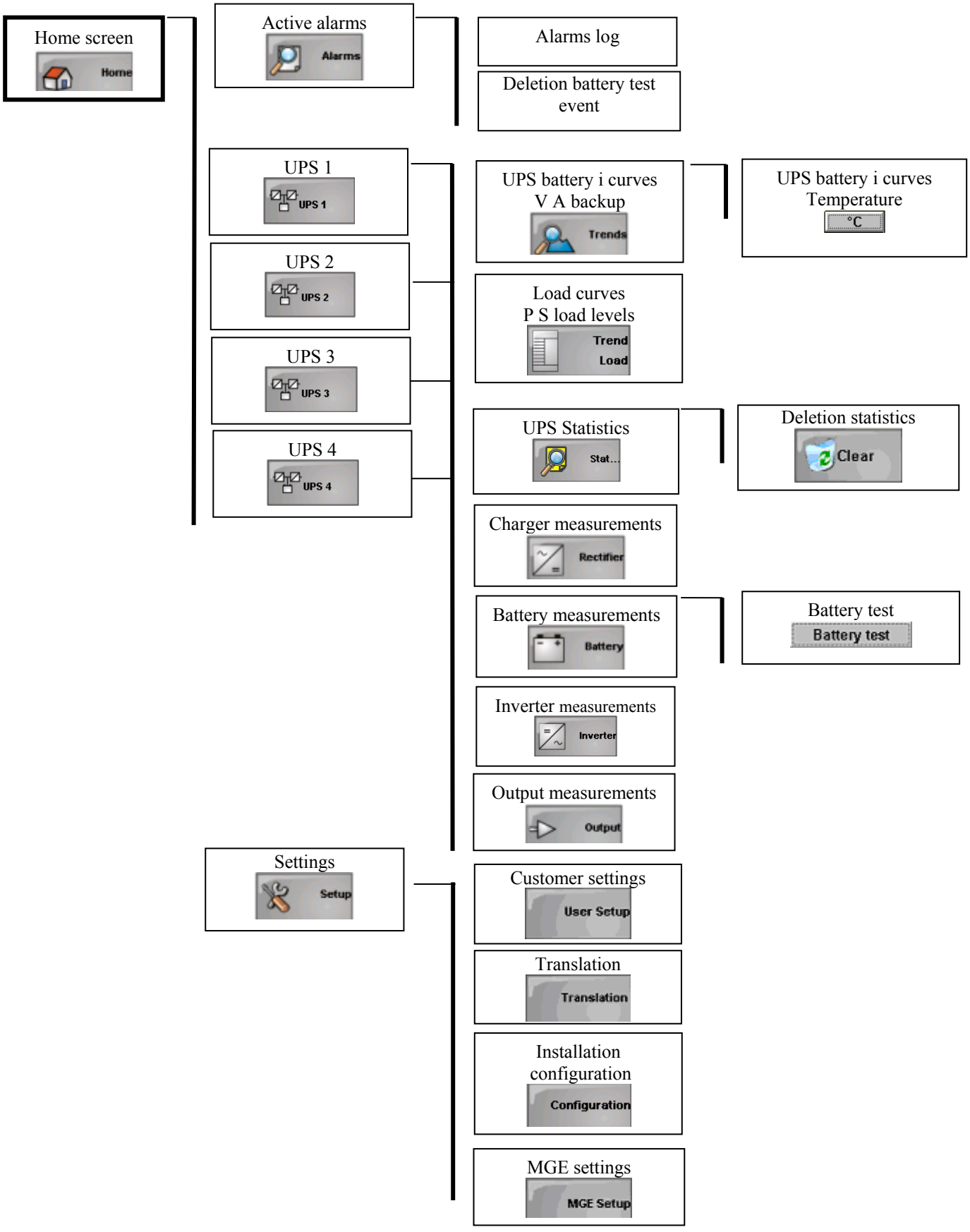
Parallel UPS with NS



Parallel UPS without NS



Modular UPS with external By-pass for maintenance



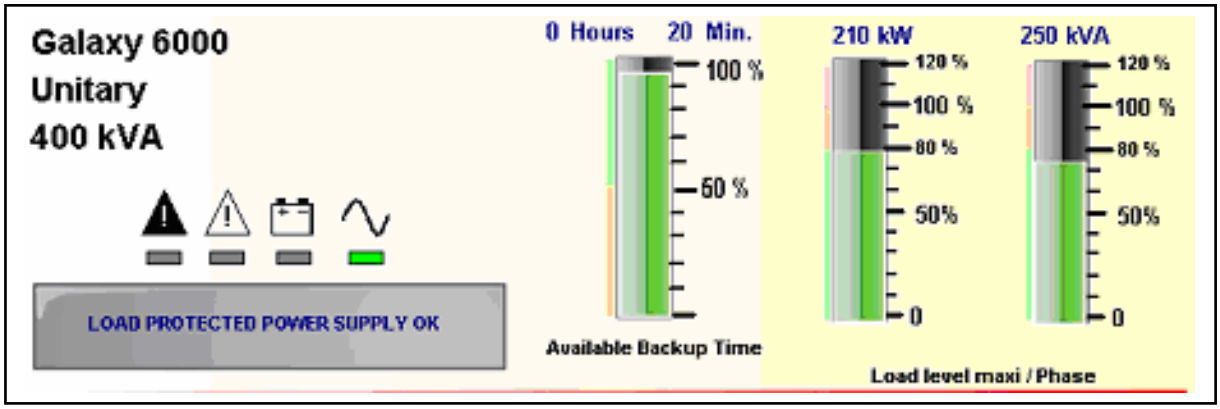
Description of screens

Information available on all screens

Information in window header

Available window headers

The two possible types of window header are shown below:



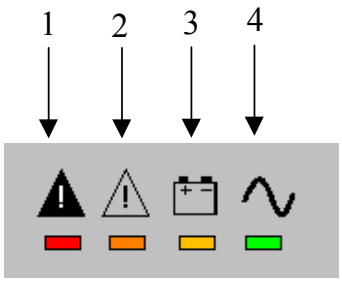
Product name and nominal power

The following is contained in the top left corner of each window header:

- Product name "MGE Galaxy 6000"
- Identification of the user configurable installation (Unitary in this case)
- UPS or installation nominal power

Indicator lamps

These indicator lamps are available in all screens. They allow UPS or installation status to be quickly evaluated.



Indicator lamp 1: load unprotected

- Red: indicates load fed by mains network 2.
- Off: load protected

Indicator lamp 2: operating anomaly but load still fed by the inverter

- Orange:
  - Operating anomaly: standby static switch ventilator fault or standby static switch control fault
  - OR environment faults: battery overload beyond tolerance limits, over 5% operating overload or mains network 2 present but out of tolerance
- Off: if no operating or environment anomaly

Indicator lamp 3: inverter operating off the battery

Flashing orange:

- Battery operation following the loss or a reduction in voltage of mains network 1
- OR a mains network 1 of insufficient power
- OR a battery anomaly

Indicator lamp 4: load protected

Green: load fed by the inverter with full battery backup in the event of a mains network 1 failure. Normal device operation.

Messages associated with the LED

ALARM...

LOAD PROTECTED – ANOMALY...

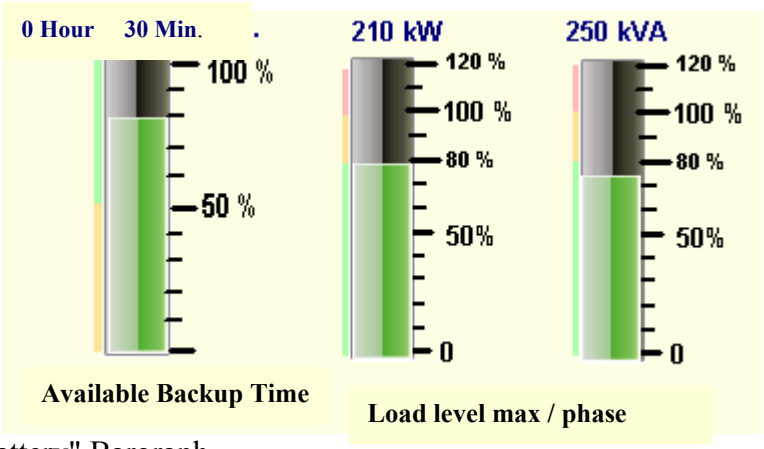
LOAD PROTECTED – BATTERY OPERATION

LOAD PROTECTED – SUPPLY OK

Measurement BarGraph

Presentation

Three "BarGraphs" are displayed on the home screen. They indicate battery backup time in minutes and percentage load used (in kW and kVA).



