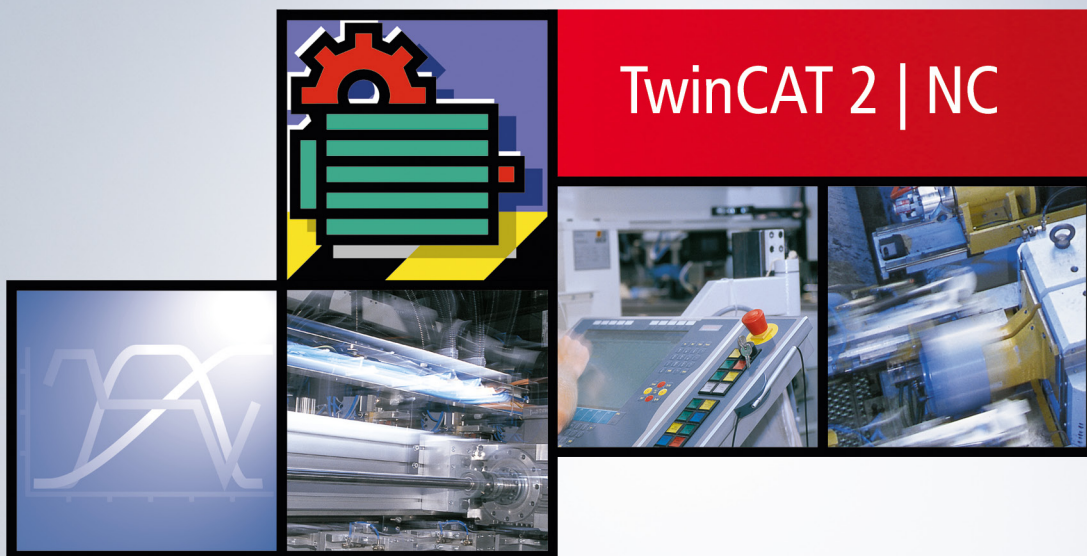


Manual | EN

# NC Errorcodes

TwinCAT 2 | Motion



TwinCAT 2 | NC



# Inhaltsverzeichnis

<b>1 Foreword</b> .....	<b>5</b>
1.1 Notes on the documentation .....	5
1.2 Safety instructions .....	6
1.3 Notes on information security.....	7
<b>2 Overview of NC Errors</b> .....	<b>8</b>
2.1 General NC Errors .....	8
2.2 Channel Errors .....	10
2.3 Group Errors .....	13
2.4 Axis Errors.....	31
2.5 Encoder Errors .....	38
2.6 Controller Errors.....	44
2.7 Drive Errors .....	48
2.8 Table Errors .....	54
2.9 NC-PLC Errors .....	56
2.10 Kinematic Transformation .....	61
2.11 Bode Return Codes.....	62
2.12 Further Error Codes .....	64



# 1 Foreword

## 1.1 Notes on the documentation

This description is only intended for the use of trained specialists in control and automation engineering who are familiar with applicable national standards.

It is essential that the documentation and the following notes and explanations are followed when installing and commissioning the components.

It is the duty of the technical personnel to use the documentation published at the respective time of each installation and commissioning.

The responsible staff must ensure that the application or use of the products described satisfy all the requirements for safety, including all the relevant laws, regulations, guidelines and standards.

### Disclaimer

The documentation has been prepared with care. The products described are, however, constantly under development.

We reserve the right to revise and change the documentation at any time and without prior announcement. No claims for the modification of products that have already been supplied may be made on the basis of the data, diagrams and descriptions in this documentation.

### Trademarks

Beckhoff®, TwinCAT®, TwinCAT/BSD®, TC/BSD®, EtherCAT®, EtherCAT G®, EtherCAT G10®, EtherCAT P®, Safety over EtherCAT®, TwinSAFE®, XFC®, XTS® and XPlanar® are registered trademarks of and licensed by Beckhoff Automation GmbH.

Other designations used in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owners.

### Patent Pending

The EtherCAT Technology is covered, including but not limited to the following patent applications and patents:

EP1590927, EP1789857, EP1456722, EP2137893, DE102015105702  
with corresponding applications or registrations in various other countries.



EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany

### Copyright

© Beckhoff Automation GmbH & Co. KG, Germany.

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited.

Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

## 1.2 Safety instructions

### Safety regulations

Please note the following safety instructions and explanations!  
Product-specific safety instructions can be found on following pages or in the areas mounting, wiring, commissioning etc.

### Exclusion of liability

All the components are supplied in particular hardware and software configurations appropriate for the application. Modifications to hardware or software configurations other than those described in the documentation are not permitted, and nullify the liability of Beckhoff Automation GmbH & Co. KG.

### Personnel qualification

This description is only intended for trained specialists in control, automation and drive engineering who are familiar with the applicable national standards.

### Description of symbols

In this documentation the following symbols are used with an accompanying safety instruction or note. The safety instructions must be read carefully and followed without fail!

#### **DANGER**

##### **Serious risk of injury!**

Failure to follow the safety instructions associated with this symbol directly endangers the life and health of persons.

#### **WARNING**

##### **Risk of injury!**

Failure to follow the safety instructions associated with this symbol endangers the life and health of persons.

#### **CAUTION**

##### **Personal injuries!**

Failure to follow the safety instructions associated with this symbol can lead to injuries to persons.

#### **NOTE**

##### **Damage to the environment or devices**

Failure to follow the instructions associated with this symbol can lead to damage to the environment or equipment.



##### **Tip or pointer**

This symbol indicates information that contributes to better understanding.

## 1.3 Notes on information security

The products of Beckhoff Automation GmbH & Co. KG (Beckhoff), insofar as they can be accessed online, are equipped with security functions that support the secure operation of plants, systems, machines and networks. Despite the security functions, the creation, implementation and constant updating of a holistic security concept for the operation are necessary to protect the respective plant, system, machine and networks against cyber threats. The products sold by Beckhoff are only part of the overall security concept. The customer is responsible for preventing unauthorized access by third parties to its equipment, systems, machines and networks. The latter should be connected to the corporate network or the Internet only if appropriate protective measures have been set up.

In addition, the recommendations from Beckhoff regarding appropriate protective measures should be observed. Further information regarding information security and industrial security can be found in our <https://www.beckhoff.com/secguide>.

Beckhoff products and solutions undergo continuous further development. This also applies to security functions. In light of this continuous further development, Beckhoff expressly recommends that the products are kept up to date at all times and that updates are installed for the products once they have been made available. Using outdated or unsupported product versions can increase the risk of cyber threats.

To stay informed about information security for Beckhoff products, subscribe to the RSS feed at <https://www.beckhoff.com/secinfo>.

## 2 Overview of NC Errors

Error code ( hex )	Description
<b>0x4000 - 0x4FFF: NC error code range</b>	
0x40nn	<a href="#">General errors [▶ 8]</a>
0x41nn	<a href="#">Channel Errors [▶ 10]</a>
0x42nn	<a href="#">Group Errors [▶ 13]</a>
0x43nn	<a href="#">Axis Errors [▶ 31]</a>
0x44nn	<a href="#">Encoder Errors [▶ 38]</a>
0x45nn	<a href="#">Controller Errors [▶ 44]</a>
0x46nn	<a href="#">Drive Errors [▶ 48]</a>
0x4Ann	<a href="#">Table Errors [▶ 54]</a>
0x4Bnn	<a href="#">NC PLC errors [▶ 56]</a>
0x4Cnn	<a href="#">Kinematic Transformation [▶ 61]</a>
<b>0x8000 ... 0x8FFF: New extended NC error code range</b>	
0x81nn - 0x811F	Bode plot (diagnosis)
0x8120 - 0x8FFF	<a href="#">further errors [▶ 64]</a>

### 2.1 General NC Errors

Error(Hex)	Error(Dec)	Error Type	Description
<b>4000</b>	<b>16384</b>	Internal	<b>"Internal error"</b> Internal system error in the NC on ring 0, no further details.
<b>4001</b>	<b>16385</b>	Memory	<b>"Memory error"</b> The ring-0 memory management is not providing the required memory. This is usually a result of another error, as a result of which the controller will halt normal operation (now if not before).
<b>4002</b>	<b>16386</b>	Internal	<b>"Nc retain data error (persistent data)"</b> Error while loading the Nc retain data. The axes concerned are no longer referenced (status flag "Homed" is set to FALSE). Possible reasons are: - Nc retain data not found - Nc retain data expired (old backup data) - Nc retain data corrupt or inconsistent
<b>4003</b>	<b>16387</b>	Parameter	<b>Parameter for Monitoring the NC Setpoint Issuing is Invalid</b> The parameter for activating or deactivating the function "cyclic monitoring of NC setpoint issuing on continuity and consistency" is invalid. (Special function.)
<b>4004</b>	<b>16388</b>	Internal	<b>External Error</b> This error code can be set by an external module (e.g. third-party module) or can be set when an external module exhibits an error.
<b>4010</b>	<b>16400</b>	Parameter	<b>"Channel identifier not allowed"</b> Either an unacceptable value (not 1...255) has been used, or a channel that does not exist in the system has been named.
<b>4011</b>	<b>16401</b>	Parameter	<b>"Group identifier not allowed"</b> Either an unacceptable value (not 1...255) has been used, or a group that does not exist in the system has been named.



Error(Hex)	Error(Dec)	Error Type	Description
4012	16402	Parameter	<b>"Axis identifier not allowed"</b> Either an unacceptable value (not 1...255) has been used, or an axis that does not exist in the system has been named.
4013	16403	Parameter	<b>"Encoder identifier not allowed"</b> Either an unacceptable value (not 1...255) has been used, or a encoder that does not exist in the system has been named.
4014	16404	Parameter	<b>"Controller identifier not allowed"</b> Either an unacceptable value (not 1...255) has been used, or a controller that does not exist in the system has been named.
4015	16405	Parameter	<b>"Drive identifier not allowed"</b> Either an unacceptable value (not 1...255) has been used, or a drive that does not exist in the system has been named.
4016	16406	Parameter	<b>"Table identifier not allowed"</b> Either an unacceptable value (not 1...255) has been used, or a table that does not exist in the system has been named.
4020	16416	Internal	<b>"No process image"</b> No PLC-axis interface during creation of an axis.
4021	16417	Internal	<b>"No process image"</b> No axis-PLC interface during creation of an axis.
4022	16418	Internal	<b>"No process image"</b> No encoder-I/O interface during creation of an axis.
4023	16419	Internal	<b>"No process image"</b> No I/O-encoder interface during creation of an axis.
4024	16420	Internal	<b>"No process image"</b> No drive-I/O interface during creation of an axis.
4025	16421	Internal	<b>"No process image"</b> No I/O-drive interface during creation of an axis.
4030	16432	Internal	<b>"Coupling type not allowed"</b> Unacceptable master/slave coupling type.
4031	16433	Internal	<b>"Axis type not allowed"</b> Unacceptable type specification during creation of an axis.
4032	16434	Parameter	<b>Unknown Channel Type</b> The NC channel type is unknown. Known types are e.g. an NCI channel, a FIFO channel, etc..
4040	16448	Internal	<b>"Axis is incompatible"</b> Axis is not suitable for the intended purpose. A high speed/low speed axis, for example, cannot function as a slave in an axis coupling.
4050	16464	Internal	<b>"Channel not ready for operation"</b> The channel is not complete, and is therefore not ready for operation. This is usually a consequence of problems at system start-up.
4051	16465	Internal	<b>"Group not ready for operation"</b> The group is not complete, and is therefore not ready for operation. This is usually a consequence of problems at system start-up.
4052	16466	Internal	<b>"Axis not ready for operation"</b> The axis is not complete, and is therefore not ready for operation. This is usually a consequence of problems at system start-up.
4060	16480	Internal	<b>"Channel exists"</b> The channel that is to be created already exists.
4061	16481	Internal	<b>"Group exists"</b> The group that is to be created already exists.

Error(Hex)	Error(Dec)	Error Type	Description
4062	16482	Internal	<b>"Axis exists"</b> The axis that is to be created already exists.
4063	16483	Internal	<b>"Table exists"</b> The table that is to be created already exists, resp. it is tried internally to use an already existing table id ( e.g. for the universal flying saw).
4070	16496	Internal	<b>"Axis index not allowed"</b> The location within the channel specified for an axis is not allowed.
4071	16497	Internal	<b>"Axis index not allowed"</b> The location within the group specified for an axis is not allowed.

## 2.2 Channel Errors

Error(Hex)	Error(Dec)	Error Type	Description
4101	16641	Parameter	<b>"Group index not allowed"</b> The location within the channel specified for a group is not allowed.
4102	16642	Address	<b>"Null pointer"</b> The pointer to the group is invalid. This is usually a consequence of an error at system start-up.
4103	16643	Internal	<b>"No process image"</b> It is not possible to exchange data with the PLC. Possible causes: n the channel does not have an interface (no interpreter present) n The connection to the PLC is faulty
4104	16644	Parameter	<b>"M-function index not allowed"</b> Unacceptable M-function (not 0...159) detected at the execution level.
4105	16645	Memory	<b>"No memory"</b> No more system memory is available. This is usually the result of another error.
4106	16646	Function	<b>"Not ready"</b> The function is not presently available, because a similar function is already being processed. This is usually the result of access conflicts: more than one instance wants to issue commands to the channel. This can, for example, be the consequence of an incorrect PLC program.
4107	16647	Function	<b>"Function/command not supported"</b> A requested function or command is not supported by the channel.
4108	16648	Parameter	<b>"Invalid parameter while starting"</b> Parameters to start the channel (TwinCAT-Start) are invalid. Typically there is an invalid memory size or channel type requested.
4109	16649	Function	<b>"Channel function/command not executable"</b> A channel function e.g. interpreter start is not executable because the channel is already busy, no program is loaded or in an error state.
410A	16650	Function	<b>"ItpGoAhead not executable"</b> The requested command is not executable, because the interpreter is not executing a decoder stop.
4110	16656	Parameter	<b>"Error opening a file"</b> The specified file does not exist. Sample: NC program unknown.
4111	16657	NC Programming	<b>"Syntax error during loading"</b> The NC has found a syntax error when loading an NC program.
4112	16658	NC Programming	<b>"Syntax error during interpretation"</b> The NC has found a syntax error when executing an NC program.

Error(Hex)	Error(Dec)	Error Type	Description
4113	16659	NC Programming	<b>"Missing subroutine"</b> The NC has found a missing subroutine while loading.
4114	16660	Memory	<b>"Loading buffer of interpreter is too small"</b> The capacity of the interpreter loading buffer has been exceeded.
4115	16661	Internal	<b>"Symbolic"</b> - reserved
4116	16662	Internal	<b>"Symbolic"</b> - reserved
4117	16663	NC Programming	<b>"Subroutine incomplete"</b> Header of subroutine is missing
4118	16664	NC Programming	<b>"Error while loading the NC program"</b> The maximum number of loadable NC programs has been reached. Possible cause: Too many sub-programs were loaded from a main program.
4119	16665	NC Programming	<b>"Error while loading the NC program"</b> The program name is too long.
4120	16672	NC Programming	<b>"Divide by zero"</b> The NC encountered a computation error during execution: division by 0.
4121	16673	NC Programming	<b>"Invalid circle parameterization"</b> The NC encountered a computation error during execution: The specified circle cannot be calculated.
4122	16674	NC Programming	<b>"Invalid FPU-Operation"</b> The NC encountered an invalid FPU-Operation during execution. This error occurs e.g. by calculating the square root of a negative number.
4130	16688	NC Programming	<b>"Stack overflow: subroutines"</b> The NC encountered a stack overflow during execution: too many subroutine levels.
4131	16689	NC Programming	<b>"Stack underflow: subroutines"</b> The NC encountered a stack underflow during execution: too many subroutine return commands. Note: A main program must not end with a return command.
4132	16690	NC Programming	<b>"Stack overflow: arithmetic unit"</b> The NC encountered a stack overflow during execution: The calculation is too complex, or has not been correctly written.
4133	16691	NC Programming	<b>"Stack underflow: arithmetic unit"</b> The NC encountered a stack underflow during execution: The calculation is too complex, or has not been correctly written.
4140	16704	Parameter	<b>"Register index not allowed"</b> The NC encountered an unacceptable register index during execution: Either the program contains an unacceptable value (not R0...R999) or a pointer register contains an unacceptable value.
4141	16705	NC Programming	<b>"Unacceptable G-function index"</b> The NC has encountered an unacceptable G-function (not 0...159) during execution.
4142	16706	NC Programming	<b>"Unacceptable M-function index"</b> The NC has encountered an unacceptable M-function (not 0...159) during execution.
4143	16707	NC Programming	<b>"Unacceptable extended address"</b> The NC has encountered an unacceptable extended address (not 1...9) during execution.

Error(Hex)	Error(Dec)	Error Type	Description
4144	16708	NC Programming	<b>"Unacceptable index to the internal H-function"</b> The NC has encountered an unacceptable internal H-function in the course of processing. This is usually a consequence of an error during loading.
4145	16709	Parameter	<b>"Machine data value unacceptable"</b> While processing instructions the NC has detected an impermissible value for the machine data (MDB) (not 0...7).
4150	16720	Parameter	<b>"Cannot change tool params here"</b> The NC has encountered an unacceptable change of parameters for the tool compensation during execution. This error occurred for instance by changing the tool radius and programming a circle in the same block.
4151	16721	Parameter	<b>"Cannot calculate tool compensation"</b> The NC has encountered an error by the calculation of the tool compensation.
4152	16722	NC Programming	<b>Tool compensation:</b> The plane for the tool compensation cannot be changed here. This error occurred for instance by changing the tool plane when the compensation is turned on or active.
4153	16723	NC Programming	<b>Tool compensation:</b> The D-Word is missing or invalid by turning on the tool compensation.
4154	16724	NC Programming	<b>Tool compensation:</b> The specified tool radius is invalid because the value is less or equal zero.
4155	16725	NC Programming	<b>Tool compensation:</b> The tool radius cannot be changed here
4156	16726	Internal	<b>Tool compensation:</b> Collision Detection Table is full.
4157	16727	Internal	<b>Tool compensation:</b> Internal error while turning on the contour collision detection.
4158	16728	Internal	<b>Tool compensation:</b> Internal error within the contour collision detection: update reversed geo failed.
4159	16729	NC Programming	<b>Tool compensation:</b> Unexpected combination of geometry types by active contour collision detection.
415A	16730	NC Programming	<b>Tool compensation:</b> Programmed inner circle is smaller than the cutter radius
415B	16731	NC Programming	<b>Tool compensation:</b> Bottle neck detection recognized contour violation
415C	16732	Memory	Table for corrected entries is full
415D	16733	Memory	Input table for tangential following is full
415E	16734	Memory	Executing table for tangential following is full
415F	16735	Internal	Geometric entry for tangential following cannot be calculated
4160	16736	Internal	reserved
4161	16737	Internal	reserved
4162	16738	Parameter	The actual active interpolation rules (g-code), zero-shifts, or rotation cannot be detected
4170	16752	NC Programming	<b>"Error while loading: Invalid parameter"</b> The NC has found an invalid parameter while loading an NC program.

Error(Hex)	Error(Dec)	Error Type	Description
4171	16753	Internal	<b>"Invalid contour start position"</b> The NC encountered a computation error during execution: The specified contour cannot be calculated because the initial position is not on the contour.
4172	16754	Internal	<b>"Retrace: Invalid internal entry index"</b> The NC encountered an invalid internal entry index during execution of the retrace function.
4173	16755	NC Programming	<b>Invalid G Code</b> Invalid default G Code. False expression/syntax in default G Code.
4174	16756	NC Programming	<b>Error while Opening the G Code File</b> Error while opening the default G code file.

## 2.3 Group Errors

Error(Hex)	Error(Dec)	Error Type	Description
4200	16896	Parameter	<p><b>"Group ID not allowed"</b> The value for the group ID is not allowed, e.g. because it has already been assigned, is less than or equal to zero, or is greater than 255.</p> <p>Value range: [1 ... 255]      Unit: 1</p>
4201	16897	Parameter	<p><b>"Group type not allowed"</b> The value for the group type is unacceptable because it is not defined.</p> <p>Type 1: PTP group with slaves (servo) Type 4: DXD group with slaves (3D group) Type 5: High/low speed group Type 6: Stepper motor group Type 9: Encoder group with slaves (servo) ...</p> <p>Value range: [1 ... 12]      Unit: 1</p>
4202	16898	Initialization	<p><b>"Master axis index not allowed"</b> The value for the master axis index in an interpolating 3D group is not allowed, because, for instance, it has gone outside the value range. Index 0: X axis (first master axis) Index 1: Y axis (second master axis) Index 2 : Z axis (third master axis)</p> <p>Value range: [0, 1, 2]      Unit: 1</p>
4203	16899	Initialization	<p><b>"Slave axis index not allowed" (INTERNAL ERROR)</b> The value for the slave axis index in a group is not allowed, because, for instance, it has passed outside the value range, the slave location to be used when inserting a new slave connection is already occupied, or because no slave is present when such a connection is being removed. Index 0: First slave axis Index 1: Second slave axis Index 2: etc.</p> <p>Value range: [0 ... 7]      Unit: 1</p>
4204	16900	Initialization	<p><b>Internal Error</b> A nonexpected internal error has occurred. The following situations may have caused this effect: There is not enough TC router memory or Windows memory to establish the internal NC objects, internal NC structures and links (pointers between NC objects) are erroneous or are missing, a fatal internal error in calculating a stop command or a halt command has occurred,</p>

Error(Hex)	Error(Dec)	Error Type	Description
			internal checking of NC own logic and algorithms (self-checking software), nonexpected modes and cases that are not intended regularly, but are recognized being erroneous. Note: Quite often in such an error situation an additional error message in the Windows event logger is thrown that can be helpful for a more detailed analysis by Beckhoff or by the user.
4205	16901	Parameter	<b>"Invalid cycle time for statement execution task (SAF)"</b> The value of the cycle time for the NC block execution task (SAF 1/2) is not allowed, because it has passed outside the value range. Value range: [0.001 ... 0.1]   Unit: s
4206	16902	Initialization	"GROUPERR_RANGE_MAXELEMENTSINAXIS "
4207	16903	Parameter	<b>"Invalid cycle time for the statement preparation task (SVB)"</b> The value of the cycle time for the NC statement preparation task (SVB 1/2) is not allowed, because it has passed outside the value range. Value range: [0.001 ... 1.0]   Unit: s
4208	16904	Parameter	<b>"Single step mode not allowed"</b> The flag for the activation or deactivation of single step mode is not allowed. Value 0: Passive (buffered operation) Value 1: Active (single-block operation) Value range: [0, 1]   Unit: 1
4209	16905	Parameter	<b>"Group deactivation not allowed" (INTERNAL ERROR)</b> The flag for the deactivation or activation of the complete group is not allowed. Value 0: Group active Value 1: Group passive Value range: [0, 1]   Unit: 1
420A	16906	Initialization	<b>"Statement execution state (SAF state) not allowed" (INTERNAL ERROR)</b> The value for the state of the block execution state machine (SAF state) is not allowed. This error occurs on passing outside the range of values, or if the state machine enters an error state. Value range: [0 ... 5]   Unit: 1
420B	16907	Address	<b>"Channel address"</b> The group does not have a channel, or the channel address has not been initialized.
420C	16908	Address	<b>"Axis address (master axis)"</b> The group does not have a master axis (or axes) or the axis address(es) has (have) not been initialized.
420D	16909	Address	<b>"Master axis address"</b> A new master/slave coupling is to be inserted into the group, but there is no valid address for the leading master axis.
420E	16910	Address	<b>"Slave axis address"</b> A master/slave coupling is to be inserted into the group, but there is no valid address for the slave axis.
420F	16911	Address	<b>"Slave set value generator address"</b> A master/slave coupling is to be inserted into the group, but there is no valid address for the slave set value generator.
4210	16912	Address	<b>"Encoder address"</b> An axis in the group does not have an encoder, or the encoder address has not been initialized.
4211	16913	Address	<b>"Controller address"</b> An axis in the group does not have a controller, or the controller address has not been initialized.
4212	16914	Address	<b>"Drive address"</b> An axis in the group does not have a drive, or the drive address has not been initialized.

Error(Hex)	Error(Dec)	Error Type	Description
4213	16915	Address	<b>Address Master Setpoint Generator</b> A group (e.g. FIFO group) does not own a master setpoint generator or a setpoint generator address has not been initialized. Possibly, there may not be enough memory available.
4214	16916	Address	<b>"Axis interface NC to PLC address"</b> Group/axis does not have an axis interface from the NC to the PLC, or the axis interface address has not been initialized.
4215	16917	Address	<b>"Slave axis address"</b> An existing master/slave coupling is to be removed from the group, but there is no valid address for the slave axis.
4216	16918	Address	<b>"Table address unknown"</b> The table, respectively the table ID, is unknown. This table is used for the master/slave coupling or for the characteristic curve.
4217	16919	Address	<b>"NcControl address"</b> The NcControl address has not been initialized.
4218	16920	Initialization	<b>"Axis is blocked for commands while persistent NC data are queued"</b> Axis is blocked for commands while waiting for valid IO data to accept the queued persistent NC data.
4219	16921	Function	<b>"The scaling mode MASTER-AUTOOFFSET is invalid because no reference table was found"</b> . The used scaling mode MASTER-AUTOOFFSET is invalid in this context because an existing reference table is missing. This error can occur for example when adding cam tables without a unique reference to an existing cam table.
421A	16922	Parameter	<b>"The master axis start position does not permit synchronization"</b> When a slave axis is being coupled on, the position of the master axis does not permit synchronization at the given synchronization positions.
421B	16923	Parameter	<b>"Slave coupling factor (gearing factor) of 0.0 is not allowed"</b> A master/slave coupling with a gearing factor of 0.0 is being created. This value is not allowed, since it does not correspond to any possible coupling, and division will generate an FPU exception.
421C	16924	Function	<b>"Insertion of master axis into group not allowed"</b> A master axis is to be inserted into a group at a location that is already occupied by another master axis. Maybe the reconfiguration cannot be done, because this axis has got an existing slave coupling. This master/slave coupling must be revoked before.
421D	16925	Function	<b>"Deletion of master axis from group not allowed" (INTERNAL ERROR)</b> A master axis is to be removed from a location in a group that is not in fact occupied by master axis.
421E	16926	Function	<b>"Function/feature is not supported from the setpoint generator"</b> A function or feature is not supported from the setpoint generator (e.g. PTP master setpoint generator). This can be in general or only in a special situation.
421F	16927	Initialization	<b>"Group initialization"</b> Group has not been initialized. Although the group has been created, the rest of the initialization has not been performed (1. Initialization of group I/O, 2. Initialization of group, 3. Reset group).
4220	16928	Monitoring	<b>"Group not ready / group not ready for new task"</b> The group is being given a new task while it is still in the process of executing an existing task. This request is not allowed because it would interrupt the execution of the previous

Error(Hex)	Error(Dec)	Error Type	Description
			task. The new task could, for instance, be a positioning command, or the "set actual position" function. Precisely the converse relationships apply for the "set new end position" function. In that case, the group/axis must still be actively moving in order to be able to cause a change in the end position.
4221	16929	Monitoring	<b>"Requested set velocity is not allowed"</b> The value requested for the set velocity of a positioning task is less than or equal to zero, larger than the "maximum velocity" (see axis parameters), or, in the case of servo-drives, is larger than the "reference velocity" of the axis (see drive parameters).
4222	16930	Monitoring	<b>"Requested target position is not allowed (master axis)"</b> The requested value for the target position of a positioning task is not within the software end locations. In other words, it is either less than the minimum software end location or larger than the maximum software end location. This check is only carried out if the relevant end position monitoring is active.
4223	16931	Monitoring	<b>"No enable for controller and/or feed (Master axis)"</b> The axis enables for the master axis needed for positioning are not present. This can involve the controller enable and/or the relevant, direction-dependent feed enable (see axis interface PlcToNc).
4224	16932	Monitoring	<b>"Movement smaller than one encoder increment (INTERNAL ERROR)"</b> The distance that a group/axis is supposed to move is smaller than the physical significance of one encoder increment. In other words the movement is smaller than the scaling factor of the axis. The reaction to this is that the axis is reported as having logically finished without having actively moved. This means that an external error is not generated for the user. This error is also issued for high/low speed axes if a loop movement with nonzero parameters is smaller than the sum of the creeping and braking distances. In such a case it is not meaningful to either exceed or to fail to reach the target position.
4225	16933	Monitoring	<b>"Drive not ready during axis start"</b> During an axis start it is ascertained that the drive is not ready. The following are possible causes: - the drive is in the error state (hardware error) - the drive is in the start-up phase (e.g. after an axis reset that was preceded by a hardware error) - the drive is missing the controller enable (ENABLE) Note: The time required for "booting" a drive after a hardware fault can amount to several seconds.
4226	16934	Monitoring	<b>"Invalid parameters of the emergency stop."</b> Either, both, the deceleration and the jerk are less than zero or one of the parameters is weaker than the corresponding parameter of the start data.
4227	16935	Function	<b>"The setpoint generator is inactive such that no instructions are accepted."</b>
4228	16936	Monitoring	<b>"Requested traverse distance is not allowed"</b> The requested traverse distance or looping distance is smaller than the braking distance of the two/speed axis.
4229	16937	Monitoring	<b>"Requested target position is not allowed (slave axis)"</b> The value for the target position of a positioning task when calculated for the slave axis is not within the software end locations. In other words, it is either less than the minimum



Error(Hex)	Error(Dec)	Error Type	Description
			software end location or larger than the maximum software end location. This check is only carried out if the relevant end position monitoring is active.
422A	16938	Monitoring	<b>"No enable for controller and/or feed (slave axis)"</b> The axis enables for one or more coupled slave axes needed for positioning are not present. This can involve the controller enable and/or the relevant, direction-dependent feed enable (see axis interface PlcToNc).
422B	16939	Parameter	<b>"The activation position (position threshold) is out of range of the actual positioning"</b> The activation position (position threshold) of a new axis command (e.g. "new velocity activated at a position") is out of range. E.g. the activation position is before the actual position or behind the target position.
422C	16940	Parameter	<b>"The start or activation data of the external setpoint generation are not valid"</b> This may be caused through: 1. The external setpoint generation is active and a new activation with a start type (1: absolute, 2: relative) unequal to the current one is send. 2. The internal setpoint generation is active (e.g. PTP) and the external one is activated with the type absolute (two setpoint generators of the type absolute are not possible).
422D	16941	Parameter	<b>"Velocity is not constant"</b> For changing the dynamic parameter 'acceleration' und 'deceleration' the axis has to be in dynamic state without acceleration and deceleration (that means constant velocity).
422E	16942	Parameter	<b>"Jerk less than or equal to 0.0 is not allowed"</b> A value less than or equal to 0.0 for the jerk (PTP and CNC) is not allowed, since the jerk is by definition positive, and with a jerk of 0.0, division will generate an FPU exception.
422F	16943	Parameter	<b>"Acceleration less than or equal to 0.0 is not allowed"</b> A value less than or equal to 0.0 for the acceleration (PTP and CNC) is not allowed, since the acceleration is positive by definition, and an acceleration of 0.0 will not allow a motion to be generated.
4230	16944	Parameter	<b>"Absolute deceleration value less than or equal to 0.0 is not allowed"</b> A value less than or equal to 0.0 for the absolute value of the deceleration (PTP and CNC) is not allowed, since the absolute value of the deceleration is positive by definition, and an absolute value of the deceleration of 0.0 will not allow a motion to be generated.
4231	16945	Parameter	<b>"Set velocity less than or equal to 0.0 is not allowed"</b> A value less than or equal to 0.0 or outside the range from $10^{-3}$ up to $10^{+10}$ for the set velocity (PTP and CNC) is not allowed, since the set velocity is by definition strictly positive, and with a set velocity of 0.0, division will generate an FPU exception.
4232	16946	Monitoring	<b>"Loss of precision when trying a positioning"</b> The positioning is so long in space or time that decimal parts loose there relevance LOSS_OF_PRECISION).
4233	16947	Parameter	<b>"Cycle time less than or equal to 0.0 is not allowed"</b> A value less than or equal to 0.0 for the cycle time (PTP and CNC) is not allowed, since the cycle time is by definition strictly positive, and with a cycle time of 0.0, division will generate an FPU exception.

Error(Hex)	Error(Dec)	Error Type	Description
4234	16948	Internal	<b>"PTP data type &lt;intasdouble&gt; range exceeded"</b> Such extreme parameters have been supplied for the start task, the override or the new target position that the internal data type loses its precision.
4235	16949	Function	<b>"PTP LHL velocity profile cannot be generated" (INTERNAL ERROR)</b> Such extreme parameters have been supplied for the start task, the override or the new target position that it is not possible to generate a velocity profile of the type LHL (Low-High-Low).
4236	16950	Function	<b>"PTP HML velocity profile cannot be generated" (INTERNAL ERROR)</b> Such extreme parameters have been supplied for the override or the new target position that it is not possible to generate a velocity profile of the type HML (High-Middle-Low).
4237	16951	Address	<b>"Start data address is invalid"</b> The address of the start data is invalid.
4238	16952	Parameter	<b>"Velocity override (start override) is not allowed"</b> The value for the velocity override is not allowed, because it is less than 0.0% or more than 100.0% (see axis interface PlcToNc). Here, 100.0 % corresponds to the integral value 1000000 in the axis interface. Value range: [0 ... 1000000]
4239	16953	Parameter	<b>"Start type not allowed"</b> The start type supplied does not exist.
423A	16954	Monitoring	<b>"Velocity overflow (overshoot in the velocity)"</b> The new dynamic with the parameterized jerk is so weak that a velocity overflow will occur (overshoot in the velocity). The command is therefore not supported.
423B	16955	Parameter	<b>"Start parameter for the axis structure is invalid"</b> External or internal parameters for the start structure for a positioning task are invalid. Thus, for instance, the scaling factor, the SAF cycle time or the requested velocity may be less than or equal to zero, which is not allowed.
423C	16956	Parameter	<b>"Override generator initialization parameter invalid"</b> One of the override generator (re)initialization parameters is invalid.
423D	16957	Monitoring	<b>"Slave axis has not set value generator" (INTERNAL ERROR)</b> It is found that a slave axis within a group does not have a valid slave generator (set value generator). A slave axis and a slave set value generator must always be present as a pair. This is an internal error.
423E	16958	Function	<b>"Table is empty"</b> Either the SVB table or the SAF table does not contain any entries.
423F	16959	Function	<b>"Table is full"</b> The SVB table or the SAF table has no more free lines.
4240	16960	Memory	<b>"No memory available"</b> SVB memory allocation for dynamic entry in SAF table failed.
4241	16961	Function	<b>"Table already contains an entry" (INTERNAL ERROR)</b> SAF table entry abandoned, because, incorrectly, an entry already exists.
4242	16962	Function	<b>"Stop is already active"</b> The stop instruction is not forwarded, because it has already been activated.
4243	16963	Function	<b>"Compensation has not been carried out over the full compensation section"</b> The compensations start parameters do not permit compensation over the full section to be compensated. For this reason the compensation will be carried out over a smaller section.

Error(Hex)	Error(Dec)	Error Type	Description
4244	16964	Parameter	<b>"Internal parameters for the compensation are invalid" (INTERNAL ERROR)</b> Invalid internal parameters or start parameters of the lower-level generator.
4245	16965	Function	<b>"Compensation active"</b> Start of compensation refused, because compensation is already active. It's also possible that the M/S axes are not active moved. Therefore an execution of the compensation is impossible.
4246	16966	Function	<b>"Compensation not active"</b> Stop of compensation refused, because compensation is not active.
4247	16967	Function	<b>"Compensation type invalid"</b> The type supplied for the section compensation is invalid. At the present time only compensation type 1 (trapezoidal velocity profile) is allowed.
4248	16968	Function	<b>"Axis address for compensation invalid" (INTERNAL ERROR)</b> The address of the master of slave axis on which the section compensation is to act is invalid. This is an internal error.
4249	16969	Address	<b>"Invalid slave address" (INTERNAL ERROR)</b> The slave address given for on-line coupling/decoupling is invalid.
424A	16970	Function	<b>"Coupling velocity invalid"</b> The velocity of what is to become the master axis is 0, which means that on-line coupling is not possible.
424B	16971	Function	<b>"Coupling velocities not constant"</b> The velocity of what is to become the master axis and the velocity of what is to become the slave axis are not constant, so that on-line coupling is not possible.
424C	16972	Parameter	<b>"Cycle time less than or equal to 0.0 is not allowed"</b> A value less than or equal to 0.0 for the cycle time (Slave) is not allowed, since the cycle time is by definition strictly positive, and with a cycle time of 0.0, division will generate an FPU exception.
424D	16973	Function	<b>"Decoupling task not allowed"</b> The slave axis is of such a type (e.g. a table slave) or is in such a state (master velocity 0) that on-line decoupling is not possible.
424E	16974	Function	<b>"Function not allowed"</b> The function cannot logically be executed, e.g. some commands are not possible and not allowed for slave axes.
424F	16975	Parameter	<b>"No valid table weighting has been set"</b> The weighting factor of each table is 0, so that no table can be read.
4250	16976	Function	<b>"Axis type, actual position type or end position type is not allowed"</b> The start type for a positioning task is invalid. Valid start types are ABSOLUTE (1), RELATIVE (2), CONTINUOUS POSITIVE (3), CONTINUOUS NEGATIVE (4), MODULO (5), etc. It is also possible that the types for setting a new actual position or for travel to a new end position are invalid.
4251	16977	Function	<b>"Function not presently supported"</b> An NC function has been activated that is currently not released for use, or which is not even implemented. This can be a command which is not possible or not allowed for master axes.
4252	16978	Monitoring	<b>"State of state machine invalid" (INTERNAL ERROR)</b> The state of an internal state machine is invalid. This is an internal error.
4253	16979	Monitoring	<b>"Reference cam became free too soon"</b> During the referencing process for an axis it is moved in the direction of the referencing cam, and is only stopped again when the cam signal is reached. After the axis has then also

Error(Hex)	Error(Dec)	Error Type	Description
			physically stopped, the referencing cam must remain occupied until the axis subsequently starts back down from the cam in the normal way.
4254	16980	Monitoring	<b>"Clearance monitoring between activation of the hardware latch and appearance of the sync pulse"</b> When the clearance monitoring is active, a check is kept on whether the number of increments between activation of the hardware latch and occurrence of the sync pulse (zero pulse) has become smaller than a pre-set value. This error is generated when that happens. (See parameters for the incremental encoder)
4255	16981	Memory	<b>"No memory available"</b> The dynamic memory allocation for the set value generator, the SVB table or the SAF table has failed.
4256	16982	Monitoring	<b>"The table slave axis has no active table"</b> Although the table slave axis has tables, none of the tables is designated as active. If this occurs during the run time the whole master/slave group is stopped by a run time error.
4257	16983	Function	<b>"Function not allowed"</b> The requested function or the requested task is not logically allowed. An example for such an error message would be "set an actual position" for an absolute encoder (M3000, KL5001, etc.).
4258	16984	Function	<b>"Stopping compensation not allowed"</b> It is not possible to stop the compensation, since compensation is already in the stopping phase.
4259	16985	Function	<b>"Slave table is being used"</b> The slave table cannot be activated, because it is currently being used.
425A	16986	Function	<b>"Master or slave axis is processing a job (e.g. positioning command) while coupling is requested"</b> A master/slave coupling of a certain slave type (e.g. linear coupling) cannot be executed. The master or intended slave axis is not in stand still state and is executing a job (e.g. positioning) at the same time as the coupling request received. For this couple type this is not allowed.
425B	16987	Parameter	<b>"Slave (start) parameter is incorrect"</b> One of the slave start/coupling parameters is not allowed (Coupling factor is zero, the master position scaling of an cam is zero, etc.).
425C	16988	Parameter	<b>"Slave type is incorrect"</b> The slave type does not match up to the (SVB) start type.
425D	16989	Function	<b>"Axis stop is already active"</b> The axis stop/Estop is not initiated, because the stop/estop is already active.
425E	16990	Function	<b>"Maximum number of tables per slavegenerator reached"</b> The maximum number of tables per slave generator is reached (e.g. "MC_MultiCamIn" is limited to 4 tables).
425F	16991	Function	<b>"The scaling mode is invalid"</b> . The used scaling is invalid in this context. Either the mode is not defined or yet not implemented or however it cannot in this constellation be put into action. For example MASTER-AUTOOFFSET cannot be used when a cam table is coupled in relative mode because this is a contradiction. Further MASTER-AUTOOFFSET cannot be used when a cam table is coupled for the first time because a relationship to an existing reference table is missing.
4260	16992	Monitoring	<b>"Controller enable"</b> Controller enable for the axis or for a coupled slave axis is not present (see axis interface PlcToNc). This error occurs if the controller enable is

Error(Hex)	Error(Dec)	Error Type	Description
			withdrawn while an axis or a group of axes (also a master/slave group) is being actively positioned. The error also occurs if a PTP axis or a coupled slave axis is started without controller enable.
4261	16993	Function	<b>"Table not found"</b> No table exists with the ID prescribed or the table ID is not unique.
4262	16994	Function	<b>"Incorrect table type"</b> The table referred to in the function is of the incorrect type.
4263	16995	Function	<b>"Single step mode"</b> This error occurs if single step mode is selected for a group or axis and a new task is requested while one of the individual tasks is still being processed.
4264	16996	Function	<b>"Group task unknown (asynchronous table entry)"</b> The group has received a task whose type or sub-type is unknown. Valid tasks can be single or multi-dimensional positioning tasks (Geo 1D, Geo 3D), referencing tasks, etc.
4265	16997	Function	<b>"Group function unknown (synchronous function)"</b> The group has received a function whose type is unknown. Valid functions are "Reset", "Stop", "New end position", "Start/stop section compensation", "Set actual position", "Set/reset referencing status" etc.
4266	16998	Function	<b>"Group task for slave not allowed"</b> Group tasks are usually only possible for master axes, not for slave axes. A slave axis only moves as an indirect result of a positioning task given to its associated master axis. A slave can thus never directly be given a task. Exception: see axis parameter "Allow motion commands to slave axis".
4267	16999	Function	<b>"Group function for slave not allowed"</b> Group functions are in principle only possible for master axes, not for slave axes. The only exception is represented by the "Start/stop section compensation" function, which is possible both for masters and for slaves. A slave cannot directly execute any other functions beyond this.
4268	17000	Function	<b>NCI Setpoint Generator is Inactive</b> An NCI command like e.g. "StopAndKeep" is sent to a logically inactive DXD group or to a group with the state channel override zero. Though, it is expected that for performing this command the NCI group resides actively in setpoint generation. This error can occur related to the functions "delete distance to go" and "measurement event (latch actual position)".
4269	17001	Parameter	<b>"Startposition=Setpoint Position"</b> Invalid position parameters.
426A	17002	Parameter	<b>"Parameters of the delay-generator are invalid"</b> Invalid external/internal parameters of the delay generator (delay time, cycle time, tics).
426B	17003	Parameter	<b>"External parameters of the superimposed instruction are invalid"</b> Invalid external parameters of the superimposed functionality (acceleration, deceleration, velocity, process velocity, length).
426C	17004	Parameter	<b>"Invalid override type."</b>
426D	17005	Function	<b>"Activation position under/overrun"</b> The requested activation position is located in the past of the master (e.g. when exchanging a cam table).

Error(Hex)	Error(Dec)	Error Type	Description
426E	17006	Function	<b>"Activation impossible: Master is standing"</b> The required activation of the correction is impossible since the master axis is not moving. A synchronization is not possible, because the master axis standing and the slave axis is still not synchronous.
426F	17007	Function	<b>"Activation mode not possible"</b> The requested activation mode is not possible when the slave axis is moving. Otherwise the slave velocity would jump to zero.
4270	17008	Parameter	<b>"Start parameter for the compensation is invalid"</b> One of the dynamic parameters for the compensation is invalid (necessary condition): Acceleration (>0) Deceleration (>0) Process velocity (>0)
4271	17009	Parameter	<b>"Start parameter for the compensation is invalid"</b> Velocity camber is negative.
4272	17010	Parameter	<b>"Start parameter for the compensation is invalid"</b> The section on which the compensation is to occur is not positive.
4273	17011	Monitoring	<b>"Target position under/overrun" (INTERNAL ERROR)</b> The position (calculated from the modulo-target-position) where the axis should stand at end of oriented stop has been run over.
4274	17012	Monitoring	<b>"Target position will be under/overrun" (INTERNAL ERROR)</b> The position (calculated from the modulo-target-position) where the axis should stand at end of oriented stop is too near and will be run over.
4275	17013	Parameter	<b>Group Parameter is Invalid</b> A group parameter is invalid. In this connection it may be e.g. a parameterized velocity, acceleration, deceleration, jerk or NC cycle time whose value has been parameterized smaller than or equal to zero.
4276	17014	Monitoring	<b>Joint Error at Start of Setpoint Generation</b> At start of setpoint generation for e.g. a flying saw different parameters or states may lead to this error. E.g. dynamic parameters as acceleration, deceleration and jerk may be invalid (smaller than or equal to zero) or the NC cycle time or the override value may reside apart from the interval 0% to 100%.
4277	17015	Monitoring	<b>"Dynamic parameters not permitted" (INTERNAL ERROR)</b> The dynamic parameters resulting from internal calculation like acceleration, deceleration and jerk are not permitted.
4279	17017	Monitoring	<b>The New Target Position is Invalid or Cannot be Reached</b> A new commanded target position is invalid because it has already been gone through or will be gone through while stopping with the currently active dynamic.
427A	17018	Monitoring	<b>New Velocity for Moving or the Final Target Velocity is Invalid</b> For a newly commanded command the demanded moving velocity or the demanded final velocity (target velocity in the target position) is invalid. The moving velocity has to be greater than zero value and the final target velocity has always to be greater than or equal to zero (default case is zero value).
427B	17019	Monitoring	<b>The Final Velocity or the New Target Position is Invalid</b>

Error(Hex)	Error(Dec)	Error Type	Description
			For a newly commanded command the demanded final velocity (target velocity in the target position) or the demanded target position is invalid. The final velocity has to be greater than or equal to zero (default case is zero value).
427C	17020	Monitoring	<b>The New Moving Velocity is Invalid</b> The newly commanded moving velocity is invalid because it is smaller than or equal to zero or other reasons do not facilitate this velocity.
427D	17021	Monitoring	<b>Internal Starting Mode is Invalid</b> For a newly commanded command this starting mode is invalid or is not permitted within this situation of movement. The user cannot influence the starting mode directly.
427E	17022	Monitoring	<b>"A requested motion command could not be realized (BISECTION)"</b> A requested motion command could not be realized using the requested parameters. The command has been executed best possible and this message is therefore to be understood just as a warning. Samples: An axis motion command is requested while the axis is in a unfavorable dynamic situation (acceleration phase), in which the covered distance is too short or the velocity is clearly too high. Another possibility is a slave axis, which is decoupled in motion in an unfavorable dynamic situation and is afterwards given a motion as in the previous case.
427F	17023	Monitoring	<b>"The new target position either has been overrun or will be overrun"</b> The new target position either has been overrun or will be overrun, since until there it is impossible to stop. An internal stop command is commended.
4280	17024	Monitoring	<b>"Group not ready / group not ready for new task" (INTERNAL ERROR / INFORMATION)</b> The group is being given a new task while it is still in the process of executing an existing task. This request is not allowed because it would interrupt the execution of the previous task. The new task could, for instance, be a positioning command, or the "set actual position" function. Precisely the converse relationships apply for the "set new end position" function. In that case, the group/axis must still be actively moving in order to be able to cause a change in the end position.
4281	17025	Parameter	<b>"The parameters of the oriented stop (O-Stop) are not admitted."</b> The modulo-target position should not be smaller than zero and not larger or equal than the encoder mod-period ( e.g. in the interval [0.0,360.0] ). <b>Note:</b> In the case of error the axis is safely stopped, but is afterwards not at the requested oriented position.
4282	17026	Monitoring	<b>"The modulo target position of the modulo-start is invalid"</b> The modulo target position is outside of the valid parameter range. So the position value should not be smaller than zero and not greater or equal than the encoder modulo-period (e. g. in the interval [0.0,360.0] for the modulo start type "SHORTEST_WAY (261)" ).
4283	17027	Parameter	<b>"The online change activation mode is invalid".</b> The activation can be used with online scaling or with online modification of motion function. The used activation is invalid in this context. Either the mode is not defined or yet not implemented or however it cannot in this constellation be put into action (e.g. when linear tables are used with an unexpected cyclic activation mode NEXTCYCLE or NEXTCYCLEONCE).

Error(Hex)	Error(Dec)	Error Type	Description
			In some case, the activation mode may be valid but the command cannot be executed due to a pending previous command.
4284	17028	Parameter	<b>"The parameterized jerk rate is not permitted"</b> . The jerk rate is smaller than the minimum jerk rate. The minimum value for jerk rate is 1.0 (e.g. mm/s <sup>3</sup> ).
4285	17029	Parameter	<b>"The parameterized acceleration or deceleration is not permitted"</b> . The parameterized acceleration or deceleration is lower than the permitted minimum acceleration. The value for minimum acceleration is calculated from minimum jerk rate and NC cycle time (minimum jerk rate multiplied with NC cycle time). The unit for example is mm/s <sup>2</sup> .
4286	17030	Parameter	<b>"The parameterized velocity is not permitted"</b> . The parameterized target velocity is lower than the minimum velocity (but the value zero is permitted). The value for minimum velocity is calculated from the minimum jerk rate and the NC cycle time (minimum jerk rate multiplied with the square of the NC cycle time). The unit for example is mm/s.
4287	17031	Monitoring	<b>"A activation cannot be executed due to a pending activation"</b> A activation e.g. "CamIn", "CamScaling" or "WriteMotionFunction" cannot be executed due to a pending activation (e.g. "CamIn", "CamScaling", "WriteMotionFunction"). Only activation can be enabled.
4288	17032	Monitoring	<b>"Illegal combination of different cycle times within an axis group"</b> A logical axis group includes elements (axes) with different cycle times for a common setpoint generator and I/O-execution, resp. This situation can occur with Master/Slave-coupling or configuring 3D- and FIFO-groups (including path, auxiliary, and slave axes).
4289	17033	Monitoring	<b>"Illegal motion reversal"</b> Due to the actual dynamical state a motion reversal will happen. To avoid this motion reversal the axis command is not performed and the previous system state restored.
428A	17034	Monitoring	<b>"Illegal moment for an axis command because there is an old axis command with activation position still active"</b> The moment for the command is illegal because there is still an old command with activation position active (e.g. "go to new velocity at threshold position" or "reach new velocity at threshold position").
428B	17035	Monitoring	<b>"Error in the stop-calculation routine" (INTERNAL ERROR)</b> Due to an internal error in the stop-calculation routine the current commando cannot be performed. The previous system state is restored.
428C	17036	Monitoring	<b>"A command with activation position cannot fully be performed because the remaining path is too short"</b> A command with activation position (threshold) like "reach a new velocity at a position" can be just partially executed because the path from the actual position to the activation position is too short.
428D	17037	Monitoring	<b>"Illegal decouple type when decoupling a slave axis"</b> The decouple and restart command contains an invalid decouple type.
428E	17038	Monitoring	<b>"Illegal target velocity when decoupling a slave axis"</b> The decouple and restart command contains an illegal target velocity [ $1 < V < V_{max}$ ].
428F	17039	Monitoring	<b>"The command new dynamic parameter cannot be performed since this would require a new target velocity"</b> Das Kommando zum Aktivieren neuer



Error(Hex)	Error(Dec)	Error Type	Description
			Dynamikparameter wie Beschleunigung, Verzögerung und Ruck kann nicht durchgeführt werden, da dies eine neue beauftragte Fahrgeschwindigkeit erfordern würde. This situation can occur, for example, if the axis is near the target position in an accelerated state and the dynamics parameter are chosen softer.
4290	17040	Monitoring	<b>"A command with activation position cannot be performed because the axis is already in the brake phase"</b> A command with activation position (threshold) e.g. "reach new velocity at position" cannot be performed because the axis is already in the brake phase and the remaining path from the actual position to the activation position is too short.
4291	17041	Monitoring	<b>"Decouple routine of slave axis doesn't return a valid solution"</b> Internal jerk scaling of decouple routine cannot evaluate a valid solution (decoupling slave axis and transform to master axis). The command is rejected because velocity can become too high, a reversal of movement can occur, or the target position can be passed.
4292	17042	Monitoring	<b>"Command not be executed because the command buffer is full filled"</b> The command is rejected because the command buffer is full filled.
4293	17043	Internal	<b>"Command is rejected due to an internal error in the Look Ahead" (INTERNAL ERROR)</b> The command is rejected due to an internal error in the "look ahead".
4294	17044	Monitoring	<b>"Command is rejected because the segment target velocity is not realized"</b> The command is rejected, because the new target segment velocity <i>Vrequ</i> is not realizable and an internal optimizing is impossible.
4295	17045	Monitoring	<b>"Successive commands have the same final position"</b> Successive commands have the same final position. So the moving distance is zero.
4296	17046	Monitoring	<b>"Logical positioning direction is inconsistent with the direction of the buffer command"</b> In the extended buffer mode, where the actual end position is replaced by the new buffer start position, the logical positioning direction is inconsistent with the direction of the buffer command (=> contradiction). A buffered command ( <i>BufferMode</i> , <i>BlendingLow</i> , <i>BlendingPrevious</i> , <i>BlendingNext</i> , <i>BlendingHigh</i> ) is rejected with error 0x4296 if the command is using the Beckhoff specific <i>optional BlendingPosition</i> but the blending position is located beyond the target position of the previous motion command.
4297	17047	Monitoring	<b>"Command is rejected because the remaining positioning length is too small"</b> The command is rejected because the remaining path length is too small. E.g. when the buffer mode is used and the remaining positioning length in the actual segment is too small for getting the axis in a force free state or to reach the new target velocity at the change of segment.
429A	17050	Function	<b>Restart has Failed</b> There is already a motion command within the PTP command buffer and a further new motion command that should have modified the current motion command by restart has failed.
429B	17051	Monitoring	„collect error for invalid start parameters“

Error(Hex)	Error(Dec)	Error Type	Description
			<p>This error refers to a wrong parameterization of the user (collect error). E. g. dynamic parameters like Velo, Acc or Dec could be equal or less than zero.</p> <p>Or following errors:</p> <ul style="list-style-type: none"> <li>- BaseFrequency &lt; 0.0</li> <li>- StartFrequency &lt; 1.0</li> <li>- StepCount &lt; 1, StepCount &gt; 200</li> <li>- BaseAmplitude &lt;= 0.0</li> <li>- StepDuration &lt;= 0.0</li> <li>- StopFrequency &gt;= 1/(2*CycleTime)</li> </ul>
<b>429C</b>	<b>17052</b>	Monitoring	<p><b>"Reference cam is not found"</b> During the referencing process for an axis it is moved in the direction of the referencing cam. This reference cam, however, was not found as expected (=&gt; leads to the abortion of the referencing procedure).</p>
<b>429D</b>	<b>17053</b>	Monitoring	<p><b>"Reference cam became not free"</b> During the referencing process for an axis it is moved in the direction of the referencing cam, and is only stopped again when the cam signal is reached. After the axis has also come to a physical standstill, the axis is subsequently started regularly from the cam again. In this case, the reference cam did not become free again as expected when driving down (=&gt; leads to the abortion of the referencing procedure).</p>
<b>429E</b>	<b>17054</b>	Monitoring	<p><b>"IO sync pulse was not found (only when using hardware latch)"</b> If the hardware latch is activated, a sync pulse (zero pulse) is expected to be found and a sync event triggered following the expiry of a certain time or a certain distance. If this is not the case, the reaction is an error and the abortion of the referencing procedure.</p>
<b>429F</b>	<b>17055</b>	Function	<p><b>The Used Buffer Mode is Unknown or not Supported in this Context</b></p> <p>The buffer mode used for a PTP command (e.g. ABORTING, etc.) is unknown or not supported in this context.</p>
<b>42A0</b>	<b>17056</b>	Internal	<p><b>"Group/axis consequential error"</b> Consequential error resulting from another causative error related to another axis within the group. Group/axis consequential errors can occur in relation to master/slave couplings or with multiple axis interpolating DXD groups. If, for instance, it is detected that the following error limit of a master axis has been exceeded, then this consequential error is assigned to all the other master axes and slave axes in this group.</p>
<b>42A1</b>	<b>17057</b>	Parameter	<p><b>"Velocity reduction factor for C0/C1 transition is not allowed"</b> A C0 transition describes two geometries which, while they are themselves continuous, do not have either continuous first or second differentials. The velocity reduction factor C0 acts on such transitions. Note: A C1 transition is characterized by the two geometries being continuous, but having only a first differential that is continuous. The velocity reduction factor C1 acts on such transitions.</p> <p>Value range: [0.0 ... 1.0]      Unit: 1</p>
<b>42A2</b>	<b>17058</b>	Parameter	<p><b>"Critical angle at segment transition not allowed"</b></p> <p>Value range: (0.0 ... 180.0]      Unit: degree</p>
<b>42A3</b>	<b>17059</b>	Parameter	<p><b>"Radius of the tolerance sphere"</b> is in an invalid rang</p> <p>Value range: [0.0 ... 100.0]      Unit: e.g. mm</p>

Error(Hex)	Error(Dec)	Error Type	Description
42A4	17060	Parameter	Not implemented.
42A5	17061	Parameter	<b>"Start type"</b> Value range: [0,1] Unit: 1
42A6	17062	Parameter	Not implemented.
42A7	17063	Parameter	<b>"Blending"</b> with given parameters not possible
42A8	17064	Parameter	Not implemented.
42A9	17065	Parameter	<b>"Curve velocity reduction method not allowed" (INTERNAL ERROR)</b> The curve velocity reduction method does not exist.
42AA	17066	Parameter	<b>"Minimum velocity not allowed"</b> The minimum velocity that has been entered is less than 0.0.
42AB	17067	Parameter	<b>"Power function input not allowed" (INTERNAL ERROR)</b> The input parameters in the power_() function lead to an FPU exception.
42AC	17068	Parameter	<b>"Dynamic change parameter not allowed"</b> A parameter that controls alterations to the dynamics is invalid. Parameter: 1. Absolute motion dynamics change: All parameters must be strictly positive. 2. Relative reduction c_f: $0.0 < c_f \leq 1.0$
42AD	17069	Memory	<b>"Memory allocation error" (INTERNAL ERROR)</b>
42AE	17070	Function	<b>"The calculated end position differs from the end position in the nc instruction (internal error)."</b>
42AF	17071	Parameter	<b>"Calculate remaining chord length"</b> invalid value Value range: [0,1]
42B0	17072	Function	<b>"Set value generator SVB active"</b> Starting the set value generator (SVB, SAF) has been refused, since the SVB task is already active.
42B1	17073	Parameter	<b>"SVB parameter not allowed" (INTERNAL ERROR)</b> A parameter related to the internal structure of the set value generator (SVB) results in logical errors and/or to an FPU exception. Affects these parameters: Minimum velocity (>0.0), TimeMode, ModeDyn, ModeGeo, StartType, DistanceToEnd, TBallRadius.
42B2	17074	Parameter	<b>"Velocity reduction factor not allowed"</b> A parameter that controls reduction of the velocity at segment transitions is invalid. Parameter: 1. Transitions with continuous first differential: VeloVertexFactorC1 2. Not once continuously differentiable transitions: VeloVertexFactorC0, CriticalVertexAngleLow, CriticalVertexAngleHigh.
42B3	17075	Parameter	<b>"Helix is a circle"</b> The helix has degenerated to a circle, and should be entered as such.
42B4	17076	Parameter	<b>"Helix is a straight line"</b> The helix has degenerated to a straight line, and should be entered as such.
42B5	17077	Parameter	<b>"Guider parameter not allowed"</b> One of the guider's parameters leads to logical errors and/or to an FPU exception.
42B6	17078	Address	<b>"Invalid segment address" (INTERNAL ERROR)</b> The geometry segment does not have a valid geometry structure address or does not have a valid dynamic structure address.
42B7	17079	Parameter	<b>"Unparameterized generator" (INTERNAL ERROR)</b> The SVB generator is not yet parameterized and is therefore unable to operate.
42B8	17080	Address	<b>"Unparameterized table" (INTERNAL ERROR)</b> The table has no information concerning the address of the corresponding dynamic generator.

Error(Hex)	Error(Dec)	Error Type	Description
42BA	17082	Internal	"The calculation of the arc length of the smoothed path failed (internal error)."
42BB	17083	Parameter	"The radius of the tolerance ball is too small (smaller than 0.1 mm)."
42BC	17084	Internal	Error while calculating DXD-Software-Limit switches (internal error)
42BD	17085	Function	<b>"NC-Block violates software limit switches of the group"</b> At least one path axis with active software limit monitoring has violated the limit switches. Therefore the geometric entry is denied with an error.
42BE	17086	Parameter	<b>"Internal error in the evaluation of a possible software limit switch violation for the segment with the block-number xx."</b> At least one path axis with active position limit monitoring has violated the limit switches.
42BF	17087	Parameter	Invalid reference speed type.
42C0	17088	Internal	<b>"Interpolating group contains axes of an incorrect axis type"</b> An interpolating 3D group may only contain continuously guided axes of axis type 1 (SERVO).
42C1	17089	Internal	<b>"Scalar product cannot be calculated"</b> The length of one of the given vectors is 0.0.
42C2	17090	Internal	<b>"Inverse cosine cannot be calculated"</b> The length of one of the given vectors is 0.0.
42C3	17091	Parameter	<b>"Invalid table entry type"</b> The given table entry type is unknown.
42C4	17092	Parameter	<b>"Invalid DIN66025 information type" (INTERNAL ERROR)</b> The given DIN66025 information type is unknown. Known types: G0, G1, G2, G3, G17, G18, G19.
42C5	17093	Parameter	<b>"Invalid dimension" (INTERNAL ERROR)</b> The CNC dimension is unknown. Known dimensions: 1, 2, 3. Or: The CNC dimension is invalid for the given geometrical object. For a circle the dimension must be 2 or 3, while for a helix it must be 3.
42C6	17094	Parameter	<b>"Geometrical object is not a straight line"</b> The given object, interpreted as a straight line, has a length of 0.0.
42C7	17095	Parameter	<b>"Geometrical object is not a circle"</b> Interpreted as a circular arc, the given object has a length of 0.0, or an angle of 0.0 or a radius of 0.0.
42C8	17096	Parameter	<b>"Geometrical object is not a helix"</b> Interpreted as a circular arc, the given object has a length of 0.0, or an angle of 0.0, or a radius of 0.0. or a height of 0.0.
42C9	17097	Parameter	<b>"Set velocity less than or equal to 0.0 is invalid"</b> A value less than or equal to 0.0 for the set velocity (CNC) is not allowed, since the set velocity is positive by definition, and a set velocity of 0.0 cannot generate any motion.
42CA	17098	Address	<b>"Address for look-ahead invalid" (INTERNAL ERROR)</b> The address supplied for the look-ahead is invalid.
42CB	17099	Function	<b>"Set value generator SAF active"</b> Starting the set value generator (SAF) has been refused, since the SAF task is already active.
42CC	17100	Function	<b>"CNC set value generation not active"</b> Stop or change of override refused, because the set value generation is not active.
42CD	17101	Function	<b>"CNC set value generation in the stop phase"</b> Stop or change of override refused, because the set value generation is in the stop phase.

Error(Hex)	Error(Dec)	Error Type	Description
42CE	17102	Parameter	<b>"Override not allowed"</b> An override of less than 0.0 % or more than 100.0 % is invalid.
42CF	17103	Address	<b>"Invalid table address" (INTERNAL ERROR)</b> The table address given for the initialization of the set value generator is invalid, or no valid logger connection (report file) is present.
42D0	17104	Parameter	<b>"Invalid table entry type"</b> The given table entry type is unknown.
42D1	17105	Memory	<b>"Memory allocation failed"</b> Memory allocation for the table has failed.
42D2	17106	Memory	<b>"Memory allocation failed"</b> Memory allocation for the filter has failed.
42D3	17107	Parameter	<b>"Invalid parameter"</b> Filter parameter is not allowed.
42D4	17108	Function	<b>"Delete Distance To Go failed"</b> Delete Distance to go (only interpolation) failed. This error occurred, if e.g. the command 'DelDTG' was not programmed in the actual movement of the nc program.
42D5	17109	Internal	<b>"The setpoint generator of the flying saw generates incompatible values (internal error)"</b>
42D6	17110	Function	<b>"Axis will be stopped since otherwise it will overrun its target position (old PTP setpoint generator)"</b> If, for example, in case of a slave to master transformation for the new master a target position is commanded that will be overrun because of the actual dynamics the axis will be stopped internally to guarantee that the target position will not be overrun.
42D7	17111	Function	<b>"Internal error in the transformation from slave to master."</b>
42D8	17112	Function	<b>"Wrong direction in the transformation of slave to master."</b>
42DA	17114	Parameter	<b>"Parameter of Motion Function (MF) table incorrect"</b> The parameter of the Motion Function (MF) are invalid. This may refer to the first time created data set or to online changed data.
42DB	17115	Parameter	<b>"Parameter of Motion Function (MF) table incorrect"</b> The parameter of the Motion Function (MF) are invalid. This may refer to the first time created data set or to online changed data. The error cause can be, that an active MF point (no IGNORE point) points at a passive MF point (IGNORE point).
42DC	17116	Monitoring	<b>"Internal error by using Motion Function (MF)"</b> An internal error occurs by using the Function (MF). This error cannot be solved by the user. Please ask the TwinCAT Support.
42DD	17117	Function	<b>"Axis coupling with synchronization generator declined because of incorrect axis dynamic values"</b> The axis coupling with the synchronization generator has been declined, because one of the slave dynamic parameter (machine data) is incorrect. Either the maximum velocity, the acceleration, the deceleration or the jerk is smaller or equal to zero, or the expected synchronous velocity of the slave axis is higher as the maximum allowed slave velocity.
42DE	17118	Function	<b>"Coupling conditions of synchronization generator incorrect"</b> During positive motion of the master axis it has to be considered, that the master synchronous position is larger than the master coupling position ("to be in the

Error(Hex)	Error(Dec)	Error Type	Description
			future"). During negative motion of the master axis it has to be considered that the master synchronous position is smaller than the master coupling position.
42DF	17119	Monitoring	<b>"Moving profile of synchronization generator declines dynamic limit of slave axis or required characteristic of profile"</b> One of the parameterized checks has recognized an overstepping of the dynamic limits (max. velocity, max. acceleration, max. deceleration or max. jerk) of the slave axis, or an profile characteristic (e.g. overshoot or undershoot in the position or velocity) is incorrect. See also further messages in the windows event log and in the message window of the System Manager.
42E0	17120	Parameter	<b>"Invalid parameter"</b> The encoder generator parameter is not allowed.
42E1	17121	Parameter	<b>"Invalid parameter"</b> The external (Fifo) generator parameter is not allowed.
42E2	17122	Function	<b>"External generator is active"</b> The external generator cannot be started, as it is already active.
42E3	17123	Function	<b>"External generator is not active"</b> The external generator cannot be stopped, as it is not active.
42E4	17124	Function	<b>"NC-Block with auxiliary axis violates software limit switches of the group"</b> At least one auxiliary axis with active software limit monitoring has violated the limit switches. Therefore the geometric entry is denied with an error.
42E5	17125	Function	<b>"NC-Block type Bezier spline curve contains a cusp (singularity)"</b> The Bezier spline curve contain a cusp, i.e. at a certain interior point both the curvature and the modulus of the velocity tend to 0 such that the radius of curvature is infinite. Note: Split the Bezier curve at that point into two Bezier spline curves according to the de "Casteljau algorithm". This preserves the geometry and eliminates the interior singularity.
42E7	17127	Parameter	<b>"Value for dead time compensation not allowed"</b> The value for the dead time compensation in seconds for a slave coupling to an encoder axis (virtual axis) is not allowed. Value range: [0.0 ... 60.0] Unit: s
42E8	17128	Parameter	<b>"GROUPERR_RANGE_NOMOTIONWINDOW"</b> Value range: [0.0 ... 1000.0] Unit: e.g. mm/s
42E9	17129	Parameter	<b>"GROUPERR_RANGE_NOMOTIONFILTERTIME"</b> Value range: [0.0 ... 60.0] Unit: s
42EA	17130	Parameter	<b>"GROUPERR_RANGE_TIMEUNITFIFO"</b> Value range: (0.0 ... 1000.0] Unit: s
42EB	17131	Parameter	<b>"GROUPERR_RANGE_OVERRIDEATYPE"</b> Value range: [1, 2] Unit: 1
42EC	17132	Parameter	<b>"GROUPERR_RANGE_OVERRIDECHANGETIME"</b> Value range: (0.0 ... 1000.0] Unit: s
42ED	17133	Parameter	<b>"GROUPERR_FIFO_INVALIDDIMENSION"</b> <b>Note:</b> Since TC 2.11 Build 1547 the FIFO-dimension (number of axes) has been increased from 8 to 16. Value range: [1 ... 8] resp. [1 ... 16] Unit: 1 (number of axes)
42EE	17134	Address	<b>"GROUPERR_ADDR_FIFOTABLE"</b>

Error(Hex)	Error(Dec)	Error Type	Description
42EF	17135	Monitoring	<b>"Axis is locked for motion commands because a stop command is still active"</b> The axis/group is locked for motion commands because a stop command is still active. The axis can be released by calling <i>MC_Stop</i> with <i>Execute=FALSE</i> or by using <i>MC_Reset (TcMC2.Lib)</i> .
42F0	17136	Parameter	<b>"Invalid number of auxiliary axes"</b> The local number of auxiliary axes does not tally with the global number of auxiliary axes.
42F1	17137	Parameter	<b>"Invalid reduction parameter for auxiliary axes"</b> The velocity reduction parameters for the auxiliary axes are inconsistent.
42F2	17138	Parameter	<b>"Invalid dynamic parameter for auxiliary axes"</b> The dynamic parameters for the auxiliary axes are inconsistent.
42F3	17139	Parameter	<b>"Invalid coupling parameter for auxiliary axes"</b> The coupling parameters for the auxiliary axes are inconsistent.
42F4	17140	Parameter	<b>"Invalid auxiliary axis entry"</b> The auxiliary axis entry is empty (no axis motion).
42F6	17142	Parameter	<b>"Invalid parameter"</b> The limit for velocity reduction of the auxiliary axes is invalid. It has to be in the interval 0..1.0
42F8	17144	Parameter	<b>"Block search - segment not found"</b> The segment specified as a parameter could not be found by the end of the NC program. Possible cause: <ul style="list-style-type: none"> <li>nBlockId is not specified in the mode described by eBlockSearchMode</li> </ul>
42F9	17145	Parameter	<b>"Blocksearch – invalid remaining segment length"</b> The remaining travel in the parameter fLength is incorrectly parameterized
42FB	17147	Internal	<b>Internal Error in the Context of Coupled Axes (Slave Axes)</b> Fatal internal error using coupled axes (slave axes). Inconsistent internal state. Please, contact the support team.
42FC	17148	Parameter	<b>Parameter for the Maximum Number of Jobs (Entries) to be Transferred is Invalid</b> The parameter that describes the maximum number of entries to transfer from the <i>SVB</i> to the <i>SAF</i> table per NC Cycle is invalid. Range of values: [1, 20] Unit: 1
42FF	17151	Monitoring	<b>Customer Specific Error</b> In this connection it is about a customer specific monitoring function.

## 2.4 Axis Errors

Error(Hex)	Error(Dec)	Error Type	Description
4300	17152	Parameter	<b>"Axis ID not allowed"</b> The value for the axis ID is not allowed, e.g. because it has already been assigned, is less than or equal to zero, is greater than 255, or does not exist in the current configuration. Value range: [1 ... 255] Unit: 1

Error(Hex)	Error(Dec)	Error Type	Description
4301	17153	Parameter	<b>"Axis type not allowed"</b> The value for the axis type is unacceptable because it is not defined. Type 1: Servo Type 2: Fast/creep Type 3: Stepper motor
			Value range: [1 ... 3] Unit: 1
4306	17158	Parameter	<b>"Slow manual velocity not allowed"</b> The value for the slow manual velocity is not allowed.
			Value range: [0.0, 10000.0] Unit: e.g. m/min
4307	17159	Parameter	<b>"Fast manual velocity not allowed"</b> The value for the fast manual velocity is not allowed.
			Value range: [0.0, 10000.0] Unit: e.g. m/min
4308	17160	Parameter	<b>"High speed not allowed"</b> The value for the high speed is not allowed.
			Value range: [0.0, 10000.0] Unit: e.g. m/min
4309	17161	Parameter	<b>"Acceleration not allowed"</b> The value for the axis acceleration is not allowed.
			Value range: [0.0, 1000000.0] Unit: e.g. m/s/s
430A	17162	Parameter	<b>"Deceleration not allowed"</b> The value for the axis deceleration is not allowed.
			Value range: [0.0, 1000000.0] Unit: e.g. m/s/s
430B	17163	Parameter	<b>"Jerk not allowed"</b> The value for the axis jerk is not allowed.
			Value range: [0.0, 1000000.0] Unit: e.g. m/s/s/s
430C	17164	Parameter	<b>"Delay time between position and velocity is not allowed"</b> The value for the delay time between position and velocity ("idle time compensation") is not allowed.
			Value range: [0, 0.1] Unit: s
430D	17165	Parameter	<b>"Override-Type not allowed"</b> The value for the velocity override type is not allowed. Type 1: With respect to the internal reduced velocity (default value) Type 2: With respect to the original external start velocity
			Value range: [1 ... 4] Unit: 1
430E	17166	Parameter	<b>"NCI: Velo-Jump-Factor not allowed"</b> The value for the velo-jump-factor ("VeloJumpFactor") is not allowed. This parameter only works for TwinCAT NCI.
			Value range: [0, 1000000] Unit: 1

Error(Hex)	Error(Dec)	Error Type	Description
430F	17167	Parameter	<b>"NCI: Radius of tolerance sphere for the auxiliary axes is invalid"</b> It was tried to enter an invalid value for the size of the tolerance sphere. This sphere affects only auxiliary axes!
			Value range: [0, 1000] Unit: e.g. mm
4310	17168	Parameter	<b>"NCI: Value for maximum deviation for the auxiliary axes is invalid"</b> It was tried to enter an invalid value for the maximum allowed deviation. This parameter affects only auxiliary axes!
			Value range: [0, 10000] Unit: e.g. mm
4312	17170	Parameter	<b>"Referencing velocity in direction of cam not allowed"</b> The value for the referencing velocity in the direction of the referencing cam is not allowed.
			Value range: [0.0, 10000.0] Unit: e.g. m/min



Error(Hex)	Error(Dec)	Error Type	Description
4313	17171	Parameter	<b>"Referencing velocity in sync direction not allowed"</b> The value for the referencing velocity in the direction of the sync pulse (zero track) is not allowed.
			Value range: [0.0, 10000.0]   Unit: e.g. m/min
4314	17172	Parameter	<b>"Pulse width in positive direction not allowed"</b> The value for the pulse width in the positive direction is not allowed (pulsed operation). The use of the pulse width for positioning is chosen implicitly through the axis start type. Pulsed operation corresponds to positioning with a relative displacement that corresponds precisely to the pulse width.
			Value range: [0.0, 1000000.0]   Unit: e.g. mm
4315	17173	Parameter	<b>"Pulse width in negative direction not allowed"</b> The value for the pulse width in the negative direction is not allowed (pulsed operation). The use of the pulse width for positioning is chosen implicitly through the axis start type. Pulsed operation corresponds to positioning with a relative displacement that corresponds precisely to the pulse width.
			Value range: [0.0, 1000000.0]   Unit: e.g. mm
4316	17174	Parameter	<b>"Pulse time in positive direction not allowed"</b> The value for the pulse width in the positive direction is not allowed (pulsed operation).
			Value range: [0.0, 600.0]   Unit: s
4317	17175	Parameter	<b>"Pulse time in negative direction not allowed"</b> The value for the pulse width in the negative direction is not allowed (pulsed operation).
			Value range: [0.0, 600.0]   Unit: s
4318	17176	Parameter	<b>"Creep distance in positive direction not allowed"</b> The value for the creep distance in the positive direction is not allowed.
			Value range: [0.0, 100000.0]   Unit: e.g. mm
4319	17177	Parameter	<b>"Creep distance in negative direction not allowed"</b> The value for the creep distance in the negative direction is not allowed.
			Value range: [0.0, 100000.0]   Unit: e.g. mm
431A	17178	Parameter	<b>"Braking distance in positive direction not allowed"</b> The value for the braking distance in the positive direction is not allowed.
			Value range: [0.0, 100000.0]   Unit: e.g. mm
431B	17179	Parameter	<b>"Braking distance in negative direction not allowed"</b> The value for the braking distance in the negative direction is not allowed.
			Value range: [0.0, 100000.0]   Unit: e.g. mm
431C	17180	Parameter	<b>"Braking time in positive direction not allowed"</b> The value for the braking time in the positive direction is not allowed.
			Value range: [0.0, 60.0]   Unit: s
431D	17181	Parameter	<b>"Braking time in negative direction not allowed"</b> The value for the braking time in the negative direction is not allowed.
			Value range: [0.0, 60.0]   Unit: s

Error(Hex)	Error(Dec)	Error Type	Description
431E	17182	Parameter	<b>"Switching time from high to low speed not allowed"</b> The value for the time to switch from high to low speed is not allowed.
			Value range: [0.0, 60.0]   Unit: s
431F	17183	Parameter	<b>"Creep distance for stop not allowed"</b> The value for the creep distance for an explicit stop is not allowed.
			Value range: [0.0, 100000.0]   Unit: e.g. mm
4320	17184	Parameter	<b>"Motion monitoring not allowed"</b> The value for the activation of the motion monitoring is not allowed.
			Value range: [0, 1]   Unit: 1
4321	17185	Parameter	<b>"Position window monitoring not allowed"</b> The value for the activation of the position window monitoring is not allowed.
			Value range: [0, 1]   Unit: 1
4322	17186	Parameter	<b>"Target window monitoring not allowed"</b> The value for the activation of target window monitoring is not allowed.
			Value range: [0, 1]   Unit: 1
4323	17187	Parameter	<b>"Loop not allowed"</b> The value for the activation of loop movement is not allowed.
			Value range: [0, 1]   Unit: 1
4324	17188	Parameter	<b>"Motion monitoring time not allowed"</b> The value for the motion monitoring time is not allowed.
			Value range: [0.0, 600.0]   Unit: s
4325	17189	Parameter	<b>"Target window range not allowed"</b> The value for the target window is not allowed.
			Value range: [0.0, 10000.0]   Unit: e.g. mm
4326	17190	Parameter	<b>"Position window range not allowed"</b> The value for the position window is not allowed.
			Value range: [0.0, 10000.0]   Unit: e.g. mm
4327	17191	Parameter	<b>"Position window monitoring time not allowed"</b> The value for the position window monitoring time is not allowed.
			Value range: [0.0, 600.0]   Unit: s
4328	17192	Parameter	<b>"Loop movement not allowed"</b> The value for the loop movement is not allowed.
			Value range: [0.0, 10000.0]   Unit: e.g. mm
4329	17193	Parameter	<b>"Axis cycle time not allowed"</b> The value for the axis cycle time is not allowed.
			Value range: [0.001, 0.1]   Unit: s
432A	17194	Parameter	<b>"Stepper motor operating mode not allowed"</b> The value for the stepper motor operating mode is not allowed.
			Value range: [1, 2]   Unit: 1
432B	17195	Parameter	<b>"Displacement per stepper motor step not allowed"</b> The value for the displacement associated with one step of the stepper motor is not allowed (step scaling).
			Value range: [0.000001, 1000.0]   Unit: e.g. mm/STEP
432C	17196	Parameter	<b>"Minimum speed for stepper motor set value profile not allowed"</b> The value for the minimum speed of the stepper motor speed profile is not allowed.
			Value range: [0.0, 1000.0]   Unit: z. B. m/min

Error(Hex)	Error(Dec)	Error Type	Description
432D	17197	Parameter	<b>"Stepper motor stages for one speed stage not allowed"</b> The value for the number of steps for each speed stage in the set value generation is not allowed.
			Value range: [0, 100]   Unit: 1
432E	17198	Parameter	<b>"DWORD for the interpretation of the axis units not allowed"</b> The value that contains the flags for the interpretation of the position and velocity units is not allowed.
			Value range: [0, 0xFFFFFFFF]   Unit: 1
432F	17199	Parameter	<b>"Maximum velocity not allowed"</b> The value for the maximum permitted velocity is not allowed.
			Value range: [0.0, 10000.0]   Unit: e.g. m/min
4330	17200	Parameter	<b>"Motion monitoring window not allowed"</b> The value for the motion monitoring window is not allowed.
			Value range: [0.0, 10000.0]   Unit: e.g. mm
4331	17201	Parameter	<b>"PEH time monitoring not allowed"</b> The value for the activation of the PEH time monitoring is not allowed (PEH: positioning end and halt).
			Value range: [0, 1]   Unit: 1
4332	17202	Parameter	<b>"PEH monitoring time not allowed"</b> The value for the PEH monitoring time (timeout) is not allowed (PEH: positioning end and halt). default value: 5s
			Value range: [0.0, 600.0]   Unit: s
4333	17203	Parameter	<b>Parameter "Break Release Delay" is Invalid</b> The parameter for Break Release Delay of a discrete (two speed) axis is invalid.
			Range of values: [0.0, 60.0]   Unit: s
4334	17204	Parameter	<b>Parameter "NC Data Persistence" is Invalid</b> The boolean parameter NC Data Persistence of an axis is invalid.
			Range of values: [0, 1]   Unit: 1
4335	17205	Parameter	<b>Parameter for the Error Reaction Mode is Invalid</b> The parameter for the error reaction mode of the axis is invalid (instantaneous, delayed).
			Range of values: [0, 1]   Unit: 1
4336	17206	Parameter	<b>Parameter for the Error Reaction Delay is Invalid</b> The parameter for the error reaction delay of the axis is invalid.
			Range of values: [0.0, 1000.0]   Unit: s
4337	17207	Parameter	<b>Parameter "Couple Slave to Actual Values if not Enabled" is Invalid</b> The parameter "Couple Slave to Actual Values if not Enabled" is invalid.
			Range of values: [0, 1]   Unit: 1
4338	17208	Parameter	<b>Parameter "Allow Motion Commands to Slave Axis" is Invalid</b> The boolean parameter "Allow Motion Commands to Slave Axis" is invalid. This parameter defines whether a motion command can be sent to a slave axis or whether this is rejected with the NC error 0x4266 or 0x4267.
			Range of values: [0, 1]   Unit: 1



Error(Hex)	Error(Dec)	Error Type	Description
4357	17239	Monitoring	<b>Feed enable negative:</b> There is no feed enable for negative motion direction (see axis interface PLC->NC). This enable is checked e.g. for a positioning task of an axis into negative motion direction.
4358	17240	Monitoring	<b>"Feed enable plus"</b> Feed enable for movement in the positive direction is not present (see axis interface SPS@NC). This enable is required, for instance, for an axis positioning task in the positive direction.
4359	17241	Monitoring	<b>"Set velocity not allowed"</b> The set velocity requested for a positioning task is not allowed. This can happen if the velocity is less than or equal to zero, larger than the maximum permitted axis velocity, or, in the case of servo-drives, is larger than the reference velocity of the axis (see axis and drive parameters).
435A	17242	Monitoring	<b>"Movement smaller than one encoder increment" (INTERNAL ERROR)</b> The movement required of an axis is, in relation to a positioning task, smaller than one encoder increment (see scaling factor). This information is, however, handled internally in such a way that the positioning is considered to have been completed without an error message being returned.
435B	17243	Monitoring	<b>"Set acceleration monitoring" (INTERNAL ERROR)</b> The set acceleration has exceeded the maximum permitted acceleration or deceleration parameters of the axis.
435C	17244	Monitoring	<b>"PEH time monitoring"</b> The PEH time monitoring has detected that, after the PEH monitoring time that follows a positioning has elapsed, the target position window has not been reached. The following points must be checked: Is the PEH monitoring time, in the sense of timeout monitoring, set to a sufficiently large value (e.g. 1-5 s)? The PEH monitoring time must be chosen to be significantly larger than the target position monitoring time. Have the criteria for the target position monitoring (range window and time) been set too strictly? Note: The PEH time monitoring only functions when target position monitoring is active!
435D	17245	Monitoring	<b>"Encoder existence monitoring / movement monitoring"</b> During the active positioning the actual encoder value has changed continuously for a default check time from NC cycle to NC cycle less than the default minimum movement limit. => Check, whether axis is mechanically blocked, or the encoder system failed, etc... Note: The check is not performed while the axis is logically standing (position control), but only at active positioning (it would make no sense if there is a mechanical holding brake at the standstill)!
435E	17246	Monitoring	<b>"Looping distance less than breaking distance"</b> The absolute value of the looping distance is less or equal than the positive or negative breaking distance. This is not allowed.
435F	17247	Monitoring	<b>Starting Velocity Invalid</b> The required starting velocity for a positioning task is not permitted (usually the starting velocity is zero). This situation can occur if the velocity is smaller than or equal to zero, greater than the axis maximum permitted velocity or for servo motion controllers greater than the axis reference velocity (see axis and motion controller parameters).

Error(Hex)	Error(Dec)	Error Type	Description
4360	17248	Monitoring	<b>Final Velocity Invalid</b> The required final velocity for a positioning task is not permitted (normally the final velocity is zero). This situation can occur if the velocity is smaller than or equal to zero, greater than the axis maximum permitted velocity or for servo motion controllers greater than the axis reference velocity (see axis and motion controller parameters).
4361	17249	Monitoring	<b>"Time range exceeded (future)"</b> The calculated position lies too far in the future (e.g. when converting a position value in a DC time stamp).
4362	17250	Monitoring	<b>"Time range exceeded (past)"</b> The calculated position lies too far in the past (e.g. when converting a position value in a DC time stamp).
4363	17251	Monitoring	<b>"Position cannot be determined"</b> The requested position cannot be determined. Case 1: It was not passed through in the past. Case 2: It cannot be reached in future. A reason can be a zero velocity value or an acceleration that causes a turn back.
4364	17252	Monitoring	<b>"Position indeterminable (conflicting direction of travel)"</b> The direction of travel expected by the caller of the function deviates from the actual direction of travel (conflict between PLC and NC view, for example when converting a position to a DC time).
4370	17264	Monitoring	<b>No Slave Coupling Possible (Velocity Violation)</b> A slave coupling to a master axis (e.g. by a universal flying saw) is rejected because otherwise the maximum velocity of the slave axis would be exceeded (a velocity monitoring has been selected).
4371	17265	Monitoring	<b>No Slave Coupling Possible (Acceleration Violation)</b> A slave coupling to a master axis (e.g. by a universal flying saw) is rejected, because otherwise the maximum acceleration of the slave axis will be exceeded (an acceleration monitoring is selected).
4372 – 438B	17266 – 17291		See <a href="#">TF5055 NC Flying Saw – Error Codes</a>
43A0	17312	Internal	<b>"Axis consequential error"</b> Consequential error resulting from another causative error related to another axis. Axis consequential errors can occur in relation to master/slave couplings or with multiple axis interpolating DXD groups.

## 2.5 Encoder Errors

Error(Hex)	Error(Dec)	Error Type	Description
4400	17408	Parameter	<b>"Encoder ID not allowed"</b> The value for the encoder ID is not allowed, e.g. because it has already been assigned, is less than or equal to zero, or is bigger than 255. Value range: [1 ... 255]   Unit: 1
4401	17409	Parameter	<b>"Encoder type not allowed"</b> The value for the encoder type is unacceptable because it is not defined. Type 1: Simulation (incremental) Type 2: M3000 (24 bit absolute) Type 3: M31x0 (24 bit incremental) Type 4: KL5101 (16 bit incremental) Type 5: KL5001 (24 bit absolute SSI) Type 6: KL5051 (16 bit BISSI) Value range: [1 ... 6]   Unit: 1

Error(Hex)	Error(Dec)	Error Type	Description
4402	17410	Parameter	<b>"Encoder mode"</b> The value for the encoder (operating) mode is not allowed. Mode 1: Determination of the actual position Mode 2: Determination of the actual position and the actual velocity (filter)
			Value range: [1, 2]   Unit: 1
4403	17411	Parameter	<b>"Encoder counting direction inverted?"</b> The flag for the encoder counting direction is not allowed. Flag 0: Positive encoder counting direction Flag 1: Negative encoder counting direction
			Value range: [0, 1]   Unit: 1
4404	17412	Initialization	<b>"Referencing status"</b> The flag for the referencing status is not allowed. Flag 0: Axis has not been referenced Flag 1: Axis has been referenced
			Value range: [0, 1]   Unit: 1
4405	17413	Parameter	<b>"Encoder increments for each physical encoder rotation"</b> The value for the number of encoder increments for each physical rotation of the encoder is not allowed. This value is used by the software for the calculation of encoder overruns and underruns.
			Value range: [255, 0xFFFFFFFF]   Unit: INC

Error(Hex)	Error(Dec)	Error Type	Description
4406	17414	Parameter	<b>"Scaling factor"</b> The value for the scaling factor is not allowed. This scaling factor provides the weighting for the conversion of an encoder increment (INC) to a physical unit such as millimeters or degrees.
			Value range: [0.000001, 100.0]   Unit: e.g. mm/INC
4407	17415	Parameter	<b>"Position offset (zero point offset)"</b> The value for the position offset of the encoder is not allowed. This value is added to the calculated encoder position, and is interpreted in the physical units of the encoder.
			Value range: [-1000000.0, 1000000.0]   Unit: e.g. mm
4408	17416	Parameter	<b>"Modulo factor"</b> The value for the encoder's modulo factor is not allowed.
			Value range: [1.0, 1000000.0]   Unit: e.g. mm
4409	17417	Parameter	<b>"Position filter time"</b> The value for the actual position filter time is not allowed (P-T1 filter).
			Value range: [0.0, 60.0]   Unit: s
440A	17418	Parameter	<b>"Velocity filter time"</b> The value for the actual velocity filter time is not allowed (P-T1 filter).
			Value range: [0.0, 60.0]   Unit: s
440B	17419	Parameter	<b>"Acceleration filter time"</b> The value for the actual acceleration filter time is not allowed (P-T1 filter).
			Value range: [0.0, 60.0]   Unit: s
440C	17420	Initialization	<b>"Cycle time not allowed" (INTERNAL ERROR)</b> The value of the SAF cycle time for the calculation of actual values is not allowed (e.g. is less than or equal to zero).
440D	17421	Initialization	<b>"Configuration of the selected units is invalid"</b> E.g. settings for modulo position, velocity per minute etc. lead to an error.
440E	17422	Parameter	<b>"Actual position correction / measurement system error correction"</b> The value for the activation of the actual position correction ("measuring system error correction") is not allowed.
			Value range: [0, 1]   Unit: 1

Error(Hex)	Error(Dec)	Error Type	Description
440F	17423	Parameter	<p><b>"Filter time actual position correction"</b> The value for the actual position correction filter time is not allowed (P-T1 filter).</p> <p>Value range: [0.0, 60.0] Unit: s</p>
4410	17424	Parameter	<p><b>"Search direction for referencing cam inverted"</b> The value of the search direction of the referencing cam in a referencing procedure is not allowed. Value 0: Positive direction Value 1: Negative direction</p> <p>Value range: [0, 1] Unit: 1</p>
4411	17425	Parameter	<p><b>"Search direction for sync pulse (zero pulse) inverted"</b> The value of the search direction of the sync pulse (zero pulse) in a referencing procedure is not allowed. Value 0: Positive direction Value 1: Negative direction</p> <p>Value range: [0, 1] Unit: 1</p>
4412	17426	Parameter	<p><b>"Reference position"</b> The value of the reference position in a referencing procedure is not allowed.</p> <p>Value range: [-1000000.0, 1000000.0] Unit: e.g. mm</p>
4413	17427	Parameter	<p><b>"Clearance monitoring between activation of the hardware latch and appearance of the sync pulse" (NOT IMPLEMENTED)</b> The flag for the clearance monitoring between activation of the hardware latch and occurrence of the sync/zero pulse ("latch valid") is not allowed. Value 0: Passive Value 1: Active</p> <p>Value range: [0, 1] Unit: 1</p>
4414	17428	Parameter	<p><b>"Minimum clearance between activation of the hardware latch and appearance of the sync pulse" (NOT IMPLEMENTED)</b> The value for the minimum clearance in increments between activation of the hardware latch and occurrence of the sync/zero pulse ("latch valid") during a referencing procedure is not allowed.</p> <p>Value range: [0, 65536] Unit: INC</p>
4415	17429	Parameter	<p><b>"External sync pulse" (NOT IMPLEMENTED)</b> The value of the activation or deactivation of the external sync pulse in a referencing procedure is not allowed. Value 0: Passive Value 1: Active</p> <p>Value range: [0, 1] Unit: 1</p>
4416	17430	Parameter	<p><b>"Scaling of the noise rate is not allowed"</b> The value of the scaling (weighting) of the synthetic noise rate is not allowed. This parameter exists only in the simulation encoder and serves to produce a realistic simulation.</p> <p>Value range: [0, 1000000] Unit: 1</p>
4417	17431	Parameter	<p><b>„Tolerance window for modulo-start“</b> The value for the tolerance window for the modulo-axis-start is invalid. The value must be greater or equal than zero and smaller than the half encoder modulo-period (e. g. in the interval [0.0,180.0) ).</p> <p>Value range: [0.0, 180], Max: 0.5*modulo-periode Unit: e. g. mm or degree</p>
4418	17432	Parameter	<p><b>„Encoder reference mode“</b> The value for the encoder reference mode is not allowed, resp. is not supported for this encoder type.</p> <p>Value range: [0, 5] Unit: 1</p>
4419	17433	Parameter	<p><b>„Encoder evaluation direction“</b> The value for the encoder evaluation direction (log. counter direction) is not allowed.</p> <p>Value range: [0, 3] Unit: 1</p>



Error(Hex)	Error(Dec)	Error Type	Description
441A	17434	Parameter	„Encoder reference system“ The value for the encoder reference system is invalid (0: incremental, 1: absolute, 2: absolute+modulo).
			Value range: [0, 2] Unit: 1
441B	17435	Parameter	„Encoder position initialization mode“ When starting the TC system the value for the encoder position initialization mode is invalid.
			Value range: [0, 1] Unit: 1
441C	17436	Parameter	„Encoder sign interpretation (UNSIGNED- / SIGNED- data type)“ The value for the encoder sign interpretation (data type) for the encoder the actual increment calculation (0: Default/not defined, 1: UNSIGNED, 2:/ SIGNED) is invalid.
			Value range: [0, 2] Unit: 1
441D	17437	Parameter	“Homing Sensor Source” The value for the encoder homing sensor source is not allowed, resp. is not supported for this encoder type.
			Value range: [0, 16] Unit: 1
4420	17440	Parameter	<b>"Software end location monitoring minimum not allowed"</b> The value for the activation of the software location monitoring minimum is not allowed.
			Value range: [0, 1] Unit: 1
4421	17441	Parameter	<b>"Software end location monitoring maximum not allowed"</b> The value for the activation of the software location monitoring maximum is not allowed.
			Value range: [0, 1] Unit: 1
4422	17442	Function	<b>"Actual value setting is outside the value range"</b> The "set actual value" function cannot be carried out, because the new actual position is outside the expected range of values.
			Value range: [-1000000.0, 1000000.0] Unit: e.g. mm
4423	17443	Parameter	<b>"Software end location minimum not allowed"</b> The value for the software end location minimum is not allowed.
			Value range: [-100000000.0, 100000000.0] Unit: e.g. mm
4424	17444	Parameter	<b>"Software end location maximum not allowed"</b> The value for the software end location maximum is not allowed.
			Value range: [-100000000.0, 100000000.0] Unit: e.g. mm
4425	17445	Parameter	„Filter mask for the raw data of the encoder is invalid“ The value for the filter mask of the encoder raw data in increments is invalid.
			Value range: [0, 0xFFFFFFFF] Unit: 1
4426	17446	Parameter	„Reference mask for the raw data of the encoder is invalid“ The value for the reference mask (increments per encoder turn, absolute resolution) for the raw data of the encoder is invalid. E.g. this value is used for axis reference sequence (calibration) with the reference mode "Software Sync".
			Value range: [0x0000000F, 0xFFFFFFFF] Unit: 1
4427	17447	Parameter	<b>Parameter Dead Time Compensation Mode (Encoder) is Invalid</b> The parameter for the mode of dead time compensation at the NC encoder is invalid (OFF, ON with velocity, ON with velocity and acceleration).
			Range of values: [0, 1, 2] Unit: 1

Error(Hex)	Error(Dec)	Error Type	Description
4428	17448	Parameter	<p><b>Parameter "Control Bits of Dead Time Compensation" (Encoder) is Invalid</b></p> <p>The parameter for the control bits of dead time compensation at the encoder is invalid (e.g. relative or absolute time interpretation).</p> <p>Range of values: [<math>&gt;0</math>]      Unit: 1</p>
4429	17449	Parameter	<p><b>Parameter "Time Related Shift of Dead Time Compensation Mode" (Encoder) is Invalid</b></p> <p>The parameter for time related shift of dead time compensation (time shift in nanoseconds) at the encoder is invalid.</p> <p>Range of values: [<math>-1.0E9 .. 1.0E9</math>]      Unit: ns</p>
4430	17456	Function	<p><b>"Hardware latch activation (encoder)"</b> Activation of the encoder hardware latch was implicitly initiated by the referencing procedure. If this function has already been activated but a latch value has not yet become valid ("latch valid"), another call to the function is refused with this error.</p>
4431	17457	Function	<p><b>"External hardware latch activation (encoder)"</b> The activation of the external hardware latch (only available on the KL5101) is initiated explicitly by an ADS command (called from the PLC program of the Visual Basic interface). If this function has already been activated, but the latch value has not yet been made valid by an external signal ("external latch valid"), another call to the function is refused with this error.</p>
4432	17458	Function	<p><b>"External hardware latch activation (encoder)"</b> If a referencing procedure has previously been initiated and the hardware still signals a valid latch value ("latch valid"), this function must not be called. In practice, however, this error can almost never occur.</p>
4433	17459	Function	<p><b>"External hardware latch activation (encoder)"</b> If this function has already been initiated and the hardware is still signaling that the external latch value is still valid ("extern latch valid"), a further activation should not be carried out and the commando will be declined with an error (the internal handshake communication between NC and IO device is still active). In that case the validity of the external hardware latch would immediately be signaled, although the old latch value would still be present.</p>
4434	17460	Monitoring	<p><b>"Encoder function not supported"</b> An encoder function has been activated that is currently not released for use, or which is not even implemented.</p>
4435	17461	Monitoring	<p><b>„Encoder function is already active“</b> An encoder function can not been activated because this functionality is already active.</p>
4440	17472	Initialization	<p><b>"Encoder initialization"</b> Encoder has not been initialized. Although the axis has been created, the rest of the initialization has not been performed (1. Initialization of axis I/O, 2. Initialization of axis, 3. Reset axis).</p>
4441	17473	Address	<p><b>"Axis address"</b> The encoder does not have an axis, or the axis address has not been initialized.</p>
4442	17474	Address	<p><b>"I/O input structure address"</b> The drive does not have a valid I/O input address in the process image.</p>
4443	17475	Address	<p><b>"I/O output structure address"</b> The encoder does not have a valid I/O output address in the process image.</p>
4450	17488	Monitoring	<p><b>"Encoder counter underflow monitoring"</b> The encoder's incremental counter has underflowed.</p>

Error(Hex)	Error(Dec)	Error Type	Description
4451	17489	Monitoring	<b>"Encoder counter overflow monitoring"</b> The encoder's incremental counter has overflowed.
4460	17504	Monitoring	<b>"Minimum Software Position Limit (Axis Start)"</b> While monitoring of the minimum software position limit is active, an axis start has been performed towards a position that lies below the minimum software position limit.
4461	17505	Monitoring	<b>"Maximum Software Position Limit (Axis Start)"</b> While monitoring of the maximum software position limit is active, an axis start has been performed towards a position that lies above the maximum software position limit.
4462	17506	Monitoring	<b>"Minimum Software Position Limit (Positioning Process)"</b> While monitoring of the minimum software position limit is active, the actual position has fallen below the minimum software position limit. In case of servo axes, which are moved continuously, this limit is expanded by the magnitude of the parameterized following error position window.
4463	17507	Monitoring	<b>"Maximum Software Position Limit (Positioning Process)"</b> While monitoring of the maximum software position limit is active, the actual position has exceeded the maximum software position limit. In case of servo axes, which are moved continuously, this limit is expanded by the magnitude of the parameterized following error position window.
4464	17508	Monitoring	<b>„Encoder hardware error“</b> The drive resp. the encoder system reports a hardware error of the encoder. An optimal error code is displayed in the message of the event log.
4465	17509	Monitoring	<b>„Position initialization error at system start“</b> At the first initialization of the set position was this for all initialization trials (without over-/under-flow, with underflow and overflow ) out of the final position minimum and maximum.
4466	17510	Monitoring	<b>Invalid IO data for more than n subsequent NC cycles (encoder)</b> The axis (encoder) has detected for more than n subsequent NC cycles (NC SAF task) invalid encoder IO data (e.g. n=3). Typically, regarding an EtherCAT member it is about a Working Counter Error (WcState) what displays that data transfer between IO device and controller is disturbed.  If this error is set for a longer period of time continuously, this situation can lead to losing the axis reference (the "homed" flag will be reset and the encoder will get the state "unreferenced").  Possible reasons for this error: An EtherCAT slave may have left its OP state or there is a too high real time usage or a too high real time jitter.
4467	17511	Monitoring	<b>Invalid Actual Position (Encoder)</b> The IO device delivers an invalid actual position (for CANopen/CoE look at bit 13 of encoder state "TxPDO data invalid" or "invalid actual position value").
4468	17512	Monitoring	<b>Invalid IO Input Data (Error Type 1)</b> The monitoring of the "cyclic IO input counter" (2 bit counter) has detected an error. The input data has not been refreshed for at least 3 NC SAF cycles (the 2 bit counter displays a constant value for multiple NC SAF cycles, instead of incrementing by exactly one from cycle to cycle).
4469	17513	Monitoring	<b>Invalid IO Input Data (Error Type 2)</b>

Error(Hex)	Error(Dec)	Error Type	Description
			The monitoring of the "cyclic I/O input counter" (2 bit counter) has detected an error. The quality of input data based on this two bit counter is not sufficient (there is here a simple statistic evaluation that evaluates GOOD cases and BAD cases and in exceeding a special limit value leads to an error).
4470	17520	Monitoring	<b>"SSI transformation fault or not finished"</b> The SSI transformation of the FOX 50 module was faulty for some NC-cycles or did not finished respectively.
44A2	17570	Monitoring	<b>"ENCERR_ADDR_CONTROLLER"</b>
44A3	17571	Monitoring	<b>"ENCERR_INVALID_CONTROLLERTYPE"</b>

## 2.6 Controller Errors

Error(Hex)	Error(Dec)	Error Type	Description
4500	17664	Parameter	<b>"Controller ID not allowed"</b> The value for the controller ID is not allowed, e.g. because it has already been assigned, is less than or equal to zero, or is greater than 255. Value range: [1 ... 255]   Unit: 1
4501	17665	Parameter	<b>"Controller type not allowed"</b> The value for the controller type is unacceptable because it is not defined. Type 1: P-controller (position) . . . Type 7: High/low speed controller Type 8: Stepper motor controller Type 9: Sercos controller Value range: [1 ... 8]   Unit: 1
4502	17666	Parameter	<b>"Controller operating mode not allowed"</b> The value for the controller operating mode is not allowed. Value range: [1]   Unit: 1
4503	17667	Parameter	<b>"Weighting of the velocity pre-control not allowed"</b> The value for the percentage weighting of the velocity pre-control is not allowed. The parameter is pre-set to 1.0 (100%) as standard. Value range: [0.0 ... 1.0]   Unit: %
4504	17668	Parameter	<b>"Following error monitoring (position) not allowed"</b> The value for the activation of the following error monitoring is not allowed. Value range: [0, 1]   Unit: 1
4505	17669	Parameter	<b>"Following error (velocity) not allowed"</b> The value for the activation of the following error monitoring (velocity) is not allowed. Value range: [0, 1]   Unit: 1
4506	17670	Parameter	<b>"Following error window (position) not allowed"</b> The value for the following error window (maximum allowable following error) is not allowed. Value range: [0.0, 10000.0]   Unit: e.g. mm
4507	17671	Parameter	<b>"Following error filter time (position) not allowed"</b> The value for the following error filter time (position) is not allowed. Value range: [0.0, 600.0]   Unit: s
4508	17672	Parameter	<b>"Following error window (velocity) not allowed"</b> The value for the following error window (velocity) is not allowed. Value range: [0.0, 10000.0]   Unit: e.g. m/min
4509	17673	Parameter	<b>"Following error filter time (velocity) not allowed"</b> The value for the following error filter time (velocity) is not allowed.

Error(Hex)	Error(Dec)	Error Type	Description
			Value range: [0.0, 600.0] Unit: s
450A	17674	Parameter	<b>"Controller Output Limitation" Improper</b> The value for output limitation of the controller at the overall setpoint quantity is improper. The presetting amounts to 0.5 (50 percent). Typically, this parameter is at work if to the motion controller device the velocity interface has been parameterized and the NC performs position control of the position on the controller.
4510	17680	Parameter	<b>"Proportional gain Kv or Kp (controller) not allowed"</b> position The value for the proportional gain (Kv factor or Kp factor) is not allowed. Value range: [0.0, 10000.0] Unit: e.g. mm/s/mm
4511	17681	Parameter	<b>"Integral-action time Tn (controller) not allowed"</b> position The value for the integral-action time is not allowed (I proportion of the PID T1 controller). Value range: [0.0, 60.0] Unit: s
4512	17682	Parameter	<b>"Derivative action time Tv (controller) not allowed"</b> position The value for the derivative action time is not allowed (D proportion of the PID T1 controller). Value range: [0.0, 60.0] Unit: s
4513	17683	Parameter	<b>"Damping time Td (controller) not allowed"</b> position The value for the damping time is not allowed (D proportion of the PID T1 controller). Suggested value: 0.1 * Tv Value range: [0.0, 60.0] Unit: s
4514	17684	Function	<b>"Activation of the automatic offset compensation not allowed"</b> Activation of the automatic offset compensation is only possible for certain types of controller (with no I component).
4515	17685	Parameter	<b>"Additional proportional gain Kv or Kp (controller) not allowed"</b> position The value for the second term of the proportional gain (Kv factor or Kp factor) is not allowed. Value range: [0.0, 10000.0] Unit: e.g. mm/s/mm
4516	17686	Parameter	<b>"Reference velocity for additional proportional gain Kv or Kp (controller) not allowed"</b> position The value for the reference velocity percentage data entry, to which the additional proportional gain is applied, is not allowed. The standard setting for the parameter is 0.5 (50%). Value range: [0.0 ... 1.0] Unit: %
4517	17687	Parameter	<b>"Proportional gain Pa (proportion) not allowed"</b> acceleration The value for the proportional gain (Pa factor) is not allowed. Value range: [0.0, 1000000.0] Unit: s
4518	17688	Parameter	<b>"Proportional gain Kv (velocity controller) not allowed"</b> The value for the proportional gain (Kv factor) is not allowed. Value range: [0.0, 10000.0] Unit: 1
4519	17689	Parameter	<b>"Reset time Tn (velocity controller) not allowed"</b> The value for the integral-action time is not allowed (I proportion of the PID T1 controller). Value range: [0.0, 60.0] Unit: s
451A	17690	Parameter	<b>Reserved</b> Reserved, currently not used.
451B	17691	Parameter	<b>Reserved</b> Reserved, currently not used.
451C	17692	Parameter	<b>"Velocity Filter Time" Improper</b>

Error(Hex)	Error(Dec)	Error Type	Description
			The parameter for velocity filter time in seconds is improper (P-T1 filter). This filter can be used within the NC for filtering an actual velocity or a velocity difference (velocity error = setpoint velocity - actual velocity) in special NC controllers (e.g. within the torque interface). Range of values: [0.0, 60.0] Unit: s
451D	17693	Parameter	„ <b>Dead zone not allowed</b> “ The value for the dead zone from the position error or the velocity error (system deviation) is not allowed (only for complex controller with velocity or torque interface). Value range: [0.0, 10000.0] Unit: mm resp. mm/s
451F	17695	Parameter	“ <b>Proportionality Factor Kcp</b> ” Improper The parameter for the “proportional factor $K_{cp}$ ” of the slave coupling differential control is improper. Range of values: [0.0, 10000.0] Unit: e.g. mm <sup>2</sup> /mm
4520	17696	Parameter	“ <b>Rate time Tv (velocity controller) not allowed</b> ” The value for the derivative action time is not allowed (D proportion of the PID T1 controller). Value range: [0.0, 60.0] Unit: s
4521	17697	Parameter	“ <b>Damping time Td (velocity controller) not allowed</b> ” The value for the damping time is not allowed (D proportion of the PID T1 controller). Suggested value: 0.1 * Tv Value range: [0.0, 60.0] Unit: s
4522	17698	Parameter	“ <b>Limitation of the I Part</b> ” Improper The parameter for limiting the I part of a PI or PID controller is improper. This inner state quantity can be limited in percent (1.0 refers to 100 percent). Range of values: [0.0 .. 1.0] Unit: %
4523	17699	Parameter	“ <b>Limitation of the D Part</b> ” Improper The parameter for limitation of the D part of a PI or PID controller is improper. This inner state quantity may be limited in percent (1.0 refers to 100 percent). Range of values: [0.0 .. 1.0] Unit: %
4524	17700	Parameter	Parameter “ <b>Switching Off the I Part During Motion</b> ” is Improper The boolean parameter for switching off the I part during an active positioning is improper. Range of values: [0, 1] Unit: 1
4525	17701	Parameter	Parameter “ <b>Filter Time for P-T2 Filter</b> ” Improper The time T0 in seconds is as filter time for the velocity controller P-T2 element improper. The filter time has to be smaller than twice the NC-SAF cycle time. Range of values: [0.0, 60.0] Unit: s
4526	17702	Parameter	Velocity Observer: “ <b>Parameterized Mode</b> ” is Improper The parameterized mode (0=OFF, 1=LUNENBERGER) for the special NC controller velocity observer within the torque interface is improper. Range of values: [0, 1] Unit: 1
4527	17703	Parameter	Velocity Observer: “ <b>Motor Torque Constant Kt or Kf</b> ” is Improper

Error(Hex)	Error(Dec)	Error Type	Description
			The parameter for the motor torque constant $K_t$ (rotational motor) or $K_f$ (linear motor) of the special NC controller velocity observer within the torque interface is improper. Range of values: [0.0 .. 100000.0]      Unit: Nm/A or N/A
4528	17704	Parameter	<b>Velocity Observer: "Motor Moment of Inertia JM" is Improper</b> The parameter for the motor moment of inertia $J_M$ of the special NC controller velocity observer within the torque interface is improper. Range of values: [0.0001 .. 100000.0]      Unit: kg cm <sup>2</sup>
4529	17705	Parameter	<b>Velocity Observer: "Band Width f0" is Improper</b> The parameter for the band width $f_0$ of the special NC controller velocity observer within the torque interface is improper. The band width has to be smaller than the reciprocal value of six times the NC cycle time ( $f_0 < 1/(6 \cdot T)$ ). Range of values: [0.0 .. 10000.0]      Unit: Hz
452A	17706	Parameter	<b>Velocity Observer: "Correction Factor kc" is Improper</b> The parameter for the correction factor $k_c$ of the special NC controller velocity observer within the torque interface is improper. The correction factor $k_c$ implements the relation between current and acceleration or angular acceleration. Range of values: [0.0 .. 100.0]      Unit: s
452B	17707	Parameter	<b>Velocity Observer: "Time Constant T for First Order Filter" is Improper</b> The time constant $T$ for the first order velocity filter (PID-T <sub>2</sub> or "Lead Lag") of the specific NC controller velocity observer within the torque interface is improper. The correction factor $k_c$ implements the relation between current and acceleration or angular acceleration. Range of values: [0.0 .. 100.0]      Unit: s
452C	17708	Parameter	<b>Velocity Observer: "Amplitude Damping d for Second Order Filter" is Improper</b> The high pass/ low pass amplitude damping $d_{HP}$ or $d_{TP}$ for the second order velocity filter ("Bi-Quad") of the special NC controller velocity observer within the torque interface is improper. Range of values: [0.2 .. 10.0]      Unit: 1
452D	17709	Parameter	<b>Velocity Observer: "Frequency fHP or Frequency fTP for Filters of Second Order" is Improper</b> The high pass frequency $f_{HP}$ or the low pass frequency $f_{TP}$ for the second order velocity filter ("Bi-Quad") of the specific NC controller velocity observer within the torque interface is improper. Range of values: [0.0, .. 10000.0]      Unit: Hz
4540	17728	Initialization	<b>"Controller initialization"</b> Controller has not been initialized. Although the controller has been created, the rest of the initialization has not been performed (1. Initialization of controller, 2. Reset controller).
4541	17729	Address	<b>"Axis address"</b> Controller does not know its axis, or the axis address has not been initialized.
4542	17730	Address	<b>"Drive address"</b> Controller does not know its drive, or the drive address has not been initialized.

Error(Hex)	Error(Dec)	Error Type	Description
4550	17744	Monitoring	<b>"Following error monitoring (position)"</b> With active following error monitoring (position) a following error exceedance has occurred, whose magnitude is greater than the following error window, and whose duration is longer than the parameterized following error filter time.
4551	17745	Monitoring	<b>"Following error monitoring (velocity)"</b> With active following error monitoring (velocity) a velocity following error exceedance has occurred, whose magnitude is greater than the following error window, and whose duration is longer than the parameterized following error filter time.
45A0	17824	Monitoring	<b>"CONTROLERR_RANGE_AREA_ASIDE"</b>
45A1	17825	Monitoring	<b>"CONTROLERR_RANGE_AREA_BSIDE"</b>
45A2	17826	Monitoring	<b>"CONTROLERR_RANGE_QNENN"</b>
45A3	17827	Monitoring	<b>"CONTROLERR_RANGE_PNENN"</b>
45A4	17828	Monitoring	<b>"CONTROLERR_RANGE_AXISIDPRESPO"</b>

## 2.7 Drive Errors

Error(hex)	Error(dec)	Error Type	Description
4600	17920	Parameter	<b>"Drive ID not allowed"</b> The value for the drive ID is not allowed, e.g. because it has already been assigned, is less than or equal to zero, or is greater than 255.
			Value range: [1 ... 255] Unit: 1
4601	17921	Parameter	<b>'Drive type impermissible'</b> The value for the drive type is impermissible, since it is not defined.
			Value range: [1, 20] Unit: 1
4602	17922	Parameter	<b>'Drive operating mode impermissible'</b> The value for the drive operating mode is impermissible (mode 1: standard).
			Value range: [1] Unit: 1
4603	17923	Parameter	<b>"Motor polarity inverted?"</b> The flag for the motor polarity is not allowed. Flag 0: Positive motor polarity flag 1: Negative motor polarity
			Value range: [0, 1] Unit: 1
4604	17924	Parameter	<b>'Drift compensation/speed offset (DAC offset)'</b> The value for the drift compensation (DAC offset) is impermissible.
			Value range: [-100.0, 100.0] Unit: e.g. m/min
4605	17925	Parameter	<b>'Reference speed (velocity pre-control)'</b> The value for the reference speed (also called velocity pilot control) is impermissible.
			Value range: [0.0, 10000.0] Unit: e.g. m/min
4606	17926	Parameter	<b>'Reference output in percent'</b> The value for the reference output in percent is impermissible. The value 1.0 (100 %) usually corresponds to a voltage of 10.0 V.
			Value range: [0.0, 5.0] Unit: %
4607	17927	Parameter	<b>'Quadrant compensation factor'</b> The value for the quadrant compensation factor is impermissible.
			Value range: [0.0, 100.0] Unit: 1
4608	17928	Parameter	<b>'Velocity reference point'</b> The value for the velocity reference point in percent is impermissible. The value 1.0 corresponds to 100 percent.
			Value range: [0.01, 1.0] Unit: %



Error(hex)	Error(dec)	Error Type	Description
4609	17929	Parameter	<b>'Output reference point'</b> The value for the output reference point in percent is impermissible. The value 1.0 corresponds to 100 percent.
			Value range: [0.01, 1.0] Unit: %

Error(hex)	Error(dec)	Error Type	Description
460A	17930	Parameter	<b>'Minimum or maximum output limits (output limitation)'</b> The value for the minimum and/or maximum output limit is impermissible. This will happen if the range of values is exceeded, the maximum limit is smaller than the minimum limit, or the distance between the minimum and maximum limits is zero. The minimum limit is initially set to -1.0 (-100 percent) and the maximum limit to 1.0 (100 percent).
			Value range: [-1.0, 1.0] Unit: %
460B	17931	Parameter	<b>Parameter "Maximum Value for Output" is Improper</b> The value for the maximum number of output digits of motion controllers (maximum output value) is improper. According to the used interface (e.g. position, velocity or torque/current). Regarding a velocity interface it is often about a signed 16 bit output value ( $\pm 32767$ ).
			Range of values: [0x000000FF .. 0xFFFFFFFF] Unit: INC or Digits
460C	17932	Parameter	<b>Parameter "Internal Drive Control Word" is Improper</b> The value as Internal Drive Control Word for the NC is improper. In this control word information from the system manager to the NC is contained what is evaluated at the TC start of the NC.
			Range of values: [>0] Unit: 1
460D	17933	Parameter	<b>Parameter "Internal Timer for RESET Behavior of Motion Controller" is Improper</b> The special parameter that influences the internal timing behavior between the NC motion controller and the IO motion controller is improper.
			Range of values: [>5] Unit: 1 (NC SAF Cycles)
460E	17934	Parameter	<b>Parameter "Master Motion Controller ID" is Improper</b> The parameter "master motion controller ID" is improper for a further NC motion controller in slave mode. An additional NC motion controller in slave mode can be used if this usage is about the same motion controller device on that different NC information for e.g. different operation modes are joined (e.g. velocity mode and torque mode). Note: This parameter is not accessible by the user directly, but can be influenced indirectly by the configuration of additional NC motion controllers below the NC axis.
			Range of values: [0 .. 255] Unit: 1
460F	17935	Parameter	<b>'Drive torque output scaling impermissible'</b> The value is impermissible as drive torque output scaling (rotary motor) or as force output scaling (linear motor).
			Value range: [0, 1000000] Unit: 1
4610	17936	Parameter	<b>„Drive velocity output scaling is not allowed“</b> The value for the drive velocity output scaling is not allowed.
			Value range: [0, 1000000] Unit: 1

Error(hex)	Error(dec)	Error Type	Description
4611	17937	Parameter	<b>'Profi Drive DSC proportional gain Kpc (controller) impermissible'</b> <i>Positions</i> The value for the Profi Drive DSC position control gain (Kpc factor) is impermissible.
			Value range: [0, 0xFFFFF]   Unit: 0.001 * 1/s
4612	17938	Parameter	<b>'Table ID is impermissible'</b> The value for the table ID is impermissible.
			Value range: [0, 255]   Unit: 1
4613	17939	Parameter	<b>'Table interpolation type is impermissible'</b> The value is impermissible as the table interpolation type.
			Value range: 0 (LINEAR), 2 (SPLINE)   Unit: 1
4614	17940	Parameter	<b>'Output offset in percent is impermissible'</b> The value is impermissible as an output offset in percent (+/- 1.0).
			Value range: [-1.0, 1.0]   Unit: %
4615	17941	Parameter	<b>'Profi Drive DSC scaling for calculation of "Xerr" (controller) impermissible'</b> <i>Positions</i> : the value is impermissible as Profi Drive DSC scaling for the calculation of 'Xerr'.
			Value range: [0, 1000000]   Unit: 1
4616	17942	Parameter	<b>'Drive acceleration output scaling impermissible'</b> The value is impermissible as drive acceleration/deceleration output scaling.
			Value range: [0, 1000000]   Unit: 1
4617	17943	Parameter	<b>'Drive position output scaling impermissible'</b> The value is impermissible as drive position output scaling.
			Value range: [0, 1000000]   Unit: 1
4618	17944	Parameter	<b>Parameter "Dead Time Compensation Mode" (Motion Controller) is Invalid</b>
			The parameter for the mode of dead time compensation of NC motion controllers is invalid (OFF, ON with velocity, ON with velocity and acceleration). Range of values: [0, 1, 2]   Unit: 1
4619	17945	Parameter	<b>Parameter "Control Bits of Dead Time Compensation" (Motion Controller) is Invalid</b>
			The parameter for "control bits of dead time compensation" of NC motion controllers is invalid (e.g. relative or absolute time interpretation). Range of values: [>0]   Unit: 1
461A	17946	Parameter	<b>Parameter "Time Shift of Dead Time Compensation" (Motion Controller) is Invalid</b>
			The parameter for the time shift of dead time compensation (time shift in nanoseconds) of the NC motion controller is invalid. Range of values: [-1.0E9 .. 1.0E9]   Unit: ns
461B	17947	Parameter	<b>Parameter "Output Delay (Velocity)" is Invalid</b>
			The parameter for an optional output delay within the velocity interface to the motion controller is invalid (output delay (velocity)). The maximum permitted delay time has to be smaller than 100 times the NC SAF cycle time. Range of values: [0.0 .. 0.1]   Unit: s

Error(hex)	Error(dec)	Error Type	Description
461C	17948	Parameter	<b>'Drive filter type impermissible for command variable filter for the output position'</b> The value is impermissible as a drive filter type for the smoothing of the output position (command variable filter for the setpoint position).
			Value range: [0, 2]   Unit: 1
461D	17949	Parameter	<b>'Drive filter time impermissible for command variable filter for the output position'</b> The value is impermissible as a drive filter time for the smoothing of the output position (command variable filter for the setpoint position).
			Value range: [0.0, 1.0]   Unit: s
461E	17950	Parameter	<b>'Drive filter order impermissible for command variable filter for the output position'</b> The value is impermissible as a drive filter order (P-Tn) for the smoothing of the output position (command variable filter for the setpoint position).
			Value range: [0, 10]   Unit: 1
4620	17952	Parameter	<b>'Bit mask for stepper motor cycle impermissible'</b> A value of the different stepper motor masks is impermissible for the respective cycle.
			Value range: [0, 255]   Unit: 1
4621	17953	Parameter	<b>'Bit mask for stepper motor holding current impermissible'</b> The value for the stepper motor holding mask is impermissible.
			Value range: [0, 255]   Unit: 1
4622	17954	Parameter	<b>'Scaling factor for actual torque (actual current) impermissible'</b> The value is impermissible as a scaling factor for the actual torque (or actual current).
			Value range: [0, 1E+30]   Unit:
4623	17955	Parameter	<b>'Filter time for actual torque is impermissible'</b> The value is impermissible as a filter time for the actual torque (or the actual current) (P-T1 filter).
			Value range: [0.0, 60.0]   Unit: s
4624	17956	Parameter	<b>'Filter time for the temporal derivation of the actual torque is impermissible'</b> The value is impermissible as a filter time for the temporal derivation of the actual torque (or actual current) (P-T1 filter).
			Value range: [0.0, 60.0]   Unit: s

Error(hex)	Error(dec)	Error Type	Description
4625	17957	Parameter	<p><b>Parameter for the “Motion Controller Operation Mode” is Invalid</b></p> <p>The parameter for the motion controller operation mode (position mode, velocity mode, torque mode, ...) is invalid. Possibly, an NC operation mode switching has been tried or at TC system start has been tried to activate a preconfigured operation mode.</p> <p>Annotations: The generic operation modes defined within the NC are realized by the NC motion controller specifically, i.e. in particular for the protocols SERCOS/ SoE and CANopen/ CoE (DS402). In this connection, protocol specific, motion controller specific or even customer specific peculiarities have to be obeyed (e.g. regarding SERCOS/ SoE merely in the SERCOS parameter range S-0-0032 to S-0-0035 predefined operation modes can be activated at runtime). Furthermore, not every generic NC operation mode can be converted into a motion controller specific operation mode (here gaps within the specification may exist).</p> <p>The generic NC operation mode 0 forms a special case. This value is used as a mark to activate an NC default operation mode (as long as this mark is known to the NC).</p> <p>Range of values: [0, &gt;=1]      Unit: 1</p>
4626	17958	Monitoring	<p><b>Motion Controller Functionality is Not Supported</b></p> <p>A motion controller functionality has been set off that has not been released for usage or has not been implemented (e.g. writing or reading of a motion controller mode that is not supported by certain motion controllers). It is also possible that this functionality is merely not supported at times (e.g. because the motion controller device resides in error state or a motion controller enable is missing).</p>
4627	17959	Function	<p><b>DRIVEOPERATIONMODEBUSY.</b> The activation of the motion controller controlling mode has failed because another object with OI... uses this interface already.</p>
4628	17960	Monitoring	<p><b>Motion Controller Operation Mode Switching has not been configured or the desired motion controller operation mode cannot be found</b></p> <p>There has not any motion controller operation mode switching been configured and thus no reading or writing of a motion controller operation mode is possible. Or the desired motion control operation mode has not been found in the list of the predefined motion controller operation modes (e.g. for SoE/ SERCOS).</p> <p>Annotation for CoE motion controllers: The reading or writing of the CoE Motion Control Operation Mode is merely possible if the CoE objects 0x6060 Modes Of Operation and 0x6061 Modes Of Operation Display can be found in the cyclic process data (PDO list) and a valid default operation mode has been configured.</p> <p>Annotation for SoE motion controllers: The reading or writing of the current SoE Motion Controller Operation Mode is merely possible if this operation mode has been predefined in one of the SoE Parameters S-0-0032 to S-0-0035.</p>
<p><b>0x4630 ... 0x463F: Error codes are reserved for external motion controller errors (e.g. stepper motor terminal or function block MC_PowerStepper).</b></p>			

Error(hex)	Error(dec)	Error Type	Description
4630	17968	Monitoring	<b>'Overtemperature'</b> Overtemperature was detected or reported in the drive or terminal.
4631	17969	Monitoring	<b>'Undervoltage'</b> Undervoltage was detected or reported in the drive or terminal.
4632	17970	Monitoring	<b>'Wire break in phase A'</b> A wire break in phase A was detected or reported in the drive or terminal.
4633	17971	Monitoring	<b>'Wire break in phase B'</b> A wire break in phase B was detected or reported in the drive or terminal.
4634	17972	Monitoring	<b>'Overcurrent in phase A'</b> Overcurrent was detected or reported in phase A in the drive or terminal.
4635	17973	Monitoring	<b>'Overcurrent in phase B'</b> Overcurrent was detected or reported in phase B in the drive or terminal.
4636	17974	Monitoring	<b>'Torque overload (stall)'</b> A torque overload (stall) was detected or reported in the drive or terminal.
4640	17984	Initialization	<b>'Drive initialization'</b> Drive has not been initialized. Although the drive has been created, the rest of the initialization has not been performed (1. Initialization of drive I/O, 2. Initialization of drive, 3. Reset drive).
4641	17985	Address	<b>'Axis address'</b> Drive does not know its axis, or the axis address has not been initialized.
4642	17986	Address	<b>'Address IO input structure'</b> Drive has no valid IO input address in the process image.
4643	17987	Address	<b>'Address IO output structure'</b> Drive has no valid IO output address in the process image.
4650	18000	Monitoring	<b>'Drive hardware not ready to operate'</b> The drive hardware is not ready for operation. The following are possible causes: - the drive is in the error state (hardware error) - the drive is in the start-up phase (e.g. after an axis reset that was preceded by a hardware error) - the drive is missing the controller enable (ENABLE) Note: The time required for "booting" a drive after a hardware fault can amount to several seconds.
4651	18001	Monitoring	<b>Error in the cyclic communication of the drive (Life Counter).</b> Reasons for this could be an interrupted fieldbus or a drive that is in the error state.
4652	18002	Monitoring	<b>'Changing the table ID when active controller enable is impermissible'</b> . Changing (deselecting, selecting) the characteristic curve table ID is not permissible when the controller enable for the axis is active.
4655	18005	Monitoring	<b>'Invalid IO data for more than 'n' continuous NC cycles'</b> The axis (encoder or drive) has detected invalid IO data (e.g. n=3) for more than 'n' continuous NC cycles (NC SAF task). EtherCAT fieldbus: 'working counter error ('WCState')' As a result it is possible that the encoder referencing flag will be reset to FALSE (i.e. the encoder is given the status 'unreferenced'). Lightbus fieldbus: 'CDL state error ('CdIState')' As a result it is possible that the encoder calibration flag will set to FALSE (that means uncalibrated).

## 2.8 Table Errors

Error(Hex)	Error(Dec)	Error Type	Description
4A00	18944	Parameter	<b>"Table ID not allowed"</b> The value for the table ID is not allowed, e.g. because it has already been assigned, is less than or equal to zero, or is greater than 255.
			Value range: [1 ... 255]   Unit: 1
4A01	18945	Parameter	<b>"Table type not allowed"</b> The value for the table type is unacceptable because it is not defined.
			Value range: [1 ]   Unit: 1
4A02	18946	Parameter	<b>"Number of lines in the table not allowed"</b> The value of the number of lines in the table is not allowed, because, for example, it is smaller than two at linear interpolation and smaller than four at spline interpolation.
			Value range: [2, 0xFFFF]   Unit: 1
4A03	18947	Parameter	<b>"Number of columns in the table is not allowed"</b> The value of the number of columns in the table is not allowed, because, for example, it is less than or equal to zero (depends upon the type of table or slave).
			Value range: [1, 0xFFFF]   Unit: 1
4A04	18948	Parameter	<b>"Step size (position delta) not allowed"</b> The value for the step size between two lines (position delta) is not allowed, because, for example, it is less than or equal to zero.
			Value range: [0.001, 1.0E+6]   Unit: e.g. mm
4A05	18949	Parameter	<b>"Period not allowed"</b> The value for the period is not allowed, because, for example, it is less than or equal to zero.
			Value range: [0.001, 1.0E+9]   Unit: e.g. mm
4A06	18950	Parameter	<b>"Table is not monotonic"</b> The value for the step size is not allowed, because, for example, it is less than or equal to zero.
4A07	18951	Initialization	<b>„Table sub type is not allowed“</b> The value for the table sub type is not allowed or otherwise the table class (slave type) do not match up to the table main type. Table sub type: (1) equidistant linear position table, (2) equidistant cyclic position table, (3) none equidistant linear position table, (4) none equidistant cyclic position table
			Value range: [1, 4]   Unit: 1
4A08	18952	Initialization	<b>„Table interpolation type is not allowed“</b> The value for the table interpolation type is allowed. Table interpolation type: (0) linear-interpolation, (1) 4-point-interpolation, (2) spline-interpolation
			Value range: [0, 2]   Unit: 1

Error(Hex)	Error(Dec)	Error Type	Description
4A09	18953	Initialization	<b>"Incorrect table main type"</b> The table main type is unknown or otherwise the table class (slave type) do not match up to the table main type. Table main type: (1) camming table, (2) characteristic table, (3) 'motion function' table (MF)
4A10	18960	Initialization	<b>"Table initialization"</b> Table has not been initialized. Although the table has been created, the rest of the initialization has not been performed. For instance, the number of lines or columns may be less than or equal to zero.

Error(Hex)	Error(Dec)	Error Type	Description
4A11	18961	Initialization	<b>"Not enough memory"</b> Table could not be created, since there is not enough memory.
4A12	18962	Function	<b>"Function not executed, function not available"</b> The function has not been implemented, or cannot be executed, for the present type of table.
4A13	18963	Function	<b>"Line index not allowed"</b> The start line index or the stop line index to be used for read or write access to the table is not allowed. For instance, the line index may be greater than the total number of lines in the table.
4A14	18964	Function	<b>"Column index not allowed"</b> The start column index or the stop column index to be used for read or write access to the table is not allowed. For instance, the column index may be greater than the total number of columns in the table.
4A15	18965	Function	<b>"Number of lines not allowed"</b> The number of lines to be read from or written to the table is not allowed. The number of lines must be an integer multiple of the number of elements in a line (n * number of columns).
4A16	18966	Function	<b>"Number of columns not allowed"</b> The number of columns to be read from or written to the table is not allowed. The number of columns must be an integer multiple of the number of elements in a column (n * number of lines).
4A17	18967	Function	<b>"Error in scaling or in range entry"</b> The entries in the table header are inconsistent, e.g. the validity range is empty. If the error is generated during the run time it is a run time error and stops the master/slave group.
4A18	18968	Function	<b>"Multi table slave out of range"</b> The slave master position is outside the table values for the master. The error is a run-time error, and stops the master/slave group.
4A19	18969	Function	<b>"Solo table underflow"</b> The slave master position is outside the table values for the master. The master value of the equidistant table, to be processed linearly, lies under the first table value. The error is a run-time error, and stops the master/slave group.
4A1A	18970	Function	<b>"Solo table overflow"</b> The slave master position is outside the table values for the master. The master value of the equidistant table, to be processed linearly, lies above the first table value. The error is a run-time error, and stops the master/slave group.
4A1B	18971	Parameter	<b>"Incorrect execution mode"</b> The cyclic execution mode can only be "true" or "false".
4A1C	18972	Parameter	<b>"Impermissible parameter"</b> The Fifo parameter is not allowed.
4A1D	18973	Parameter	<b>"Fifo is empty"</b> The Fifo of the external generator is empty. This can signify end of track or a run time error.
4A1E	18974	Parameter	<b>"Fifo is full"</b> The Fifo of the external generator is full. It is the user's task to continue to attempt to fill the Fifo with the rejected values.
4A1F	18975	Parameter	<b>„Point-Index of Motion Function invalid“</b> The point index of a Motion Function Point of a Function Table is invalid. First the point index has to be larger than zero and second it has to be numerical continuously for one column in the Motion Function Table (e.g. 1,2,3,... or 10,11,12,...). Remark: The point index is not online-changeable but must be constant.
4A20	18976	Initialization	<b>„No diagonalization of matrix“</b> The spline can not be calculated. The master positions are not correct.

Error(Hex)	Error(Dec)	Error Type	Description
4A21	18977	Initialization	„ <b>Number of spline points to less</b> “ The number of points of a cubic spline has to be greater than two.
4A22	18978	Initialization	„ <b>Fifo must not be overwritten</b> “ Fifo must not be overwritten since then the active line would be overwritten. It is the task of the user to secure that the active line is not modified.
4A23	18979	Function	„ <b>Insufficient number of Motion Function points</b> “ The number of valid Motion Function points is less than two. Either the entire number of points is too low or the point type of many points is set to <i>Ignore Point</i> .
4A25	18981	Initialization	“ <b>Table master start position is not allowed</b> ” A periodic position table must start with a master position zero. A Motion Function (MF) table can start at a position greater than zero but less than the cam period.

## 2.9 NC-PLC Errors

Error(Hex)	Error(dec)	Error type	Description
4B00	19200	Parameter	<b>"Axis was stopped"</b> The axis was stopped during travel to the target position. The axis may have been stopped with a PLC command via ADS, a call via AXFNC, or by the System Manager.
4B01	19201	Parameter	<b>"Axis cannot be started"</b> The axis cannot be started because: <ul style="list-style-type: none"> <li>• the axis is in error status,</li> <li>• the axis is executing another command,</li> <li>• the axis is in protected mode,</li> <li>• the axis is not ready for operation.</li> </ul>
4B02	19202	Parameter	<b>"Control mode not permitted"</b> No target position control, and no position range control.
4B03	19203	Parameter	<b>"Axis is not moving"</b> The position and velocity can only be restarted while the axis is physically in motion.
4B04	19204	Parameter	<b>"Invalid mode"</b> Examples: Invalid <i>Direction</i> with <i>MC_MoveModulo</i> . Inactive axis parameter <i>Position correction</i> with <i>MC_BacklashCompensation</i> .
4B05	19205	Parameter	<b>"Command not permitted"</b> <ul style="list-style-type: none"> <li>• Continuous motion in an unspecified direction</li> <li>• Read/Write parameters: type mismatch</li> </ul>
4B06	19206	Parameter	<b>"Parameter incorrect"</b> <ul style="list-style-type: none"> <li>• Incorrect override: &gt; 100% or &lt; 0%</li> <li>• Incorrect gear ratio: RatioDenominator = 0</li> </ul>
4B07	19207	Parameter	<b>"Timeout axis function block"</b> After positioning, all "MC_Move..." blocks check whether positioning was completed successfully. In the simplest case, the "AxisHasJob" flag of the NC axis is checked, which initially signifies that positioning was logically completed. Depending on the parameterization of the NC axis, further checks (quality criteria) are used: <ul style="list-style-type: none"> <li>• "Position range monitoring" If position range monitoring is active, the system waits for feedback from the NC. After positioning, the axis must be within the specified positioning range window.</li> </ul>



Error(Hex)	Error(dec)	Error type	Description
			<p>If necessary, the position controller ensures that the axis is moved to the target position. If the position controller is switched off (Kv=0) or weak, the target may not be reached.</p> <ul style="list-style-type: none"> <li>"Target position monitoring" If target position monitoring is active, the system waits for feedback from the NC. After positioning, the axis must be within the specified target position window for at least the specified time. If necessary, the position controller ensures that the axis is moved to the target position. If the position controller is switched off (Kv=0) or weak, the target may not be reached. Floating position control may lead to the axis oscillating around the window but not remaining inside the window.</li> </ul> <p>If the axis is logically at the target position (logical standstill) but the parameterized position window has not been reached, monitoring of the above-mentioned NC feedback is aborted with error 19207 (0x4B07) after a constant timeout of 6 seconds.</p>
4B08	19208	Parameter	<b>"Axis is in protected mode"</b> The axis is in protected mode (e.g., coupled) and cannot be moved.
4B09	19209	Parameter	<b>"Axis is not ready"</b> The axis is not ready and cannot be moved.
4B0A	19210	Parameter	<b>"Error during referencing"</b> Referencing (homing) of the axis could not be started or was not successful.
4B0B	19211	Parameter	<b>"Incorrect definition of the trigger input"</b> The definition of the trigger signal for function block MC_TouchProbe is incorrect. The defined encoder-ID, the trigger signal or the trigger edge are invalid.
4B0C	19212	Function	<b>"Position latch was disabled"</b> The function block MC_TouchProbe has detected that a measuring probe cycle it had started was disabled. The reason may be an axis reset, for example.
4B0D	19213	Function	<b>"NC status feedback timeout"</b> A function was successfully sent from the PLC to the NC. An expected feedback in the axis status word has not arrived.
4B0E	19214	Function	<b>"Additional product not installed"</b> The function is available as an additional product but is not installed on the system.
4B0F	19215	Function	<b>"No NC Cycle Counter Update"</b> – The NcToPlc Interface or the NC Cycle Counter in the NcToPlc Interface was not updated.
<b>Error numbers 0x4B10 .. 0x4B2F are used in the <i>TwinCAT NCI</i> context:</b>			
4B10	19216	Function	<b>"M-function query missing"</b> This error occurs if the M-function was confirmed, but the request bit was not set.
4B11	19217	Parameter	<b>"Zero shift index is outside the range"</b> The index of the zero shift is invalid.
4B12	19218	Parameter	<b>"R-parameter index or size is invalid"</b> This error occurs if the R-parameters are written or read but the index or size are outside the range.
4B13	19219	Parameter	<b>"Index for tool description is invalid"</b>
4B14	19220	Function	<b>"Version of the cyclic channel interface does not match the requested function or the function block"</b> This error occurs if an older TwinCAT version is used to call new functions of a later TcNci.lib version.

Error(Hex)	Error(dec)	Error type	Description
4B15	19221	Function	<b>"Channel is not ready for the requested function"</b> The requested function cannot be executed, because the channel is in the wrong state. This error occurs during reverse travel, for example, if the axis was not stopped with ItpEStop first.
4B16	19222	Function	<b>"Requested function is not activated"</b> The requested function requires explicit activation.
4B17	19223	Function	<b>"Axis is already in another group"</b> The axis has already been added to another group.
4B18	19224	Function	<b>"Block search could not be executed successfully"</b> The block search has failed. Possible causes: <ul style="list-style-type: none"> <li>Invalid block number</li> </ul>
4B19	19225	Parameter	<b>"Invalid block search parameter"</b> This error occurs if the FB ItpBlocksearch is called with invalid parameters (e.g., E_ItpDryRunMode, E_ItpBlockSearchMode)
4B20	19232	Function	<b>"Cannot add all axes"</b> This error occurs if an auxiliary axis is to be added to an interpolation group, but the function fails. It is likely that a preceding instruction of an auxiliary axis was skipped.
<b>Error numbers 0x4B30 .. 0x4B3F are used in the TcMcCam library (MC_NC_TableErrorCodes):</b>			
4B30	19248	Parameter	<b>"Pointer is invalid"</b> A pointer to a data structure is invalid, e.g., Null <ul style="list-style-type: none"> <li>Data structure MC_CAM_REF was not initialized</li> </ul>
4B31	19249	Parameter	<b>"Memory size invalid"</b> The specification of the memory size (SIZE) for a data structure is invalid. <ul style="list-style-type: none"> <li>The value of the size parameter is 0 or less than the size of one element of the addressed data structure.</li> <li>The value of the size parameter is less than the requested amount of data.</li> <li>The value of the size parameter does not match other parameters as number of points, number of rows or number of columns.</li> </ul>
4B32	19250	Parameter	<b>"Cam table ID is invalid"</b> The ID of a cam table is not between 1 and 255.
4B33	19251	Parameter	<b>"Point ID is invalid"</b> The ID of a point (sampling point) of a motion function is less than 1.
4B34	19252	Parameter	<b>"Number of points is invalid"</b> The number of points (sampling points) of a cam plate to be read or written is less than 1.
4B35	19253	Parameter	<b>"MC table type is invalid"</b> The type of a cam plate does not match the definition <i>MC_TableType</i> .
4B36	19254	Parameter	<b>"Number of rows invalid"</b> The number of rows (sampling points) of a cam table is less than 1.
4B37	19255	Parameter	<b>"Number of columns invalid"</b> The number of columns of a cam table is invalid. <ul style="list-style-type: none"> <li>The number of columns of a motion function is not equal 1</li> <li>The number of columns of a standard cam table is not equal 2</li> <li>The number of columns does not match another parameter (ValueSelectMask)</li> </ul>
4B38	19256	Parameter	<b>"Step size invalid"</b> . The increment for the interpolation is invalid, e.g., less than or equal to zero.

Error(Hex)	Error(dec)	Error type	Description
<b>Error numbers 0x4B0F, 0x4B40 .. 0x4B4F are used in several libraries (TcNc-Lib / Tc2_MC2_XFC-Lib):</b>			
4B40	19264	Monitoring	<b>"Terminal type not supported"</b> The terminal used is not supported by this function block.
4B41	19265	Monitoring	<b>"Register read/write error"</b> This error implies a validity error.
4B42	19266	Monitoring	<b>"Axis is enabled"</b> The axis is enabled but should not be enabled for this process.
4B43	19267	Parameter	<b>"Incorrect size of the compensation table"</b> The specified table size (in bytes) does not match the actual size
4B44	19268	Parameter	The minimum/maximum position in the compensation table does not match the position in the table description (ST_CompensationDesc)
4B45	19269	Parameter	<b>"Not implemented"</b> The requested function is not implemented in this combination
4B46	19270	Parameter	<b>"Window not in the specified modulo range"</b> The parameterized min or max position is not in the specified modulo range
4B47	19271	Monitoring	<b>"Buffer overflow"</b> The number of events has led to an overflow of the buffer and not all events could be acquired.
<b>Error numbers 0x4B50 .. 0x4B5F are used in the TcRemoteSyn-Lib:</b>			
<b>Error numbers 0x4B60 .. 0x4B6F are used in the TcMc2-Lib in the buffered commands context:</b>			
4B60	19296	Monitoring	<b>"Motion command did not become active"</b> A motion command has been started and has been buffered and confirmed by the NC. Nevertheless, the motion command did not become active (possibly due to a terminating condition or an internal NC error).
4B61	19297	Monitoring	<b>"Motion command could not be monitored by the PLC"</b> A motion command has been started and has been buffered and confirmed by the NC. The PLC has not been able to monitor the execution of this command and the execution status is unclear since the NC is already executing a more recent command. The execution state is unclear. This error may come up with very short buffered motion commands which are executed during one PLC cycle.
4B62	19298	Monitoring	<b>"Buffered command was terminated with an error"</b> A buffered command was terminated with an error. The error number is not available, because a new command is already being executed.
4B63	19299	Monitoring	<b>"Buffered command was completed without feedback"</b> A buffered command was completed but there was no feedback to indicate success or failure.
4B64	19300	Monitoring	<b>" 'BufferMode' is not supported by the command"</b> The 'BufferMode' is not supported by this command.
4B65	19301	Monitoring	<b>"Command number is zero"</b> The command number for queued commands managed by the system unexpectedly has the value 0.
4B66	19302	Monitoring	<b>"Function block was not called cyclically"</b> The function block was not called cyclically. The command execution could not be monitored by the PLC, because the NC was already executing a subsequent command. The execution state is unclear.
<b>Error numbers 0x4B70 .. 0x4B8F are used in the TcPlcInterpolation-Lib:</b>			

Error(Hex)	Error(dec)	Error type	Description
4B71	19313	Parameter	"Invalid NCI entry type". The FB FB_NciFeedTablePreparation was called with an unknown nEntryType.
4B72	19314	Function	"NCI feed table full" The table is full, and the entry is therefore not accepted. Remedy: Transfer the context of the table with FB_NciFeedTable to the NC kernel. If bFeedingDone = TRUE, the table can be reset in FB_NciFeedTablePreparation with bResetTable and then filled with new entries.
4B73	19315	Function	internal error
4B74	19316	Parameter	"ST_NciTangentialFollowingDesc: Tangential axis is not an auxiliary axis" In the entry for the tangential following, a tangential axis was named that is not an auxiliary axis.
4B75	19317	Parameter	ST_NciTangentialFollowingDesc: nPathAxis1 or nPathAxis2 is not a path axis. It is therefore not possible to determine the plane.
4B76	19318	Parameter	ST_NciTangentialFollowingDesc: nPathAxis1 and nPathAxis2 are the same. It is therefore not possible to determine the plane.
4B77	19319	Parameter	ST_NciGeoCirclePlane: Circle incorrectly parameterized
4B78	19320	Function	Internal error during calculation of tangential following
4B79	19321	Monitoring	Tangential following: Monitoring of the deviation angle was activated during activation of tangential following (E_TfErrorOnCritical1), and an excessively large deviation angle was detected in the current segment.
4B7A	19322	Function	not implemented
4B7B	19323	Parameter	Tangential following: the radius of the current arc is too small
4B7C	19324	Parameter	FB_NciFeedTablePreparation: pEntry is NULL
4B7D	19325	Parameter	FB_NciFeedTablePreparation: the specified nEntryType does not match the structure type
4B7E	19326	Parameter	ST_NciMFuncFast and ST_NciMFuncHsk: the requested M-function is not between 0 and 159
4B7F	19327	Parameter	ST_NciDynOvr: the requested value for the dynamic override is not between 0.01 and 1
4B80	19328	Parameter	ST_NciVertexSmoothing: invalid parameter. This error is generated if a negative smoothing radius or an unknown smoothing type is encountered.
4B81	19329	Parameter	FB_NciFeedTablePreparation: The requested velocity is not in the valid range
4B82	19330	Parameter	ST_Nci*: invalid parameter
<b>Error numbers 0x4B90 .. 0x4B9F are used in the Tc3_MC2_AdvancedHoming-Lib(PLCopen Part 5: Homing Procedures):</b>			
4B90	19344	Parameter	Determined <b>drive type</b> is not supported
4B91	19345	Parameter	<b>Direction</b> is impermissible
4B92	19346		<b>SwitchMode</b> is impermissible
4B93	19347		<b>Mode</b> for the parameter handling is impermissible
4B94	19348		Parameterization of the torque limits is inconsistent
4B95	19349		Parameterization of the position lag limit is impermissible (<=0).
4B96	19350		Parameterization of the distance limit is impermissible (<0)

Error(Hex)	Error(dec)	Error type	Description
4B97	19351		An attempt was made to back up parameters again, although they have already been backed up.
4B98	19352		An attempt was made to restore parameters, although none have been backed up.
4B9F	19359		The abortion of a homing has failed.
<b>Error numbers 0x4BA0 .. 0x4BAF are used in the <i>TcNcKinematicTransformation-Lib</i>:</b>			
4BA0	19360	Function	<b>KinGroup error:</b> the kinematic group is in an error state. This error may occur if the kinematic group is in an error state or an unexpected state when it is called (e.g., simultaneous call via several FB instances).
4BA1	19361	Function	<b>KinGroup timeout:</b> timeout during call of a kinematic block
<b>Error numbers 0x4BB0 .. 0x4BBF are used in the <i>Tc2_MC2_Drive-Lib</i>:</b>			
4BB0	19376	Function	The current axis position or the axis position resulting from the new position offset exceeds the valid range of values.
4BB1	19377	Function	The new position offset exceeds the valid range of values [AX5000: 2 <sup>31</sup> ].
4BB2	19378	Function	The current axis position or the axis position resulting from the new position offset falls below the valid range of values.
4BB3	19379	Function	The new position offset falls below the valid range of values [AX5000: -2 <sup>31</sup> ].
4BB4	19380	Function	The activated feedback and/or storage location (AX5000: P-0-0275) differ from the parameterization on the function block.
4BB5	19381	Function	Reinitialization of the actual NC position has failed, e.g., reference system = "ABSOLUTE (with single overflow)" & software end position monitoring is disabled.
4BB6	19382	Function	The command to set or delete a position offset was rejected without feedback data, e.g., if the drive controller's firmware does not support the corresponding command.
4BB7	19383	Function	The command to set or delete a position offset was rejected with feedback data. The information in the feedback data may contain further information about the cause.  e.g., if the drive controller's firmware does not support the corresponding command.
4BB8	19384	Function	A firmware version >= 19 is required for the servo terminal.
4BB9	19385	Function	The modulo settings on the drive controller and NC are different.
<b>Error numbers 0x4BC0 .. 0x4BCF are used in the <i>Tc3_DriveMotionControl-Lib</i>:</b>			
4BC2	19394		The new position offset exceeds the valid value range.
4BC3	19395		I/O data are invalid or the terminal is in an error state.

## 2.10 Kinematic Transformation

Error(Hex)	Error(Dec)	Error Type	Description
4C00	19456		<b>Transformation failed.</b>
4C01	19457		<b>Ambiguous answer.</b> The answer of the transformation is not explicit.

Error(Hex)	Error(Dec)	Error Type	Description
4C02	19458		<b>Invalid axis position:</b> The transformation can not be calculated with the current position data. Possible causes: <ul style="list-style-type: none"> <li>The position is outside the working area of the kinematics</li> </ul>
4C03	19459	Configuration	<b>Invalid dimension:</b> The dimension of the parameterized input parameter does not match the dimension expected by the kinematic object. Possible causes: <ul style="list-style-type: none"> <li>Too many position values are supplied for this configuration. Check the number of parameterized axes.</li> </ul>
4C04	19460		<b>NCERR_KINTRAF0_REGISTRATION</b>
4C05	19461	Internal	<b>Newton iteration failed:</b> The Newton iteration does not converge.
4C06	19462	Internal	<b>Jacobi matrix cannot be inverted</b>
4C07	19463	Configuration	<b>Invalid cascade:</b> This kinematic configuration is not permitted.
4C08	19464	Programming	<b>Singularity:</b> The machine configuration results in singular axis velocities.
4C0B	19467	Internal	<b>No metainfo:</b> Metainfo pointer is null.
4C13	19475	Internal	<b>NCERR_RBTFRAME_INVALIDWCSTOMCS</b> The employed <code>WcsToMcs</code> component leads to positions that the selected kinematics cannot adopt to. Tailoring the <code>WcsToMcs</code> parameters is required.
4C20	19488	Internal	<b>Transformation failed:</b> Call of extended kinematic model failed.
4C30	19504	Programming	<b>Invalid input frame:</b> Programmed Cartesian position cannot be reached in the ACS configuration.
4C50	19536	Internal	<b>Invalid Offset:</b> Access violation within the observer detected.

## 2.11 Bode Return Codes

The following bode plot specific error codes are used in the bode plot server:

Code Hex	Code Dec	Symbol	Description
0x8100	33024	INTERNAL	Internal error
0x8101	33025	NOTINITIALIZED	Not initialized (e.g. no nc axis)
0x8102	33026	INVALIDPARAM	Invalid parameter
0x8103	33027	INVALIDOFFSET	Invalid index offset
0x8104	33028	INVALIDSIZE	Invalid parameter size
0x8105	33029	INVALIDSTARTPARAM	Invalid start parameter (set point generator)
0x8106	33030	NOTSUPPORTED	Not supported
0x8107	33031	AXISNOTENABLED	Nc axis not enabled
0x8108	33032	AXISINERRORSTATE	Nc axis in error state
0x8109	33033	DRIVEINERRORSTATE	IO drive in error state
0x810A	33034	AXISANDDRIVEINERROR-STATE	Nc axis AND IO drive in error state

Code Hex	Code Dec	Symbol	Description
0x810B	33035	INVALIDDRIVEOPMODE	Invalid drive operation mode active or requested (no bode plot mode)
0x810C	33036	INVALIDCONTEXT	Invalid context for this command (mandatory task or windows context needed)
0x810D	33037	NOAXISINTERFACE	<b>Missing TCom axis interface (axis null pointer).</b> There is no connection to the NC axis. Either no axis (or axis ID) has been parameterized, or the parameterized axis does not exist.
0x810E	33038	INPUTCYCLECOUNTER	<b>Invalid input cycle counter from IO drive (e.g. frozen).</b> The cyclic drive data are backed up by an 'InputCycleCounter' during the bode plot recording. This allows firstly the detection of an unexpected communication loss (keyword: LifeCounter) and secondly a check for temporal data consistency to be performed. <b>Sample 1:</b> This error can occur if the cycle time of the calling task is larger than the assumed drive cycle time (in this case, however, the error occurs right at the start of the recording). <b>Sample 2:</b> This error can occur if the calling task has real-time errors (e.g. the "Exceed Counter" of the task increments or the task has a lower priority, as is often the case, for example, with the PLC). In this case the error can also occur at any time during the recording. <b>Sample 3:</b> This error can occur more frequently if the real-time load on the computer is quite high (>50 %). <b>Note:</b> Refer also to the corresponding AX5000 drive error code F440.
0x810F	33039	POSITIONMONITORING (=> NC Runtime Error)	<b>Position monitoring: Axis position is outside of the maximum allowed moving range.</b> The axis has left the parameterized position range window, whereupon the recording was aborted and the NC axis was placed in the error state 0x810F (with standard NC error handling). The position range window acts symmetrically around the initial position of the axis (see also parameter description <i>Position Monitoring Window</i> ). Typical error message in the logger: <i>"BodePlot: 'Position Monitoring' error 0x%x because the actual position %f is above the maximum limit %f of the allowed position range (StartPos=%f, Window=%f)"</i>
0x8110	33040	DRIVELIMITATIONDETECTE D	<b>Driver limitations detected (current or velocity limitations) which causes a nonlinear behavior and invalid results of the bode plot.</b> A bode plot recording requires an approximately linear transmission link. If the speed or current is limited in the drive unit, however, this non-linear behavior is detected and the bode plot recording is aborted. Reasons for these limitations can be: choosing too large an amplitude for the position, speed or torque interface, or an unsuitable choice of amplitude scaling mode (see also parameter description <i>Amplitude Scaling Mode, Base Amplitude, Signal Amplitude</i> ).

Code Hex	Code Dec	Symbol	Description
			Typical error message in the logger: <i>"BodePlot: Sequence aborted with error 0x%x because the current limit of the drive has been exceeded (%d times) which causes a nonlinear behavior and invalid results of the bode plot"</i>
0x8111	33041	LIFECOUNTERMONITORING (=> NC Runtime Error)	<b>Life counter monitoring (heartbeat): Lost of communication to GUI detected after watchdog timeout is elapsed.</b>  The graphical user interface from which the bode plot recording was started is no longer communicating with the bode plot driver in the expected rhythm (keyword: 'Life Counter'). Therefore the recording is terminated immediately and the NC axes are placed in the error state 0x8111 (with standard NC error handling). Possible reasons for this can be an operating interface crash or a major malfunction of the Windows context.  Typical error message in the logger: <i>"BodePlot: Sequence aborted with GUI Life Counter error 0x%x because the WatchDog timeout of %f s elapsed (%s)"</i>
0x8112	33042	NCERR_BODEPLOT_WCSTATE	<b>WC state error (IO data working counter)</b>  IO working counter error (WC state), for example due to real-time errors, EtherCAT CRC errors or telegram failures, EtherCAT device not communicating (OP state), etc.
0x8113-0x811F	33043-33055	RESERVED	<b>Reserved area</b>

## 2.12 Further Error Codes

Error(Hex)	Error(Dec)	Error Type	Description
0x8120	33056	Environment	<b>Invalid configuration for Object (e.g. in System Manager).</b>
0x8121	33057	Environment	<b>Invalid environment for Object (e.g. TcCom-Object's Hierarchy or missing/faulty Objects).</b>
0x8122	33058	Environment	<b>Incompatible Driver or Object.</b>
0x8124	33060	Function Block	<b>Command execution does not terminate (e. g. MC_Reset does not signal DONE).</b>
0x8130	33072	Communication	<b>Invalid ObjectID of Communication Target.</b>
0x8131	33073	Communication	<b>Communication Target expects Call in different Context.</b>
0x8132	33074	Communication	<b>Invalid State of Communication Target.</b>
0x8134	33076	Communication	<b>Communication with Communication Target cannot be established.</b>
0x813b	33083	Parameter	<b>Transition Mode is invalid.</b>
0x813c	33084	Parameter	<b>BufferMode is invalid.</b>
0x813d	33085	Function Block	<b>Only one active Instance of Function Block per Group is allowed.</b>
0x813e	33086	State	<b>Command is not allowed in current group state.</b>
0x813f	33087	Function Block	<b>Slave cannot synchronize.</b> The slave cannot reach the SlaveSyncPosition with the given dynamics.



Error(Hex)	Error(Dec)	Error Type	Description
0x8140	33088	Parameter	<b>Invalid value for one or more of the dynamic parameters (Acceleration, Deceleration, Jerk).</b>
0x8141	33089	Parameter	<b>IdentInGroup is invalid.</b>
0x8142	33090	Parameter	<b>The number of axes in the group is incompatible with the axes convention.</b>
0x8143	33091	Communication	<b>Function Block or respective Command is not supported by Target.</b>
0x8144	33092	State	<b>Command queue full.</b> Command queue is completely filled up and cannot accept additional commands until some commands are fully processed.
0x8145	33093	Function Block	<b>Mapping of Cyclic Interface between NC and PLC is missing (e.g. AXIS_REF, AXES_GROUP_REF, ...).</b>
0x8146	33094	Function Block	<b>Invalid Velocity Value.</b> The velocity was not set or the entered value is invalid
0x8147	33095	Parameter	<b>Invalid Coordinate Dimension.</b> The dimension of the set coordinate interpretation does not meet the requirements.
0x8148	33096	Function Block	<b>Invalid Input Value.</b>
0x8149	33097	Parameter	<b>Unsupported Dynamics for selected Group Kernel.</b>
0x814a	33098	Parameter	<b>The programmed position dimension incompatible with the axes convention.</b>
0x814b	33099	Function Block	<b>Path buffer is invalid. E.g. because provided buffer has invalid address or is not big enough.</b>
0x814c	33100	Function Block	<b>Path does not contain any element.</b>
0x814d	33101	Function Block	<b>Provided Path buffer is too small to store more Path Elements.</b>
0x814e	33102	Parameter	<b>Dimension or at least one Value of Transition Parameters is invalid.</b>
0x814f	33103	Function Block	<b>Invalid or Incomplete Input Array.</b>
0x8150	33104	Function Block	<b>Path length is zero.</b>
0x8151	33105	State	<b>Command is not allowed in current axis state.</b>
0x8152	33106	State	<b>TwinCAT System is shutting down and cannot complete request.</b>
0x8153	33107	Parameter	<b>Configured axes convention and configured axes do not match.</b>
0x8154	33108	Initialization	<b>Invalid Number of ACS Axes.</b> The number of ACS input axes does not match the number of ACS input axes expected by the kinematic transformation.
0x8155	33109	Initialization	<b>Invalid Number of MCS Data.</b> The number of MCS input data does not match the number expected by the kinematic transformation.
0x8156	33110	Initialization	<b>Invalid Value Set for Kinematic Parameters.</b> The numeric value set for the parameter does not reside within the respective definition range.
0x8158	33112	NC Programming	<b>The Given ACS Values Cannot be Reached.</b> The given ACS values result in an invalid machine configuration.

Error(Hex)	Error(Dec)	Error Type	Description
0x8159	33113	NC Programming	<b>The Set Target Positions Cannot be Reached.</b> The set target positions reside outside the admissible working space.
0x815d	33117	NC Programming	<b>Discontinuity in ACS axes detected.</b> Discontinuity in ACS axes detected.
0x8160	33120	NC Programming	<b>Circle Specification in Path is invalid.</b> The specification of a circle segment in the programmed interpolated path (e.g. via MC_MovePath) has an invalid or ambiguous description. Probably its center cannot be determined reliably.
0x8161	33121	NC Programming	<b>Maximum stream lines reached.</b> The maximum number of stream lines is limited. Please refer to function block documentation for details.
0x8163	33123	Function Block	<b>Invalid First Segment.</b> The corresponding element can only be analyzed with a well-defined start point.
0x8164	33124	Function Block	<b>Invalid auxiliary point.</b> The auxiliary point is not well-defined.
0x8166	33126	Function Block	<b>Invalid parameter for GapControlMode.</b> Invalid parameter for GapControlMode, most likely in combination with the group parameter GapControlDirection.
0x8167	33127	External	<b>Group got unsupported Axis Event (e.g. State Change).</b> Group got unsupported Axis Event (e.g. State Change e.g. triggered by a Single Axis Reset).
0x8168	33128	Parameter	<b>Unsupported Compensation Type.</b> The compensation type was either not set or is not supported by the addressed object.
0x8169	33129	Function Block	<b>Master axis does not exist or cannot be used.</b>
0x816a	33130	External	<b>Invalid or Missing Tracking Transformation.</b> This error occurs at MC_TrackConveyorBelt if at the CoordTransform input an invalid object ID is used or the object ID points to an object that is not supported as coordinate transformation.
0x816b	33131	Function Block	<b>Position is not on Track.</b> Either Track cannot be activated because Actual Position is not on Track, or Target Position is not on Active Track or TrackPart
0x816c	33132	Function Block	<b>Axis does not have an activated track.</b>
0x816d	33133	NC Programming	<b>Invalid Compensation ObjectID.</b> An Object with this ObjectID does not exist or it is not of the right type (has to be a compensation).
0x816e	33134	Monitoring	<b>Axis is in error because axis was not in Target when InTargetAlarm Timer expired.</b>
0x816f	33135	State	<b>Coupling would cause a cyclic dependency of axis (e.g. via MC_GearInPos).</b>
0x8170	33136	Function Block	<b>Axis was not added to an axes group, the command is not valid.</b>
0x817f	33151	State	<b>Drive has invalid State.</b>
0x8181	33153	Function Block	<b>Parameter for gap control are invalid with the current configuration.</b> Function block with gap control was issued to an axis that is not in a CA group
0x8182	33154	State	<b>Software position limit violation.</b> Software position limits of at least one axis have been or would have been violated by a command.

Error(Hex)	Error(Dec)	Error Type	Description
0x8183	33155	NC Programming	<b>Target position is not reachable.</b> There is no path available to the target position or target position is unreachable in general.
0x8185	33157	NC Programming	<b>The mover or one of its relevant coordinates is busy.</b> Either the whole mover or at least of its coordinates relevant to the command are busy.
0x8186	33158	NC Programming	<b>A collision has occurred or would occur.</b> Either a collision has occurred or would occur if the command was executed.
0x8187	33159	NC Programming	<b>Invalid Track Specification.</b>
0x8188	33160	NC Programming	<b>Command not allowed in track state.</b>
0x8189	33161	Function Block	<b>Invalid Reference passed to Function Block.</b> An invalid reference (or pointer) was used in a function block call. This can happen if a reference type is used before it was initialized.
0x818a	33162	NC Programming	<b>Path is locked against modifications.</b> The path was locked to further changes. However, it might be resettable.
0x8f38 - 0x8f50	36664 - 36688	Internal	<b>Internal Error.</b>
0x8f56	36694	Internal	<b>Internal Error.</b>
0x8f59	36697	Internal	<b>Internal Error.</b>
0x8f5c - 0x8f62	36700 - 36706	Internal	<b>Internal Error.</b>
0x8f65	36709	Internal	<b>Internal Error.</b>
0x8f68 - 0x8ffe	36712 - 36862	Internal	<b>Internal Error.</b>



More Information:  
**[www.beckhoff.com](http://www.beckhoff.com)**

Beckhoff Automation GmbH & Co. KG  
Hülshorstweg 20  
33415 Verl  
Germany  
Phone: +49 5246 9630  
[info@beckhoff.com](mailto:info@beckhoff.com)  
[www.beckhoff.com](http://www.beckhoff.com)

