37387

DTSC-200
ATS Controller

Operation
Software Version 1.0xxx

Manual 37387

WARNING

Read this entire manual and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment. Practice all plant and safety instructions and precautions. Failure to follow instructions can cause personal injury and/or property damage.

The engine, turbine, or other type of prime mover should be equipped with an overspeed (overtemperature, or overpressure, where applicable) shutdown device(s), that operates totally independently of the prime mover control device(s) to protect against runaway or damage to the engine, turbine, or other type of prime mover with possible personal injury or loss of life should the mechanical-hydraulic governor(s) or electric control(s), the actuator(s), fuel control(s), the driving mechanism(s), the linkage(s), or the controlled device(s) fail.

Any unauthorized modifications to or use of this equipment outside its specified mechanical, electrical, or other operating limits may cause personal injury and/or property damage, including damage to the equipment. Any such unauthorized modifications: (i) constitute "misuse" and/or "negligence" within the meaning of the product warranty thereby excluding warranty coverage for any resulting damage, and (ii) invalidate product certifications or listings.

CAUTION

To prevent damage to a control system that uses an alternator or battery-charging device, make sure the charging device is turned off before disconnecting the battery from the system.

Electronic controls contain static-sensitive parts. Observe the following precautions to prevent damage to these parts.

- **Discharge body static before handling the control (with power to the control turned off, contact a grounded surface and maintain contact while handling the control).**
- **Avoid all plastic, vinyl, and Styrofoam (except antistatic versions) around printed circuit boards.**
- **Do not touch the components or conductors on a printed circuit board with your hands or with conductive devices.**

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Important definitions

WARNING

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation that, if not avoided, could result in damage to equipment.

NOTE

Provides other helpful information that does not fall under the warning or caution categories.

Revision History

Rev.	Date	Editor	Changes
NEW	07-12-12	TP	Release

Content

Illustrations And Tables

Illustrations

Tables

Chapter 1.
General Information

Related Documents

Type		English	German
DTSC-200 Series			
DTSC-200 - Installation		37385	-
DTSC-200 - Configuration		37386	-
DTSC-200 - Operation	this manual ⇨	37387	-
DTSC-200 - Application		37388	-
DTSC-200 - Interfaces		37389	-
Additional Manuals			
IKD 1 - Manual		37135	GR37135
Discrete expansion board with 8 discrete inputs and 8 relay outputs that can be coupled via the CAN bus to the control unit. Evaluation of the discrete inputs as well as control of the relay outputs is done via the control unit.			
LeoPC1 - User Manual		37146	GR37146
PC program for visualization, configuration, remote control, data logging, language upload, alarm and user management, and management of the event recorder. This manual describes the set up of the program and interfacing with the control unit.			
LeoPC1 - Engineering Manual		37164	GR37164
PC program for visualization, configuration, remote control, data logging, language upload, alarm and user management, and management of the event recorder. This manual describes the configuration and customization of the program.			

Table 1-1: Manual - Overview

Intended Use The unit must only be operated for the uses described in this manual. The prerequisite for a proper and safe operation of the product is correct transportation, storage, and installation as well as careful operation and maintenance.

NOTE

This manual has been developed for a unit fitted with all available options. Inputs/outputs, functions, configuration screens and other details described, which do not exist on your unit may be ignored.

The present manual has been prepared to enable the installation and commissioning of the unit. On account of the large variety of parameter settings, it is not possible to cover every possible combination. The manual is therefore only a guide. In case of incorrect entries or a total loss of functions, the default settings can be taken from the enclosed list of parameters at the rear of this manual.

Chapter 2.
Navigation / Operation

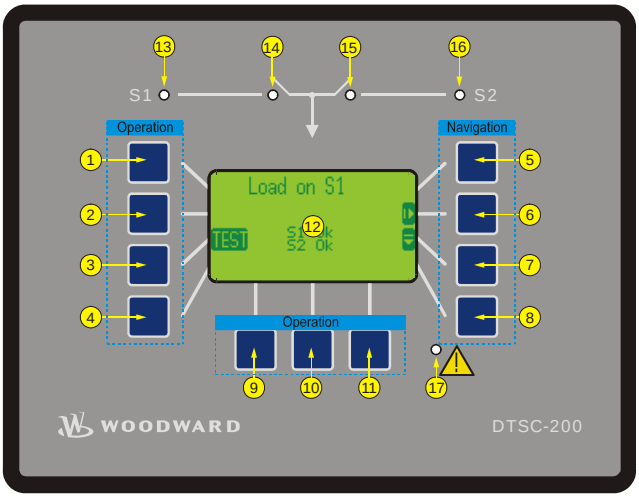


Figure 2-1: Front panel and display

Figure 2-1 illustrates the front panel/display, which includes push buttons, LEDs and the Liquid Crystal display (LC display). A short description of the front panel is given below.

Fct.-block

Function blocks

Buttons that have the same function within one screen are grouped into function blocks. The function blocks are defined as:

Operation ....Used to perform manual operation of the genset (page 11).
Navigation ...Navigation between system and configuration screens, and alarm list (page 12).

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

Push buttons

The push buttons on the front panel are assigned to softkeys on the display. Each softkey is assigned to a function depending on the mode of operation.

⑫

Liquid Crystal Display (LC display)

The display contains softkey characters, measuring values, modes of operation, and alarms. The functionality of the display screens as well as the description of the functions is detailed in the " Navigation" section (page 7).

⑬ ⑭ ⑮ ⑯ ⑰

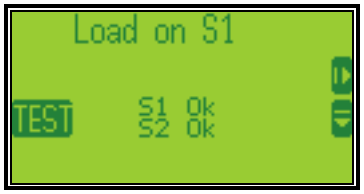
LEDs

The left LED ⑬ indicates that Source 1 is available. The second LED ⑭ indicates that the switch is closed to Source 1 position. The third LED ⑮ indicates that the switch is closed to Source 2 position. The right LED ⑯ indicates that Source 2 is available. The lower LED ⑰ indicates that alarm messages are active / present in the control unit.

Navigation

Individual display screens are listed in the following text. All softkeys, which are available in the individual screens are described with their function.

Screen "Automatic operation" / "Start screen" **[all application modes]**



This screen appears upon startup of the unit. The symbol AUTO, located in the lower left corner of the display, indicates that the ATS controller is in automatic operation.

Navigate to the next screen

Main menu

This softkey is only displayed if an alarm is present (the alarm message is indicated on the display). If it is flashing, the alarm is still unacknowledged. This softkey displays the alarm list.

This softkey is only displayed if the Alarm LED is flashing (An alarm is present, which has not yet been acknowledged as 'Seen'). This softkey resets the horn and acknowledges the alarm as 'Seen'.

BPASS This softkey is only displayed, if a timer is currently active. If a timer is active, the timer is indicated in the upper section of the display and the remaining time is displayed next to the "Bypass" softkey. The active timer may be bypassed by pressing this softkey. Refer to page 28 for more information about the timers.

TEST This softkey enables the test mode.

Screen "Source 1 values - Details" **[all application modes]**

Note: The display may differ from this example (3Ph/4W) depending on the configured voltage system.

This screen appears after pressing the softkey again. All measured source 1 values are displayed in this screen.