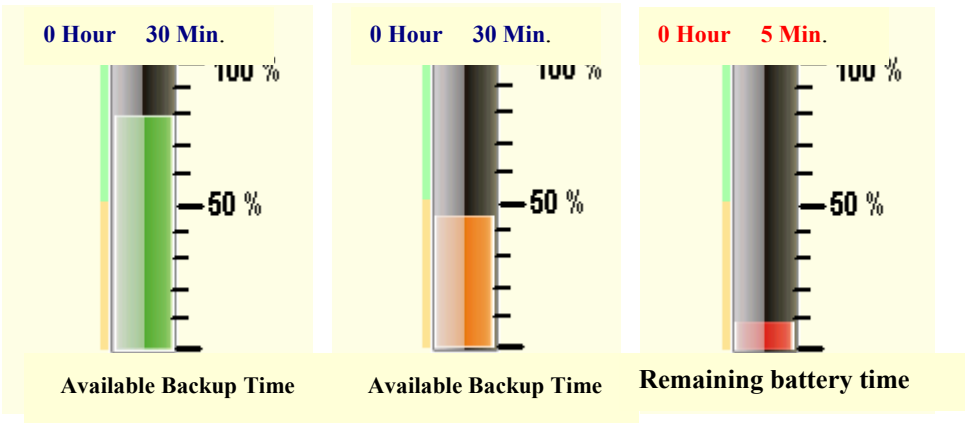
"Battery" Bargraph

The measurement of available battery backup is given as a %. The remaining backup time is permanently displayed in hours and minutes.

The "bargraph" of available battery backup time is displayed when this option is available and if it can be selected from the settings menu.
The "bargraph" colour of available battery backup time changes according to the percentage measured:

- green for 50 % and over and no alarm
- orange for less than 50 % and no alarm
- red if one of the following conditions is true:
  - end of battery backup pre-alarms
  - minimum battery voltage
  - end of battery backup or end of battery service life.

  In this case, the numerical display of backup time turns to red and flashes

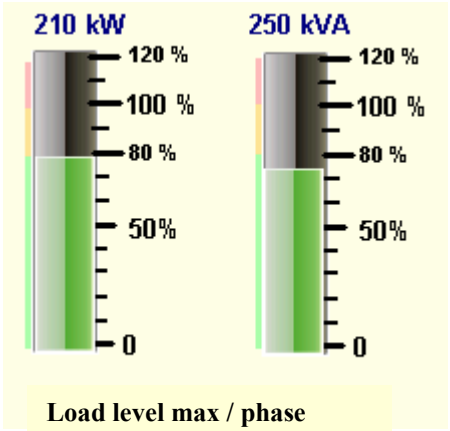


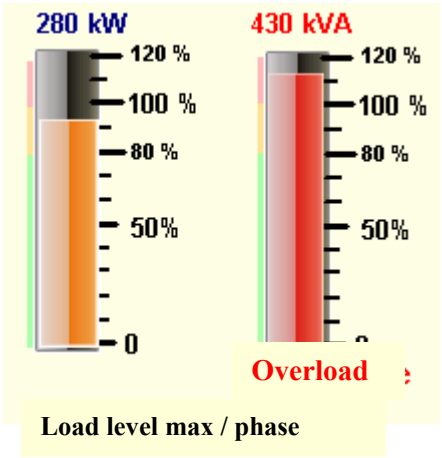
The "Available backup" and "Remaining backup" messages, located underneath the "bargraph", correspond to battery charging and discharging states respectively.

"Load level" bargraph

The colour of the "bargraph" indicating the percentage of power used changes according to the percentage measured. The "bargraph" shows the power load level for the most heavily loaded phase. The numerical value displayed corresponds to the active and apparent power of the three phases.

- For a load level < 80%, the "bargraph" is green.
- For a load level between 80 and 100 %, the "bargraph" is orange.
- For a load level > 100 %, the "bargraph" is red and its numerical value as well as an "Overload" message are displayed in red and flash.



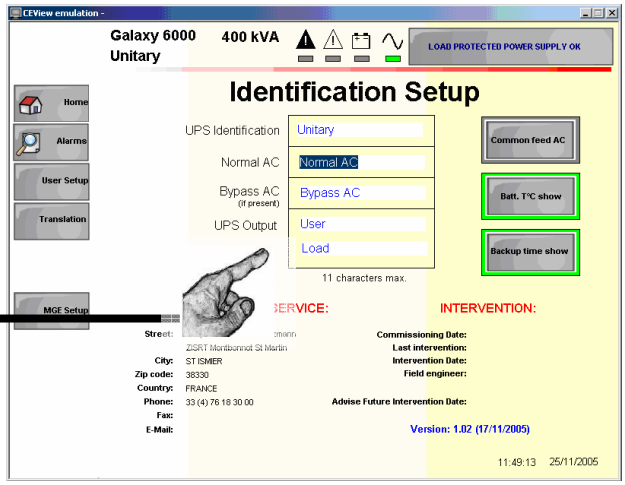


Virtual keyboard

"Clicking" inside a text entry box displays a virtual keyboard.

"Lower case" mode

"Upper case" mode

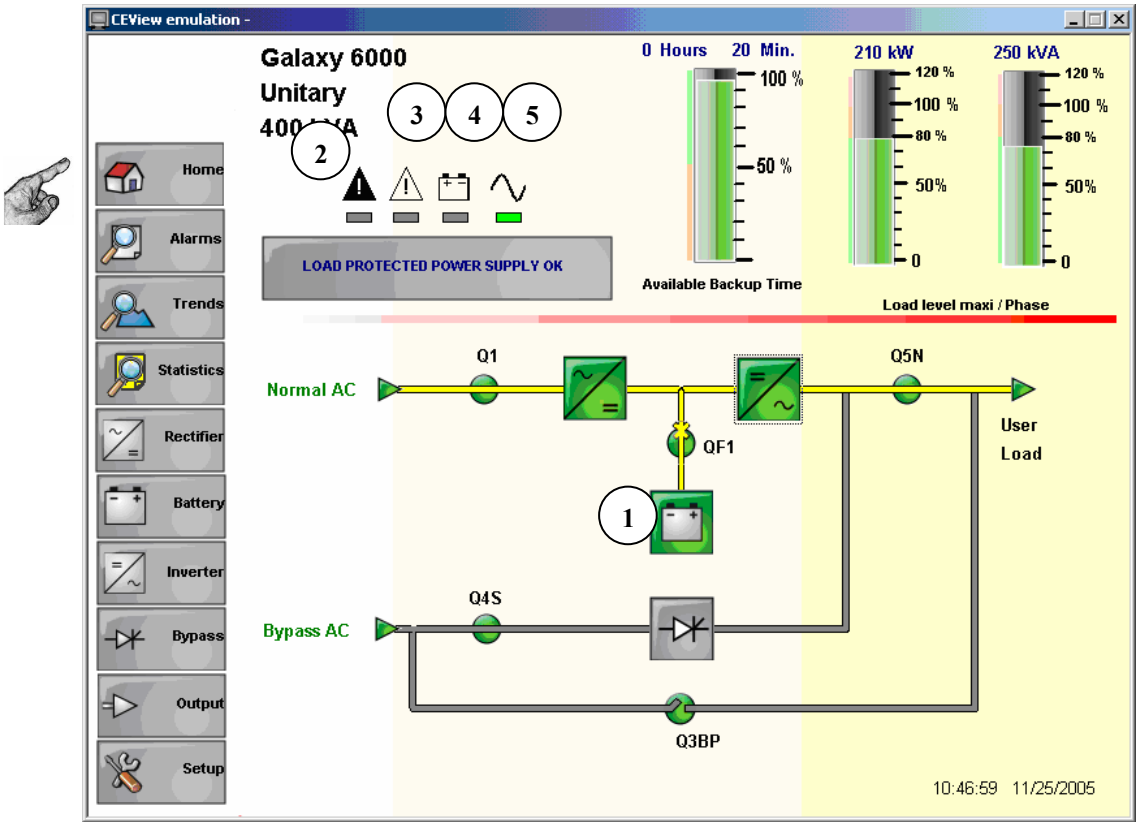


Home screen

Presentation

It shows a block diagram of the installation.

Single unitary or modular UPS



Configurable elements in the user settings menu:

- Normal AC and Bypass AC input names shown in the block diagram
- User load name
- UPS name (Galaxy 6000 in this example)
- Installation name (Unitary in this example)

Colour signification

Colour code:
For the active elements of the block diagram:

- Green: element in normal operation
- Red: element faulty (an element with a majour fault for a UPS)
- Orange: deteriorated element (battery less than 50% charged for a UPS operating off its battery)
- Grey: Modbus communication absent or element operational but shutdown

For block diagram wires:

- Yellow: segments in working order and active; represents power flow
- Grey: inactive or Modbus communication problem

Main operating sequences

Normal AC and Bypass AC networks are present.

The "load protected" green indicator lamp **(5)** is lit.
The power required by the load is supplied by the Normal AC network, via the [rectifier-charger] and [inverter] chain. The rectifier – charger also supplies the current needed to maintain and recharge the battery **(1)**. The [rectifier-charger] and [inverter] power flow is shown in yellow, the [rectifier-charger], [inverter] and [battery] functions are shown in green.

