ORBIT
MOTION SYSTEMS

125 Broadcommon Road
Bristol RI 02809
401-213-3320
www.orbitmotionsystems.com

Elau Error Codes

1	0xx "Messages" diagnostic messages
15	1xx "Drives" diagnostic
40	2xx “Object managing”
45	3xx “General” diagnosis messages
57	4xx “IEC-Task” diagnosis messages
59	5xx “SERCOS / realtime” diagnosis messages
67	6xx "master encoder" diagnosis messages
69	7xx "field buses and expansion module" diagnosis messages
88	8xx "System" diagnosis messages
92	9xx "Software" diagnosis messages

001 Diagnosis acknowledgement

A diagnostic message was acknowledged.

The "001 diagnosis acknowledgement" message is always entered in the message logger even if the diagnosis class (see 8.2 The Notion of 'Diagnosis Classes') of the message was set to 9 using the DiagConfigSet() function.

002 PacController boot started

The PacDrive controller was restarted.

In V00.15.00 or higher, the firmware version is shown in the ext. diagnosis in the message logger (e.g. FW V00.15.00).

003 PacController boot finished

The startup procedure for the PacDrive controller is complete.

In V00.15.00 or higher, the kernel version is shown in the ext. diagnosis in the message logger (e.g. V00.02.05 MAx4).

004 IEC program started

The IEC program in the PacDrive controller was restarted.

005 automatic program start active

The autom. program start of the IEC program is active in the PacDrive controller.

006 IEC program stopped

The IEC program in the PacDrive controller was stopped.

007 login

A login to the PacDrive controller was performed. The application that performed the login (e.g. EPAS-4) is shown in the extended diagnosis.

008 logout

A logout from the PacDrive controller was performed. The application that performed the logout (e.g. EPAS-4) is displayed in the extended diagnosis.

009 IEC program reset

A program reset was triggered with EPAS-4.

010 write file

File transfer via communication server. The file name is displayed in DiagExtCode.

011 connect to WEBS

Connecting to webserver.

012 disconnect from WEBS

Disconnecting from webserver.

013 connect to TCP/IP server

Connecting to communication server of PacDrive controller.

014 disconnect from TCP/IP server

Disconnecting from communication server of PacDrive controller.

015 filesystem <ide0:> repaired

Error in filesystem detected and corrected.

CAUTION
The filesystem is consistent again. This may also mean that files have been deleted.

016 system reset

warm start

017 CanOpen emergency message reset

A CANopen node has sent a CANopen emergency message reset to the bus.

Meaning of ext. diagnosis:
The system displays the node address, the error code and the error register.

Structure: Nxxx Cxxxx Rxx

N node address decimal CANopen node address

C error code hexadecimal CANopen error code

R error register hexadecimal CANopen error register.

018 CanOpen node guarding error resolved

A CANopen node has sent a CANopen emergency message reset to the bus.
Function DiagQuit()

Meaning of ext. diagnosis:
The system displays the node address, the error code and the error register.

Structure: Nxxx Cxxxx Rxx

N node address decimal CANopen node address

C error code hexadecimal CANopen error code

R error register hexadecimal CANopen error register.

019 CanOpen node-specific error info

A CANopen node has sent an emergency message to the bus. This diagnosis message is always sent with the 754 "CanOpen emergency message" (see 8.6.8.30 754 CanOpen emergency message)diagnosis message. It contains manufacturer-specific error data. This data consists of 5 byte values.

Meaning of ext. diagnosis:

Structure: b1 b2 b3 b4 b5

b1-b5 hexadecimal date

020 IEC cycle check changed

The CycleCheckSet() function was used to enable/disable the cycle check. TRUE or FALSE is displayed in DiagExtCode.

021 IEC cycle check values are changed

The CycleCheckSet() function was used to change the times for monitoring single and excessive cycles time overruns. The file name is displayed in DiagExtCode.

022 Calling SetTaskPriority()

The SetTaskPriority() function has been called up.

023 system shutdown

SysShutdown is used via:

- IEC function: SysShutdown()
- UPS shutdown

DiagExtMsg: Windows

If Windows XP is shut down while the real-time system is running, then the message in the P600 PacDrive controller may have other causes:

- Supply voltage is 0V => UPS shuts P600 down
- The startup procedure for the PacDrive controller is complete.

Up to version V00.16.xx diagnosis message 8016 “System reset” was set.

024 modem connected

Successful connection through a modem.

025 modem disconnected

Disconnection via a modem.

026 user exception

The function SysUserCallStack() caused an entry in the message logger. The value the function delivers is available in “Ext. Diagnosis” in the message logger. The message logger call hierarchy function can be used to "backtrace" the function block call or nesting.

027 open write file

028 close write file

029 UPS ok

UPS monitoring reported "UPS ok" (State = 1).

030 UPS active, no power

UPS monitoring reports that no power is available (State = 3).

031 UPS power ok

UPS monitoring reports that power is available.

032 Begin saving retainarea

At shutdown, via UPS monitoring, saving retain area was started.

033 Retainarea saved

At shutdown, via UPS monitoring, saving retain area was terminated.

034 IEC-tasks terminated

At shutdown, via UPS monitoring, the IEC tasks were terminated.

035 UPS active - system shutdown started

At shutdown, via UPS monitoring, the O_OffValue output was set to switch off the UPS.

036 Rebooting started

At shutdown, via UPS monitoring, the power supply of the PacDrive controller was found to be OK. A reboot of the PacDrive controller was initiated.

037 Battery low

The battery power is below the minimum permitted value.

- The battery voltage is too low.

- ► Change the battery for the PacNet optional module PN-4.

038 Power fail

- ▪ A power failure has occurred at the NvRam and the real-time clock (RTC). The NvRam has been deleted and the system time is incorrect.
- ▪ The system was shut off for too long and the battery power is too low (see 8.6.1.37 037 Battery low).
- ► Retain range and reinitialize clock.
- ► Change the battery for the PacNet optional module PN-4.

039 file removed

Filter type 13 “extended system messages”

The system has deleted a file. Deletion is triggered when, for example, there is a symbol file that does not match the program file.
The file name is shown in **Ext. Diagnosis**.

040 file copied

The system copied a file. The "Boot.sbd" symbol file is copied to "Download.sbd" when, for example, Online-Change is executed without downloading a program and the system is reset (boot procedure).

041 file renamed

The system renamed a file.

042 SERCOS phase changed

A SERCOS phase change has occurred. The message logger Ext. diagnosis, the new phase is displayed (e.g. Phase=4).

DiagExtCode	Meaning
Phase=0	Phase change after Phase 0
Phase=1	Phase change after Phase 1
Phase=1/4MBd	Tells you the baud rate in V00.24.00 and higher
Phase=1/xxx	Internal error xxx during phase change after phase 1
Phase=2	Phase change after Phase 2
Phase=2/L=25%	Tells you the SERCOS cycle load in percent in V00.22.00 and higher
Phase=2/xxx	Internal error xxx during phase change after phase 2
Phase=3	Phase change after Phase 3
Phase=3/2ms	Tells you the SERCOS cycle time in V00.24.00 and higher
Phase=3/xxx	Internal error xxx during phase change after phase 3
Phase=4	Phase change after Phase 4
Phase=4/xxx	Internal error xxx during phase change after phase 4
Phase=5	Phase change after Phase 5
Phase=5/xxx	Internal error xxx during phase change after phase 5

Table 8-3: Possible values for DiagExtCode for diagnostic message 042 "SERCOS phase change"

"Phase=<Phase number>/<internal error number>":

- An error occurred when the phase changed.
- ► Check the message logger for other SERCOS diagnostic messages.
- ► Note the description of these diagnostic messages.

"Phase=1/-<internal error number>":

- SCL-055 motors are connected to the PacDrive controller. The connection of the SCL-055 motors in the PacDrive PD-8 box is not correct.
- ► Check the connection of the SCL-055 motors in the PacDrive PD-8 box. Simply placing jumpers on the desired terminals will not resolve the problem. No nodes to be plugged into the following SERCOS plug-in position.
- ► Observe also the information outlined in the "SCL" and "PS-4 and PD-8" operating manuals.

043 Detect SERCOS configuration

The SERCOS configuration is being detected. During the detection a scan is processed.

Ext. diagnosis	Meaning
Start	Configuration scanning started.
Position	The physical address of the instance in the SERCOS loop and the device type is shown (e.g. instance "SLAVE1" Pos=03,Type=MC4). If the device type cannot be determined, then "Type=yyy" is eliminated. In controller version 00.23.00 or lower, the device type is not displayed.
End	Configuration scanning stopped.
No slaves	No SERCOS slaves found.
Duplicate	There are several devices with the same address in the SERCOS loop. The additional "xxx" indicates the loop position in which the last device with a duplicate address was found.

Table 8-4: Meaning of ext. diagnosis:

044 SERCOS firmware download

A firmware download is being executed from the PacDrive controller to a SERCOS bus slave.

The message logger Ext. diagnosis shows the following values:

- DL start -> Firmware download started
- Dl x OK -> Successful firmware download to slave x (x is the RealTimeBusAdr)

045 error by writing in file

An error has occurred while writing in a file.

- Insufficient memory space.
- ► Check to see that memory capacity is sufficient (parameter RamDiskFree, Diskfree).
- ► Increase the RamDiskSize.
  (the default size has been increased from 128 kBytes to 1 MByte in V00.16.10 and higher).
- An attempt was made to write a trace file to the RAM disk (“ram0”).

► Increase the RamDiskSize.
(the default size has been increased from 128 kBytes to 1 MByte in V00.16.10 and higher).

046 FPGA firmware download

This diagnosis message is triggered after the FPGA (C400, C600 and P600) is programmed or an error occurs.

The various causes for this message are displayed through different external diagnosis codes. Below is a summary of all external diagnosis codes along with their causes and means of correction:

DiagExtCode: C6_xpxx.esv (z.B. C6_0301.esv) oder C6_xpxx.xsv (z.B. C6_0301.xsv)

▪ The FPGA firmware was programmed successfully. The DiagExtCode now indicates the name of the programmed FPGA file.
► -

DiagExtCode: PinOut <> "p" (e.g. PinOut <> 3)

▪ No C6_xpxx.xsv file with a matching pinout was found on the flash disk (C400 or C600) or hard disk. (P600). xpxx corresponds to the FPGA firmware version. The FPGA programming was not executed. The PinOut number "p" contained in the file name indicates the required hardware version. i.e. a certain hardware version is required for an FPGA version.
► Contact ELAU customer service to obtain the correct FPGA version for your hardware.

047 PIC firmware download

The firmware of the PIC controller (on the PacDrive controller C400, C600 or P600) is being replaced. The extended diagnosis code shows the name of the firmware file (e.g. “c6p_0510.bin”).
If an error occurs during the firmware exchange, the 826 "PCI update error" (see 8.6.9.27 826 Error During PIC FW Update)diagnosis message will be triggered.

048 BT-4 firmware download

The firmware of the **BT-4/DIO1** or **BT-4/ENC1** bus terminal is being exchanged.

In the following HW versions or higher, an automatic FW update of the connected **BT-4/DIO1** bus terminal is possible with controllers C600, C600, C-4 and P1:

- P600/C600/C400 with FPGA version x311 or higher
- C200 with FPGA version x209 or higher

Other requirements:

- Firmware file for **BT-4/DIO1**: "BD1_xxxx.ESV"
- Firmware file for **BT-4/ENC1** : "BE1_xxxx.ESV"

To execute the update, the firmware file for the **BT-4/DIO1** or **BT-4/ENC1** bus terminal must be copied to the root directory of the controller. The update will be automatically executed at the next startup.

Duration of the update Controllers C400, C600 and P600: about 1 minute / bus terminal
Controller C200: approx. 3.5 minutes / bus terminal

CAUTION
After the update, all BT-4/DIO1 or BT-4/ENC1 bus terminals must be switched off and on. A standard reset on the controller is sufficient. The update will only be executed if a bus terminal has a differing firmware version.

050 No reaction from Windows

Windows did not react within the WinWatchDog time. The control task can react to certain events in a fast task.

051 Controller type

The PacDrive controller was restarted (rebooted). Shortly before the start procedure ends, the controller type will be saved as a diagnosis message in the message logger.

Example:
Max4/FPGA/=130f/CPU=581/AX=8/RAM=32/NRAM=32/DiskS=16

CAUTION
The controller type may not be displayed in full, as the message text does not have enough characters.

052 Extended SERCOS diagnosis (MASTER)



The "extended SERCOS diagnosis (MASTER)" is no longer needed. Use **PacDrive Diagnostics** (SERCOS topology) and the RDISTCounter, RERRCounter, FIBBR-Counter, MSTLateCounter and MSTEarlyCounter parameters of the SERCOS slave devices for debugging.

As it is very difficult to get an exact SERCOS diagnosis and localize communication errors, especially when complex errors occur in pure SCL systems, the first stage for extended diagnosis functions was implemented in V00.16.30.

Operating principle

If a communication error occurs, the controller will, at specified times, record the error counter in the SERCOR memory and the pending error events (error interrupts) in the SERCOS registers.

At first, these times refer to the occurrence of the first fault as a simple cycle error. Secondly, they refer to the occurrence of a multiple cycle error, which results when simple cycle errors occur directly after each other. Finally, a recording is made directly before the controller returns to phase 0.

These recordings are displayed in the message logger. To prevent these messages from being displayed when a machine is shut down intentionally, they will be displayed with a delay of 10 seconds and then triggered at a lower priority level. If during this time the pending errors are acknowledged, the message will also be displayed without delay.

Vorraussetzungen

The following requirements must be observed when using the extended SERCOS diagnosis:

- PacDrive controller – firmware version V00.16.30 or higher
- EPAS-4 as of V 16.22 or higher (PacControl CD V16 SP3)

Operation

Activation To activate the extended SERCOS diagnosis, the Bit0 of the TestSwitch1 must be set to 1 in the PLC configuration.

The Testswitch1 may only be set in version V00.16.30 / V00.16.40 or higher. In versions above V00.16.40, expect the Testswitch to have a new purpose with different functions! The support of "Extended SERCOS diagnosis" in a newer firmware version is no longer required.

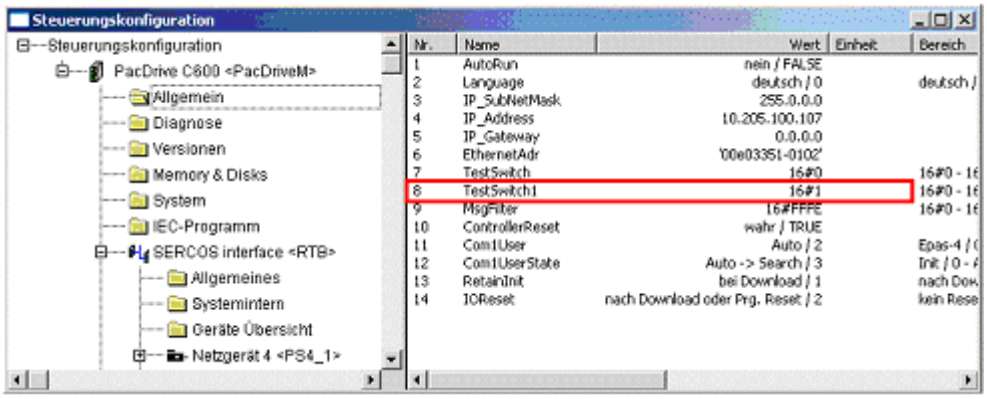
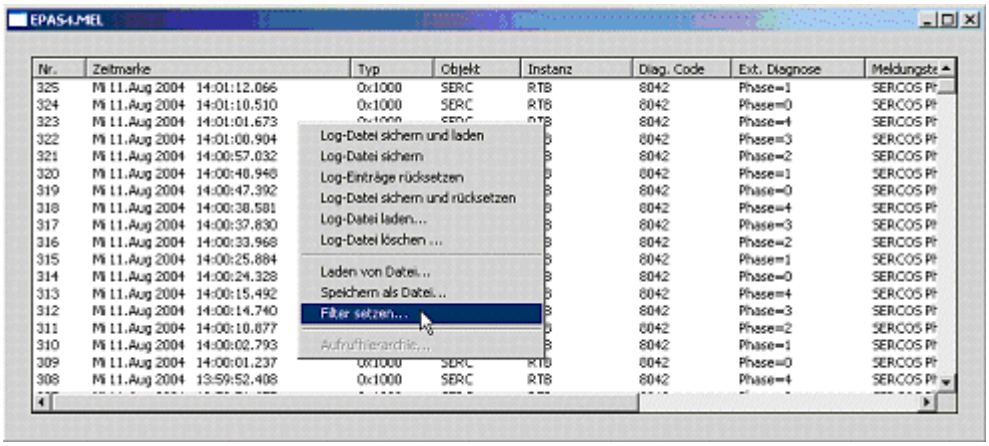


Figure 8-10: Set TestSwitch1 parameter to 1 (V00.16.30 / V00.16.40)

The display filter settings in the message logger must continue to include the 5th entry ("additional SERCOS diagnosis"):



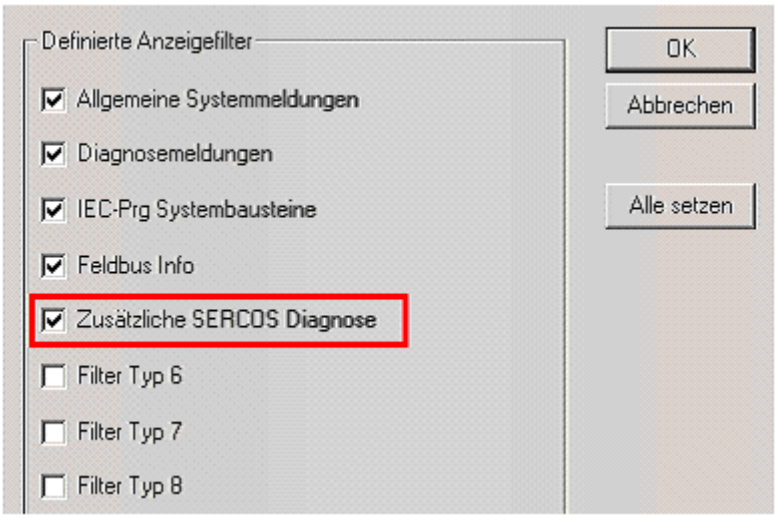


Figure 8-11: Set the filter in the message logger for "additional SERCOS diagnosis".

However, the filter settings should correspond to the basic settings in EPAS-4 V16 SP3 or higher.

Evaluation After a SERCOS cycle error occurs, entries can be found in the message logger in a way similar to the figure below:

EPAS4.MEL

Nr.	Zeitmarke	Typ	Objekt	Instanz	Diag. Code	Ext. Diagnose	Meldungstext
19	2:01.380	0x0010	SERC	RTB	8052	r=18	Erweiterte SERCOS Diagnose
18	2:01.376	0x0010	SERC	RTB	8052	R=17	Erweiterte SERCOS Diagnose
17	2:01.376	0x0010	MC_4	Axis_3	8052	nerr=0	Erweiterte SERCOS Diagnose
16	2:01.376	0x0010	MC_4	Axis_2	8052	nerr=18	Erweiterte SERCOS Diagnose
15	2:01.376	0x0010	MC_4	Axis_1	8052	nerr=0	Erweiterte SERCOS Diagnose
14	2:01.376	0x0010	SERC	RTB	8052	0:111352ms	Erweiterte SERCOS Diagnose
13	2:01.376	0x0010	SERC	RTB	8052	r=2	Erweiterte SERCOS Diagnose
12	2:01.376	0x0010	SERC	RTB	8052	R=1	Erweiterte SERCOS Diagnose
11	2:01.376	0x0010	MC_4	Axis_2	8052	nerr=2	Erweiterte SERCOS Diagnose
10	2:01.376	0x0010	SERC	RTB	8052	M:111288ms	Erweiterte SERCOS Diagnose
9	2:01.376	0x0010	SERC	RTB	8052	r=1	Erweiterte SERCOS Diagnose
8	2:01.376	0x0010	MC_4	Axis_2	8052	nerr=1	Erweiterte SERCOS Diagnose
7	2:01.376	0x0010	SERC	RTB	8052	S:111284ms	Erweiterte SERCOS Diagnose
6	1:51.372	0x1000	SERC	RTB	8042	Phase=0	SERCOS Phasenwechsel
5	1:51.288	0x0002	SERC	RTB	1506	Rr	mehrfacher SERCOS Zyklusfehler
4	1:43.356	0x1000	SERC	RTB	8042	Phase=4	SERCOS Phasenwechsel
3	1:42.912	0x1000	SERC	RTB	8042	Phase=3	SERCOS Phasenwechsel
2	1:39.140	0x1000	SERC	RTB	8042	Phase=2	SERCOS Phasenwechsel
1	1:36.564	0x1000	SERC	RTB	8042	Phase=1	SERCOS Phasenwechsel

Figure 8-12: SERCOS interface / example of a message logger when an error occurs

The usual error message for a multiple cycle error appears at the beginning of line number 6.

After line number 6, the first block of the extended SERCOS diagnosis appears (line numbers 8-10).

An info mark ("S:111284ms") appears at the beginning of this diagnosis block (here line number 7) and allows the block to be assigned a specific error message. In this case, a distinction is made between the three diagnosis situations:

S – single SERCOS cycle error (SingleCycleError)
M – multiple SERCOS cycle error (MultiCycleError)
0 – switch to phase 0

The time mark (in ms) of when the error occurred is shown in connection with this error type.

All axes whose receive error counter (nerr) has changed since the last diagnosis acknowledgement or phase startup (line number 8) are then listed. The error counter is assigned to the axis via the "Object" and "Instance" columns.



The value displayed in connection with "nerr=x" is only reset during phase startup. If more than one single SERCOS cycle error occurs during operation, the error counter will increase each time accordingly.

The remaining information refers to the error status (line no. 9). Each error status is reset during each phase startup and each error acknowledgement. This information always consists of a letter and a number ("r=1"). Each error status is reset during each phase startup and each error acknowledgement.

The meaning of the letter is the same as the letter in the ext. diagnosis messages for SERCOS cycle errors:

R – double miss of drive telegrams (RMISS)
R – double miss of the synchronous telegram (MSTMISS)
F – fiberoptic break (FIBBR)
1 – late reception of the synchronous telegram (MSTLATE)
e – early reception of the synchronous telegram (MSTEARLY)
d – receive distortion
r – single miss of a drive telegram (RERR)

Hence, the first diagnosis block would be interpreted as follows:

"Simple SERCOS cycle error at 111284 ms. A single telegram miss at the axis_2 drive was determined".

A second block follows the first block. In this case, the display of the multiple cycle error is involved, since the telegram from the axis_2 drive was missed a second time.

