AMKmotion
Interface description
EtherCAT (CoE)

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AMKmotion
MEMBER OF THE ARBURG FAMILY

Imprint

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Change	**Letter symbol**
• AMKmotion Design • Changes in the state machine, transition and commands	LeS / STL

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For fast and reliable troubleshooting, you can help us by informing our Customer Service about the following:

- Type plate data for each unit
- Software version
- Device configuration and application
- Type of fault/problem and suspected cause
- Diagnostic messages (error messages)

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Content

1 About this documentation

1.1 Structure of this document

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1.2 Keeping this document

This document must permanently be available and readable at the place where the product is in use. If the product is used at another place or changed the owner, the document must be passed on.

1.3 Target group

This document is addressed to people who program controllers, communicating with the AMK drives via the EtherCAT (CoE) protocol.

1.4 Purpose

The present document describes the function supported by AMK of the following standards:

- Protocol: CiA Drive Profile DSP 402 V2.0 for CANopen drives supporting the drive profile
- IEC 61800-7-201/-301 for EtherCAT (CoE) drives supporting the Drive Profile

Described are the supported objects and functions (profile modes). This document supports users controlling the AMK drives with the communication protocol EtherCAT (CoE).

1.5 Display conventions

Display	Meaning
	This symbol points to parts of the text to which particular attention should be paid!
0x	0x followed by a hexadecimal number, e. g. 0x500A
0x1234/5	Object index/sub-index
'Names'	Names are represented with apostrophes e. g. parameters, variables, etc.
See 'chapter name' on page x	Executable cross-reference in electronic output media

1.6 Appendant documents

Standards and directives

Name	Title
CiA Draft Standard Proposal 301	CANopen Application Layer and Communication Profile Version 4.01
CiA Draft Standard Proposal 402	Device Profile Drives and Motion Control Version 2.0
IEC 61800-7-201/-301	ETG Implementation Guidline for the CiA 402 Drive Profile

Functional documentations

AMK part-no.	Title
203704	Parameter description

AMK part-no.	Title
25786	Diagnostic messages

Device descriptions

AMK part-no.	Title
203445	Decentralized drive technology iC / iX / iDT5
205186	Decentralized drive technology ihX

2 Product overview

2.1 Basics

The drive profile CiA 402 defines a user interface, consisting of objects and functions to control servo drives, standardized according to the standard IEC 61800-7-201/301.

The communication between the controller and the drives is based on one of the following mechanism:

- EtherCAT CoE (CAN over EtherCAT)
  Real-time doe to the principle of 'distributed clock'
- CANopen protocol CiA DS 301 V4.01 (e.g. PDO, SDO, emergency messages...).

The functions 'Cyclic sync torque mode', 'Cyclic sync velocity mode' and 'Cyclic sync position mode' base on the definition of the documentation 'ETG Implementation Guidline for the CiA 402 Drive Profile'.

The drives are working as slave participants in the bus.

The AMK database system images all parameters as index / sub-index. From index 0x2000, the manufacturer-specific parameters are contained whose contents are based on the AMK internal parameters according to SERCOS.
In CoE there is only one parameter set.

All parameter changes are temporary, i.e. changes are only kept in RAM memory. All remanent parameters can be stored in the remanenent data memory (SEEP) via object 0x1010 'Store parameters'.

With the object 0x1011 the command "initial program loading" is executed and all parameters are set to factory settings.

AMK CoE devices support diagnostics according to CiA 402 as far as the AMK error messages that can be mapped to them. All diagnostic messages can be read via the manufacturer-specific objects 0x2186 'Diagnostic number' and 0x222F 'Diagnostic list'. Error states can be deleted with the object 0x223F'Clear error'. The relationships are described in the state diagram (state machine).

