MAKING MODERN LIVING POSSIBLE

TLX
User Manual

Three-phase – 6k, 8k, 10k, 12.5k and 15k

SOLAR INVERTERS

Contents

1

1 Introduction

1.1 Introduction

This manual provides information on functionality and maintenance of the TLX Series solar inverter.

Illustration 1.1 Solar Inverter

CE	CE marking - This certifies the conformity of the equipment with the regulations which apply in accordance with the directives 2004/108/EC and 2006/95/EC.

Table 1.1

1.2 Definition of Operation Modes

Off grid (LEDs off)
When no power has been delivered to the AC grid for more than 10 minutes, the inverter disconnects from the grid and shuts down. This is the normal night mode. The user and communication interfaces are still powered for communication purposes.

Connecting (Green LED flashing)
The inverter starts up when the PV input voltage reaches 250 V. The inverter performs a series of internal self-tests, including PV auto detection and measurement of the resistance between the PV arrays and earth. Meanwhile, it also monitors the grid parameters. When the grid parameters have been within the specifications for the required amount of time (depends on grid code), the inverter starts to energise the grid.

On grid (Green LED on)
The inverter is connected to the grid and energises the grid. The inverter disconnects if: It detects abnormal grid conditions (depending on grid code), if an internal event occurs or if no PV power is available (no power is supplied to the grid for 10 minutes). It then goes into connecting mode or off grid mode.

Fail Safe (Red LED flashing)
If the inverter detects an error in its circuits during the self-test (in connecting mode) or during operation, the inverter enters fail safe mode, disconnecting from PV. The inverter will remain in fail safe mode until PV power has been absent for a minimum of 10 minutes, or the inverter has been shut down completely (AC and PV).

Refer to *4 Troubleshooting* for further information.

2 Display

NOTE

The display activates up to 10 seconds after power up.

The integrated display on the inverter front gives the user access to information about the PV system and the inverter.

The display has two modes:

1. **Normal:** The display is in use.
2. **Power saving:** After 10 min. of no display activity the back light of the display turns off to save power. Re-activate the display by pressing any key

Illustration 2.1 Overview of Display Buttons and Functionality

F1	View 1/View 2 - Screen
F2	Status Menu
F3	Production Log Menu
F4	Setup Menu
NOTE **When an F-key is selected the LED above it will light up.**	
Home	Return to View Screen
OK	Enter/select
Arrow up	A step up/increase value
Arrow Down	A step down/decrease value
Arrow Right	Moves cursor right
Arrow Left	Moves cursor left
Back	Return/de-select
On - Green LED	On/flashing=On grid/Connecting
Alarm - Red LED	Flashing=Fail safe
	The inverter is configured as master. Icons can be found in the top right corner.*
	The inverter is connected to a master. Icons can be found in the top right corner.*

Table 2.1 Legend to *Illustration 2.1*

**TLX Pro and TLX Pro+ only.*

NOTE

The contrast level of the display can be altered by pressing the arrow up/down button while holding down the F1 button.

The menu structure is divided into four main sections

1. **View** - presents a short list of information, read only.
2. **Status** - shows inverter parameter readings, read only.
3. **Production log** - shows logged data.
4. **Setup** - shows configurable parameters, read/ write.

See the following sections for more detailed information.

2

2.1.1 View

Parameter	Description
Mode: On grid	Displays present inverter mode. See operation mode definitions
Prod. today: 12345 kWh	Energy production today in kWh. Value from inverter or S0 energy-meter
Output Power: 12345 W	Current output power in Watt
[--- utilization bar ---]	Shows level of inverter utilisation as % of max. utilisation

Table 2.2 Menu Structure - View

2.1.2 View 2

Pressing F1 once more will result in the following screen being shown (see section on buttons for more information):

Parameter	Description
Grid mgmt:	Indicates whether or not any grid management measures are in effect. Hidden if no grid management measures are in effect.
Performance ratio: 87 %*	Performance ratio is shown if irradiation sensor is available (local or master).
Total CO_2 saved:123 T*	Lifetime CO_2 emission saved, calculated using configured value.
Total revenue: 234.5 Euro *	Lifetime revenue, calculated using configured value.

Table 2.3 Menu Structure- View 2

** For TLX Pro only.*

2.1.3 Status

Display Functions	Description
[-] Ambient Conditions	Only applicable if sensors are connected
Irradiance: 1400W/m^2	Irradiance. “NC” if not connected
PV module temp: 100 ºC	PV module temperature. “NC” if not connected
Ambient temp: 20 ºC	Ambient temperature. “NC” if not connected
Irr. sensor temp: 20 ºC	Irradiation sensor temperature. “NC” if not connected
[-] Photovoltaic	
[-] Present values	
[-] PV input 1	
Voltage: 1000V	Voltage detected at PV input 1
Current: 15.0 A	Current detected at PV input 1
Power 10000 W	Power detected at PV input 1
[+] PV input 2	
[+] PV input 3	Not visible if inverter type is 10 kW
[-] Insulation Resistance	
Resistance: 45 MΩ	PV insulation resistance at start-up
[-] PV Input Energy	
Total: 369000kWh	Daily production of all PV inputs
PV1: 123000 kWh	Daily production of PV input 1
PV2: 123000 kWh	Daily production of PV input 2
PV3: 123000 kWh	Daily production of PV input 3. Not visible if inverter only has 2 PV inputs.
[-] PV Configuration	
PV input 1: Individual	Configuration of PV input 1. The configuration is only shown when the inverter is in Connecting or On grid mode.
PV input 2: Individual	
PV input 3: Individual	Not visible if inverter only has 2 PV inputs.

Display Functions	Description
[-] AC-grid	
[-] Present Values	
[-] Phase 1	
Voltage: 250 V	Voltage on phase 1
Current: 11.5 A	Current on phase 1
Frequency: 50 Hz	Frequency on phase 1
Power: 4997 W	Power on phase 1
[+] Phase 2	
[+] Phase 3	
[-] Residual Current Monitor	
Current: 350 mA	Residual current in mA
[-] Grid management	
[-] Apparent power (S)	If the inverter being configured is the Master, then the entered limit will be treated as the plant limit.
Plant max. (S): 15 kVA	If not configured the value will not be shown
[-] Active power (P)	If the inverter being configured is the Master, then the entered limit will be treated as the plant limit.
Limit type: Off	
Max. power (P): 15 kW	
PLA: 100%	Only shown if Limit type is Off
[-] Reactive power (Q)	If the inverter being configured is the Master, then the setpoint will be distributed to all inverters.
Set-point: Off	When using a dynamic reactive power mode (Q(U) or PF(P)) the inverter status will be shown as Constant Q or Constant PF respectively.
Value: -	
[-] Inverter	
Country: Misc	
Grid: VDE 126_1_1_A1	Read only. To change go to Setup menu
[-] Internal Conditions	
Power module 1: 100 °C	Temperature detected at the power module
PCB1 (AUX): 100 °C	Temperature detected internally
Fan 1: 6000 RPM	Speed of the fan
[-] Serial no. and SW ver.	
[-] Inverter	
Prod- and serial number:	
123A4567	Inverter product number
123456A789	Inverter serial number
Software version:	Inverter software version
MAC address:	The MAC address of the communication board
...	
[-] Control board	
Part- and serial number:	
123A4567	Control board part number
123456A789	Control board serial number
Software version:	Control board software version. Build number: 3.
[-] Power board	
Part- and serial number:	
123A4567	Power board part number
123456A789	Power board serial number
[-] AUX board	
Part- and serial number:	
123A4567	Aux board part number
123456A789	Aux board serial number

2

Display Functions	Description
[-] Communication board	
Part- and serial number:	
123A4567	Communication board part number
123456A789	Communication board serial number
Software version:	Communication board software version. Build number: 1.
[-] Func. Safety Processor	
Software version:	Functional Safety processor software version
[-] Display	
Software version:	Display software version
[-] Upload status	
Upload status: Off	Current upload status
* Signal strength:	Signal strength. Should preferably be between 16-31. '-' indicates no signal.
* GSM status: None	Current GSM network status
Network:	Network to which the modem is connected
Failed uploads: 0	Number of consecutive failed uploads
Last error: 0	Last error ID, please see the GSM manual for further assistance
-	Time and date of last error
Last upload:	
-	Time and date of last successful upload

