



Liebert® Trinergy Cube Touch Screen

Installer/User Guide

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Technical Support Site

If you encounter any installation or operational issues with your product, check the pertinent section of this manual to see if the issue can be resolved by following outlined procedures.

Visit <https://www.vertiv.com/en-us/support/> for additional assistance.

TABLE OF CONTENTS

1 Introduction	1
1.1 Local Operator Console	1
1.2 Vertiv™ Liebert® Trinergy Cube Touch Screen Setup	2
1.2.1 Touch Screen Calibration	2
1.2.2 Language Selection	3
2 Local Touch Screen	5
2.1 Menu: Overview	6
2.1.1 Technical Symbols	7
2.1.2 Fault acknowledge	7
2.1.3 Inverter Control	8
2.1.4 Cabinet Icons	9
2.1.5 Dashboard Indicators	10
2.1.6 Ambient and Battery Temperature	11
2.1.7 Battery Capacity Status	12
2.1.8 System Load Gauge	12
2.1.9 Phase Load Balance	12
2.1.10 Alarm/Status Banner	12
2.1.11 Alarm/Status Banner Background Colors	13
2.2 Menu - Energy Log	13
2.3 Menu - Event Log	14
2.4 Menu - Settings	15
2.4.1 UPS Settings	16
2.4.2 Date and Time Configuration	19
2.4.3 Network Settings	24
2.5 Menu - About	27
3 Troubleshooting	29
4 Appendices	33
4.1 Network Resources Summary	33
4.2 SNMP Alarm Details	34
4.3 List of Touch Screen Information	35

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1 Introduction

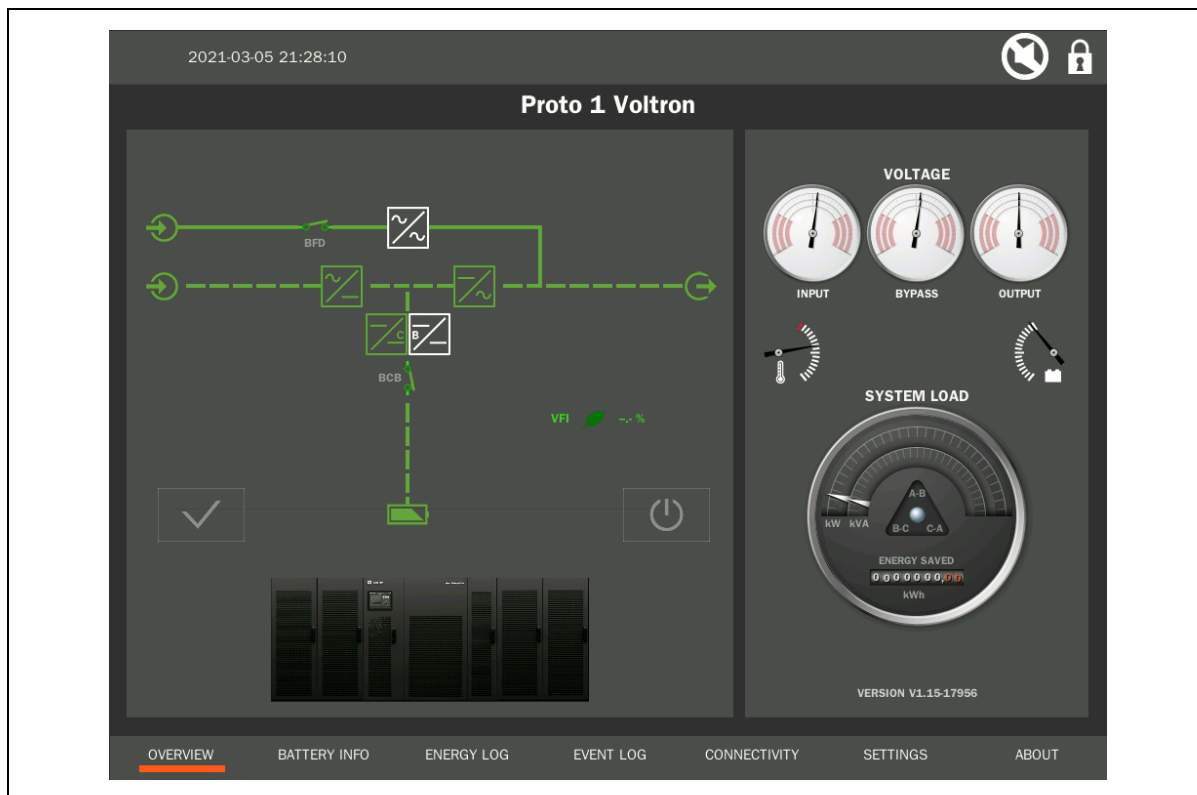
Vertiv™ Liebert® Trinegy Cube monitoring and control is realized with a Touch Screen. Major system values and conditions, power and environmental data, battery charge indicator, service history logs and more can be viewed via the Touch Screen. Navigation through the menus is managed by software-assigned buttons combined with graphical interfaces. Access to the Touch Screen menus especially the amendment of settings could be restricted using individual User Accounts and Passwords.

The Trinegy Cube Touch Screen is an industrial grade computer with integrated touch sensitive display. The host operating system is LINUX. The text displayed by the Touch Screen will be available in English and in several other languages, selectable by the user. During UPS operation, a screen saver might be activated. Touch the screen to awaken it. The main page of the user interface will be shown.

1.1 Local Operator Console

Besides the application software pre-installed on the Touch Screen computer that provides system aggregation and control functions on the local “operator” touch-sensitive display.

Figure 1.1 Local Operator Console



- View aggregated system status & power
- View “CORE” details
- View Event Log and Energy Log.
- Numeric keypad for passcode protected controls*:
 - Inverter engage/disengage
 - Acknowledge fault alarms

- Set threshold alarms:
 - Power Margin
 - Phase Load Imbalance
 - Redundancy
- LAN/WAN IP address setup
- Local time zone
- Set display language

* System controls are only enabled for local touch operation.

1.2 Vertiv™ Liebert® Trinergy Cube Touch Screen Setup

1.2.1 Touch Screen Calibration

After booting the Touch Screen it is possible – during a timeframe of 5 seconds – to enter the calibration procedure. During the booting process a Vertiv brand splash screen will be displayed. Follow the instructions on the screen as closely as possible by touching the crosses exactly where they appear with your finger or an appropriate pen.

Figure 1.2 Touch Screen - Calibration



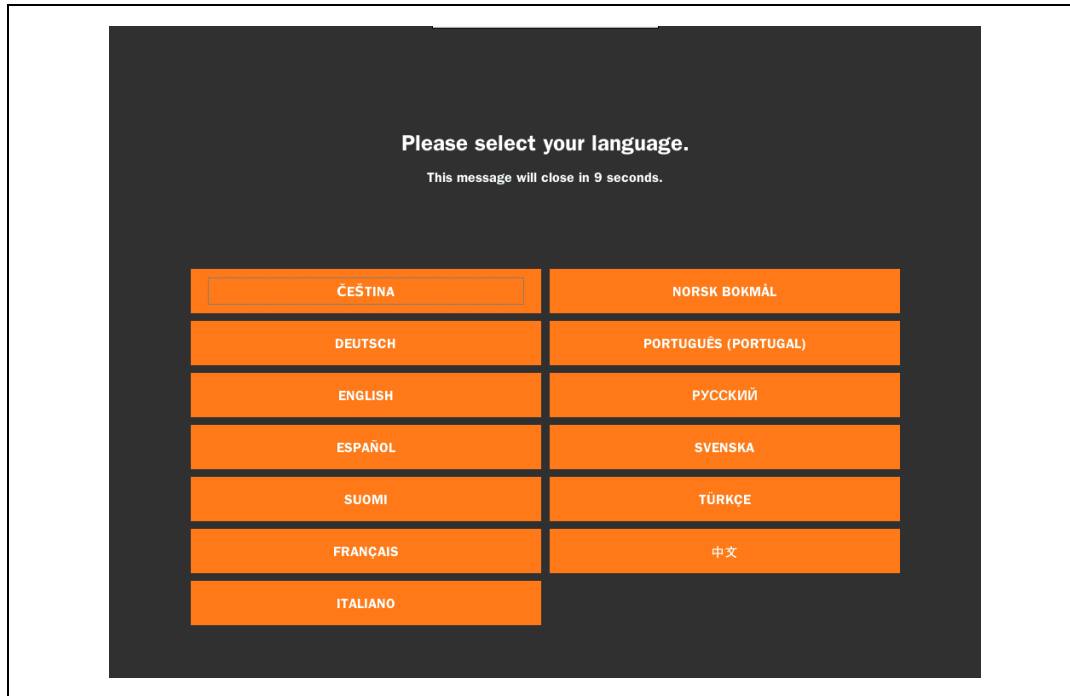
After the calibration is finished or the timeframe is expired, the graphical user interface will be started.

NOTE: During regular operation it is also possible to calibrate the Touch Screen anew. This can be achieved by pressing the screen for 30 seconds. The same procedure like mentioned above will be entered. However, at the end of the process the screen will return to the default page.

1.2.2 Language Selection

The Touch Screen language can be selected from the Settings page of the user interface. The language can also be changed using the WEB Browser Remote Access menu “Advanced Configuration”. For details **Figure 1.3** below. After entering the language selection screen, it is possible to select the preferred language within 5 seconds. If no language was selected before time out, the display will default to the last selected language.

Figure 1.3 Touch Screen - Language Selection



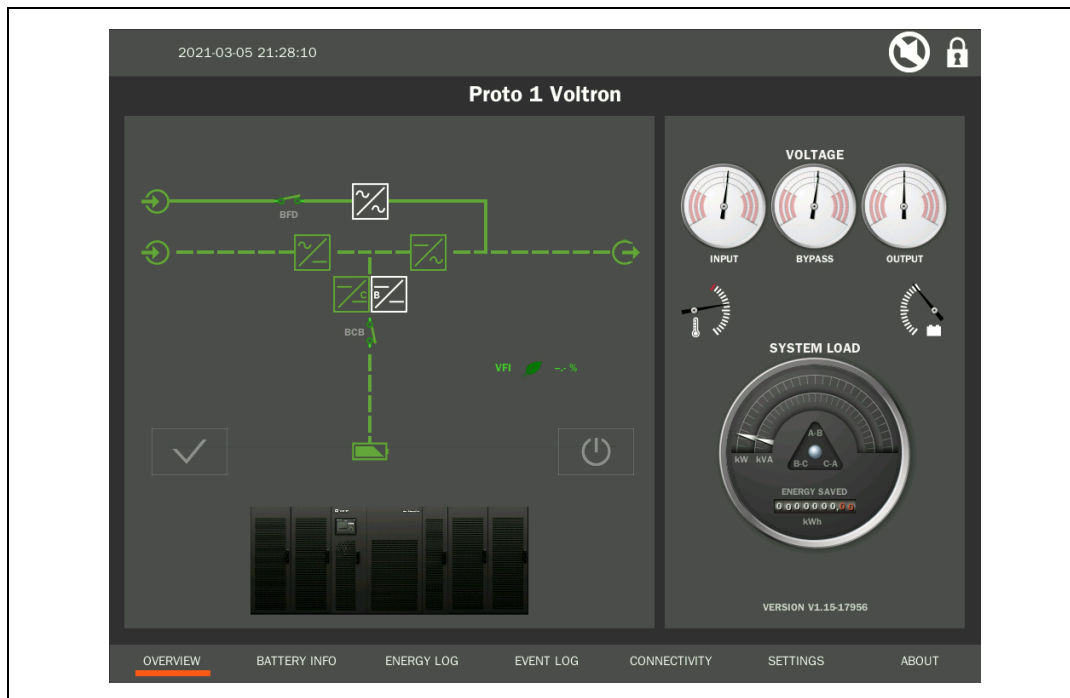
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2 Local Touch Screen

A single-line diagram of Vertiv™ Liebert® Trinergy Cube UPS (I/O Box and attached COREs) is displayed on the Touch Screen default page. The single-line diagram of each CORE can be viewed by entering the according subpage on the Touch Screen. The main functional blocks and power paths of the system or COREs are displayed using simple universal technical symbols, communicating the overall status of the UPS.