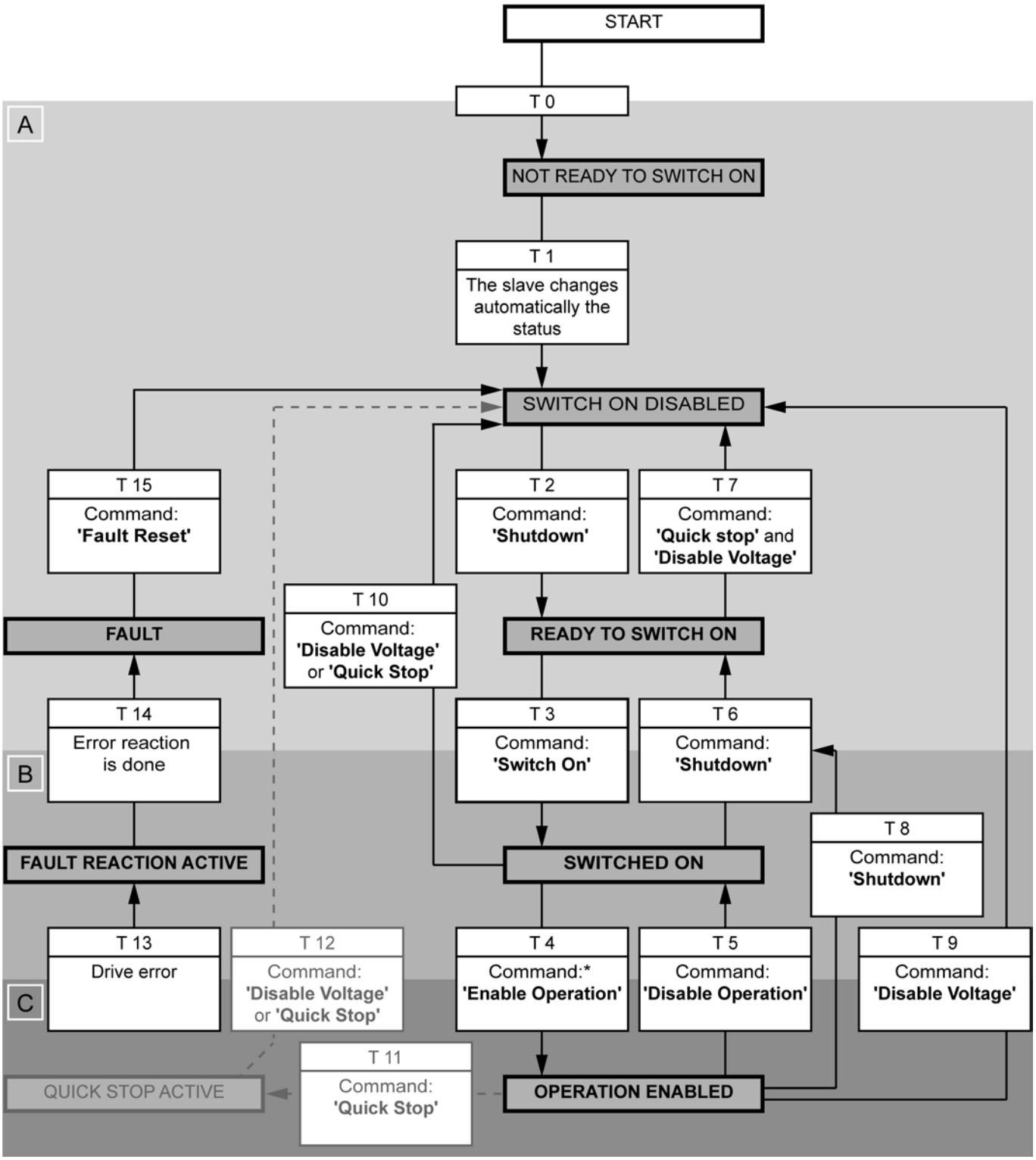
2.2 Device description files

The device description file describes the properties and the supported objects for the controller. The file has to be rebound in the controller.

File for EtherCAT (CoE):	≥ AMK_ECcoe_102_206581.xml

2.3 'State machine' diagram

The following diagram shows the correlation between the object 0x6040 'Control word' and object 0x6041 'Status word' and the equivalent AMK control and status messages. The diagram is derived of the 'State machine' described in the standard CiA DSP 402.