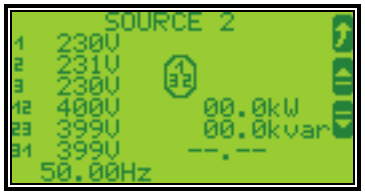
Navigate to the next screen

Navigate to the previous screen

Return to the start screen

1 / **2** / **3** ..... Source 1 voltages V_{L1N} / V_{L2N} / V_{L3N}
12 / **23** / **31** ... Source 1 voltages V_{L12} / V_{L23} / V_{L31}
00.00Hz..... Source 1 frequency
..... Phase rotation clockwise ↻
..... Phase rotation counterclockwise ↺

Screen "Source 2 values - Details" **[all application modes]**



Note: The display may differ from this example (3Ph/4W) depending on the configured voltage system.

This screen appears after pressing the softkey again. All measured source 2 values are displayed in this screen.

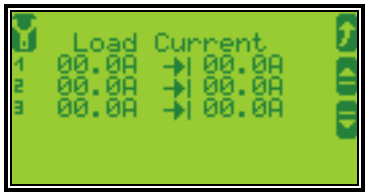
Navigate to the next screen

Navigate to the previous screen

Return to the start screen

1 / **2** / **3**.....Source 2 voltages V_{L1N} / V_{L2N} / V_{L3N}
12 / **23** / **31**....Source 2 voltages V_{L12} / V_{L23} / V_{L31}
00.00Hz.....Source 2 frequency
000kW.....Source 2 real power
000kvar.....Source 2 reactive power
1.00.....Source 2 power factor = 1
Lg0.00 .....Source 2 power factor (lagging)
Ld0.00 .....Source 2 power factor (leading)
.....Phase rotation clockwise ↻
.....Phase rotation counterclockwise ↺

Screen "Load current slave pointer " **[all application modes]**



This screen appears after pressing the softkey again. The slave pointers →| show the maximum currents monitored by the control unit.

Navigate to the next screen

Navigate to the previous screen

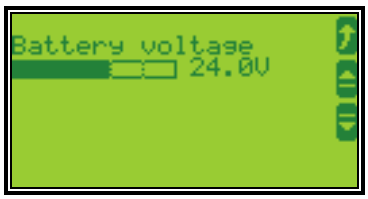
Return to the start screen

→| Left of the →| sign: present monitored value
Right of the →| sign: maximum monitored values

Reset the maximum measured values.

1 / **2** / **3**.....Load current I_{L1} / I_{L2} / I_{L3}

Screen "Battery voltage value - Details" **[all application modes]**



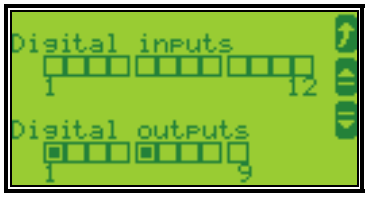
This screen appears after pressing the softkey again. The measured battery voltage value is displayed graphically and numerically.

Navigate to the next screen

Navigate to the previous screen

Return to the start screen

Screen "Discrete inputs / discrete (relay) outputs – Status display" **[all application modes]**



This screen appears after pressing the softkey again. Discrete input and discrete output status are displayed.

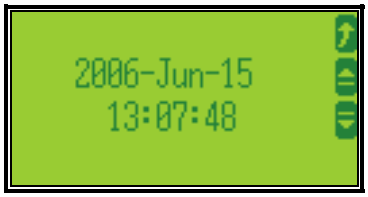
Navigate to the next screen

Navigate to the previous screen

Return to the start screen

Status display of the discrete inputs and discrete outputs.
(Note: The configured logic for the discrete input "N.O./N.C." will determine how the easYgen reacts to the state ▣ of the digital input. If the respective DI is configured to N.O, the unit reacts on the energized state (▣); if it is configured to N.C., it reacts on the de-energized state □.)
Discrete input: ▣ energized
□ de-energized
Discrete output: ▣ relay activated
□ relay de-activated

Screen "Time / Date" **[all application modes]**



This screen appears after pressing the softkey again. Here the time and date are displayed.

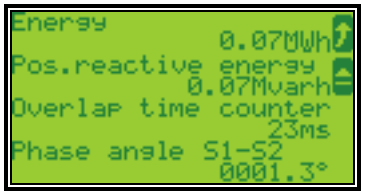
Navigate to the next screen

Navigate to the previous screen

Return to the start screen

0000-XXX-00 - Date
0000 = Year
XXX = Month
00 = Day
00:00:00 - Time
00 = Hour
00 = Minute
00 = Second

Screen "Counters" **[all application modes]**



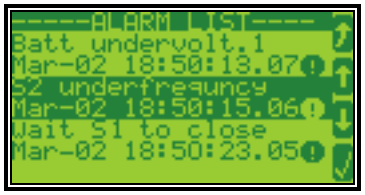
This screen appears after pressing the softkey once more. Here the counters are displayed.

Navigate to the previous screen

Return to the start screen

Energy 0.00 kWh - Generator real energy
0.00MWh = Total generator real energy
Pos. reactive energy 0.00 Mvar - Generator reactive energy
0.00Mvarh = Total generator reactive energy
Overlap time counter 00 ms - Overlap time
00ms = Overlap time of the last transfer
Phase angle S1-S2 000.0° - Phase angle
0000.0° = Ph. angle between source 1 and source 2

Screen "Alarm list" **[all application modes]**



This screen appears after pressing the softkey in the start screen. All alarm messages, which have not been acknowledged and cleared, are displayed. Each alarm is displayed in two lines; the first line describes the alarm message and the second line is the date and time of the alarm occurred in the format Mon-dd hh:mm:ss.ss. The symbol indicates that this alarm condition is still present.

Return to the start screen

Scroll up to next alarm message

Scroll down to next alarm message

The selected alarm message (displayed inverted) will be acknowledged. This is only possible, if the alarm condition is no longer present. If the Alarm LED is still flashing (an alarm is present, which has not yet been acknowledged as 'Seen'), this softkey resets the horn and acknowledges the alarm as 'Seen'.

Screen "Test mode" **[all application modes]**

This screen appears after pressing the softkey TEST in the start screen.

Navigate to the next screen

Main menu

CANCL TEST This softkey disables the test mode and returns to the start menu.

LOAD TEST This softkey enables a load test.

ENGINE TEST This softkey enables an engine test (no load test).

BYPASS This softkey is only displayed, if a timer is currently active. If a timer is active, the timer is indicated in the upper section of the display and the remaining time is displayed next to the "Bypass" softkey. The active timer may be bypassed by pressing this softkey. Refer to page 28 for more information about the timers.

Operation

The display is partitioned into different areas to give an overview of the displayed data.