Table 2.4 Menu Structure - Status

** Visible when communication channel is set to GSM.*

2.1.4 Production Log

Display Functions	Description
Total production: 123456 kWh	Total production since installation of inverter
Total operating time: 20 hours	Total operating time since installation of inverter
[-] Production log	
[-] This week	Production from this week
Monday: 37 kWh	Production from one day shown in KWh
Tuesday: 67 kWh	
Wednesday: 47 kWh	
Thursday: 21 kWh	
Friday: 32 kWh	
Saturday: 38 kWh	
Sunday: 34 kWh	
[-] Past 4 weeks	
This week: 250 kWh	Production from this week shown in KWh
Last Week: 251 KWh	
2 Weeks ago: 254 KWh	
3 Weeks ago: 458 KWh	
4 Weeks ago: 254 KWh	
[-] This year	
January: 1000 kWh	Production from one month shown in kWh
February: 1252 KWh	
March: 1254 KWh	
April: 1654 KWh	
May: 1584 KWh	
June: 1587 KWh	
July: 1687 KWh	

Display Functions	Description
August: 1685 KWh	
September: 1587 KWh	
October: 1698 KWh	
November: 1247 KWh	
December: 1247 KWh	
[-] Past years	Yearly production, up to 20 years back
This year: 10000 kWh	Production from this year shown in KWh
Last year: 10000 kWh/m^2	
2 years ago: 10000 kWh/m^2	
3 years ago: 10000 kWh/m^2	
...	
20 years ago: 10000 kWh/m^2	
[-] Irradiation log	Only visible if it contains non-zero values
[-] This week	Irradiation from this week
Monday: 37 kWh/m^2	Irradiation from one day shown in kWh/m^2
Tuesday: 45 kWh/m^2	
Wednesday: 79 kWh/m^2	
Thursday: 65 kWh/m^2	
Friday: 88 kWh/m^2	
Saturday: 76 kWh/m^2	
Sunday: 77 kWh/m^2	
[-] Past 4 weeks	Irradiation from this week shown in kWh/m^2
This week: 250 kWh/m^2	
Last week: 320 kWh/m^2	
2 weeks ago: 450 kWh/m^2	
3 weeks ago: 421 kWh/m^2	
4 weeks ago: 483 kWh/m^2	
[-] This year	
January: 1000 kWh/m^2	Irradiation from one month shown in kWh/m^2
February: 1000 kWh/m^2	
March: 1000 kWh/m^2	
April: 1000 kWh/m^2	
May: 1000 kWh/m^2	
June: 1000 kWh/m^2	
July: 1000 kWh/m^2	
August: 1000 kWh/m^2	
September: 1000 kWh/m^2	
October: 1000 kWh/m^2	
November: 1000 kWh/m^2	
December: 1000 kWh/m^2	
[-] Past years	Yearly irradiation up to 20 years back are shown
This year: 10000 kWh/m^2	
Last year: 10000 kWh/m^2	
2 years ago: 10000 kWh/m^2	
3 years ago: 10000 kWh/m^2	
...	
20 years ago: 10000 kWh/m^2	
[-] Time stamps	
Installed: 31-12-07	Date of first grid connection
Power down: 21:00:00	When the inverter was last connected to grid
Prod. initiated: 06:00:00	When the inverter first connected to grid today

2

Display Functions	Description
[-] De-rating	
Total de-rate: 0 h	Period of time the inverter has limited power production in total, shown in hours.
Freq. stabiliza.: 0 h	Period of time the inverter has limited power production due to frequency support. Only visible if enabled by the current grid code.
Pwr level adjust: 0 h	Period of time the inverter has limited power production due to Power level adjustment. Only visible if enabled by the current grid code.
Reactive Power: 0 h	Due to reactive energy support.
[-] Reactive Power	Only visible if the current grid code is an MV country or custom, and in TLX+ and TLX Pro+ variants.
[-] Reactive Energy (underexcited):	
1000 000 VArh	
[-] Reactive Energy (overexcited):	
1000 000 VArh	
[-] Event log	
Latest event: 0	The latest event is displayed. The number is for service purposes. Zero indicates no error.
[-] Last 20 events	The latest 20 events are displayed
1 : 29-01-2009 14:33:28	Date and time of the event
Grid 29 off	Group - ID - Status of the event
2 : 29-01-2009 14:33:27	
Grid 29 on	
-	
20:	

Table 2.5 Menu Structure - Production Log

2.1.5 Setup

Display Functions	Description
[-] Relay	Set relay functionality to either Alarm or Self-consumption
Function: Alarm	Default setting of Function
Stop Alarm	Stop alarm
Test Alarm	Includes testing red LED on front
Alarm state: Disabled	
Alarm time-out: 60 s	Alarm time limit. If 0, the alarm will be active until fixed
Function: Self-consumption	
Power level	Minimum level to activate self-consumption
Duration	Duration of power level to activate self-consumption
Trigger time	Hour of day to activate self-consumption
[-] Setup details	
Language: English	The language in the display; changing the display language does not affect country setting
[-] Inverter details	
Inverter name: Danfoss	 The inverter's name. Max. 15 characters and not only numbers.
Group name:* Group name	The name of the group the inverter is part of Max. 15 characters
[-] Master mode*	
Master mode: Enabled*	
[-] Network*	Only visible if Master mode is enabled.
[-] Initiate network scan*	
[-] Scan progress: 0%*	

Display Functions			Description
		[-] Inverters found: 0	
	Plant name:*		The name of the plant.
	Plant name*		Max. 15 characters
	[-] Set date and time		
		Date: dd.mm.yyyy (30.12.2002)	Set the current date
		Time: hh.mm.ss (13.45.27)	Set the current time
[-] Calibration			Only applicable if sensors are connected
	[-] PV array		
		PV input 1: 6000 W	
		PV 1 area: 123 m^2	
		PV input 2: 6000 W	
		PV 2 area: 123 m^2	
		PV input 3: 6000 W	Not visible if inverter only has 2 PV inputs
		PV 3 area: 123 m^2	Not visible if inverter only has 2 PV inputs
	[-] Irradiation sensor		
		Scale (mV/1000 W/m^2): 75	Sensor calibration
		Temp. coeff: 0.06 %/°C	Sensor calibration
	[-] Temp. sensor offset		
		PV module temp: 2 °C	Sensor calibration (offset)
		Ambient Temp: 2°C	Sensor calibration (offset)
	[-] S0 sensor input		
		Scale (pulses/kWh): 1000	Sensor calibration. See note
	[-] Environment*		
		CO_2 emission factor:*	Value to be used for total CO_2 saved calculation
		0.5 kg/kWh*	
		Remuneration per kWh:*	Value to be used for total revenue calculation
		44.42 ct/kWh	
		Yield start count: 1000 kWh*	A value used as an offset from the current production value when calculating the yield.
[-] Communication setup			Only applicable if communication accessories are connected
	[-] RS485 setup		
		Network: 15	
		Subnet:15	
		Address: 255	
	[-] IP Setup		
		IP config: Automatic	
		IP address:	
		192.168.1.191	
		Subnet mask:	
		255.255.255.0	
		Default gateway:	
		192.168.1.1	
		DNS server:	
		123.123.123.123	
	GPRS connection setup		
		SIM PIN code: 0000	4-8 characters
		Access point name: name	Max. 24 characters
		User name: user	Max. 24 characters
		Password: password	Max. 24 characters

2

Display Functions	Description
Roaming: Disabled	
[-] Data warehouse service	
Start log upload	Requires data from at least 10 min. of energy production
Upload internal:	Never Hourly Daily Weekly Monthly
D.W FTP server address: www.inverterdata.com	
D.W server port: 65535	
D.W. server user name:	Default serial number of the inverter
User	User name for Data warehouse account, max. 20 chars.
D.W server password	
Password	Password for Data warehouse account, max 20 chars.
Communication channel :	
Communication channel: GSM	
[-] Autotest	Autotest is initiated automatically upon entering the menu.
Status: Off	
Ugrid: 234 V	Only visible during voltage tests
Utest: 234 V	Only visible during voltage tests
Fgrid: 50.03 Hz	Only visible during frequency tests
Ftest: 50.03 Hz	Only visible during frequency tests
Disconnection time: 53 ms	Not visible in Off and Completed OK states
[-] Logging	
Interval: 10 min*	The interval between each logging
Logging capacity: 10 Days	
[-] Web Server	
Reset password	Resets the password of the Web Server to its default value
[-] Service	
Restart comm.	Restarts the communication board in case of, for example, an FTP error
Restart control	Restarts the control board
[-] Security	
Password: 0000	Level of access to inverter parameters and settings
Security level: 0	Current security level
Log out	Log out to security level 0
[-] Service logon	Only to be used by authorised service personnel
User name: user name	
Password: password	

Table 2.6 Menu Structure - Setup

** For TLX Pro only.*

NOTE

When a value is set in the S0 energy meter calibration menu the inverter disables its own energy counter in order to show the value from the S0 meter. Therefore the energy count will not be shown if a value is set, even though no S0 meter is connected.