Legend:

States in [**bold**]	The acknowledgment of these states must be monitored by the master
States in [normal]	The slave uses these states independently
T x	Transition / state transition
*	Prerequisites for the 'Enable Operation' command: Object 0x221F 'Source RF' = 5 alternative Object 0x221F 'Source RF' = 25
A	Low-level power: Electronic supply available
B	High-level power: Power supply DC bus available
C	Torque: Power output stage enabled and motor is energized

Further notes:

- The 'State Machine' is executed in 1 ms cycle time.
- Drive is braking according to object 0x221E 'Deceleration ramp RF inactive'
- The transition 11 and 12 and the command 'Quick Stop' are not supported.

2.3.1 State according the state machine

Siehe '0x6041 'Status word' ' auf Seite 299.

2.3.2 Commands according the state machine

Siehe '0x6040 'Control word'' auf Seite 298.

2.3.3 Transitions

Transition	Initial state	→	New state	Trigger	Action
T 0	'START'	→	'NOT READY TO SWITCH ON'	System internal, after completion of the actions in the state 'START'	If the 24 VDC power supply is connected to the system, the system automatically runs to the state 'SWITCH ON DISABLED'.
T 1	'NOT READY TO SWITCH ON'	→	'SWITCH ON DISABLED'	System internal, after completion of the actions in the state 'NOT READY TO SWITCH ON'	
T 2	'SWITCH ON DISABLED'	→	'READY TO SWITCH ON'	'Shutdown' command received	none
T 3	'READY TO SWITCH ON'	→	'SWITCHED ON'	'Switch On' command received	System checks if power supply is switched on. When the power supply is switched on, the system switched to the 'SWITCHED ON' state.
T 4	'SWITCHED ON'	→	'OPERATION ENABLED'	'Enable Operation' command received	The power output stage is enabled and the motor is energized. If available, the motor holding brake is opened. Drive functions are possible (this corresponds to the normal operation of the drive)

Transition	Initial state	→	New state	Trigger	Action
T 5	'OPERATION ENABLED'	→	'SWITCHED ON'	'Disable Operation' command received	The motor is decelerated to standstill with the deceleration ramp according 0x221E 'Deceleration ramp RF inactive'. In the detected standstill, the motor holding brake is closed and the power output stage is disabled.
T 6	'SWITCHED ON'	→	'READY TO SWITCH ON'	'Shutdown' command received	none
T 7	'READY TO SWITCH ON'	→	'SWITCH ON DISABLED'	'Disable Voltage' and 'Quick Stop' *) command received	none
T 8	'OPERATION ENABLED'	→	'READY TO SWITCH ON'	'Shutdown' command received	The motor is decelerated to standstill with the deceleration ramp according to 0x221E 'Deceleration ramp RF inactive'. In the detected standstill, the motor holding brake is closed and the power output stage is disabled.
T 9	'OPERATION ENABLED'	→	'SWITCH ON DISABLED'	'Disable Voltage' command received	Power output stage is immediately disabled and the motor coasts. If available, the motor holding brake is closed immediately.
T 10	'SWITCHED ON'	→	'SWITCH ON DISABLED'	'Disable Voltage' or 'Quick Stop' *) command received	none
T 11	'OPERATION ENABLED'	→	'QUICK STOP ACTIVE'	'Quick Stop' *) command received	'Quick Stop' is not supported
T 12	'QUICK STOP ACTIVE'	→	'SWITCH ON DISABLED'	'Quick Stop' *) is completed or 'Disable Voltage' command received	'Quick Stop' is not supported
T 13	All states	→	'FAULT REACTION ACTIVE'	Error condition detected	none
T 14	'FAULT REACTION ACTIVE'	→	'FAULT'	Error reaction completed	The control bit 'Fault Reset' in the 'Control word' bit 7 must be reset.
T 15	'FAULT'	→	'SWITCH ON DISABLED'	'Fault Reset' command received	Reset the fault state, System booting, New calculation of any changed parameters