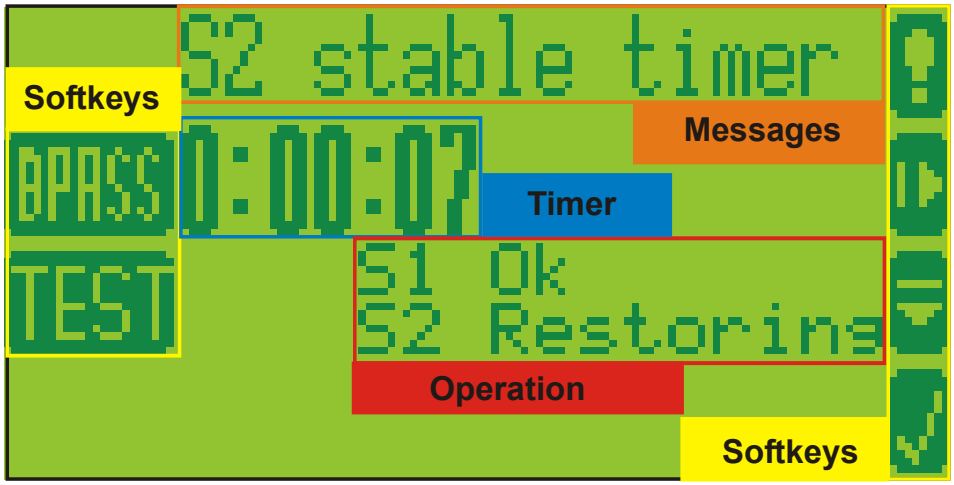


Figure 2-2: Screen - Level overview

"Operation"

The "Operation" section of the screen shows the current status of the sources.

"Messages"

The "Messages" section of the screen shows all active alarms and operations information.

"Timer

The "Timer" section of the screen indicates a count-down timer if a timer is currently active.

"Softkeys"

The "Softkeys" permit navigation between screens, levels and functions and may be used to operate the unit. Refer to the Operation Display section on page 12 for detailed information.

Operation Display

"Operation" display

The current operation state of the unit and the condition of the sources are displayed during normal operation.

Operation state

The current operation state of the unit is indicated in the "Messages" section of the screen. Refer to Appendix A: Messages on page 28 for a list of the possible operation states.

Source condition

The current source condition is indicated in the "Operation" section of the screen. The following source conditions are possible:

S1/2 Ok
Source 1/2 is considered as "OK", i.e. the voltage and frequency of Source 1/2 are within the restore limits (refer to the Configuration Manual 37386 for more information).

S1/2 Fail
Source 1/2 is considered as "not OK", i.e. the voltage or frequency of Source 1/2 are not within the restore limits (refer to the Configuration Manual 37386 for more information).

S1/2 Restore
Source 1/2 is considered as "OK", but the stable timer for the respective source has not yet expired (refer to the Configuration Manual 37386 for more information).

Timer Display

"Timer" display

If a timer is active, it is indicated in the "Messages" section of the screen and a numerical indication In the "Timer" section counts down the remaining time in seconds before the timer expires.

BPASS **Bypass timer**

If a timer is currently active, it may be bypassed with the "Bypass" softkey. This means that the timer expires immediately and the unit proceeds with the next operation. Refer to Appendix A: Messages on page 28 for a list of the possible timers.

Navigation

Softkeys "Navigation"

For navigation between the main screens the softkeys displayed in the right section are used. The softkeys are assigned with different functions.

Read alarm list

If alarms have occurred during operation this softkey character appears. By pressing this softkey the alarm list is displayed.

Leave current screen ("Escape" / "ESC")

By pressing this softkey character you exit and go to the previous screen. If the Escape key is used to leave a configuration screen, any unconfirmed changes made will not be stored.

Changing screen levels

These softkeys are used to navigate from screen to screen.

Activate configuration mode

To activate configuration mode this softkey is used to enter the main menu.

Navigation within the configuration

These softkeys scroll between parameters forward or backward, change the cursor position within a parameter, increase the current digit of the parameter and confirm any modifications made within the parameters.

Acknowledgement

This softkey acknowledges an active alarm and turns off the horn in the main menu or the alarm list.

LogicsManager

Some parameters of the DTSC-200 are configured via the *LogicsManager* (refer to Configuration Manual 37386). A typical *LogicsManager* screen is shown in the following. You may configure a logical operation using various command variables, signs, and logical operators to achieve the desired logical output.

***LogicsManager* Screen**

For configuration of the *LogicsManager* the softkeys displayed in the right section are used. The softkey on the left opens a help screen. The softkeys are assigned with different functions.

Leave current screen ("Escape" / "ESC")

By pressing this softkey character you exit and go to the previous screen. If the Escape key is used to leave a *LogicsManager* configuration screen, any unconfirmed changes made will not be stored.

Change option

By pressing these softkey characters you may change the option of the selected *LogicsManager* parameter upwards or downwards.

Confirm selection

By pressing this softkey character you confirm the configured option of the selected *LogicsManager* parameter.

Select parameter

By pressing this softkey character you may select the *LogicsManager* parameter to be configured. Each time this softkey character is pressed, the parameter will be advanced.

Help button

By pressing this softkey character you get to a help screen, which displays the logical operators of the *LogicsManager*. You may change the help screens with the Down and Up buttons. You may return to the *LogicsManager* with the Escape button.

Chapter 3.
Functional Description

General ATS Functionality

The following flowchart shows the typical ATS functionality:

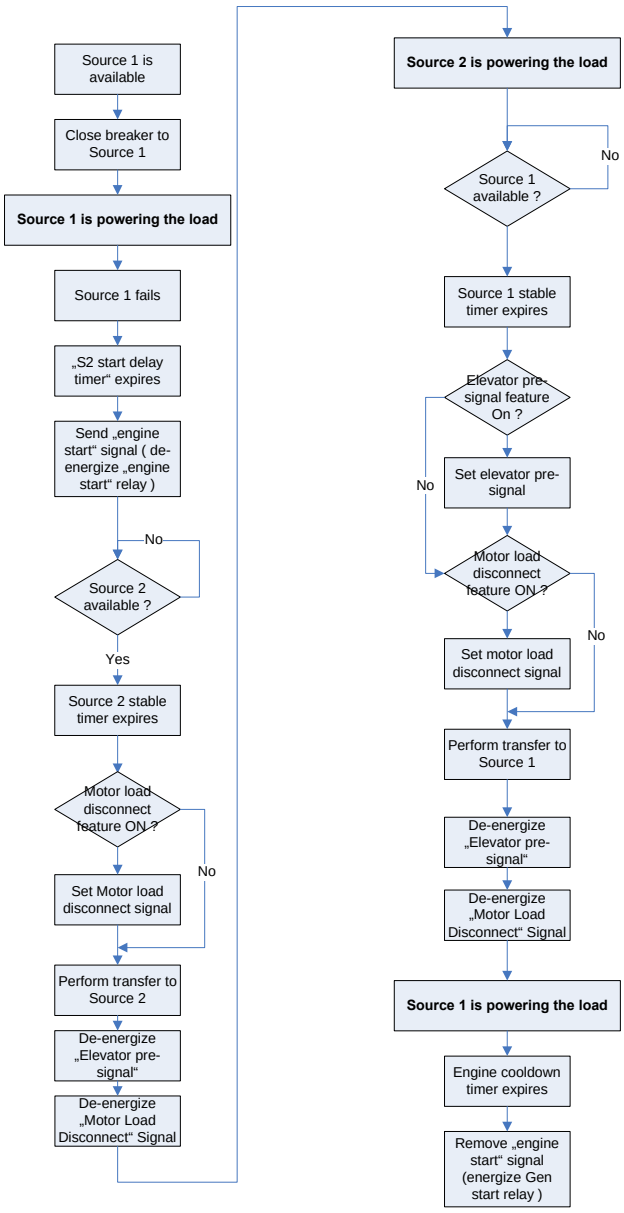
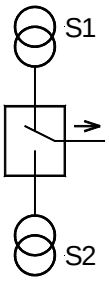


Figure 3-1: General ATS functionality - flowchart

Application Modes

The application mode may be configured in the unit (refer to the Configuration Manual 37386 for more information). This is only possible in code level 2. The most important features and differences of the three application modes are illustrated in the following section. A description of the functions that are possible during each application mode can be found in the configuration manual (manual 37386).