3 Web Server Quick Guide

CAUTION

TLX Pro and TLX Pro+ inverters connected to the internet through Ethernet must be behind a firewall.

3.1 Introduction

These instructions describe the TLX Pro web interface, which facilitates remote access to the inverter.
The Web Server is available in TLX Pro and TLX Pro+ inverters only.
Refer to the download area at *www.danfoss.com/solar* for the newest instructions.

3.2 Supported Characters

For all language versions, the web interface software supports characters compatible with Unicode.

For plant, group and inverter name, only the following characters are supported:

Letters	abcdefghijklmnopqrstuvwxyz
Capital letters	ABCDEFGHIJKLMNOPQRSTUVWXYZ
Numbers	0123456789
Special characters	- _.

Table 3.1 Supported Characters

NOTE

No spaces are allowed in inverter name.

3.3 Access and Initial Setup

3.3.1 Access via PC Ethernet Interface

Setup Sequence:

1. Select which inverter will be set up as master (usually the one connected to the PC or closest to the router (in a daisy chain) + sensors connected).
2. Open the cover of this inverter. Refer to the *TLX Series Installation Manual* for instructions.
3. Connect the inverter RJ-45 interface to the PC Ethernet interface using a patch cable (network cable cat5e, crossed or straight through).
4. On the PC, wait until Windows*) reports limited connectivity (if no DHCP is present). Open the internet browser and ensure pop-ups are enabled.
5. Type http://invertername in the address field:
   - Find the serial number on the product label, located on the side of the housing.
   - 'Invertername' is the final 10 digits of the serial number (1).

**) Only works for Windows 95 and XP. For MAC and Windows 7 (and newer), the setup wizard in the display must be used for initial start-up of the inverter.*

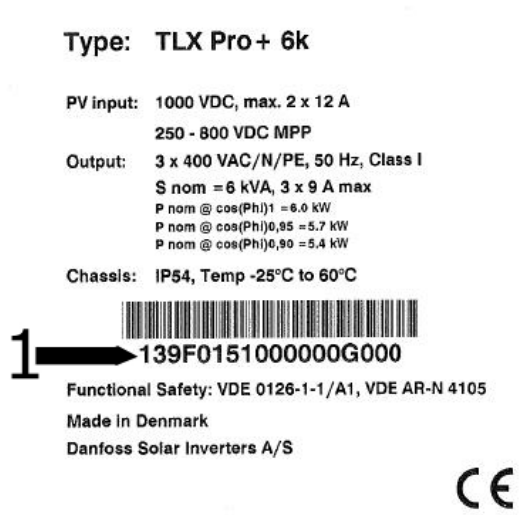

Illustration 3.1 Product Label

6. At initial start-up, the inverter runs a setup wizard.

3

3.3.2 Setup Wizard

The setup wizard consists of 8 steps to guide the user through the basic setup of the inverter.

NOTE

If the setup wizard has been completed via the display, the user will be taken to the logon screen.

NOTE

Initial setup is only performed once.

CAUTION

Change the web interface logon and password immediately for optimal security. To change the password go to [Plant level: Setup → Web Server → Admin].

3.4 Operation

3.4.1 Web Interface Structure

The web interface overview is structured as follows.

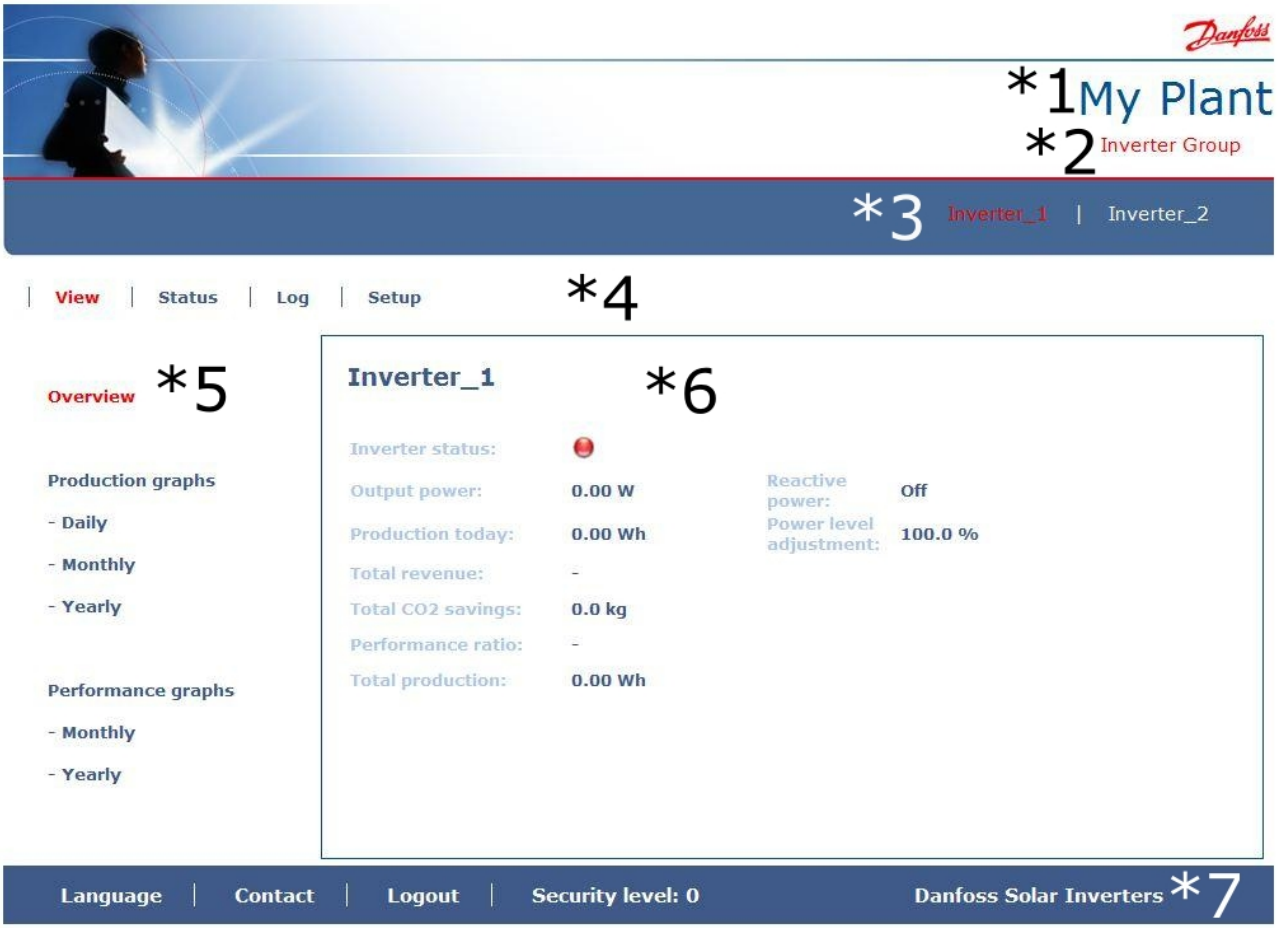

Illustration 3.2 Overview

1. **Plant name:** Displays the current plant name:
    - Click on the plant name to display the plant view.
    - Change the plant name at [Setup→Plant details].
2. **Group menu:** Displays groups of inverters:
    - Inverters join group 1 by default
    - Click on a group name to display the group view, and a list of inverters in the group.
    - Change the group name via [Setup→Inverter details] in the inverter view.
3. **Group members:** Displays the inverter names in the group currently selected. The default inverter name is based on the serial number (see *3.3 Access and Initial Setup*):
    - Click on an inverter name to display the inverter view.
    - Change the name of the inverter via [Setup→Inverter details] in the inverter view.
4. **Main menu:** This menu corresponds to the inverter display main menu.
5. **Sub menu:** The sub menu corresponds to the main menu item currently selected. All sub menu items belonging to a particular main menu item are displayed here.
6. **Content area:** The web interface main menu and sub menus are identical to the menus in the inverter display. The sub menu content displayed here corresponds to the sub menu selected: [Overview]. On some pages, a horizontal menu is provided for improved readability.
7. **Footer:** Options on the footer bar:
    - **Language:** Opens a pop-up window. Click on the country flag to change the language of the web interface to the desired language for the active session.
    - **Contact:** Opens a pop-up window which displays Danfoss contact information.
    - **Logout:** Opens the log in / log out dialog box.
    - **Security level:** Displays the current security level as explained in .