*) 'Quick Stop' is not supported

3 Functions

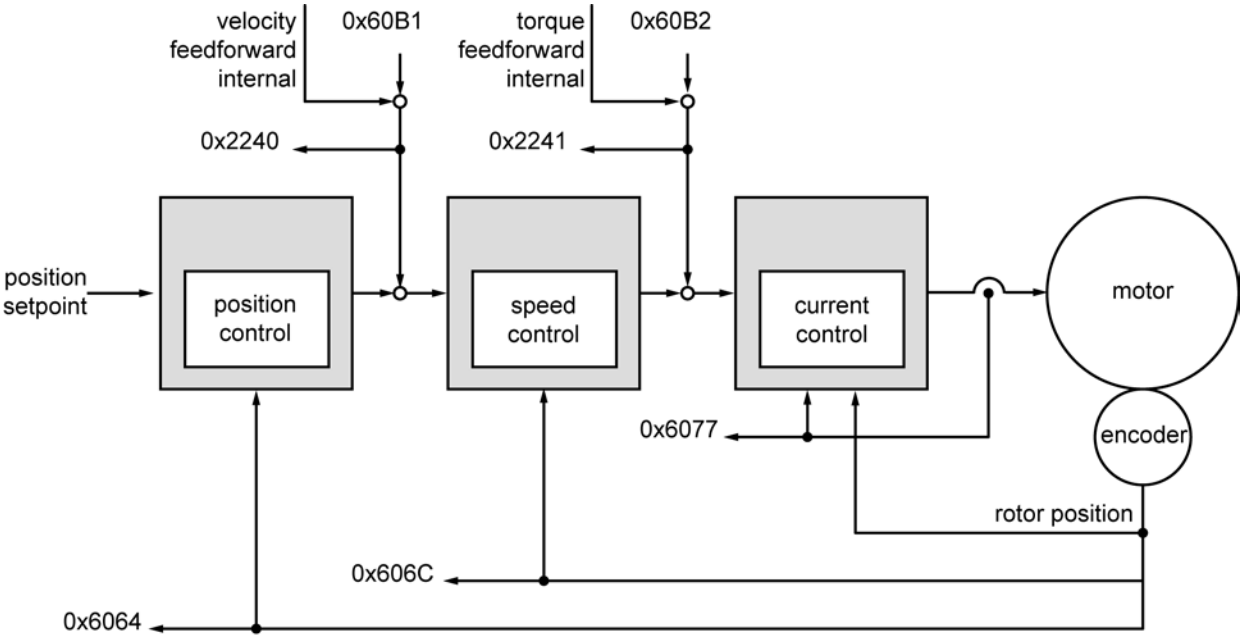
3.1 Operating mode change

Siehe '0x6060 'Modes of operation'' auf Seite 300.
Siehe '0x6061 'Modes of operation display'' auf Seite 300.

Siehe '0x6040 'Control word'' auf Seite 298.
Siehe '0x6041 'Status word' ' auf Seite 299.