The default screen also displays the Trinergy Cube output load percentage incl. phase balance, the UPS input, bypass and output voltage as well as temperature and battery condition, using dashboard style indicators.

Figure 2.1 Touch Screen – Default Page

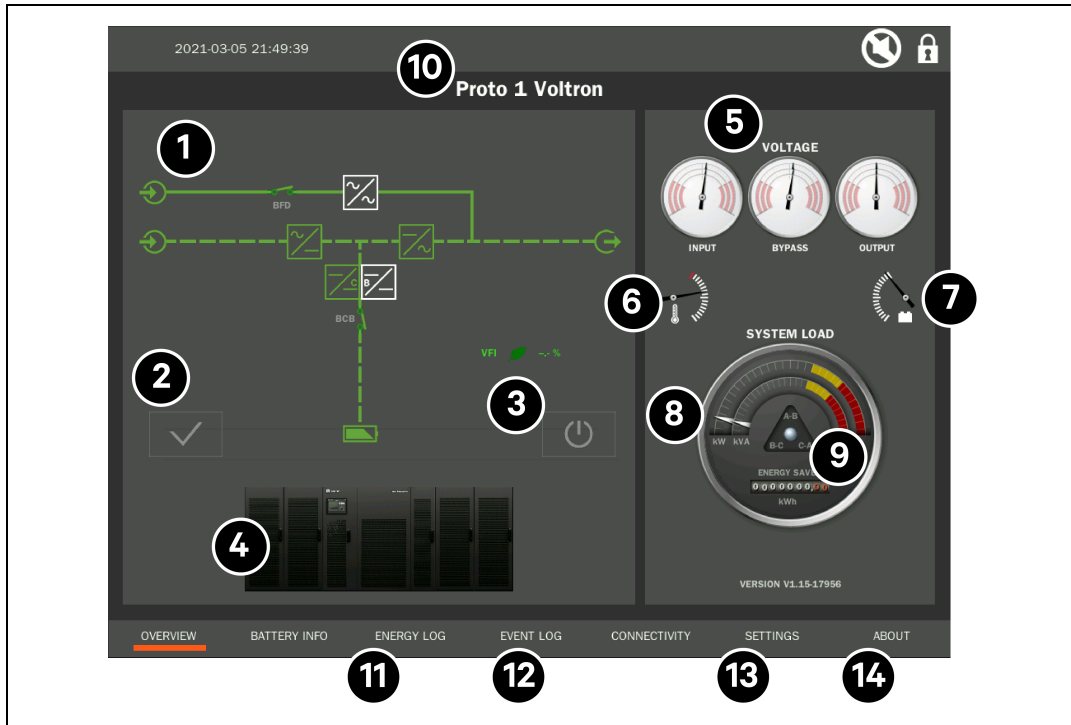


It is possible to access the “Status”, “Warning” and “Fault” summary page directly from the default page. Status, Warnings and Faults are identified by text strings and codes.

The Touch Screen will also provide the estimated backup time in minutes if the battery autonomy calculation is active and correctly configured.

2.1 Menu: Overview

Figure 2.2 Touch Screen – Default Page



Number	Description
1	Technical Symbols - see Technical Symbols on the facing page for more information.
2	Fault acknowledge - see Fault acknowledge on the facing page for more information.
3	Inverter Control - see Inverter Control on page 8 for more information.
4	Cabinet Icons - see Cabinet Icons on page 9 for more information.
5	Dashboard Indicators - see Dashboard Indicators on page 10 for more information.
6	Ambient and Battery Temperature - see Ambient and Battery Temperature on page 11 for more information.
7	Battery Capacity Status - see Battery Capacity Status on page 12 for more information.
8	System Load Gauge - see System Load Gauge on page 12 for more information.
9	Phase Load Balance - see Phase Load Balance on page 12 for more information.
10	Alarm/Status Banner - see Alarm/Status Banner on page 12 for more information.
11	Access to Energy Log - Shows selected measuring data.
12	Access to Event Log - Shows the different states and happenings in the past.
13	Access to Settings - e.g. system time.
14	Access to About Menu

2.1.1 Technical Symbols

Using simple universal technical symbols the animated block diagram of the system presents the active power path for the aggregated system;

Underneath the single-line diagram the present operating mode and the efficiency of the system are shown.

VFI  95,2 %

This component is measured by the control system within each CORE. The information is collected and aggregated by the I/O Box reporting it to the Touch Screen. Operating efficiency is a function of operating mode and load % on the system.

2.1.2 Fault acknowledge

This component is the Fault Acknowledge button. When any CORE or I/O Box in the system reports a severe (red) alarm, the alarm will remain “latched” on the Touch Screen until it is acknowledged by the human operator. If the alarm condition was a temporary problem, the display will return to “Normal” after the fault is acknowledged. If the fault is a persistent condition, the fault color and marquee message will remain.

When the button is pressed, the display will present the numeric key pad to identify/authenticate the person acknowledging the fault condition and a prompt to verify the User Action. When the Proceed button is pressed, the User Action will be logged in the Event Log of the display.

Figure 2.3 Key Pad

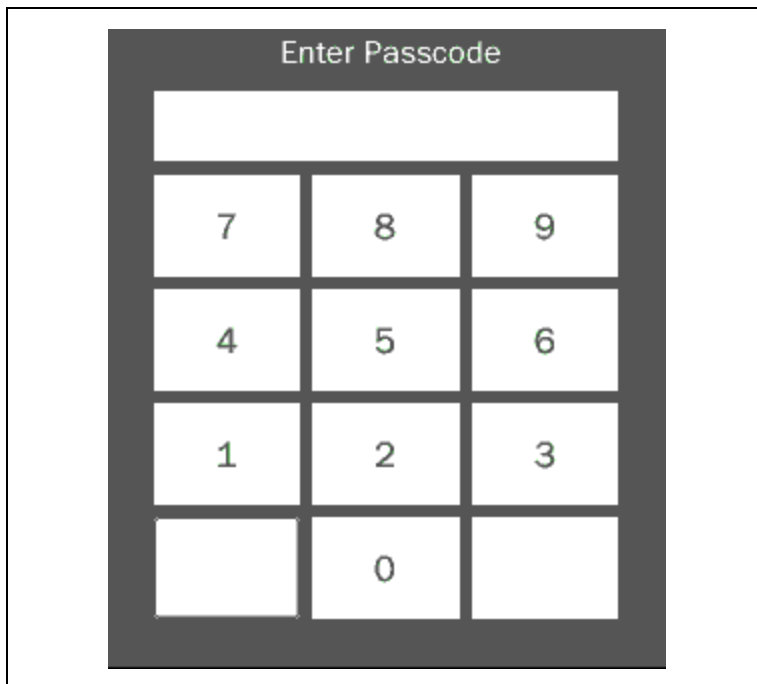
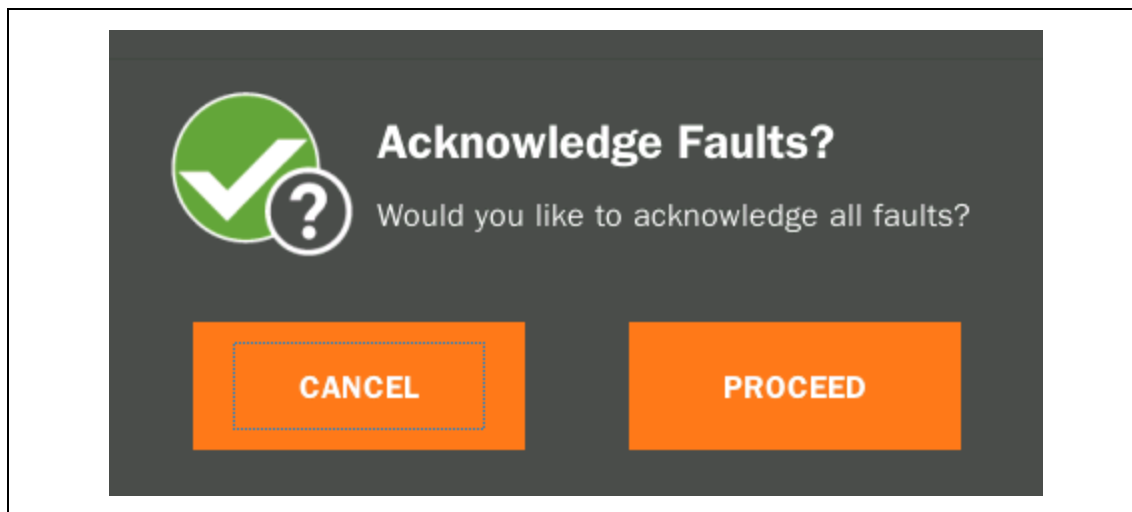


Figure 2.4 Acknowledge Faults



2.1.3 Inverter Control

To enable or disable the inverter (i.e. put the system on bypass), press the button, enter the numeric passcode and respond to the prompt to confirm;

The inverter control action will be logged in the Event Log of the Touch Screen.

Figure 2.5 Key Pad

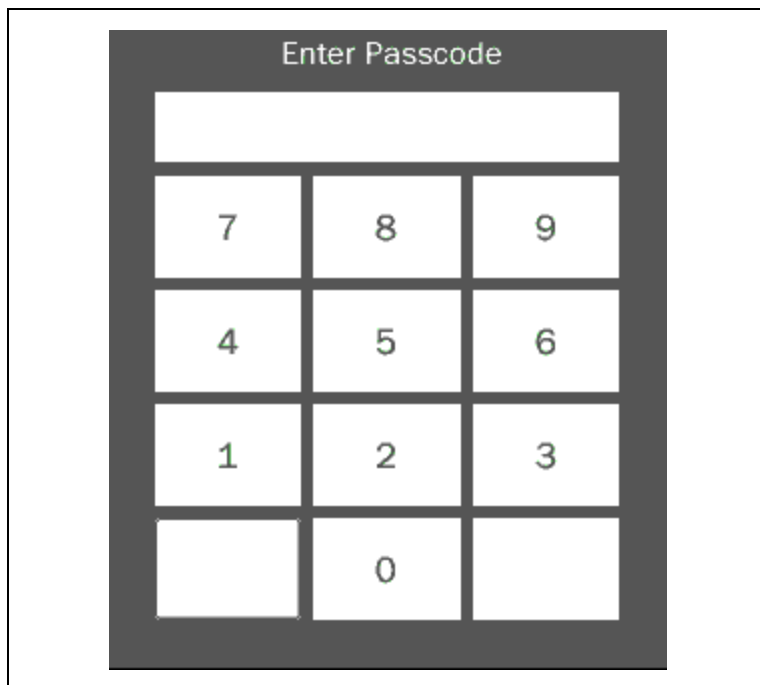
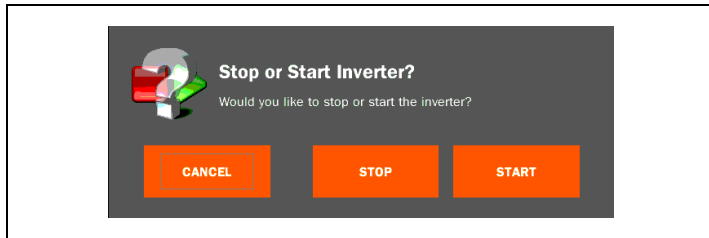


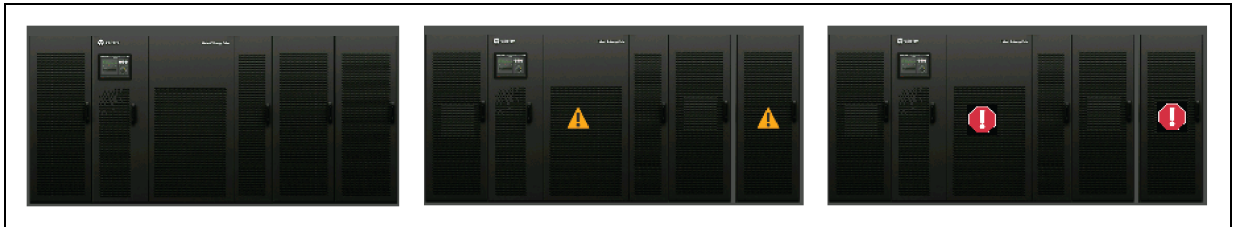
Figure 2.6 Stop or Start Inverter



2.1.4 Cabinet Icons

Shows the highest severity of alarms present on specific CORE or I/O Box.

