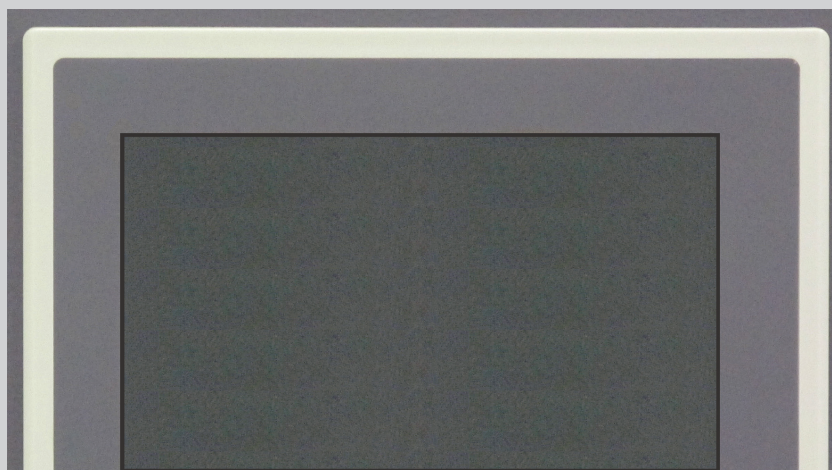


USER'S MANUAL



CONTROL PANEL WITH TOUCH SCREEN

SLC CUBE 3+

SALICRU

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1. FIRST COMMISSIONING PROCEDURE.


Fig. 1. First commissioning setting menu.


- When starting the equipment up for first time, it is automatically activated the first commissioning menu in the control panel, being as a preset language «English». Through this menu the following parameters are set: language, date, nominal voltage and frequency of the equipment.
 -  For parallel systems, repeat these steps in each equipment that belongs to, being able to set all of them at the same time or one by one.
 - Supply voltage to the input of the switchgear panel.
 - Turn the input switch of the panel «On».
 - Turn the input switch **(Q1a)** of the UPS «On» or each one of the equipments that make the parallel system. The screen shown in Fig. 1 will be displayed and an acoustic alarm will be triggered, beeping every 5 seconds.
1.  The «drop-down» button allows, depending on the field, opening the menu and select one of the suggested variables or entering a figure by means of the pop up touch keyboard to change it.
- Next, and in correlative order, start the following selections as a setting mode, by means of the «Drop-down» button of each box or submenu:
 - Preset language is «English». Drop-down list that allows changing the language of the LCD panel among one of the available four, but depending on the equipment, it can have one of the three available language groups:
 - English, Spanish, French and German.
 - English, Spanish, Catalan and Portuguese.
 - English, French, Turkish and Russian.
 - Time (hour and minutes) and date (weekday, month day, month and year).
 - Nominal operating voltage of the equipment corresponding to the nominal figure among phases. The system will allow setting the nominal voltage figure with the values of table 1. In case the desired figure was not in that table, the nearest figure must be selected.

Voltage type	Voltage among phases values
LV (Low voltage). Models labelled as «A»	3x200 V / 3x208 V / 3x220 V / 3x230 V
HV (High voltage)	3x380 V / 3x400 V / 3x415 V

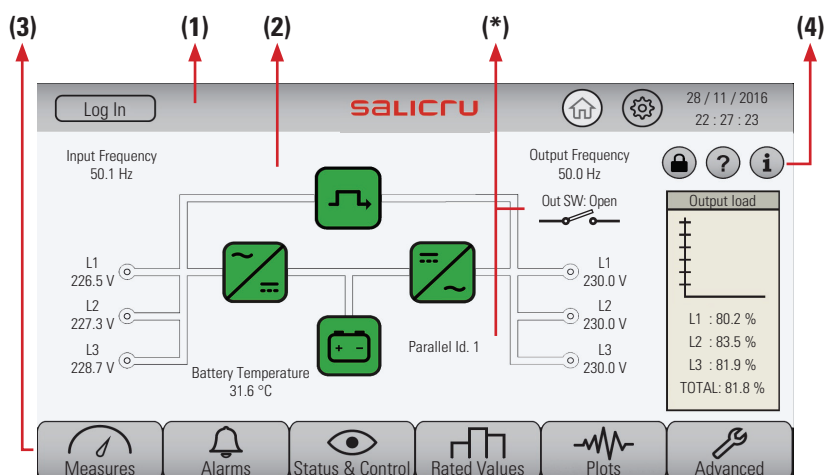
Tabla 1. Nominal operating voltages of the equipment.

- Finally, set the nominal frequency figure. The system allows selecting three options for the nominal frequency figure:
 - 50 Hz: The frequency of the equipment (rectifier and inverter), will be set to 50 Hz.
 - 60 Hz: The frequency of the equipment (rectifier and inverter), will be set to 60 Hz.
 - AUTO: Every start up of the UPS, the input frequency will be sensed and set to 50 or 60 Hz.
 -  This setting is not recommended in case the equipment is supplied by a generator set.
 - Finally, confirm the set figures.
2.  The «Confirm» button is used to accept the entered values in the equipment setting. Once is pressed, the acoustic alarm will be stopped.