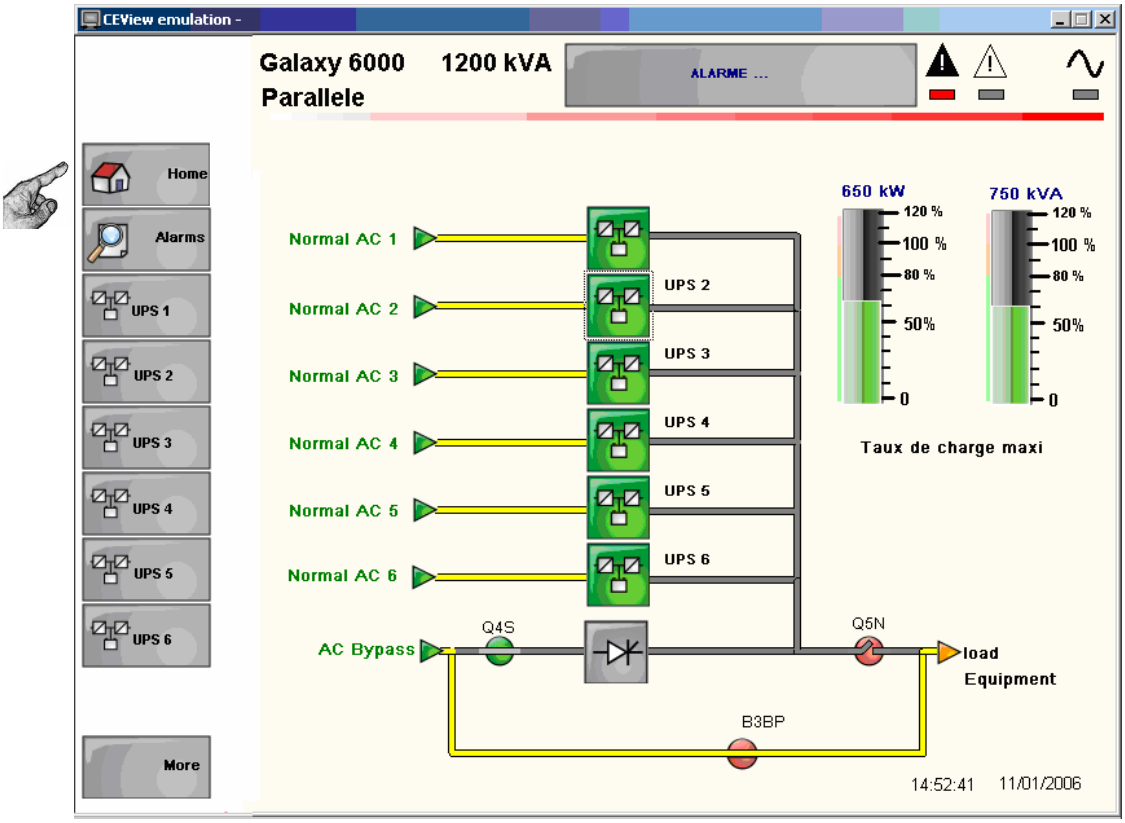
The Normal AC is absent.

The "load protected" green indicator lamp **(5)** is lit. The user is warned that the system is running off the battery by the flashing "battery operation" orange indicator lamp **(4).**
When the Normal AC network voltage disappears, or is less than the allowed amplitude limit of –10% (–15% optional), the rectifier-charger shuts down and the battery supplies the power needed by the inverter to feed the load. The battery, placed as a buffer between the rectifier-charger and the inverter, is being discharged. The [rectifier-charger] power flow and the [rectifier-charger] function are shown in grey.

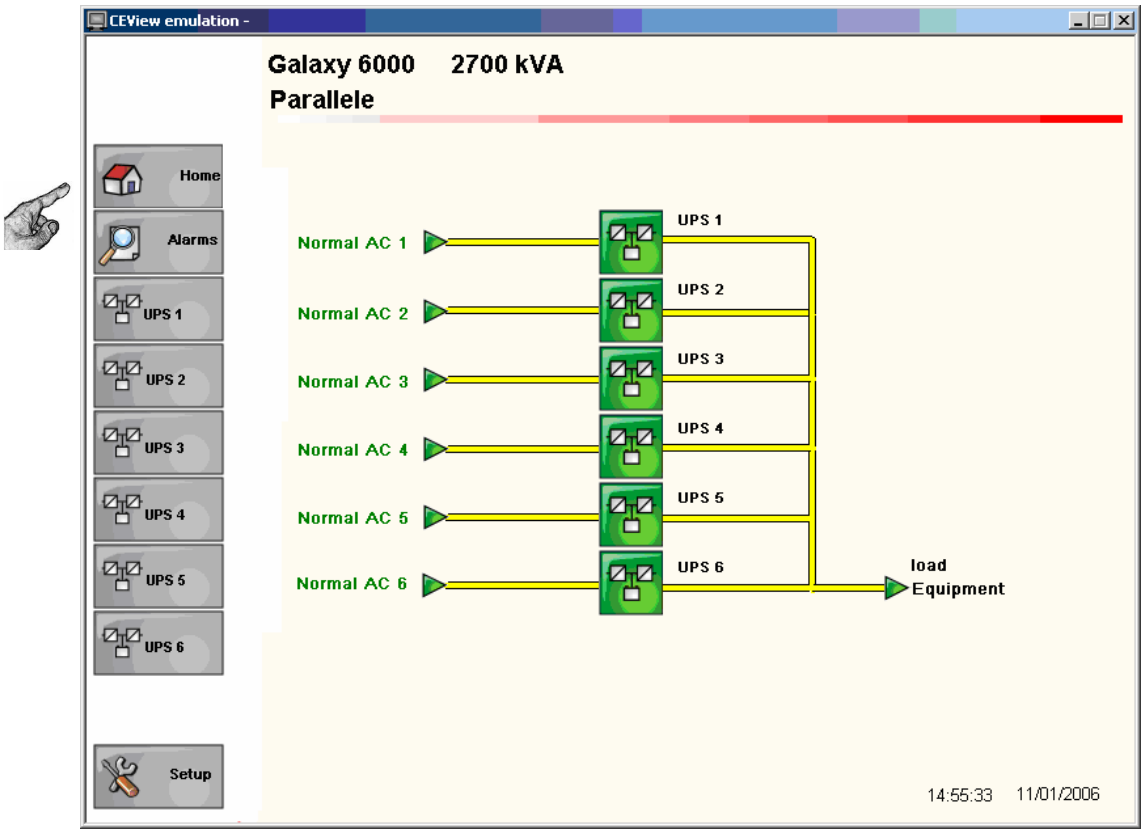
Shutdown of the static supply and overload (devices or installations with a Bypass AC network).

Inverter shutdown and supply of the load by the Bypass AC network causes the "load protected" green indicator lamp **(5)** to go out, and the "unprotected load" red indicator lamp (**2)** to light up. The [rectifier-charger] and [inverter] power flow is shown in grey; the [static switch] power flow is shown in yellow. The [rectifier-charger] and [battery] functions are shown in green (if Normal AC is present); the [inverter] function is shown in grey.