NOTE

The content of the main menu changes depending on which view is currently selected: the plant, a group of inverters or an individual inverter. The active view is indicated by text in red.

3.4.2 Plant, Group and Inverter Views

The overview screens for plant view, group view, and inverter view display the same overall status information.

3

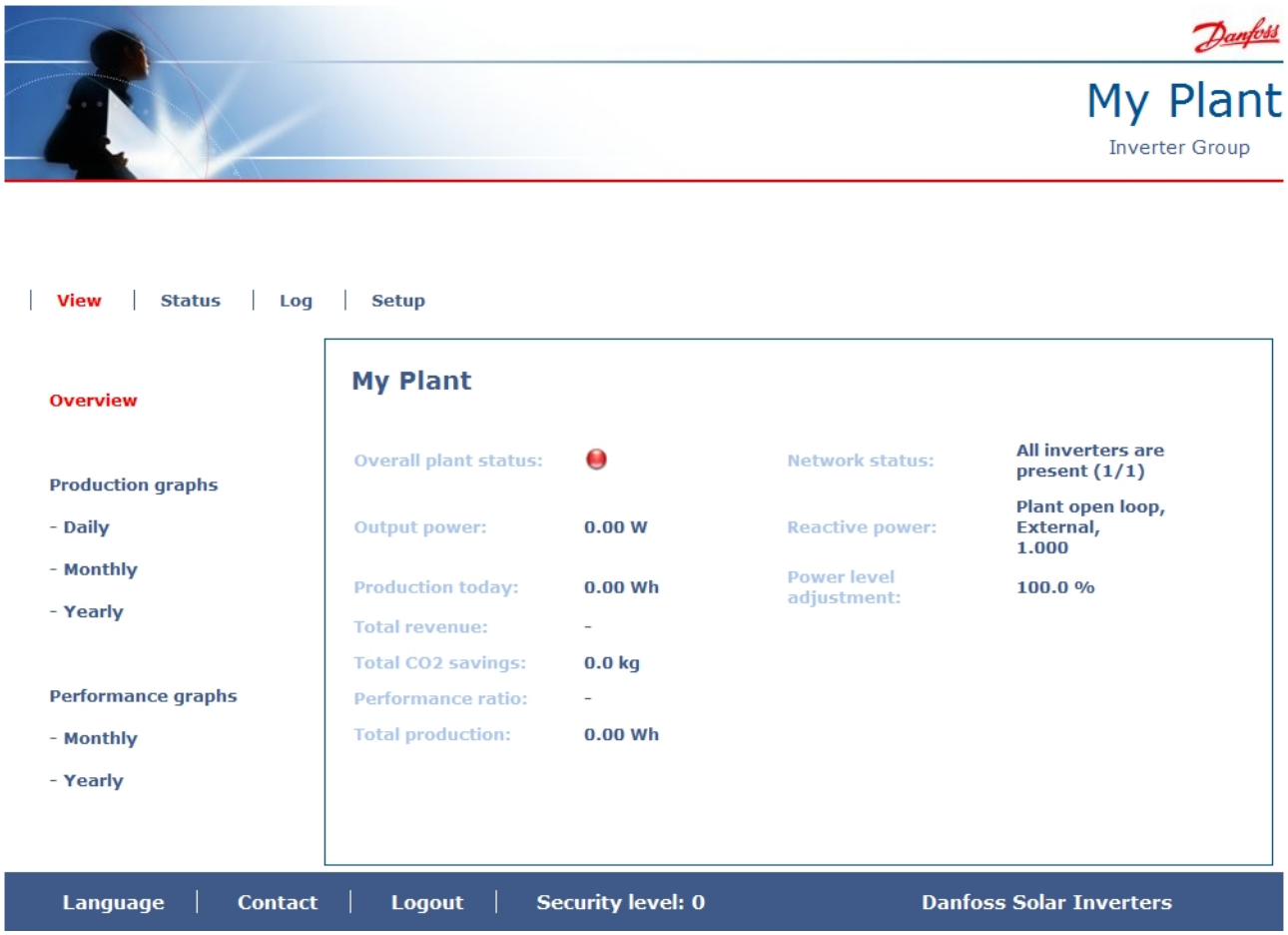

Illustration 3.3 Plant View

Item	Unit	View		Description
		Plant and Group	Inverter	
Overall plant status	-	x		**Red:** Plant PR <50%, or: Any inverter in the network - in *fail safe* mode, or - missing from the scan list, no contact with the master **Yellow:** Any inverter in the network - with PR <70%, or - in *Connecting* or *Off grid* mode **Green:** Plant PR ≥70%, and - all inverters with PR ≥70%, and - all inverters in *On grid* mode
			x	**Red:** Inverter PR <50%, or inverter has an error **Yellow:** Inverter PR between 51% and 70%, or inverter in *Connecting* mode **Green:** No errors, and - inverter PR ≥70%, and - inverter in *On grid* mode
Current production	kW	x	x	Real time energy production level
Yield today	kWh	x	x	Cumulative yield for the day
Total revenue	Euro	x	x	Cumulative revenue earned since initial startup
Total CO_2 saving	kg	x	x	Cumulative CO_2 saved since initial startup
Performance ratio	%	x	x	Real time performance ratio
Total yield	kWh	x	x	Cumulative yield since initial startup
Power limit adjustment	%		x	Power limit as % of nominal inverter AC output rating

Table 3.2 Plant Overview

NOTE

To calculate performance ratio (PR), an irradiation sensor is required, go to [Setup → Calibration].

3.5 Additional Information

Refer to the *TLX Series Web Server User Manual* to learn more about:

- Inverter start-up and check of settings
- Messaging
- Graphs
- Remote access
- Web portal upload
- Logging capacity and changing the logging interval
- Settings backup and restore

4 Troubleshooting

⚠WARNING

Only trained and authorised personnel familiar with electrical systems and safety issues may work on inverters and electrical installations.

If the inverter does not supply energy as expected, go through this checklist before calling service.

1. Check that the grid is properly connected to the inverter and that the mains switch is not switched off.
2. Check that there is sufficient solar radiation to generate power (U_{PV} >250 V).
3. Check for shading and loose cables/connections in the PV system.
4. Check whether the voltage of the PV modules are within the expected values. If not go to point 7.
5. Check whether the voltage values of the grid lie within the threshold values. If this is not the case, contact your public utility for technical assistance.
6. If the above-mentioned points are OK, wait 15 minutes to find out whether there is a permanent failure.
7. If the PV system still supplies no power to the grid, check the display for:
   - PV module voltage, current and power
   - grid voltage, current and power
   - event text, see log area

If no resolution is reached, call service.

In the event of a failure, the red LED will flash and the display will show an event. Refer to *Table 4.1* for event descriptions and recommended actions.

Event text	Description	Remedy
Grid	Grid values are out of range	Check the voltage and frequency values in the display. If values are zero, check the circuit-breaker (fuses) and cables. If values are outside the applied limits, request technical service from installer/ energy company.
PV	The PV isolation resistance is too low	Make a visual inspection of all PV cables and modules. If the event occurs frequently, request technical service.
Internal	An internal event has occurred	Make sure airflow over the heat sink is not obstructed. Wait 5 minutes. If the inverter does not reconnect (although sufficient irradiance is available) or the event occurs regularly, action must be taken. Service inverter.
Fail Safe	Internal or AC installation error	Turn off both AC and DC (PV) power to the inverter. Make a visual inspection of the PV installation, if everything is in order, wait 5 minutes and re-apply AC and DC (PV) power. If the inverter resumes fail safe operation, action must be taken. Service inverter.

Table 4.1 Events

NOTE

For more event descriptions, refer to *6 Appendix A - Event List*.

5 Maintenance

Normally, the inverter needs no maintenance or calibration. Ensure the heatsink at the rear of the inverter is not covered. Clean the contacts of the PV load switch once per year. Perform cleaning by cycling the switch to on and off positions ten times.The PV load switch is located at the base of the inverter.

5.1.1 Cleaning the Cabinet

Clean the inverter cabinet using pressurised air, a soft cloth or a brush.

5.1.2 Cleaning the Heatsink

Clean the heatsink using pressurised air, a soft cloth or a brush.
For correct operation and long service life, ensure free air circulation

- around the heatsink at the rear of the inverter
- to the fan at the inverter base

⚠WARNING

Do not touch the heatsink during operation.
Temperature can exceed 70 °C.

NOTE

Do not cover the inverter.
Do not use a water hose, aggressive chemicals, cleaning solvents or strong detergents to clean the inverter.