EPAS4.MEL

Nr.	Zeitmarke	Typ	Objekt	Instanz	Diag. Code	Ext. Diagnose	Meldungstext
19	2:01.380	0x0010	SERC	RTB	8052	r=18	Erweiterte SERCOS Diagnose
18	2:01.376	0x0010	SERC	RTB	8052	R=17	Erweiterte SERCOS Diagnose
17	2:01.376	0x0010	MC_4	Axis_3	8052	nerr=0	Erweiterte SERCOS Diagnose
16	2:01.376	0x0010	MC_4	Axis_2	8052	nerr=18	Erweiterte SERCOS Diagnose
15	2:01.376	0x0010	MC_4	Axis_1	8052	nerr=0	Erweiterte SERCOS Diagnose
14	2:01.376	0x0010	SERC	RTB	8052	0:111352ms	Erweiterte SERCOS Diagnose
13	2:01.376	0x0010	SERC	RTB	8052	r=2	Erweiterte SERCOS Diagnose
12	2:01.376	0x0010	SERC	RTB	8052	R=1	Erweiterte SERCOS Diagnose
11	2:01.376	0x0010	MC_4	Axis_2	8052	nerr=2	Erweiterte SERCOS Diagnose
10	2:01.376	0x0010	SERC	RTB	8052	M:111288ms	Erweiterte SERCOS Diagnose
9	2:01.376	0x0010	SERC	RTB	8052	r=1	Erweiterte SERCOS Diagnose
8	2:01.376	0x0010	MC_4	Axis_2	8052	nerr=1	Erweiterte SERCOS Diagnose
7	2:01.376	0x0010	SERC	RTB	8052	S:111284ms	Erweiterte SERCOS Diagnose
6	1:51.372	0x1000	SERC	RTB	8042	Phase=0	SERCOS Phasenwechsel
5	1:51.288	0x0002	SERC	RTB	1506	Rr	mehrfacher SERCOS Zyklusfehler
4	1:43.356	0x1000	SERC	RTB	8042	Phase=4	SERCOS Phasenwechsel
3	1:42.912	0x1000	SERC	RTB	8042	Phase=3	SERCOS Phasenwechsel
2	1:39.140	0x1000	SERC	RTB	8042	Phase=2	SERCOS Phasenwechsel
1	1:36.564	0x1000	SERC	RTB	8042	Phase=1	SERCOS Phasenwechsel

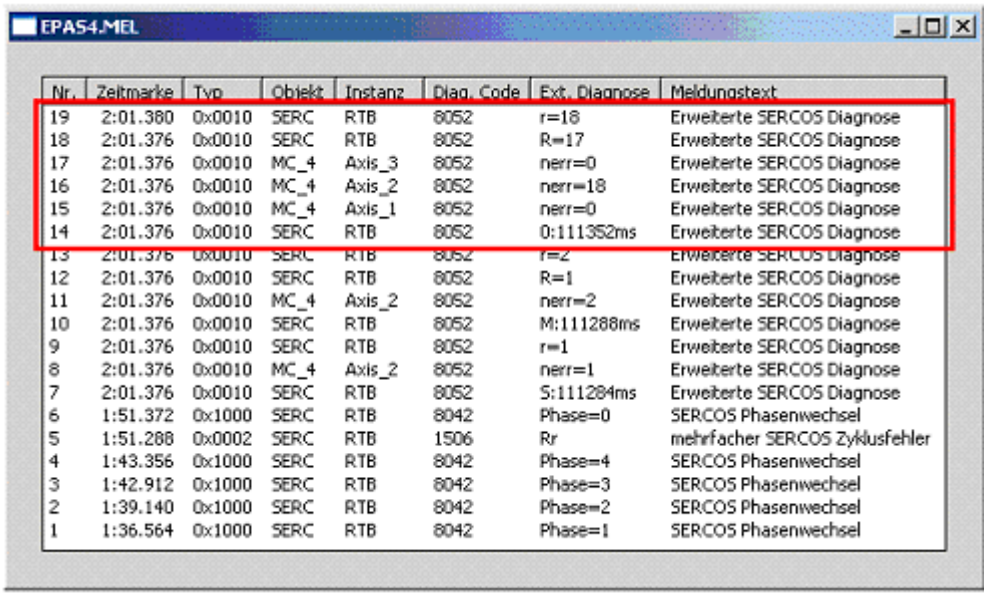
Figure 8-13: SERCOS interface / example of a message logger when an error occurs (multiple cycle error)

The multiple cycle error occurred directly in the next cycle (cycle time 4 ms) after the single cycle error and affected the axis_2 drive again. The error counter for this drive

("nerr=2") increased to 2 as did the error counter for simple cycle errors ("r=2"). The error counter for the multiple cycle error ("R=2") also increases for the first time.

The only difference between the last diagnosis block and the first two is that the error counters of all the connected drives are displayed when switching to phase 0, even for those that did not have an error ("axis_1" and "axis_3").

The time span between the multiple cycle error and the last switch to phase 0 can vary greatly and depends on a number of different factors. However, the values of 10-20 cycles are typical.



Nr.	Zeitmarke	Typ	Objekt	Instanz	Diag. Code	Ext. Diagnose	Meldungstext
19	2:01.380	0x0010	SERC	RTB	8052	r=18	Erweiterte SERCOS Diagnose
18	2:01.376	0x0010	SERC	RTB	8052	R=17	Erweiterte SERCOS Diagnose
17	2:01.376	0x0010	MC_4	Axis_3	8052	nerr=0	Erweiterte SERCOS Diagnose
16	2:01.376	0x0010	MC_4	Axis_2	8052	nerr=18	Erweiterte SERCOS Diagnose
15	2:01.376	0x0010	MC_4	Axis_1	8052	nerr=0	Erweiterte SERCOS Diagnose
14	2:01.376	0x0010	SERC	RTB	8052	0:111352ms	Erweiterte SERCOS Diagnose
13	2:01.376	0x0010	SERC	RTB	8052	r=2	Erweiterte SERCOS Diagnose
12	2:01.376	0x0010	SERC	RTB	8052	R=1	Erweiterte SERCOS Diagnose
11	2:01.376	0x0010	MC_4	Axis_2	8052	nerr=2	Erweiterte SERCOS Diagnose
10	2:01.376	0x0010	SERC	RTB	8052	M:111288ms	Erweiterte SERCOS Diagnose
9	2:01.376	0x0010	SERC	RTB	8052	r=1	Erweiterte SERCOS Diagnose
8	2:01.376	0x0010	MC_4	Axis_2	8052	nerr=1	Erweiterte SERCOS Diagnose
7	2:01.376	0x0010	SERC	RTB	8052	S:111284ms	Erweiterte SERCOS Diagnose
6	1:51.372	0x1000	SERC	RTB	8042	Phase=0	SERCOS Phasenwechsel
5	1:51.288	0x0002	SERC	RTB	1506	Rr	mehrfacher SERCOS Zyklusfehler
4	1:43.356	0x1000	SERC	RTB	8042	Phase=4	SERCOS Phasenwechsel
3	1:42.912	0x1000	SERC	RTB	8042	Phase=3	SERCOS Phasenwechsel
2	1:39.140	0x1000	SERC	RTB	8042	Phase=2	SERCOS Phasenwechsel
1	1:36.564	0x1000	SERC	RTB	8042	Phase=1	SERCOS Phasenwechsel

Figure 8-14: SERCOS interface / example of a message logger when an error occurs (switch to phase 0)

053 UPS active, overtemperature

Diagnostic class (Default): 8
Diagnosis message removed in V00.22.00 or higher (see 339 "UPS active - system temperature too high" (see 8.6.4.40 339 UPS active - system temperature too high))

The system has detected a temperature that is too high and will change the state to “System Shutdown/4” after 70 seconds.

See also:

- UPS.State parameter

054 Temperature Warning

Diagnostic class (standard): 6

The temperature in the device (C400, C600 and P600) is outside the specified range. If the temperature continues to decrease the controller may shut itself off.

DiagExtCode: Temp<5°C

The temperature in the device is less than 5°C.
The following message text appears on the display:
1st line: temperature warning
3rd line: Temp < 5°C
This message can be acknowledged.
The warning is given for PIC version (software version) 0512 and higher.

- The temperature of the surroundings decreases significantly. The switching cabinet door may be open.
- ► Check ambient temperature.
- The device will be switched on and the ambient temperature is too low.
- ► Check ambient temperature.

055 Hardware Monitoring Debug Message

Diagnostic class (standard): 8

MsgFilter: Bit 14 "Filter Type 15"

See also:

- Diagnosis message 056 “Shutdown due to supply voltage outage”
- Diagnosis message 827 “Power-Off due to hardware monitoring”

DiagMsg:

-> specific error message for debugging purposes
Structure: <last error entry> : <error group> : <cause of error>

Error groups:
- VoltageError
- TempError
- EnvError

Cause of error (VoltageError):
- V3.3 < Vmin
- V5 < Vmin
- V+12 < Vmin
- V-12 < Vmin
- Vin < Vshutd
- VAccu < Vshutd
- Vin_jit < Vshutd
- capacitance
- LTC error
- Vin > Vmax
- VAccu > Vmax
- V3.3 > Vmax
- V5 > Vmax
- V+12 > Vmax
- V-12 > Vmax
- VcpuCore<Vmin
- VcpuIO < Vmin
- VM2.5 < Vmin
- VM3.3 < Vmin
- VM5 < Vmin
- VM+12 < Vmin
- VM-12 < Vmin
- VcpuCore>Vmax
- VcpuIO > Vmax
- VM2.5 > Vmax
- VM3.3 > Vmax
- VM5 > Vmax
- VM+12 > Vmax
- VM-12 > Vmax

Cause of error (TempError):
- Vin < Vmin
- VAccu < Vmin

- TAccu < Tmin
- TLM75 < Tmin
- TCPU < Tmin
- TM1 < Tmin
- TM2 < Tmin
- TAccu > Tshutd
- TLM75 > Tshutd
- TCPU > Tshutd
- TM1 > Tshutd
- TM2 > Tshutd
- TAccu > Tmax
- TLM75 > Tmax
- TCPU > Tmax
- TM1 > Tmax
- TM2 > Tmax
- I2C bus failed
- LM75 failed

Cause of error (EnvError):
- fan1stop-shutd
- fan1stop-off
- fan2stop-shutd
- fan2stop-off
- fan3stop-shutd
- fan3stop-off

Example of message text: -1 : TempError : TLM75 > Tshutd

-> The error was in the last error entry created. It is a temperature error in which the LM75 sensor detected a temperature that is too high. The shutdown limit was exceeded, and so the system shut down after the timer ran out.

056 Shutdown due to supply voltage outage

Diagnostic class (standard): 8

MsgFilter: Bit 1 "Diagnosis Messages"

The hardware provides an internal error logger that logs all the causes for error-dependent controller deactivations. The next time the controller is started up the error logger is analyzed and the cause of the error can be output in the message logger. If the reason for the shutdown was a supply voltage outage, message 056 “Shutdown due to supply voltage outage” is output.

In addition, a more specific message is displayed (055 "Debug message cause by hardware monitor") that can be enabled by the MsgFilter Parameter through the EPAS-4 message logger. This message is intended to be a debug message and outputs the exact cause of the deactivation.

057 Online-change

Filter type 13 “extended system messages”

An online change was performed.

058 Controller synchronization

V00.22.00 and higher

General status information on controller synchronization (Encoder Network)

Ext. diagnosis	Meaning
Conf slave	The synchronization slave is configured by the synchronization master.
Start Sync	The synchronization process started.
Sync OK	The **synchronization slaves** are not synchronized with the **synchronization master**.
Data Ready	Sync. Encoder inputs are configured by the sync. encoder outputs and ready for data exchange.
Data Enable	**Sync. encoder outputs** distribute encoder data to the **sync. encoder inputs.**

059 UPS active - IEC-control task running

060 control task active on changing state

Filter type 13 “extended system messages”

The control task can react to certain events in a fast task. The UPS uses this tool to delay the shutdown of the **PacDrive Controllers**, so that certain actions defined in an application can be executed before the system is switched off.

For this purpose, an event starting the configured **monitoring task** is triggered for the following changes in the UPS state machine:

- UPS.State = 3 – UPS active – no power
- UPS.State = 4 – UPS active – system shutdown started
- UPS.State = 6 – UPS active – system temperature too high

The **060 control task active on changing state** diagnostic message is displayed if a **control task** that has been started by UPS is still active on the following UPS state changes:

- UPS.State=3 -> UPS.State=4
- UPS.State=3 -> UPS.State=6
- UPS.State=6 -> UPS.State=4

061 retain variables

1xx "Drives" diagnostic messages

100 I2T Motor

Diagnostic class (standard): 2
Reaction (see 8.3 Reactions of "drives"): B

The motor is overloaded or the power supplied to the motor is too high. The integrator (I2t parameter) has increased to 100%. The motor I2t monitoring is performed with the help of an integrator that is derived from the following equations.

$ü=I_{current}/I_{NM}$

Delta t_{at}=45s/(ü²1)

Delta t_{at}=45s/(ü²1)

$I_{current}$ = current power
I_{NM} = motor rated power (in V00.11.00 or higher, the I0M / I_{NM} characteristic curve is incorporated).
t_{at} = build up time
t_{from} = dissipation time

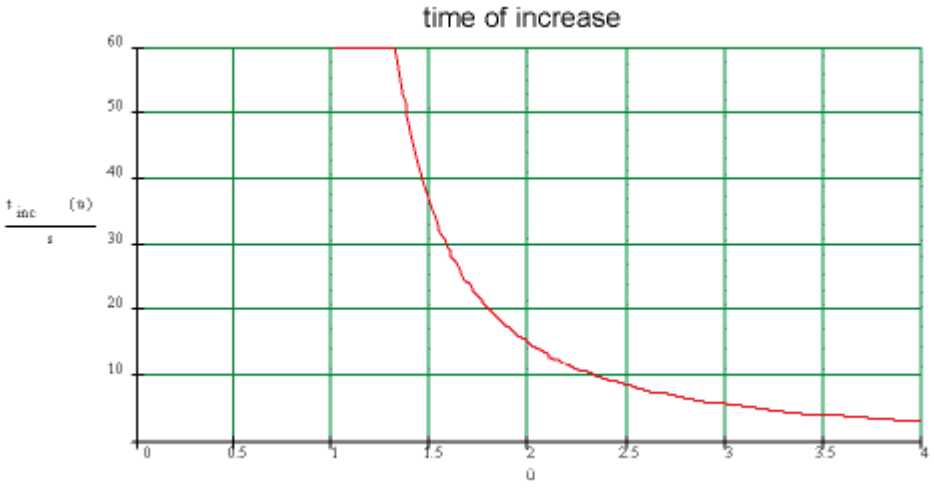


Figure 8-15: I2T motor / build up time diagnosis message

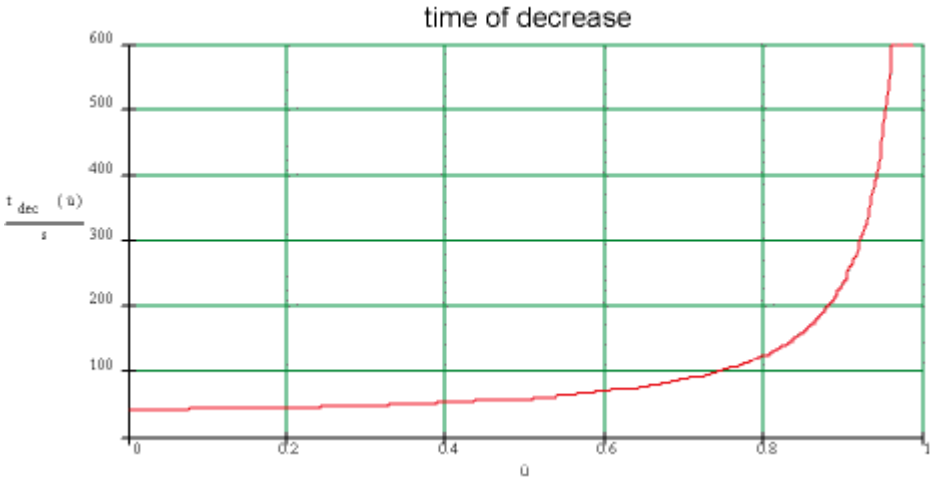


Figure 8-16: I2T motor / dissipation time diagnosis message

- The holding brake is not released (cable break, power outside the 24 V +/- 10% range).
- ▸ Check the brake and the wiring.
- The lubrication system is defective.
- ▸ Check lubrication.
- Blunt tool.
- ▸ Check/replace the tool.
- The motor is vibrating.
- ▸ Check the controller parameters.
- The shutdown limit was exceeded, and so the system shut down after the timer ran out.

- ► Check drive sizing and weight distribution.
- ► Drive/accelerate the system at a slower speed.

- ▪ The motor is de-magnetized.
- ► Replace the motor.

101 Amplifier – power off due to overtemperature

Diagnostic class (standard): 2
Reaction (see 8.3 Reactions of "drives"): B

The cooling element of the PacDrive servo amplifier is too hot.

- ▪ Insufficient ventilation or ambient temperature too high.
- ► Check device fans and ventilation slots (if available).
- ► Check ventilation in switching cabinet.
- ► If installed, make sure the air conditioning unit is functioning properly.

- ▪ The final stage or the power rectifier is overloaded.
- ► Check combination motor / actuator.
- ► Check calculation of motor and actuator.

- ▪ Hardware error: The temperature sensor is defective.
- ► Replace the device.

102 Motor - PowerOff due to overtemperature

Diagnostic class (standard): 2
Reaction (see 8.3 Reactions of "drives"): B

The internal motor temperature (temperature switch in the motor) is at least 2 seconds too high (approx. 130°C).

- ▪ Wiring error: The temperature switch in the motor winding is not connected properly.
- ► Check the wiring.

- ▪ Wiring error: The shielding of the motor cable is not attached properly.
- ► Check the shielded terminal on the bottom of the MC-4 servo amplifier and the terminal boxes of the SM motor.

- ▪ Holding brake not vented
- ► Release the brake.

- ▪ The motor is overloaded.
- ► Ext. diagnosis
- ► Check drive sizing.
- ► Use a larger motor for this application.

- ▪ Commutation error, i.e. the encoder is not aligned / leveled.
- ► Align / level the encoder.

- ▪ Hardware error: The temperature switch in the motor winding is defective.
- ► Replace the motor.

103 PowerOff due to cooling error

Diagnostic class (standard): 2
Reaction (see 8.3 Reactions of "drives"): B

The internal temperature of the device is too high.

In the PS-5 the fan is switched on at temperatures over 55°C and switched off again below 40°C .

- Insufficient ventilation or ambient temperature too high.
- ▶ Check device fans and ventilation slots (if available).
- ▶ Check ventilation in switching cabinet.

- Hardware error: The temperature sensor is defective.
- ▶ Replace the device.

104 PowerOff due to control voltage error

Diagnostic class (standard): 2
Reaction (see 8.3 Reactions of "drives"): B

The control voltage is incorrect.

- The control voltage is too low / a brief voltage failure of the 24 V DC has occurred.
- ▶ Check the 24 V control voltage.

105 Feedback error (track monitoring)

Diagnostic class (standard): 1
Reaction (see 8.3 Reactions of "drives"): A

A hardware encoder error has occurred. The device that triggered this error must be reset.

- Wiring error: Encoder cable at the encoder or the servo amplifier / PacDrive controller has been removed or is defective.
- ▶ Check the encoder cable and replace if necessary.
- ▶ Check the ground connection (shield).

- The encoder voltage is unavailable or incorrect.
- ▶ Check the encoder voltage.

- Hardware error: Encoder is defective.
- ▶ Replace the encoder.

106 Communication error DC controller

Diagnostic class (standard): 2
Reaction (see 8.3 Reactions of "drives"): A

An internal system error has occurred.

- EMC faults.
- ▶ Reset the PacDrive system (PacDrive controller and servo amplifier).

- Hardware error: Servo amplifier defective.
- ▶ Replace the servo amplifier.

107 Excess current

Diagnostic class (standard): 1
Reaction (see 8.3 Reactions of "drives"): A

The current through the final stage of the servo amplifier or in the DC bus of the power supply is too high. In contrast to the diagnosis messages 120 "Overload PowerOff of output stage" (see 8.6.2.21 120 Overload PowerOff of output stage) and 146 "DC bus overload" (see 8.6.2.21 120 Overload PowerOff of output stage), the device is switched off immediately after the maximum current is exceeded.

In the PS-5 diagnostic message 146 "DC bus overload" is also reported as diagnostic message 107 "excess current".

- Wiring error: The shielding of the motor cable is not attached properly.
- ► Check the wiring.

- Servo amplifier: The current controller parameters are incorrect.
- ► Check the power control parameters Curr_P_Gain, Curr_I_Gain and CurrFilter and set them to default, if necessary.

- Hardware error servo amplifier: The motor has a short circuit.
- ► Replace the motor.

- Power supplies **PS-4**/**PS-5**: Too many loads (ServoDrive **SCL**, Intelligent Servo Module **iSH**) are connected.
- ► Use an additional power supply and distribute the sinks' power supply.
- ► It may be that the existing device constellation will be sufficient by adapting the application (e.g. less acceleration).

108 Excess voltage

Diagnostic class (standard): 2
Reaction (see 8.3 Reactions of "drives"): A

The DC bus voltage is too high (for 400 V AC devices greater than 860 V DC; for 230 V AC devices greater than 430 V DC).

- Wiring error: Bleeder is not connected.
- ► Connect bleeder.

- Ventilation is inadequate or the ambient temperature is too high.
- ► Brake at a slower rate.
- ► Check the dimensioning of the bleeder.
- ► Apply additional bleeder (bleeder module **BM-4**) with 400 V AC units.

- The mains voltage is too high.
- ► Check the mains supply.

- Hardware error: Servo amplifier defective.
- ► Replace the servo amplifier.

109 Undervoltage

Diagnostic class (standard): 2
Reaction (see 8.3 Reactions of "drives"): B

The DC bus voltage is too low.

device	Thresholds
MC-4	• 480 V DC, for 400 V AC devices (less than V00.20.00: 450 V DC) • 240 V DC, for 230 V AC devices (less than V00.20.00: 225 V DC)
SCL	• 225 V DC
PS-4	• 260 V DC
iSH	• 400 V DC
PS-5	• 400 V DC

- The mains voltage is too low.
- ► Check the mains voltage (see technical data).

- If DC buses are connected in parallel, an error has occurred in a servo amplifier.
- ► Locate servo amplifier with error and eliminate error.

110 Phase error (power supply)

Diagnostic class (standard): 2
Reaction (see 8.3 Reactions of "drives"): B

Failure of one or two phases of the mains connection of the servo amplifier. 131 “Phase failure of power supply warning” (see 8.6.2.32 131 Phase failure of power supply Warning)must have been pending 10 s in advance.

- Wiring error: Not all phases are connected properly / the mains contactor is not wired properly.
- ► Check the wiring.

- External fuse has blown.
- ► Check fuses.

111 Excessive following error

Diagnostic class (standard): 2
Reaction (see 8.3 Reactions of "drives"): B

A very large following error has occurred - more than 8 times the value of the FollowingLimit.

- This error normally only occurs in conjunction with the CAM movement functions (e.g. MultiCam()).
- ► Check curve data.

- The axis should be operated at regulated speeds.
- ► Set parameter Pos_P_Gain to "0".

112 Communication error real-time bus

Diagnostic class (Default): 2
Reaction (see 8.3 Reactions of "drives"): B

The device (SERCOS slave) did not receive a valid telegram via the real-time bus (SERCOS).

CAUTION
CONNECTION TO CONTROLLER INTERRUPTED ▪ The diagnostic message 112 "Communication error real time bus" (see 8.6.2.13 112 Communication error real-time bus) is not reported in the system because the SERCOS slave cannot report the diagnosis code via the SERCOS bus to the Controller in case of an error. • In this case, diagnosis code 506 "Fatal SERCOS error (MASTER)" (see 8.6.6.7 506 Fatal SERCOS error (MASTER))is reported. **Failure to follow these instructions can result in equipment damage.**

- The intensity of the fiber optic signal from the preceding device is too low or too high.
- ► Set Intensity according to specifications.

- Hardware error: Fiber-optic conductor is defective or the signal is too weak as a result of deterioration.

- ► Increasing the intensity may solve the problem.
- ► Replace the fiber-optic conductor

- ▪ Hardware error: Device is defective
- ► Replace the device.

113 Bleeder defective

Diagnostic class (standard): 1
Reaction (see 8.3 Reactions of "drives"): A

A defect in the bleeder was detected by the device.

- ▪ Wiring: The bleeder or the feed line has a short-circuit.
- ► Check the bleeder and feed lines.

- ▪ The bleeder has a wrong size (too low ohm value).
- ► Check the bleeder sizing (also refer to the project planning guide and technical data).

- ▪ Hardware error: Bleeder defective.
- ► Measure the bleeder
- ► Replace bleeder if necessary.

- ▪ Hardware error: Device with internal bleeder is defective.
- ► Replace the device.

114 Error reading EEPROM

Diagnostic class (standard): 1
Reaction (see 8.3 Reactions of "drives"): A

The electronic device type plate cannot be read from the EEPROM.
The type plate contains e.g. the device type, serial number, alignment values, etc.

- ▪ Hardware error: The EEPROM is defective.
- ► Contact ELAU customer service.
- ► Replace the servo amplifier.

115 Gate - power failure

Diagnostic class (standard): 1
Reaction (see 8.3 Reactions of "drives"): A

There is no supply voltage at the output stage of the servo amplifier.

- ▪ Hardware error: Servo amplifier defective.
- ► Replace the servo amplifier.

116 Commutation error

Diagnostic class (standard): 2
Reaction (see 8.3 Reactions of "drives"): A

Unable to determine the commutation.

- ▪ Motor turns when starting (boot procedure) the MC-4 servo amplifier.
- ► Make sure that the motor is still when starting (boot procedure) the servo amplifier.

- ▪ Wiring error: encoder cable is not plugged in or defective.
- ► Check the wiring.

117 Reading error encoder EEPROM

Diagnostic class (standard): 1
Reaction (see 8.3 Reactions of "drives"): A

The electronic motor type plate cannot be read from the EEPROM encoder.

- Wiring error: Encoder cable is not correct.
- ▸ Check the wiring.

- Hardware error: Encoder is defective.
- ▸ Change out the motor or the encoder.

118 "Error on ser. interface to encoder

Diagnostic class (standard): 1
Reaction (see 8.3 Reactions of "drives"): A

The data transfer to the encoder is disrupted.

- Wiring error: Encoder cable is defective.
- ▸ Check the encoder cable and replace if necessary.
- ▸ Check the ground connection (shield)
- ▸ Check the jumpers in the encoder cable connector.

- The encoder voltage is unavailable or incorrect.
- ▸ Check the encoder voltage.

- Hardware error: Encoder is defective.
- ▸ Change out the motor or the encoder.

119 Short circuit or ground fault in output stage

Diagnostic class (standard): 1
Reaction (see 8.3 Reactions of "drives"): A

The motor and motor lines are checked for short circuits (phase short circuit).

- Wiring error: Short circuit in motor cable.
- ▸ Replace the motor cable.

- The electronic device type plate cannot be read from the EEPROM.
- ▸ Replace the motor.

- Hardware error: final stage in servo amplifier defective.
- ▸ Replace the servo amplifier.

120 Overload PowerOff of output stage

Diagnostic class (standard): 2
Reaction (see 8.3 Reactions of "drives"): B

The final stage is overloaded. In contrast to the 107 "Excess current" (see 8.6.2.8 107 Excess current)diagnosis message, the power is switched off as soon as the max. current value is exceeded. The thermal overload of the device is observed for a specific period of time.

- The final stage is overloaded.
- ▸ Check combination motor / actuator.
- ▸ Check calculation of motor and actuator.
- ▸ Ext. diagnosis

- The motor brake is not open.
- ▸ Check the wiring of the motor brake (voltage reversal, cable break …).

- Hardware error: Servo amplifier defective.
- ▶ Replace the servo amplifier.

121 Bleeder Temperature Too High

Diagnostic class (see 8.2 The Notion of 'Diagnosis Classes') (standard): 2
Reaction (see 8.3 Reactions of "drives"): B

The bleeder is overloaded.

- The drive has incorrect dimensions.
- ▶ Check drive sizing.

- Hardware error: The braking resistor or addressing is defective.
- ▶ Contact ELAU customer service.

122 Max. motor speed reached

Diagnostic class (standard): 2
Reaction (see 8.3 Reactions of "drives"): B

The current speed is greater than the rated speed of the motor.

- Error occurs when using motor SH-055 with a rated speed greater than 6000 rpm.
- ▶ Use firmware version no earlier than V00.22.00 in the servo amplifier MC-4.

- Error occurs with CAM movement function (e.g. MultiCam()) due to incorrect curves or profile data.
- ▶ Check curve data and program.

- Jumps occurred in the master encoder.
- ▶ Check the master encoder.

- The error occurs during a CAM movement function due to an incorrect position manipulation (e.g. Setpos1() function).
- ▶ Check the program.

- Hardware error: Commutation error, i.e. the motor encoder (SinCos) is not calibrated or leveled.
- ▶ Contact ELAU customer service.

123 Error inverter enable

Diagnostic class (standard): 2
Reaction (see 8.3 Reactions of "drives"): A

The Inverter Enable input changed to LOW while the drive was "under control" (DeviceState =16#05, =16#06, =16#08, >= 16#20).

CAUTION
If the drive is brought to a standstill using HW_Enable or ControllerEnable, control remains active until the drive stops and then the brake engages (BrakeCouplingTime).

- Wiring error.
- ▶ Check wiring of "Inverter Enable" input.

- Circuit error: The "Inverter Enable" input was set to LOW.
- ▶ Check the control of the “Inverter Enable” input.

- **Ext. diagnosis = Wrong Mode: xx**
  The mode set in the parameter InverterEnableMode does not correspond to the real devices.
- ► Check the parameter **InverterEnableMode** and adjust it, if necessary.
- ► Check **iSH** hardware configuration and connect or disconnect **iSH-DIS1** if necessary.

124 PowerOff due to overload

Diagnostic class (standard): 5
Reaction: C

Overload PowerOff determined that torque was exceeded (Overload function).

You can switch the diagnosis message off using the OverloadErrorOff() function and switch it back on (default) using the OverloadErrorOn() function.

- An overload will occur if the overload function is active.
- ►

125 "I^2t motor warning

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

The motor is overloading. The integrator (I2tparameter) has already increased to 80%. A 100 "I2T Motor" (see 8.6.2.1 100 I2T Motor) error may result.

126 Amplifier – overtemperature warning

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

The cooling element of the MC-4/SCL/PS-4 is too hot. A 101 "Amplifier – power off due to overtemperature" (see 8.6.2.2 101 Amplifier – power off due to overtemperature) error may result.

127 Overtemperature motor warning

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

The internal motor temperature (temperature switch in the motor) is too high (approx. 130°C). If the internal motor temperature switch detects a too high temperature for at least 2 seconds, error 102 "Motor - Excess temperture switch off" (see 8.6.2.3 102 Motor - PowerOff due to overtemperature) will occur.

128 Cooling error warning

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

The internal temperature of the device is too high. With SCL, the internal power supply may also be overloaded. A 103 "PowerOff due to cooling error" (see 8.6.2.4 103 PowerOff due to cooling error)error may result.

129 Overload PowerOff of output stage warning

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

The final stage is overloaded. A 120 "Overload PowerOff of output stage" (see 8.6.2.21 120 Overload PowerOff of output stage) error may result.

130 Bleeder temperature rising

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

The bleeder is overloading. A 121 "Bleeder temperature too high" (see 8.6.2.22 121 Bleeder Temperature Too High) error may result.

131 Phase failure of power supply Warning

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

Failure of one or two phases of the mains connection of the servo amplifier. If the warning persists for 10 s or longer, a 110 "Phase failure (power supply)" (see 8.6.2.11 110 Phase error (power supply))error will occur.

132 Following error

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

A position following error in the position controller of the servo amplifier has occurred that is greater than the "FollowingLimit" parameter.

- The following error monitoring is too strict.
  - Increase the FollowingLimit object parameter.
- The acceleration is too high.
  - Reduce acceleration.
- The following error is a result of the 100 "I2T Motor" diagnosis message.
  - See diagnosis message 100 "I2T Motor" (see 8.6.2.1 100 I2T Motor)
- The mechanical system is sluggish or blocked.
  - Check the travel range.
- Incorrect parameter settings.
  - Check the controller parameters and the J_Load .
- The current feedforward is switched off.
  - Set the CurrFeedForw parameter to "on / TRUE".
- Wiring error: The wires in the motor or encoder cable are interchanged.
  - Check the cable connection /cable.
- Wiring error: An incorrect encoder connector or motor connector is plugged-in (possibly from the neighboring actuator).
  - Check the encoder connecter and the motor connector.
  - Check the encoder cable and motor cable.
- Wiring error: holding brake not vented
  - Check the holding brake.

- No mains voltage.
- ► Check the mains voltage at the servo amplifier.

- An encoder with an incorrect number of pulses was used.
- ► Check the encoder.

- Hardware error: The coupling to the position controller is loose.
- ► Check the encoder coupling.

- Hardware error: Encoder signal jumps.
- ► Check the travel range.

- The axis should be operated at regulated speeds.
- ► Set the Pos_P_Gain parameter to 0.

133 Speed-dependent power reduction

Diagnostic class (standard): 7
Reaction (see 8.3 Reactions of "drives"): E

Starting at a motor speed of < 75 rpm (112.5 rpm for SR058, 150 rpm for SM070) the maximum motor current is restricted to 70 % of the top current of the servo amplifier (e.g. MC-4). This is a security measure to protect the final stage of the servo amplifier when reaching the stop position.
In V00.11.00 or higher, this message is only generated when the target current is actually limited to 70% of the peak current.
In previous versions the message is generated when the limit is active, even if the target current is below 70% of the peak current.

- The axis is moved to a block.
- ► Check traversing range of the axis.

134 External 24V power supply too low

Diagnostic class (standard): 6 (lower than V00.24.01: 7)
Reaction (see 8.3 Reactions of "drives"): E

The control voltage (24 V DC) is too low.

- Control voltage too low.
- ► Check the control voltage (see technical data of the device).

135 Undervoltage warning

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

An attempt is being made to start the drive, but the DC bus voltage is too low.

device	Thresholds
MC-4	• 480 V DC, for 400 V AC devices (less than V00.20.00: 450 V DC) • 240 V DC, for 230 V AC devices (less than V00.20.00: 225 V DC)
SCL	• 240 V DC (less than V00.20.00: 225 V DC)
PS-4	• 260 V DC

device	Thresholds
iSH	• 420 V DC, if the drive is "in control" (DeviceState >= 16#20) • 440 V DC, if the drive is not "in control" (DeviceState < 16#20)
PS-5	• 420 V DC, if the drive is "in control" (DeviceState >= 16#20) • 450 V DC, if the drive is not "in control" (DeviceState < 16#20)

For V00.20.00 and higher, the diagnosis message is also generated when the drive is "under control" (DeviceState >=16#20) (except for PS-4). If the DC bus voltage continues to drop while the drive is "under control", diagnosis message 109 "Under voltage" (see 8.6.2.10 109 Undervoltage) is triggered.

▪ Hardware Enable and Software Enable are there but the mains voltage is too low.
► Check the mains voltage (see the technical data on the device); the mains contactor may not be connected.

▪ If DC buses are connected in parallel, an error has occurred in a servo amplifier.
► Locate servo amplifier with error.
► Eliminate error.

136 Inverter enable warning

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

An attempt is being made to start the drive, but Inverter Enable is still LOW.

▪ Hardware Enable and Software Enable are available, but "Inverter Enable" is still LOW.
► The output stage is overloaded.

137 Motorless

Diagnostic class (standard): 2
Reaction (see 8.3 Reactions of "drives"): A

When switching the MC-4 servo amplifier from motorless to normal mode, a message reporting a motor error that has occurred will appear.

Motor errors that result in the diagnosis message:

- 102 Motor - PowerOff due to overtemperature (see 8.6.2.3 102 Motor - PowerOff due to overtemperature)
- 105 Feedback error (track monitoring) (see 8.6.2.6 105 Feedback error (track monitoring))
- 111 Excessive following error (see 8.6.2.12 111 Excessive following error)
- 116 Commutation error (see 8.6.2.17 116 Commutation error)
- 117 Reading error encoder EEPROM (see 8.6.2.18 117 Reading error encoder EEPROM)
- 118 "Error on ser. interface to encoder (see 8.6.2.19 118 "Error on ser. interface to encoder)
- 122 Max. motor speed reached (see 8.6.2.23 122 Max. motor speed reached)

The above error messages are disabled in the motorless mode (Motorless Parameter = yes) and result in the 137 "Motorless" error message when reverting to normal mode (Motorless parameter = no).

Note here that the 105, 117 and 118 diagnosis messages can also result in the 137 “Motorless” diagnosis message if the messages occur in normal mode and afterwards the mode is switched to motorless and then back to normal.

- A motor error has occurred.
- ► Perform a hardware reset on MC-4 or switch back to motorless mode.

- The MC-4 was not switched off when coupling a motor to a servo amplifier that was set to motorless. The current feedforward is switched off.
- ► Perform a hardware reset on MC-4 or switch back to motorless mode.

138 Impermissible motor

Diagnostic class (standard): 1
Reaction (see 8.3 Reactions of "drives"): A

An impermissible motor is connected to the servo amplifier.

- An SM 070 60 010 is connected to the MC-4 / 22 A.
- ► Use a "larger" motor (e.g. SM 070 60 020) or a "smaller" servo amplifier (e.g. MC-4 / 10 A).

- An SM 070 60 010, SM 070 60 020 or SM 100 50 030 is connected to the MC-4 / 50 A.
- ► Use a "larger" motor (e.g. SM 100 40 050) or a "smaller" servo amplifier (e.g. MC-4 / 10 A).

139 Error in DC-precharge

Diagnostic class (standard): 2
Reaction (see 8.3 Reactions of "drives"): A (**MC-4**/**PS-4** V00.16.30 or higher)
Reaction (see 8.3 Reactions of "drives"): B (**MC-4**/**PS-4** versions < V00.16.30)

The error message will be triggered if the mains voltage is present and the DC bus voltage is not reached after the main phases are activated.

The phase check (**MC-4**: PhaseCheck, **PS-4**: PhaseCheckMode) does not affect this error monitoring.

device	Thresholds	Monitoring times
MC-4	• 450 V DC, for 400 V AC devices • 225 V DC, for 230 V AC devices	• 1000 ms
PS-4	• 225 V DC	• 350 ms (V00.22.00 or lower: 1000 ms)

This monitoring feature protects the internal precharging circuit.

- The following order causes the diagnosis message:
  1. The parameter DC_LowCheck is "off".
  2. The mains voltage decreases and the drive remains under control.
  (If **DC_LowCheck** is "on", then diagnostic message 109 "under voltage" (see 8.6.2.10 109 Undervoltage) is displayed. This leads to a Reaction (see 8.3 Reactions of "drives") B and the drive does not remain in control mode.)
  3. The mains voltage increases again (drive still under control!) while a load pushes on the axis, for example (energy consumption at the shaft!). In doing so, enough energy is used that the DC circuit cannot be charged.
- ► Prevent the mains voltage from dropping while the drive is under control.
- ► Switch off controller or final stage of servo amplifier when switching off the mains contactor (parameter ControllerEnable or input enable at the servo amplifier).

- Short circuit or ground fault in DC bus wiring.
- ► Check the wiring.

140 Ramp-down braking time exceeded

Diagnostic class (standard): 2
Reaction (see 8.3 Reactions of "drives"): B

The maximum ramp down time was exceeded during control down ramping of motor.
When switching off

- ControllerEnable or
- HW_Enable or
- when an error occurs with **Reaction** B (best possible stoppage) or user driven stoppage

the ramp down time is determined by the parameter StopTimeLim. If the drive has not stopped at the end of the down ramp time, the brake engages and the error message **Ramp down time exceeded** is emitted. Once the BrakeCouplingTime is up, the drive is connected torque free.

For error with Reaction C (Overload function) the ramp down time is firmly set at 800ms. If the drive is not still once the ramp down time has expired the error message **Ramp down time exceeded** with **Reaction** B is triggered. In so doing, the ramp down time (**StopTimeLim**) is restarted until the brake engages. Once the **BrakeCoupling-Time** is up, the drive is connected torque free.

▪ The load on the drive is too great to adhere to the set ramp down time.
► Check parameter **StopTimeLim**.
If the diagnostic message occurs in conjunction with the **Overload Functions**, keep in mind that in this case the ramp down time is firmly set to 800ms and is thus triggered independently from **StopTimeLim**. In this case, a more powerful motor / servo amplifier combination is required.

▪ Encoder in the motor defective (or commutation not OK).
► Replace the motor.

141 EncoderPosition Reading Error

Diagnostic class (standard): 5
Reaction (see 8.3 Reactions of "drives"): D

An impermissible motor is connected to the servo amplifier.
The diagnostic message will be replaced as of MotorController Firmware 00.20.00 by the diagnostic message 170 "Reading error DrvEncPosition" (see 8.6.2.71 170 DrvEncPosition reading error).

▪ The function DrvEncSetPosition() was called up but could not be properly processed.
► Call up function DrvEncSetPosition() again.

▪ Encoder in the motor is defective.
► Replace the motor.

142 Board - PowerOff due to overtemperature

Diagnostic class (standard): 2
Reaction (see 8.3 Reactions of "drives"): B

The temperature of the power board inside the housing is too high.

▪ Insufficient ventilation or ambient temperature too high.
► Check ventilation in switching cabinet.

► If installed, make sure the air conditioning unit is functioning properly.

▪ Hardware error: The temperature sensor is defective.
► Replace the device.

143 Encoder temperature warning

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

The temperature inside the encoder is too high.

▪ Insufficient ventilation or ambient temperature too high.
► Check device fans and ventilation slots (if available).
► Check ventilation in switching cabinet.
► If installed, make sure the air conditioning unit is functioning properly.

▪ Hardware error: The temperature sensor is defective.
► Replace the device.

144 DC bus short circuit

Diagnostic class (standard): 1
Reaction (see 8.3 Reactions of "drives"): A

A short circuit has occurred in the DC bus of the power supplies **PS-4**/**PS-5**.

It is also possible that a ground fault has occurred in the **PS-5** .

▪ Wiring error:
The connection cables from the power supply to the servo drives through the distribution boxes are not connected properly or have a short circuit.
► Check the cables and replace if necessary.

145 DC bus ground fault

Diagnostic class (standard): 1
Reaction (see 8.3 Reactions of "drives"): A

A ground fault has occurred on the power supply**PS-4**

▪ Wiring error:
The connection cables from the power supply to the servo drives through the distribution boxes are not connected properly or have a ground fault.
► Check the cables and replace if necessary.

146 DC bus overload

Diagnostic class (standard): 1
Reaction (see 8.3 Reactions of "drives"): B

The DC-circuit is overloaded. In this case, unlike diagnostic message 107 "over-current" (see 8.6.2.8 107 Excess current), switch off does not occur as soon as the current threshold has been exceeded. The thermal overload of the device is observed for a specific period of time.

▪ Too many loads (e.g. ServoDrive SCL) are connected to the DC circuit.
► It may be that the existing device constellation will be sufficient by adapting the application (e.g. less acceleration).
► Use another mains device PS-4 and distribute supply of loads.

147 24V power supply overload

Diagnostic class (standard): 1
Reaction (see 8.3 Reactions of "drives"): B

The 24V provided at the output of the power supplies **PS-4**/**PS-5** to serve the Servo-Drives **SCL**/**iSH** is overloaded.

If the diagnostic message occurs in the **PS-5** (load >100%) and the burden continues to rise to >130%, the 24V for the inferior **iSH** and **DB-5** will be switched off. This means that the **iSH** can no longer be reached via SERCOS. The **PS-5** can still be reached in the SERCOS ring, as the **PS-5** closes the ring in this case.

- Wiring error: A short circuit has occurred.
- ► Check the wiring of the 24 V supply from the power supply to the servo drives through the distribution boxes.

- Too many loads (ServoDrive **SCL**, Intelligent Servo Module **iSH**) are connected.
- ► Use an additional power supply and distribute the sinks' power supply.

148 Internal voltage error 15V

Diagnostic class (standard): 1
Reaction (see 8.3 Reactions of "drives"): A

The device-internal 15 V voltage is too low.

- The device is defective.
- ► Replace the device.

149 Internal voltage error 12V

Diagnostic class (standard): 1
Reaction (see 8.3 Reactions of "drives"): B

The device-internal 12 V voltage is too low.

- The device is defective.
- ► Replace the device.

150 Phase L1 failure

Diagnostic class (standard): 1
Reaction (see 8.3 Reactions of "drives"): B

The L1 phase of the mains connection to the device has failed or is too low.

The diagnostic message can be deactivated with the parameter PhaseCheckMode.

- Wiring error.
- ► Check the connection of the phase.
- ► Check the wiring of the mains contactor.

- External fuse has blown.
- ► Check fuses.

- Too many loads (e.g. ServoDrive SCL) are connected to the DC circuit.
- ► Replace the mains contactor.

151 Phase L2 failure

Diagnostic class (standard): 1
Reaction (see 8.3 Reactions of "drives"): B

The L2 phase of the mains connection to the device has failed or is too low.

The diagnostic message can be deactivated with the parameter PhaseCheckMode.

- Wiring error.
- ▶ Check the connection of the phase.
- ▶ Check the wiring of the mains contactor.

- External fuse has blown.
- ▶ Check fuses.

- Too many loads (e.g. ServoDrive SCL) are connected to the DC circuit.
- ▶ Replace the mains contactor.

152 Phase L3 failure

Diagnostic class (standard): 1
Reaction (see 8.3 Reactions of "drives"): B

The L3 phase of the mains connection to the device has failed or is too low.

The diagnostic message can be deactivated with the parameter PhaseCheckMode.

- Wiring error.
- ▶ Check the connection of the phase.
- ▶ Check the wiring of the mains contactor.

- External fuse has blown.
- ▶ Check fuses.

- Too many loads (e.g. ServoDrive SCL) are connected to the DC circuit.
- ▶ Replace the mains contactor.

153 DC bus discharge failure

Diagnostic class (standard): 1
Reaction (see 8.3 Reactions of "drives"): B

DC bus was not discharged properly.

- Too much braking energy is being fed from the connected SCL back into DC bus.
- ▶ Decelerate the drives before discharging (at a reduced rate of speed if necessary) and then start the discharge procedure.

- Incorrect shutdown sequence; phase voltage has been present for too long (see also 159 "DC bus no discharged warning" (see 8.6.2.60 159 DC bus no discharged warning)).
- ▶ Allow the mains contractor to release before activating the discharge.

- The bleeder (responsible for the discharge) reaches its maximum load when the discharge begins.
- ▶ Decelerate the drives before discharging (at a reduced rate of speed if necessary) and then start the discharge procedure.

154 Phase L1 warning

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

The L1 phase of the mains connection to the device has failed. If the drive is in controlled operation and the phase has failed for 10 s, error 150 "Phase failure L1" (see 8.6.2.51 150 Phase L1 failure) will occur.

155 Phase L2 warning

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

The L2 phase of the mains connection to the device has failed. If the drive is in controlled operation and the phase has failed for 10 s, error 151 "Phase failure L2" (see 8.6.2.52 151 Phase L2 failure) will occur.

156 Phase L3 warning

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

The L3 phase of the mains connection to the device has failed. If the drive is in controlled operation and the phase has failed for 10 s, error 152 "Phase failure L3" (see 8.6.2.53 152 Phase L3 failure) will occur.

157 DC bus overload warning

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

The load of the DC bus is at 80%. This is displayed by the parameter DC_BusOverload. If the load increases to 100%, error message 146 "DC bus overload" (see 8.6.2.47 146 DC bus overload) will occur.

158 24V power supply overload warning

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

The load of the 24 lV power supply for the devices SCL, iSH, PS-4 and PS-5 is at 80%. If the load increases to 100%, error message 147 "24 V power supply overload" (see 8.6.2.48 147 24V power supply overload) is triggered.

159 DC bus no discharged warning

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

An attempt was made to discharge the DC bus, but the mains voltage is still present. If the DC bus voltage does not decrease to 25 V within 200 ms of this warning appearing, the system issues the error message 153 "DC bus discharge failure" (see 8.6.2.54 153 DC bus discharge failure) is triggered.

- Wiring error: The mains contactor is not controlled correctly.
- ▸ Check the wiring.

160 Undervoltage power stage driver

Diagnostic class (standard): 1
Reaction (see 8.3 Reactions of "drives"): A

The supply voltage of the power stage driver is too low.

- Hardware error: Device is defective
- ▸ Replace the device.

161 Overtemperature board warning

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

The temperature of the power board inside the housing is too high. If the temperature continues to rise, it comes to the diagnostic message 142 "Board-PowerOff due to overtemperature". (see 8.6.2.43 142 Board - PowerOff due to overtemperature)

162 Wiring error O_0

Diagnostic class (standard): 5
Reaction (see 8.3 Reactions of "drives"): B

There is a wiring error at Pin 1 of the sensor/actor connector of the SCL.

- Too much braking energy is being fed from the connected SCL back into DC bus.
- ► Decelerate the drives before discharging (at a reduced rate of speed if necessary) and then start the discharge procedure.

- Hardware error: The output function block is defective.
- ► Replace the device.

163 SERCOS: C1D error

Diagnostic class (standard): 1
Reaction: manufacturer-specific

A SERCOS error in diagnosis class 1 (C1D) has occurred. The extended diagnosis contains a data word that provides information on the exact cause.

⚠ WARNING

THE MEANING OF THE DATA WORD HAS CHANGED!

- Refer to the operating instructions of the SERCOS device.

Incorrect interpretation of the error message.

The individual bits of this data word have the following meanings:

Bit	Meaning
Bit 0	overload shut-down
Bit 1	amplifier overtemperature shut-down
Bit 2	motor overtemperature shut-down
Bit 3	cooling error shut-down
Bit 4	control voltage error
Bit 5	feedback error
Bit 6	error in the “commutation” system
Bit 7	overcurrent error
Bit 8	overvoltage error
Bit 9	undervoltage error
Bit 10	power supply phase error
Bit 11	excessive position deviation
Bit 12	communication error
Bit 13	overtravel limit is exceeded (shut-down)

Bit	Meaning
Bit 14	reserved
Bit 15	manufacturer-specific error (see #1164)

Table 8-5: SERCOS C1D error (assignment according to SERCOS specifications)

164 SERCOS: C1D manufacturer-specific error

Diagnostic class (standard): 1
Reaction: manufacturer-specific

A manufacturer-specific SERCOS error in diagnosis class 1 (C1D) has occurred. The extended diagnosis contains a data word that provides information on the exact cause. For information on what each bit means, refer to the manual of the SERCOS device manufacturer.

165 SERCOS: C2D warning

Diagnostic class (standard): 6
Reaction: manufacturer-specific

A SERCOS warning in diagnosis class 2 (C2D) has occurred. The extended diagnosis contains a data word that provides information on the exact cause.

⚠ WARNING

THE MEANING OF THE DATA WORD HAS CHANGED!

- Refer to the operating instructions of the SERCOS device.

Incorrect interpretation of the error message.

The individual bits of this data word have the following meanings:

Bit	Meaning
Bit 0	overload warning
Bit 1	amplifier overtemperature warning
Bit 2	motor overtemperature warning
Bit 3	cooling error warning
Bit 4	reserved
Bit 5	feedback error
Bit 6	reserved
Bit 7	reserved
Bit 8	reserved
Bit 9	undervoltage error
Bit 10	reserved
Bit 11	excessive velocity deviation
Bit 12	reserved
Bit 13	Target position outside of travel range
Bit 14	reserved
Bit 15	Manufacturer-specific error (see #6166)

Table 8-6: SERCOS C2D warning (assignment according to SERCOS specifications)

166 SERCOS: C2D manufacturer-specific warning

Diagnostic class (standard): 6
Reaction: manufacturer-specific

A manufacturer-specific SERCOS warning in diagnosis class 2 (C2D) has occurred. The extended diagnosis contains a data word that provides information on the exact cause. For information on what each bit means, refer to the manual of the SERCOS device manufacturer.

167 SERCOS: C3D operation status

Diagnostic class (standard): 9

A SERCOS C3D operation status of diagnostic class 3 (C3D) has changed. The extended diagnosis contains a data word that provides information on the exact cause.

⚠ WARNING

THE MEANING OF THE DATA WORD HAS CHANGED!

- Refer to the operating instructions of the SERCOS device.

Incorrect interpretation of the error message.

The individual bits of this data word have the following meanings:

Bit	Meaning
Bit 0	overload warning
Bit 1	n(feedback) = 0
Bit 2	| n(feedback) | < | n(x) |
Bit 3	| T | >= | T(x) |
Bit 4	| T | >= | T(limit) |
Bit 5	| n(command) | > | n limit |
Bit 6	in position
Bit 7	| P | >= | P(x) |
Bit 8	Position feedback = Active target position
Bit 9	| n(feedback) | <= minimum spindle speed
Bit 10	| n(feedback) | >= maximum spindle speed
Bit 11	excessive velocity deviation
Bit 12	Target position attained
Bit 13	Interpolator halted
Bit 14	reserved
Bit 15	Manufacturer-specific operation status (see #9168)

Table 8-7: SERCOS C3D operation status (assignment according to SERCOS specifications)

168 SERCOS: C3D manufacturer-specific status

Diagnostic class (standard): 9
Reaction: manufacturer-specific

A manufacturer-specific SERCOS operation status of diagnosis class 3 (C3D) has changed. The extended diagnosis contains a data word that provides information on the exact cause. For information on what each bit means, refer to the manual of the SERCOS device manufacturer.

169 Single SERCOS error (SLAVE)

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

A temporary signal fault on the SERCOS bus has been detected. The MDT data may now be incorrect due to this fault. In this case, the data of the last cycle is reused.

Temporary faults can have the following causes:

- Signal distortion
- Loss of more than 10 signal edges (fibreoptic b reak)
- Failure of the master synchronous telegram (MST)
- Failure of the master data telegram (MDT)

▪ Signal over the SERCOS fiberoptic conductor is incorrect.
► Check the intensity setting in the PacDrive controller and on the servo amplifier.
► Service transfer error

▪ EMC problems.
► Check the wiring.

▪ SCL-055 motors are connected to the PacDrive controller. The connection of the SCL-055 motors in the PacDrive PD-8 box is not correct.
► Check the connection of the SCL-055 motors in the PacDrive PD-8 box. Simply placing jumpers on the desired terminals will not resolve the problem. No nodes to be plugged into the following SERCOS plug-in position.
In addition, follow the notes in the "SCL" and "PS-4 and PD-8" operating instructions.

170 DrvEncPosition reading error

Diagnostic class (standard): 2
Reaction (see 8.3 Reactions of "drives"): B

The error message is triggered when an error occurs as the position is being read from or written to the electronic type plate of the motor. The writing of the position occurs with the DrvEncSetPosition() function.
This diagnosis message replaces the diagnosis message 141 "Reading error encoderposition" (see 8.6.2.42 141 EncoderPosition Reading Error)in MotorController firmware version 00.20.00 or higher.

▪ The DrvEncSetPosition() function was called and could not be processed properly.
► Call the DrvEncSetPosition() function again.

▪ Encoder in the motor is defective.
► Replace the motor.

171 Encoder communication warning

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

Incorrect interpretation of the error message.

▪ Wiring error: Encoder cable is not correct.
► Check the wiring.

▪ Hardware error: Encoder is defective.
► Change out the motor or the encoder.

172 Extended diagnosis message

Diagnostic class (standard): 8
Reaction (see 8.3 Reactions of "drives"): E

For now, this diagnosis message is only intended for internal ELAU use. To view the diagnosis message in the **message logger**, **Set filter...** must be used to set **Filter Type 15.**

173 Feedback warning (track monitoring)

Diagnostic class (standard): 8
Reaction (see 8.3 Reactions of "drives"): E

For now, this diagnosis message is only intended for internal ELAU use. To view the diagnosis message in the **message logger**, **Set filter...** must be used to set **Filter Type 15.**

174 Excess current warning

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): E
Filter type 2 "Diagnosis messages"

As from hardware code xx3xxx, an **"Excess current warning"** will be triggered in the power unit **PS-4** if there is a DC bus current of more than 50 A for at least 1 ms. The error message 107 "Excess current" will be generated if the DC bus current reaches 55A .

- Too many loads (e.g. ServoDrive **SCL**) are connected to the DC circuit.
- ► Use an additional power supply **PS-4** and distribute the sinks' power supply.
- ► It may be that the existing device constellation will be sufficient by adapting the application (e.g. less acceleration).

175 Bleeder overload

Diagnostic class (standard): 9
Reaction (see 8.3 Reactions of "drives"): E
Filter type 2 "Diagnosis messages"

A bleeder load of 86 %(**MC-4** and **PS-4**) or 90 % (**PS-5**) can trigger the message **"Bleeder overload"**.

By default, this message is assigned to **diagnostic class** 9 and therefore is not visible. If you want to react to the diagnostic message, you can reconfigure the **diagnostic class** (e.g. to **diagnostic class** 7 or 8).
At 100 %**Bleeder-I2t** the bleeder will be deactivated without further notification (as before). Not until the DC bus driver increases to more than 860V , the error message (as previously) 108 "Excess voltage" is generated.

- Ventilation is inadequate or the ambient temperature is too high.
- ► Brake at a slower rate.
- ► Check the dimensioning of the bleeder.
- ► Apply additional bleeder (bleeder module **BM-4**) with 400 V AC units.

176

reserved

177 Power board - PowerOff due to excess temp

Diagnostic class (standard): 2
Reaction (see 8.3 Reactions of "drives"): B

The temperature of the power board inside the housing is too high.

- Insufficient ventilation or ambient temperature too high.
- ► Check ventilation in switching cabinet.
- ► If installed, make sure the air conditioning unit is functioning properly.

- Hardware error: The temperature sensor is defective.
- ► Replace the device.

178 Device error

Diagnostic class (standard): 2
Reaction (see 8.3 Reactions of "drives"): A

An internal error has occurred.

- Device error
- ► Contact your ELAU responsible.

- Device is defective
- ► Replace the device.

179 Warning bleeder overload

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

The Bleeder-I2t has reached a value of 80 % at **PS-5** .

At 100 %**bleeder** the bleeder will be deactivated without further notification. Not until the DC bus driver increases to more than 850 V, the error message (as previously) 108 "Excess voltage" is generated.

- Ventilation is inadequate or the ambient temperature is too high.
- ► Brake at a slower rate.
- ► Check the dimensioning of the bleeder.
- ► Use additional bleeder.

180 Warning Board - PowerOff due to excess temp.

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

The temperature of the power board inside the housing is too high. If the temperature continues to rise, it results in the diagnostic message 177 "Board-PowerOff due to overtemperature". (see 8.6.2.78 177 Power board - PowerOff due to excess temp)

181 Warning defective fan

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): D

A fan error has occurred.

- The fan is blocked.

⚠ CAUTION
ROTATING FAN. • Open main switch. • Prevent main switch from being switched back on. May cause bodily harm.

► The existing arrangement of devices may be made adequate by adjusting one of the applications (e.g. decreasing acceleration).
► Clean dirt out of the fan.

▪ The fan is defective.
► Replace the device.

182 External 24 V power supply too high

Diagnostic class (standard): 6
Reaction (see 8.3 Reactions of "drives"): E

The control voltage (DC 24 V) is too high.

▪ Control voltage is too high.
► Check the control voltage (see technical data of the device).

Diagnostic messages 2xx “Object managing”

200 Faulty logical address of parameter

Diagnostic class (standard): 4

The temperature of the power board inside the housing is too high. In the ext. diagnosis in the message logger, the logical address is displayed.

▪ Ventilation is inadequate or the ambient temperature is too high.
► Check the program.
Please contact our application support department.

▪ Subsequent errors from diagnosis message 209 “last boot failed”.
► See diagnostic message 209 "last boot failed".

▪ The configuration file on the controller is incorrect.
► Transfer the configuration file to the controller again.

201 Faulty parameter type code

Diagnostic class (standard): 4

The type code of a parameter is incorrect.

▪ Software error
► Contact your ELAU responsible.

202 Faulty configuration file

Diagnostic class (standard): 4

The configuration file is no longer readable.

In controller firmware version 00.16.30 or higher, the name of the temporary configuration file is displayed in the ext. diagnosis in the message logger.

- There is no configuration file in the PacDrive controller or the configuration file is corrupt.
- ► Transfer the configuration file with EPAS-4 again.

203 Faulty parameter file

Diagnostic class (standard): 4

The parameter file is not readable.

In controller firmware version 00.16.30 or higher, the name of the temporary parameter file is displayed in the ext. diagnosis in the message logger.

- The temperature of the power board inside the housing is too high.
- ► Transfer the parameter file with EPAS-4 again.

204 IEC program cannot be loaded

Diagnostic class (standard): 4

Unable to load the IEC program.

Additional information on how to limit errors is stored in the DiagExtCode or the ext. diagnosis in the message logger.

Ext. diagnosis	Meaning
prog xhhhhhhhh	IEC program code is too big
bad version	The IEC program is not compatible with the PacDrive controller firmware (V00.10.00 or higher)
data xhhhhhhhh	IEC data area is too large -> adjust number of data segments
ret xhhhhhhhh	The retain area is too large
DOWNLOAD	Unable to load and prepare the IEC program.
.. miscellaneous	Other data errors

Cause of “data xhhhhhhhh”:

A project was developed for an older version of the PacDrive controller firmware. In this project, the number of data segments is greater than two (e.g. three). If you now transfer the program to the controller, EPAS-4 will display the following message after the transfer is complete: "IEC program cannot be loaded!"

- ► If this happens, reduce the number of data segments to two and transfer the project to the controller again after the conversion process is complete.

Cause of “DOWNLOAD”:

A subsequent error is involved in this case.

- ► Refer to the previous error message (e.g. 312 "Parameter relocation failed" (see 8.6.4.13 312 Parameter relocation failed)).

- There is no IEC program in the PacDrive controller or the IEC program is incompatible.
- ► Transfer the IEC program again using EPAS-4.

- The fan is blocked.
- ► See DiagExtCode.
- ► Adjust project.

- The setting in EPAS-4 > Project > Options > Compilation options in the item "Number of Data Segments" is less than 2 (DiagExtCode = ret xhhhhhhhh).
- ► Increase the number of data segments.

205 Impermissible parameter value

Diagnostic class (standard): 4

A parameter has an impermissible value. The DiagExtCode parameter in the PLC configuration or message logger can be used to determine the logical address of the parameter that contains an impermissible value. This allows assignment to the PLC configuration.

- **Ext. diagnosis: BaudRate=<illegal value>M**
  In V00.15.00 or higher, the PacDrive controller supports the BaudRate SERCOS parameter.
  2, 4, 8 and 16 MBaud values are supported in general.
  Only specific values are supported depending on the type of PacDrive controller (Max-4, CXX, PXX). Each value is dynamically checked when written. Incorrect values are not transferred. Diagnosis message 205 "Impermissible parameter value" is triggered.
- ▶ Enter a valid BaudRate value.

- I=0Bxx0004; i.e., a value is entered that is either too small or too large for acceleration.
- ▶ In the ext. diagnosis in the message logger, logical address is displayed.

- I=03xx0025; i.e. the J_Load in the PLC configuration is too large.
- ▶ Check the program.

- I=01010004; i.e. the IP_Gateway in the PLC configuration does not match the IP_SubNetMask.
- ▶ Only use standard IP address names.

206 Faulty ObjType of LogAdr

Diagnostic class (standard): 4

No object with the type code exists. The DiagExtCode parameter in the PLC configuration or message logger can be used to determine the logical address of the parameter that contains an impermissible value. This allows assignment to the PLC configuration.

- Subsequent errors from diagnosis message 209 “last boot failed (see 8.6.3.10 209 Last boot failed)”.
- ▶ See diagnostic message 209 "last boot failed".

- Software error
- ▶ Contact your ELAU responsible.

207 Hardware module does not exist

Diagnostic class (standard): 4

The parameter file is not readable. The DiagExtCode parameter in the PLC configuration or message logger can be used to determine the type of the hardware module.

- A non-existent analog input or physical encoder was entered into the PLC configuration.
- ▶ Check the PLC configuration.

- There is no parameter file in the PacDrive controller or the parameter file is defective.
- ▶ Replace the PacDrive controller or optional module.

208 Too many real axes in config

Diagnostic class (standard): 4

The number of axes in the PLC configuration is too large.

CAUTION

In V00.15.00 or higher, the diagnosis message is replaced by the 518 "Too many real SERCOS Slaves" (see 8.6.6.18 518 Too many real SERCOS Slaves) diagnosis message.

- The number of axes for the CycleTime is too high.
- ► Check the CycleTime.

- There is no IEC program in the PacDrive controller or the IEC program is incompatible.
- ► Check the PacDrive controller type by referring to the type plate.

209 Last boot failed

Diagnostic class (standard): 4

A drop in the control voltage of the PacDrive controller, a reset of the PacDrive controller or a fatal error occurred in the last boot procedure. Use DiagExtCode to localize the problem.

While booting, the PacDrive controller logs the individual phases in the NvRam. If this results in a fatal error (err LED continually ON), then the next boot will use the default configuration and diagnosis message 209 will be triggered.

⚠ CAUTION

IF THE PACDRIVE CONTROLLER IS STARTED IN MINIMAL BOOT MODE, THE CONFIGURATION AND THE PLC CONFIGURATION PARAMETERS WILL BE SET TO THEIR DEFAULT VALUES.

TCP / IP – address is set to its default value
A configured modem is not available.
Subsequent errors will result when loading the IEC program (e.g. diagnosis messages 200 and 206).

CAUTION

The third startup will occur in normal boot mode.
If this does not happen, the default configuration will used for the next startup, and the process will be repeated ... !

DiagExtCode	Meaning
1	Boot procedure begins before kernel initialization
2	Kernel initialization complete; FTP server priority adjusted; Time Slicing switched on; System clock; No. Tick per second determined
3	Init logger and NvRam complete; interrupts blocked
31	Before ScanDisk
4	Diag created, messages sent, before ObjectContr new
10	Begin Constructor ObjVerObjektContr; Tasklock active
11	Config and Par file read

DiagExtCode	Meaning
12	Config file evaluated, generate before objects
13	generate after objects
14	set after CycleTime
15	after init of Moni.Max, LogGeb, VirtGeb, PhyGeb, construction of RTP before filling in indication table
16	set after parameter
17	after Sercos startup
18	after runtime system start
19	after RTP start, before IEC program load
20	after IEC program load
5	after ObjectContr new
6	after axis release, before WatchDogEin
RAM < 32MB	insufficient RAM in the PacDrive controller

Procedure:

- Read out and evaluate EPAS-4 connection with TCP/IP default address or serial
- message logger (important DiagExtCode!)
- The DiagExtCode can be used to read which phase of the boot procedure was executed correctly the last time.

CAUTION
If the PacDrive controller is booted using the minimal configuration settings (LED blinks quickly), then the program, parameter and configuration will always be available for download in the download box when you log in with the EPAS-4 (V00.07.00 or higher). This does not indicate different versions of the files on the PacDrive controller! Since the PacDrive controller was booted in the default configuration, the 206 Faulty type code of LogAdr (see 8.6.3.7 206 Faulty ObjType of LogAdr)diagnostic message will be triggered when downloading the IEC program since the program will use parameters that are not available.

▪ The SysReset() function was called, although the boot procedure of the PacDrive controller is not yet complete.
▶ Use the GetPacDriveBootState() function to make sure that the PacDrive controller has stopped the boot procedure before you use the SysReset() function.

▪ DiagExtCode = 19: Program error; i.e. the IEC program file is incorrect.
▶ Overwrite the IEC program on the PacDrive controller by transferring the IEC project (dummy) with the default configuration.
▶ Check your program and send an error-free project to the PacDrive controller.

▪ DiagExtCode is not 19.
▶ Contact your ELAU responsible.

▪ The PacDrive controller was booted twice in quick succession. This may have been caused by pressing the reset button twice or a drop in the control voltage.
▶ Check the control voltage (also refer to the technical data).

▪ Insufficient RAM in the PacDrive controller for the project (DiagExtCode=out of memory).
Meaning:
A memory requirement could not be executed. Memory requirements are execut-

ed when booting, resetting the IEC task, calling a system functional block, setting/reading parameters, establishing/terminating an FTP connection, transferring data (remote device), communicating with EPAS-4, establishing/terminating a Telnet connection and communicating with Telnet.

- ► Reduce configuration.
- ► RamDiskSize must be decreased.
- ► Reduce number of tasks.
- ► Apply a PacDrive controller that has more RAM.

- ▪ A PacDrive controller with version 00.15.00 or higher is being used.
  The user data area was increased from 2 MB to 3.7 MB in this version. If the PacDrive controller has less than 32 MB of RAM, the PacDrive will start up in minimal boot mode.
- ► Use a PacDrive controller that has least 32 MB of RAM or firmware version V00.15.00 or lower.

210 Last boot failed

Diagnostic class (standard): 4

This diagnosis message is used to differentiate from the 209 "Last boot failed" (see 8.6.3.10 209 Last boot failed) message for minimal boot (boot not complete). In such a case the last boot failed.

Ext. diagnosis: RAM < 32MB

- ▪ If this diagnosis message appears, the minimal boot is also in error. However, this is caused by having insufficient RAM in the MAx-4 PacDrive controller (RAM<32 MB).
- ► Replace MAx-4 PacDrive controller with a device that has newer hardware.
  or
  Use an older firmware version in the MAx-4 PacDrive controller (V00.15.03 or lower).

211 Invalid configuration

Diagnostic class (standard): 4

A configuration error has occurred.

Cause, Firmware V00.20.00:

The Connector parameter is set for the "Bottom / 1" connector, but there is no expansion module present in the PacDrive controller (C600 or P600).

- ► Check the Connector parameter in the PLC configuration.
- ► Check whether an expansion module is present in the PacDrive controller.

Cause, Firmware V00.16.41:

This diagnosis message will be triggered if there are two field buses configured in PacDrive controller C600 or P600 that cannot be connected at the same time.
CAN Layer2 and DeviceNet Slave are configured;
or CANopen Master and DeviceNet Slave are configured;
or PROFIBUS DP master and PROFIBUS DP slave are configured.

- ► Check the PLC configuration.

3xx “General” diagnosis messages

300 Division error

Diagnostic class (standard): 4

A division by “0” should be executed in the IEC program.

CAUTION
The division by “0” is defined for REAL and LREAL and hence does not generate the 300 “Division error” diagnosis message.

- The divisor was zero in an IEC division function.
- ► Include division by “0” in the IEC program.
- ► Check the number range.

301 Coprocessor segment overflow

Diagnostic class (standard): 4

A system error has occurred.

- An internal system error has occurred.
- ► Please contact your ELAU representative.

302 Stack error

Diagnostic class (standard): 4

A system error has occurred.

- An internal system error has occurred.
- ► Please contact your ELAU representative.

303 General protection error

Diagnostic class (standard): 4

A system error has occurred.

- An internal system error has occurred.
- ► Please contact your ELAU representative.

304 Coprocessor error

Diagnostic class (standard): 4

A system error has occurred.

- An internal system error has occurred.
- ► Please contact your ELAU representative.

305 Memory limit exceeded

Diagnostic class (standard): 4

A system error has occurred.

- An internal system error has occurred.
- ► Please contact your ELAU representative.

306 Arithmetic overflow

Diagnostic class (standard): 4

A system error has occurred.

- An internal system error has occurred.

► Please contact your ELAU representative.

307 Double execution error

Diagnostic class (standard): 4

A system error has occurred.

▪ An internal system error has occurred.
► Please contact your ELAU representative.

308 Invalid task state segment

Diagnostic class (standard): 4

A system error has occurred.

▪ An internal system error has occurred.
► Please contact your ELAU representative.

309 No memory segment

Diagnostic class (standard): 4

A system error has occurred.

▪ An internal system error has occurred.
► Please contact your ELAU representative.

310 Faulty memory segment adjustment

Diagnostic class (standard): 4

A system error has occurred.

▪ An internal system error has occurred.
► Please contact your ELAU representative.

311 Coprocessor division error

Diagnostic class (standard): 4

A system error has occurred.

▪ An internal system error has occurred.
► Please contact your ELAU representative.

312 Parameter relocation failed

Diagnostic class (standard): 4

A system error has occurred.

▪ An internal system error has occurred.
► Please contact your ELAU representative.

313 Excessive cycle time overrun

Diagnostic class (see 8.2 The Notion of 'Diagnosis Classes') (standard): 4

The excessive cycle time error is monitored by the system. The IEC task is stops immediately, if a fatal error occurs because of a cycle time overrun. Stopping the task is controlled by the system, not by the task itself so it is done without taking care of the current or following operations. Therefore, it can not be ruled out, that the task is per-

forming e.g. a read/write operation on the file system and so blocks another system resource exclusively. This resource is not released, when the task is stopped. If other tasks try to access this resource following errors may occur.

The fatal cycle error of an IEC task is reported when the 10x cycle time (see task configuration) is exceeded.
The task then receives an error status. You can quit the error message by resetting the IEC program but the error itself can be solved only by resetting the controller (Online > Reset PacDrive controller). The cycle time monitoring of the IEC task refers to the load parameter that is displayed in the IEC task expansion object in the PLC Configuration.

- The processing time of a parameter or system functional block that is being called is taking "too long".
- ► Perform a reset of the the controller, as soon as possible.
- ► Check program (e.g. access to SERCOS Parameter or WaitTime() function).

- The time interval in the task configuration is too short.
- ► Increase the time interval in the task configuration.
- ► if possible, use critical activities in new/another task.

314 Program file defective

(only in versions below 00.07.00)
Diagnostic class (see 8.2 The Notion of 'Diagnosis Classes') (standard): 4

A system error has occurred.

- An internal system error has occurred.
- ► Transfer the program again.

315 Library function not implemented

Diagnostic class (standard): 4

The program used an interface library that is not supported or not fully supported by the current PacDrive controller. (For the name of the function, see DiagExtCode)

- Firmware in the PacDrive controller is obsolete.
- ► Update firmware in the PacDrive controller.
- ► Using older library versions may also work.

316 Faulty NvRam CRC

Diagnostic class (standard): 6

The NvRam lost the data. This means that the data in the message logger and the IEC variable values have been deleted. In this case the message logger is automatically deleted by the system.

- **"Object" in the message logger: "Cx00"**
  The battery in the PacDrive controller is empty and the PacDrive controller was turned off (control voltage!).
- ► Replace battery in the PacDrive controller.
- ► Retain range and reinitialize clock.

- **"Object" in the message logger: "MAX4"**
  The PacDrive controller has not been switched on for over 7 days (control voltage!).
- ► Reboot the PacDrive controller. The error should now be resolved.

- **"Object" in the message logger: "PN4"**
  The internal or external battery on the PN-4 optional module is empty and the PacDrive controller has not been switched on in over 7 days (control voltage!).
- ▶ Reboot the PacDrive controller. The error should now be resolved.

- **"Object" in the message logger: "Cx00"**
  A system error has occurred.
  The NvRam on the PacDrive controller is defective.
- ▶ Replace PacDrive controller.

- **"Object" in the message logger: "MAX4"**
  A system error has occurred.
  The NvRam on the PacDrive controller is defective.
- ▶ Replace PacDrive controller.

- **"Object" in the message logger: "PN4"**
  A system error has occurred.
  The NvRam on the PN-4 optional module is defective.
- ▶ Replace the PN-4 optional module.

- An internal system error has occurred.
- ▶ Replace PacDrive controller.

317 Cycle time overrun

Diagnostic class (see 8.2 The Notion of 'Diagnosis Classes') (standard): 6

A cycle time error has been found. This error is triggered when the cycle time exceeds one system clock tick (default value for a system clock tick is 250 µs or 1 ms with the C200). DiagExtCode shows the “current cycle time” / “cycle time from the task configuration” in ms.

318 Calculated profile deleted

Diagnostic class (standard): 5

An attempt was made to calculate a profile (e.g. CamMasterStart()) that was just deleted with the ProfilDelete(). The DiagExtCode displays the profile in hexadecimal form (e.g. Prof=1001000).

- An internal system error has occurred.
- ▶ Check the program.

- Program error: asynchronously running high-priority FastTasks were used.
- ▶ Synchronize **FastTask** to real-time process.

319 TPEdge not valid at 4ms

Diagnostic class (standard): 2

The touchprobe measurement is not valid at the specified CycleTime of 4 ms.

- A cycle time of 4 ms is specified in the PLC configuration and the PacDrive controller hardware does not support the touchprobe measurement correctly for this cycle time.
- ▶ Set the cycle time to 1 or 2, if possible.
- ▶ Update the PacDrive controller hardware.
  Contact your ELAU responsible.

320 Bad array access (check)

Diagnostic class (standard): 5

An array access error in the IEC user program was found by the Check.lib. The message logger call hierarchy function can be used to "backtrace" the function block call or nesting.

- While accessing an array, the area limits of that array were breached in the IEC user program.
- ► Reboot the PacDrive controller.

321 Division by zero (check)

Diagnostic class (standard): 5

A division by zero was found in the IEC user program by the Check.lib. The message logger call hierarchy function can be used to "backtrace" the function block call or nesting.

- A division by zero should executed in the IEC program.
- ► Include division by “0” in the IEC program.
- ► Check the number range.

322 Exception by IEC task

Diagnostic class (standard): 5

(For the name of the function, see DiagExtCode) The message logger call hierarchy function can be used to "backtrace" the function block call or nesting.

323 String too long

Diagnostic class (standard): 5

The maximum string length (255) was found in the IEC user program by the Check.lib. The message logger call hierarchy function can be used to "backtrace" the function block call or nesting.

- The maximum string length in the IEC user program was exceeded.
- ► Reboot the PacDrive controller.

324 UPS internal failure

Diagnostic class (standard): 5

There is an internal error in the UPS.

- The battery of the UPS is empty.
- ► Charge the battery.

- The power supply of the UPS is working, but the “ON/OFF” input of the UPS is set to OFF.
- ► If the voltage supply is correct, then the “ON/OFF” input must be ON in order to use the UPS.

- An USV Object is specified in the PLC configuration, but no UPS is connected.
- ► Check the IEC program.

- An internal UPS error has occurred.
- ► Check the program.

Ext. diagnosis: "PIC fail" or "State = 5"

- Program error: Asynchronous running high priority FastTasks were used.
- ► Contact your ELAU responsible.

325 Fle corrupt

Diagnostic class (standard): 5

A problem (file non existent or CRC error) occured while reading the retain file. The retain file will be read by the flash disk while the PacDrive controller boots if the Enable parameter of the UPS object is set to "External / 1".

- An USV Object is specified in the PLC configuration, but no UPS is connected.
- ► Check the IEC program.

- The UPS is not functioning properly.
- ► Check the UPS.

326 Unsupported function

Diagnostic class (standard): 5

A division by zero was found in the IEC user program by the Check.lib. Further information of the object type and the instance is displayed in the message logger. The DiagExtCode also provides information on the error cause.

- A division by zero should executed in the IEC program.
- ► Check the hardware version in reference to the type plate and the MAx4Type parameter.

327 Invalid PositionSource

Diagnostic class (standard): 6

The CamTrack in the PositionSource parameter contains an invalid value.

- The symbolic name of a logical encoder or an axis (MC-4 or SCL) was not specified in the PositionSource parameter.
- ► Check the value in the PositionSource parameter.

328 Invalid Destination

Diagnostic class (standard): 6

The CamTrack in the Destination parameter contains an invalid value.

- The message logger call hierarchy function can be used to "backtrace" the function block call or nesting.
- ► If an IEC task detects a fatal error (e.g. access error using pointer), it triggers a diagnosis message.

329 Invalid BitNumber

Diagnostic class (standard): 6

The CamTrack in the Bitno parameter contains an invalid value.

- The maximum string length in the IEC user program was exceeded.
- ► Check the IEC program.

330 Bad master parameter data

Diagnostic class (standard): 5

There is an internal error in the UPS.

Charge the battery. XXX indicates the generator type while YYY indicates the Master-JobId of the job that caused the problem.

The power supply of the UPS is working, but the "ON/OFF" input of the UPS is set to OFF.
0 -> CAM
1 -> POS

- Internal calculation error.
- ► Contact your ELAU responsible.

331 Licensing

Diagnostic class (standard): 5

This diagnostic message will be triggered by the license server of the PacDrive controller (e.g. C600) if a function block is used without a sufficient number of points. The 331 “Licensing” error (can be acknowledged) will be triggered first so as to notify the user that the remaining run time of the system is only six hours. More information on the object type and the instance is displayed in the message logger. When this time period has elapsed, a high priority error (see 8.6.4.33 332 Licensing) that cannot be acknowledged is triggered. After a few minutes (about 5 min.), the SERCOS bus is shut down, making any further use of the affected controller impossible.

- The PacDrive controller hardware does not support this function.
- ► Check the number of required license points by means of parameter for licensing in the PLC configuration.

332 Licensing

Diagnostic class (standard): 5

This diagnostic message will be triggered by the license server of the PacDrive controller (e.g. C600) if a function block is used without a sufficient number of points. The 331 “Licensing” error (can be acknowledged) will be triggered first so as to notify the user that the remaining run time of the system is only six hours. More information on the object type and the instance is displayed in the message logger. The DiagExtCode also provides information on the error cause. After a few minutes (about 5 min.), the SERCOS bus is shut down, making any further use of the affected controller impossible.

- The PacDrive controller hardware does not support this function.
- ► Check the number of required license points by means of parameter for licensing in the PLC configuration.

333 Fatal error receiving encoder data

V00.22.00 and higher
Diagnostic class (see 8.2 The Notion of 'Diagnosis Classes') (standard): 5

In the encoder network, a fatal error occurred while distributing the encoder positions.

Ext. diagnosis: "Dupl. Obj."

- Multiple initialization of object (SYN_DIN, SYN_DOUT).
- ► -

Ext. diagnosis: "Int.Err=-xxx"

- Internal error code.
- ► -

Ext. diagnosis: "SyncLost"

- Synchronization was lost while the object (SYN_DIN, SYN_DOUT) was active.

► -

Ext. diagnosis: "No Data: xxx"

- The number of data sets (xxx) that was not received sequentially exceeds the limit specified in DataCycleErrorLimit.

► -

Ext. diagnosis: "Send error"

- Due to an internal mistake for 5 cycles no telegrams were dispatched.

► -

334 Error receiving encoder data (warning)

V00.22.00 and higher
Diagnostic class (see 8.2 The Notion of 'Diagnosis Classes') (standard): 6

An error occurred in the encoder network while distributing the encoder positions.

Ext. diagnosis: "No Data: xxx"

- The Destination parameter was specified either without the symbolic name of an output group or with "none". If the number (xxx) of data sets that was not received sequentially exceeds the limit specified in DataCycleErrorLimit the 333 "Fatal error receiving encoder data" (see 8.6.4.34 333 Fatal error receiving encoder data) diagnosis message will be triggered.

► -

335 Fatal synchronization error

V00.22.00 and higher
Diagnostic class (see 8.2 The Notion of 'Diagnosis Classes') (standard): 5
Filter type 2 "Diagnosis messages"

A server error in the encoder network occurred while synchronizing the controller system clocks.

Ext. diagnosis: "Sync Init" (Object SYN_M or SYN_S)

- The initialization of synchronization master or synchronization slave failed.
  The IP address (SlaveIPAddress) of the sync. module is assigned twice.

► Check parameter **SlaveIPAddress** of the **sync. modules** in the **synchronization master** PLC configuration.

Ext. diagnosis: "SercosPhase xxx"

- The SERCOS ring is not in phase 4.

► SERCOS bus in phase 4 "booted".

Ext. diagnosis: "Dupl. MasterID"

- The set MasterID is already being used by another **synchronization master** in the same network.

► Change the **MasterID**.

Ext. diagnosis: "Sync Init" (Object SYN_M or SYN_S)

- The **synchronization master** protocol version no longer matches the **synchronization slave** protocol version.

► Check the SlaveIPAddress parameter of the sync. module in the synchronization master PLC configuration.

- ► Contact your ELAU responsible.

Ext. Diagnosis: "Ping Master"

- ▪ The **synchronization master** failed to respond to a ping.
- ► Check the Ethernet connection to the **synchronization master**.

Ext. Diagnosis "Dupl. Slave IP" (object SYN_MOD

- ▪ The IP address (SlaveIPAddress) of the sync. module is assigned twice.
- ► Check parameter **SlaveIPAddress** of the **sync. modules** in the **synchronization master** PLC configuration.

Ext. Diagnosis: "SlaveCycleTime"

- ▪ The SlaveCycleTime is not a multiple of the SERCOS cycle time.
- ► parameter **SlaveCycleTime** or adjust the **SERCOS cycle time**.

Ext. diagnosis: "Wrong config" (object SYN_MOD)

- ▪ The activated **synchronization slave** is not configured properly or is not responding.
- ► Check the configuration of the **synchronization slave** (e.g. same CycleTime).
- ► Check TCP/IP connection between **synchronization master** and **synchronization slave**.

Ext. diagnosis: "Wrong config" (object SYN_S)

- ▪ The SERCOS cycle times differ between **synchronization master** and **synchronization slave** or the **synchronization slave**-configuration cannot be transmitted.
- ► Adjust the CycleTime parameter of the **synchronization master** and/or **synchronization slaves**.

Ext. diagnosis: "Wrong State"

- ▪ The activated **synchronization slave** is in an error state.
- ► Acknowledge the error in the **synchronization slave**.

Ext. diagnosis: "No DataOut"

- ▪ No sync. encoder output has been configured or activated. Encoder output has been configured or activated.
- ► Check the PLC configuration.
- ► Check the TCP/IP connection **synchronization master** to **synchronization slave**. Activate **endocer output** (parameter Enable).

Ext. diagnosis: "No Module"

- ▪ No **sync. encoder output** has been configured or activated. **module** and no **sync. encoder output** are configured or active.
- ► Check the PLC configuration.
- ► Check the TCP/IP connection **synchronization master** to **synchronization slave**. **moduel** or **sync.** Activate **encoder output** (**sync. module** parameter Enable or **sync. encoder input** parameter Enable).

Ext. diagnosis: "Sync Err"

- ▪ The **synchronization slaves** are unable to synchronize with the **synchronization master**.
  The Ethernet (see parameter SyncQuality) and/or the CPU load (see parameter AvailableLoad) is too high.
- ► Check the Ethernet connection.
- ► Optimize the IEC project to reduce the CPU load.

Ext. diagnosis: "No Sync: xxx"

- The number of sequential synchronization telegrams (xxx) which were not received exceeded the number specified in SlaveCycleErrorLimit.
  The Ethernet (see parameter SyncQuality) and/or the CPU load (see parameter AvailableLoad) is too high.
- ► Check the Ethernet connection.
- ► Optimize the IEC project to reduce the CPU load.
- ► Increase **SlaveCycleErrorLimit** .

Ext. diagnosis: "DataReady Err"

- The number of sequential synchronization telegrams (xxx) which were not received exceeded the number specified in **SlaveCycleErrorLimit**. **Encoder outputs** cannot configure **sync. encoder inputs** or a data error occured in the course of normal operation.
- ► Check parameter DiagCode of **sync. modules** to obtain more detailed information about the source of the error.

Ext. diagnosis: "DataReady Err"

- Either the **sync. encoder outputs** are unable to configure the **sync. encoder inputs** or a data error has occurred while the system is running. **Encoder outputs** and **sync. encoder inputs** are ready for data exchange.
- ► Check parameter DiagCode of **sync. modules** to obtain more detailed information about the source of the error.

Ext. diagnosis: "Wrong IP Add"

- The **SlaveIPAddress** parameter is not set.
- ► Contact your ELAU responsible.

Ext. diagnosis: "Wrong IP Add"

- The SlaveIPAddress parameter is not set.
- ► Contact your ELAU responsible.

Ext. diagnosis: "Sync Err Wnd"

The synchronization has been interrupted due to excessive telegram delays.

- Ethernet data communication excessive.
- ►

Ext. diagnosis: "Sync Err LCyc"

The synchronization has been interrupted due to excessive telegram failures.

-
- ►

Ext. diagnosis: "Sync Err CtrlM"

The synchronization master has received an error message from a slave reporting a severe communication error.

-
- ►

Ext. diagnosis: "Sync Err CtrlS"

The synchronization slave has received an error message from the master reporting a severe communication error.

-
- ►

Ext. diagnosis: "Sync Err CtrlN"

The synchronization module has received an error message from the corresponding synchronization slave reporting a severe communication error and was unable to read more detailed diagnosis information.

▪
►

Ext. diagnosis: "Sync TimeoutM"

The synchronization master has determined a timeout for establishing synchronization (> 5min).

▪
►

Ext. diagnosis: "Sync TimeoutS"

The synchronization slave has determined a timeout for establishing synchronization (> 5min).

▪
►

336 Synchronization error (warning)

V00.22.00 and higher
Diagnostic class (see 8.2 The Notion of 'Diagnosis Classes') (standard): 6

A fatal error has occurred in the encoder network, while synchronizing the controller system clocks.

Ext. diagnosis: "No Sync: xxx"

- More than half of the synchronization telegrams (xxx) specified in SlaveCycleErrorLimit have not been received sequentially. If more than the number of synchronization telegrams specified in **SlaveCycleErrorLimit** are not received in a row, diagnostic message 335 "Fatal synchronization error" (see 8.6.4.36 335 Fatal synchronization error) is triggered.

► -

337 Insufficient system memory to create DynIECData

V00.22.00 and higher
Diagnostic class (see 8.2 The Notion of 'Diagnosis Classes') (standard): 4
Filter type 1 "general system messages"

The dynamic memory area, which was specified with the DynIECDataSize parameter, could not be reserved due to insufficient memory (RAM). During IEC program start, a check will be performed to determine if there is at least 4 MB of available memory after the dynamic memory area is reserved (also see the Memoryfreeparameter).

- The dynamic memory area to be reserved is too high.

► Reduce the value of the parameter **DynIECDataSize**.

338 UPS accu error

Diagnostic class (standard): 5

The battery is not sufficiently charged.

Ext. diagnosis: "State = 2"

- The PacDrive controller has been switched off for too long.

► Switch on the PacDrive controller.
✓ The battery will be charged automatically when the PacDrive controller is on.

▪ The UPS has been operating in the battery mode (State = 3) for an extended period.
► Check the supply voltage.
► Switch on the PacDrive controller if it is off.
✓ The battery will be charged automatically when the PacDrive controller is on.

▪ The battery capacity is insufficient due to aging.
► Contact your ELAU responsible.

339 UPS active - system temperature too high

Diagnostic class (standard): 5

The temperature in the PacDrive controller is too high.

Ext. diagnosis: "State = 6"

▪ Ambient temperature too high.
► For further details, please refer to the technical data on the PacDrive controller (see operating instructions).

340 Outside of limits (check)

reserved

341 Invalid PositionType

Diagnostic class (standard): 6

The CamTrack in the parameter PositionType contains an illegal value.

▪ No valid position type (parameter **PositionType**) of the position source PositionSource (see 8.6.4.28 327 Invalid PositionSource)) has been entered.
► Check the parameters **PositionType** and **PositionSource**.

4xx “IEC-Task” diagnosis messages

400 IEC diagnosis message class 2

Diagnostic class (standard): 2

A diagnostic message from the IEC program has been triggered with the DiagMsgWrite() function.

▪ The error was triggered by the IEC program.
► See description of your IEC program. It is possible to display an additional error text with the DiagMsgWrite() function.

401 IEC diagnosis message class 3

Diagnostic class (standard): 3

A diagnostic message from the IEC program has been triggered with the DiagMsgWrite() function.

▪ The error was triggered by the IEC program.
► See description of your IEC program. It is possible to display an additional error text with the DiagMsgWrite() function.

402 IEC diagnosis message class 4

Diagnostic class (standard): 4

A diagnostic message from the IEC program has been triggered with the DiagMsgWrite() function.

- The error was triggered by the IEC program.
- ► See description of your IEC program. It is possible to display an additional error text with the DiagMsgWrite() function.

403 IEC diagnosis message class 5

Diagnostic class (standard): 5

A diagnostic message from the IEC program has been triggered with the DiagMsgWrite() function.

- The error was triggered by the IEC program.
- ► See description of your IEC program. It is possible to display an additional error text with the DiagMsgWrite() function.

404 IEC diagnosis message class 6

Diagnostic class (standard): 6

A diagnostic message from the IEC program has been triggered with the DiagMsgWrite() function.

- The error was triggered by the IEC program.
- ► See description of your IEC program. It is possible to display an additional error text with the DiagMsgWrite() function.

405 IEC diagnosis message class 7

Diagnostic class (standard): 7

A diagnostic message from the IEC program has been triggered with the DiagMsgWrite() function.

- The error was triggered by the IEC program.
- ► See description of your IEC program. It is possible to display an additional error text with the DiagMsgWrite() function.

406 IEC diagnosis message class 1

Diagnostic class (standard): 1

A diagnostic message from the IEC program has been triggered with the DiagMsgWrite() function.

- The error was triggered by the IEC program.
- ► See description of your IEC program. It is possible to display an additional error text with the DiagMsgWrite() function.

407 IEC diagnosis message class 8

Diagnostic class (standard): 8

A diagnostic message from the IEC program has been triggered with the DiagMsgWrite() function.

- The error was triggered by the IEC program.

- ► See description of your IEC program. It is possible to display an additional error text with the DiagMsgWrite() function.

5xx “SERCOS / realtime” diagnosis messages

500 SERCOS slave with duplicate address

Diagnostic class (standard): 1

While booting the SERCOS bus' in phase 3, the addresses of the detected SERCOS slaves are checked. The system detects any multiple address assignments. This function, however, must by supported by the SERCOS slaves. ELAU slaves (MC-4, SCL and PS-4) support this function in V00.15.00 or higher.

- ▪ A SERCOS slave address has been assigned to the SERCOS slaves twice.
- ► Check the rotary switch settings on the SERCOS slaves.

Meaning in versions below V00.15.00:
A SERCOS slave address has been assigned more than once in the PLC configuration. The DiagExtCode parameter displays the address that has been assigned multiple times. If the address is displayed once, it has been assigned twice; if it is displayed twice, it has been assigned three times, and so forth.

- ▪ A SERCOS slave address has been assigned more than once in the PLC configuration.
- ► DiagMsgWrite function.
- ► Check and adjust the RealTimeBusAdr parameter in the PLC configuration.

501 SERCOS slave not found

Diagnostic class (see 8.2 The Notion of 'Diagnosis Classes') (standard): 1

The device, that was expected at the position (x), was not found. (PDIII)

- ▪ Error when assigning the identification features.
- ► Check the settings of the identification features (for example: ConfiguredTopologyAddress)

A SERCOS slave specified in the PLC configuration is not detected in the SERCOS bus.

- ▪ SERCOS slave not present in the SERCOS bus.
- ► Integrate the SERCOS slave in the SERCOS-Bus
  or remove the SERCOS slave from the PLC configuration or parameterize it as a virtual device.

- ▪ SCL-055 motors are connected to the PacDrive controller. The connection of the SCL-055 motors in the PacDrive PD-8 box is not correct.
- ► Check the connection of the SCL-055 motors in the PacDrive PD-8 box. Simply placing jumpers on the desired terminals will not resolve the problem. No nodes to be plugged into the following SERCOS plug-in position.
  In addition, follow the notes in the "SCL" and "PS-4 and PD-8" operating instructions.

502 Ring not closed

Diagnostic class (standard): 1

The SERCOS ring is not closed. The result was a longer interruption (>100 ms) of the ring.

You can detect whether the interruption is still present using Light diode "bus err" (see 8.4 Device display elements (LEDs)) and the RingStatus (see 8.4 Device display elements (LEDs)) parameter.

When the interruption has been eliminated and the SERCOS bus is at least in phase 2, the source of the error can be narrowed down with the help of the **SERCOS Firmware Assistenten** in the data view **System diagnosis > SERCOS-configuration** and SERCOS Topology.

- Signal over the SERCOS fiberoptic conductor is incorrect.
- ► Check the intensity setting in the PacDrive controller and on the servo amplifier.
- ► Check wiring (see parameter RingStatus).

- A device in the SERCOS ring is switched off or was reset.
- ► Check the power supply (24 V) of the device.
- ► Switch on the device.

- **SCL-055**motors are connected to the PacDrive controller. The **SCL-055** motors are not connected properly in the PacDrive **PD-8** box.
- ► Check the connection of the **SCL-055** motors in the PacDrive **PD-8** box. Simply placing jumpers on the desired terminals will not resolve the problem. No nodes to be plugged into the following SERCOS plug-in position.
  Please refer to the notes provided in the "**SCL**" and "**PS-4**" and **PD-8** operating instructions.

503 Error in parameter channel

Diagnostic class (standard): 4

A transfer error has occurred in the SERCOS bus during operation. Additional information will be stored in DiagExtCode .

DiagExtCode	Meaning
ST-Err:xxx	Service transfer error
ST Timeout	Timeout during service transfer
ST Any	Other service transfer error
ST-99	Error while processing reset ZK1
ST -99 ChangeBit	Error while processing reset ZK1; change bit was not set or protocol error
no SYNC	Communication synchronization with slave disrupted.

- **DiagExtCode = no SYNC**
  There are SERCOS slaves (MC-4) with a firmware version below V00.15.00 in the loop that are not responding as real devices. The result is a serious error during phase start up of the SERCOS bus, interrupting the phase start up.
- ► If there are SERCOS slaves (MC-4) with a firmware version below V00.15.00 that have not responded as real devices, the SERCOS address on the device must be set to zero.

- EMC problem
- ► Connect the SERCOS slave to the SERCOS bus

- Hardware problem with a SERCOS slave (e.g. servo amplifier MC-4) or a SERCOS master (e.g. PacDrive controller Max-4).
- ► Contact your ELAU responsible.

504 Read cycle overflow

Diagnostic class (standard): 4

The transfer of the actual position of the axes (servo amplifiers) to the PacDrive controller occurred too late. The actual values of the next SERCOS cycle have already been read. The actual velocity for the IEC program may not be correct.

- SERCOS bus is overloaded.
- ► Increase CycleTime parameter in the PLC Configuration.

- A device in the SERCOS ring is switched off or was reset.
- ► Switch on SERCOS slave.

505 Single SERCOS error (MASTER)

Diagnostic class (default): 6

A check sum error on the SERCOS bus has been detected. Additional information will be stored in DiagExtCode .

- Signal over the SERCOS fiberoptic conductor is incorrect.
- ► Check the intensity setting in the PacDrive controller and on the servo amplifier.
- ► Service transfer error

- EMC problems.
- ► Check the wiring.

- SCL-055 motors are connected to the PacDrive controller. The connection of the SCL-055 motors in the PacDrive PD-8 box is not correct.
- ► Check the connection of the SCL-055 motors in the PacDrive PD-8 box. Simply placing jumpers on the desired terminals will not resolve the problem. No nodes to be plugged into the following SERCOS plug-in position.
  In addition, follow the notes in the "SCL" and "PS-4 and PD-8" operating instructions.

506 Fatal SERCOS error (MASTER)

Diagnostic class (Default): 1

SERCOS communication interrupted, because no link exists anymore on both ports. (PDIII)

- Wiring error (cable separated).
- ► Check wiring.

- SERCOS slave failed after the controller.
- ► Check device and reset if necessary.

SERCOS communication interrupted, because more than the allowed numbers of DT's have failed sequentially. (PDIII)

- Wiring error (cable separated).
- ► Check wiring.

- A SERCOS slave has failed.
- ► Check device and reset if necessary.

In two consecutive cycles, an error was detected on the SERCOS bus while receiving data. The SERCOS bus was shut down. For firmware versions earlier than V00.15,00 it is necessary to reset the PacDrive controller to start the SERCOS bus.

⚠ CAUTION

POSITION LOSS DUE TO SERIOUS SERCOS BUS ERROR!

- Due to the erroneous acknowledgement of diagnostic message 506 "Serious SERCOS error (MASTER)", without restarting the controller, loss of position of the axes and physical encoder (SinCos, incremental encoder) from V00.15.00 is possible.
- Acknowledge the diagnosis message only after the re-initialization or referencing of the system is secured by the IEC program.
- The capability to acknowledge the diagnostic message can be switched off with the function DiagNoQuitSet().
- If necessary, use the SysReset() or the PrgResetAndStart().

A non-observance of these instructions can cause bodily injury or damage the equipment.

CAUTION

CONNECTION TO CONTROLLER INTERRUPTED

- The diagnostic message 112 "Communication error real time bus" (see 8.6.2.13 112 Communication error real-time bus) is not reported in the system because the SERCOS slave cannot report the diagnosis code via the SERCOS bus to the Controller in case of an error.
- In this case, diagnosis code 506 "Fatal SERCOS error (MASTER)" (see 8.6.6.7 506 Fatal SERCOS error (MASTER))is reported.

Failure to follow these instructions can result in equipment damage.

- DiagExtCode = RFr or RFlr (see 8.6.1.51 052 Extended SERCOS diagnosis (MASTER))
  Control voltage dropped (24 V DC). Diagnostic message 134 "External 24V power supply too low" (see 8.6.2.35 134 External 24V power supply too low) may still be entered in the message logger (if it was still possible to transfer it via the SERCOS bus).
  ▶ Check the control voltage (see technical data of the device).
- DiagExtCode = Rr (see 8.6.1.51 052 Extended SERCOS diagnosis (MASTER)) during the phase start up
  There are SERCOS-Slaves (**MC-4**, **SCL**, **PS-4**) in the ring with a firmware version lower thanV00.20.00 and the parameter FastBootUp is set to TRUE. The result is a serious error during phase start up of the SERCOS bus, interrupting the phase start up.
  ▶ If there are SERCOS slaves (**MC-4**, **SCL**, **PS-4**) with a firmware version lower than V00.20.00 in the ring, the parameter **FastBootUp** must be set to FALSE.
- DiagExtCode = RFr (see 8.6.1.51 052 Extended SERCOS diagnosis (MASTER)) during phase start up
  There are SERCOS slaves (MC-4) with a firmware version earlier than V00.15.00 in the ring that are not addressed as real devices. The result is a serious error during phase start up of the SERCOS bus, interrupting the phase start up.
  ▶ For SERCOS slaves (MC-4) with a firmware version earlier than V00.15,00 that are not being addressed as real devices, the SERCOS address must be set to 0.
- SCL-055 motors are connected to the PacDrive controller. The connection of the SCL-055 motors in the PacDrive PD-8 box is not correct.

- ► Check the connection of the SCL-055 motors in the PacDrive PD-8 box. Simply placing jumpers on the desired terminals will not resolve the problem. No nodes to be plugged into the following SERCOS plug-in position.
  Please refer to the notes provided in the "SCL" and "PS-4 and PD-8" operating instructions.

507 Write cycle overflow

Diagnostic class (default): 4

The transfer of the target position to the SERCOS bus occurred too late. Check the fiberoptic conductor. This results in at velocity jump in the drives (see parameter RTPWriteRes)

- ▪ SERCOS bus is overloaded.
- ► Increase CycleTime parameter in the PLC Configuration.

- ▪ The real-time process is overloaded.
- ► Simply placing jumpers on the desired terminals will not resolve the problem.

- ▪ A device in the SERCOS ring is switched off or was reset.
- ► Switch on SERCOS slave.

508 SERCOS run-up-error

Diagnostic class (see 8.2 The Notion of 'Diagnosis Classes') (Default): 1

At least one SERCOS slave does not react on time after the phase change to phase 3. (PDIII)

- ▪ Software error in FW 1.29.14.0
- ► Start SERCOS start-up again.

- ▪ General software error in one of the SERCOS slaves.
- ► Reset the SERCOS slave and start SERCOS start-up again.

No telegrams were received in phase 0, the ring is not closed. (PDIII)

- ▪ Wiring error (cable separated).
- ► Check wiring.

- ▪ SERCOS slave failed after the controller.
- ► Check device and reset if necessary.

A system error has occurred.

- ▪ Virtual SERCOS slaves are specified in the PLC configuration although the slaves are physically connected on the SERCOS bus.
- ► Check the RealTimeBusAdr parameter of the SERCOS slaves in the PLC configuration.

- ▪ There are more SERCOS slaves in the loop than specified in the PLC configuration.
- ► Check the number of SERCOS slaves in the PLC configuration.
- ► Check and RealTimeBusAdr parameter in the PLC configuration.
- ► Remove the SERCO slave from the loop or set the address on the device to zero.

- ▪ SCL-055 motors are connected to the PacDrive controller. The connection of the SCL-055 motors in the PacDrive PD-8 box is not correct.
- ► Check the connection of the SCL-055 motors in the PacDrive PD-8 box. Simply placing jumpers on the desired terminals will not resolve the problem. No nodes to be plugged into the following SERCOS plug-in position.
  Please refer to the notes provided in the "SCL" and "PS-4 and PD-8" operating instructions.

- **Ext. Diagnose: "no telegram"**
  On a bad connection it can happen that a ring interruption was not detected yet. However, the transfer quality on the BUS may be so bad that no telegrams can be transmitted. A Start up from phase 0 is then cancelled without a diagnosis message. The message logger then shows that the change from phase 0 to phase 1 was cancelled with internal error code -483.
- ▶ Check the intensity settings for the SERCOS interface.
- ▶ Check the SERCOS bus wiring.
- ▶ Check the setting of the MaxPhysicalSlaves parameter.

- **Ext. Diagnose: "SemDPM-Timeout"**
  A synchronization error occurred during the phase start-up.
- ▶ Contact your ELAU responsible.

- **Ext. Diagnose: "AutoRunTimeout"**
  The phase start-up of the SERCOS bus took too long.
  The diagnostic message is triggered when booting the control system. In addition, the following conditions must apply: Parameter AutoRun = TRUE and PhaseSet = 4. The IEC program is started automatically when the diagnostic message has been triggered.
- ▶ Contact your ELAU responsible.

509 Unsupported FW-version

Diagnostic class (default): 4

The firmware version of the SERCOS slave is incorrect.

- The firmware version of the SERCOS slaves (MC-4, SCL, PS-4, ...) is higher than the firmware version of the PacDrive controller in the first 4 positions.
- ▶ Increase the CycleTime parameter in the PLC configuration.

- **Ext. diagnosis = Vxx.yy.zz BLD**
  The SERCOS slave is in bootloader mode. The version of the Bootloader is shown in the message logger under **Ext. Diagnosis**. The SERCOS slave can also be found using the information on the **object** and **instance** provided in the message logger.
- ▶ Reduce the number of objects with real-time tasks (e.g. virtual axes, virtual encoders, logical encoders, sum encoders, ...).
- ▶ Reset the SERCOS slaves.
- ▶ Acknowledge the diagnosis message.
- ✓ The SERCOS bus is running in phase 4.

510 EZB IRQ lost

Diagnostic class (default): 4

The interruption of the SERCOS buy has not been received in at least twice the cycle time. This diagnosis message normally occurs at the same time as other diagnosis messages (504 Read cycle overflow (see 8.6.6.5 504 Read cycle overflow) ... 507 Write cycle overflow (see 8.6.6.8 507 Write cycle overflow)).

- The problem occurs when the system shuts down. The 24 V control voltage of the SERCOS slave is removed faster than the 24 V control voltage of the PacDrive controller.
- ▶ Check the wiring or connection diagram.

- However, the transfer quality on the BUS may be so bad that no telegrams can be transmitted.
- ▶ Check the intensity setting for the SERCOS interface.

- Ext. diagnosis: "SemDPM-Timeout"
- ► Check the SERCOS slave.

511 CPU time overflow

Diagnostic class (default): 2

The real-time process is overloaded (CycleLoad >95 %). The DiagExtCode parameter displays the measured load as ‘Load = xxx%’ with xxx indicating the load in %.

CAUTION
After detecting the error, the actual and target values for the encoders, generators and axes will no longer be processed in the real-time process. As a result, the “target and actual values” parameter of the axes will show invalid values.

- The version of the bootloader is displayed in the message logger under Ext. diagnosis.
- ► Increase the CycleTime parameter of the SERCOS interface in the PLC configuration.

512 SERCOS wrong device type

Diagnostic class (see 8.2 The Notion of 'Diagnosis Classes') (Default): 1

The device type of the SERCOS slave found on position (x) does not match the expected type (type). (PDIII)

- Error when assigning the identification features.
- ► Check the settings of the identification features (for example: ConfiguredTopologyAddress).

When starting up the SERCOS bus in Phase 2, the type of the detected SERCOS slave will be checked (MC-4, SCL, PS-4, ...) with the slave that is entered in the PLC configuration. The interrupt of the SERCOS bus has not been received in at least twice the cycle time . The SERCOS address and the detected type will be entered in the extended diagnosis.



The problem occurs when the system shuts down.
If this is the case, at least two SERCOS slaves have the same address.

- The SERCOS slave address (RealTimeBusAdr) on the SERCOS slave (MC-4, SCL, PS-4) was not set correctly.
- ► Replace the fiberoptic conductor.
- ► Check if the address setting on the SERCOS slave matches the address setting in the PLC configuration (RealTimeBusAdr).

- A SERCOS slave has failed.
- ► Check the SERCOS slave.

513 Download result

Diagnostic class (default): 4
Filter type 2 "Diagnosis messages"

An error has occurred during the program-controlled firmware download.

If no match is found, the SERCOS bus phase startup will be cancelled.
DI <SERCOS address> Err <internl error code>

- **Ext. diagnosis = DI <SERCOS address> Err -479**
  A wrong device type was entered in the configuration file (e.g. one **PS-4** firmware for another **MC-4**). If this is the case, at least two SERCOS slaves have the same address.
- ▶ Adjust the configuration file.

- **Ext. diagnosis = DI < SERCOS address> Err -495**
  The “Download Mode” in the configuration file is specified as “upgrade” (or “downgrade") and the current firmware version is higher (or lower) than the firmware version that is to be programmed.
- ▶ Check the address setting on the SERCOS slave that is displayed in the diagnosis message.
- ▶ Check if the address setting on the SERCOS slave matches the address setting in the PLC configuration (RealTimeBusAdr).

514 Error download configuration file

Diagnostic class (default): 4

516 SERCOS wrong device position

Diagnostic class (default): 1

When the SERCOS bus boots at the end of Phase 3, the assignment of the SCLs to the PS-4 systems is checked. All SCLs that have been assigned a specific PS-4 power supply in the PLC configuration must be physically connected with that PS-4. If an assignment error occurs, the 516 “SERCOS wrong device position” diagnosis message will be displayed.
The message appears for the affected SCL. The DiagExtCode displays the name of the PS-4 that actually should be assigned to the SCL.

- This diagnosis message is generated for each SERCOS slave.
- ▶ Adjust the configuration file.

- The addresses of the PS-4 power supply have been incorrectly set via the rotary switch on the device.
- ▶ Check the address settings on the PS-4.

- The RealTimeBusAdr parameter in the PLC configuration contains incorrectly specified PS-4 and/or SCL addresses.
- ▶ Check the RealTimeBusAdr parameter in the PLC configuration.

517 Multiple used RealTimeBusAdr

Diagnostic class (standard): 1

A SERCOS address (RealTimeBusAdr) has been assigned more than once in the PLC configuration. A check is performed while preparing the SERCOS phase 1. The boot procedure of the SERCOS bus will be cancelled. The DiagExtCode parameter and the ext. diagnosis in the message logger display the address that have been assigned more than once.

- A SERCOS address has been assigned more than once in the RealTimeBusAdre parameter in the PLC configuration.
- ▶ Check the RealTimeBusAdr parameter in the PLC configuration.

518 Too many real SERCOS Slaves

Diagnostic class (see 8.2 The Notion of 'Diagnosis Classes') (standard): 4

Too many SERCOS slaves have been connected (x), not able to connect them all with the logical objects (y). (PDIII)

- The WorkingMode is not configured correctly.
- ► Check if for every real connected slave an appropriate object is existent in the PLC configuration where the WorkingMode is set to real or optional.

- The identification features are not configured correctly.
- ► Check if for every real connected slave, by the appropriate objects in the PLC configuration, the correct identification features are entered (for example, correct TopologyAddress)

The number of real SERCOS slaves is too high.

Ext. diagnosis: HW <maximum number of SERCOS slaves on the controller>/<Number of configured SERCOS slaves>

- Limiting through the Controller type:
  Before exiting the SERCOS Phase 0, the number of configured real SERCOS slaves in the PLC configuration is being checked. The number must be smaller or equal to the licensed number for the PacDrive controller. If this value is exceeded, the startup will be cancelled. The extended diagnosis shows the licensed and the configured number together with the "HW" prefix.
  As of controller firmware version 00.23.00, power supplies (**PS-4**, **PS-5**) are no longer counted as SERCOS slaves.
- ► Check the PacDrive controller type by referring to the type plate.

Ext. diagnosis: BUS t=<time overrun>µs

- The communication parameters of the SERCOS slave are queried in the SERCOS phase 2. Together with the settings of the SERCOS master, the time slots for the cyclical telegram traffic will be determined and set. The BaudRate and CycleTime paramteres determine the available BUS bandwidth. If the bandwidth is insufficient, the startup will be cancelled with the 518 “Too many real SERCOS Slaves” diagnosis message. The extended diagnosis shows the time by which the cycle time has been exceeded as a negative value.
- The number of SERCOS slaves (MC-4, PS-4, SCL) for the cycle time is too high.
- ► Check the CycleTime.
- ► Check the BaudRate.

The addresses of the integrated SCL servo drive have been incorrectly set via the rotary switch on the device.

- Limiting through the hardware configuration (licensing):
  Before exiting the SERCOS phase 0, the number of configured real SERCOS-SercDrv slaves in the PLC configuration is being checked. The number must be smaller or equal to the licensed number for the PacDrive controller. If this value is exceeded, the startup will be cancelled. The extended diagnosis shows the licensed and the configured number together with the “SercDrv” prefix.
- ► Check the PacDrive controller type.
- ► Contact your ELAU responsible.

6xx "master encoder" diagnosis messages

600 Serial interface problem

Diagnostic class (standard): 4

The number of real SERCOS slaves is too high.

⚠ CAUTION
INITPOSITION AND ENCODERPOSITION ARE POSSIBLY INCORRECT. • Ext. diagnosis: HW <maximum number of SERCOS slaves on controller>/<number of configured SERCOS slaves> Damage may result from a non-referenced machine.

- Wiring error: The encoder cable is not plugged in correctly or is defective.
- ► Check the encoder cable and replace if necessary.
- ► Contact your ELAU representative.

- Data is exchanged using the encoder's serial interface during the functions PhyEndGetPosition(),PhyEncResetEncoder() and PhyEndSetPosition(). The actual data exchange is performed by the system task (TASK_TYPE_PHY_ENC_JOB_Server). If the function is active, this task must query the serial interface on a regular basis (usually<2ms). Insufficiently allocated processing time may result in data loss (diagnosis message 600).
  The TASK_TYPE_PHY_ENC_JOB_Server system task runs at IEC priority 5 (same as system priority 225). If the above functions in the IEC tasks are called with a priority of 1 to 4, this problem may result when the processing requirements are too high.
- ► Check the cycle time.
- ► Contact your ELAU representative.

Example:
The PhyEncGetPosition() function is triggered from an IEC task with IEC priority of 4. The IEC task normally requires 2.5ms for processing. Increase the priority of the system task from 225 (or IEC priority 5) to 224 (IEC priority 4) for example.
SetTaskPriority(lTaskType:=TASK_TYP_PHY_ENC_JOB_Server, lPriority:=224);

- Hardware error: The SinCos encoder is defective.
- ► Replace the encoder.
- ► Contact your ELAU representative.

- Hardware error: The SinCos encoder is defective.
- ► Replace the controller.

601 Encoder track error

Diagnostic class (standard): 4

Unable to receive analog data from the SinCos master encoder.

⚠ CAUTION
HARDWARE ENCODER ERROR! • Acknowledge the diagnosis message only after the re-initialization or referencing of the system is secured by the IEC program. • If necessary, use the SysReset() or the PrdResetAndStart(). Reset the PacDrive controller.

- Wiring error: The encoder cable is not plugged in correctly or is defective.
- ► Check the encoder cable and replace if necessary.

- Hardware error: The SinCos encoder is defective.
- ► Replace the encoder.

- Hardware error: The SinCos encoder is defective.
- ► Replace the controller.

7xx "field buses and expansion module" diagnosis messages

700 CAN layer2 driver error

Diagnostic class (standard): 4

Unable to start the driver for the CANopen module.

- TM Safety Instructions Position Loss
- ► Hardware encoder error!

- Wiring error: The encoder cable is not plugged in correctly or is defective.
- ► Check the I/O address.
- ► Check the interrupt setting

- Hardware error: The SinCos encoder is defective.
- ► Replace the CAN module.

- Hardware error: Controller is defective.
- ► Replace the controller.

701 CAN layer2 init error

Diagnostic class (standard): 4

Initialization has failed.

- No CAN module in the PacDrive controller.
- ► -

- Incorrect I/O address or interrupt setting.
- ► Replace the module.

702 CAN layer2 single error detected

Diagnostic class (standard): 4

A send or receive error has occurred.
Meaning of ext. diagnosis:
The system displays the pending register information at the time the error occurred.
Structure: eXXsXXrXXtXX (XX indicates a hexadecimal number)
e error register (error code capture register)

Bit 7	Bit 6
0	0: Bit error
0	1: Format error
1	0: Stuff error
1	1: Other error

Bit 5
0: Send error
1: Receive error

Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Description
0	0	0	1	1	Start of frame
0	0	0	1	0	ID.28 to ID.21

Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Description
0	0	1	1	0	ID.20 to ID.18
0	0	1	0	0	Bit SRTR
0	0	1	0	1	Bit IDE
0	0	1	1	1	ID.17 to ID.13
0	1	1	1	1	ID.12 to ID.5
0	1	1	1	0	ID.4 to ID.0
0	1	1	0	0	Bit RTR
0	1	1	0	1	Reserved bit 1
0	1	0	0	1	Reserved bit 0
0	1	0	1	1	Data length code
0	1	0	1	0	Data field
0	1	0	0	0	CRC sequence
1	1	0	0	0	CRC delimiter
1	1	0	0	1	Acknowledge slot
1	1	0	1	1	Acknowledge delimiter
1	1	0	1	0	End of frame
1	0	0	1	0	Intermission
1	0	0	0	1	Active error flag
1	0	1	1	0	Passive error flag
1	0	0	1	1	Tolerate dominant bits
1	0	1	1	1	Error delimiter
1	1	1	0	0	Overload flag

Table 8-8: Bit 4 to Bit 0 indicate the position of the error.

s Status Register (see Status parameter)
r Receive Error Counter (see Status parameter)
t Send Error Counter (see Status parameter)

- Bit Error + Data Length Code.
  Two nodes are using the same identifier or COB-ID.
- ► Check the identifier or COB-ID.

- Bit Error + Identifier
  Intermittent connection error to receiver.
- ► -

- Stuff Error + Identifier
  Dominant signal level due to external interference.
- ► -

- Format error + Acknowledge delimiter
  Critical bus time setting (Baudrate) or bus length.
- ► -

Ext. diagnosis = count=xx/yy

xx: Contains the value of the ErrorCount at the time the error occurred.
yy: Contains the value of the ErrorOffCount parameter at the time the error occurred.
The GlobalError parameter is set to Bit 4.

- Bus error.
- ► -

703 CAN layer2 errors reach warning limit

Diagnostic class (standard): 4

The number of send or receive errors specified in the warning limit register has been exceeded.

Meaning of ext. diagnosis: The system displays the pending register information at the time the error occurred.
Structure: sXXrXXtXX
s Status register (see Status)
r Receive Error Counter (see Status parameter)
t Send Error Counter (see Status parameter)

704 CAN layer2 switched passive

Diagnostic class (standard): 4

128 send or receive errors have occurred. In passive mode, no CAN messages are acknowledged and no error messages are sent to the bus.

Meaning of ext. diagnosis: The system displays the pending register information at the time the error occurred.
Structure: sXXrXXtXX
s Status register (see Status)
r Receive Error Counter (see Status parameter)
t Send Error Counter (see Status parameter)

705 CAN system error

Diagnostic class (standard): 4

An internal error in the CAN module has occurred. The type of error is specified in more detail in the ext. diagnosis.

- **Ext. diagnosis = msg lost=XXX:**
  The PLC firmware was unable to retrieve the command or status messages from the CAN module fast enough, which led to a buffer overrun and the loss of XXX messages.
  ▶ Contact your ELAU responsible.
- **Ext. diagnosis = fmsg lost=XXX:**
  The control firmware was unable to retrieve the layer2 messages from the CAN module fast enough.
  ▶ Contact your ELAU responsible.
- **Ext. diagnosis = module overload:**
  CPU on CAN module was unable to read the data from the CAN bus fast enough and messages have been lost as a result.
  ▶ Contact your ELAU responsible.
- **Ext. diagnosis = module int lost:**
  CPU on CAN module was unable to read the CAN messages (intended for CAL/CANopen) from the bus fast enough. No messages for CAL/CANopen have been defined for layer 2. Error is not permitted to occur with the CAN layer 2 module.
  ▶ Contact your ELAU responsible.
- **Ext. diagnosis = mod queue out:**
  CPU on CAN module was unable to read the CAN messages send for CAL/CANopen fast enough. No messages for CAL/CANopen have been defined for layer 2. Error is not permitted to occur with the CAN layer 2 module.
  ▶ Contact your ELAU responsible.

- **Ext. diagnosis = mod error:**
  Event error of the CAN module not specified in more detail. Default branch event error evaluation. Should not occur.
- ► Contact your ELAU responsible.

706 CAN layer2 errors below warning limit

Diagnostic class (standard): 8

The number of send or receive errors specified in the warning limit register has been exceeded. Sending or receiving functioning again.

707 CAN layer2 switched active

Diagnostic class (standard): 8

The number of send or receive errors (128) has been exceeded. The CAN module is running again in active mode. Sending or receiving functioning again.

Meaning of ext. diagnosis: The system displays the pending register information at the time the error occurred.
Structure: sXXrXXtXX
s Status register (see Status)
r Receive Error Counter (see Status parameter)
t Send Error Counter (see Status parameter)

720 No module found

Diagnostic class (standard): 4

Unable to find module identifier or field bus firmware update not possible.
A **iSH-DIO8** wwas configured on the **iSH** and activated (Enable = TRUE), but not detected during the SERCOS phase boot.

- The firmware file on the flash disk (or the hard disk of P600) could not be found or is incorrect.
- ► Check if a valid firmware file is present.

- Optional module not found.
- ► Install module or send in the controller/drive for retrofitting.

- An optional module was entered in the PLC configuration that is not available.
- ► Check the PLC configuration.

- A **phys. master encoder** (SinCos-Geber) is entered in the PLC configuration on the **BT-4/ENC1**, but no **phys. master encoder** is detected on the connector **BT-4/ENC1**.
- ► Plug the incremental encoder cable in at the **BT-4/ENC1** connection.
- ► Check the encoder cable.

- The I/O address is incorrectly set.
- ► Check the I/O address.

- Hardware error: Module defective.
- ► Replace the module.

- Hardware error: Controller is defective.
- ► Replace the controller.

721 Module not ready

Diagnostic class (standard): 4

The module does not respond after initialization by the controller.

- Module defective.
- ▶ Replace module in controller.

- **Ext. diagnosis = no answer:**
  Watchdog monitoring for the (Profibus) module has triggered. The module does not respond within the preset monitoring time (see default configuration).
- ▶ Replace module in controller.

- **Ext. diagnosis = FPGA defect:**
  Unable to program FPGA. The module is not ready.
- ▶ Replace module in controller.

- **Ext. diagnosis = FPGA PinOut:**
  The FPGA firmware file does not match the FPGA pinout. This may result in damage to the module.
- ▶ Via FTP, copy the correct FPGA firmware to the flash disk of the controller and restart the controller.

- **Ext. diagnosis = FPGA prg fail:**
  Unable to program the FPGA. The firmware is not compatible with the module.
- ▶ Via FTP, copy the correct FPGA firmware to the flash disk of the controller and restart the controller.

- **Ext. diagnosis = no FPGAfl open:**
  Unable to open the FPGA firmware file. The flash disk may be defective.
- ▶ Replace the flash disk.

- **Ext. diagnosis = def FPGA-head:**
  The header in the firmware file is not correct.
- ▶ Via FTP, copy the correct FPGA firmware to the flash disk of the controller and restart the controller.

- **Ext. diagnosis = wr FPGA size:**
  The size of the FPGA file is incorrect.
- ▶ Via FTP, copy the correct FPGA firmware to the flash disk of the controller and restart the controller.

- **Ext. diagnosis = no FPGAfile:**
  An FPGA firmware file was not found on the flash disk.
- ▶ Via FTP, copy the correct FPGA firmware to the flash disk of the controller and restart the controller.

- **Ext. diagnosis = RTC is damaged:**
  Unable to set the time of the RealTimeClock in the PN-4 option module. The diagnosis message cannot be acknowledged.
- ▶ This is due to a problem in a very early hardware version of the PN-4. To correct the error, the PN-4 module must be replaced. The problem has been corrected in hardware code 030033 and higher.
  Workaround:
  The DiagNoQuitReset() IEC function can be used to make the diagnosis message acknowledgeable.
  Example
  DiagNoQuitReset(721);

722 No cyclic telegram

Diagnostic class (standard): 4

The exchange of cyclical data was interrupted.

CAUTION
No error is displayed when the connection between the PROFIBUS-DP Slave und PROFIBUS-DP master is interrupted if the response monitoring in the slave was shut off by the master. This means that diagnosis code 722 is not triggered.

- The master interrupts the sending of cyclical data.
- ► Check the master.

- Cable fault.
- ► Check the wiring.

- The slave address has been assigned twice in the network.
- ► Check the configuration.

723 No profibus configuration data

Diagnostic class (standard): 4

This diagnosis message only occurs in the boot phase of the PacDrive controller or with bus enable. No configuration file was found on the flash disk of the PacDrive controller.
A DiagExtCode may be generated.

- **Database:** Unable to delete the SyCon configuration database on the Profibus card software.
- **bad load:** No configuration file was found on the flash disk of the controller.
- **bad sldata:** The slave data of the configuration file is incorrect. Should occur together with the 730 "Bad master parameter data" (see 8.6.8.16 730 Bad master parameter data) diagnosis message. If not, the incorrect configuration will result in the Profibus card resetting.
- **bad madata:** The master bus data of the configuration file is incorrect. Should occur together with the 730 "Bad master parameter data" diagnosis message. If not, the incorrect configuration will result in the Profibus card resetting.

- Communication problems.
- ► Retransmit the PLC configuration.

- The slave address has been assigned twice in the network.
- ► Check the configuration.

- Hardware error: Flash disk defective.
- ► Replace the flash disk.

- Hardware error: Controller is defective.
- ► Replace the controller.

724 no I/O area detected

Diagnostic class (standard): 4

The field bus server(s) did not detect an IEC I/O area. The I/O area is prepared while loading the IEC program.

- Subsequent error to diagnosis message 204 "IEC program cannot be loaded".
- ► See 204 "IEC program cannot be loaded" (see 8.6.3.5 204 IEC program cannot be loaded)diagnostic message.

- Libraries in the project were modified or replaced. This can occur in controller versions below V00.16.20.
- ► Reset the controller (EPAS-4: Online > Reset PacDrive Controller).

- A project was transferred with EPAS-4 using a different setting from the MaxNumOfPOUs in the "EPAS-4.ini" file.
- ► Adjust the setting for MaxNumOfPOUs to match your EPAS-4 installations. Reset the controller (EPAS-4: Online > Reset PacDrive Controller).

- Defective project.
- ► Reconvert the project by choosing "Project > Fix All" in the EPAS-4 and then "Project > Convert All". Then transfer the project again to the controller and reset the controller (EPAS-4: Online > Resetting the PacDrive Controller).

725 Firmware of the module was replaced

Diagnostic class (standard): 7

This message shows that the firmware of a fieldbus module was replaced.
In controller firmware version 00.16.40 or higher, the version of the new fieldbus firmware is displayed in the ext. diagnosis in the message logger.

726 Firmware of the module is incorrect

Diagnostic class (standard): 4

This message shows that the firmware of a fieldbus module is incorrect.

- Firmware download for a fieldbus module via the controller failed.
- ► Repeat the firmware download.

730 Bad master parameter data

Diagnostic class (standard): 4

The slave and/or master data of the configuration file are incorrect. The error code specified after "Err=" corresponds to the error code of the ErrorCode parameter.

- Communication problems when transferring the PLC configuration from EPAS-4 to controller.
- ► Transfer the PLC configuration again.

- Hardware error: Controller or flash disk defective.
- ► Replace the controller.

731 Automatic bus deactivation

Diagnostic class (standard): 4

The Auto Clear Bit in the master is set and at least one slave is not exchanging cyclical I/O data. The error code specified after "Err=" corresponds to the error code of the ErrorCode parameter.

- Slave has been disabled.
- ► Reactivate slave.

- At least one slave is not configured correctly.
- ► Check the configuration.

- Wiring error: Cable fault in bus.
- ► Check cable.

- Wiring error: Incorrect bus topology.
- ► Check terminals, transmission lines, …

732 Slave not responding

Diagnostic class (standard): 4

Slave with bus address preceded by “SI=” is not exchanging cyclical I/O data. The error code specified after "Err=" corresponds to the error code of the ErrorCode parameter.
If the Activation parameter is set to "false", then this diagnostic message will not be triggered in V00.20.00 or higher.

- Slave has been disabled.
- ▸ Reactivate slave.

- At least one slave is not configured correctly.
- ▸ Check the configuration.

- Wiring error: Cable fault in PROFIBUS-DP.
- ▸ Check cable.

- Wiring error: Incorrect bus topology.
- ▸ Check terminals, transmission lines, …

733 Fatal bus error

Diagnostic class (standard): 4

Further bus communication is not possible due to a severe bus error.

⚠ CAUTION

NO DATA EXCHANGE WITH BUS TERMINAL BT-4 ENC1!

- Acknowledge the diagnosis message only after the re-initialization or referencing of the system is secured by the IEC program.
- If necessary, use the SysReset() or the PrdResetAndStart().

Position loss of the master encoder connected to bus terminal BT-4/ENC1.

- Wiring error: Incorrect bus topology.
- ▸ Check terminals, transmission lines, …

- EMC faults.
- ▸ Check the wiring and EMC protection.

- **Ext. diagnosis = asynchronous:**
  A synchronization error has occurred. The touchprobes on the **BT-4/DIO1** are not working..
- ▸ Check the jumper cable that connects the controller to the optional module **PN-4** (in the controller).

- **Ext. diagnosis = clock miss:**
  A communication error has occurred in PacNet. This may be due to a variety of causes:
  - PacNet loop not closed
  - PacNet terminating plug is missing
  - A module connected to PacNet failed (no power)
- ▸ Check the PacNet loop and all the modules in the loop.

734 Bus short circuit detected

Diagnostic class (standard): 4

The number of bus short circuits specifed by "count=" was detected.

- Slave fault.
- ► Check the slave device.

- EMC problem.
- ► Check the wiring.

- Wiring error: Cable is defective.
- ► Check the wiring.

735 Reject bus telegrams

Diagnostic class (standard): 4

The number of telegrams specified in "count=" was rejected.
One or more telegrams could not be transmitted to the bus. This occurs, for example, when there are no further slaves in the bus, which is confirmed by the telegram.

- Wiring error: Cable is defective.
- ► Check the wiring.

736 No I/O data exchange with slave

Diagnostic class (standard): 4

Slave with bus address preceded by “SI=” is not exchanging cyclical I/O data.

- Slave is not configured correctly.
- ► Check the configuration based on the documentation for the slave.

737 Double IEC address assigned

Diagnostic class (standard): 4

The IEC start address for the input or output area was assigned more than once.

DiagExtCode:

- **I SIxxx=SIyyy:** The slaves with the Profibus addresses xxx and yyy have been specified with the same start address for the IEC input data.
- **O SIxxx=SIyyy:** The slaves with the Profibus addresses xxx and yyy have been specified with the same start address for the IEC output data.

- Slaves are not configured correctly.
- ► Check the configuration.
- ► Adjust the addresses manually or select "Addresses automatic" in the properties dialog box of the Profibus master object in the PLC configuration.

738 Conf. I/O data > permissible IO are a

Diagnostic class (standard): 4

The maximum IO data size has been exceeded.

DiagExtCode:

- **I D=xxx>yyy:** The maximum input data size of yyy bytes was exceeded by the configured data size of xxx bytes.
- **O D=xxx>yyy:** The maximum output data size of yyy bytes was exceeded by the configured data size of xxx bytes.

- Slaves are not configured correctly.
- ► Reduce the IO data of the slave.

739 Double profibus address assigned

Diagnostic class (standard): 4

The Profibus Adr=xxx has been assigned twice in a master configuration.

- Slave is not configured correctly.
- ► Check the configuration.
- ► Adjust the addresses manually or select "Addresses automatic" in the properties dialog box of the Profibus master object in the PLC configuration.

750 CanOpen node does not exist

Diagnostic class (standard): 4

The bus will be examined for existing nodes using the default Sdo Index 0x1000. This diagnosis message will be triggered if nodes are detected that do not exist in the configuration. This diagnosis message will be triggered if the configuration contains nodes that have not been detected.

Ext. diagnosis:
Displays the node addresses of the nodes that have been configured but not detected on the bus.
Structure: NodeId=xxx
xxx decimal node address

- Node not switched on or ready when the check is performed; node does not permit Sdo access to the index 0x1000; node addresses are not set correctly.
- ► Check the configuration.

- Electrical connection incorrect or defective.
- ► Check the wiring.

751 CanOpen node not configured

Diagnostic class (standard): 7

The bus will be examined for existing nodes using the default Sdo Index 0x1000. This diagnosis message will be triggered if nodes are detected that do not exist in the configuration. This diagnosis message will be triggered if nodes are detected that do not exist in the configuration.

Ext. diagnosis:
Displays the node addresses of the detected node that has not been configured.
Structure: NodeId=xxx
xxx decimal node address

- CanOpen node not configured.
- ► Configure or switch off node.

752 No CanOpen EDS file exists

Diagnostic class (standard): 4

Unable to load the COPMAX4.EDS CANopen description file on the flash disk of the controller.

- Description file has not been transferred to the controller or has been deleted.
- ► Transfer the description file to the controller via FTP.

753 Initialisation CanOpen module failed

Diagnostic class (standard): 4

An error has occurred during the initialization phase of the CANopen module.

Meaning of ext. diagnosis:

- **can_open:** Init driver of the can_open call failed.
- **CmsConfig:** Init driver of the CmsConfig call failed.
- **SetHostEndian:** Init driver of the SetHostEndien call failed.
- **InquiryStatus:** Init driver of the InquiryStatus call failed.
- **SSyncToHost:** Init driver of the SsyncToHost call failed.
- **Baudrate:** Init driver of the Baudrate call failed.
- **Termination:** Init driver of the Termination call failed.
- **LsBusOnReq:** init driver of the LsBusOnReq call failed.
- **CalMaster:** Init driver of the CalMaster call failed.
- **IdVersReq:** Init driver of the IdVersReq call failed.
- **LsSwitchBerrReq:** Init driver of the LsSwitchBerrReq call failed.

▪ Software error.
► Contact your ELAU responsible.

754 CanOpen emergency message

Diagnostic class (standard): 4

A CANopen node has sent an emergency message to the bus.

Meaning of ext. diagnosis:
The system displays the node address, the error code and the error register.
Structure: Nxxx Cxxxx Rxx
N node address decimal CANopen node address
C error code hexadecimal CANopen error code

Error code (hex)	Meaning
00xx	Error reset or no error
10xx	Generic error
20xx	Current
21xx	Current, device input side
22xx	Current, inside the device
23xx	Current, device output side
30xx	Voltage
31xx	Mains voltage
32xx	Voltage inside the device
33xx	Output voltage
40xx	Temperature
41xx	Ambient temperature
42xx	Device temperature
50xx	Device hardware
60xx	Device software
61xx	Internal software
62xx	User software
63xx	Data set
70xx	Additional modules
80xx	Monitoring
81xx	Communication
90xx	External error

Error code (hex)	Meaning
F0xx	Additional function
FFxx	Device specific

Table 8-9: Error Code (hex) and meaning

Bit	M/O	Meaning
0	M	Generic error
0	O	Current
0	O	Voltage
0	O	Temperature
0	O	Communication error (overrun, error state)
0	O	Device profile specific
0	O	reserved
0	O	Manufacturer-specific

Table 8-10: R error register hexadecimal CANopen error register

Bit: Bit number in error register
M/O: Mandatory/Optional

- See description of the triggering node

► -

- CopMaTriggerEmcy was called by another controller.

► -

755 CanOpen node guarding error

Diagnostic class (standard): 4

The CANopen master can monitor the individual CANopen slave nodes. While monitoring, the status of the nodes is queried in configurable intervals (Guard Time). If a response is not received within a specified time (Guard Time * Life Time Factor), this diagnosis message will be triggered. The CANopen slave also checks the time between monitoring queries (Guard Time * Life Time Factor) after the first monitoring query is received. No ext. diagnosis is displayed in this case.

Meaning of the ext. diagnosis of the CANopen master:

Structure: Nxxx timeout
N decimal CANopen node address
The displayed node has not responded to a monitoring query within the specified time (Guard Time * Life Time Factor).

Structure: Nxxx toogle bit
N decimal CANopen node address
The displayed node has responded to a query with an incorrect monitoring response. The "toggle bit" has not been sent properly. The correction of this error will not be displayed.

Structure: Nxxx e=xx r=xx
N decimal CANopen node address
e= expected status of hexadecimal CANopen status
r= received status of hexadecimal CANopen node address
Status: DISCONNECTED, INITIALISING0
CONNECTED3
PREPARED4

OPERATIONAL5
PRE_OPERATIONAL7f

The displayed node has responded to a query with an incorrect monitoring response. An unexpected status was received.

- CANopen node has not processed the reset or a configuration has not been sent.
- ►

- Electrical bus connection faulty or incorrect.
- ► Check the wiring.

756 CanOpen DPM access timeout

Diagnostic class (standard): 4

Unable to read one or more input application objects.

Meaning of ext. diagnosis:
Displays the size of the non-readable application object.

- Software error; module overload.
- ► Contact your ELAU responsible.

757 CanOpen config error

Diagnostic class (standard): 4

An error has occurred while configuring the individual CANopen slaves.

Meaning of the ext. diagnosis (Controller MAx-4):
Structure: xxxxSyyzzvvNcc
Upper case characters appear directly.
Lower case characters have the following meanings:

Character	Meaning
xxxx	Cop Index in hex display
yy	Cop SubIndex in hex display
zz	Meaning of Cop Index is displayed as follows: MT: Map entry for send PDO MR: Map entry for receive PDO T: send PDO R: receive PDO ' ': Index has nothing to do with PDO.
vv	Number of the respective PDOs in hex display
cc	Node number in hex display

- CANopen node not reachable via Sdo access (e.g. node still in startup phase); node not available; mapping of application object not permitted (application object not available or mappable); write access to the index is not permitted for this node.
- ►

- Electrical bus connection faulty or interrupted.
- ► Check the electrical connection.

- **Ext. diagnosis: <None>**
  Parameterization error.
- ► See GlobalError parameter (Bit 0 is set).
  Contact your ELAU responsible.

- **Ext. diagnosis: Database**
  Message is generated when a hardware error occurs.
- ► Contact your ELAU responsible.

Ext. diagnosis: Sl=xx Err=yy
xx: Contains the CANopen bus address of the slave that has configuration data with errors.
yy: Contains the value of the Status parameter at the time the error occurred.

758 Application object size not supported

Diagnostic class (standard): 4

The CANopen master provides the specified application objects. If the application objects are configured in the CANopen node configuration with an application object size that is not available, this diagnosis message will be triggered.

Meaning of ext. diagnosis:
Structure: Nxxx Cxxxx Rxx
CID Pdo CobId hexadecimal CopIf (Identifier) of the Pdos in which the application object has been mapped.
S size of the application object of the hexadecimal application object size
N hexadecimal CANopen node address

- Configuration error.
- ► Check the configuration.

759 Application obj. max count limit reached

Diagnostic class (standard): 4

The CANopen master provides the application objects described in the operating manual. If more application objects are configured in the CANopen master configuration than are actually available, this diagnosis message will be triggered.

Meaning of ext. diagnosis:
Structure: Nxxx Cxxxx Rxx
CID Pdo CobId hexadecimal CopIf (Identifier) of the Pdos in which the application object has been mapped.
S size of the application object of the hexadecimal application object size
N hexadecimal CANopen node address

- Configuration error.
- ► Check the configuration.

770 Option-modules area exceeded

Diagnostic class (standard): 4

An overlapping of the IO area of the optional module was detected. The DiagExt-Code displays the number code of the type key of the overlapping module.

Example:
DiagExtCode = '3/01 2/02'; i.e. the IO address of the PROFIBUS-DP master module (2/02) is within the IO address area of the DeviceNet slave module (3/01).

- The IO area of the optional module has not been set properly in the controller.
- ► Check the IO area settings based on the operating instructions for the option modules.

771 Double IRQ config of the option-modules

Diagnostic class (standard): 4

A double interrupt use by the optional module was detected. The DiagExtCode displays the interrupt that was used twice.

- The interrupt of the optional module has not been set properly in the controller.
- ► Check the interrupt settings based on the operating instructions for the option modules.

780 Frequence > 1MHZ

Diagnostic class (standard): 5

The incremental speed to be output was too high.

⚠ CAUTION

INCREMENTAL SPEED TOO HIGH.

- Carry out the referencing of the amplified incremental encoder inputs or systems again.
- Note the causes and troubleshooting measures listed below.

Position loss at the incremental encoder output.
Position loss at the incremental encoder output.

- The speed of the encoder to be simulated is too high.
- ► Reduce the speed of the encoder.

- The resolution and/or FeedConstant parameters have not been entered correctly.
- ► Check the parameters.

- The connector of the incremental encoder was connected or removed while the device was switched on (control voltage on).

⚠ CAUTION

DEVICE SWITCHED ON.

- Switch off the power supply before connecting or removing the connector.

Changes to the wiring can damage the device.

- ► Switch off the device.
- ► Connect or remove the connector.
- ► Switch on the device.

781 No connection to encoder

Diagnostic class (standard): 5

The jumper in the encoder cable connecter to the controller was not detected.
This monitoring function is active in the MAx-4 optional INC-4 optional module when connecting an incremental encoder. The monitoring function for the SinCos encoder is active on the Cx00 and P600 controller.

- Wiring error: Encoder cable to the controller removed.
- ► Plug in the encoder cable.

- Wiring error: Encoder cable is defective.

► Check the encoder cable and replace if necessary.

782 Track error

Diagnostic class (standard): 5

A hardware encoder error occurred at the incremental encoder input (**BT-4/ENC1** or incremental encoder module **INC-4**).

⚠ CAUTION
HARDWARE ENCODER ERROR! • Acknowledge the diagnosis message only after the re-initialization or referencing of the system is secured by the IEC program. • If necessary, use the SysReset() or the PrdResetAndStart(). **Reset the PacDrive controller.**

▪ Wiring error: Encoder cable at the encoder or the encoder input has been removed or is defective.
► Check the encoder cable and replace if necessary.
► Check the ground connection (shield).

▪ The encoder / encoder supply or encoder simulation is not ready.
► Switch off the default monitoring with the parameter CheckOff.
► If the encoder or encoder simulation is ready, then activate the monitoring in the IEC program.

▪ Encoder defective.
► Replace the encoder.

785 Hardware defect

Diagnostic class (standard): 4

A hardware defect exists.

▪ **Ext. diagnosis = PIIX Error**
► Replace the controller.

▪ **Ext. diagnosis = EEPROM damag**
► Replace the PN-4 optional module.

▪ **Ext. diagnosis = EEPROM S xxxx**
► Replace the PN-4 optional module.

▪ **Ext. diagnosis = RTC is damaged**
Unable to set the time of the RealTimeClock in the PN-4 option module.
This is due to a problem in a very early hardware version of the PN-4. This problem has been removed in hardware code 030033 or higher.
► Replace the PN-4 module.

▪ **Ext. diagnosis = Ref PowerFail**
Instance= OutputGroup
The status of the digital outputs remains unchanged until the supply voltage (connector X1) has fallen to 0 volts. The diagnosis message can be entered in the message log when the controller is switched off, as the voltage drop of the supply voltage causes a Spi error before the CPU detects a power failure.
Instance= InputGroup
The digital inputs cannot be evaluated. The diagnosis message can be entered

in the message log when the controller is switched off, as the voltage drop of the supply voltage causes a Spi error before the CPU detects a power failure.

► Check the supply voltage.

- **Ext. diagnosis = Ref PowerFail**
  Evaluation of the digital inputs in accordance with the en61131-2 type 1 standard is no longer guaranteed. The diagnosis message can be entered in the message log when the controller is switched off, as the voltage drop of the supply voltage causes a Ref PowerFail error before the CPU detects a power failure.

► Check the supply voltage.

786 Asynchronous to SERCOS bus

Diagnostic class (standard): 4

787 Configuration error

Diagnostic class (standard): 4

A configuration error has occurred.

- **Ext. diagnosis = Mtype=xx wrong (xx = detected module)**
  A non-configured module was detected on PacNet. The module cannot be used.

► Check the configuration of the module in the PLC configuration.

- **Ext. diagnosis = Mtype=0 wrong**
  No module was found on PacNet.

► Switch on the control voltage on the module.

- **Ext. diagnosis = M=xx n.res**
  The module with bus address xx repeatedly gives no response. This may be caused by a power failure or a defective module. The module cannot be used.

► Check the module address on the module.
► Check the module address in the PLC configuration.
► Check the power supply of the module.
► Replace the module if necessary.

- **Ext. diagnosis = Powerfail 0-7**
  The power supply for outputs 0 through 7 of the **BT-4/DIO1** or **iSH-DIO8** is not available or too low (<14 V). These outputs cannot be used.
  The **iSH-DIO8** triggers the diagnostic message only if PowerSupply = "Extern / TRUE".

► Check the power supply of the outputs.

CAUTION
The DiagPF0_7Enable parameter allows you to switch off the message.

- **Ext. diagnosis = Powerfail 8-15**
  The power supply for outputs 0 through 7 of the **BT-4/DIO1** is not available or too low (<14 V). These outputs cannot be used.

► Check the power supply of the outputs.

CAUTION
The DiagPF8_15Enable parameter allows you to switch off the message.

- **Ext. diagnosis = no FPGAfile**
  No "c2_xpxx.bin" file was found on the flash disk of the C200. xpxx stands for the FPGA firmware version. The C200 controller cannot be used. The pinout of the C200 controller must match the pinout of the FPGA firmware. The pinout of the FPGA firmware is the number represented by p in the xpxx of the FPGA firmware version. The pinout of the controller can be read in the ControllerType1 parameter and is indicated by the p in FPGA=pyxxxx.
- ▶ Install a valid "c2_xpxx.bin" FPGA firmware file with a matching pinout on the flash disk of the C200.

CAUTION
While installing a firmware version on the C200 controller, the Firmware Assistant automatically copies the "c2_xpxx.bin" to the flash disk of the C200.

- **Ext. diagnosis = FPGA Pinout**
  No "c2_xpxx.bin" file with a matching pinout was found on the flash disk of the C200. xpxx stands for the FPGA firmware version. The C200 controller cannot be used. The pinout of the C200 controller must match the pinout of the FPGA firmware. The pinout of the FPGA firmware is the number represented by p in the xpxx of the FPGA firmware version. The pinout of the controller can be read in the ControllerType1 parameter and is indicated by the p in FPGA=pyxxxx.
- ▶ Install a valid "c2_xpxx.bin" FPGA firmware file with a matching pinout on the flash disk of the C200.

CAUTION
While installing a firmware version on the C200 controller, the Firmware Assistant automatically copies the "c2_xpxx.bin" to the flash disk of the C200.

- **Ext. diagnosis = FPGA not supp.**
  The current firmware on the controller (**C400**, **C600** or **P600**) does not match the controller hardware.
- ▶ Install a matching firmware version on the controller with the **Firmware Assistent-en**.
  Example:
  Firmware versions below 00.16.40 (e.g. 00.16.32) do not support HW versions with the FPGA pinout "3" (e.g. FPGA version = 0316).
  The controller hardware used does not yet support **BT-4/ENC1** bus terminals.
- **Ext. diagnosis = FPGA Version**
  An FPGA version was found on the controller (C200, C400, C600 or P600) that is specified as a beta test version.
  The pinout of the FPGA firmware is the number represented by p in the zpxx of the FPGA firmware version. The pinout of the controller can be read in the ControllerType1 parameter and is indicated by the p (for C200, under FPGA=pyzpxx). The highest bit indicated by z is a beta test version.
- ▶ Install a released FPGA firmware file on the controller (C200, C400 and C600 -> flash disk; P600 -> hard disk).
- **Ext. diagnosis = BusAddr > Max**
  The PROFIBUS address is larger than the maximum permitted bus address.
- ▶ Check the PROFIBUS configuration.

- **Ext. Diagnosis = too many IM**
  With iSH-DIO8, the sum of the measuring inputs and the Impulse Counters is more than two.
- ▶ Check the configuration (parameter IO0_Mode ... IO7_Mode).

788 Wiring error

Diagnostic class (standard): 5

There is a wiring error.

- **Ext. diagnosis = Overload**
  The affected output is short circuited or overloaded.
  iSH-DIO8 triggers the diagnostic message only if PowerSupply = "Intern / FALSE".
- ▶ Check the wiring of the output.

- **Ext. diagnosis = Openload**
  The output is not connected or only slightly loaded.
- ▶ Check the wiring of the output.
- ▶ It may be useful to disable the diagnosis message.

- **Ext. diagnosis = PowerFail**
  The external power supply of the digital outputs was not connected. The supply of the digital outputs is checked when at least one bit is set to 1 in the DiagMask parameter of the output group object.
- ▶ Check the power supply of the digital outputs.
- ▶ Check the DiagMask parameter.

- **Ext. Diagnosis = PowerFail** (**BT-4/ENC1**)
  The power supply of the encoder is too low.
  Parameter EncPowerSupply = "Intern / FALSE":
  Short circuit of the power supply (pins 5 and 9) of the connected encoder or defective bus terminal**BT-4/ENC1**
  Parameter **EncPowerSupply** = "Extern / TRUE":
  The is no or not enough power at the X5 plug connector or there is a short circuit of the power supply (pins 5 and 9) of the connected encoder.
- ▶ Check the power supply of the encoder.
- ▶ Check the encoder cable.

- **Ext. Diagnosis = PowerFail** (**BT-4/ENC1**)
  A SinCos encoder (physical encoder) was entered in the PLC configuration, but no SinCos encoder is recognized at connector X2 or X3 of **BT-4/ENC1**.
- ▶ Plug the SinCos encoder cable into the **BT-4/ENC1** X2 or X3 connections.
- ▶ Check the encoder cable.

- **Ext. diagnosis = type not supp.**
  The connected encoder type is not supported by the system.
- ▶ Connect an encoder supported by the system.

- **Ext. diagnosis = out <-> out**
  Power is supplied externally to the connectors X2, X3, or X4 (pin 5 and 9) of the bus terminal **BT-4/ENC1**. The connector for the incremental encoder output may have been plugged into an encoder input.
- ▶ Check the assignment of the encoder connectors.

789 Single bus error

Diagnostic class (standard): 6

A single bus error has occurred.

- **Ext. diagnosis = M=xx n.res**
  The module with bus address xx is suddenly not responding.
  The transfer is disrupted.
- ► Check the wiring of the module.

- PacNet Warning. An RX clock is missing.
- ► Check the wiring of the module.

790 Module error

Diagnostic class (standard): 5

There is a module error.

- **Ext. Diagnosis = Com. Ext. Diagnosis = Com. IOModule**
  A communication error occurred between **iSH-DIO8** and **iSH**.
- ► Contact your ELAU responsible.

- **Ext. Diagnosis = DIVCLK**
  An error occurred while synchronizing with the SERCOS cycle.
- ► Contact your ELAU responsible.

- **Ext. Diagnosis = drive disabled**
  The **iSH,** on which the **iSH-DIO8** was configured is disabled (RealTimeBusAdr = 200 ... 299) and the **iSH-DIO8** is enabled (Enable = TRUE).
- ► Check the PLC configuration.

- **Ext. Diagnosis = int. error**
  Internal error.
- ► Contact your ELAU responsible.

8xx "System" diagnosis messages

800 Insufficient memory

Diagnostic class (standard): 2

The 800 diagnosis message is triggered as soon as the free main memory exceeds 512000 bytes. The DiagExtCode parameter in the PLC Configuration or message logger can be used to localize the problem.

- Insufficient RAM for the project (DiagExtCode=free<512000).
- ► Reduce the PLC Configuration, decrease RamDiskSize reduce the number of tasks, use a controller with more memory.

General Information on ScanDisk

A function for checking the file system on the IDE disk has been integrated in the firmware. This ScanDisk function is automatically called when the system boots. Errors are automatically detected, logged and corrected. The consistency of the file system is repaired. Defective, incomplete file are removed. A detailed protocol is saved in the message logger. After ScanDisk repairs, a message (015 "File system <ide0:> restored" (see 8.6.1.15 015 filesystem <ide0:> repaired)) is triggered.
ScanDisk generates the following diagnosis messages:

DiagCode	DiagMsg	DiagExtCode
800	Insufficient memory	
801	Error reading FAT	
802	Error writing FAT	FAT <nr>
803	Inconsistency of FAT's	
804	Corrupt cluster detected	<dirname>

DiagCode	DiagMsg	DiagExtCode
805	Corrupt filename detected	<filename>
806	Corrupt file size detected	<filename>
807	Multiple used cluster/block detected	<dirname>
808	Corrupt directory name detected	<dirname>
809	Circular linked clusters/blocks detected	<dirname>
810	Error reading directory entry	<dirname>
811	Error writing directory entry	<dirname>
812	Lost cluster/block found	<number cluster>
813	Device <ide0:> not found	<devicename>
814	Initialization of <ide0:> failed	<devicename>
815	Error using function with <ide0:>	<devicename>
816	Bootrom.sys	
817	No devicename	
818	File not found	
819	File open error	
820	File read error	
821	File not continous	
822	Cluster read error	
823	Contents of file different	
824	No file name	
825	Invalid directory size	

801 Error reading FAT

Diagnostic class (standard): 2

802 Error writing FAT

Diagnostic class (standard): 2

803 Inconsistency of FAT's

Diagnostic class (standard): 2

804 Corrupt cluster detected

Diagnostic class (standard): 2

805 Corrupt file name detected

Diagnostic class (standard): 2

806 Corrupt file size detected

Diagnostic class (standard): 2

807 Multiple used cluster/block detected

Diagnostic class (standard): 2

808 Corrupt directory name detected

Diagnostic class (standard): 2

809 Circular linked clusters/blocks detected

Diagnostic class (standard): 2

810 Error reading directory entry

Diagnostic class (standard): 2

811 Error writing directory entry

Diagnostic class (standard): 2

812 Lost cluster/block found

Diagnostic class (standard): 2

813 Device <ide0:> not found

Diagnostic class (standard): 2

814 Initialization of <ide0:> failed

Diagnostic class (standard): 2

815 error using function with <ide0:>

Diagnostic class (standard): 2

816 Bootrom.sys

Diagnostic class (standard): 2

817 No devicename

Diagnostic class (standard): 2

818 File not found

Diagnostic class (standard): 2

819 File open error

Diagnostic class (standard): 2

820 File read error

Diagnostic class (standard): 2

821 File not continuous

Diagnostic class (standard): 2

822 Cluster read error

Diagnostic class (standard): 2

823 Contents of file different

Diagnostic class (standard): 2

824 No filename

Diagnostic class (standard): 2

825 Invalid directory size

Diagnostic class (standard): 2

826 Error During PIC FW Update

Diagnostic class (standard): 1

An error occurred during a firmware exchange for the PIC controller (on C400, C600, or P600). The firmware (such as file "c6p_0511.bin") is on the flash disk (C400 and C600) or on the hard disk (P600). When the firmware has been exchanged, the controller will be reset (Reset).
PacDrive controller P600 has no automatic reset. A note appears on the display. After the real-time system successfully starts up, the firmware file is deleted automatically.

- **Ext. diagnosis = bootl.active**
  This message appears after an unsuccessful PIC firmware update.
- ▶ The PacDrive controller attempts to exchange the firmware again.
- ▶ If you do not succeed, please contact your ELAU responsible.

- **Ext. diagnosis = File not found**
  This message appears with message "bootl. active." This means it appears when an update is forced in the PIC bootloader but the necessary file is not on the flash disk (C400 and C600) or on the hard disk (P600).
- ▶ Transfer the firmware file to the flash disk (C400 and C600) or to the hard disk (P600).
- ▶ If this attempt also fails, contact your ELAU customer service representative.

- **Ext. diagnosis = File not OK**
  This message appears when the PIC update file is incorrect.
- ▶ Transfer the correct firmware file to the flash disk (C400 and C600) or to the hard disk (P600).

- ► If you do not succeed, please contact your ELAU responsible.

- ▪ **Ext. diagnosis = Header not OK**
  This message appears when the ELAU header in the file is not correct.
- ► Transfer the correct firmware file to the flash disk (C400 and C600) or to the hard disk (P600).
- ► If you do not succeed, please contact your ELAU responsible.

- ▪ **Ex. Diagnosis = HWIndex <> <Index>** (e.g. HWIndex <> 5)
  Ex. The message appears if PIC update files are found that have an incorrect hardware code. The index outputs the required HW index.
- ► Use the PIC update file that matches the device (hardware).

827 Power-Off due to hardware monitoring

Diagnostic class (standard): 3
MsgFilter: Bit 1 "Diagnosis Messages"

The hardware provides an internal error logger that logs all the causes for error-dependent controller deactivations. The next time the controller is started up the error logger is analyzed and the cause of the error can be output in the message logger. In addition, a more specific message is output (055 “Hardware Monitoring Debug Message” (see 8.6.1.54 055 Hardware Monitoring Debug Message)) that can be enabled by the MsgFilter parameter through the EPAS-4 message logger. This message is intended to be a debug message and outputs the exact cause of the deactivation.

- ▪ The DiagExtCode defines the error further (high or low voltage, high or low temperature, fan error, temperature sensor error):
  - Voltage<Min
  - Voltage>Max
  - Temp<Min
  - Temp>Max
  - Fan error
  - LM75 error
- ► Contact your ELAU responsible.

828 Library active

Diagnostic class (standard): 8

9xx "Software" diagnosis messages

900 Software error (suspend Task)

Diagnostic class (standard): 4

This error should not occur during operation of the PacDrive system.

- ▪ -
- ► Contact your ELAU responsible.

901 Software error (invalid opcode)

Diagnostic class (standard): 4

This error should not occur during operation of the PacDrive system.

- ▪ -
- ► Contact your ELAU responsible.

902 Software error (page fault)

Diagnostic class (standard): 4

This error should not occur during operation of the PacDrive system.

- An firmware version older than < V00.10.00 was played onto a PacDrive controller and the project on the flash disk of the PacDrive controller was created for firmware >= 00.10.00.
  The error occurred while booting and is recorded under the MAX4 object in the message logger.
- ► Retransmit project from EPAS-4.
- It is entered under object IECPRG in the message logger. A serious error has been detected in the IEC task named under instance in the message logger. Possible errors include e.g. not observing the array limits, faulty handling of pointers or the address operator (ADR).
- ► Record faulty program spot and correct user program.

903 Software error (class 2)

Diagnostic class (standard): 2

This error should not occur during operation of the PacDrive system.

- -
- ► Get in touch with your ELAU contact person.

904 Software error (class 1)

Diagnostic class (standard): 1

This error should not occur during operation of the PacDrive system.

- -
- ► Contact your ELAU responsible.