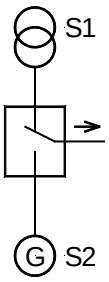
Util-Util Application Mode



This application mode has the following characteristics:

- The ATS controller monitors two mains sources and transfers the load to the secondary source in case the primary source fails
- The ATS controller operates as Master controller

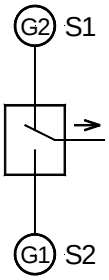
Util-Gen Application Mode



This application mode has the following characteristics:

- The ATS controller monitors a mains sources and a generator source and transfers the load to the generator source in case the mains source fails
- The ATS controller operates as Master controller

Gen-Gen Application Mode



This application mode has the following characteristics:

- The ATS controller monitors two generator sources and transfers the load to the other source in case the regular source fails
- The ATS controller operates as Slave controller
- This application is not a stand-alone application and always combined with another ATS controller in Util-Gen application mode, which operates as Master controller (refer to the Application Manual 37388 for more information)

Blocking Transfer Operations

The following conditions result in blocking all transfer operations. This means that the *LogicsManager* flags

- 20.07 "Close to S1"
- 20.09 "Close to S2"
- 20.08 "Open from S1"
- 20.10 "Open from S2"

are **not** enabled anymore. This blocks all transfer operations!

LogicsManager function "Inhibit ATS"

If the *LogicsManager* function "Inhibit ATS" (parameter 12600) is TRUE, all transfers are blocked! Refer to the Configuration Manual 37386 for a description of this parameter.

Switch Failures

Depending on the configured "Transfer switch type" (parameter 3424), all transfers are blocked if specific switch failures occur. Refer to the Configuration Manual 37386 for a description of this parameter.

Transfer Switch Type "Standard"

If one of the following failure conditions is present, all transfer operations are blocked and the respective failure must be acknowledged before a new transfer is possible:

- Fail to close S1 is present
- Fail to close S2 is present

Transfer Switch Type "Delayed"

If one of the following failure conditions is present, all transfer operations are blocked and the respective failure(s) must be acknowledged before a new transfer is possible:

- Fail to open S1 is present
- Fail to open S2 is present

- The transfer switch is in NEUTRAL position AND
  - Fail to close S1 is present AND
  - Fail to close S2 is present

Transfer Switch Type "Closed"

If one of the following failure conditions is present, all transfer operations are blocked and the respective failure(s) must be acknowledged before a new transfer is possible:

- Fail to close S1 is present
- Fail to close S2 is present
- Shunt trip enable flag (20.12) is enabled

- The transfer switch is in S1 or S2 position AND
  - Fail to open S1 is present OR
  - Fail to open S2 is present

Mechanical Failure (Limit Switch Monitoring)

Functional Description

If the "Limit switch monitoring" function (parameter 3430, refer to the Configuration Manual 37386 for more information about the parameter) is enabled, it is always active, if no transfer command (C2, C1, C2O, C1O) is currently being issued by the ATS controller. The DTSC-200 evaluates the currently present replies from the ATS limit switch together with the currently available source to determine which reply signals are currently expected to be able to supply the load.
The plausibility of the ATS limit switch replies will be monitored. It is not plausible for example that no or both replies are present for an "open transition switch".
If such a plausibility conflict is detected, the ATS controller blocks all further automatic transfers and displays the "Limit switch fail" message together with the actual and expected replies.

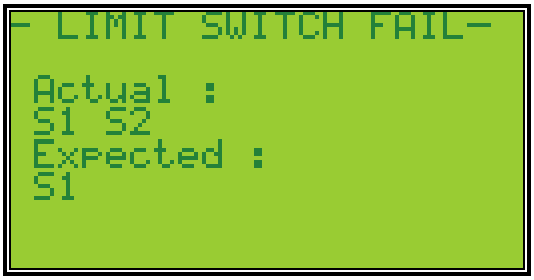


Figure 3-2: Limit switch monitoring - failure message

"Actual" indicates the reply messages, which are currently detected by the ATS limit switch.
"Expected" indicates the reply messages, which are expected to be detected by the ATS limit switch.

A continued automatic operation of the ATS controller is only possible after the "Actual" state matches the "Expected" state again. A "Reset" button will be displayed in the lower section of the screen if this is the case. This button must be pressed by the operator to acknowledge the detection and the removal of the failure.

Signal and Command Abbreviations

- S1 Signal: breaker in source 1 position
- S2 Signal: breaker in source 2 position
- S1O Signal: breaker in source 1 OPEN position
- S2O Signal: breaker in source 2 OPEN position
- C1 Command: close to source 1
- C2 Command: close to source 2
- C1O Command: open from source 1
- C2O Command: open from source 2

Truth Tables

The truth tables indicate all possible reply signal combination conditions and the respective reactions of the ATS controller depending on the configuration of the parameters 3424 "Transfer switch type" and 3434 "Use limit sw. OPEN replies". All conditions, which are OK according to the table (columns Actual and Expected) do not result a "Limit switch fail" message.

Table 3-1 is valid for the following settings:

- Parameter 3424 "Transfer switch type" is configured to "Standard"
- Parameter 3434 "Use limit sw. OPEN replies" is configured to "NO"

S1 preferred	S1 source OK	S2 source OK	S1 closed signal	S2 closed signal	Actual	Expected
0	0	0	0	0	-----	S2
0	0	0	0	1	OK	OK
0	0	0	1	0	OK	OK
0	0	0	1	1	S1 S2	S2
0	0	1	0	0	-----	S2
0	0	1	0	1	OK	OK
0	0	1	1	0	OK	OK
0	0	1	1	1	S1 S2	S2
0	1	0	0	0	-----	S1
0	1	0	0	1	OK	OK
0	1	0	1	0	OK	OK
0	1	0	1	1	S1 S2	S1
0	1	1	0	0	-----	S2
0	1	1	0	1	OK	OK
0	1	1	1	0	OK	OK
0	1	1	1	1	S1 S2	S1
1	0	0	0	0	-----	S1
1	0	0	0	1	OK	OK
1	0	0	1	0	OK	OK
1	0	0	1	1	S1 S2	S1
1	0	1	0	0	-----	S2
1	0	1	0	1	OK	OK
1	0	1	1	0	OK	OK
1	0	1	1	1	S1 S2	S2
1	1	0	0	0	-----	S1
1	1	0	0	1	OK	OK
1	1	0	1	0	OK	OK
1	1	0	1	1	S1 S2	S1
1	1	1	0	0	S1 S2	S1
1	1	1	0	1	OK	OK
1	1	1	1	0	OK	OK
1	1	1	1	1	S1 S2	S1

Table 3-1: Limit switch monitoring - truth table for "Standard" limit switch w/o "Open" replies

Table 3-2 is valid for the following settings:

- Parameter 3424 "Transfer switch type" is configured to "Delayed"
- Parameter 3434 "Use limit sw. OPEN replies" is configured to "NO"

S1 preferred	S1 source OK	S2 source OK	S1 closed signal	S2 closed signal	Actual	Expected
0	0	0	0	0	OK	OK
0	0	0	0	1	OK	OK
0	0	0	1	0	OK	OK
0	0	0	1	1	S1 S2	S2
0	0	1	0	0	OK	OK
0	0	1	0	1	OK	OK
0	0	1	1	0	OK	OK
0	0	1	1	1	S1 S2	S2
0	1	0	0	0	OK	OK
0	1	0	0	1	OK	OK
0	1	0	1	0	OK	OK
0	1	0	1	1	S1 S2	S1
0	1	1	0	0	OK	OK
0	1	1	0	1	OK	OK
0	1	1	1	0	OK	OK
0	1	1	1	1	S1 S2	S2
1	0	0	0	0	OK	OK
1	0	0	0	1	OK	OK
1	0	0	1	0	OK	OK
1	0	0	1	1	S1 S2	S1
1	0	1	0	0	OK	OK
1	0	1	0	1	OK	OK
1	0	1	1	0	OK	OK
1	0	1	1	1	S1 S2	S2
1	1	0	0	0	OK	OK
1	1	0	0	1	OK	OK
1	1	0	1	0	OK	OK
1	1	0	1	1	S1 S2	S1
1	1	1	0	0	OK	OK
1	1	1	0	1	OK	OK
1	1	1	1	0	OK	OK
1	1	1	1	1	S1 S2	S1

Table 3-2: Limit switch monitoring - truth table for "Delayed" limit switch w/o "Open" replies

Limit switch monitoring is disabled for the following settings:

- Parameter 3424 "Transfer switch type" is configured to "Open"
- Parameter 3434 "Use limit sw. OPEN replies" is configured to "NO"

Table 3-3 is valid for the following settings:

- Parameter 3424 "Transfer switch type" is configured to "Open"
- Parameter 3434 "Use limit sw. OPEN replies" is configured to "YES"

S1 preferred	S1 OK	S2 OK	S1 closed signal	S2 closed signal	S1 open signal	S2 open signal	Actual	Expected
0	0	0	0	0	0	0	-----	S2 S1O
0	0	0	0	0	0	1	S2O	S2 S1O
0	0	0	0	0	1	0	S1O	S2 S1O
0	0	0	0	0	1	1	OK	OK
0	0	0	0	1	0	0	S2	S2 S1O
0	0	0	0	1	0	1	S2 S2O	S2 S1O
0	0	0	0	1	1	0	OK	OK
0	0	0	0	1	1	1	S2 S1O S2O	S2 S1O
0	0	0	1	0	0	0	S1	S2 S1O
0	0	0	1	0	0	1	OK	OK
0	0	0	1	0	1	0	S1 S1O	S2 S1O
0	0	0	1	0	1	1	S1 S1O S2O	S2 S1O
0	0	0	1	1	0	0	S1 S2	S2 S1O
0	0	0	1	1	0	1	S1 S2 S2O	S2 S1O

S1 preferred	S1 OK	S2 OK	S1 closed signal	S2 closed signal	S1 open signal	S2 open signal	Actual	Expected
0	0	0	1	1	1	0	S1 S2 S1O	S2 S1O
0	0	0	1	1	1	1	S1 S2 S1O S2O	S2 S1O
0	0	1	0	0	0	0	-----	S2 S1O
0	0	1	0	0	0	1	S2O	S2 S1O
0	0	1	0	0	1	0	S1O	S2 S1O
0	0	1	0	0	1	1	OK	OK
0	0	1	0	1	0	0	S2	S2 S1O
0	0	1	0	1	0	1	S2 S2O	S2 S1O
0	0	1	0	1	1	0	OK	OK
0	0	1	0	1	1	1	S2 S1O S2O	S2 S1O
0	0	1	1	0	0	0	S1	S2 S1O
0	0	1	1	0	0	1	OK	OK
0	0	1	1	0	1	0	S1 S1O	S2 S1O
0	0	1	1	0	1	1	S1 S1O S2O	S2 S1O
0	0	1	1	1	0	0	S1 S2	S2 S1O
0	0	1	1	1	0	1	S1 S2 S2O	S2 S1O
0	0	1	1	1	1	0	S1 S2 S1O	S2 S1O
0	0	1	1	1	1	1	S1 S2 S1O S2O	S2 S1O
0	1	0	0	0	0	0	-----	S1 S2O
0	1	0	0	0	0	1	S2O	S1 S2O
0	1	0	0	0	1	0	S1O	S1 S2O
0	1	0	0	0	1	1	OK	OK
0	1	0	0	1	0	0	S2	S1 S2O
0	1	0	0	1	0	1	S2 S2O	S1 S2O
0	1	0	0	1	1	0	OK	OK
0	1	0	0	1	1	1	S2 S1O S2O	S1 S2O
0	1	0	1	0	0	0	S1	S1 S2O
0	1	0	1	0	0	1	OK	OK
0	1	0	1	0	1	0	S1 S1O	S1 S2O
0	1	0	1	0	1	1	S1 S1O S2O	S1 S2O
0	1	0	1	1	0	0	S1 S2	S1 S2O
0	1	0	1	1	0	1	S1 S2 S2O	S1 S2O
0	1	0	1	1	1	0	S1 S2 S1O	S1 S2O
0	1	0	1	1	1	1	S1 S2 S1O S2O	S1 S2O
0	1	1	0	0	0	0	-----	S2 S1O
0	1	1	0	0	0	1	S2O	S2 S1O
0	1	1	0	0	1	0	S1O	S2 S1O
0	1	1	0	0	1	1	OK	OK
0	1	1	0	1	0	0	S2	S2 S1O
0	1	1	0	1	0	1	S2 S2O	S2 S1O
0	1	1	0	1	1	0	OK	OK
0	1	1	0	1	1	1	S2 S1O S2O	S2 S1O
0	1	1	1	0	0	0	S1	S2 S1O
0	1	1	1	0	0	1	OK	OK
0	1	1	1	0	1	0	S1 S1O	S2 S1O
0	1	1	1	0	1	1	S1 S1O S2O	S2 S1O
0	1	1	1	1	0	0	S1 S2	S2 S1O
0	1	1	1	1	0	1	S1 S2 S2O	S2 S1O
0	1	1	1	1	1	0	S1 S2 S1O	S2 S1O
0	1	1	1	1	1	1	S1 S2 S1O S2O	S2 S1O
1	0	0	0	0	0	0	-----	S1 S2O
1	0	0	0	0	0	1	S2O	S1 S2O
1	0	0	0	0	1	0	S1O	S1 S2O
1	0	0	0	0	1	1	OK	OK
1	0	0	0	1	0	0	S2	S1 S2O
1	0	0	0	1	0	1	S2 S2O	S1 S2O
1	0	0	0	1	1	0	OK	OK
1	0	0	0	1	1	1	S2 S1O S2O	S1 S2O
1	0	0	1	0	0	0	S1	S1 S2O
1	0	0	1	0	0	1	OK	OK
1	0	0	1	0	1	0	S1 S1O	S1 S2O
1	0	0	1	0	1	1	S1 S1O S2O	S1 S2O
1	0	0	1	1	0	0	S1 S2	S1 S2O
1	0	0	1	1	0	1	S1 S2 S2O	S1 S2O
1	0	0	1	1	1	0	S1 S2 S1O	S1 S2O
1	0	0	1	1	1	1	S1 S2 S1O S2O	S1 S2O

S1 preferred	S1 OK	S2 OK	S1 closed signal	S2 closed signal	S1 open signal	S2 open signal	Actual	Expected
1	0	1	0	0	0	0	-----	S2 S1O
1	0	1	0	0	0	1	S2O	S2 S1O
1	0	1	0	0	1	0	S1O	S2 S1O
1	0	1	0	0	1	1	OK	OK
1	0	1	0	1	0	0	S2	S2 S1O
1	0	1	0	1	0	1	S2 S2O	S2 S1O
1	0	1	0	1	1	0	OK	OK
1	0	1	0	1	1	1	S2 S1O S2O	S2 S1O
1	0	1	1	0	0	0	S1	S2 S1O
1	0	1	1	0	0	1	OK	OK
1	0	1	1	0	1	0	S1 S1O	S2 S1O
1	0	1	1	0	1	1	S1 S1O S2O	S2 S1O
1	0	1	1	1	0	0	S1 S2	S2 S1O
1	0	1	1	1	0	1	S1 S2 S2O	S2 S1O
1	0	1	1	1	1	0	S1 S2 S1O	S2 S1O
1	0	1	1	1	1	1	S1 S2 S1O S2O	S2 S1O
1	1	0	0	0	0	0	-----	S1 S2O
1	1	0	0	0	0	1	S2O	S1 S2O
1	1	0	0	0	1	0	S1O	S1 S2O
1	1	0	0	0	1	1	OK	OK
1	1	0	0	1	0	0	S2	S1 S2O
1	1	0	0	1	0	1	S2 S2O	S1 S2O
1	1	0	0	1	1	0	OK	OK
1	1	0	0	1	1	1	S2 S1O S2O	S1 S2O
1	1	0	1	0	0	0	S1	S1 S2O
1	1	0	1	0	0	1	OK	OK
1	1	0	1	0	1	0	S1 S1O	S1 S2O
1	1	0	1	0	1	1	S1 S1O S2O	S1 S2O
1	1	0	1	1	0	0	S1 S2	S1 S2O
1	1	0	1	1	0	1	S1 S2 S2O	S1 S2O
1	1	0	1	1	1	0	S1 S2 S1O	S1 S2O
1	1	0	1	1	1	1	S1 S2 S1O S2O	S1 S2O
1	1	1	0	0	0	0	-----	S1 S2O
1	1	1	0	0	0	1	S2O	S1 S2O
1	1	1	0	0	1	0	S1O	S1 S2O
1	1	1	0	0	1	1	OK	OK
1	1	1	0	1	0	0	S2	S1 S2O
1	1	1	0	1	0	1	S2 S2O	S1 S2O
1	1	1	0	1	1	0	OK	OK
1	1	1	0	1	1	1	S2 S1O S2O	S1 S2O
1	1	1	1	0	0	0	S1	S1 S2O
1	1	1	1	0	0	1	OK	OK
1	1	1	1	0	1	0	S1 S1O	S1 S2O
1	1	1	1	0	1	1	S1 S1O S2O	S1 S2O
1	1	1	1	1	0	0	S1 S2	S1 S2O
1	1	1	1	1	0	1	S1 S2 S2O	S1 S2O
1	1	1	1	1	1	0	S1 S2 S1O	S1 S2O
1	1	1	1	1	1	1	S1 S2 S1O S2O	S1 S2O

Table 3-3: Limit switch monitoring - truth table for "Open" limit switch with "Open" replies

Chapter 4.
Configuration

This chapter provides information "how to configure the unit via the LC display" as well as the description of all parameters that may be changed without a password. If you have the correct passwords to access all code levels in order configure the unit, refer to manual 37386 for a description of all parameters, their setting range, and their influence to the operation of the unit.

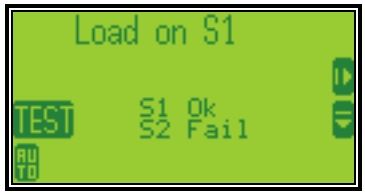
Structure of the Parameters

The parameters, which may be accessed in code level 0 (no access restrictions) are structured as follows (refer to the Parameters section on page 25 for a more detailed description):

Main Menu

- Language
  - English
  - German
- Password
- Change display contrast
- Configure monitoring
  - Time until horn reset
- System parameter
  - Password system
    - Code level display
    - Code level CAN port
    - Code level serial port / DPC
    - Password
    - Password CAN
    - Password DPC
    - Factory settings
  - Set clock
    - Hour
    - Minute
    - Second
    - Day
    - Month
    - Year
  - Version

Access configuration menus



By pressing the softkey, the main menu will be displayed to permit configuration of the control unit.

Softkeys "Configuration - select parameter"

Navigation through the parameters is carried out using the softkeys and . To edit the selected parameter press . To save the edited parameter press . To exit the parameter without saving any changes press .

Return to the Main Screen/exit parameter without saving changes ("Escape")

Navigate ..... Pressing the softkey will return the operator to the main display screen that shows monitored parameters. If the operator is configuring the control unit, this will return the user to the previous screen displayed.

Edit ..... I If it is desired to exit a parameter without saving changes made there, press the softkey and the user will be returned to the previous screen.

Next parameter

Navigate ..... This softkey permits the user to navigate down through the parameters. Only the parameters assigned by the active password will be displayed. The parameters that may be viewed without a password are described later in this manual.

Previous parameter/increase/change function

Navigate ..... This softkey permits the user to navigate upwards through the parameters.

Edit ..... If the desired parameter has been selected by pressing the softkey, and the cursor has been moved to the appropriate position via the softkey, the value of the digit may be increased by one using the softkey. If the digit has reached the highest numeral permitted for the placeholder, the unit will return to the lowest digit by pressing the softkey again.

Select parameter/input confirmation ("Enter")

Navigate ..... A highlighted parameter may be enter into for configuration by pressing the softkey. This permits the changing of the configured value within the parameter.

Edit ..... Any value that has been changed within a parameter is changed and stored in the unit memory by pressing the softkey.

Next digit of the selected parameter

If the parameter has a numeric value (i.e. the password) that is to be changed, the digits must be changed individually. The softkey permits navigation to each cursor position of the number to be changed. See the softkey symbols for an explanation of how to change the digit.

Parameters

NOTE

A description of all parameters, which may be edited/configured via the display, are described in manual 37386.

Language

EN DE
Language
Language

Change language **{Language}**

{Language}..The selection of a language will affect the following text in the control unit:

- Text in the operating field which are not defined by an input (i.e. discrete inputs may be a user-defined text)
- The alarm list text
- All parameters which may be changed via the unit panel

Password

EN GR
Password
Passwort

Password for access via the unit panel **0000 to 9999**

A password must be entered to permit configuration of the unit via the unit panel. If a password is not entered only the displayed parameters may be edited. All other parameters and a description of their functions may be found in the manual 37386.