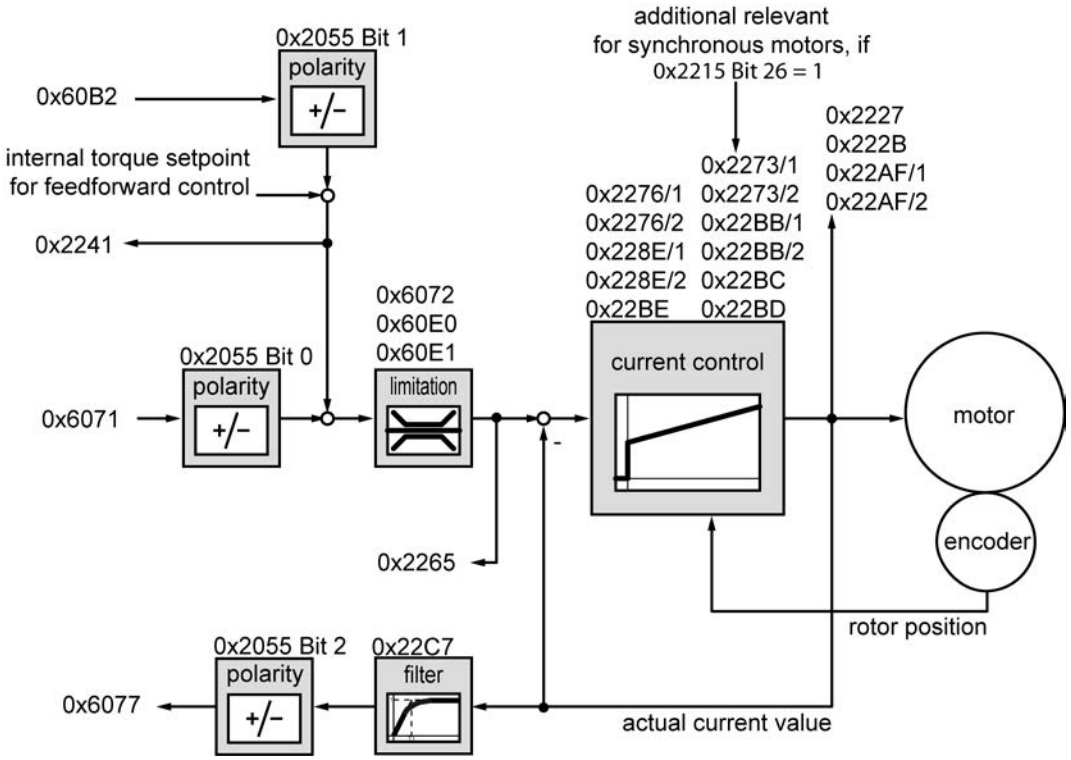
3.2 Structure of the control loops

3.2.1 Overview control loops



Object	Name
0x60B1	'Velocity offset'
0x606C	'Velocity actual value'
0x6064	'Position actual value'
0x60B2	'Torque offset'
0x6077	'Torque actual value'
0x2240	'Sum of additive velocities'
0x2241	'Sum of additive torques'