6 Appendix A - Event List

6.1.1 How to Read the Event List

The Event List holds an action field for each event, or the categorised group of events. The 'Action' field should be understood as progressive steps and recommendations as follows:

- Step 1: End User
- Step 2: Installer
- Step 3: Service

6.1.2 Grid Events

Event ID 1-6	Display Text	Action
Description: Grid voltage too low	*UgridRmsLowS2L1* *UgridRmsLowS2L2* *UgridRmsLowS2L3* *UgridRmsLowS1L1* *UgridRmsLowS1L2* *UgridRmsLowS1L3* *) S1 = STAGE 1 S2 = STAGE 2 L1 = PHASE 1 L2 = PHASE 2 L3 = PHASE 3	**End user:** Call the installer and inform about the grid-phase voltage. • Voltage on corresponding phase is OK: - Wait 10 minutes on phase L1, L2 and/or L3 to see if the inverter reconnects to the grid - If the event reappears on site, service is needed **Installer:** Check the AC installation • Check all fuses and the RCD/RCMU - All OK – call service **Service:** Exchange the inverter.

Event ID 7-9	Display Text	Action
Description: Grid-voltage average over 10 min. too high	*UGRID_RMS_10MINAVG_HIGH_L1* *UGRID_RMS_10MINAVG_HIGH_L2* *UGRID_RMS_10MINAVG_HIGH_L3*	**End user:** Call the installer and inform about the grid-phase voltage. • Voltage on corresponding phase is OK: - Wait 10 minutes on phase L1, L2 and/or L3 to see if the inverter reconnects to the grid - If the event reappears on site, service is needed **Installer:** Mitigation possibilities: • Install cable of larger diameter (to reduce the voltage drop) between inverter and meter • Program PF(P) – TLX+ and TLX Pro+ only • Call DNO to get permission to increase limit (note: Ugrid_RMS_high) Use installation tester to test resistance in the installation (phase-neutral) **Service:** None.

Event ID 10-15	Display Text	Action
Description: Grid voltage too high	*UGRID_RMS_HIGH_S1_L1* *UGRID_RMS_HIGH_S1_L2* *UGRID_RMS_HIGH_S1_L3* *UGRID_RMS_HIGH_S2_L1* *UGRID_RMS_HIGH_S2_L2* *UGRID_RMS_HIGH_S2_L3* *) S1 = STAGE 1 S2 = STAGE 2 L1 = PHASE 1 L2 = PHASE 2 L3 = PHASE 3	**End user:** Call the installer and inform about the grid-phase voltage. • Voltage on phase 1 is OK: - Wait 10 minutes on phase L1, L2 and/or L3 to see if the inverter reconnects to the grid - If the event reappears on site, service is needed **Installer:** Measure the grid voltage: • OK – call service • Not OK – call the DNO for a resolution **Service:** Exchange the inverter.

Event ID 16-18	Display Text	Action
Description: The inverter has detected a voltage peak on the grid.	*UGRID_INSTANTANIOUS_HIGH_L1* *UGRID_INSTANTANIOUS_HIGH_L2* *UGRID_INSTANTANIOUS_HIGH_L3*	**End user:** Call the installer and inform about the grid-phase voltage. • Voltage on phase 1 is OK: - Wait 10 minutes on phase L1, L2 and/or L3 to see if the inverter reconnects to the grid - If the event reappears on site, service is needed **Installer:** Check the AC installation (all fuses and the RCD): • OK – call service **Service:** Exchange the inverter.

Event ID 19-24, 48-53	Display Text	Action
Description: Grid frequency too low or too high	*FGRID_LOW_S1_L1* *FGRID_LOW_S1_L2* *FGRID_LOW_S1_L3* *FGRID_HIGH_S1_L1* *FGRID_HIGH_S1_L2* *FGRID_HIGH_S1_L3*	**End user:** Call the installer and inform about the grid frequency. • Frequency is OK: - Wait 10 minutes to see if the inverter reconnects to the grid. - If the event reappears on site, service is needed **Installer:** Check the AC installation (all fuses and the RCD): • OK – call service **Service:** Exchange the inverter.

Event ID 25-27	Display Text	Action
Description: Phase-to-phase voltages too low	*LOM_LINETOLINE_LOW_L1* *LOM_LINETOLINE_LOW_L2* *LOM_LINETOLINE_LOW_L3*	**End user:** Call the installer and inform about the voltage on all three phases. • Voltages are OK: - Wait 10 minutes to see if the inverter reconnects to the grid - If the event reappears on site, service is needed **Installer:** Check the AC installation (all fuses and the RCD): • OK – call service **Service:** Exchange the inverter.

6

Event ID 28-30	Display Text	Action
Description: Rate Of Change Of Frequency (ROCOF) too high	*LOM_ROCOF_HIGH_L1* *LOM_ROCOF_HIGH_L2* *LOM_ROCOF_HIGH_L3*	**End user:** If the event reoccurs several times each day, contact the DNO. **Installer:** None. **Service:** None.

Event ID 31-33, 44-46	Display Text	Action
Description: DC grid current too high	*IGRID_DC_CURRENT_HIGH_L1S1* *IGRID_DC_CURRENT_HIGH_L2S2* *IGRID_DC_CURRENT_HIGH_L3S3* *IGRID_DC_CURRENT_HIGH_STEP_L1* *IGRID_DC_CURRENT_HIGH_STEP_L2* *IGRID_DC_CURRENT_HIGH_STEP_L3*	**End user:** Check SW version [Status] • If SW version 2.15, 1.12 or older, a SW update is required. Call the installer. **Installer:** Install newest SW. version **Service:** None.

Event ID 34-37	Display Text	Action
Description: Residual Current Monitoring Unit (RCMU) has measured an excessive current	*IRESIDUAL_HIGH* *IRESIDUAL_STEP_S3_HIGH* *IRESIDUAL_STEP_S2_HIGH* *IRESIDUAL_STEP_S1_HIGH*	**End user:** Turn both DC and AC off and wait until the display turns off. Then turn on DC and AC and observe if the event reoccurs. If the event reoccurs, call the installer. **Installer:** Check the PV installation. If OK, call service. **Service:** Exchange the inverter.

Event ID 40	Display Text	Action
Description: AC grid out of spec for more than 10 minutes (frequency and/or voltage)	*GRID_DURING_CONNECT*	**End user:** Call the installer and inform about: • Frequency Display: [Status → Inverter → AC grid → Present value] • Voltage Display: [Status → Inverter → AC grid → Present value] • SW version Display: [Status → Inverter → Serial no. and SW version → Inverter] • Grid code setting (eg. “Germany LV 1”) Display [Status → Inverter] **Installer:** If SW version is 2.15 or older, an update is needed. Check the log for other events. Check the AC installation. **Service:** None.

Event ID 41-43	Display Text	Action
Description: The inverter has detected that grid voltage was below a certain level	*FAULT_RIDE_THROUGH_L1* *FAULT_RIDE_THROUGH_L2* *FAULT_RIDE_THROUGH_L3*	**End user:** If this event is reported several times each day, contact the installer. **Installer:** Perform on-site grid analysis. **Service:** None.

Event ID 47-48	Display Text	Action
Description: The inverter disconnects from grid if PLA is below 3% of nominal power	*PLA_BELOW_THRESHOLD*	**End user:** Contact the DNO and obtain status on active power reduction (PLA). **Installer:** None. **Service:** None.

Event ID 54-56,	Display Text	Action
Description: DC grid current too high (stage 2)	*IGRID_DC_CURRENT_HIGH_L1S2* *IGRID_DC_CURRENT_HIGH_L2S2* *IGRID_DC_CURRENT_HIGH_L3S2*	**End user:** If this event is reported several times each day, contact the installer. **Installer:** Perform on-site grid analysis. **Service:** None.

6.1.3 PV Events

Event ID 100-102	Display Text	Action
Description: The input current is negative; the polarity of the PV string is wrong. Should only appear during or immediately after installation or service	*IPV_NEGATIVE_PV1* *IPV_NEGATIVE_PV2* *IPV_NEGATIVE_PV3*	**End user:** Call the installer. **Installer:** • Is the polarity of the PV strings reversed (e.g. PV plus-wire connected with inverter minus-input)? • If not, call service **Service:** Exchange the inverter.

Event ID 103-105	Display Text	Action
Description: The input current is too high. Too many PV modules connected in parallel. Should only appear on newly installed systems	*IPV_HIGH_PV1* *IPV_HIGH_PV2* *IPV_HIGH_PV3*	**End user:** Call the installer. **Installer:** Check PV installation • How many strings are in parallel? What are their current ratings? Has the 12 A input limit been exceeded? • Has the inverter derated on PV current [Log → derate, level 1]? If too many strings are in parallel, then fix it by: - connecting the inverter inputs in parallel to distribute the current into the inverter - installing a second inverter **Service:** None.