 Once the settings are confirmed, it will not be possible to change them again, being necessary to call to the Service and Technical Support (**S.T.S.**).

-  **Section 4.3 describes all the touch button elements grouped in the «STATUS AND CONTROL» icon with the following functions:**
 - UPS start up and shutdown.**
 - Battery test.**
 - Battery test properties.**
 - ECO-Mode shifting (loads supplied by the static bypass line) or load feedback by the UPS inverter.**
- Refer to this section for any of the quoted operating.**

2 GENERAL DESCRIPTION OF THE TOUCH PANEL



(*) Information available in equipments to work in parallel only. Even though any number can be assigned as «Id.», it is recommended to use from 1 to 4, being 4 the maximum number of units to parallel. The assignment or setting of the «Id.» address is reserved for the authorised personnel by means of restricted access by Password.

Fig. 2. View of the touch screen parts.

2.1. STRUCTURE OF THE TOUCH PANEL.

To manage the equipment and to access to the system information, the touch screen is divided into four categories.

Item	Category	Description
(1)	Title	It informs to the end-user about the category were he is and allows accessing to the start screen and to the basic settings of the system. It is located in the top part of the screen.
(2)	Contents	It shows the information corresponding to the section that the end-user is and allows changing the parameters depending on the selected section. It is located in the centre part of the screen.
(3)	Main menu	It allows a quick access to any information of the equipment at all times, because this menu is always visible in the bottom part of the screen.
(4)	Side menu	It is a dynamic menu that allows moving inside each section. In the initial screen is used to show the load of the equipment and it is located in the right part of the panel.

Tabla 2. Categories of the touch screen.

2.2. TOUCH PANEL SECTIONS.

Table 3 shows, in columns, the available sections of the touch panel and the information that can provide in each one of them. To access to any section, just press in the touch screen the corresponding icon.

Once it is accessed to the section, its contents and the side menu will be altered showing the related information and possible browsing options (side panel) respectively.

Main menu is shown in the bottom part of the screen, it will always be visible and unalterable regardless of the selected icon.

To browse through each section, it will be used the right side menu, so it means that the information shown in it will be changed accordingly.

The «Advanced» icon is exclusive reserved for the Service and Technical Support (**S.T.S.**) personnel, it needs password.

The information shown in Fig. 2 to 5 concerning to «Id» and the output switch, is only available in those equipments set to operate in parallel.

Start (🏠)	Setting (⚙️)	Measures	Alarms	Status - Control	Rated Values	Plots	Advanced
Synoptic unit	Time and date	Input	Actives	Start up	I/O voltages	Oscilloscope	Technical service
Voltages	Language	Output	Data logger	Battery test	Voltage range	Data logger	-
Frequencies	Communication	PFC and inverter	-	ECO-Mode	Battery current	-	-
Percentage load	-	Bypass	-	-	Bypass voltage	-	-
🔒 Unit locking	-	Batteries	-	-	Bypass range	-	-
❓ Help	-	-	-	-	Inverter voltage	-	-
👤 Unit information	-	-	-	-	DC bus voltage	-	-


Tabla 3. Control panel sections.

3. DESCRIPTION OF THE SECTIONS.

This description shows all the sections of the touch panel. The order of the description is the order that the buttons can be found in the touch panel, from left to right and from top to bottom.


3.1. LOG IN.

The «Log In» button is located in the top left corner inside the categorie «Title». This is a restricted section for Service and Technical Support (**S.T.S.**) personnel use only.

 When pressing the «Log In» button, it is displayed a pop up keypad to enter the password, allowing our Service and Technical Support (**S.T.S.**) personnel making changes in the equipment settings.

3.2. START SCREEN «HOME».

The «Start» button is located in the top right corner inside the categorie «Title».

 When pressing «Start» button, the initial screen is displayed, which among other informations it has the single line diagram of the equipment. In this diagram the operating flow can be checked (lines filled with movement indicators, which can vary, depending on the operating mode of the UPS in that moment). Regardless of that, the illustrations in Fig 3 to 6 show some structural examples of the unit as three phase in and out, single in and three phase out..., even though there are other configurations, which will be displayed in the own control panel.

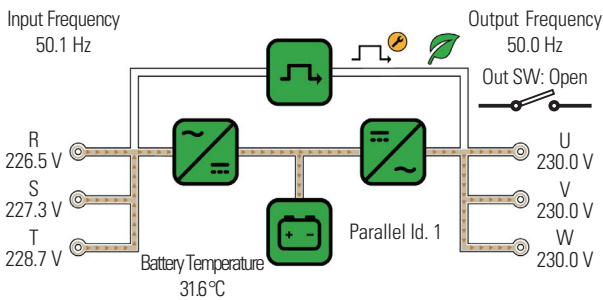


Fig. 3. Start screen (Three-Three phase I/O example).