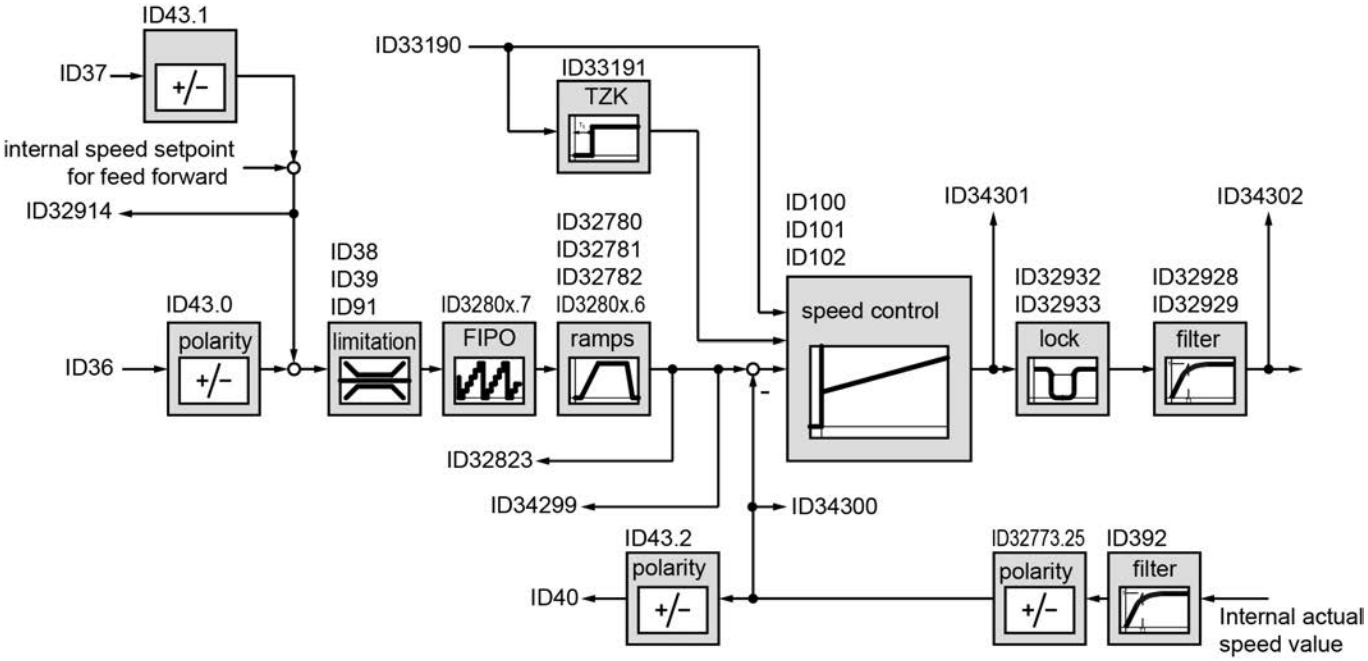
3.2.2 Torque and current control



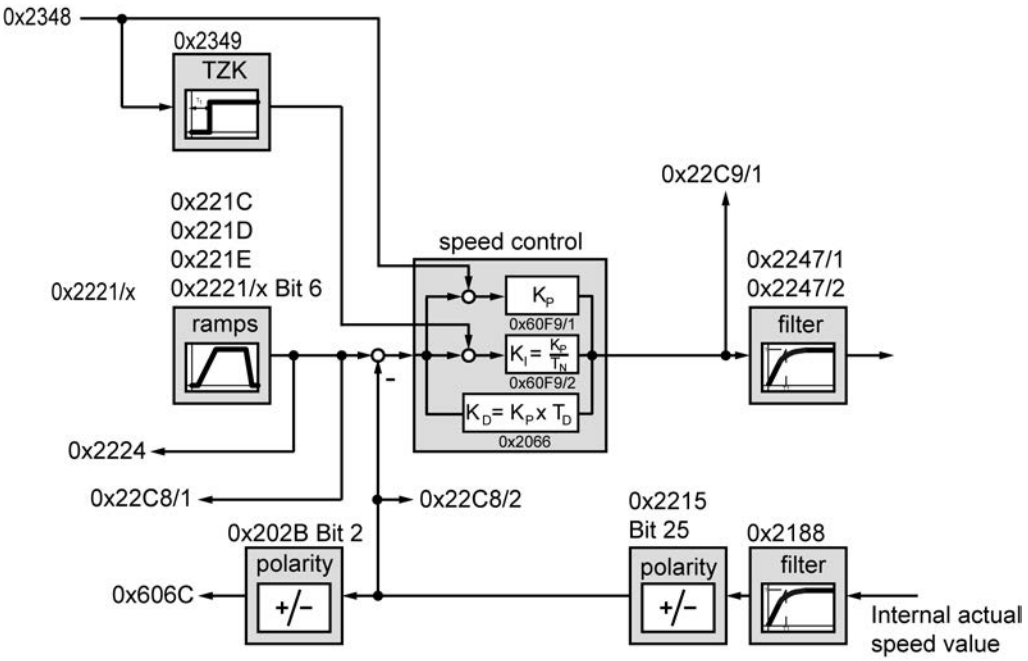
Object	Name
0x6071	'Target torque'
0x60B2	'Torque offset'
0x60E0	'Positive torque limit value'
0x60E1	'Negative torque limit value'
0x6077	'Torque actual value'
0x2055	'Torque polarity'
0x2056	'Torque data scaling'
0x2215	'Service bits'
0x2221/8	'AMK digital torque control'
0x2227	'Magnetising current feedback'
0x222B	'Torque current feedback'
0x2241	'Sum of additive torques'
0x2265	'Torque setpoint at controller'
0x2273/1	'Inductance path D'
0x2273/2	'Inductance path Q'
0x2276/1	'Current path Q integral-action time'
0x2276/2	'Current path D integral-action time'
0x228E/1	'Current path Q proportional gain'
0x228E/2	'Current path D proportional gain'
0x22AF/1	'Voltage path Q'
0x22AF/2	'Voltage path D'
0x22BB/1	'Feed forward control voltage path Q'
0x22BB/2	'Feed forward control voltage path D'
0x22BC	'Phase resistance'
0x22BD	'Voltage constant Ke'
0x22BE	'Increase motor voltage'

Object	Name
0x6072	'Maximal torque'
0x22C7	'Torque feedback filter'