Figure 2.7 Cabinet Icons



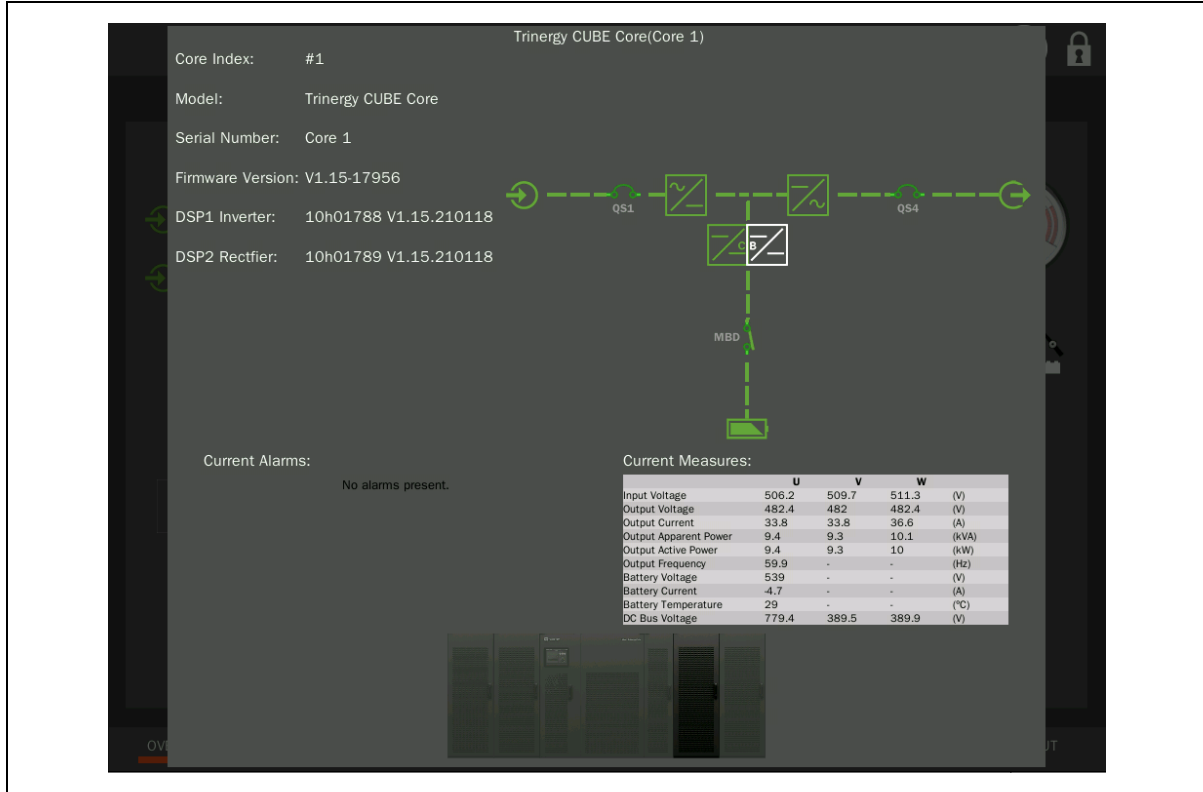
IMPORTANT! Alarms might not appear on all COREs, as the each CORE is generating its individual messages. These messages are combined within the Liebert Trinergy Cube Touch Screen.

For further details about this topic please see point 10.

By touching a CORE-graphic, an according subpage is accessed with identity information, animated block diagram and the last 10 CORE-individual messages.

On the subpage touch another CORE on the faded part of the system icon(s) to switch the detail view to that CORE;

Figure 2.8 CORE Details



By tapping on one of the symbols within the above shown single-line diagram additional fields open containing more information about rectifier, bypass, inverter or battery of that individual CORE.

Figure 2.9 Details – Rectifier Values

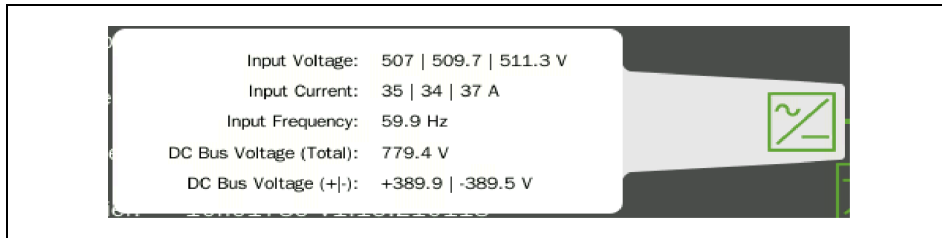
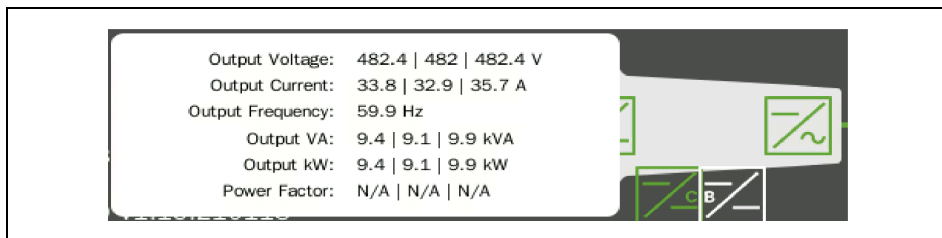


Figure 2.10 Details – Inverter Values



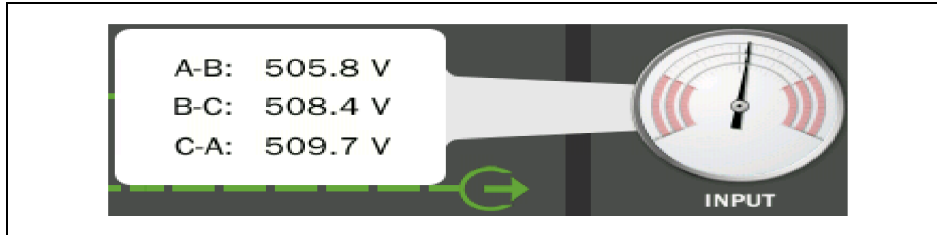
2.1.5 Dashboard Indicators

The dashboard indicators show the input, the bypass and the output voltage as well as the phase balance.

Each of the three needle tips per gauge represent a phase.

Touch the gauge to view the specific data points associated with a gauge. Touch anywhere outside the data pop-up to hide the data display.

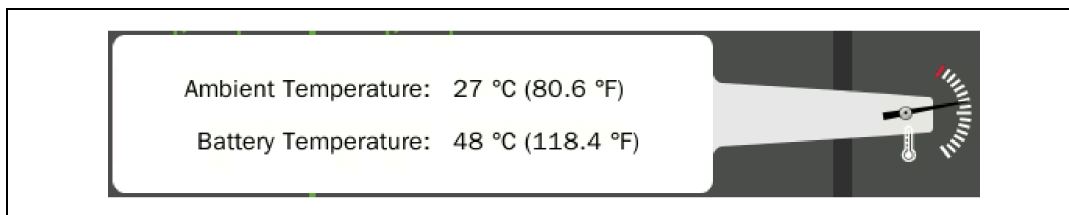
Figure 2.11 Input Gauge Details



2.1.6 Ambient and Battery Temperature

Ambient and battery temperature. Touching the icon will reveal both temperatures.

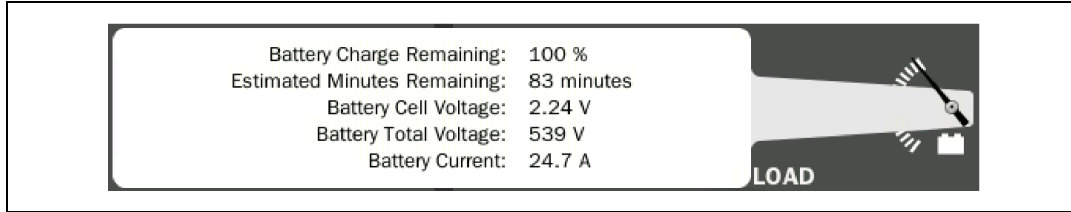
Figure 2.12 Ambient and Battery Temperature



2.1.7 Battery Capacity Status

This icon provides details about remaining battery charge, estimated back-up time, battery cell voltage, battery string voltage and battery current.

Figure 2.13 Battery Capacity Status



NOTE: Under certain Liebert Trinergy Cube working conditions the autonomy calculation might not be precise.

2.1.8 System Load Gauge

Shows the relation between system kW and kVA and the system overall working load.

The red and yellow scale represents the user settable thresholds (Settings area) for Power Margin (yellow) and Redundancy (red). see Figure 2.21 on page 17 UPS Settings for further details.

2.1.9 Phase Load Balance

The moving bubble within the triangle shows the balance between the phases.

A threshold value for Phase Load Imbalance Threshold alarm can be defined in the Settings area.

2.1.10 Alarm/Status Banner

The banner at the top of the screen presents active alarm messages from the system (if any).

All alarm messages will also be logged in the on-board Event Log file with time stamps ("Alarm Started" and "Alarm Cleared") and underlying detailed alarm code for service diagnosis.

Alarms may indicate a user-defined threshold, a system state or a service alert.

Figure 2.14 Severe alarms are color coded red



Figure 2.15 Warning level alarms are color coded yellow



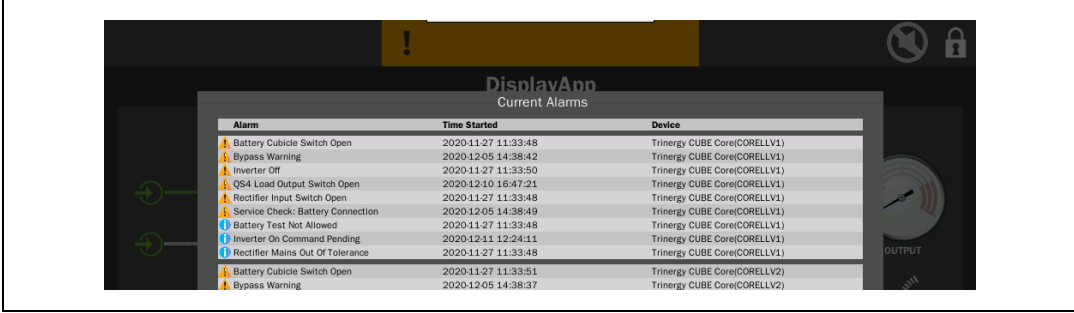
Figure 2.16 Informational level alarms are color coded blue



If multiple alarms exist, the background color of the banner at the top of the screen will reflect the color code of the most severe alarm condition and the individual message will be presented in continuous rotation until the status returns to normal.