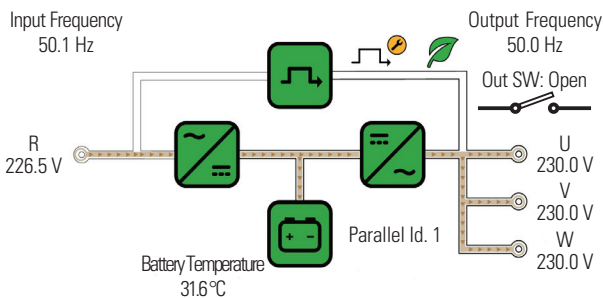


Fig. 4. Start screen (Single - Three phase I/O example).

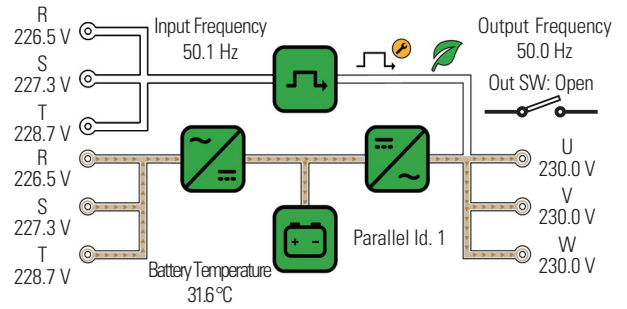


Fig. 5. Start screen (Three -three phase I/O example with separate bypass line).

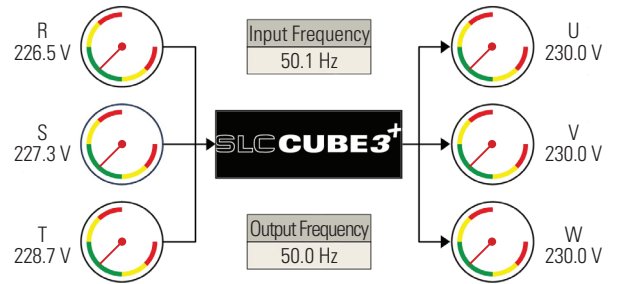












Fig. 6. Start screen (particular equipment example).



In the start screen, a part from the intrinsic UPS configuration (single line diagram), input and output voltages and frequencies are shown, as well as the ambient temperature of the battery block. Likewise, the equipments set as parallel, it is also displayed its «Id.» address and the its output switch position «On» (closed) or «Off» (opened).

Also, when pressing over any icon or defined area of the single line diagram, the «Measures» menu with the several magnitudes and the related values with that area will displayed, according to the following icons:

1.  When pressing over any of these icons, you access to the «Input» menu directly.
 2.  When pressing over this icon, you access to the «Bypass» menu directly.
 3.  When pressing over this icon, you access to the «PFC and Inverter» menu directly, although the icon is only referred to the PFC.
 4.  When pressing over this icon, you access to the «PFC and Inverter» menu directly, although the icon is only referred to the inverter.
 5.  When pressing over this icon, you access the «Battery» menu directly.
 6.  When pressing over any of these icons, you access the «Output» menu directly.
-  When an icon is displayed in red colour, it will mean that an alarm is present. Next it is shown the icon representation and its meaning:

7.  The rectifier of the equipment is blocked and it does not work.
8.  The inverter of the equipment is blocked and it does not work.
9.  The battery of the equipment is disconnected or battery test has failed.

In addition to the previous described icons, another warning icons can be displayed:

10.  Warning, the manual bypass switch of the equipment is turned «On» (maintenance position).
11.  Warning, the equipment is working on ECO-Mode (loads supplied by the static bypass of the equipment).

On the top right corner of the side «Start» menu, there are three buttons, «Lock», «Help» and «Information» with the following functionality.

3.2.1. Lock.



The «Lock» button allows the end-user to protect the control panel against malicious manoeuvring or accidents by third persons. To lock it, it is needed to enter the password **2002**. The same password will be entered to unlock it.



The icon doesn't inform about the current status, but it informs the action that it will be when touching it.

3.2.2. Help.





When touching the «Help» touch button, there is access to a screen with three additional buttons, «Quick guide», «Energy Flow» and «Contact»

3.2.2.1. Quick guide.




The «Quick guide» touch button has a basic and useful information about how to use the touch screen to control the equipment.

The «Quick Guide» is based on six chained screens. All of them shows an image and at its right side there are the basic instructions, which depends on the contents. To move through the different screens use the following buttons:

1.  The «Right» icon allows to move forward in the shown instructions in the screen and to go to the next correlative screens.
2.  The «Left» icon is used to move backward in the instructions and to go to the previous screen inside the «Quick Guide».

In the top of this section, it is located the «Backward» key:

3.  The «Backward» key will move to the end-user to the «Help» screen.

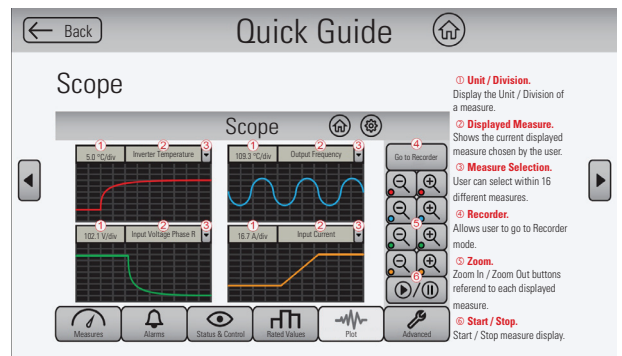
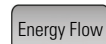



Fig. 7. Quick Guide (Example: Screen 4th)

In the two first screens, it is shown the functionality of each button, which you may access from main screen. The third screen describes the definition of the particular icons that are displayed in the different menus. In the next two screens, it is explained each one of the panels shown in the «Graphic» section. Finally, in the last screen, it is explained the «Alarms» section and the functionality of each element.