6

Event ID 115	Display Text	Action
Description: The resistance between the PV strings and ground is too low for the inverter to start up	*PV_ISO_TOO_LOW*	**End user:** Call the installer and inform about isolation resistance. Display: [Status → Photovoltaic → Isolation resistance]. **Installer:** Check minimum recorded isolation resistance [Status → Photovoltaic → Isolation resistance], security level 1 needed • Go through the PV installation and check connectors, cables and modules for insulation-failure. • If the failure is present while on site, disconnect PV input 1 and restart the inverter to locate the affected PV string. Continue with strings 2 and 3. Make a visual inspection of all PV cables and modules. Check that the installation is correct according to the installation manual as this event could indicate that the PE connection is missing. **Service:** None.

Event ID 116	Display Text	Action
Description: Wrong PV polarity	*SELF_TEST_4_6_WRONG_POLARITY*	**End user:** Call the installer. **Installer:** Check whether or not the inverter starts when connecting each PV input separately. Be aware of parallel connections. **Service:** None.

6.1.4 Internal Events

Event ID 201-208	Display Text	Action
Description: Internal temperature is too high	*TPOWER_HIGH_L1* *TPOWER_HIGH_L2* *TPOWER_HIGH_L3* *TPOWER_HIGH_BOOSTER* *TPCB_CTRL_HIGH* *TPCB_COMM_HIG* *TPCB_AUX_HIGH* *TPCB_AUX_POWER*	**End user:** Make sure that the inverter is not covered and that the ventilation duct (heat sink) is not blocked. If not, call the installer. **Installer:** Has the inverter derated on temperature [Log → derate], security level 1 required Has the inverter reported event 211 (fan)? • No: call service. • Yes: clean heatsink / remove obstruction (see description for event 211). **Service:** Exchange the inverter.

Event ID 209-210	Display Text	Action
Description: Voltage on DC bus is too high	*UDC_POS_HIGH* *UDC_NEG_HIGH*	**End user:** Reset the inverter by disconnecting DC and AC, using the switches. If the event is repeated, call the installer. **Installer:** Check whether AC voltage is below max. rating or check the event log to see if other errors have occurred. If AC voltage is too high: wait 10 minutes, then try to reconnect. **Service:** None.

Event ID 211	Display Text	Action
Description: Fan speed is too low	*FAN_RPM_LOW*	**End user:** Is the inverter fan blocked? • Yes: clean the fan • No: call the installer **Installer:** Exchange the fan. **Service:** None.

Event ID 212	Display Text	Action
Description: Inverter unable to balance DC bus	*DCBUS_BALANCE_TIMEOUT*	**End user:** Call the installer. **Installer:** Call service. **Service:** Exchange the inverter.

Event ID 213-215	Display Text	Action
Description: Internal error Voltage measured before and after the relay differs by more than 20 V	*UGRID_UINV_DIFF_HIGH_L1* *UGRID_UINV_DIFF_HIGH_L2* *UGRID_UINV_DIFF_HIGH_L3*	**End user:** Call the installer. **Installer:** Call service. **Service:** Exchange the inverter.

Event ID 216-218	Display Text	Action
Description: Current measured on AC side is too high	*IGRID_HW_TRIP_L1* *IGRID_HW_TRIP_L2* *IGRID_HW_TRIP_L3*	**End user:** Call the installer. **Installer:** If software version is 1.09 or older, update to latest software version. If this does not help, call service. Display: [Status → Inverter → Serial no. and SW version] **Service:** Exchange the inverter.

Event ID 223	Display Text	Action
Description: Replaced by events 255-257	*IGRID_SUM_HIGH*	**End user:** Call the installer. **Installer:** Update software to latest version. **Service:** None.

Event ID 224	Display Text	Action
Description: Defective RCMU circuit, should also include events 350-352 from self-test (fail safe)	*RCMU_OVERRANGE*	**End user:** Call the installer. **Installer:** If self-test does not complete successfully, call service partner. **Service:** Exchange the inverter.

Event ID 225-231	Display Text	Action
Description: Failure in Memory/ Eeprom	*CTRL_EEPROM_CHECKSUM_ERROR* *COMM_EEPROM_CHECKSUM_ERROR* *AUX_EEPROM_CHECKSUM_ERROR* *POWER_EEPROM_CHECKSUM_ERROR* *CTRL_FLASH_CHECKSUM_ERROR* *COMM_FLASH_CHECKSUM_ERROR* *FSP_FLASH_CHECKSUM_ERROR*	**End user:** Call the installer. **Installer:** Call service. **Service:** Exchange board or inverter.

Event ID 233-240	Display Text	Action
Description: Memory check failed	*CTRL_RAM_CHECK_ERROR* *COMM_RAM_CHECK_ERROR* *FSP_RAM_CHECK_ERROR* *CTRL_RAM_COMPLEMENT_ERROR* *COMM_RAM_COMPLEMENT_ERROR* *xxx_RAM_COMPLEMENT_ERROR*	**End user:** Restart the inverter by disconnecting AC and DC, using the switches. If the event persists, call the installer. **Installer:** Call service. **Service:** Exchange board or inverter.

Event ID 241	Display Text	Action
Description: No contact to sensor	*I2C_FAULT*	**End user:** Restart the inverter by disconnecting AC and DC, using the switches. If the event persists, call the installer. **Installer:** Call service. **Service:** Exchange board or inverter.

Event ID 242	Display Text	Action
Description: Communication between inverter and control board failed for more than 10 seconds	*SPI_FAULT*	**End user:** Restart the inverter by disconnecting AC and DC, using the switches. If the event persists, call the installer. **Installer:** Call service. **Service:** Exchange board or inverter.

Event ID 243-244, 249	Display Text	Action
Description: Internal communi-cation error	*FPGA_WATCHDOG_TIMEOUT* *FSP_WATCHDOG_TIMEOUT* *FSP_COMM_FAULT*	**End user:** Restart the inverter by disconnecting AC and DC, using the switches. If the event persists, call the installer. **Installer:** Call service. **Service:** Exchange board or inverter.

Event ID 245	Display Text	Action
Description: Cannot be displayed after software version 2.01 (new communication boards introduced week 37, 2010)	*EVT_COVER_OPEN*	**End user:** **Installer:** **Service:**

Event ID 246	Display Text	Action
Description: Functional safety processor detected grid event	*FSP_GRID_EVENT*	**End user:** Check event log for other grid events (1-55) and follow the instructions for these events. If the event persists, call the installer. **Installer:** If the event persists after 24 hours, call service. **Service:** Exchange the inverter.

Event ID 247	Display Text	Action
Description: A plausibility fault has occurred in the functional safety processor	*FSP_PLAUSIBILITY_FAULT*	**End user:** Check event log for other grid events (1-55) and follow the instructions for these events. If the event persists, call the installer. **Installer:** If the event persists after 24 hours, call service. **Service:** Exchange the inverter.

Event ID 248, 251	Display Text	Action
Description: The self-test has failed	*SELF_TEST_FAILED FSP_FAIL_SAFE*	**End user:** Check event log for other grid events (1-55) and follow the instructions for these events. If the event persists, call the installer. **Installer:** If the event persists after 24 hours, call service. **Service:** Exchange the inverter.

Event ID 255-257	Display Text	Action
Description: Islanding event logged	*UGRID_ABS_MEAN_HIGH_L1* *UGRID_ABS_MEAN_HIGH_L2* *UGRID_ABS_MEAN_HIGH_L3*	**End user:** Check event log for other grid events (1-55) and follow the instructions for these events. If the event persists, call the installer. **Installer:** If the event persists after 24 hours, call service. **Service:** Exchange the inverter.

Event ID 255-257	Display Text	Action
Description: DC bus overvoltage	*UDCPROTECT_OVERVOLTAGE*	**End user:** If the event persists for 2-3 days, call the installer. **Installer:** Check PV installation/layout. If OK, and if event reoccurs after 24 hours, call service. **Service:** Exchange the inverter.

Event ID 259	Display Text	Action
Description: Internal parameter is too low	*SELF_TEST_4_4_INTERNAL_PARAMETER_TOO_LOW*	**End user:** Call the installer. **Installer:** Call service. **Service:** Exchange the inverter.