Touch anywhere in the Alarm/Status Banner to open a list of all current alarms that also shows the start time and source of the alarm.

Figure 2.17 Current Alarms Listing



Alarm	Time Started	Device
⚠ Battery Cubicle Switch Open	2020-11-27 11:33:48	Trinergy CUBE Core(CORELLV1)
⚠ Bypass Warning	2020-12-05 14:38:42	Trinergy CUBE Core(CORELLV1)
⚠ Inverter Off	2020-11-27 11:33:50	Trinergy CUBE Core(CORELLV1)
⚠ QS4 Load Output Switch Open	2020-12-10 16:47:21	Trinergy CUBE Core(CORELLV1)
⚠ Rectifier Input Switch Open	2020-11-27 11:33:48	Trinergy CUBE Core(CORELLV1)
⚠ Service Check: Battery Connection	2020-12-05 14:38:49	Trinergy CUBE Core(CORELLV1)
ⓘ Battery Test Not Allowed	2020-11-27 11:33:48	Trinergy CUBE Core(CORELLV1)
ⓘ Inverter On Command Pending	2020-12-11 12:24:11	Trinergy CUBE Core(CORELLV1)
ⓘ Rectifier Mains Out Of Tolerance	2020-11-27 11:33:48	Trinergy CUBE Core(CORELLV1)
⚠ Battery Cubicle Switch Open	2020-11-27 11:33:51	Trinergy CUBE Core(CORELLV2)
⚠ Bypass Warning	2020-12-05 14:38:37	Trinergy CUBE Core(CORELLV2)

Messages are grouped together if they are provided by more than one CORE.

E.g. In case of message "Battery Recharging In Progress (2)", the "(2)" means that two COREs have this message;

It must be noted that different COREs may have different alarm messages.

E.g. During battery charging it might be possible by reaching the end-of-charge voltage, that some COREs already stopped charging due to slight differences in measurement and therefore reaching the stop-charging threshold earlier than others. This effect could be even more visible in case of separate batteries.

2.1.11 Alarm/Status Banner Background Colors

The Alarm/Status Banner at the top of the screen indicates the current state of the UPS. If the banner is not shown the system is in normal operation: no warnings or faults are present.

If the banner is YELLOW the system is in warning condition: a condition is present, which could affect the nominal functioning of the UPS; in general these conditions may not originate from the UPS, but could be caused either by the surrounding environment or by the electrical installation (mains side and load side).

If the banner is RED the system is in fault condition: immediate attention should be paid to the severity of the alarm and service should be done promptly.

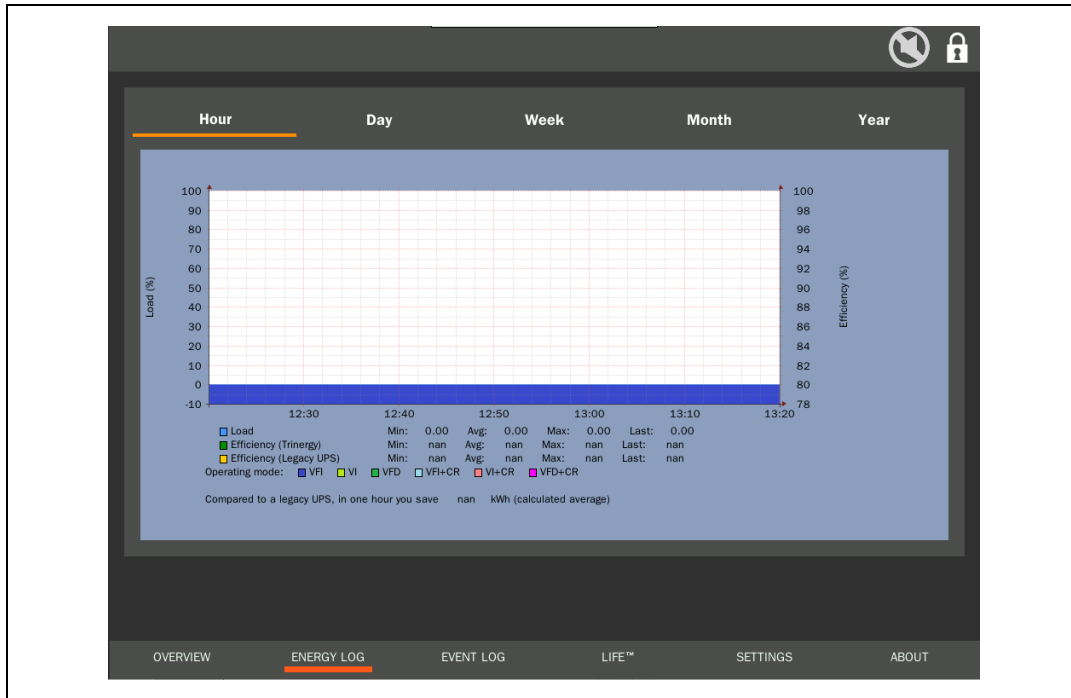
2.2 Menu - Energy Log

The Energy Log viewer presents each of the key system operating parameters charted for easy viewing. Reference lines are provided in the chart for easy comparison of the actual data vs. nominal, expected or relevant threshold values.

Provided UPS parameters are:

- Output currents
- Input and output voltage vs. nominal voltage
- Input and output frequency vs. nominal frequency
- Ambient temperature
- System Load %
- System Battery %

Figure 2.18 Touch Screen – Energy Log



2.3 Menu - Event Log

The Event Log viewer presents a chronology of alarm activity and other events recorded by the Touch Screen. Events in the log include the starting and clearing of alarm conditions from the system as well as User Actions and Touch Screen system events such as firmware update, startup after power down etc.

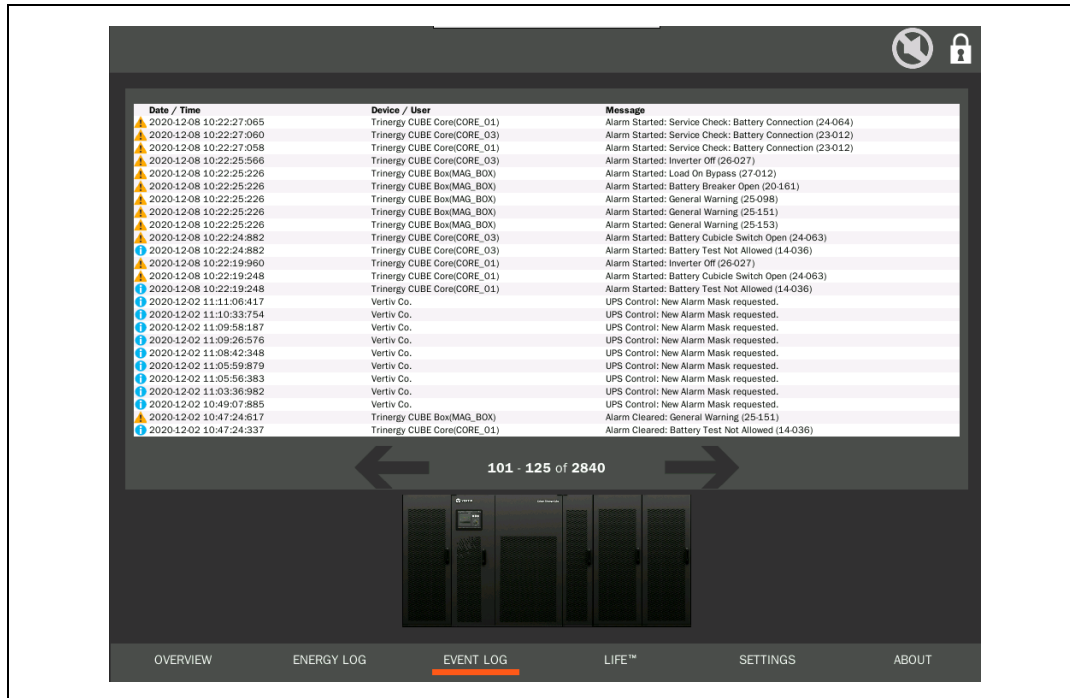
The Touch Screen provides a memory capacity of more than 1 GB. Almost the entire memory is available for logging events. No specific maximum amount of events is defined as the storage capacity depends on the length of the event description and on the number of incidences. Taking an average message length as a basis it is possible to save more than 1 million events.

The name of a user associated with a specific passcode entered to authorize control or configuration changes will be recorded (i.e. Administrator in the below sample list). Alarm messages are a record of any alarms presented on the Alarm/Status Marquee. Note the numeric code (27 012) included at the end of each alarm event message entry. These codes are deep level diagnostics that an authorized Service representative can use to analyze the likely cause of the alarm condition. Events are presented with a date/time stamp that reflects “local” time zone configured in the Touch Screen See **Figure 2.20** on page 16 Settings. Most recent events will be at the top of the list. Use the arrows below the chart to scroll up and down through the list.

Use the arrows below the chart to scroll up and down through the list.

The Event Log can be downloaded in CSV format from the WEB Browser Remote Access interface of the Touch Screen.

Figure 2.19 Touch Screen – Event Log



NOTE: The messages are saved into the Event Log in the language which was set on the Touch Screen when the event happens. Changing the Touch Screen language to another one, does not translate the messages to that newly set language. New messages will now be saved with the new set language.

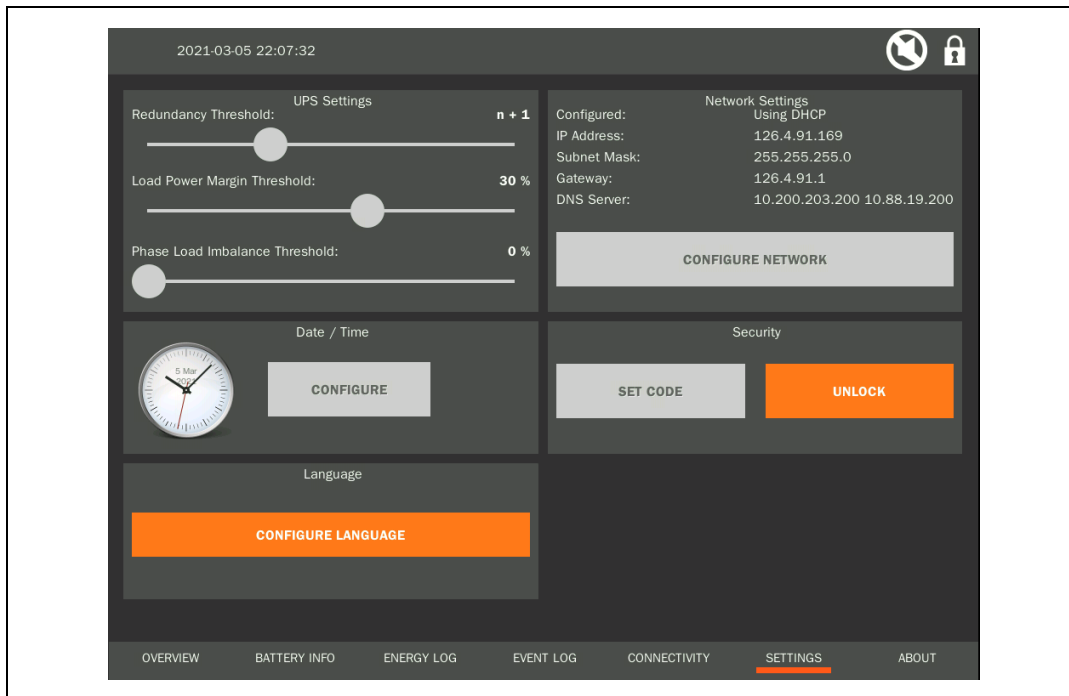
2.4 Menu - Settings

With the Settings menu (passcode required) a list of parameters can be set via the different sections visible on the figure below:

- Load Power Margin Threshold
- Phase Load Imbalance Threshold
- Date & Time
- Network Settings (IP address)
- Security (new/change password)
- Language

Thresholds for Redundancy, Load Power Margin and Phase Load Imbalance Alarms should be reviewed by the UPS Operator and Facilities Team and set to meet site-specific practices and interests.

Figure 2.20 Touch Screen – Settings



2.4.1 UPS Settings

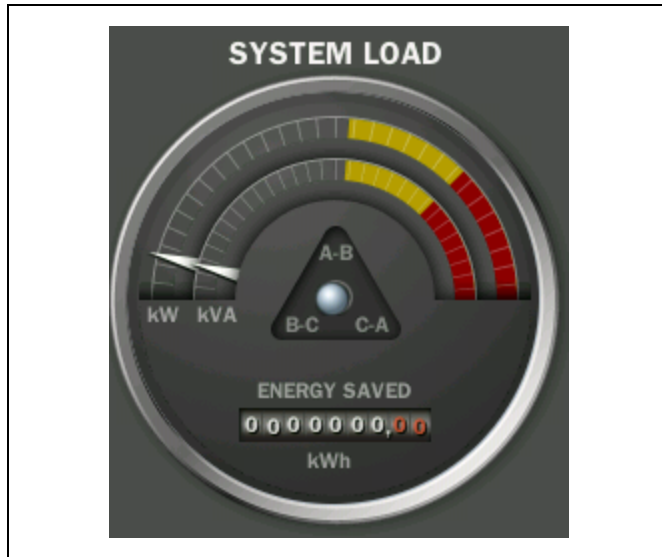
The following thresholds can be set with UPS Settings:

1. Redundancy Threshold
2. Load Power Margin Threshold
3. Phase Load Imbalance Threshold

Points A and B are visualized within the Overview Page section System load again.

The scale of the gauge is divided into several sections:

- Grey section
- Yellow section
- Red section and a
- Black section

Figure 2.21 System Load Gauge

Each of the sections does have its own individual meaning. Apart from the gray section, the other sections depend on threshold settings.

The Redundancy Threshold represented by the RED area, visualizes how many COREs are redundant. The total (physical) capacity of the system is reduced to the designed (redundant) capacity.

E.g. for an 800kVA system (four COREs), the setting $n+2$ equals $50\%=400\text{kVA}$ of the total capacity see **Figure 2.21** (above - red + black section) as two of the four COREs are redundant.

A BLACK area is present if e.g. due to open output switch, CORE(s) are physically not available to support the load with energy.

By entering the Load Power Margin Threshold represented by the YELLOW area, a power margin pre-warning threshold is set to inform the customer via the Touch Screen that the workload is getting close to the full designed system capacity.

The set percentage is based on the designed system capacity.

The triangle below the scale shows the actual load imbalance between the single phases.

The Phase Load Imbalance Threshold is setting a permitted difference between the loads of the single phases. If this permitted difference is exceeded an information message Phase Load Imbalance (18-024) is issued to inform the customer.

E.g. if the threshold is set to 75% and the phases have 2%, 80% and 4% load, than the difference between the phases is larger than 75%. A message is issued.

Security

The Touch Screen will lock itself after a few seconds of non-use. The default code is "0000".

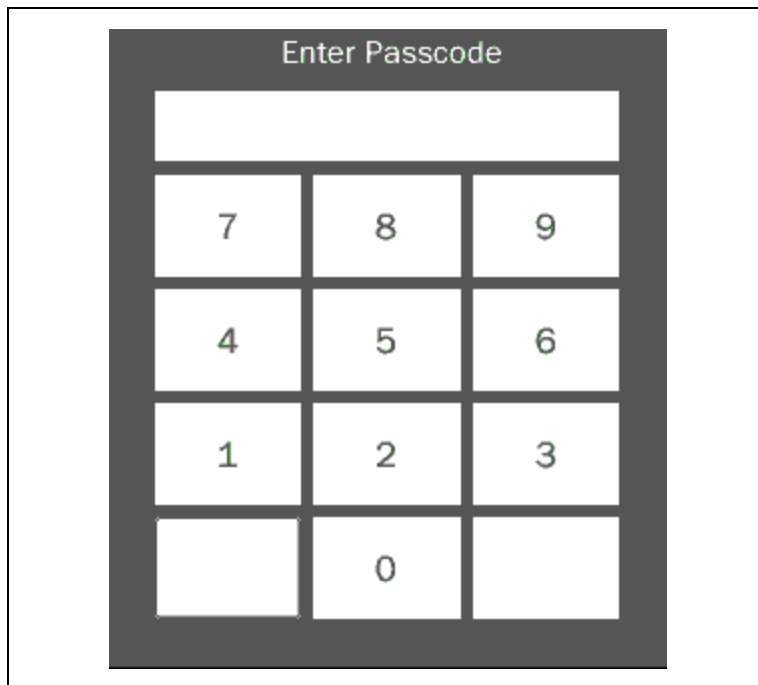
1. To change the code this section can be used. Press the "Unlock" button.

Figure 2.22 Touch Screen - Security Settings

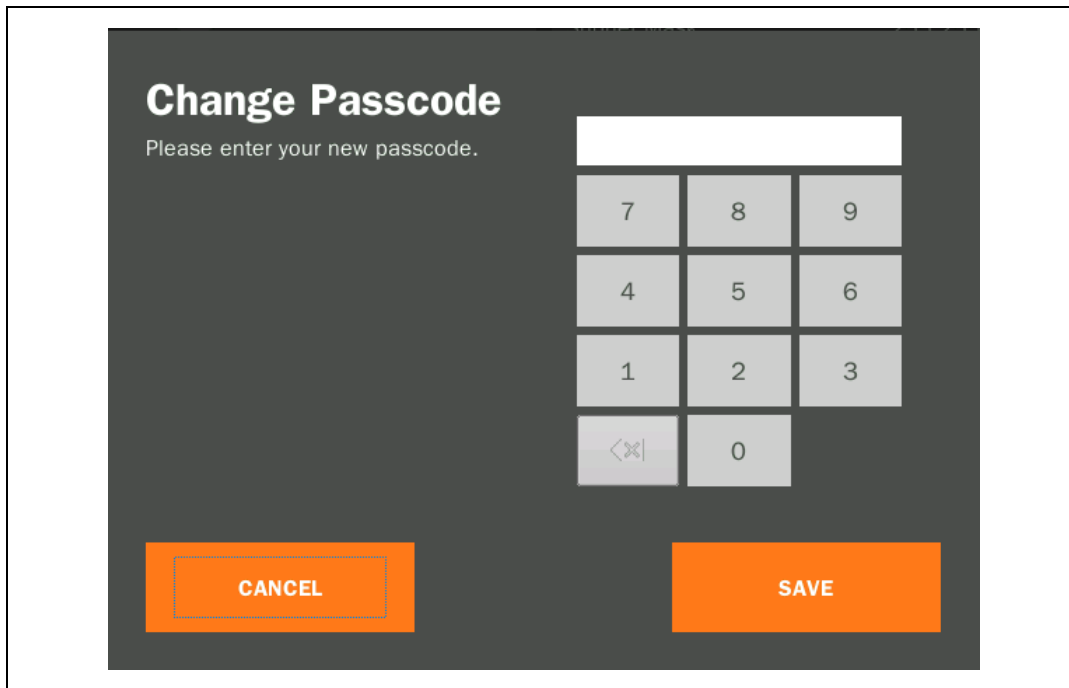


2. Enter your Passcode and acknowledge with the confirmation-button (✓).

Figure 2.23 Touch Screen - Security Settings - Passcode



3. Enter a new Passcode. You will see the entered numbers.
4. Confirm the new Passcode by pressing the "Save" button.

Figure 2.24 Touch Screen – Security Settings

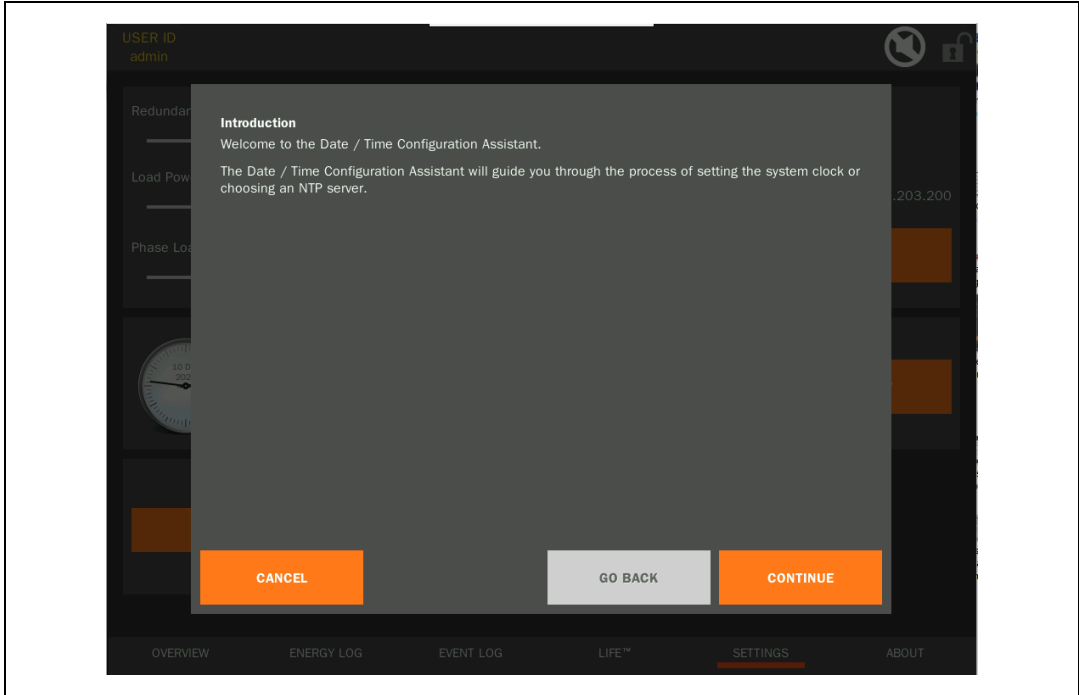
You will return to the Settings page automatically and for a short duration you will see the word "Saved" inside the "Set Code" button within section Security.

2.4.2 Date and Time Configuration

UPS Date & Time is normally set by the UPS Service engineer at time of commissioning. Time settings can be reviewed and changed via the Touch Screen for network vs. manual synchronization and local time zone.

The Touch Screen must be unlocked to enter the Date & Time Configuration Assistant.

Figure 2.25 Touch Screen – Date & Time Configuration 1

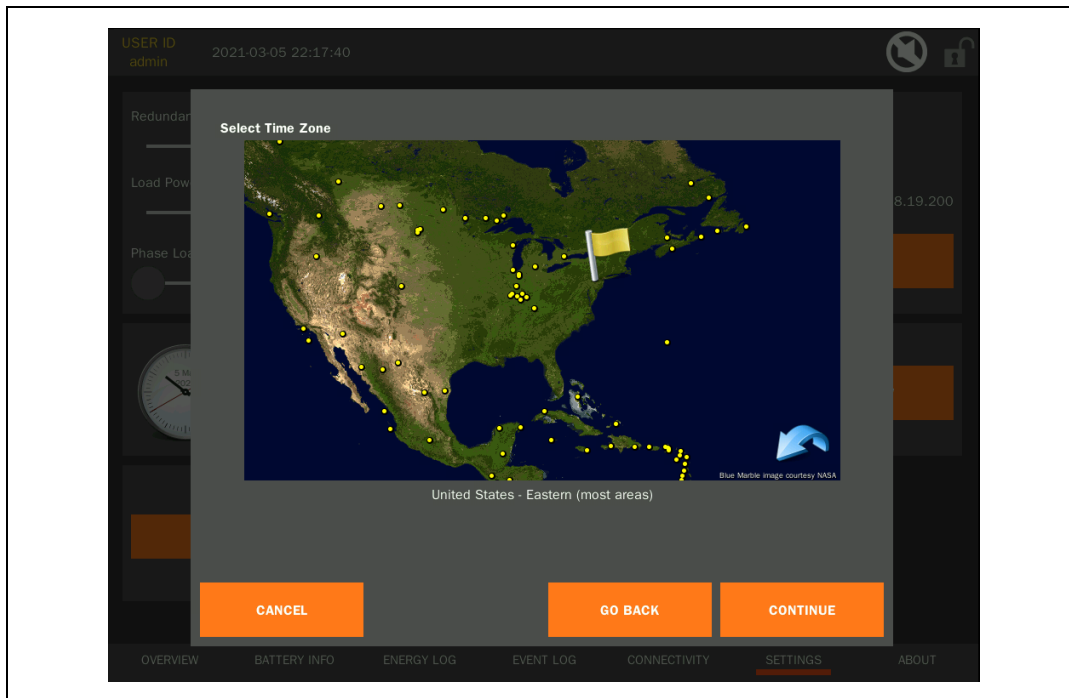


The configuration assistant presents the options of setting the time manually through the local Touch Screen interface – or automatically via an NTP server on the premises network.

NOTE: The Touch Screen computer is also an NTP Server for the computers running within in each CORE and I/O Box of one Vertiv™ Liebert® Trinerigy Cube UPS. This allows all clocks in the system to be synchronized to the Touch Screen and to your overall network time standard if the Touch Screen is attached to your network and configured to use the NTP option.

After pressing “Continue” a time zone must be select on the following screen. This can be achieved by touching a continent and selecting the according country on the detail page. (The yellow dots represent the possibilities.) Use your finger tip to move the map within the view window.

Figure 2.26 Touch Screen – Date & Time Configuration 2

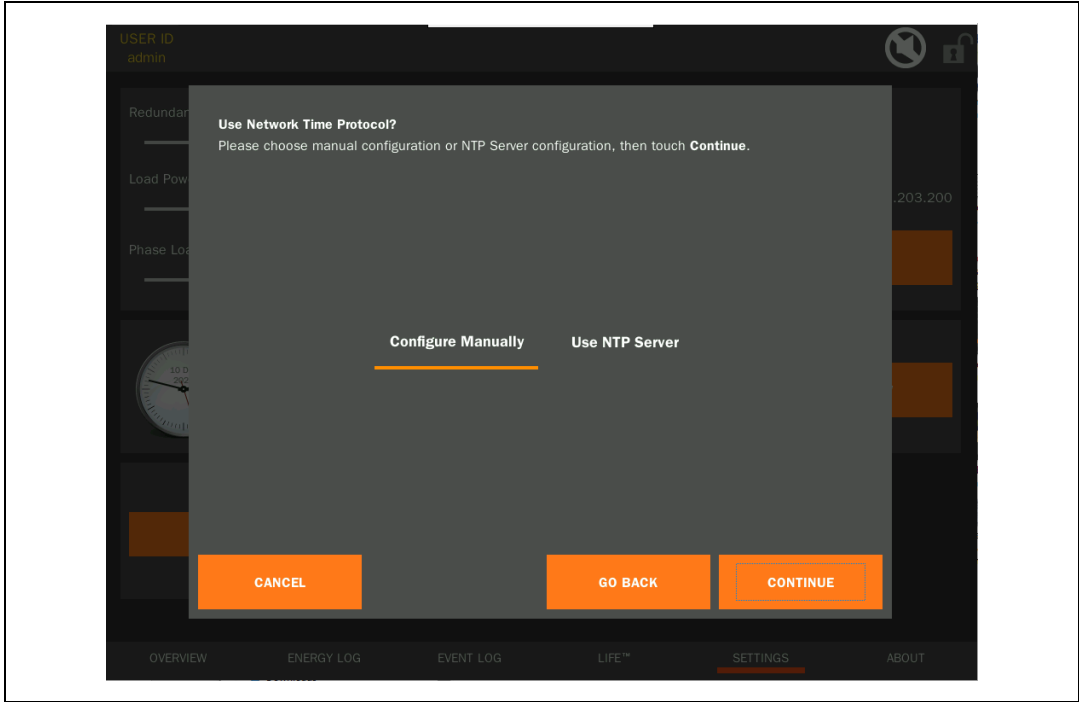


The time zone setting determines how the Touch Screen presents time information when viewing the Data Log and Event Log entries that are stored in the Touch Screen.

- Event and Data timestamps are stored and exported in log files (CSV) in UTC time.
- Event and Data timestamps are presented in the Touch Screen in Local time.

On the next screen it must be decided, if the clock will be set manually or if a NTP Server (Network Time Protocol) will be used. To use a NTP Server the Touch Screen must be connected to a customer premises network (according RJ45 interface).

Figure 2.27 Touch Screen – Date & Time Configuration 3



For the manual configuration enter date and time:

Figure 2.28 Touch Screen – Date & Time Configuration 4



After pressing "Continue" another screen will show a summary of the settings. They must be confirmed by pressing "Finish".

If NTP Server configuration was selected, this screen will ask for the IP address of the server:

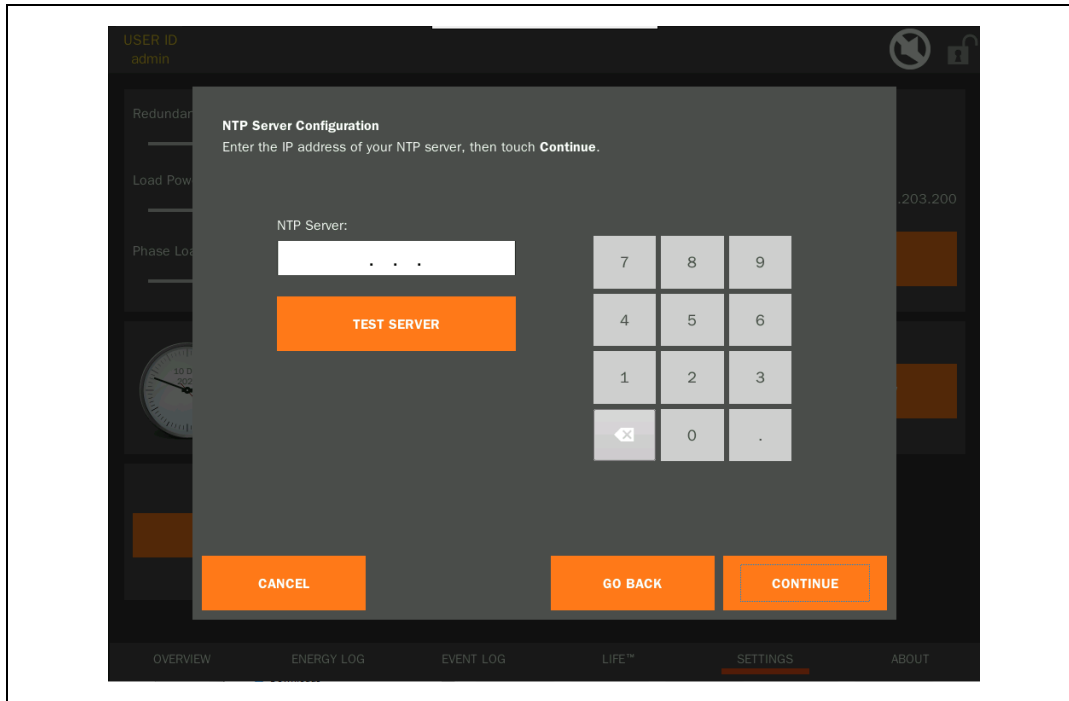
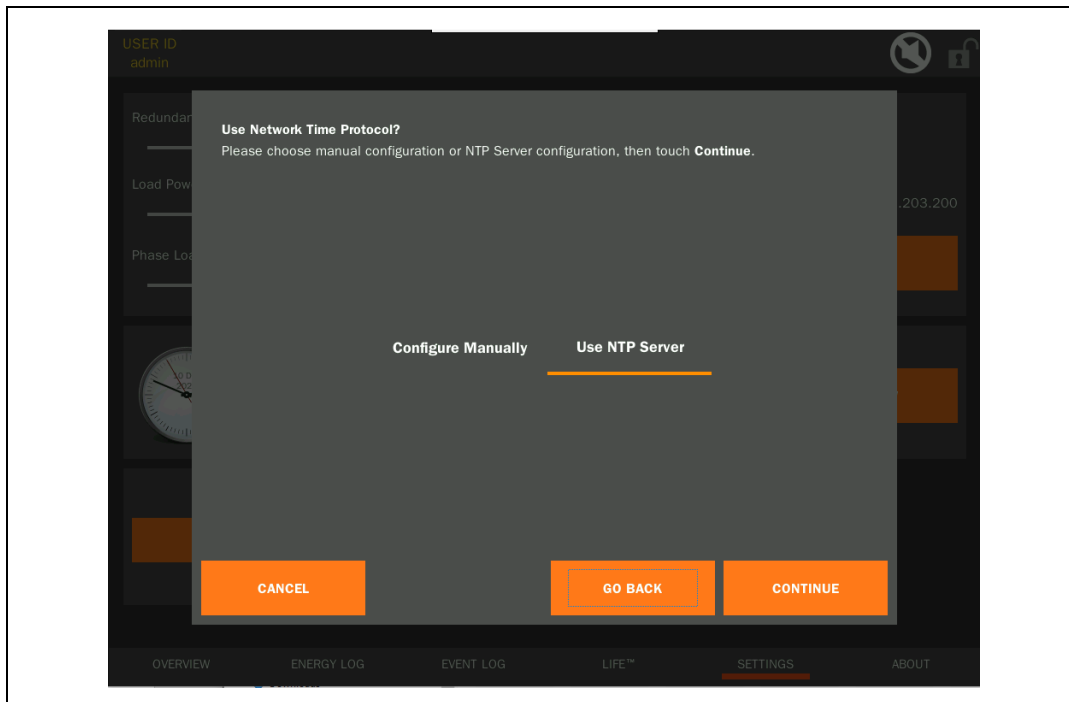


Figure 2.29 Touch Screen – Date & Time Configuration 5



Connection to the server can be tested by pressing the “Test Server” button.

After pressing “Continue” also a summary will be shown, the setting process must be finished by pressing the according button.

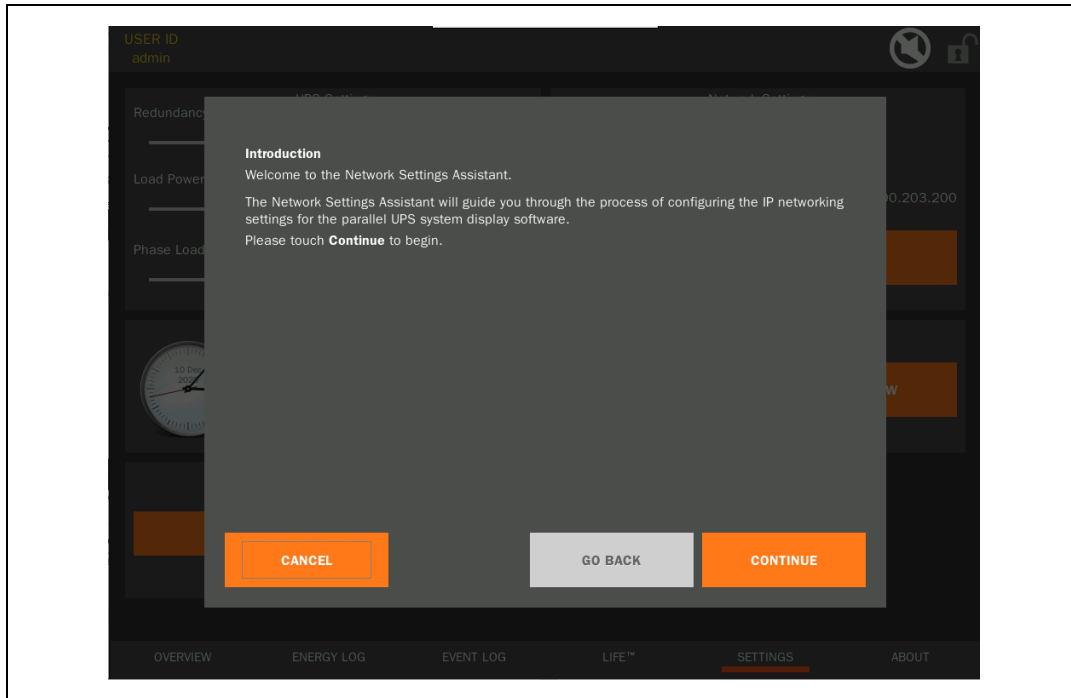
2.4.3 Network Settings

Network Settings define the IP address settings for the Touch Screen to use when connected to the customer premises network.

The default configuration will accept network settings automatically from a DHCP Server. If the address will be assigned manually, enter your passcode to enable the network configuration dialog. Have all of the Network Settings defined for you by the administrator of the premise LAN.

NOTE: The entered passcode must belong to a User Account permitted to change Network Settings; See Figure 2.30 below The Touch Screen must be unlocked to enter the Network Settings Assistant.

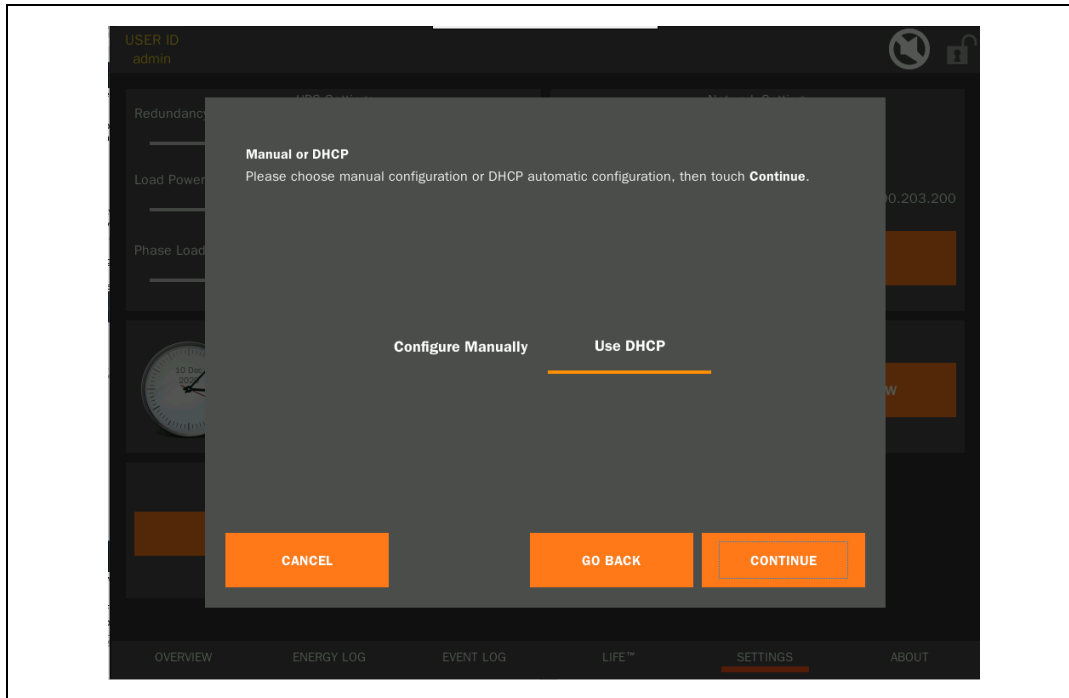
Figure 2.30 Touch Screen – Network Configuration 1



On the next screen it must be decided, if the network will be configured manually or if a DHCP Server will be used.

To use a DHCP Server the Touch Screen must be connected to a UPS external network (customer premises network) using the according RJ45 interface on the Touch Screen.

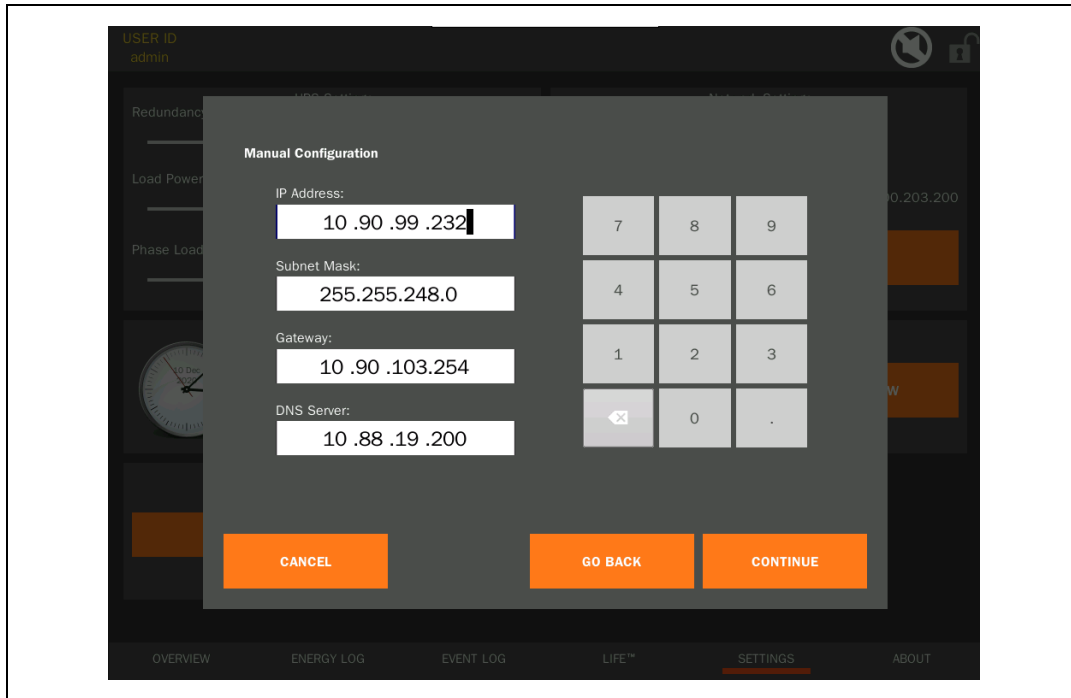
Figure 2.31 Touch Screen – Network Configuration 2



For the manual configuration enter via numeric touchpad the network parameters provided by the administrator of the premises LAN:

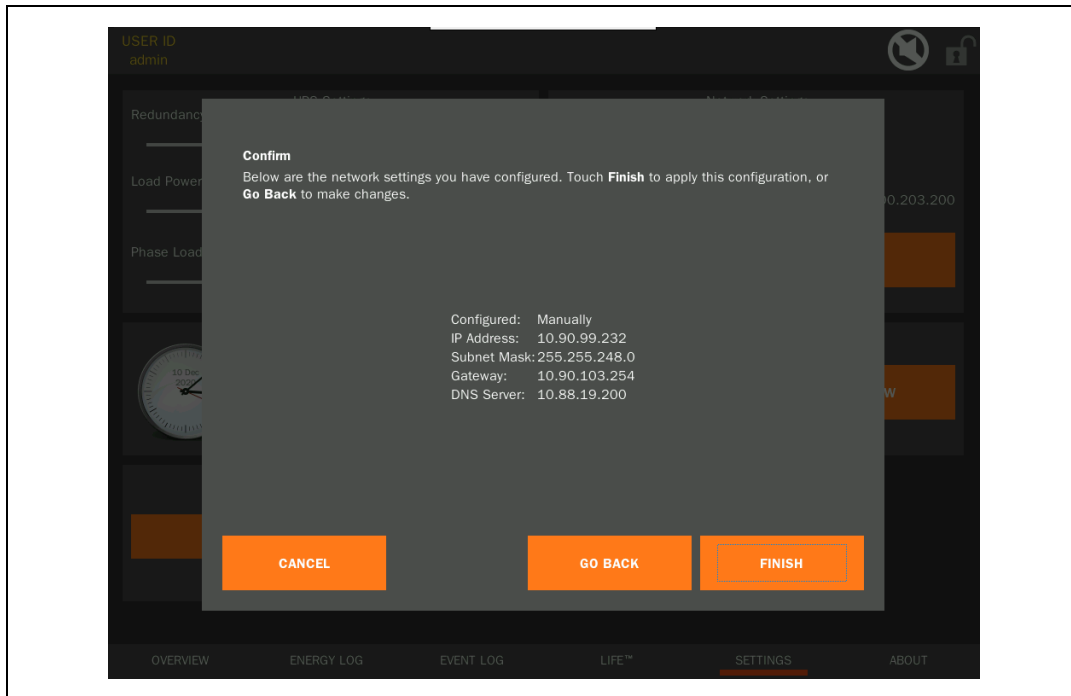
- IP Address
- Subnet Mask
- Gateway
- DNS Server

Figure 2.32 Touch Screen – Network Configuration 3



After pressing “Continue” another screen will show a summary of the settings. These must be confirmed to finalize the activation of the IP settings by pressing “Finish”.

Figure 2.33 Touch Screen – Network Configuration 4



If UDHCP Server configuration was selected, the setting screen is skipped and a summary page (like above) will be shown immediately. Also here a confirmation must be done to finalize activation of the IP settings by pressing the according button.

2.5 Menu - About

The About menu will show the current firmware version, some other information and credits.

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3 Troubleshooting

Generally alarm messages or Event Log entries should provide a good explanation of the actual situation. Supplementary some additional notes can be found in the enclosed listing.

Rectification of Errors

Despite the high reliability of this device, problem may occur. If you are having an abnormal situations please check the following points before contacting your customer service representative:


- Is there mains power on the UPS input?
- Are there input fuses blown or have circuit breakers tripped?

If you contact your customer service representative, please have the following information ready:

- Device information = model, order no., series no. as per identification plate.
- An exact description of the problem (what loads are being powered, whether the problem occurs regularly or sporadically, etc.)

Problem	Possible cause(s)	Action
Touch Screen is dark; No acoustic signals; (UPS seems not to be working)	I/O Box and/or all CORE mains switches turned off	Contact your service representative for commissioning the UPS
	No mains voltage present	Have mains inspected by qualified electrician; Wait till mains returned Consider external mains separation switches;
	Input fuse(s) defective.	Contact your service representative for replacing the defective fuses
Touch Screen is completely black or turned completely black. (UPS seems to be working)	Power supply of the Touch Screen is missing or defective.	Verify if the power plug of the Touch Screen inside the I/O Box door is connected. Contact your service representative for checking additionally the UPS internal power connections of the Touch Screen.
	Touch Screen defective.	Contact your service representative for replacing the Touch Screen.
Touch Screen is yellow; Line power not available and buzzer sounds at regular intervals.	No mains voltage present.	UPS is in battery mode; (Normal mode) Wait till mains returns; Check mains input.
Touch Screen is yellow and mains voltage present; Buzzer sounds at regular intervals.	Input fuse(s) defective.	Contact your service representative for replacing the input fuses.
Touch Screen is red; Buzzer sounds continuously.	UPS error	Contact your service representative.
	Overheating	Reduce ambient temperature.
Touch Screen is not reacting to (finger) touch.	Touch Screen "touch" calibration might not be done at all or not done correctly.	Press the Touch Screen for 30 seconds to enter the calibration menu; follow the instructions on screen;
Touch Screen is not showing all installed COREs and message "Lost Network Communication" is present	The Touch Screen might still be remembering other COREs, formerly installed to the Box.	Contact your service representative.

Problem	Possible cause(s)	Action
Message "Lost Network Communication" present	High internal communication traffic.	Contact your service representative.
Interruption of power to both, mains and bypass line present	A single differential breaker upstream of the UPS and a fault in the installation earthing system caused a problem.	Check your earthing system.
Backup time less than specified	Batteries are not charged completely.	Verify the quality of the batteries; Charge batteries, and test backup time; If problem persists, contact your service representative.
	Battery fuse(s) "open".	Contact your service representative for replacing the fuses.
	External battery cabinet fuse(s) "open";	Move the fuse switch to the "ON" position.
	Batteries are defective.	Contact your service representative for exchanging the batteries.
	Backup time calculation data might not be accurately.	Contact your service representative for verifying the autonomy calculation settings.
	Charging device is defective.	Check the battery charge status on display; Contact your service representative for further actions.
No backup time is shown while UPS in Battery mode	Battery calculation disabled.	Contact your service representative.
A message concerning end of battery power is displayed (e.g. Battery Stage fault "34-011 – Resttime exceeded"), despite there should be quite a bit of backup time left.	Battery characteristics not correctly set.	Contact your service representative for checking and/or correcting the battery settings.
	Battery fuse(s) "open".	Contact your service representative for replacing the fuses.
Battery temperature shows always 20°C	The "Battery temperature sensor" is not active.	Contact your service representative for enabling the battery temperature sensor.
No or slow communication between UPS and notebook	LAN cable defective.	Check network cable.
	Interface on notebook is being used by another process or is defective.	Check whether other software/ service is accessing the interface on the PC, try to select a different interface.
	Interference on the data cable.	Lay cable differently.
	Communication assignment problems.	Disconnect and connect the LAN cable again to establish a new communication link.
	Communication assignment problems due to untimely connection.	Establish connection between UPS and notebook only after UPS logic is fully supplied/started up; Otherwise problems concerning IP address assignment could occur.
It is not possible to access the Touch Screen via WEB browser (browser message similar to: "Page cannot be found")	The wrong RJ45 plug on Touch Screen is used.	Verify if the Premises LAN RJ45 plug is used for accessing the Touch Screen via WEB Browser. If necessary correct the connection. See also 1.2.1 Physical Connections.

Problem	Possible cause(s)	Action
WEB Browser Remote Access is not showing graphics	Adobe Flash Player might not be installed.	Install Adobe Flash Player onto your notebook.
The Navigation Tree within the WEB Browser Remote Access is displayed with another language than the Touch Screen	Preferred browser language is not set.	Add your preferred language to the browser.
<p>A message similar to the following appears on the left bottom corner of the WEB Browser Remote Access:</p> 	Firmware update failed.	Contact your service representative.

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4 Appendices

4.1 Network Resources Summary

You may need to know the following information to setup and/or configure the Vertiv™ Liebert® Trinergy Cube Touch Screen:

System Name		
Device Names	Device 1	
	Device 2	
	Device 3	
	Device 4	
	Device 5	
	Device 6	
	Device 7	
	Device 8	
	Device 9	

Data	Value	Description
IP Address		Static IP address assigned to the Touch Screen within customer premises network if no DHCP Server is used.
IP Subnet Mask		Subnet Mask of the network that the UPS unit is on.
Gateway		The local default gateway (IP address of the router).
DNS Server		IP address of the DNS server.
NTP Server IP Address		For automatically setting the clock.
SMTP Server IP Address		For email notifications; (Server access information and email addresses of whom should get notifications)
SMTP Server Port		
SMTP Email Destinations		
SNMP Trap Receiver IP Address		NMS server access information and information for further processing of received Traps.
SNMP Trap Receiver Port		
SNMP Trap Communities		
SNMP Set enable?		Information for the Touch Screen how to proceed with certain data and actions.
Suppress non-RFC1628 Traps?		
SNMP UDP Port		
SNMP Read and Write Community		
Modbus Device ID		Connecting information of the Modbus master station.
Modbus TCP Port		

4.2 SNMP Alarm Details

SNMP Alarm ID	Severity	SNMP MIB OID Ref	Log Entry & Condition Email Subject	Probable Cause
1	severe	upsAlarmBatteryBad	Module Battery Needs Replacing	UPS battery needs replacing.
2	warning	upsAlarmOnBattery	Module On Battery	UPS is running on battery power.
3	warning	upsAlarmLowBattery	Module Low Battery Condition	Run time left is less than configured low battery alarm value.
4	severe	upsAlarmDepletedBattery	Module Depleted Battery	Run time is just about zero.
5	severe	upsAlarmTempBad	Module Temperature Limit was Exceeded	Temperature near the battery is too hot.
6		upsAlarmInputBad	SNMP Trap only	Input power is out of limits or not present.
7		upsAlarmOutputBad	SNMP Trap only	An output condition is out of tolerance.
8	severe	upsAlarmOutputOverload	Module Output Overload	Output load power is > 100% of rated capacity.
9	warning	upsAlarmOnBypass	Module on Bypass	The bypass is engaged by the UPS.
10	severe	upsAlarmBypassBad	Module Bypass Bad	Battery charger has failed or its fuse has blown.
11	info	upsAlarmOutputOffAsRequested	Output Off As Requested	UPS output has been turned off via UPS Com port command.
12	info	upsAlarmUpsOffAsRequested	Module Off As Requested	UPS has been turned off via UPS Com port command.
13	severe	upsAlarmChargerFailed	Module Charger Failed	Battery charger has failed or its fuse has blown.
14	info	upsAlarmUpsOutputOff	Module Output Is Off	Confirmation that the UPS output is off, but the UPS control logic is still operating; this trap can only be sent if the adapter is powered from a source other than UPS output.
15	info	upsAlarmUpsSystemOff	Module System Is Off	UPS output and control logic is off; will likely never be seen.
16	severe	upsAlarmFanFailure	Module Fan Failure	Fan failure detected.
17	severe	upsAlarmFuseFailure	Module Fuse Failure	Input circuit breaker is open or charger fuse has blown.
18	severe	upsAlarmGeneralFault	Module Requires Servicing	A UPS fault was detected that is not specifically identified in the UPS protocol or defined in the standard MIB.
19	severe	upsAlarmDiagnosticTestFailed	Module Diagnostics Failed	A user initiated test has failed.
20	severe	upsAlarmCommunicationsLost	Module Lost Communication	Adapter has lost serial communication with the UPS.
21	info	upsAlarmAwaitingPower	Module Awaiting Power	UPS output is off and the UPS is waiting for input power to be restored;
22	info	upsAlarmShutdownPending	Shutdown Pending On Module	A UPS shutdown timer has begun counting - typically means UPS monitoring software has requested UPS output to be turned off after a delay period;
23	info	upsAlarmShutdownImminent	Shutdown Imminent On Module	Output shutdown will occur in approximately 5 seconds;

SNMP Alarm ID	Severity	SNMP MIB OID Ref	Log Entry & Condition Email Subject	Probable Cause
24	info	upsAlarmTestInProgress	Module Diagnostics Test in Progress	A user requested UPS test has begun.
25*	info	upsAlarmBatteryCharging	Module Battery Charging	The UPS battery is recovering from a recent discharge.
26*	severe	upsAlarmBackfeedRelayFailure	Module Backfeed Relay Failure	Backfeed relay failure detected.
27*	severe	upsAlarmBatteryFuseBlown	Module Battery Fuse Blown	Battery fuse failure detected.
28*	info	upsAlarmSystemRestartPending	System Restart Pending	The UPS is counting a user specified restart delay after AC input is restored.
29*	severe	upsAlarmBatteryDegraded	Module Battery Degraded	The UPS detects that the battery may need to be replaced soon
30*	info	upsAlarmAutonomyCalibration	Module Autonomy Calibration	The UPS is discharging the battery an calibrating its run time (autonomy) estimates.
31*	warning	upsAlarmGeneralWarning	Module General Warning	The UPS is indicating an unspecified fault condition
*	severe		Module Lost Communication While On Battery	Adapter has lost serial communication with the UPS after the UPS reported an On Battery condition.
*	severe		System Load Exceeds Power Margin	The load reported by the UPS exceeds the user specified power margin.
*	warning		Module Running on Booster	The UPS is correcting a low input line condition without using battery reserves.

* These messages are not included in the RFC1628 standard;

4.3 List of Touch Screen Information

Enclosed the Vertiv™ Liebert® Trinergy Cube Touch Screen information in tabulated form.

Not all values are always applicable.

Default Page

Messages & other Information	Dashboard Measurements
System status (blue = ok; yellow = warning; red = fault)	Actual unit input voltage [V] of each phase incl. phase balance
List of possible messages on the default page can be viewed in the following see chapter List on Events on page 1	Actual unit bypass voltage [V] of each phase incl. phase balance
Unit name	Actual unit output voltage [V] of each phase incl. phase balance
Operating mode	Actual real power [kW] of the unit ("Systemload")
Status of the converters	Actual apparent power [kVA] of the unit ("Systemload")
Efficiency	Power margin threshold
Firmware version	Redundancy threshold
	Phase load balance

Messages & other Information	Dashboard Measurements
	Ambient temperature
	Battery temperature
	Battery charge remaining
	Estimated minutes remaining
	Battery cell voltage
	Battery total voltage
	Battery current

CORE Subpage

Information	Rectifier Measurements
Manufacturer	Rectifier input voltage per phase
Model	Rectifier input current per phase
Serial number	Rectifier input frequency
Firmware version	DC Bus voltage (+/- and total)
Current alarm messages of the specific CORE	Input THDi
Last 10 cleared alarms	
Last 10 Service visits	

Bypass Measurements	Inverter Measurements
Bypass voltage per phase	Inverter output voltage per phase
Bypass current per phase	Inverter output current per phase
Bypass frequency	Inverter output frequency
	Inverter output VA per phase
	Inverter output kW per phase
	Output THDv
	Power factor

Battery Measurements
Battery replacement date
Battery age
Battery voltage
Battery cell voltage
Battery current

Data Log

Current	Voltage
Output current developing	Input voltage developing (vs. nominal)
	Output voltage developing (vs. nominal)

Frequency	Temperature
Input frequency developing (vs. nominal)	Ambient temperature developing
Output frequency developing (vs. nominal)	

% Load
Percentage system load
Percentage system battery

Event & Service Log

Event Log	Service Log
List of events	List of service visits

Settings

UPS Settings & other Information	Network Settings
Redundancy Threshold	Configuration status
Load Power Margin Threshold	IP Address
Phase Load Imbalance Threshold	Subnet Mask
Date & Time	Gateway
	DNS Server

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