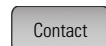
3.2.2.2. Energy Flow.




The second «Help» button in the «Energy Flow» touch button, has information about the different possible electrical energy flows inside the equipment.

1.  The «Backward» key will move back the end-user to the «Help» screen.

3.2.2.3. Contact.




The third and last from «Help» touch button is «Contact», which includes the needed information to contact with the manufacturer.

1.  The «Backward» key will go back the end-user to the «Help» screen.

3.2.3. Information.



When pressing the «Information» button, the data of the equipment like serial number, software version, PCB identifier, unit status, output status, parallel unit status,... (see Fig. 8).

1.  The «Backward» key will go back the end-user to the Start screen «Home».

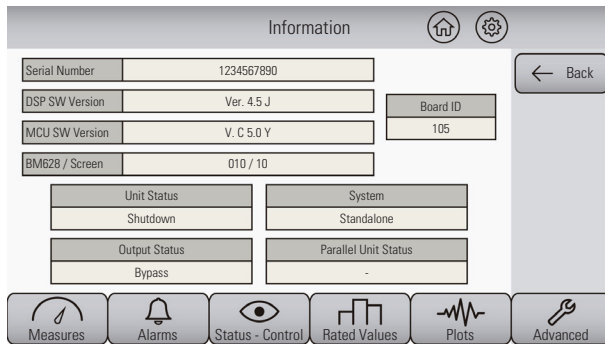


Fig. 8. Information screen.

Below the «Lock», «Help» and «Information» buttons, it is displayed a chart with the connected load in each phase and total of the equipment, in a numerical and bar way (see Fig. 9).

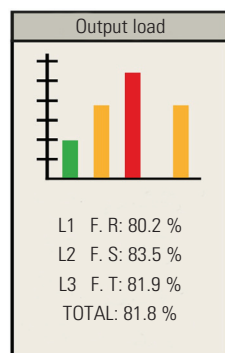


Fig. 9. Side panel in the start menu.

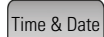
3.3. SETTING.

The «Setting» buttons are located in the right top corner of «Title» categorie.



When pressing over the «Setting» section, there is access to its menu. The side menu shows the different options «Time and Date», «Language» and «Communication». The end-user may access to the contents of each one of them when touching the respective field in the touch screen.

3.3.1. Time and date.



This menu shows a panel with different programmable fields, like: hour, minute, day, year, month and week day.

Time & Date			
Hour		Day	
Minute		Year	
Month			
Week Day			

Fig. 10. Time and date setting of the equipment.

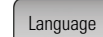
1. The «Drop-down» button allows, depending on the field, opening the menu and selecting one of the proposed variables or entering a value by means of the pop up keyboard,

to change it. When touching on any field, there will be a «Pop up» screen, which allows any of these two options.

The date format can be set between «Day/Months/Year» and «Year/Month/Day».

2. The «Day/Month/Year» button allows setting the date, making the first character displayed is the day, then the month and year.
3. The «Year/Month/Day» button allows setting the date, making the first character displayed is the year, then the month and finally the day.

3.3.2. Language.



In the «Language» section, the end-user can choose between one of the available languages, by clicking its respective icon to change the descriptive in the screen.

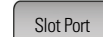
Section 1 states the available languages and their constraints to display them in the control panel.

3.3.3. Communication.



In the «Communication» menu, the end-user can set the parameters of the «Slot port» and «Port 0» of the system like: modbus address, baud rate, parity, stop bits and protocol.

3.3.3.1. Slot port.



The «Slot Port» key allows selecting this communication channel to change its parameters, if available.

The available variable are the same as the ones shown in Fig. 11 for «Port 0».

3.3.3.2. Port 0.



The «Port 0» key allows selecting this communication channel to change its parameters, by setting the following five parameters (see Fig. 11).

- It allows setting the Modbus Address. Address range between 1 and 247.
- Baudrate (communication speed in Bauds). Options: 1200, 2400, 4800, 9600 or 19200.
- Communication parity. Options: No parity, Even or Odd.
- Stop bits. Options: 1 and 2
- Communication protocol. Options: SEC or MODBUS 2

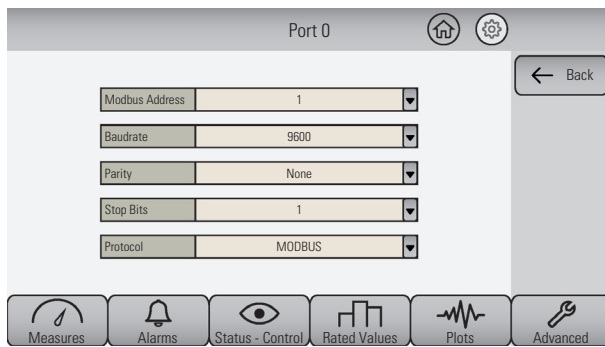




Fig. 11. Port 0 parameters.