Event ID 260	Display Text	Action
Description: Unable to change the voltage between ground and neutral during isolation test (by less than 10 V)	*SELF_TEST_4_4_VEN_TOO_LOW*	**End user:** Call the installer. **Installer:** Check the PV installation for isolation error. If OK, call service. **Service:** Exchange the inverter.

Event ID 261	Display Text	Action
Description: Short-circuited booster transistor or wrong PV polarity	*SELF_TEST_4_6_SHORT_CIRCUIT*	**End user:** Call the installer. **Installer:** Call service. **Service:** Exchange the inverter

Event ID 262	Display Text	Action
Description: Short-circuited booster transistor or wrong PV polarity	*SELF_TEST_4_6_SHORT_CIRCUIT_WRONG_POLARITY*	**End user:** Call the installer. **Installer:** Check the PV installation for polarity errors. If OK, exchange the inverter. Call service. **Service:** Exchange the inverter.

Event ID 263	Display Text	Action
Description: Internal software error	*INTERNAL_ERROR*	**End user:** Check event log to see if this is logged more than once per day: • If no: no action required • If yes: call the installer **Installer:** Update software to latest version. **Service:** Exchange the inverter.

Event ID 350	Display Text	Action
Description: DC bias in RCMU is too high during self-test	*SELF_TEST_4_5_DC_BIAS_FAILED*	**End user:** Call the installer. **Installer:** Call service. **Service:** Exchange the inverter.

Event ID 351	Display Text	Action
Description: DC bias in RCMU is too high during self-test	*SELF_TEST_4_5_RMS_BIAS_FAILED*	**End user:** Call the installer. **Installer:** Call service. **Service:** Exchange the inverter.

Event ID 352	Display Text	Action
Description: RCMU cannot detect step (of 25 mA) in residual current	*SELF_TEST_4_5_STEP_FAILED*	**End user:** Call the installer. **Installer:** Call service. **Service:** Exchange the inverter.

Event ID 353	Display Text	Action
Description: Short-circuited inverter transistor (AC)	*SELF_TEST_4_6_CURRENT_AT_OPEN_I GRID_FAILED*	**End user:** Call the installer. **Installer:** Call service. **Service:** Exchange the inverter.

Event ID 354	Display Text	Action
Description: Short-circuited inverter transistor (AC) (average)	*SELF_TEST_4_6_CURRENT_AT_OPEN_I GRID_AVG_FAILED*	**End user:** Call the installer. **Installer:** Call service. **Service:** Exchange the inverter.

Event ID 356	Display Text	Action
Description: Test of inverter relay and voltage measurements cannot be performed	*SELF_TEST_4_7_INVERTER_BIAS_FAILE D*	**End user:** Call the installer. **Installer:** Call service. **Service:** Exchange the inverter.

Event ID 357	Display Text	Action
Description: Inverter relay has failed (contact assumed welded)	*SELF_TEST_4_7_INVERTER_RELAY_FAIL ED*	**End user:** Call the installer. **Installer:** Call service. **Service:** Exchange the inverter.

Event ID 358	Display Text	Action
Description: Inverter relay has failed (contact assumed welded)	*SELF_TEST_4_7_INVERTER_INV_VOLTA GE_FAILED*	**End user:** Call the installer. **Installer:** Call service. **Service:** Exchange the inverter.

Event ID 359	Display Text	Action
Description: Inverter relay or transistor has failed (assumed open circuit)	*SELF_TEST_4_7_INVERTER_RELAY_INV_UPPER_FAILED*	**End user:** Call the installer. **Installer:** Call service. **Service:** Exchange the inverter.

Event ID 360	Display Text	Action
Description: Inverter relay or transistor has failed (assumed open circuit)	*SELF_TEST_4_7_INVERTER_RELAY_INV_LOWER_FAILED*	**End user:** Call the installer. **Installer:** Call service. **Service:** Exchange the inverter.

Event ID 361	Display Text	Action
Description: Grid relay has failed (assumed open circuit)	*SELF_TEST_4_8_GRID_DIF_FAILED*	**End user:** Call the installer. **Installer:** Check and/or fix the neutral wire. Call service. **Service:** Exchange the inverter.

Event ID 362	Display Text	Action
Description: Neutral relay has failed (inverter relay assumed welded)	*SELF_TEST_4_9_NEUTRAL_INV_RELAY_FAILED*	**End user:** Call the installer. **Installer:** Check and/or fix the neutral wire. Call service. **Service:** Exchange the inverter.

Event ID 363	Display Text	Action
Description: Neutral relay has failed (grid relay assumed welded)	*SELF_TEST_4_9_NEUTRAL_GRID_RELAY_FAILED*	**End user:** Call the installer. **Installer:** Check and/or fix the neutral wire. Call service. **Service:** Exchange the inverter.

Event ID 364	Display Text	Action
Description: Neutral connection is damaged or missing	*SELF_TEST_4_9_NEUTRAL_RELAYS_FAILED*	**End user:** Call the installer. **Installer:** Check AC installation for failures on neutral connection. Call service. **Service:** Verify that the AC installation is correct according to the installation manual. Verify that the neutral wire is correctly connected. The failure is most likely in the installation.

6.1.5 Communication Events

Event ID 1	Label	GSM	LAN	Action
Description: Dynamic memory allocation failed	eNoMemory	✓		**End user:** Reset the inverter by disconnection. If the event persists, call the installer. **Installer:** Call service. **Service:** Report the error.

Event ID 3	Label	GSM	LAN	Action
Description: Incoming data buffer overflowed (modem response too long)	eModemBufferInO-verflow	✓		**End user:** Reset the inverter by disconnection. If the event persists, call the installer. **Installer:** Call service. **Service:** Report the error.

Event ID 4	Label	GSM	LAN	Action
Description: Current modem command received "ERROR" response	eModemCmdReplyError	✓		**End user:** Reset the inverter by disconnection. If the event persists, call the installer. **Installer:** Call service. **Service:** Report the error.

Event ID 5	Label	GSM	LAN	Action
Description: Current modem command timed out. GSM is not connected or it has a serious problem because it did not respond to last AT command.	eModemCmdTimeout	✓		**End user:** Call the installer. **Installer:** **End user:** Open the cover and check if the modem is installed. Verify that the SIM card is installed and working. This is done by moving the SIM card to a phone. If problem persists, call service. **Service:** Exchange the GSM module.

Event ID 7	Label	GSM	LAN	Action
Description: Modem's low-level initialisation failed. The GSM module has a serious problem.	eModemInitFail	✓		**End user:** Call the installer. **Installer:** **End user:** Open the cover and check if the modem is installed. Verify that the SIM card is installed and working. This is done by moving the SIM card to a phone. If problem persists, call service. **Service:** Exchange the GSM module.

Event ID 9	Label	GSM	LAN	Action
Description: Internal fault, unexpected state.	eUnexpectedState	✓		**End user:** Reset the inverter by disconnection. If the event persists, call the installer. **Installer:** Call service. **Service:** Report the error.

Event ID 10	Label	GSM	LAN	Action
Description: Modem response not recognised	eModemReplyParse-Failed	✓		**End user:** Reset the inverter by disconnection. If the event persists, call the installer. **Installer:** Call service. **Service:** Report the error.

Event ID 11	Label	GSM	LAN	Action
Description: Upload failed, not logged into home nor roaming (if allowed) GSM network. GM logs on and off GSM network. Indicates poor signal reception.	eConnectionUna-vailable	✓		**End user:** Only take action if the event reoccurs. • Check GSM signal strength - If not OK, try a different provider • Check if the SIM cards work (in a mobile phone). - Call the installer **Installer:** Install router with built-in GSM modem and place it for better reception. **Service:** None.

Event ID 12	Label	GSM	LAN	Action
Description: Failed to open upload connection (generic). Something other than GPRS or FTP failed.	eModemLinkOpenFail	✓		**End user:** Only take action if the event reoccurs. • Check GSM signal strength - If not OK, try a different provider • Check if the SIM cards work (in a mobile phone) • Other FTP server: Try to configure another/different FTP server If event persists, call the installer. **Installer:** Call service. **Service:** Report the error.

Event ID 13	Label	GSM	LAN	Action
Description: Failed to close connection (FTP or GPRS) after upload. Not critical, data was sent OK.	eModemLinkCloseFail	✓		**End user:** Not a serious event. If the event reoccurs, inform the installer. **Installer:** Call service. **Service provider:** Report the error.

Event ID 17	Label	GSM	LAN	Action
Description: Uploaded file size check did not match. Part of the file was probably lost. The upload file was corrupted during upload.	eUploadFileSize	✓	✓	**End user:** Call the installer. **Installer:** Change FTP server configuration (spec. defining supported FTP configuration needed). **Service:** None.