Display Contrast

EN GR
Change display contrast
Displaykontrast ändern

Change display contrast **+ / -**

In parameter "Change display contrast" the display contrast may be increased or decrease using these softkey characters.

+.....Increase the display contrast.
-.....Decrease the display contrast.
8.....Performs a lamp test.

Deactivate Horn

EN GR
Time until horn reset
Zeit Hupenreset

Self acknowledgement of the horn signal **0 to 1.000 s**

A horn signal is issued and the alarm LED flashes when a fault condition occurs. This signal will be disabled when the configured time expires. This is the maximum time, for which a horn signal is active (it will also be deactivated if it is acknowledged before). If this parameter is configured to 0, the horn will remain active until it will be aconowledged.

Code Levels

GR EN **Code level display**
GR **Codeebene Display**

Code level via display **Info**

This value displays the code level that is currently active for access via the front panel.

GR EN **Code level CAN port**
GR **Codeebene CAN Schnittstel.**

Password CAN-Bus **Info**

This value displays the code level that is currently active for access via the CAN bus.

GR EN **Code level serial port / DPC**
GR **Codebene serielle Schnittstel**

Code level RS-232 (DPC interface) **Info**

This value displays the code level that is currently active for access via the serial RS-232 (DPC) interface.

Password

GR EN **Password**
GR **Passwort**

Password for access via the unit panel **0000 to 9999**

A password must be entered to permit configuration of the unit via the unit panel. If a password is not entered only the displayed parameters may be edited. All other parameters and a description of their functions may be found in the manual 37386.

GR EN **Password CAN**
GR **Passwort CAN**

Password for access via CAN **0000 to 9999**

A password must be entered to permit configuration of the unit via the CAN bus. If a password is not entered only the displayed parameters may be edited. All other parameters and a description of their functions may be found in the manual 37386.

GR EN **Password DPC**
GR **Passwort RS232**

Password for access via DPC **0000 to 9999**

A password must be entered to permit configuration of the unit via the DPC interface. If a password is not entered only the displayed parameters may be edited. All other parameters and a description of their functions may be found in the manual 37386.

Factory (Default) Values

GR EN **Factory settings**
GR **Werkseinstellung**

Factory setting **YES/NO**

The factory settings (default values) may be loaded. Select YES to enable the following screen to be displayed. It is possible to load the factory settings (default values) for all displayed parameters.

GR EN **Set default values**
GR **Standardwerte**

Set default values **YES/NO**

Entering YES overwrites the current configured values with the default values. Only those parameters will be reset, which are permitted to change in the selected code level.

Real-Time Clock - Time

GR EN
Hour
Stunden

Adjust clock time: hour **0 to 23**

The hour of the current time is set here. Example:
0.....0th hour of the day.
23.....23rd hour of the day.

GR EN
Minute
Minuten

Adjust clock time: minute **0 to 59**

The minute of the current time is set here. Example:
0.....0th minute of the hour.
59.....59th minute of the hour.

GR EN
Second
Sekunden

Adjust clock time: second **0 to 59**

The second of the current time is set here. Example:
0.....0th second of the minute.
59.....59th second of the minute.

Real-Time Clock - Date

GR EN
Day
Tag

Adjust date: day **1 to 31**

The day of the current date is set here. Example:
1.....1st day of the month.
31.....31st day of the month.

GR EN
Month
Monat

Adjust date: month **1 to 12**

The month of the current date is set here. Example:
1.....1st month of the year.
12.....12th month of the year.

GR EN
Year
Jahr

Adjust date: year **0 to 99**

The year of the current date is set here. Example:
0.....Year 2000.
99.....Year 2099.

Version

GR EN
Version
Version

Displays system information **Info**

System information, like serial number of the unit and software version is displayed.

Appendix A. Messages

Timer / Operation States

The following table indicates the display messages of the various timers and operations states:

Display text	Description	Corresponding timer parameter	Note
S1 Start delay	Source 2 has failed, and now the S1 start delay timer is running.	"S1 start delay time"	Gen-Gen mode only
S2 Start delay	Source 1 has failed, and now the S2 start delay timer is running.	"S2 start delay time"	Util-Gen and Gen-Gen mode only
S1 Stable timer	The transfer from Source 2 to Source 1 is delayed, to permit stabilization of Source 1 before a re-transfer is made. If Source2 fails during timing, a re-transfer to Source 1 will be performed immediately.	"S1 Source Stable time"	
S2 Stable timer	The transfer from Source 1 to Source 2 is delayed, to permit stabilization of Source 2 before a transfer is made.	"S2 Source Stable time"	
S1 Cooldown	Engine runs unloaded, after a retransfer to Source 2 has been made. This is to ensure that engine 1 has enough time to cool down.	"S1 cooldown time"	Only for Gen-Gen applications
S2 Cooldown	Engine runs unloaded, after a retransfer to Source 1 has been made. This is to ensure that engine 2 has enough time to cool down.	"S2 cooldown time"	Util-Gen and Gen-Gen mode only
Load on S1	Source 1 is connected to the load.	-	
Starting S2	Engine 2 is being started.	"S2 Start fail delay time"	
Load on S2	Source 1 has failed, and Source 2 is powering the load.	-	
Load test	The ATS system is in "Load test" mode . A Source 1 failure is simulated (The ATS controllers behaves in the same way like an Source 1 failure has been occurred).	Load test activation either via "Load test" Softkey or via "Load Test - Logicsmanager"	
No load test	The ATS system is in "No load Test" mode. This means, that the engine runs unloaded, and no transfers will take place. This test mode is used to check whether the engine is started or not.	No load test activation either via "Engine test" Softkey or via "No Load Test - Logicsmanager"	
Elevator signal	The Elevator pre-signal timer is running. This message only occurs, if the "Elevator pre-signal" feature is activated and BOTH sources are available. If only one source is available (like in an emergency case) the elevator pre-signal timer will automatically be bypassed.	Elevator pre-signal duration	
Starting S1	Engine 1 is being started.	"S1 Start fail delay time"	Only for Gen-Gen applications
Wait S1 to open	A command is issued by the ATS Controller to open the ATS switch from Source 1 position	"Limit switch reply timeout"	
Wait S2 to open	A command is issued by the ATS Controller to open the ATS switch from Source 2 position	"Limit switch reply timeout"	
Wait S1 to close	A command is issued by the ATS Controller to close the ATS switch into Source 1 position	"Limit switch reply timeout"	
Wait S2 to close	A command is issued by the ATS Controller to close the ATS switch into Source 2 position	"Limit switch reply timeout"	
Rem. peak shave	"Remote peak shave" mode is active	Remote peak shave activation via "Remote peak shave - Logicsmanager"	
Motor Load Disc.	The Motor Load Disconnect timer is running. This message only occurs, if the "Motor load disconnect" feature is activated.	"Disconnect time S1" and/or "Disconnect time S2"	
Inhib. XFR to S1	A transfer to Source 1 is inhibited although Source 1 is available. In the case of an Source 2 failure, a transfer to Source 1 takes place, even the transfer is inhibited	"Inhibit transfer to Source 1" activation via "Inhib. XFR to Source 1 - Logicsmanager"	

Display text	Description	Corresponding timer parameter	Note
Inhib. XFR to S2	A transfer to Source 2 is inhibited although Source 2 is available. In the case of an Source 1 failure, a transfer to Source 2 takes place, even the transfer is inhibited.	"Inhibit transfer to Source 2" activation via "Inhib. XFR to Source 2 - Logicsmanager"	
Load Shed active	Load shed is active	-	
Pwr. rate. prov.	"Interruptible power rate provisions" mode is active	"Interruptible power rate provisions" activation via "Int. Power Rates - Logicsmanager"	
ATS inhibit	The ATS Controller is in "Inhibit mode". No transfers take place if the ATS controller is set into this mode.	"ATS inhibit" activation via "Inhibit ATS - Logicsmanager"	
Neutral S1→S2	The ATS controller delays the transfer from NEUTRAL position to Source 2 position.	Neutral time S1→S2	Only available if Transition mode "Delayed" or "Closed" is selected.
Neutral S1←S2	The ATS controller delays the transfer from NEUTRAL position to Source 1 position.	Neutral time S2→S1	Only available if Transition mode "Delayed" or "Closed" is selected.
In-Phase Check	The ATS controller performs an In-Phase check before a transfer is made. This message only occurs, if the "In-phase monitor" feature is activated.	-	
Transfer pause	The ATS controller delays the next transfer attempt.	"Wait time until next XFR attempt"	

Table 4-1: Timer / operation states - display

Alarm Messages

Message in LeoPC1 Message in the display	Meaning
Batt.overvolt. Lev.1 **Batt.overvolt.1**	**Battery overvoltage, limit value 1** The battery voltage has exceeded the limit value 1 for battery overvoltage for at least the configured time and did not fall below the value of the hysteresis. Additionally, the alarm has not been acknowledged (unless the "Self acknowledgement" is configured YES).
Batt.overvolt. Lev.2 **Batt.overvolt.2**	**Battery overvoltage, limit value 2** The battery voltage has exceeded the limit value 2 for battery overvoltage for at least the configured time and did not fall below the value of the hysteresis. Additionally, the alarm has not been acknowledged (unless the "Self acknowledgement" is configured YES).
Batt.undervolt. Lev.1 **Batt.undervolt.1**	**Battery undervoltage, limit value 1** The battery voltage has fallen below the limit value 1 for battery undervoltage for at least the configured time and has not exceeded the value of the hysteresis. Additionally, the alarm has not been acknowledged (unless the "Self acknowledgement" is configured YES).
Batt.undervolt. Lev.2 **Batt.undervolt.2**	**Battery undervoltage, limit value 2** The battery voltage has fallen below the limit value 2 for battery undervoltage for at least the configured time and has not exceeded the value of the hysteresis. Additionally, the alarm has not been acknowledged (unless the "Self acknowledgement" is configured YES).
CAN Open Fault **CAN Open Fault**	**Interface alarm CAN Open** The communication with external expansion boards via the CAN Open interface has been interrupted and no data can be transmitted or received over the bus. Additionally, the alarm has not been acknowledged (unless the "Self acknowledgement" is configured YES).
Fail to close S1	**Switch failed to close to source 1** The ATS controller has issued a "close" command to close the transfer switch to source 1 position, but did not receive any feedback from the limit switch reply "SN" at DI 1 (terminal 51) within the configured time.
Fail to close S2	**Switch failed to close to source 2** The ATS controller has issued a "close" command to close the transfer switch to source 2 position, but did not receive any feedback from the limit switch reply "SE" at DI 2 (terminal 52) within the configured time.
Fail to open S1	**Switch failed to open from source 1** The ATS controller has issued an "open" command to open the transfer switch from source 1 position, but did not receive any feedback from the limit switch reply "SNO" at DI 5 (terminal 55) within the configured time.
Fail to open S2	**Switch failed to open from source 2** The ATS controller has issued an "open" command to open the transfer switch from source 2 position, but did not receive any feedback from the limit switch reply "SNE" at DI 4 (terminal 54) within the configured time.
Overcurrent Lev.1	**Overcurrent, limit value 1** The generator current has exceeded the limit value 1 for the generator overcurrent for at least the configured time and did not fall below the value of the hysteresis. Additionally, the alarm has not been acknowledged (unless the "Self acknowledgement" is configured YES).
Overcurrent Lev.2	**Overcurrent, limit value 2** The generator current has exceeded the limit value 2 for the generator overcurrent for at least the configured time and did not fall below the value of the hysteresis. Additionally, the alarm has not been acknowledged (unless the "Self acknowledgement" is configured YES).
Overcurrent Lev.3	**Overcurrent, limit value 3** The generator current has exceeded the limit value 3 for the generator overcurrent for at least the configured time and did not fall below the value of the hysteresis. Additionally, the alarm has not been acknowledged (unless the "Self acknowledgement" is configured YES).
Gen.overload Lev.1	**Overload, limit value 1** The generator power has exceeded the limit value 1 for generator overload for at least the configured time and did not fall below the value of the hysteresis. Additionally, the alarm has not been acknowledged (unless the "Self acknowledgement" is configured YES).
Gen.overload Lev.2	**Overload, limit value 1** The generator power has exceeded the limit value 1 for generator overload for at least the configured time and did not fall below the value of the hysteresis. Additionally, the alarm has not been acknowledged (unless the "Self acknowledgement" is configured YES).

Message in LeoPC1 Message in the display	Meaning
In-phase timeout	**Inphase timer has expired** If inphase monitoring is enabled and the unit was not able to detect a synchronicity between source 1 and source 2 within the configured time, this message will be displayed.
Mechanical fail	**Mechanical failure occurred** The limit switch reply evaluation system has recognized an irregular state of the limit switches from the transfer switch. The screen gives detailed information about the ACTUAL reply signals, and the EXPECTED reply signals. Once the Actual reply signals meet the same state than the expected ones, the mechanical failure will acknowledge itself and records an entry in the event history.
Overlap timeout	**Switch was unable to open from overlap position** The limit switch reply evaluation system has recognized an irregular state of the limit switches from the transfer switch. It was not possible to open the transfer switch from both sources.
S1 phase rot.mis.	**Source 1 phase rotation miswired** If source 1 phase rotation monitoring is enabled and a miswired phase rotation has been detected, this message will be displayed.
S2 phase rot.mis.	**Source 2 phase rotation miswired** If source 2 phase rotation monitoring is enabled and a miswired phase rotation has been detected, this message will be displayed.
Start fail S1	**Source 1 could not be started** Genset 1 could not be started. This is only valid if the application mode is configured to "Gen-Gen".
Start fail S2	**Source 2 could not be started** Genset 2 could not be started.
Un. stop S1	**Genset 1 has stopped unintentionally** An unintended stop of genset 1 has occurred (possibly due to a fuel shortage or a general problem with the engine). This is only valid if the application mode is configured to "Gen-Gen".
Un. stop S2	**Genset 2 has stopped unintentionally** An unintended stop of genset 2 has occurred (possibly due to a fuel shortage or a general problem with the engine).

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Please include the manual number from the front cover of this publication.

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2007/12/Stuttgart