-  The «Drop-down» button allows, depending on the field, opening the menu and selecting one of the proposed variables or entering a value by means of the pop up keyboard, to change it.
-  The «Backward» key will go back the end-user to «Communication» screen.

4. MAIN MENU.

4.1. MEASURES.

The «Measures» touch icon is located in the bottom area, of the first main menu.



When touching in the touch screen over the «Measures» menu, all the browsing icons describes in this section will be displayed in the side bar, they will be shown in a column and in the same described order.

Any data is updated constantly and displayed in one or three lines, depending on both the equipment is single or three phase and the parameter.

4.1.1. Input.



By means of this button the following information related with the UPS input can be displayed:

- Voltage.
- Frequency.
- Current.
- Power factor.
- Apparent power.
- Active power.

As an example, Fig. 12 shows the screen illustration corresponding to the input measurements. The rest of the measurement screens will be similar and in line with the parameter of the measurement.

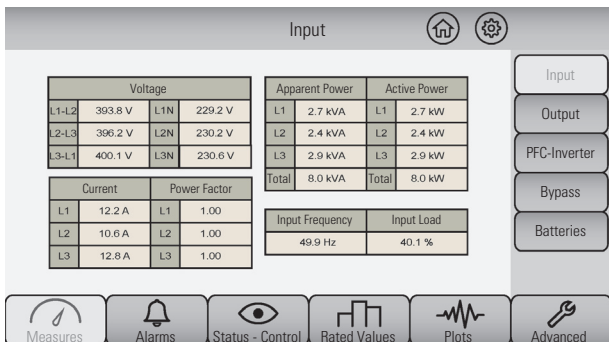


Fig. 12. Input measurements screen.

4.1.2. Output.



By means of this button the following information related with the UPS output can be displayed:

- Voltage.
- Frequency.
- Current.
- Power factor.
- Apparent power.
- Active power.

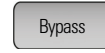
4.1.3. PFC and inverter.



By means of this button the following information related with this stage can be displayed:

- Inverter voltage.
- DC bus voltage.
- Inverter heatsink temperature.
- PFC heatsink temperature.

4.1.4. Bypass.



By means of this button the following information related with this stage can be displayed:

- Voltage.
- Current.
- Frequency.

4.1.5. Batteries.



By means of this button the following information related with the UPS batteries can be displayed:

- Charging current.
- Voltage.
- Discharging current.
- Estimated back up time.
- Temperature.

4.2. ALARMS.

The available alarms for the touch panel and alphanumerical LCD are the same, even though the graphics are different due to the own features of both screens.



All the alarms, which can be displayed in the touch screen are listed in table 4 and in section 7.3.5 of the document EN014*01 (user's manual of the equipment) it is stated their triggering condition.

The appointment numbering for each alarm in «Ref.» column of table 4, means their correlation.

The «Alarms» touch icon is located in the bottom area, in the second position of main menu.



When touching the «Alarms» chart, it is displayed the active alarms only, ordered in the «Active alarms» table, showing the most recent first (see Fig. 13 as an example).

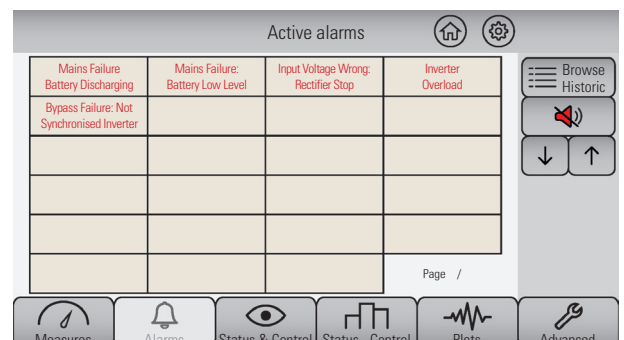







Fig. 13. Active alarms screen.

Any alarm shown in the «Active alarms» submenu of the touch screen, triggers an acoustic alarm with the same modulation and intensity for any of them.

The side menu has four graphic buttons, which are described as follows.

1.  It allows displaying a record table, with the last 100 events. See section 4.2.1.
2.  «Acknowledge alarms» button. It has the function to acknowledge any active alarm, which is displayed in the «Active alarms» table. When touching over this icon of the touch screen, all the alarms are silenced with only one action, by changing from dark to light colour in the table meanwhile they are still present or clearing them if they have been cancelled.
3.  The «Down» key allows going to the next page, which will be displaying the oldest active alarms.
4.  The «Up» key allows going to the previous page, which will be displaying the most recent active alarms.

 The «Alarm» icon in red colour can be shown in the main menu located in the lower side of any screen. And it means that any alarm in the UPS is active, regardless of it is acknowledged or not.

Representation on the touch screen	Alarms	Ref. ⁽¹⁾
Rectifier Overload	RECTIFIER	4.1
Inverter Overload	INVERTER	4.2
Mains Failure: Battery Low Level		4.3
Inverter Voltage Out of Margins		4.4
DC Voltage Detected at the Output		4.5
Maintenance Bypass: Inverter not Available		4.6
Mains Failure Battery Discharging		UPS
High Temperature: Reduce Output Load	4.8	
Battery Switch Open: Switch it ON	4.9	
Bypass Failure: Not Synchronised Inverter	4.10	
Unit on Bypass: Initialise UPS	4.11	

Representation on the touch screen	Alarms	Ref. ⁽¹⁾
Some Unit(s) Blocked due to Maintenance Bypass	UPS	4.12
CAN BUS 1 Communication Failure		4.13
CAN BUS 2 Communication Failure		4.14
End of Battery Life		4.15
Battery Temperature too High		4.16
Battery Test Not Succeeded		4.17
Battery Disconnection: Shutdown & Restart		4.18
Mains Phases Rotation: UPS Start Disabled		4.19
Bypass Phases Rotation: UPS Start Disabled		4.20
EEPROM Failure		4.20A
Error Communications: Parallel Master Fixed		PARALLEL
Parallel System: Redundancy Lost	4.22	
Input Voltage Wrong: Rectifier Stop	RECTIFIER STOPS	4.23
Rectifier Desaturation: Rectifier Stop		4.24
DSP Internal Error: Rectifier Stop		4.25
Input Phases Rotation: Rectifier Stop		4.26
DC BUS Voltage Wrong: Rectifier Stop		4.27
Parallel System: Rectifier Stop		4.28
Contactors Test Fail: Rectifier Stop		4.29
Inverter Desaturation: Inverter Stop	INVERTER STOPS	4.30
Inverter Overload: Inverter Stop		4.31
Command Shutdown Inverter Stopped		4.32
Maintenance Bypass: Inverter Stop		4.33
Parallel System Discharging: Inverter Stop		4.34
High Overload: Inverter Stop		4.35


Representation on the touch screen	Alarms	Ref. ⁽¹⁾	
Overtemperature: Inverter Stop	INVERTER STOPS	4.36	
Rectifier Overload: Inverter Stop		4.37	
DSP Internal Error: Inverter Stop		4.38	
Output Short-circuit: Inverter Stop		4.39	
Bypass Phases Rotation: Inverter Stop		4.40	
Inverter Failure/Overload Inverter Stop		4.41	
Voltage Ramp Error: Inverter Stop		4.42	
Parallel System: Inverter Stop		4.43	
Low Battery: Inverter Stop		4.44	
DSP Internal Error: UPS Stop		UPS STOPS	4.45
Overtemperature: UPS Stop			4.45A
PFC & Inv. Stop: UPS Stop	4.46		
Parallel System: UPS Stop	4.47		
Emergency Power Off (EPO): No Output Voltage	BYPASS STOPS	4.48	
Output Short-circuit: No Output Voltage		4.49	
DSP Internal Error: Blocked UPS		4.50	
DC BUS Voltage Wrong: Rectifier Block	RECTIFIER BLOCKS	4.51	
Rectifier Blocked: BLK. UPS>> BLK. REC		4.52	
Desaturations: Rectifier Block		4.53	
Voltage Ramp Error: Rectifier Block		4.54	
Intern. Exec. Error: Rectifier Block		4.55	
Rectifier Block: DSP Internal Error		4.56	
Contactor Test Failure: Rectifier Block		4.57	
Voltage Ramp Error: Inverter Block		4.58	
Output DC Voltage: Inverter Block	INVERTER BLOCKS	4.59	
Inverter Blocked: BLK. UPS>> BLK. INV		4.60	

Representation on the touch screen	Alarms	Ref. ⁽¹⁾
Inverter Desaturations: Inverter Block	INVERTER BLOCKS	4.61
Internal Exec. Error: Inverter Block		4.62
DSP Internal Error: Inverter Block		4.63
Inverter Failure: Inverter Block		4.64
UPS Blocked: BLK. REC>> BLK. UPS	UPS BLOCKS	4.65
Internal Initialisation Error: UPS Block (DSP)		4.66
Internal Execution Error: UPS Block (DSP)		4.67
UPS Blocked: BLK. INV>> BLK. UPS		4.68
Internal Communication Error: UPS Block (DSP)		4.69
Discharging DC Bus Wrong: UPS Block		4.70
UPS Overtemperature: UPS Block		4.71
Rectifier Overload: UPS Block		4.72
Inverter Desaturations: UPS Block		4.73
DSP Internal Error: UPS Block		4.74
PFC & Inverter Blockage: UPS Block		4.75
Parallel Communications Error: UPS Block	4.76	
Frequency Detection Failure: UPS Block	4.77	

⁽¹⁾ Correlation numbering reference with the description of section 7.3.5 from the document EN014*01 (equipment user's manual).

Table 4. Alarm messages and their correlation reference.




4.2.1. Data logger browsing.

 When touching the «Browse Historic» graphic from side menu in «Alarms» section, the last one hundred alarms in the equipment can be consulted through the screen labelled as «Data Logger» (see Fig. 14 as an example).