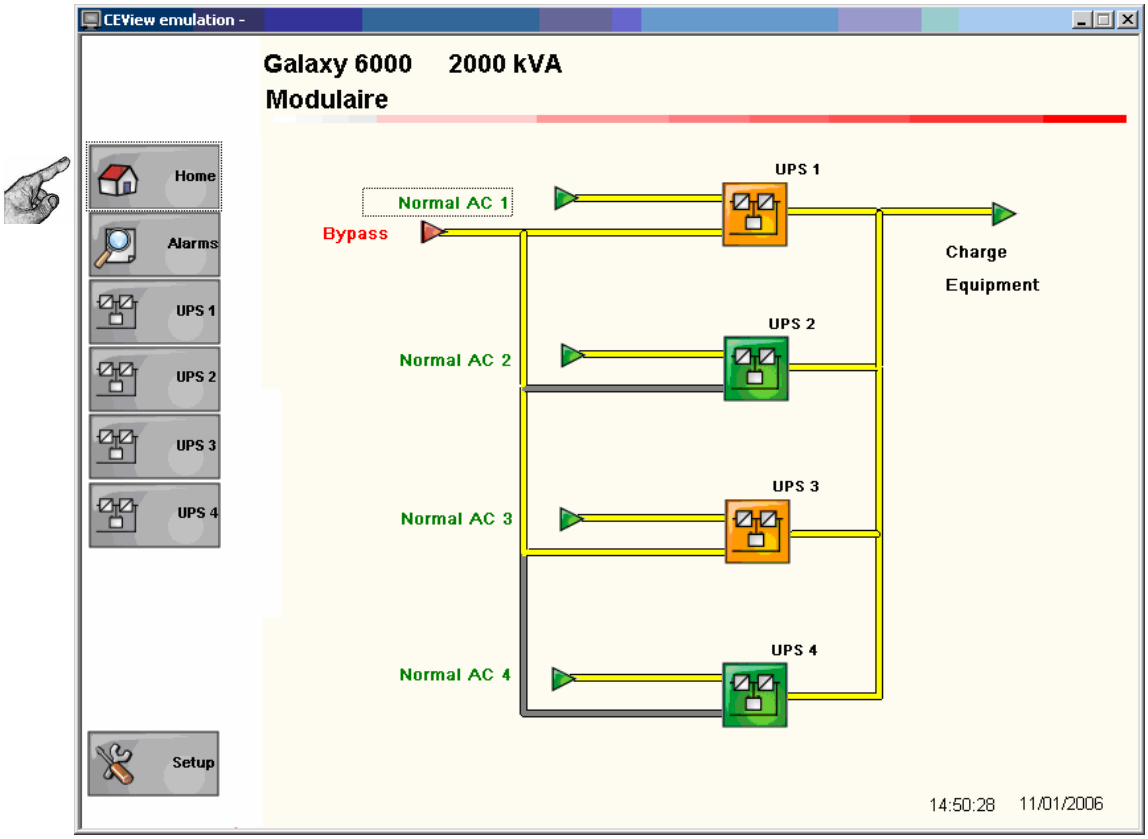
Parallel UPS with NS



Parallel UPS without NS



Modular UPS with external By-pass for maintenance



Alarms screen

Presentation

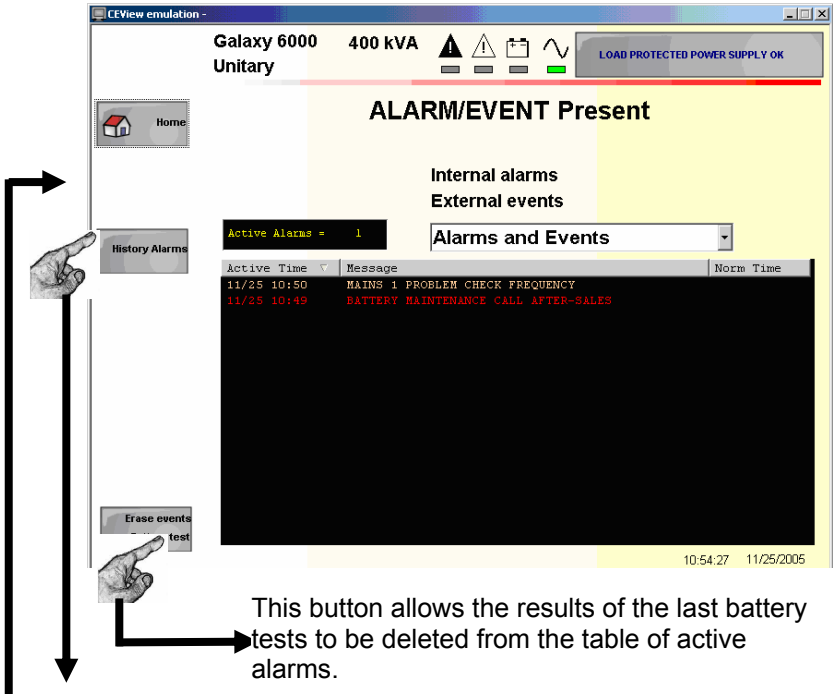
The red indicator lamp **(2) (cf. home screen)** indicates that:
 the load is being fed by the Bypass AC; this is because the inverter has shutdown (voluntary or following an overload or internal fault) or because the inverter output switch Q5N is open;
 it is impossible to operate on battery backup because the battery circuit-breaker QF1 is open.

The orange indicator lamp **(3) (cf. home screen)** indicates an operating anomaly or an environment fault; the load may however still be fed by the inverter.

Active alarms

As soon as an alarm or event occurs, a message appears in the table, along with the time of occurence.
A selection of alarms and/or events can be made.

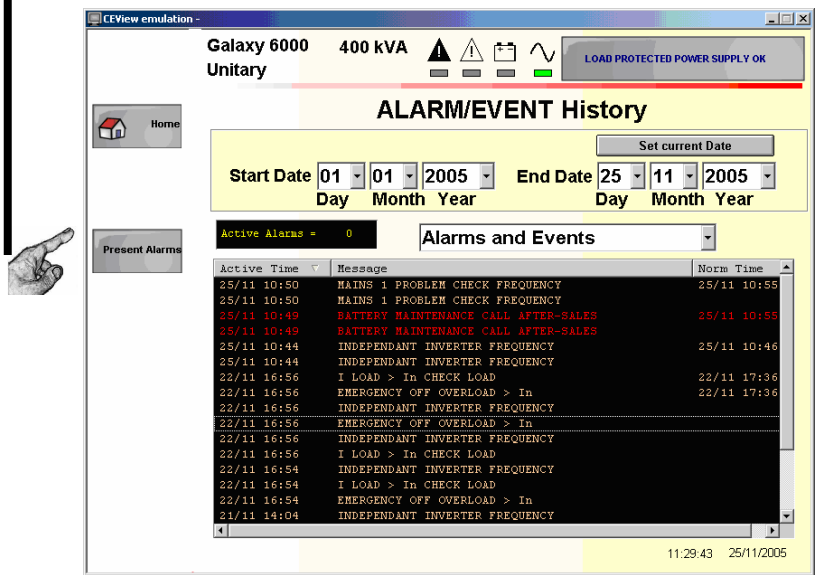
Colours:
Alarms are displayed in red, events in orange.



This button allows the results of the last battery tests to be deleted from the table of active alarms.

Alarm log

When the fault is no longer present the message is automatically transferred to the alarm log, and the time when normal operation resumed is added.
The alarm log for the installation is saved for one year from the moment the display is activated or the faults reset.
A selection can be made for a given period by choosing the start and end dates.

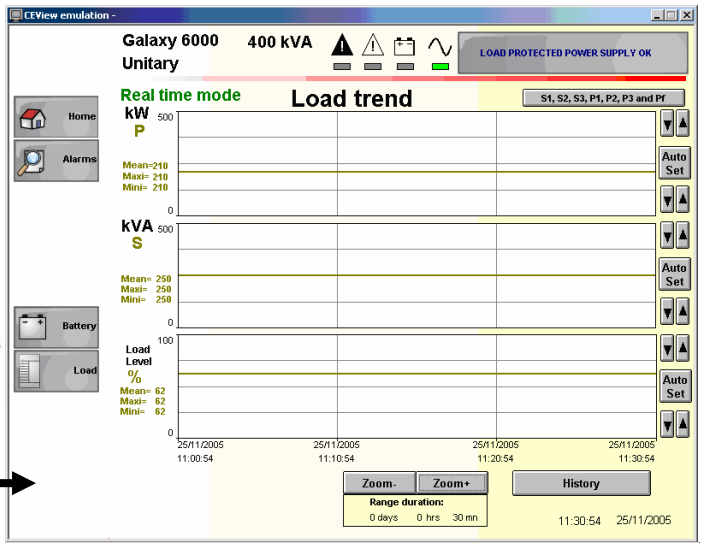


Alarm and event details are available in the MGE™ Galaxy™ 6000 user manual.

Curves screen

Presentation

Measurements can be displayed in two modes:
"Real time" mode draws the curves in real time and memorises the measurements in a Compact Flash file.



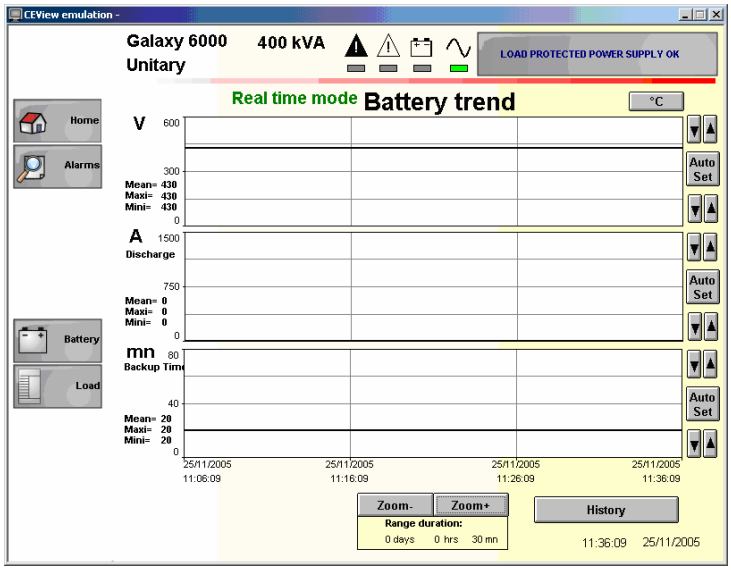
Loads:

- Total active power
- Total apparent power
- % load

by clicking on the button

S1, S2, S3, P1, P2, P3 et Pf

- Active power per phase
- Apparent power per phase
- Power factor



Battery:

- DC voltage
- Discharge current
- Remaining backup

by clicking on the button

°C

- Battery temperature (if sensor is present)

See below for the curves available according to the type of UPS

Curves available according to the type of installation:

	Unitary UPS	Modular UPS	Parallel UPS without NS	Parallel UPS with NS
Total active power curve	Y	Y (1)		Y (2)
Total apparent power	Y	Y (1)		Y (2)
Active power per phase	Y			Y (2)
Apparent power per phase	Y			Y (2)
% load rate	Y	Y (1)		Y (2)
Power factor	Y			Y (2)
Power factor	Y			Y (2)
DC battery voltage	Y (3)	Y (3)	Y (3)	Y (3)
Battery discharge current	Y (3)	Y (3)	Y (3)	Y (3)
Battery temperature	Y (4)	Y (4)	Y (4)	Y (4)

(1): For modular unit only. Does not concern the entire installation.
(2): Measurements provided by the normal-standby cubicle only.
(3): Only if the battery is present.
(4): Only if battery and temperature sensor available.