3.2.3 Speed control



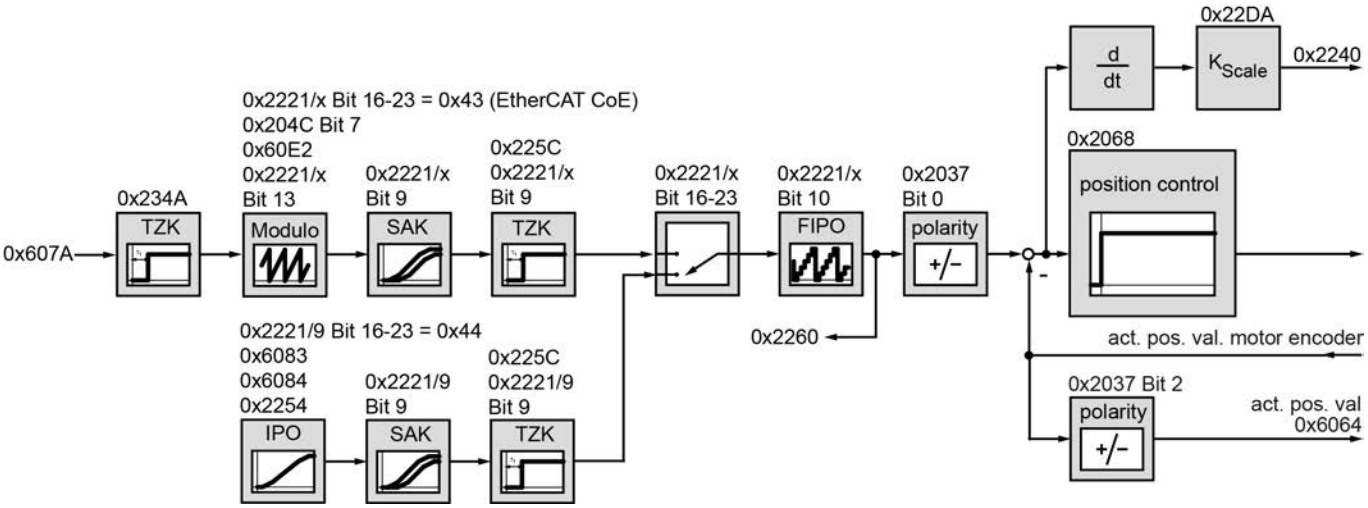
Speed control in detail



Object	Name
0x60FF	'Target velocity'
0x60B1	'Velocity offset'
0x2026	'Positive velocity limit'
0x2027	'Negative velocity limit'
0x606C	'Velocity actual value'
0x202B	'Velocity polarity'
0x60F9/1	'Gain'
0x60F9/2	'Ti - integration time constant'
0x2066	'Differentiating time speed control TD'
0x2188	'Velocity setpoint filter'

Object	Name
0x2215	'Service bits'
0x221C	'Acceleration ramp'
0x221D	'Deceleration ramp'
0x221E	'Deceleration ramp RF inactive'
0x2221/3	'AMK secondary operation mode 2'
0x2221/A	'AMK digital speed control'
0x2224	'Velocity control command after ramp'
0x2240	'Sum of additive velocities'
0x2247/1	'Time filter 1'
0x2247/2	'Time filter 2'
0x2248	'Barrier frequency'
0x2249	'Band width'
0x2348	'Velocity feedforward factor 1'
0x2349	'Velocity feedforward delay 1'
0x22C8/1	'Velocity setpoint in control'
0x22C8/2	'Velocity actual value in control'
0x22C9/1	'Torque setpoint filter input'
0x22C9/2	'Torque setpoint filter output'

3.2.4 Position control



Object	Name
0x607A	'Target position'
0x6064	'Position actual value'
0x2037	'Closed loop polarity'
0x204C	'Position data scaling'
0x60E2	'Modulo value'
0x2068	'Position loop factor'
0x6083	'Profile acceleration'
0x6084	'Profile deceleration'
0x2221/2	'AMK secondary operation mode 1'
0x2221/9	'AMK position control'
0x2240	'Sum of additive velocities'
0x2254	'Additional acceleration value'
0x225C	'Dead time compensation 2'
0x2260	'Increase position value 2'
0x2264	'Position feedback modulo'
0x22DA	'Damping factor position'
0x234A	'Delay target position value'

3.3 Profile velocity mode

3.3.1 Introduction

The operating mode 'Profile velocity mode' supports the following features:

- Operating mode active according to 0x2221/A 'AMK digital speed control'
- