



E.H. Wachs
600 Knightsbridge Parkway
Lincolnshire, IL 60069
www.ehwachs.com

MDSF Servo Electric Drive User's Manual



E.H. Wachs Part No. 69-SERVO-MAN-01
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MDSF Servo Electric Drive

PURPOSE OF THIS DOCUMENT

This document explains how to operate the E.H. Wachs MDSF servo electric drive. It describes the equipment components and operating features, and includes a reference of error codes and troubleshooting.

The servo electric drive can also be used to operate the EP 424 end prep machine, using an optional adapter (part no. 81-180-00).

Each page is designed with two columns. This large column on the inside of the page contains instructions and illustrations. Use these instructions to perform the machining operation.

The narrower column on the outside contains additional information such as warnings, special notes, and definitions. Refer to it for safety notes and other information.



This is the **safety alert symbol**. It is used to alert you to **potential personal injury hazards**. Obey all safety messages that follow this symbol to avoid possible injury or death.

In This Document

PURPOSE OF THIS DOCUMENT
EQUIPMENT DESCRIPTION
SETUP AND CONNECTIONS
OPERATING INSTRUCTIONS
MAINTENANCE



WARNING

A **WARNING** alert with the safety alert symbol indicates a potentially hazardous situation that **could** result in **serious injury or death**.



CAUTION

A CAUTION alert with the safety alert symbol indicates a potentially hazardous situation that **could** result in **minor or moderate injury**.



CAUTION

A CAUTION alert with the damage alert symbol indicates a situation that **will** result in **damage to the equipment**.



IMPORTANT

An IMPORTANT alert with the damage alert symbol indicates a situation that **may** result in **damage to the equipment**.



NOTE

A NOTE provides supplementary information or operating tips.



This is the **equipment damage alert symbol**. It is used to alert you to **potential equipment damage situations**. Obey all messages that follow this symbol to avoid damaging the equipment or workpiece on which it is operating.



NOTE

This symbol indicates a user note. **Notes** provide additional information to supplement the instructions, or tips for easier operation.

Read and follow all safety guidelines and instructions in the manual for your MDSF or EP 424 machine.

EQUIPMENT DESCRIPTION

The servo electric drive provides high operating torque through its full speed range. Electric power requirements are 380-480 VAC, 50/60 Hz.

The system includes the following components:

- power supply cabinet with on/off switch and electronic error code display panel
- electric drive motor assembly with adapter for mounting to MDSF pinion housing
- control pendant with start/stop, speed control, and emergency stop
- power cable
- storage/shipping case
- optional drive adapter (81-180-00) for EP 424.

These components are shown in the following figures.

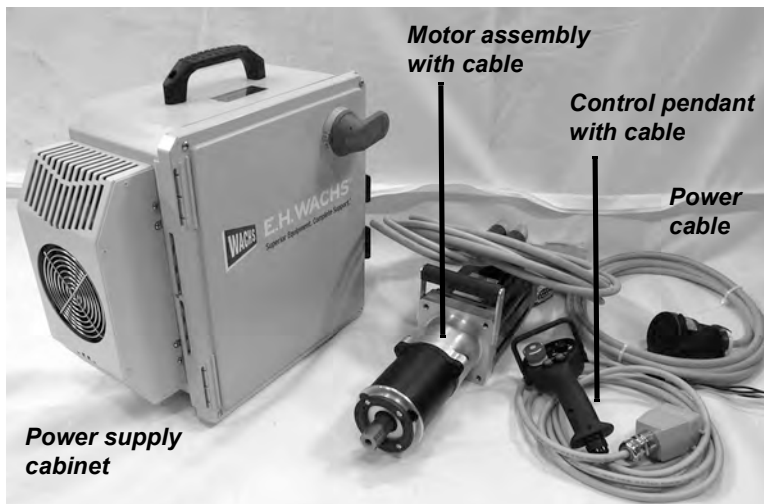


Figure 1-1. The photo shows the components of the servo electric drive.



Figure 1-2. The drive system is provided in a custom storage/shipping case. Keep all components stored in the case when not in use.

Specifications

Table 1: Servo Electric Drive Specifications

Power Requirements		380-480 VAC, 50/60 Hz
Component Weights	Power cabinet	40.8 lb (18.5 kg)
	Motor assembly with cable	40.2 lb (18.3 kg)
	Pendant with cable	2.6 lb (1.2 kg)
Cable lengths	Power	12 ft (3.7 m)
	Pendant	12 ft (3.7 m)
	Motor power and encoder	15 ft (4.6 m)
Operating speed/range (motor shaft)		0-90 RPM
Power		4.5 HP

SETUP AND CONNECTIONS

Installing the Motor on the MDSF

1. Mount and position the MDSF on the pipe according to the instructions in the MDSF user's manual.
2. Mount the motor to the MDSF pinion assembly. Use a lifting device if necessary; the drive motor assembly has a lift handle.
 - Insert the motor drive shaft all the way into the pinion spline, engaging the face gear.
 - Snap the motor mounting clamp handle over the motor adapter ring.

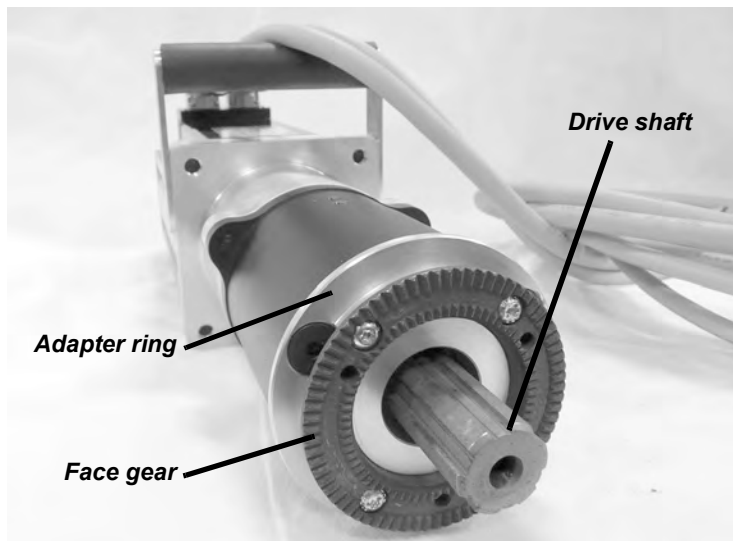


Figure 1-3. The photo shows the motor mounting interface to the MDSF.

Installing the Motor on the EP 424

1. Mount the EP 424 on the pipe according to the instructions in the EP 424 user's manual.
2. Mount the optional adapter (81-180-00) onto the motor shaft.
3. Attach the motor to the drive mount on the EP 424.



NOTE

You can remove the screws from the pinion assembly to mount the SDE. Engage the square shaft in the pinion gear, then rotate the drive so you can install the screws.



NOTE

The cable is supplied from the factory without a wall plug. Install the appropriate plug for your electrical service.

Connecting the Cables and Using the Control Cabinet

1. A power cable for the appropriate electrical service is provided with the control cabinet. Connect it to the back of the control cabinet.
 - **NOTE: Do not plug the power cable into the electrical source until you have the machine and drive mounted and ready to operate.**
2. Connect the power (orange) and feedback (gray) cables from the drive motor assembly to the back of the control cabinet.
3. Attach the pendant cable to the connector on the control cabinet.

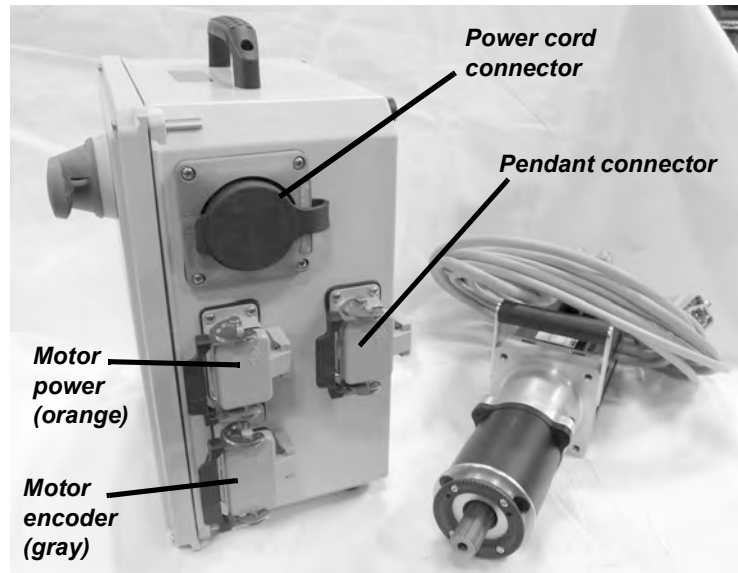


Figure 1-4. Attach the cables to the control cabinet as shown.



Figure 1-5. Press the tab as shown to unlock the connector cover.

OPERATING INSTRUCTIONS

Using the Control Pendant

The control pendant is enabled when the electrical system is powered on.

When not operating the drive, push in the Emergency Stop button to prevent accidentally engaging the motor.

To re-enable operation, pull out the Emergency Stop button, then press the Reset button.

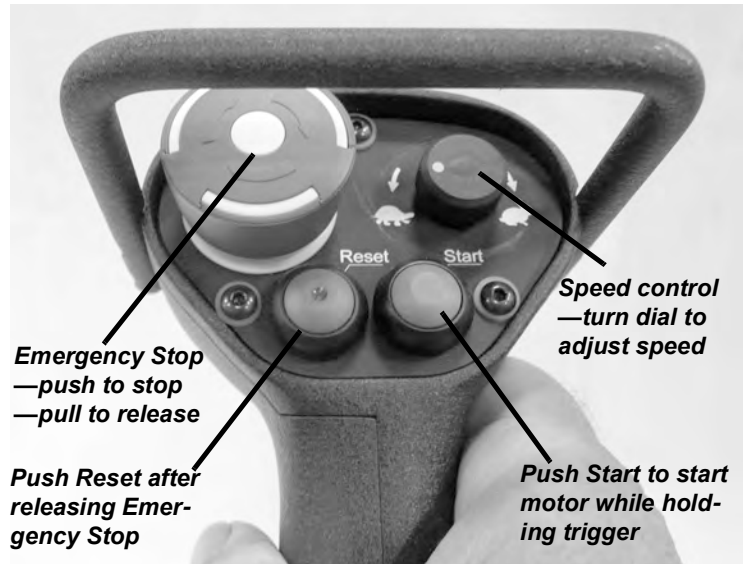


Figure 1-6. Use the control pendant to operate the drive.