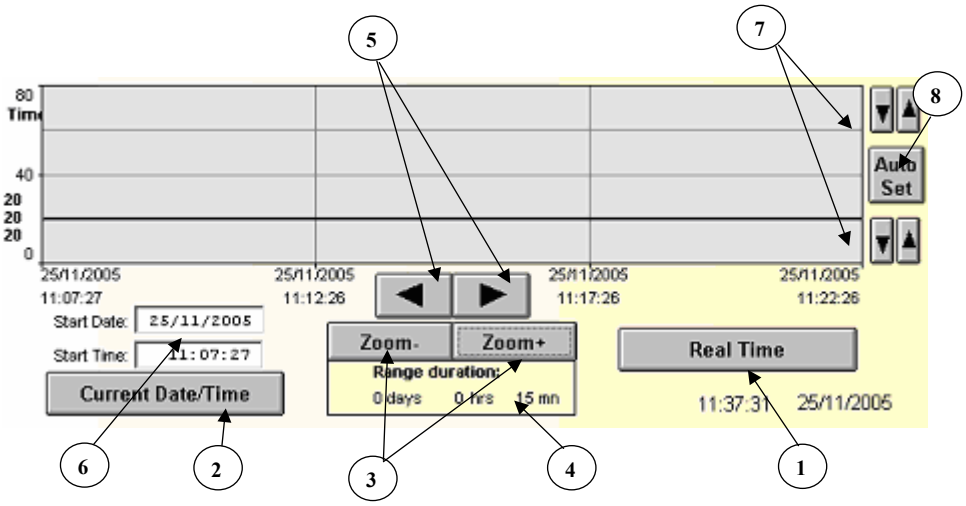
Curve functions

Measurements can be displayed in two modes:

- **"Real time" mode** draws the curves in real time and memorises the measurements
- **"Log" mode** which allows the memorised curves to be analysed (in this mode, the measurements continue to be recorded)

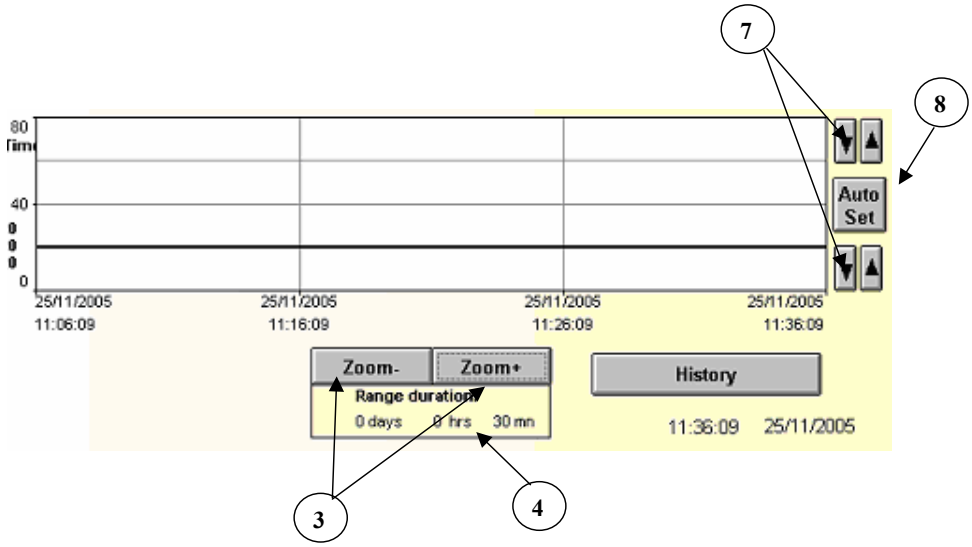
"Log" mode

Different functions and information are available to the user:



- **(1)** : To go to "Real time" mode.
- **(2)** : Only available in "log" mode. It enables the start of curve analysis to be synchronised with the current date and time.
- **(3)** : Only available in "log" mode. Time window zoom-in and zoom-out (1 minute to one year). Minimum value 1 minute, maximum value 30 days.
- **(4)** : Display of the time window period in days, hours and minutes.
- **(5)** : To move the time window period.
- **(6)** : Allows the date and time of the start of the display window to be set (in "log" mode only).
- **(7)** : Setting of minimum and maximum values of the window amplitudes.
- **(8)** : Automatic window amplitude setting according to curve values.

"Real time" mode



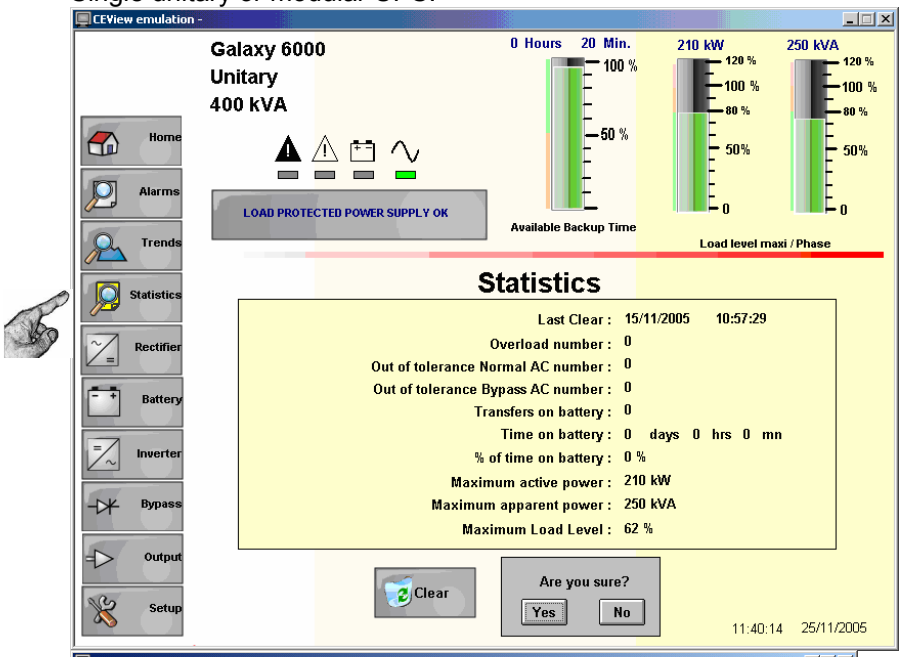
Statistics screen

Presentation

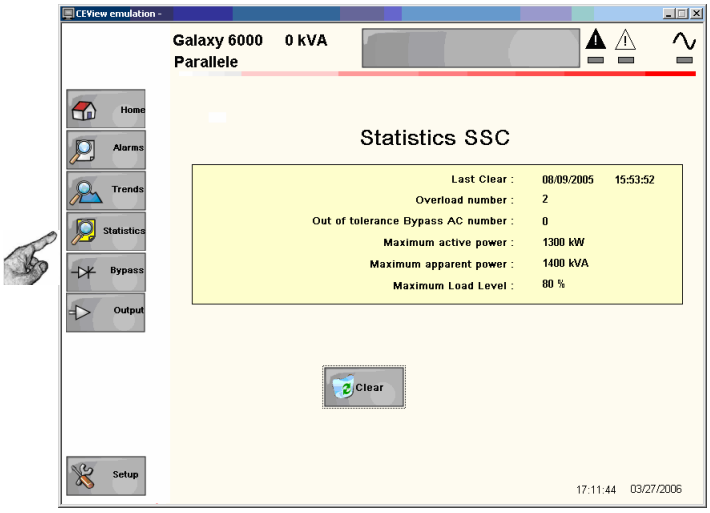
List of available information:

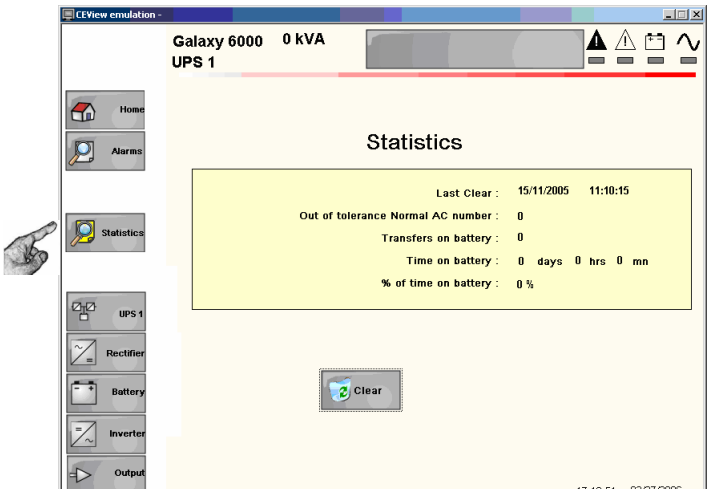
- Number of overloads: number of times the load level exceeds 100%
- Number of times Normal AC goes out of tolerance: number of times the Normal AC input voltage exceeds tolerance limits (voltage or frequency limits)
- Number of times Bypass AC goes out of tolerance: number of times the Bypass AC input voltage exceeds tolerance limits (voltage or frequency limits)
- Transfers to battery: totalises the number of times the inverter input is transferred to the battery
- Time spent in battery operation: totalises the time which the inverter is fed by the battery
- % time spent in battery operation: shows the ratio of time spent in battery operation to total inverter operation time, as a %
- Maximum active power: records the highest active power value supplied by the inverter
- Maximum apparent power: records the highest apparent power value supplied by the inverter
- Maximum load level: records the highest inverter load level value

Single unitary or modular UPS:



Parallel UPS with SSC:



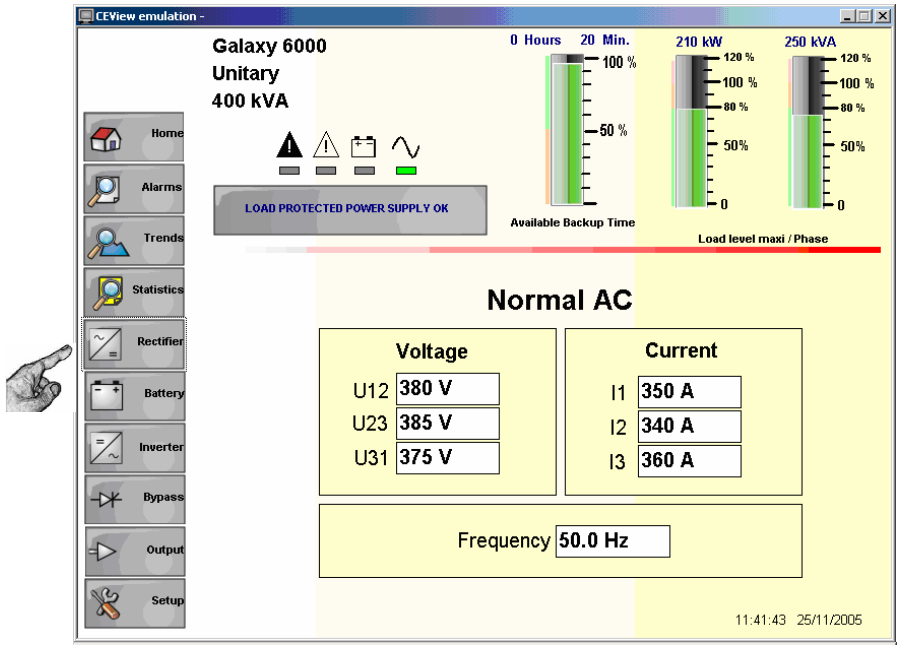


Measurement screens

Charger

Available measurements

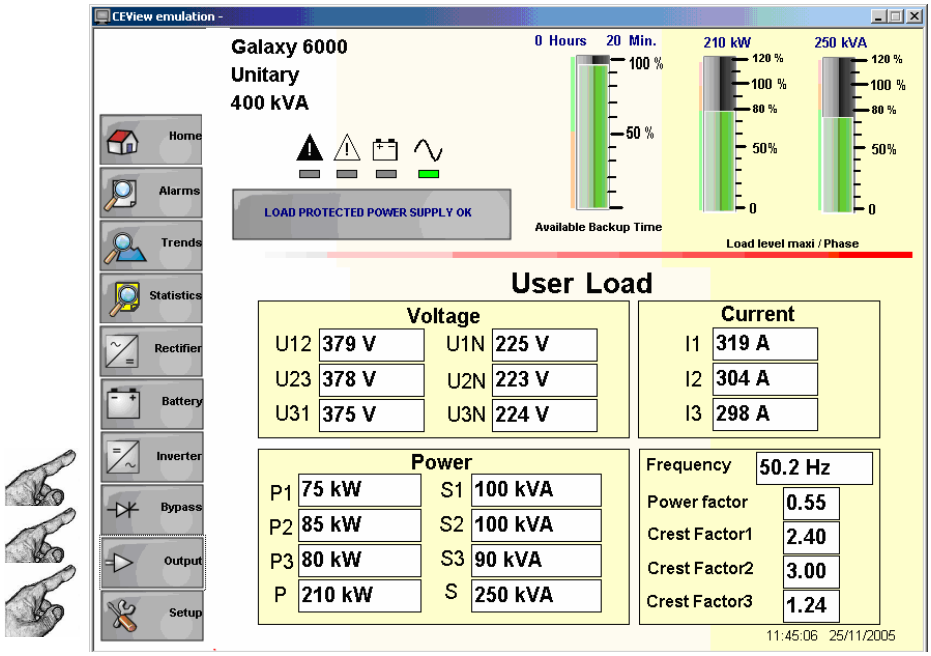
- Phase to phase voltages
- Phase currents
- Frequency at charger input



Inverter / By Pass / Output

Available measurements

- Phase to phase and phase to neutral voltages
- Phase currents
- Frequency
- Phase power factors (PF) and crest factors
- Phase active powers
- Phase apparent powers
- Global active power
- Global apparent power



Battery

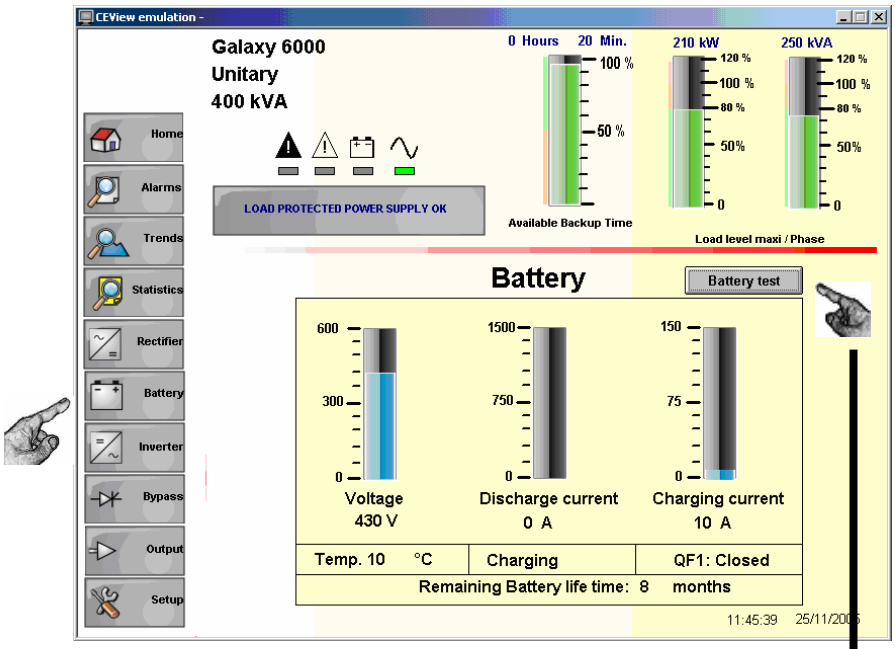
Measurements

Available measurements

- Voltage, battery charging and discharging current in "bargraph" and numerical form
- Indication of battery temperature if temperature sensor present

Information available

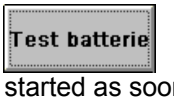
- Circuit-breaker QF1 status and battery charging or discharging status
- Remaining battery service life



Battery test

Conditions for starting a battery test

- Load protected
- Bypass AC network present and within tolerance
- Battery charged >90%
- No battery test already underway

Manual test: 

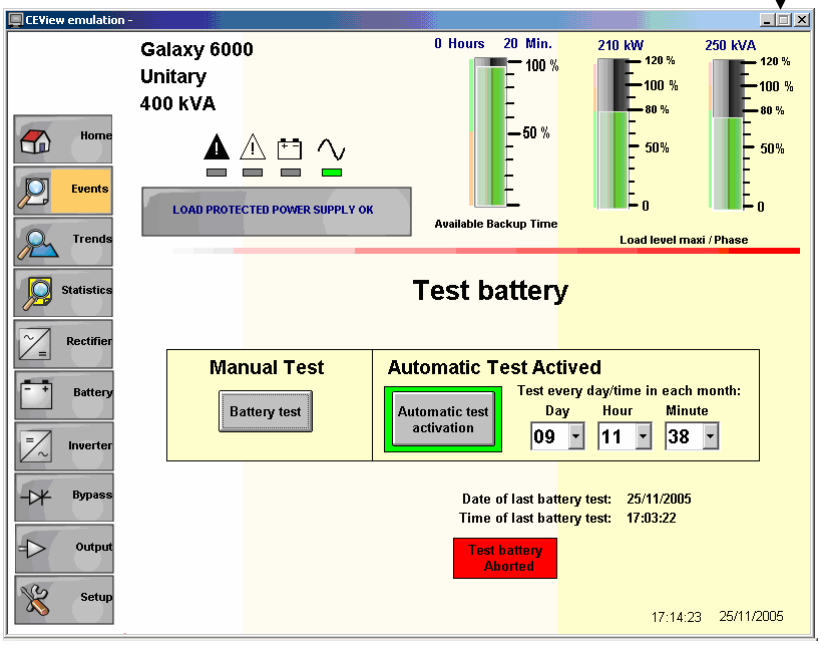
A manual test is started as soon as the Battery Test command is given.

Automatic test

Validated by sending an automatic test command (green indicator lamp).
Select the day, hour and minute.
The test will be run each month on the chosen day and chosen time.

Result

The result is displayed in the alarm menu and in the "Battery test" window. It can be manually removed from the "active alarms" window by pressing the "result deletion" key.



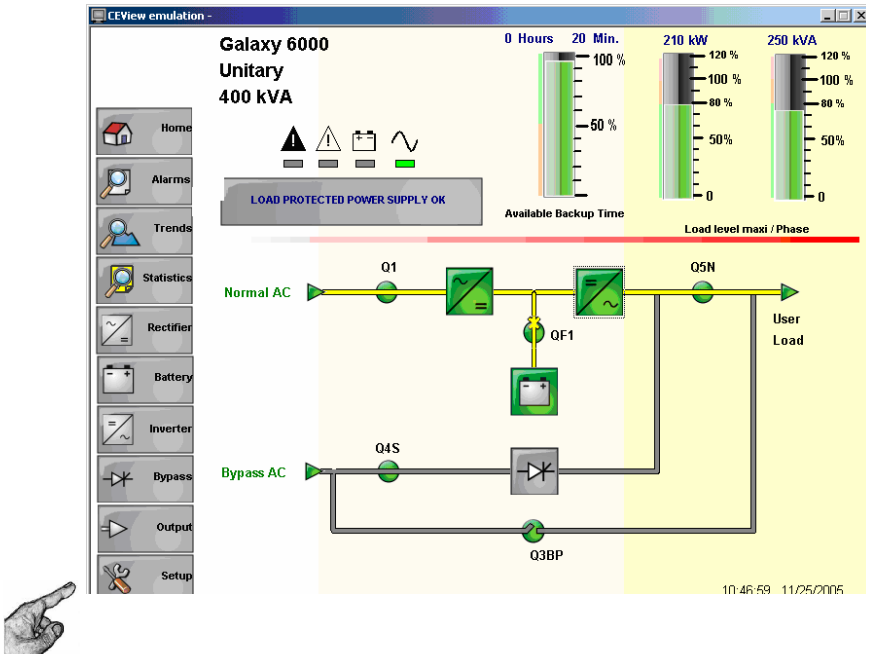
Possible results:

- Battery OK: test correct
- Battery NOK: test incorrect, call the after-sales service
- Battery test interrupted: test interrupted by the user
- Battery test failure: failure of battery test, the inverter cannot provide a result
- Battery test stopped: the inverter did not respond to the battery test (appears 4 minutes after the test command is given)

Settings screen

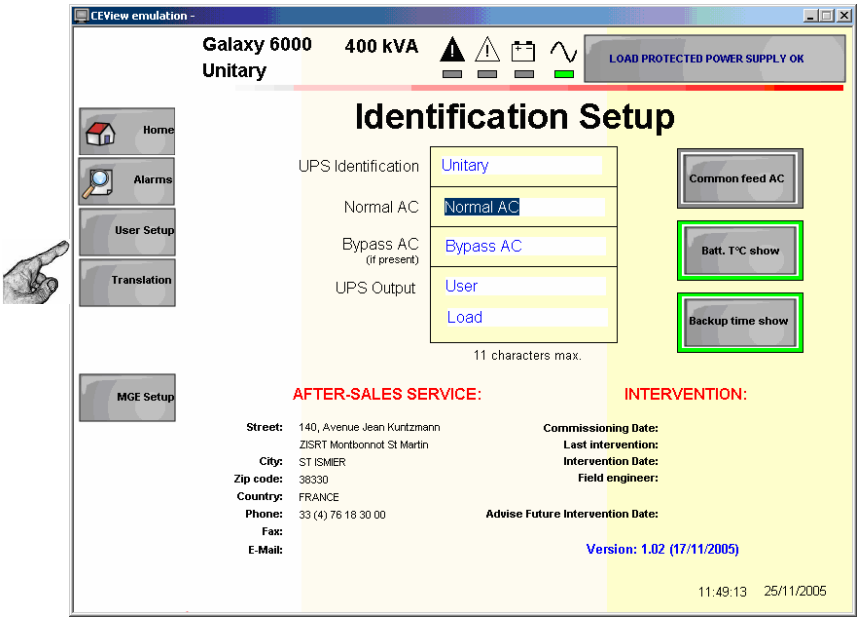
This screen is displayed by touching the "Settings" button.
The contact details of the after-sales service and information on the last intervention are displayed on the screen.
This information is accessible without needing a password. This information can be customised by the user by clicking directly in the desired field.

Single unitary or modular UPS

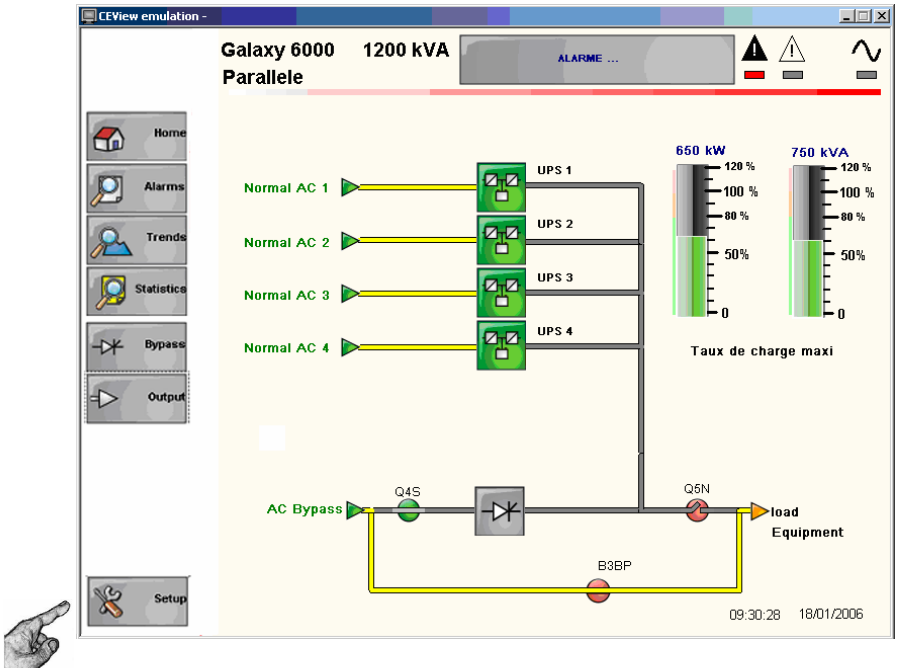


Configuration settings

- UPS identification
- Load designation (two fields)
- "Normal AC" input name
- "Bypass AC" input name
- Presence or non-presence of a link between Normal AC and By-pass AC inputs
- Presence or non-presence of a battery temperature sensor
- Authorisation to display battery backup time (if option available)