Id.	Alarm Description	Date	PFC	Inverter	Parallel	UPS	Flag Code
8.3	Mains Failure Battery Discharging	27/11/16 - 00:50:17 27/11/16 - 00:50:37	OFF	OFF	INI	READY	4
8.2	Mains Failure: Battery Low Level	27/11/16 - 00:50:12 27/11/16 - 00:50:37	OFF	OFF	INI	READY	0
8.1	Input Voltage Wrong: Rectifier Stop	27/11/16 - 00:50:12 27/11/16 - 00:50:37	OFF	OFF	INI	READY	4
8.0	Inverter Overload	26/11/16 - 09:54:11 26/11/16 - 09:54:13	WCCT	OFF	INI	BYPASS	0
7.9	Bypass Failure: Not Synchronised Inverter	22/11/16 - 13:52:16 22/11/16 - 13:52:22	OFF	OFF	INI	READY	0

Fig. 14. Data logger alarms.

These alarms have an identifier or "Id" displayed in the first column of the «Data logger» table. The second column displays the description of the triggered alarm and the third column displays the start and end dates of this alarm. The next columns show the status of the PFC, inverter, equipment in parallel and UPS, when the alarm was triggered. Finally, the column labelled as "Flag Code", it is an internal code of the equipment.

-  The «Backward» key will go back the end-user to the «Alarms» screen.
-  The «Down» key allows going to the next page, which will display the oldest alarms in the data logger.
-  The «Up» key allows going to the previous page, which will display the most recent alarms in the data logger.

4.3. STATUS AND CONTROL.





The «Status and Control» touch icon is located in the bottom area, in the third position of main menu.



When touching the graphic, the status of the different parts of the UPS are shown in the centre of the screen.

- UPS status.
- Battery test status.
- ECO-Mode status.

In the side bar of the same screen there are four graphics as a buttons, three of «Start/Stop» and one to set the «Battery Test properties». They are displayed in the following order:

-  Touch button to start up or shutdown the UPS.
-  Touch button to start the UPS battery test.
-  To get useful and operating information, see section 4.3.1.
-  Touch button used to put the UPS on Smart ECO-Mode (loads are supplied through the static bypass line directly, less in case of mains failure or out of limits).

When touching over any touch «Start/Stop» graphic, a dialogue "Pop up" window will be displayed, by asking the end user if the selection is the correct one (see Fig. 15).




Fig. 15. Pop up requesting confirmation.

4.3.1. Battery test features.



This touch button allows setting the battery test parameters. When entering into this menu, there are two blocks, «Automatic Test Class» and «Battery Test Programming: Date and Time».

-  The «Drop-down» list button allows, depending on the field, opening the menu and selecting one of the proposed variables or entering a value through the pop up keyboard, in order to change it. When touching one of the fields, a "Pop up" window will be displayed, which allows one of these two options.



4.4. NOMINAL VALUES.

The «Nominal values» touch icon is located in the bottom area, in the fourth position of main menu.



By means of this button the following nominal values of the UPS can be checked:

- Input voltage.
- Output voltage.
- Lower input voltage range.
- Upper input voltage range.
- Battery charging current.
- Output current.
- Bypass voltage.
- Lower bypass voltage range.
- Upper bypass voltage range.
- Inverter voltage.
- DC bus voltage.

-  The «Down» key allows going to the next page, of parameters, which will display more nominal values.
-  The «Up» key allows going to the previous page, of parameters, which will display more nominal values.

4.5. PLOTS.

The «Plots» touch icon is located in the bottom area, in the fifth position of main menu.



By means of this button as an icon mode, two different ways of data logger visualisation can be displayed (see Fig. 16 and 17), but in both cases, four parameters only.

The first mode allows displaying up to four measurements of the equipment temporarily (every 0.5s approximately) and independent among them, so the current status of the measurement and the previous instants are shown. The graphics are displayed as they were from an oscilloscope. Each one has one channel of different colour.

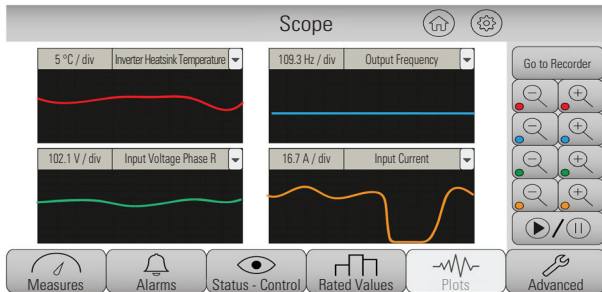


Fig. 16. Instantaneous plots screen.

In the side bar there are several buttons, which allows setting the visualization of the graphics. The first button is detailed in section 4.5.1. «Go to data logger».

1. The «Drop-down» list icon is located in the right side of each one of the parameters located in the headline of the graphics, it gives access to one of the measurements of the following list directly. Any of these parameters can be assigned to any graphic, allowing the end-user doing multiple configurations:
 - PFC heatsink temperature.
 - Inverter heatsink temperature.
 - Battery temperature.
 - Input voltage L1, L2 and L3 (R.M.S. value).
 - Output voltage RMS L1, L2 and L3 (R.M.S. value).
 - Input current L1, L2 and L3 (R.M.S. value).
 - Output current L1, L2 and L3 (R.M.S. value).
 - Battery charging current.
 - Battery discharging current.
 - Positive and negative battery voltage.
 - Positive and negative DC bus voltage.
 - Input and output frequency.
 - Bypass frequency.