Event ID 18	Label	GSM	LAN	Action
Description: Modem did not connect to any GSM network. Either GSM coverage is missing or SIM card is not activated.	eModemNoNetwork	✓		**End user:** • Check GSM signal strength - If not OK, try a different provider • Check if the SIM cards work (in a mobile phone) **Installer:** Install router with built-in GSM modem and replace for better reception. **Service:** None.

Event ID 19	Label	GSM	LAN	Action
Description: SIM card did not respond to PIN query. SIM card is missing or has failed.	eModemSIMResponse	✓		**End user:** Check if the SIM card works (in a mobile phone) . **Installer:** Replace modem. **Service:** None.

Event ID 20	Label	GSM	LAN	Action
Description: Upload file exists on server (with exactly the same serial and time stamp in name). DWH refuses to overwrite existing log files on server.	eUploadFileExists	✓		**End user:** Avoid uploading to the same FTP server from different sites. **Installer:** Change FTP server configuration (spec. defining supported FTP configuration needed). If the problem persists, call service. **Service:** Report the error.

Event ID 21	Label	GSM	LAN	Action
Description: Failed to parse modem manufacturer.	eModemParseMfgr	✓		**End user:** Call the installer. **Installer:** Replace modem. **Service:** None.

Event ID 22	Label	GSM	LAN	Action
Description: Failed to parse modem model.	eModemParseModel	✓		**End user:** Call the installer. **Installer:** Replace modem. **Service:** None.

Event ID 23	Label	GSM	LAN	Action
Description: Failed to parse modem revision.	eModemParseRvsn	✓		**End user:** Call the installer. **Installer:** Replace modem. **Service:** None.

Event ID 24	Label	GSM	LAN	Action
Description: Failed to parse modem RSSI.	eModemParseRSSI	✓		**End user:** Call the installer. **Installer:** Replace modem. **Service:** None.

Event ID 26	Label	GSM	LAN	Action
Description: SIM card requests a code, but it is not PIN (commonly PUK, because SIM is locked).	eModemSecurityNotPIN	✓		**End user:** This SIM card is blocked. Find the PUK code, insert the SIM into a mobile phone and unblock it. Try a different provider. **Installer:** None. **Service:** None.

Event ID 27	Label	GSM	LAN	Action
Description: Failed to parse response to pin status query.	eModemParsePINStatus	✓		**End user:** Reset the inverter by disconnection. If the event persists, call the installer. **Installer:** Call service. **Service:** Report the error.

Event ID 28	Label	GSM	LAN	Action
Description: Failed to parse response to network registration status query.	eModemParseNe-tRegStat	✓		**End user:** Power-cycle the inverter. **Installer:** Replace modem. If that does not help, call service. **Service provider:** Report the error.

Event ID 29	Label	GSM	LAN	Action
Description: Internal fault, unexpected MCH initialisation state.	eUnexpectedInitState	✓		**End user:** **Installer:** **Service:** Report the error.

Event ID 30	Label	GSM	LAN	Action
Description: Failed to set PIN code. The PIN code is wrong. Be careful – if the inverter is reset, it will set the same PIN code again. After two resets, the SIM will block because it received 3 attempts to set wrong PIN.	eModemSetPIN	✓		**End user:** See description. If the card is blocked, put it in a mobile phone and use the PUK code to unlock. **Installer:** None. **Service provider:** None.

Event ID 31	Label	GSM	LAN	Action
Description: Failed to set GPRS access point name (APN). APN is invalid. Use only alpha-numeric (a-z, A-Z, 0-9) and dot (.) characters.	eGPRSParams	✓		**End user:** APN is invalid. Use only alpha-numeric (a-z, A-Z, 0-9) and dot (.) characters. **Installer:** None. **Service:** None.

Event ID 33	Label	GSM	LAN	Action
Description: Failed to set GPRS username. User name is invalid. Avoid white space.	eGPRSAuthPasswd	✓		**End user:** User name is invalid. Avoid white space. **Installer:** None. **Service:** None.

Event ID 34	Label	GSM	LAN	Action
Description: Failed to set GPRS password. Password is invalid. Avoid white space.	eGPRSAuthPasswd	✓		**End user:** User name is invalid. Avoid white space. **Installer:** None. **Service:** None.

Event ID 35	Label	GSM	LAN	Action
Description: Failed to open GPRS connection.	eGPRSOpe	✓		**End user:** Many things can cause the GPRS connection to fail. The APN, username or password might be wrong. Ask GSM provider for GPRS configuration. Maybe GPRS is not enabled for the SIM in question? **Installer:** None. **Service:** None.

Event ID 36	Label	GSM	LAN	Action
Description: Failed to open FTP connection.	eFTPOpen	✓	✓	**End user:** • Possible causes: - No internet connection - Wrong FTP server address - Wrong username or password • Try to connect to the FTP server from the PC. - Verify that the inverter has access to the internet **Installer:** None. **Service:** None.

6

Event ID 37	Label	GSM	LAN	Action
Description: Failed to set FTP mode. The server refused to accept binary mode transfer. This should not happen in production release when uploading to current Meteocontrol FTP server.	eFTPTransferType	✓		**End user:** Call the installer. **Installer:** Change the FTP server configuration (spec. defining supported FTP configuration. needed). Call service. **Service:** Report the error.

Event ID 38	Label	GSM	LAN	Action
Description: Failed to change FTP directory (only if FTP directory has been specified).	eFTPChdir	✓		**End user:** Call the installer. **Installer:** Change the FTP server configuration (spec. defining supported FTP configuration needed). Call service. **Service:** Report the error.

Event ID 39	Label	GSM	LAN	Action
Description: Failed to start file upload. Uploading the file fails when the server refuses it or when there is a problem with the internet connection. Maybe the firewall blocks active mode FTP?	eFTPPut	✓	✓	**End user:** Uploading the file fails when the server refuses it or when there is a problem with the internet connection. Maybe the firewall blocks active mode FTP? **Installer:** None. **Service:** None.

Event ID 40	Label	GSM	LAN	Action
Description: Failed to read uploaded file back to verify. Getting the file listing from FTP server failed. This indicates that there is a problem with the server or internet connection.	eUploadFileRead	✓		**End user:** Call the installer. **Installer:** Change the FTP server configuration (spec. defining supported FTP configuration needed). **Service:** Report the error.

Event ID 41	Label	GSM	LAN	Action
Description: There is no data log to upload. All unsent log has been sent and inverter has not yet generated any new log. This is not an error. It just indicates that all logged data that need uploading have already been uploaded.	eNoData	✓		**End user:** **Installer:** **Service:**

Event ID 42	Label	GSM	LAN	Action
Description: The master inverter's RTC is not set. Inverter time and date must be set for uploads to occur.	eTimeNotSet	✓	✓	**End user:** Call the installer. **Installer:** Set time and date. **Service:** None.

Event ID 43	Label	GSM	LAN	Action
Description: The master inverter's serial number is invalid.	eInvalidSerial	✓		**End user:** Call the installer. **Installer:** Call the service provider. **Service provider:** Fix serial number.

Event ID 44	Label	GSM	LAN	Action
Description: The SIM PIN code is not valid. A PIN code must be 4-8 characters long and consist only of digits. No other characters are permitted.	eInvalidPIN	✓		**End user:** A PIN code must be 4-8 characters long and consist only of digits. No other characters are permitted. **Installer:** None. **Service:** None.

Event ID 45	Label	GSM	LAN	Action
Description: Failed to open FTP file for uploading.	eModemFileOpenFail	✓		**End user:** Call the installer. **Installer:** Change the FTP server configuration (spec. defining supported FTP configuration. needed). Call service. **Service:** Report the error.

Event ID 46	Label	GSM	LAN	Action
Description: Failed to send an SMS. This error does not occur when uploading to data warehouse.	eModemSendSMSFail			**End user:** Move SIM to a phone and try to send SMS. Possible cause: lack of credit Try different SIM cards. **Installer:** Call service. **Service:** Report the error.

Event ID 47	Label	GSM	LAN	Action
Description: Failed to send an email via GSM. This error does not occur when uploading to data warehouse.	eModemSendEmailFail			**End user:** Move SIM to a phone and try to send email. Possible cause: lack of credit. Try different SIM cards. **Installer:** Call service. **Service:** Report the error.

Danfoss Solar Inverters A/S
Ulsnaes 1
DK-6300 Graasten
Denmark
Tel: +45 7488 1300
Fax: +45 7488 1301
E-mail: solar-inverters@danfoss.com
www.danfoss.com/solar

Rev. date 2012-11-25 Lit. No. L00410310-09_02