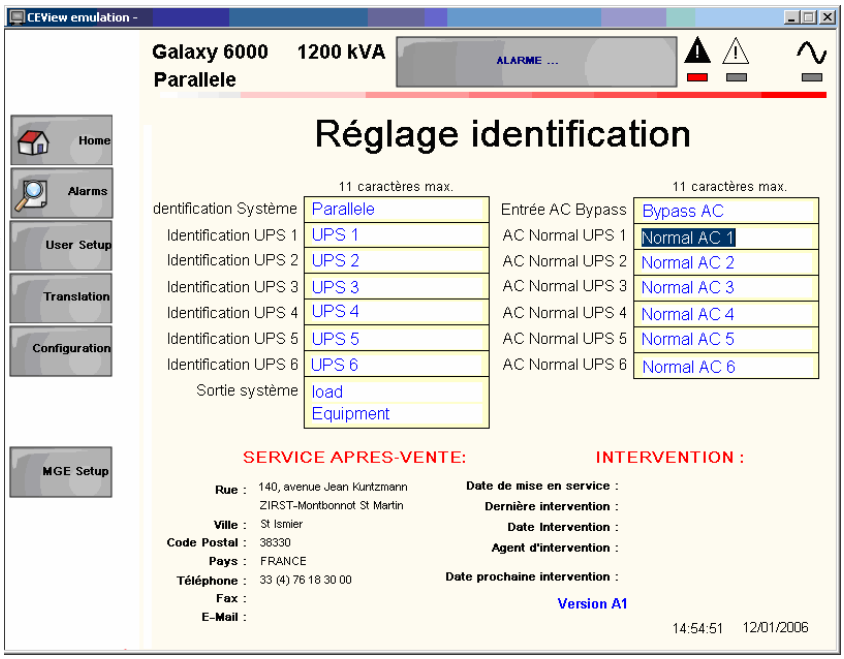


Parallel UPS with or without NS

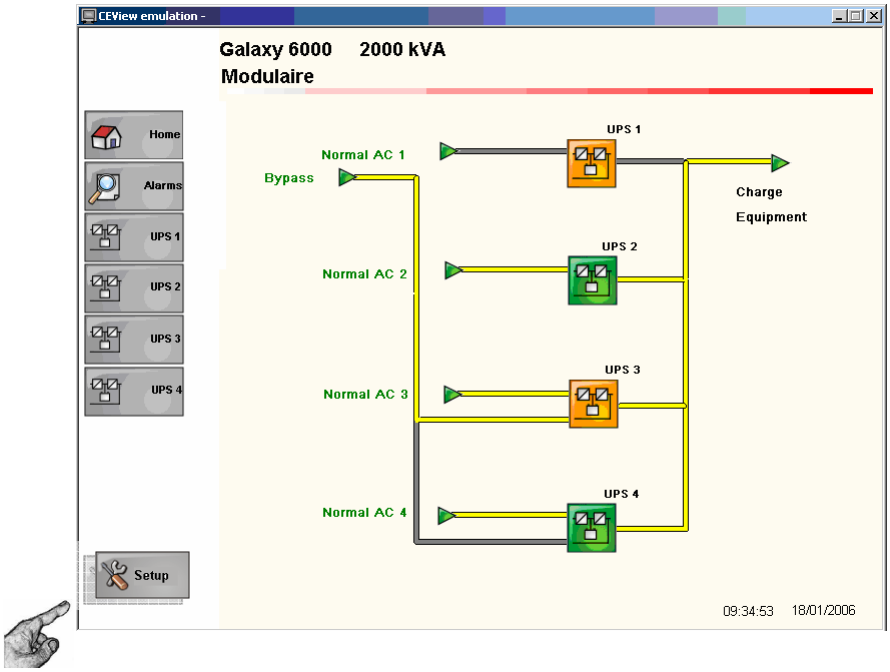


Configuration settings

- Installation identification
- Identification of each UPS
- Load designation (two fields)
- "Normal AC" input name for each UPS
- "Bypass AC" input name

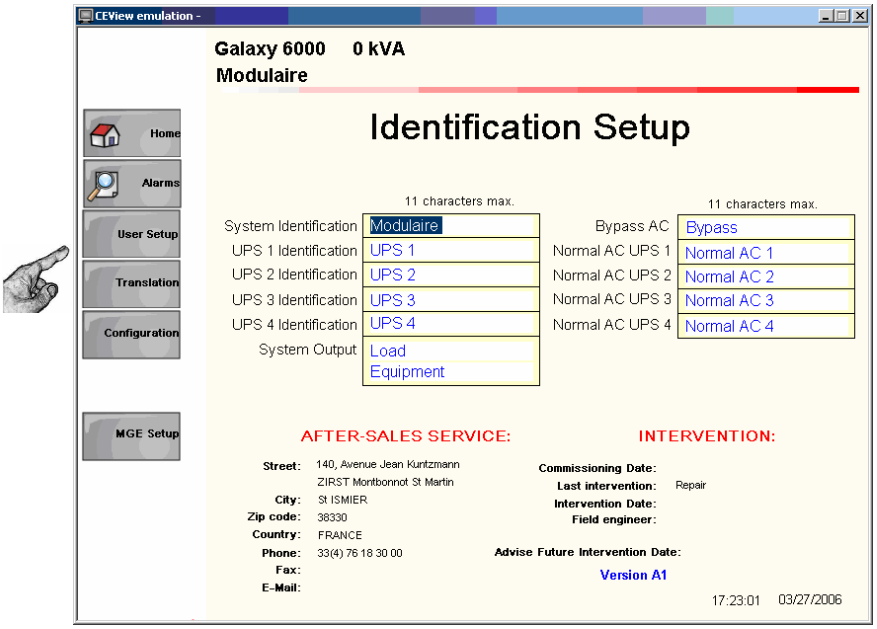


Modular UPS



Configuration settings

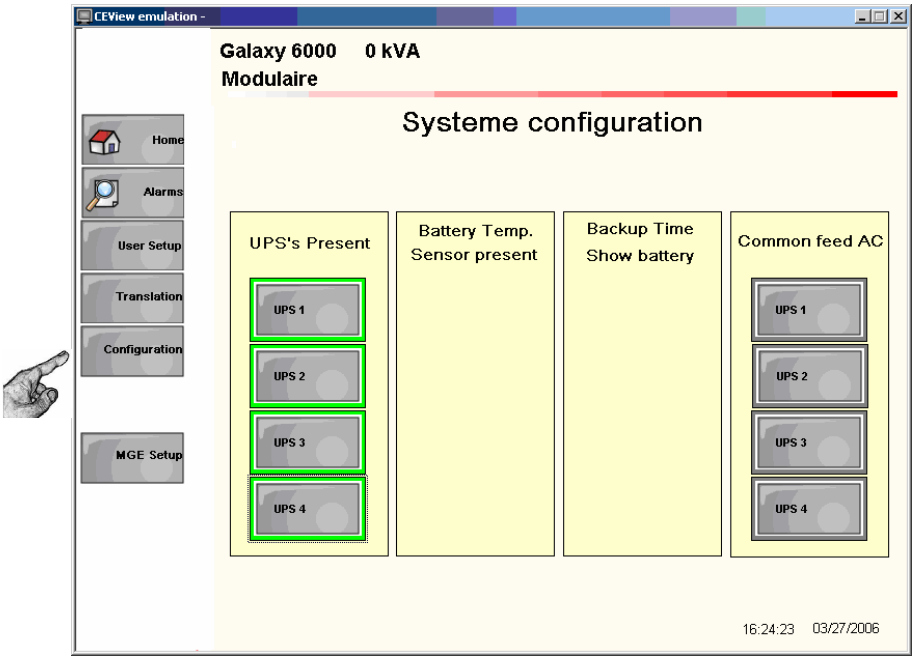
- Installation identification
- Identification of each UPS
- Load designation (two fields)
- "Normal AC" input name for each UPS
- "Bypass AC" input name



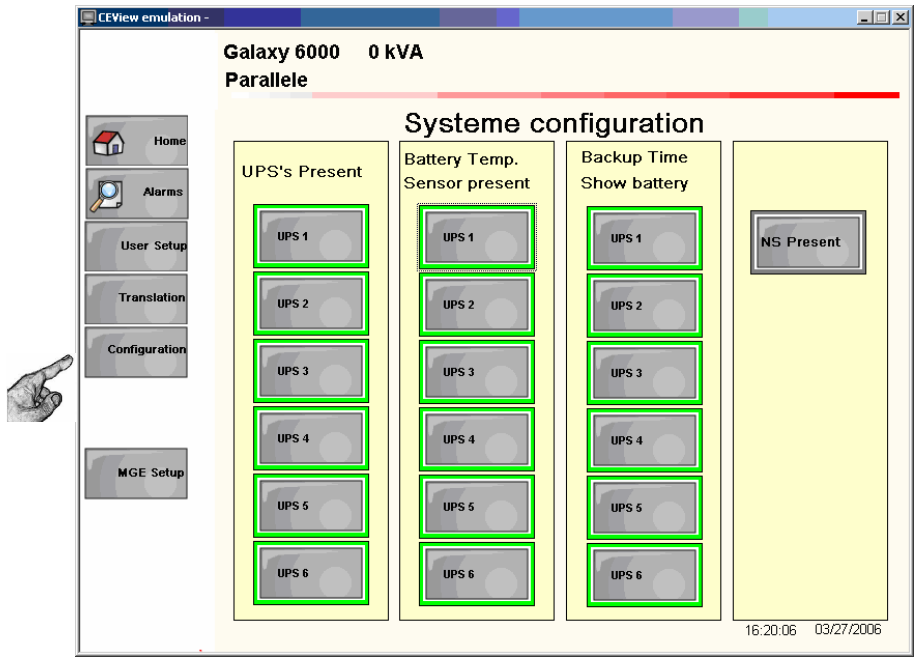
Installation configuration screen

Modular or parallel UPS

Modular UPS with external By-pass for maintenance:



Parallel UPS:



Presentation

This menu allows the presence (or non-presence) of one or more UPS or NS (parallel UPS only) to be validated.

For each UPS, it is possible to validate (or not validate):

- the presence of a temperature sensor,
- the display of backup time,
- the link between the Normal AC and Bypass AC inputs for each UPS (for modular UPS with external By-pass for maintenance).

The validation buttons for the temperature sensor are only displayed if the battery and temperature sensor are present.

The validation buttons for displaying battery backup time are only displayed if the battery is present.

Validation of an element results in a green colour.