Figure 1-7. Squeeze the hold-to-run trigger to operate the motor. Releasing the trigger will stop the motor; to re-start, hold the trigger and press the **Start** button.

Operating the Drive

1. Make sure the cables are connected to the control cabinet:
 - power source
 - motor power (orange)

- motor encoder (gray)
 - pendant (gray)
- 2.** If necessary, install the appropriate power plug to the power source cable.
 - 3.** Check that the cutting machine (MDSF or EP 424) is ready for operation, and that the drive assembly is correctly mounted to the machine.
 - 4.** Plug the power cable into the source. (380-480 VAC, 50/60 Hz.)
 - 5.** Push in the Emergency Stop button on the pendant. (See pendant operating instruction in the previous section.)
 - 6.** Turn the power switch on the front of the cabinet to the ON position.



Figure 1-8. Turn the power switch to the ON position.

- 7.** Pull out the Emergency Stop button on the pendant.
- 8.** Press the Reset button on the pendant.
- 9.** Turn the speed dial on the pendant to the low speed position (all the way counter-clockwise).
- 10.** Squeeze and hold the trigger on the control pendant, and press the Start button.



NOTE

Use the **Reset** button to re-enable operation after turning off power, disconnecting components, or using the Emergency Stop.



NOTE

After releasing the trigger, you will have to squeeze the trigger and press **Start** again to re-start the motor.

- 11.** Turn the speed dial clockwise to increase the speed to the desired speed.
- 12.** As the machine operates, continue holding the trigger and adjust the speed as necessary using the speed dial. Release the trigger to stop the machine.
- 13.** If necessary, press the Emergency Stop button on the pendant to immediately stop the machine and disable power.
- 14.** Always press in the Emergency Stop button when making adjustments to the cutting machine.
- 15.** Turn the main power switch on the cabinet OFF when the operation is complete, or when connecting or disconnecting any components.



Figure 1-9. Turn the main power off when finished or when changing connections.

MAINTENANCE

The servo electric drive does not require any lubrication. Mechanical components are sealed and lubricated for life.

Error Codes

The LED display on top of the control cabinet displays error codes when there is an error condition. Appendix A lists and describes the error codes.



Figure 1-10. The LCD screen on top of the control cabinet displays error codes during operation.

APPENDIX A: ERROR CODE REFERENCE

Hex	Decimal	Error Name	Error Reaction	Description
2311	8977	Effective motor current monitor	Reaction 2: Downramp / apply brake / de-energize..	Reduce motor load (less current, more standstill phases of the drive, lower clock time, lower accelerations), check thermal time constant and nominal or reference current of the motor. Check motor dimensioning and replace motor by an adequately dimensioned model if necessary; use cooling option (water, air) if available, optimize mechanic components.
2312	8978	Effective drive current monitor	Reaction 2: Downramp / apply brake / de-energize..	Reduce device load (less current, more standstill phases of the drive, lower clock times, lower accelerations), check device dimensioning and replace controller by an adequate model if necessary, reset switching frequency of the power stage to default values, optimize mechanic components.
2320	8992	Overcurrent power stage	Reaction 5: Switch-off of the current immediately (without ramp), application of the brake	<p>Check cable and connectors of motor and braking resistor (insulation, cable clamping screws of the connector fastened tightly).</p> <p>Check motor (if insulation class of the motor is sufficient, look out for defective windings (e.g. due to overheating))</p> <p>Check braking resistor.</p> <p>Check controller settings for instabilities: Current loop: Current controller bandwidth too large (>50%)-> current controller may be instable, saturation characteristic required, are the el. motor data (resistance, inductance) correct, right commutation offset ("phasing") of the position feedback? The error may also be eliminated by setting the option "activate voltage decoupling" (O2230.24) in the controller optimization.</p> <p>Speed control: Stiffness and/or damping set too high, too high signal delay in the control loop (current bandwidth too small (<50%), control signal or actual speed value filter (1 and 2) set too high), control loop parameterized correctly (moment of inertia approx. correctly configured, for oscillating systems (e.g. toothed belt axes) a D-component (values >1000%) and/or a speed filter value >500% (or 600us) are required. 600 us) required).</p> <p>Speed observer: With active disturbance compensation, increase observer time constant and/or filter time constant for the disturbance value or reduce current controller bandwidth (or stiffness).</p> <p>Check current (in stable control loop) for oscillations (e.g. first and</p>
2331	9009	Earth fault phase 1	Reaction 5: Switch-off of the current immediately (without ramp), application of the brake	Reduce device usage (reduce current of the drives, lower accelerations), check axis combination dimensioning.
2332	9010	Earth fault phase 2	Reaction 1: Downramp actual speed; remain in position control state.	Check multi axis system for earth leakage (faulty motor cable etc.) - even if the power stage is not powered. Turn device off and back on again after repair (24V Off/On).
2333	9011	Earth fault phase 3	Reaction 1: Downramp actual speed; remain in position control state.	Check mains connection and fuses
2340	9024	Short-circuit between phases	Reaction 1: Downramp actual speed; remain in position control state.	Check mains connection and fuses, check if the correct supply voltage was configured (230V for intermediate voltage 290V..360V, 400V for intermediate voltage 500V..620V and 480V for intermediate voltage 620V..740V)
2380	9088	C3 PSUP: DC link current exceeds limit	Reaction 1: Downramp actual speed; remain in position control state.	Check configuration of all devices in the axis combination. The set mains voltage must be the same for all devices.

2381	9089	C3 PSUP: DC bus current offset too high	Reaction 2: Downramp / apply brake / de-energize..	Reduce feedback energy (smaller deceleration), allow for more discharge time (reduce cycle time) or connect bus circuits of several drives (low resistance!). Update in the C3M network with Firmware R09-62 (important PSUP -> 1st axis). General solution: Use braking or ballast resistor (connection X2)!
3130	12592	C3H: Phase failure	Reaction 1: Downramp actual speed; remain in position control state.	
3180	12672	C3 PSUP: Phase error	Reaction 1: Downramp actual speed; remain in position control state.	Please check the motor's maximum permissible DC bus voltage. If it is too low, this error might occur. If this value is set correctly, the power voltage must be reduced.
3181	12673	C3M: Mains voltage incorrectly configured	Reaction 2: Downramp / apply brake / de-energize..	Check mains supply (status display intermediate voltage), check if the correct supply voltage was configured (230V for intermediate voltage 290V..360V, 400V for intermediate voltage 500V..620V and 480V for intermediate voltage 620V..740V)
3210	12816	DC link voltage exceeds limit	Reaction 5: Switch-off of the current immediately (without ramp), application of the brake	Check power voltage supply (status display of DC bus voltage). If you wish to operate Compax3 with a lower DC bus voltage (<70V), mask this error. As from Release 05, this can be achieved in the configuration via IEC (T30, T40) with the error module C3_ErrorMask, or with the C3_SetErrorReaction, or with the C3Plus.ErrorEvent1_Mask6.15:=FALSE term; if you have an older release version or the I10T10 device by deleting bit 15 counted from 0 (-32768) directly in object 511.6 (error mask 6, error event 1). If an undervoltage can be excluded, a break in the internal fusing may be the cause (must then be replaced). The device must be repaired by the manufacturer. The cause of the broken fuse may be a defective braking resistor or a defective braking resistor cable (-> please check before exchanging the device!). Note on C3H: Operation of the motor is not possible with a DC bus voltage below 420V.
3211	12817	C3 PSUP: Voltage in DC bus too high	Reaction 5: Switch-off of the current immediately (without ramp), application of the brake	Reduce device load (less current, more standstill phases of the drive, higher machine cycle time, lower acceleration/deceleration), reduce ambient temperature, check device dimensioning and replace drive with an adequate model if necessary, reset switching frequency of the power stage to default values, optimize mechanic components. Attention, if this error occurs even in cold state on the C3M300D6FxxlxxTxxMxxS1, there is a defect in the STO safety function. The device must be immediately repaired by the manufacturer.

3212	12818	AC voltage supply too high	Reaction 5: Switch-off of the current immediately (without ramp), application of the brake	Reduce motor utilization (Effective cycle). Current ripple may lead to motor heating due to a switching frequency set too low (increase switching frequency). If the motor is to be operated without temperature monitoring, you can deactivate the monitoring in the motor manager. Is the motor temperature sensor (correctly) connected and configured (threshold value/type in the MotorManager)? Maybe there is a line breakage or a short circuit on GND with PTC sensors or a short circuit on 5V with NTC sensors. Please note that only the KTY84-130 sensor will deliver the correct temperature value, this does however not influence the temperature monitoring (only the resistance value is relevant). NTC sensors are supported as from R09-10!
3221	12833	C3 PSUP: Voltage in DC bus too low	Reaction 1: Downramp actual speed; remain in position control state.	Provide for better cooling or reduce power consumption.
3222	12834	DC link voltage too low	Reaction 2: Downramp / apply brake / de-energize..	Reduce usage of the braking resistor by longer regenerative times. Check air supply for cooling the braking resistor. If none of the described measures is successful or can be taken, a resistor with a higher nominal power must be used. Note: If no braking resistor or a braking resistor without temperature switch is used, a wire jumper must be inserted between T1R and T2R on connector X40.
4210	16912	Temperature of power output stage / device	Reaction 2: Downramp / apply brake / de-energize..	Verify external wiring.
4310	17168	Motor Temperature	Reaction 2: Downramp / apply brake / de-energize..	Verify wiring and power supply unit.
4410	17424	C3 PSUP: Device temperature too high	Reaction 1: Downramp actual speed; remain in position control state.	Verify external wiring.
4480	17536	C3 PSUP: Temperature of braking resistor	Reaction 1: Downramp actual speed; remain in position control state.	Verify wiring and power supply unit.
5111	20753	Auxiliary Voltage 15V faulty	Reaction 2: Downramp / apply brake / de-energize..	Verify external 24V on X22 pin 11, mind the wiring.
5112	20754	Overvoltage on 24V	Reaction 2: Downramp / apply brake / de-energize..	Check sensor and cable. If the sensor is not to be monitored, adapt monitoring limits 172.9 and 172.10.
5115	20757	Auxiliary voltage -15V faulty	Reaction 2: Downramp / apply brake / de-energize..	Check sensor and cable. If the sensor is not to be monitored, adapt monitoring limits 173.9 and 173.10.
5116	20758	Undervoltage 24V	Reaction 2: Downramp / apply brake / de-energize..	Check sensor and cable. If the sensor is not to be monitored, adapt monitoring limits 174.9 and 174.10.
5117	20759	Undervoltage options	Reaction 1: Downramp actual speed; remain in position control state.	Check sensor and cable. If the sensor is not to be monitored, adapt monitoring limits 175.9 and 175.10.
5231	21041	Sensor error In0	Reaction 2: Downramp / apply brake / de-energize..	Check sensor and cable. Check sensor and cable. If the sensor is not to be monitored, adapt monitoring limits 176.9 and 176.10.
5232	21042	Sensor error In1	Reaction 2: Downramp / apply brake / de-energize..	Check sensor and cable. Check sensor and cable. If the sensor is not to be monitored, adapt monitoring limits 177.9 and 177.10.

5233	21043	Sensor error In2	Reaction 2: Downramp / apply brake / de-energize..	Check digital outputs (X12 (pin 2, 3, 4, 5) and/or X22 (for additional option M12 or M10)) for short circuit (max. 100 mA and 50nF capacitive load per output).
5234	21044	Sensor error In3	Reaction 2: Downramp / apply brake / de-energize..	Reduce deceleration of the drive, dimension resistor correctly.
5235	21045	Sensor error In4	Reaction 1: Downramp actual speed; remain in position control state.	Reduce deceleration of the drive, dimension resistor correctly.
5236	21046	Sensor error In5	Reaction 1: Downramp actual speed; remain in position control state.	Reduce ramp, use braking resistor with a higher power, reduce utilization factor.
5280	21120	CTP not recognized (EEPROM)	Reaction 1: Downramp actual speed; remain in position control state.	Reduce device usage (reduce current, more standstill phases of the drives, lower clock times, lower accelerations), check device dimensioning.
5281	21121	Firmware in FLASH invalid	Reaction 1: Downramp actual speed; remain in position control state.	Current for the holding brake is above 2.0A, check brake and brake cables for short circuit or use an internal relay for braking control.
5380	21376	Short Circuit on Digital Output	Reaction 2: Downramp / apply brake / de-energize..	A braking current of more than 150 mA must flow for faultless operation. Remedy: Do not control brake via a relay or switch a resistor in parallel.
5420	21536	Braking Resistor overloaded, pulse current	Reaction 2: Downramp / apply brake / de-energize..	If the STO is no longer required, the Enable_in (Pin 3 at X4) be supplied with 24 Volts. Then, the error must be acknowledged.
5421	21537	Braking Resistor overloaded, continuous Current	Reaction 2: Downramp / apply brake / de-energize..	Close safety circuit or check function.
5425	21541	Braking resistor overload	Reaction 1: Downramp actual speed; remain in position control state.	Caution! The safety of the STO safety function is no longer guaranteed. Please check external wiring! Error cannot be acknowledged, when the error is eliminated, the 24V must be switched on again. If the cause of the error lies within the C3M device, the Compax3 must immediately be repaired by the manufacturer.
5432	21554	C3 PSUP: Continuous device usage too high	Reaction 1: Downramp actual speed; remain in position control state.	Caution! The safety of the STO safety function is no longer guaranteed. Please check external wiring! If the cause of the error lies within the C3M device, the Compax3 must immediately be repaired by the manufacturer.
5480	21632	Motor Brake overload	Reaction 1: Downramp actual speed; remain in position control state.	Move axis into the travel range. If E5 is not used as limit switch, the error reaction should be explicitly switched off in the configuration or in the IEC program. The error may occur if E5 is designed as a freely assignable input and for example C3_ErrorMask is used in the IEC-program.
5481	21633	Open Circuit - Motor Brake	Reaction 1: Downramp actual speed; remain in position control state.	Move axis into the travel range. If E6 is not used as limit switch, the error reaction should be explicitly switched off in the configuration or in the IEC program. The error may occur if E6 is designed as a freely assignable input and for example C3_ErrorMask is used in the IEC-program.
5491	21649	Power Stage disable	Reaction 5: Switch-off of the current immediately (without ramp), application of the brake	Reduce motor load (less current, more standstill phases of the drive, lower clock time, lower accelerations), check thermal time constant and nominal or reference current of the motor. Check motor dimensioning and replace motor by an adequately dimensioned model if necessary; use cooling option (water, air) if available, optimize mechanic components
5492	21650	Safe torque off (STO) active	Reaction 5: Switch-off of the current immediately (without ramp), application of the brake	

5493	21651	Error in the STO safety function	Reaction 5: Switch-off of the current immediately (without ramp), application of the brake	
5494	21651	Error in the STO safety function (S3)	Reaction 5: Switch-off of the current immediately (without ramp), application of the brake	T30/T40: Reduce number of instructions in the IEC 500us task, avoid commands issued at the same time to several profile generators (C3F: main axis/auxiliary axis or virtual master - C3S, M, H: triggering motion function / control virtual master and/or control of superimposed movements). When using the oscilloscope (in "normal", "single" or "auto" mode with more than one channel): Reduce number of channels or set scanning time to values higher than 10ms/div. Do use advanced controller optimization (notch filter, monitor, filters,...) only if they are without any doubt advantageous. Check the number of process data objects transmitted for bus devices (HEDA and/or fieldbus) and reduce them if necessary. Upgrading to >= R09-70 firmware might cure the problems because of the modified (relaxed) error trigger.
54A0	21664	Limit switch E5 (X12/12) activated	Reaction 2: Downramp / apply brake / de-energize..	Processing time 500µs optimizing the task, remove modules that are not required from the task list
54A1	21665	Limit switch I6 (X12/13) activated	Reaction 2: Downramp / apply brake / de-energize..	Debug IEC program
5520	21792	Object directory faulty	Reaction 1: Downramp actual speed; remain in position control state.	Optimize program (runtime), increase target cycle time (in the IEC download dialog), refrain from using time-intensive processes (for example saving objects in Flash)
5F48	24392	Effective motor usage too high (i ² t)	Reaction 2: Downramp / apply brake / de-energize..	Reduce interleaving depth in function and subprogram calls
6010	24592	Watchdog Timeout	Reaction 5: Switch-off of the current immediately (without ramp), application of the brake	Reduce the number of or the interleaving depth of function module instances
6011	24593	System overload 31.25us	Reaction 2: Downramp / apply brake / de-energize..	Recompile the program / download and verify the compiler version
6012	24594	System overload 500us	Reaction 2: Downramp / apply brake / de-energize..	Increase object 50.13 PLC_InstLimit_500 (check calculation time demand) or reduce instructions in the 500us IEC Task.
6080	24704	System overload controller task 250us	Reaction 2: Downramp / apply brake / de-energize..	Check connection of braking resistor and function of braking resistor on C3 PSUP.
6280	25216	IEC61131-3 Division by zero	Reaction 2: Downramp / apply brake / de-energize..	Current limitation (O402.3 Limit_CurrentPositive, O402.4 Limit_CurrentNegative and O402.6 Limit_CurrentFine) in configuration IEC check fieldbus, reduce switching frequency (Derating at increased frequency not respected), check motor commutation with motor tool, check feedback resolution per pitch, check motor wiring (line breakage/motor connector), check current controller configuration (correct winding data?), remove mechanical blockage or motor brake fault, check setpoint profile (especially at Homing with "reversal via current" as well as "moving to block") (maybe acceleration/jerk too low), check device/motor dimensioning (too weak?).

6281	25217	IEC61131-3 Cycle time exceeded	Reaction 2: Downramp / apply brake / de-energize..	Reduce motor load (less current, more standstill phases of the drive, lower clock time, lower accelerations), check thermal time constant and nominal or reference current of the motor. Check motor dimensioning and replace motor by an adequately dimensioned model if necessary; use cooling option (water, air) if available, optimize mechanic components. Check for controller instability (current and/or speed control loop) (high frequency oscillation in the current status value) and stabilize controller by suitable parameter modification.
6282	25218	IEC61131-3 program stack overflow	Reaction 2: Downramp / apply brake / de-energize..	Check cable (repair line breakage/short circuit).
6283	25219	IEC61131-3 FB overflow	Reaction 2: Downramp / apply brake / de-energize..	C3S/C3M/C3H: Adapt thresholds corresponding to the requirements within the configuration/on the limit objects (IEC program, external PLC) / within the motor data. Check feedback if necessary: * EMC immunity/shielding is sufficient (especially, if the error occurs during automatic commutation)? * Feedback resolution/line count is correctly configured? Maybe you are facing 'motor runaway' situation caused by positiv controller feedback in speed control loop -> check motor commutation from within MotorManager. If it is not correct there might be the following causes: * wrong motor wiring (Phases swapped / shifted) * wrong feedback wiring (e.g. tracks/signals swapped) * wrong motor configured/connected or motor feedback was not 'phased'. C3Fluid: Adapt thresholds corresponding to the requirements within the configuration/on the limit objects (IEC program, external PLC) / within the cylinder data. Check feedback if necessary: * EMC immunity/shielding is sufficient? * Feedback resolution/line count is correctly configured?
6284	25220	IEC61131-3 illegal instruction	Reaction 2: Downramp / apply brake / de-energize..	Optimize controller alignment (increase stiffness), increase following error window and / or following error time, heed notes on error 7121 "motor stalled". In the Homing with "reversal via current" as well as "referencing to block" modes, it may be necessary to filter the controller control signal via =2100.20 and/or O2100.10 so that the end stop can be correctly detected (observe the influence on the control, the current setpoint must be in block form in the event of a limitation)
6285	25221	IEC61131-3 500us instruction limit	Reaction 2: Downramp / apply brake / de-energize..	Optimize controller adjustment (increase stiffness),increase following error window and / or following error time. Refers to the position controller of the auxiliary axis

6310	25360	Checksums	Reaction 1: Downramp actual speed; remain in position control state.	<p>If the software end limits are exceeded: Check set value default, end limits and referencing, bring axis back into permissible range.</p> <p>Invalid target position: Limit target position to the permissible travel range.</p> <p>In order to avoid the error message (not recommended in general, but absolutely necessary in endless applications with reset distance) assign True to the "Disable_SoftwareLimit_Pos" input of the "C3_ErrorMask" IEC module, call up the "C3_SetErrorReaction" IEC module with ErrorID "29475" and Reaction "0" (no reaction, error is deactivated) or deactivate the function in the configuration.</p> <p>Firmware update to release version higher than R07-1, if error during manual travel.</p>
7113	28947	C3 PSUP: Short circuit of braking resistor	Reaction 1: Downramp actual speed; remain in position control state.	<p>If the software end limits are exceeded: Check set value default, end limits and referencing, bring axis back into permissible range.</p> <p>Invalid target position: Limit target position to the permissible travel range.</p> <p>In order to avoid the error message (not recommended in general, but absolutely necessary in endless applications with reset distance) assign True to the "Disable_SoftwareLimit_Neg" input of the "C3_ErrorMask" IEC module, call up the "C3_SetErrorReaction" IEC module with ErrorID "29476" and Reaction "0" (no reaction, error is deactivated) or deactivate the function in the configuration.</p> <p>Firmware update to release version higher than R07-1, if error during manual travel.</p>
7121	28961	Motor Stall occurred	Reaction 2: Downramp / apply brake / de-energize..	<p>If the software end limits are exceeded: Check set value default, end limits and referencing, bring axis back into permissible range.</p> <p>Invalid target position: Limit target position to the permissible travel range.</p> <p>In order to avoid the error message, deactivate the positive end limit error in the configuration or in the IEC program (not recommended).</p> <p>Firmware update to release version higher than R07-1, if error during manual travel.</p>
7180	29056	Motor pulse usage too high (i ² t)	Reaction 2: Downramp / apply brake / de-energize..	<p>If the software end limits are exceeded: Check set value default, end limits and referencing, bring axis back into permissible range.</p> <p>Invalid target position: Limit target position to the permissible travel range.</p> <p>In order to avoid the error message, deactivate the negative end limit error in the configuration or in the IEC program (not recommended).</p> <p>Firmware update to release version higher than R07-1, if error during manual travel.</p>
7181	29057	Line breakage motor temperature monitoring	Reaction 1: Downramp actual speed; remain in position control state.	<p>Increase deceleration and deceleration jerk, execute following movement earlier (from a smaller speed or with a longer distance to the following movement). As from R07-3, it is possible to activate option "permit higher deceleration for RegMove" in the configuration of reg-related positioning with T11, in order to avoid the error.</p> <p>If (with T30/T40) the monitoring is not desired, object 1111.17 must be set to zero.</p>

7303	29443	Resolver 1 damaged	Reaction 5: Switch-off of the current immediately (without ramp), application of the brake	Check feedback cable or feedback. EMC problems/very long motor cable? Is the resolver type used suitable for operation with Compax3 (transformation ratio)? If needs be, adapt (reduce) excitation voltage (O280.5 - Resolver_ExcitationLevel) or software gain factor (O280.3 Resolver_LevelAdaption). Please note: The feedback excitation voltage is deactivated for level errors!
7310	29456	Speed too high	Reaction 5: Switch-off of the current immediately (without ramp), application of the brake	Check feedback cable or feedback. Is the resolver type used suitable for operation with Compax3 (transmission ratio)? Configure device according to the connected feedback (F11 with SinCos) or use correct device (F12 with EnDat or Encoder). If needs be, adapt (increase) excitation voltage (O280.5 - Resolver_ExcitationLevel) or software gain factor (O280.3 Resolver_LevelAdaption). Please note: The feedback excitation voltage is deactivated for level errors!
7311	29457	Speed error	Reaction 1: Downramp actual speed; remain in position control state.	Increase configured tolerance window, check configuration of the load feedback system (direction of rotation, feedback resolution,...), the feedback system might be defective or there might be a line break. Object C3.StatusPosition_LoadControlDeviationMax (680.21) can be used as lead for the window to be configured. Please note, that cyclic reset of the position difference must take place in applications where slip between motor and load feedback occurs (e.g. roller feed), otherwise the position difference will accumulate. Resetting is possible by writing "1" into C3Plus.LoadControl_Command (O2201.2) as well as by a homing run (also "Teaching") of the drive. As an alternative, position difference monitoring can be deactivated after the setup phase (O410.6 = 0) if there is another means to detect a line break (e.g. load feedback velocity in the IEC program).Furthermore, the value is automatically reset on each new positioning, if continuous operation is configured (wizard for IxxT11 or via C3Plus.POSITION_resetposition_mode IEC variable (O1111.8) = 1 for T30 T40).
7312	29458	Speed warning	Reaction 2: Downramp / apply brake / de-energize..	Check feedback cable (shield, breakage, short-circuit) or feedback, ensure EMC compliant wiring. Configure the correct feedback A/B (RS422 instead of SineCosine). Please note: The feedback power supply voltage is deactivated for F11!
7320	29472	Following error	Reaction 2: Downramp / apply brake / de-energize..	Check feedback cable (shield, breakage, short-circuit) or feedback (also SinCos communication), PowerOFF/On of the device. Configure device according to the connected feedback (F10 with Resolver) or use correct device (F10 with Resolver). Make sure that the configuration wizard is completely run through upon a change of the motor in the MotorManager, such as a change of the feedback type (e.g. SineCosine Encoder -> A/B (TTL) Encoder) and that the configuration download takes place after completion. Please note: The feedback power supply voltage is deactivated for F11! Firmware update for EnDat encoders without incremental track (EnDat2.2 requires Firmware >= 2012R09-40, EnDat2.1 requires Firmware >= 2013R09-50).
7321	29473	Tracking error warning	Reaction 1: Downramp actual speed; remain in position control state.	Approach machine zero again and switch off and on the device (POWEROFF/ON).

7322	29474	Following error auxiliary axis	Reaction 2: Downramp / apply brake / de-energize..	Check feedback wiring, check EMC, exchange feedback, perform Homing again, deactivate use of the feedback memory.
7323	29475	Target or actual position exceeds positive end limit	Reaction 2: Downramp / apply brake / de-energize..	Exchange feedback device.
7324	29476	Target or actual position exceeds negative end limit	Reaction 2: Downramp / apply brake / de-energize..	Contact our technical support.
7325	29477	Target or actual position exceeds positive end limit	Reaction 2: Downramp / apply brake / de-energize..	Check hall wiring and verify function of hall sensors. Eliminate (EMC) disturbances on hall signals. In this error case you should test, if the error does also occur after device PowerOn when manually shifting/turning the motor (motor not energized).
7326	29478	Target or actual position exceeds negative end limit	Reaction 2: Downramp / apply brake / de-energize..	Configure hall direction and/or motor pitch resp. number of motor poles correctly (check with MotorManager). Eliminate (EMC) disturbances on hall signals. Check hall wiring and verify function of hall sensors (function, distance tolerance of the hall sensors). Does the position acquisition work (Status actual position)? This error was reported without cause in the firmware version of release 2004R03-0x (between V02.05.03 and V02.05.55).
7327	29479	Change of direction during movement	Reaction 2: Downramp / apply brake / de-energize..	Check hall wiring and verify function of hall sensors. If needs be, eliminate (EMC) disturbance on hall signals, e.g. improve motor cable shielding, optimize signal lead of the hall signals (in the case of an error you should test, if the error does also occur after device PowerOn when manually shifting/turning the motor (motor NOT energized)). Hall sensors.
7380	29568	Feedback error	Reaction 1: Downramp actual speed; remain in position control state.	Check hall wiring and verify function of hall sensors. If needs be, eliminate (EMC) disturbance on hall signals, e.g. improve motor cable shielding, optimize signal lead of the hall signals (in the case of an error you should test, if the error does also occur after device PowerOn when manually shifting/turning the motor (motor NOT energized)). Motor feedback: Eliminate EMC disturbances (motor cable shield connected, shielded cable used, ...?) ensure correct position acquisition (check feedback cable (is one or both tracks missing)), eliminate contamination, replace damaged tape scale, correct bad reader head alignment (Caution: distance may depend on position due to guiding system)). Motor cable C3M: If motors feature temperature sensor lines in the motor cable (connected to X15), these must be protected from disturbances due to the motor phases by a special internal shield. Configuration: Check feedback resolution per pitch or resolution, correct hall direction and/or motor pitch or number of motor poles (check with the MotorManager).
7381	29569	Resolver output level too high	Reaction 5: Switch-off of the current immediately (without ramp), application of the brake	Check signal quality of feedback (noise), bring drive to a standstill.

7382	29570	Resolver output level too low	Reaction 5: Switch-off of the current immediately (without ramp), application of the brake	Malfunction (motion caused by external source) of the motor during automatic commutation, starting current too great, incorrect parameter for commutation direction (use MotorManager to determine the values). Check feedback resolution (per pitch) and/or number of feedback or motor poles. A motor phase has been (temporarily) interrupted. Post-pulse oscillation of the drive due to a too high excitation in a feebly attenuated system -> = increase O2190.1 AutoCommutationControl_Ramptime and/or vary O2190.4 AutoCommutationControl_MotionReduction.
7383	29571	Synchronization of resolver excitation	Reaction 5: Switch-off of the current immediately (without ramp), application of the brake	Eliminate external influence on the motor or device current is too small resp. friction is too high. Post-pulse oscillation of the drive due to a too high excitation in a feebly attenuated system -> = increase O2190.1 AutoCommutationControl_Ramptime and/or vary O2190.4 AutoCommutationControl_MotionReduction. The commutation direction may be badly parameterized (use MotorManager to determine the values).
7385	29573	Position difference between load mounted and motor feedback too high	Reaction 2: Downramp / apply brake / de-energize..	Avoid external influences on the motor, check feedback (sufficient EMC immunity/shielding, resolution not configured). In very easy running systems, it may be necessary to increase O2190.1 AutoCommutationControl_Ramptime. If needs be, increase O2190.7 AutoCommutationControl_Standstillthreshold as well.
7390	29584	SinCos internal feedback error (group bit)	Reaction 2: Downramp / apply brake / de-energize..	Increase starting current O2190.2 and eliminate very high direction dependence or friction if any. Check feedback resolution and/or number of feedback or motor poles. With a high inertia (or mass)/torque constant KT ratio, it might in addition be necessary to reduce the motion threshold O2190.3.
7391	29585	Feedback level exceeds limit	Reaction 5: Switch-off of the current immediately (without ramp), application of the brake	Increase the starting current or eliminate external influence on the motor. Check feedback resolution and/or number of feedback or motor poles, update firmware to a release higher than 04_2005-3 (Firmware V02.07.16).
7392	29586	Feedback level too low	Reaction 5: Switch-off of the current immediately (without ramp), application of the brake	Increase automatic commutation starting current, eliminate motor block, check parameters for motor current (too small, device extremely under-dimensioned), current controller unstable. With a high inertia (or mass)/torque constant KT ratio, it might in addition be necessary to reduce the motion threshold O2190.3.
7393	29587	SinCos RS-485 communication error (multiple bit)	Reaction 2: Downramp / apply brake / de-energize..	Connect motor resp. check wiring. In the case of high winding resistance reduce peak current so that $R_{kk} \cdot I_{max}$ is inferior to $U_{mains} \cdot 0.8$. The power stage may be defective.
7394	29588	Feedback EEPROM data invalid	Reaction 2: Downramp / apply brake / de-energize..	Check and correct feedback sensor adjustment as well as feedback wiring.
7395	29589	Error while storing data in feedback EEPROM	Reaction 2: Downramp / apply brake / de-energize..	Increase baud rate
7396	29590	Checksum error SinCos® EEPROM	Reaction 2: Downramp / apply brake / de-energize..	Check feedback and feedback cable.
7397	29591	SinCos® FF feedback type is not supported	Reaction 2: Downramp / apply brake / de-energize..	Check feedback and feedback cable or reduce lower limit value (Obj287.10) if needs be

73A0	29600	Hall commutation: Invalid combination of hall signals	Reaction 5: Switch-off of the current immediately (without ramp), application of the brake	Check feedback and feedback cable or increase upper limit value (Obj287.11) if needs be.
73A1	29601	Hall commutation: Invalid correction value fine angle	Reaction 2: Downramp / apply brake / de-energize..	Increase baud rate
73A2	29602	Hall commutation: Invalid hall signal sequence	Reaction 5: Switch-off of the current immediately (without ramp), application of the brake	Check feedback and feedback cable.
73A3	29603	Hall commutation: Commutation error	Reaction 5: Switch-off of the current immediately (without ramp), application of the brake	Check feedback and feedback cable or reduce lower limit value (Obj288.10) if needs be
73A5	29605	Automatic commutation: No standstill of drive on start	Reaction 2: Downramp / apply brake / de-energize..	Check feedback and feedback cable or increase upper limit value (Obj288.11) if needs be.
73A6	29606	Automatic commutation: Movement of more than 60 electrical degrees	Reaction 2: Downramp / apply brake / de-energize..	Optimize controller adjustment (increase stiffness),increase following error window and / or following error time
73A7	29607	Automatic commutation: More than 5° el. movement during phase2	Reaction 2: Downramp / apply brake / de-energize..	Optimize controller adjustment (increase stiffness),increase following error window and / or following error time. Refers to the force controller of the auxiliary axis
73A8	29608	Automatic commutation: No standstill during phase 3	Reaction 2: Downramp / apply brake / de-energize..	Increase configured maximum pressure, check maximum pressure of the selected pump.
73A9	29609	Automatic commutation: Timeout during phase 3	Reaction 2: Downramp / apply brake / de-energize..	Optimize controller adjustment, increase following error window and / or following error time.
73AA	29610	Automatic commutation: Too many trials during phase 3	Reaction 2: Downramp / apply brake / de-energize..	Optimize controller adjustment, increase following error window and / or following error time.
73AB	29611	Automatic commutation: Timeout	Reaction 2: Downramp / apply brake / de-energize..	Check segment entries of the linking table and/or verify the contents of the curve header / memory.
73AC	29612	Automatic commutation: No motor connected	Reaction 2: Downramp / apply brake / de-energize..	Verify master segment distances and/or master segment factors in the linking table.
73B0	29616	Distance coding: Invalid reference mark position	Reaction 2: Downramp / apply brake / de-energize..	Verify configuration of the master channel (normalization), verify master segment distance and/or factor (too small?), if needs be, reduce number of interpolation points of the curve. Check master position for (small) position steps (observe master speed).
73C0	29632	Feedback 1 SSI/Start- Stop: Transmission time too short	Reaction 1: Downramp actual speed; remain in position control state.	Verify normalized master positions in the flash.
73C1	29633	Feedback 1: SSI in error state	Reaction 2: Downramp / apply brake / de-energize..	as 7482 but with coupling segment

73C2	29634	Feedback 1 SSI/Start-Stop: Value below lower limit	Reaction 2: Downramp / apply brake / de-energize..	as 7483 but with coupling segment
73C3	29635	Feedback 1 SSI/Start-Stop: Value above upper limit	Reaction 2: Downramp / apply brake / de-energize..	Verify configuration of the master channel (normalization), verify master segment distance and/or factor (too small?). The cause of the error might be a large master position step with active cam generator e.g. due to bus problems/master failure or a reset of the transmitted value. This kind of position step is not allowed!
73C8	29640	Feedback 2 SSI/Start-Stop: Transmission time too short	Reaction 1: Downramp actual speed; remain in position control state.	Master and slave normalization, verify master and slave factors as well as master or slave segment distances, reduce master velocity.
73C9	29641	Feedback 2: SSI in error state	Reaction 2: Downramp / apply brake / de-energize..	Check or modify if necessary configuration (travel/revolution of master or slave, master clock distance etc.) and cam parameters (master/slave distances).
73CA	29642	Feedback 2 SSI/Start-Stop: Value below lower limit	Reaction 2: Downramp / apply brake / de-energize..	Change of the Y4 factors O201.11 and O201.2 only at standstill or if the interpolator output is not being used.
73CB	29643	Feedback 2 SSI/Start-Stop: Value above upper limit	Reaction 2: Downramp / apply brake / de-energize..	Avoid position steps in the setpoint value (if the interpolator output is used), reduce increase of the Y4 factor (bus increments/drive unit) for the interpolation setpoint value O201.11, reduce master speed.
73D0	29648	Tracking error Force control main axis	Reaction 2: Downramp / apply brake / de-energize..	Adapt interpolator input modulo range of the Compax3 (O3921.3 or O3921.10 and O3921.2 or O3921.9) or output modulo of the controller.
73D1	29649	Tracking error Force control aux. Axis	Reaction 1: Downramp actual speed; remain in position control state.	Respect limit values, edit the lower modulo threshold value first if necessary.
73D5	29653	Actual pressure is too high	Reaction 1: Downramp actual speed; remain in position control state.	Reduce or deactivate reset distance actual position, decrease Y4 factor O.201.2 or set modulo actual position operating mode to "bus format (I32)".
73D6	29654	Following error of volume flow rate controller	Reaction 1: Downramp actual speed; remain in position control state.	Reduce/modify travel/motor revolution of the drive (Slave) or Y4 factor O201.2, if necessary contact Parker's technical support.
73D7	29655	Following error of pressure controller	Reaction 1: Downramp actual speed; remain in position control state.	Check HEDA cable. Are the terminating connectors correctly fixed? Is the red HEDA-LED off on all devices? Is there a Master and are all of its transmit slots active?
7480	29824	Cam generator: Invalid segment in linking table	Reaction 2: Downramp / apply brake / de-energize..	Check HEDA cable. Are the terminating connectors correctly fixed? Could double assignments in a transmit slot lead to collisions? Watch HEDA-LED!
7481	29825	Cam generator: Invalid master segment distance	Reaction 2: Downramp / apply brake / de-energize..	
7482	29826	Cam generator: Cam point not found	Reaction 1: Downramp actual speed; remain in position control state.	
7483	29827	Cam generator: Cam data error	Reaction 2: Downramp / apply brake / de-energize..	Select a different receive slot! Are too many receive slots activated? Max. four slots per axis may be active. An interval of at least 125µs is required between the slots. Setting via object 900.5.
7484	29828	Cam generator: cam point of coupling segment not found	Reaction 2: Downramp / apply brake / de-energize..	Set lower baud rate.

7485	29829	Cam generator: cam data coupling segment error	Reaction 2: Downramp / apply brake / de-energize..	Wiring, terminal connector, check baud rate.
7486	29830	Cam generator: multiple segment change	Reaction 2: Downramp / apply brake / de-energize..	Reestablish bus connection. The hardware may be defective. With CANopen (and high bus load), object 0x100D (life time factor) and/or object 0x100C (guard time in ms) must be increased. With ProfiNet it might help to increase the fieldbus master cycle time (as the drive might not be able to follow).
7487	29831	Cam generator: maximum allowable master or slave speed value exceeded	Reaction 2: Downramp / apply brake / de-energize..	Reduce setpoint value or adapt limitation parameters (configuration or object 402.1 and 402.2) or maximum velocity or speed in the motor data (MotorManager).
7488	29832	Cam generator: maximum allowable internal speed value exceeded	Reaction 2: Downramp / apply brake / de-energize..	
7489	29833	Cam generator: reserved	Reaction 1: Downramp actual speed; remain in position control state.	The error occurs for example if the response times of the PC are too long for RS232 communication. Check energy options of laptops (set continuous mode or desktop). On slow computers, assign a fixed value to the swap file. If needs be, increase watchdog time (=0.40.3*100ms). Acknowledge Error.
74A0	29856	It is not permitted to change the Y4 factor	Reaction 1: Downramp actual speed; remain in position control state.	Reduce homing offset (O1130.5) or homing target position (O1130.6)
74A1	29857	Fieldbus Interpolator: Speed too high	Reaction 1: Downramp actual speed; remain in position control state.	Replace T40 IEC project by T30 or do only use IEC modules or IEC targets supported in this firmware. Module C3_CamReset requires at least firmware R08-3.
74A2	29858	Fieldbus Interpolator: Invalid position input value	Reaction 1: Downramp actual speed; remain in position control state.	Please take the order of the commands SetC and SetM into consideration.

74A3	29859	Fieldbus Interpolator: Invalid modulo settings	Reaction 1: Downramp actual speed; remain in position control state.	<p>Create the prerequisites for the command: Setting the Master (Cmd 2,3) only if "global enable" (O3020.4) is not placed. Prepare coupling by change-over (Cmd 4, C3_CamIn,C3_CamOut) only if coupling / decoupling is not taking place at the same time. Prepare quadratic coupling (Cmd 5,7, C3_CamIn) only if coupling is not taking place at the same time and if the Master has already been set. Prepare quadratic decoupling (Cmd 6,8, C3_CamOut) only if coupling is not taking place at the same time and if the Master has already been set. Set master position for display (Cmd10, C3_SetMaster) only if not synchronized (coupling or decoupling resp. curve mode). Set master position in Mode relative/absolute (Cmd11/12/13, C3_CamTableSelect) only without master position enable for Cam (O3030.17 = 0). Resetting the curve generator (Cmd23, C3_CamReset) only if not synchronized (coupling or decoupling resp. curve mode).</p> <p>The last CamCmd declined for this reason (O3010.1 = -3) can be read out via O3010.3 (LastNAKCommand).</p>
74A4	29860	Invalid modulo settings for fieldbus actual position	Reaction 1: Downramp actual speed; remain in position control state.	Correct specification for selected curve (O3011.2) and/or start line of the curve (O3040).
74A5	29861	Overflow during calculation of the fieldbus actual position modulo	Reaction 1: Downramp actual speed; remain in position control state.	Select valid coupling segment (O3011.3) or verify curve memory.
7590	30096	HEDA synchronization error	Reaction 2: Downramp / apply brake / de-energize..	Select valid segment or verify curve memory.
7591	30097	HEDA communication error	Reaction 2: Downramp / apply brake / de-energize..	Specify permitted value for master segment distance (O3056) or master segment factor (O3058).
7592	30098	HEDA Acyclic Receiver Overrun	Reaction 1: Downramp actual speed; remain in position control state.	Load curve data into the device or reduce number of segments.
7593	30099	HEDA PLL failure	Reaction 2: Downramp / apply brake / de-energize..	Check master reset distance used (very short or zero (deactivated))? Check contents of O1139.4 or O1140.5.
7594	30100	HEDA Cyclic Receiver Overrun	Reaction 2: Downramp / apply brake / de-energize..	Verify, if the configuration used makes sense. Send the configuration and cam data to technical support.
8110	33040	Receive buffer overflow	Reaction 2: Downramp / apply brake / de-energize..	Verify the current segment (O3031.1) with reference to its sequence at the selected coupling / decoupling positions (O1139.1 and =1140.1) (the gradient of the segment must be positive and unequal to zero) and the selected delta values (O1139.4 and =1140.4). Please note that the coupling/decoupling positions (O1139.1 and O1140.1) are corrected into number range 0..master reset distance.
8120	33056	CANopen/DeviceNet: CRC error or passive mode (CAN controller)	Reaction 1: Downramp actual speed; remain in position control state.	Verify the default values numerator (O3011.5) and/or denominator of the reset distance (=3011.6). Verify the configuration of master and master signal sources.

8130	33072	FBI Timeout	Reaction 1: Downramp actual speed; remain in position control state.	Define or check active signal source for CAM. Select valid source for switching or configure source to which you wish to switch (C3_MasterControl).
8181	33153	Invalid velocity	Reaction 1: Downramp actual speed; remain in position control state.	
8182	33154	CAM command error	Reaction 2: Downramp / apply brake / de-energize..	Check connection and master; check sync anticipation period in O820.8 (ComCyclePeriod, 0x60C2) or check period duration in the master, check jitter (see object 820.25). With high jitter activate option "distributed clock" in the EtherCat Master, up to R09-20: Change method of synchronization (see obj. 820.24).
8183	33155	Watchdog test movement	Reaction 2: Downramp / apply brake / de-energize..	Check wiring (X30, X31) and voltage supply 24V
8184	33156	Invalid position specification for machine zero	Reaction 1: Downramp actual speed; remain in position control state.	
8190	33168	CamCommand: Unknown command or no T40	Reaction 2: Downramp / apply brake / de-energize..	
8191	33169	CamCommand: SetC must be executed before SetM	Reaction 2: Downramp / apply brake / de-energize..	Reduce test signal amplitude, increase monitoring range.
8192	33170	CamCommand: command not permitted at present	Reaction 2: Downramp / apply brake / de-energize..	Select correct machine zero mode, check reference point (initiators, feedback zero), (cable, voltage supply, feedback type,...) debounce reversal switches (via software debounce time), reduce acceleration for reversal via current and/or check controller settings.
8193	33171	CamCommand: invalid table row entry for the selected cam	Reaction 2: Downramp / apply brake / de-energize..	Reduce test signal amplitude or -time, increase monitoring range.
8194	33172	CamCommand: invalid coupling segment	Reaction 2: Downramp / apply brake / de-energize..	Remove error cause (falling edge of masked digital input), if functionality is desired but error occurs unintended: Check wiring, input polarity and EMI influence.
8195	33173	CamCommand: invalid segment	Reaction 2: Downramp / apply brake / de-energize..	Wait until DC bus is charged, check and/or apply AC power, configure correct AC supply voltage, might be a subsequent error of 0xFF33 'CRC error of E ² PROM of C3H power stage', Resolver excitation offset (O280.7/O280.8) should be set to zero.
8196	33174	CamCommand: Invalid master segment distance	Reaction 2: Downramp / apply brake / de-energize..	-
8197	33175	CamCommand: invalid segment figure in cam memory	Reaction 2: Downramp / apply brake / de-energize..	The problem can occur with old firmware (R08 (before V04.05.07) or older) if during already active cyclic fieldbus mapping the mapped object list is modified. -> in this case please update Compax3 firmware. Please check electrical installation regarding correct usage of EMI measures. Otherwise contact EME tech support.

8198	33176	CamCommand: invalid delta value for quadratic coupling	Reaction 2: Downramp / apply brake / de-energize..	The problem can occur with old firmware (R08 (before V04.05.07) or older) if during already active cyclic fieldbus mapping the mapped object list is modified. -> in this case please update Compax3 firmware. Please check electrical installation regarding correct usage of EMI measures. Otherwise contact EME tech support.
8199	33177	CamCommand: internal value range overflow	Reaction 2: Downramp / apply brake / de-energize..	
819a	33178	CamCommand: invalid slope of quadratic coupling	Reaction 2: Downramp / apply brake / de-energize..	
819b	33179	CamCommand: invalid parameters for changing of master reset distance	Reaction 2: Downramp / apply brake / de-energize..	
819c	33180	CamCommand: invalid master source selected	Reaction 2: Downramp / apply brake / de-energize..	
819d	33181	CamCommand: reserved	Reaction 2: Downramp / apply brake / de-energize..	
819e	33182	CamCommand: reserved	Reaction 2: Downramp / apply brake / de-energize..	
81F0	33264	CAN Bus: inactive status	Reaction 1: Downramp actual speed; remain in position control state.	
81F1	33265	Fieldbus synchronization error	Reaction 1: Downramp actual speed; remain in position control state.	
81F2	33266	C3M: Timeout in the cyclic data exchange	Reaction 2: Downramp / apply brake / de-energize..	
8380	33664	Effective force of main axis is higher than maximum force	Reaction 2: Downramp / apply brake / de-energize..	
8381	33665	Effective force of auxiliary axis is higher than maximum force	Reaction 2: Downramp / apply brake / de-energize..	
8480	33920	Velocity limit exceeded during signal analysis	Reaction 2: Downramp / apply brake / de-energize..	
8612	34322	No reference point for machine zero detected	Reaction 2: Downramp / apply brake / de-energize..	
8680	34432	Position monitoring range was left during signal analysis	Reaction 2: Downramp / apply brake / de-energize..	
8701	34561	Fast emergency stop was triggered	Reaction 2: Downramp / apply brake / de-energize..	

8702	34562	PowerOn (or state 'Switched On') not allowed	Reaction 2: Downramp / apply brake / de-energize..	
FE00	65024	Exception 00 DSP-System	Switch-off of the current immediately (without ramp), application of the brake, output error number, system restart (software-reset).	
FE01	65025	Exception 00 DSP-System	Switch-off of the current immediately (without ramp), application of the brake, output error number, system restart (software-reset).	
FE02	65026	Exception 02 DSP-System	Switch-off of the current immediately (without ramp), application of the brake, output error number, system restart (software-reset).	
FE04	65028	Exception 04 DSP-System	Switch-off of the current immediately (without ramp), application of the brake, output error number, system restart (software-reset).	
FE06	65030	Exception 06 DSP-System	Switch-off of the current immediately (without ramp), application of the brake, output error number, system restart (software-reset).	
FE08	65032	Exception 08 DSP-System	Switch-off of the current immediately (without ramp), application of the brake, output error number, system restart (software-reset).	
FE0A	65034	Exception 0A DSP-System	Switch-off of the current immediately (without ramp), application of the brake, output error number, system restart (software-reset).	
FF01	65281	No object with this index available	Reaction 1: Downramp actual speed; remain in position control state.	
FF02	65282	No object with this subindex available	Reaction 1: Downramp actual speed; remain in position control state.	
FF03	65283	Object is "read only"	Reaction 1: Downramp actual speed; remain in position control state.	
FF04	65284	Object cannot be read	Reaction 1: Downramp actual speed; remain in position control state.	The error may occur if there is an older bootloader version in a fieldbus module and if the fieldbus firmware is to be actualized again after an update without PowerOff/PowerOn.

FF05	65285	Version conflict: Object data in the flash are invalid	Reaction 1: Downramp actual speed; remain in position control state.	
FF06	65286	No object for process data; object cannot be mapped	Reaction 1: Downramp actual speed; remain in position control state.	
FF07	65287	Data not valid	Reaction 1: Downramp actual speed; remain in position control state.	
FF08	65288	No convert function	Reaction 1: Downramp actual speed; remain in position control state.	Drive needs to be repaired.
FF09	65289	Process data overflow	Reaction 1: Downramp actual speed; remain in position control state.	Load IEC project again into device, configure device anew (if needs be, create new project)
FF10	65296	Command syntax error	Reaction 1: Downramp actual speed; remain in position control state.	Error history, retain variables and absolute positions invalid. Flash defective? Verify shutdown sequence! New data block is created and saved with the next shutdown.
FF11	65297	Value not valid	Reaction 1: Downramp actual speed; remain in position control state.	Load application data into device (configuration).
FF12	65298	Checksum error	Reaction 1: Downramp actual speed; remain in position control state.	Load application data into device (IEC61131-3 program). Turn device off and back on again. Update Firmware or adapt IEC program if necessary. Please use a Compax3 tool release (C3Mgr) higher than R08-1 for very old devices (firmware V01.xx.yy).
FF13	65299	Timeout error	Reaction 1: Downramp actual speed; remain in position control state.	
FF14	65300	Overflow error	Reaction 1: Downramp actual speed; remain in position control state.	De-energize motor, then perform function
FF15	65301	Parity error	Reaction 1: Downramp actual speed; remain in position control state.	
FF16	65302	Frame error	Reaction 1: Downramp actual speed; remain in position control state.	Find cause: Read objects 25.4 and 25.5
FF17	65303	Gateway Timeout	Reaction 1: Downramp actual speed; remain in position control state.	Load configuration into device or avoid WriteFlash command in cam operation.
FF1A	65306	C3MCom: Wrong Block-Check-Character (BBC)	Reaction 1: Downramp actual speed; remain in position control state.	
FF1B	65307	C3MCom: Timeout	Reaction 1: Downramp actual speed; remain in position control state.	Adapt buffer reservation for IEC program (Object 30.2) or download IEC program again with the C3-Manager.
FF1C	65308	C3MCom: Overrun	Reaction 1: Downramp actual speed; remain in position control state.	Check IEC program for objects unknown to the current Firmware. Maybe the wrong IEC Target was selected (e.g. C3F Target for C3).
FF1D	65309	C3MCom: Parity	Reaction 1: Downramp actual speed; remain in position control state.	Check IEC compiler settings and re-compile IEC program if necessary. Update Firmware if necessary.
FF1E	65310	C3MCom: Frame	Reaction 1: Downramp actual speed; remain in position control state.	Configure device again (if needs be, create new project) and load into device.

FF20	65312	Flash sector delete failed	Reaction 1: Downramp actual speed; remain in position control state.	
FF21	65313	Program flash cell failed	Reaction 1: Downramp actual speed; remain in position control state.	
FF22	65314	Checksum error of prog. Flash area	Reaction 1: Downramp actual speed; remain in position control state.	
FF23	65315	DOWN/UPLOAD activated	Reaction 1: Downramp actual speed; remain in position control state.	
FF24	65316	DOWN/UPLOAD not activated	Reaction 1: Downramp actual speed; remain in position control state.	CANopen Master did not receive a confirmation from the accessed CANopen node.
FF30	65328	EEPROM Delay Count Error	Reaction 1: Downramp actual speed; remain in position control state.	
FF31	65329	EEPROM Timeout Error	Reaction 1: Downramp actual speed; remain in position control state.	Exchange or have feedback system repaired.
FF32	65330	EEPROM ACK error	Reaction 1: Downramp actual speed; remain in position control state.	Exchange or have feedback system repaired.
FF33	65331	C3H power stage E ² Prom check sum error	Reaction 1: Downramp actual speed; remain in position control state.	Exchange or have feedback system repaired.
FF40	65344	Memory for PLC could not be reserved	Reaction 1: Downramp actual speed; remain in position control state.	Reduce speed, check feedback cable for EMC conform wiring (correct screening), reduce EMC emissions in the environment (is the motor screened, is the system correctly grounded etc.), reduce line length.
FF41	65345	Power-fail-safe data are invalid	Reaction 1: Downramp actual speed; remain in position control state.	Reduce feedback ambient temperature.
FF42	65346	Device is not configured (no objects available)	Reaction 1: Downramp actual speed; remain in position control state.	Exchange or repair feedback system
FF43	65347	No IEC61131 program	Reaction 1: Downramp actual speed; remain in position control state.	"Replace" or update firmware, use device required for configured motor (or its feedback).
FF44	65348	Command unknown	Reaction 1: Downramp actual speed; remain in position control state.	Check hall wiring and verify function of hall sensors. If necessary, eliminate (EMC) disturbances (caused in most cases by the Compax3 PWM power stage) on hall signals by providing correct and complete shielding (without interruption) of the motor cables and the hall signal cables. Are hall sensors connected at all or wanted as source? As an alternative (if the application allows), you can select "automatic commutation with movement" instead of hall sensors as source of commutation in the MotorManager.
FF45	65349	No FBI	Reaction 1: Downramp actual speed; remain in position control state.	Switch device off and on again or execute commands 9 and 10 one after the other, can be directly acknowledged as from firmware V03.01.xx (R05).
FF46	65350	Motor powered	Reaction 1: Downramp actual speed; remain in position control state.	Check Hardware (feedback cable, feedback or Compax3) and replace if defective.

FF47	65351	Device type dif	Reaction 1: Downramp actual speed; remain in position control state.	Check feedback cable for EMC conform wiring (correct screening), reduce EMC emissions in the environment (is the motor screened, is the system correctly grounded etc.), reduce line length. Select a memory range for the memory access via objects.
FF48	65352	BDM configuration download is not possible	Reaction 1: Downramp actual speed; remain in position control state.	Check feedback cable for EMC conform wiring (correct screening), reduce EMC emissions in the environment (is the motor screened, is the system correctly grounded etc.), reduce line length. Check clock and data lines for breakages and for contact problems With new model (ID 0000811814_52) of Parker SBC motor feedback variant B9 (EnDat EQI 1331) this error was also triggered accidentally because of a firmware bug. Error is fixed with Firmware Release >=R09-42.
FF49	65353	Irregular device state	Reaction 1: Downramp actual speed; remain in position control state.	Check feedback cable for EMC conform wiring (correct screening), reduce EMC emissions in the environment (is the motor screened, is the system correctly grounded etc.), reduce line length.
FF4A	65354	SCI_FBI Timeout error	Reaction 1: Downramp actual speed; remain in position control state.	Avoid the listed error sources. The error might also be given if there is a problem with the feedback cable (e.g. bad Clock signal connection).
FF4B	65355	Insufficient memory for IEC program	Reaction 1: Downramp actual speed; remain in position control state.	Exchange or have feedback system repaired.
FF4C	65356	IEC: object not found	Reaction 1: Downramp actual speed; remain in position control state.	Switch on Compax3 (24V supply) with EnDat with a lower speed or at standstill.
FF4D	65357	IEC: Version conflict	Reaction 1: Downramp actual speed; remain in position control state.	Check cable, connect EnDat feedback or configure the "right" desired feedback.
FF4E	65358	Not enough memory for configured Scope settings available	Reaction 1: Downramp actual speed; remain in position control state.	Connect EnDat2.2 feedback device or configure feedback as EnDat2.1 feedback (with incremental signals) (Motor manager).
FF50	65360	HEDA Sync error	Reaction 1: Downramp actual speed; remain in position control state.	Operate EnDat feedback device if possible (cable, feedback type) with incremental signals (configuration in the Motor Manager), replace feedback device by a compatible type.
FF51	65361	HEDA timeout error	Reaction 1: Downramp actual speed; remain in position control state.	Do not attempt access or contact our technical support.
FF52	65362	No HEDA Master	Reaction 1: Downramp actual speed; remain in position control state.	Exchange feedback.
FF60	65376	CANopen library	Reaction 1: Downramp actual speed; remain in position control state.	Exchange feedback.
FF61	65377	CANopen confirmation	Reaction 1: Downramp actual speed; remain in position control state.	Exchange feedback.
FF62	65378	No CANopen master	Reaction 1: Downramp actual speed; remain in position control state.	Exchange feedback.
FF70	65392	EnDat: Internal alarm "illumination"	Reaction 2: Downramp / apply brake / de-energize..	Exchange feedback.
FF71	65393	EnDat: Internal alarm "signal amplitude"	Reaction 2: Downramp / apply brake / de-energize..	Exchange feedback.

FF72	65394	EnDat: Internal alarm "position error"	Reaction 2: Downramp / apply brake / de-energize..	Exchange feedback.
FF73	65395	EnDat: Internal alarm "overvoltage"	Reaction 2: Downramp / apply brake / de-energize..	Exchange feedback.
FF74	65396	EnDat: Internal alarm "undervoltage"	Reaction 2: Downramp / apply brake / de-energize..	Exchange feedback.
FF75	65397	EnDat: Internal alarm "overcurrent"	Reaction 2: Downramp / apply brake / de-energize..	Exchange feedback.
FF76	65398	EnDat: Internal alarm "battery failure"	Reaction 2: Downramp / apply brake / de-energize..	Exchange feedback.
FF77	65399	EnDat: Internal alarm	Reaction 2: Downramp / apply brake / de-energize..	Exchange feedback.
FF80	65408	EnDat: Internal warning "frequency transgression"	Reaction 1: Downramp actual speed; remain in position control state.	Exchange feedback.
FF81	65409	EnDat: Internal warning "temperature transgression"	Reaction 1: Downramp actual speed; remain in position control state.	Exchange feedback.
FF82	65410	EnDat: Internal warning "control reserve illumination"	Reaction 1: Downramp actual speed; remain in position control state.	Exchange feedback.
FF83	65411	EnDat: Internal warning: "battery charge"	Reaction 1: Downramp actual speed; remain in position control state.	Exchange feedback.
FF84	65412	EnDat: Internal warning: "reference point"	Reaction 1: Downramp actual speed; remain in position control state.	Exchange feedback.
FF85	65413	EnDat: Internal warning	Reaction 1: Downramp actual speed; remain in position control state.	Exchange feedback.
FF90	65424	Feedback system incompatible with the device type or the firmware version	Reaction 1: Downramp actual speed; remain in position control state.	Exchange feedback.
FF91	65425	Invalid combination of hall signals rough commutation	Reaction 1: Downramp actual speed; remain in position control state.	Exchange feedback.
FF92	65426	Invalid commutation	Reaction 1: Downramp actual speed; remain in position control state.	Exchange feedback.
FF95	65429	EnDat: Timeout	Reaction 2: Downramp / apply brake / de-energize..	Exchange feedback.
FF96	65430	EnDat: Error type A	Reaction 2: Downramp / apply brake / de-energize..	Exchange feedback.
FF97	65431	EnDat: CRC error	Reaction 2: Downramp / apply brake / de-energize..	Exchange feedback.

FF98	65432	EnDat: Acknowledgement error	Reaction 1: Downramp actual speed; remain in position control state.	Exchange feedback.
FF99	65433	EnDat: Error type B	Reaction 2: Downramp / apply brake / de-energize..	Exchange feedback.
FF9A	65434	EnDat: invalid EEPROM parameter	Reaction 2: Downramp / apply brake / de-energize..	Exchange feedback.
FF9B	65435	EnDat: Rotation speed too high	Reaction 1: Downramp actual speed; remain in position control state.	Check wiring, check feedback. Ensure EMC immunity by the aid of correct screening.
FF9C	65436	EnDat: No EnDat feedback	Reaction 1: Downramp actual speed; remain in position control state.	Check wiring, check feedback. Ensure EMC immunity by the aid of correct screening (e.g. metallic joint for shield contact for motors with terminal box).
FF9D	65437	EnDat2.2: Set of commands not supported	Reaction 1: Downramp actual speed; remain in position control state.	Check wiring, check feedback. Ensure EMC immunity by the aid of correct screening.
FF9E	65438	EnDat2.2: Feedback variant is not supported	Reaction 1: Downramp actual speed; remain in position control state.	Check wiring, check feedback. Ensure EMC immunity by the aid of correct screening.
FF9F	65439	EnDat2.2: Acyclic feedback communication disabled	Reaction 1: Downramp actual speed; remain in position control state.	Check wiring, check feedback. Ensure EMC immunity by the aid of correct screening.
FFA0	65440	FBK error	Reaction 1: Downramp actual speed; remain in position control state.	Update Compax3 firmware.
FFA1	65441	SinCos® Analog signals beyond specification	Reaction 2: Downramp / apply brake / de-energize..	Ensure that the motor is at a standstill.
FFA2	65442	SinCos® internal angle offset faulty	Reaction 2: Downramp / apply brake / de-energize..	Replace Hardware, configure "right" feedback.
FFA3	65443	SinCos® table destroyed via data field partition	Reaction 2: Downramp / apply brake / de-energize..	Use standard feedback, contact technical support. EnDat2.2 requires Firmware >= 2012R09-40, EnDat2.1 without incremental track requires Firmware >= 2013R09-50).
FFA4	65444	SinCos® analog limit values not available	Reaction 2: Downramp / apply brake / de-energize..	Do not call PLCopen function module MC_Home during an ongoing positioning process or while a stop command is running or while deactivating the drive (prevent short pulse at the MC_Power Enable if the MC_Home is directly connected). Blocking implemented with both conditions would be ideal (execute MC_ReadStatus immediately before MC_Home!).
FFA5	65445	SinCos® internal I ² C bus not functioning	Reaction 2: Downramp / apply brake / de-energize..	PLCopen function module CamOut cannot be called during coupling process.
FFA6	65446	SinCos® internal checksum error	Reaction 2: Downramp / apply brake / de-energize..	Call PLCopen function module with matching parameters
FFA7	65447	SinCos® feedback reset caused by program monitoring	Reaction 2: Downramp / apply brake / de-energize..	Use C3_CamIn/-Out with mode 0 or MC_CamIn.
FFA8	65448	SinCos® counter overflow	Reaction 2: Downramp / apply brake / de-energize..	Update C3 powerPLmC and Compax3 to the same software release version.

FFA9	65449	SinCos® Parity error	Reaction 2: Downramp / apply brake / de-energize..	Delete object 820.8 (if sync functionality is not required) or use firmware >=R08-3, delete object 2215.1 (if pressure/force control is not required), reduce fast cycle calculation time load (if possible disable speed observer, reduce HEDA mapping objects, ...), contact technical support.
FFAA	65450	SinCos® checksum of transmitted data is faulty	Reaction 2: Downramp / apply brake / de-energize..	Delete object 820.8 (if sync functionality is not required) or use firmware >=R08-3, delete object 2215.1 (if pressure/force control is not required), reduce fast cycle calculation time load (if possible disable speed observer, reduce HEDA mapping objects, ...)) The error was also generated in firmware R09-62 ... R09-65 with Force-Control in FNI mode and SinCos (F11) motor (or F12 feedback) in combination with M21 analog input option card. With that constellation please upgrade your firmware to >= 2015R09-70. Contact technical support.
FFAB	65451	SinCos® unknown command code	Reaction 2: Downramp / apply brake / de-energize..	Delete object 820.8 (if sync functionality is not required) or use firmware >=R08-3, delete object 2215.1 (if pressure/force control is not required), reduce fast cycle calculation time load (if possible disable speed observer, reduce HEDA mapping objects, ...), contact technical support.
FFAC	65452	SinCos® number of transmitted data is faulty	Reaction 2: Downramp / apply brake / de-energize..	Maybe a SineCosine encoder is operated in excess of the maximum possible velocity. Due to the damping of the sine-cosine signals accompanying an increasing feedback output frequency, correct position acquisition is no longer possible when a limit velocity is exceeded. Remedy: Reduce velocity specification. Check feedback level of the 1Vss signals - for low values and corresponding measurement system, check sensor adjustment. Please heed the measures to avoid EMC influences: * feedback cable shielded, shield not interrupted and shields with large contact areas in the Compax3 feedback connector. * Motor cable shielded, shield not interrupted and shield contacted on motor and Compax3 side (shield clamp). * Use motor output filter/mains input filter for long motor cables. * Avoid electrostatic charges of movable drive parts by applying suitable grounding measures. * Also check further machine components (frequency converter etc.). * The error may also be reported if the feedback connector is drawn from the switched-on device.
FFAD	65453	SinCos® improper command argument transmitted	Reaction 2: Downramp / apply brake / de-energize..	
FFAE	65454	SinCos® The selected data field is not to be exceeded	Reaction 2: Downramp / apply brake / de-energize..	
FFAF	65455	SinCos® invalid access code	Reaction 2: Downramp / apply brake / de-energize..	

FFB0	65456	SinCos® size of the stated data field is not variable	Reaction 2: Downramp / apply brake / de-energize..	
FFB1	65457	SinCos® stated word address beyond data field	Reaction 2: Downramp / apply brake / de-energize..	
FFB2	65458	SinCos® access to non-existing data field	Reaction 2: Downramp / apply brake / de-energize..	
FFBC	65468	SinCos® absolute value control of the analog signals	Reaction 2: Downramp / apply brake / de-energize..	
FFBD	65469	SinCos® transmitter current approaching limit	Reaction 2: Downramp / apply brake / de-energize..	
FFBE	65470	SinCos® feedback temperature approaching limit	Reaction 2: Downramp / apply brake / de-energize..	
FFBF	65471	SinCos® speed exceeds normal, no position generation permitted	Reaction 2: Downramp / apply brake / de-energize..	
FFC0	65472	SinCos® Singleturn position unreliable	Reaction 2: Downramp / apply brake / de-energize..	
FFC1	65473	SinCos® Multiturn position error	Reaction 2: Downramp / apply brake / de-energize..	
FFC2	65474	SinCos® Multiturn position error	Reaction 2: Downramp / apply brake / de-energize..	
FFC3	65475	SinCos® Multiturn position error	Reaction 2: Downramp / apply brake / de-energize..	
FFC4	65476	SinCos® internal error	Reaction 2: Downramp / apply brake / de-energize..	
FFD0	65488	SinCos® CRC	Reaction 2: Downramp / apply brake / de-energize..	

FFD1	65489	SinCos® RX Timeout	Reaction 2: Downramp / apply brake / de-energize..	<p>Check motor cable and connector</p> <p>Check motor (if insulation class of the motor is sufficient, look out for defective windings (e.g. due to overheating))</p> <p>Check controller settings for instabilities:</p> <p>Current loop: Current controller bandwidth too large (>50%)-> current controller may be unstable, saturation characteristic required, are the el. motor data correct?</p> <p>Speed control: Stiffness and/or damping set too high, too high signal delay in the control loop (current bandwidth too small (<50%), actual speed value filter (1 and 2) set too high), control loop parameterized correctly (moment of inertia approx. correctly configured, for oscillating systems (e.g. toothed belt axes) a D-component (values >1000%) and/or a speed filter value >500% (or 600us) are required.</p> <p>Check current (in stable control loops) for ondulations (e.g. first and second mechanical frequency caused by resolver errors or load resp. moment of inertia variations). If ondulations are considerably higher than the nominal device current, reduce stiffness and/or current control bandwidth.</p> <p>When working with high motor speed and operation at the voltage limit, make sure you use a release >= 2004R03 (Firmware and PC Software!).</p> <p>With older firmware versions, the error may be reported in connection with activating the enable input (Pin3 on X4) (even with device not energized) (depending on timing, signal release and</p>
FFD2	65490	SinCos® RX Overrun	Reaction 2: Downramp / apply brake / de-energize..	
FFD3	65491	SinCos® RX Parity	Reaction 2: Downramp / apply brake / de-energize..	
FFD4	65492	SinCos® RX Frame	Reaction 2: Downramp / apply brake / de-energize..	
FFD5	65493	SinCos® unknown feedback type	Reaction 1: Downramp actual speed; remain in position control state.	
FFD6	65494	SinCos® speed exceeds normal when writing encoder position	Reaction 2: Downramp / apply brake / de-energize..	
FFD7	65495	Feedback system not compatible with the controller hardware version (CTP) used	Reaction 1: Downramp actual speed; remain in position control state.	
FFD8	65496	Feedback system variant is not supported	Reaction 1: Downramp actual speed; remain in position control state.	
FFE0	65504	MC_Home is only permitted in the "Standstill" state (with energized drive)	Reaction 1: Downramp actual speed; remain in position control state.	
FFE1	65505	CamOut not possible during coupling	Reaction 2: Downramp / apply brake / de-energize..	

FFE2	65506	Call up of a function module with invalid parameters	Reaction 2: Downramp / apply brake / de-energize..	
FFE3	65507	Wrong coupling/decoupling mode for C3_CamIn/-Out	Reaction 2: Downramp / apply brake / de-energize..	
FFE4	65508	C3 powerPLmC and Compax3 software versions are incompatible	Reaction 1: Downramp actual speed; remain in position control state.	
FFE5	65509		Reaction 1: Downramp actual speed; remain in position control state.	
FFE6	65510		Reaction 1: Downramp actual speed; remain in position control state.	SinCos reports an error
FFE7	65511		Reaction 1: Downramp actual speed; remain in position control state.	Check feedback cable or feedback
FFEA	65514	FBK System Error 1	Reaction 2: Downramp / apply brake / de-energize..	
FFEB	65515	FBK System Error 2	Reaction 2: Downramp / apply brake / de-energize..	
FFEC	65516	FBK System Error 3	Reaction 2: Downramp / apply brake / de-energize..	
FFED	65517	FBK System Error 4	Reaction 2: Downramp / apply brake / de-energize..	
FFF0	65520	User error 0	Reaction 1: Downramp actual speed; remain in position control state.	
FFF1	65521	User Error 1	Reaction 1: Downramp actual speed; remain in position control state.	
FFF2	65522	User Error 2	Reaction 1: Downramp actual speed; remain in position control state.	
FFF3	65523	User Error 3	Reaction 1: Downramp actual speed; remain in position control state.	
FFF4	65524	User Error 4	Reaction 1: Downramp actual speed; remain in position control state.	
FFF5	65525	User Error 5	Reaction 1: Downramp actual speed; remain in position control state.	
FFF6	65526	User error 6	Reaction 1: Downramp actual speed; remain in position control state.	
FFF7	65527	User error 7	Reaction 1: Downramp actual speed; remain in position control state.	

FFF8	65528	User error 8	Reaction 1: Downramp actual speed; remain in position control state.	
FFF9	65529	User error 9	Reaction 1: Downramp actual speed; remain in position control state.	
FFFA	65530	User error 10	Reaction 1: Downramp actual speed; remain in position control state.	
FFFB	65531	User error 11	Reaction 1: Downramp actual speed; remain in position control state.	
FFFC	65532	User error 12	Reaction 1: Downramp actual speed; remain in position control state.	
FFFD	65533	User error 13	Reaction 1: Downramp actual speed; remain in position control state.	
FFFE	65534	User error 14	Reaction 1: Downramp actual speed; remain in position control state.	
FFFF	65535	User Error 15	Reaction 1: Downramp actual speed; remain in position control state.	