By selecting one parameter only, it is started the record of the data in order to make the graph in the selected oscilloscope. Also, each graph, in any of the representative way «Instantaneous graphic» or «Data logger» will always be displayed in the same colour, but different to the other three. As it can be checked, the touch graphic «Zoom» is repeated in each graph and it is associated to one colour, two by two (increasing and decreasing).

1. The touch button «Zoom – red» allows the end-user increasing the scale unit/frame of the red colour graph, in order to decrease as regards to the screen.
2. The touch button «Zoom + red» allows the end-user decreasing the scale unit/frame of the red colour graph, in order to increase as regards to the screen.

3. The touch button «Zoom – blue» allows the end-user increasing the scale unit/frame of the blue colour graph, in order to decrease as regards to the screen.
4. The touch button «Zoom + blue» allows the end-user decreasing the scale unit/frame of the blue colour graph, in order to increase as regards to the screen.
5. The touch button «Zoom – green» allows the end-user increasing the scale unit/frame of the green colour graph, in order to decrease as regards to the screen.
6. The touch button «Zoom + green» allows the end-user decreasing the scale unit/frame of the green colour graph, in order to increase as regards to the screen.
7. The touch button «Zoom – yellow» allows the end-user increasing the scale unit/frame of the yellow colour graph, in order to decrease as regards to the screen.
8. The touch button «Zoom + yellow» allows the end-user decreasing the scale unit/frame of the yellow colour graph, in order to increase as regards to the screen.
9. The touch button «Play / Pause» allows the end-user to stop and resume the time effect in the signal.

REC In the main menu, this graphic can be displayed in the same touch button «Graphics». The acronym REC indicates to the end-user that the graph data logger is being recorded.

4.5.1. Go to Recorder.

This touch button in the side bar changes to data logger recording mode. It corresponds to the second graph mode, which allows defining the period of time that the end-user can record the data of up to four signals. The measurements of the same parameters can be set in the instantaneous graphic display, but for a longer period of time. In this mode there are two oscilloscopes, but both allow two channels and represented by different colours.

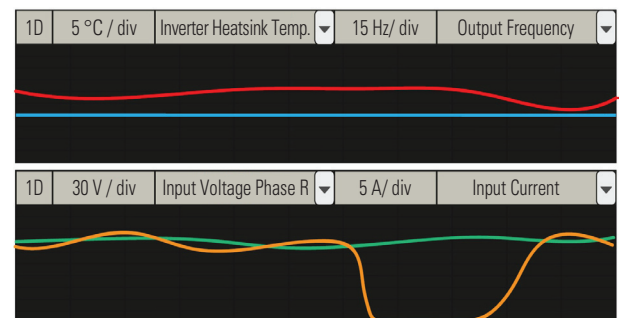





Fig. 17. Recorder screen.




In the side menu there are several touch buttons related with the data logger with the following functionality. Notice that the «Setting» button is described in section 4.5.1.1.

1.  This touch button of the sidebar allows going back to «Scope» mode.
2.  For the touch button functionality related with the zoom, see previous section 4.5.

4.5.1.1. Settings.

 It is used to set the recording time, to start and stop it.

In the side bar of this menu, the following touch buttons can be found:

1.  The «Backward» key, will go back the end-user to the «Graphic logger» screen.
2.  The «Record» key is used to start the recording.
3.  The «Stop» key is used to stop the recording and clear the data.


In the middle of the screen there are three boxes, the first is not editable and the next two can be set through the drop-down list.

- In the first box, it is displayed the status of the «Plot Recorder»:
 - Stand-By**. When it is not recording.
 - Recording**. When this action is in process.
- In the second and third boxes, the «Recording time» will be set, in a numerical way from 1 to 24 and selectable between hours and days respectively, so the time can vary between 1 hour and 24 days.

In case the recording limits of 1 hour and 24 days were exceeded, the keypad will not be hidden till cancelling it or entering a valid value inside the foreseen range.

If after ending a recording, programmed or manual, the touch button «Start recording» is touched again, the content data will be cleared and the data log will be started again.

Once a recording is stopped, it is still displayed in the screen till a new recording is started.

1.  The «Drop-down» list icon allows, depending on the field, opening the menu and selecting one of the proposed variables or entering/changing a value with the pop up keyboard. When touching over a field, a «Pop up» window will be shown, which allows one of these two options.

4.5.2. Advanced.

 The «Advanced» button is reserved for the Service and Technical Support technicians only.

To access, it is needed a «Password», which must be entered by means of the pop up keyboard displayed when pressing the «Enter» button of this menu.

This menu is very useful to set critical parameters of the UPS like initialization, offsets, settings and start up.

4.6. SCREEN SETTINGS.

To access to «Setting» menu of the touch screen is needed to press over any point of the screen 20 consecutive times, but the pressed area cannot be over any touch button.

Once this action is done, a blue screen will be shown, which will display the corners with a cross «+» where the end-user must press to set it.

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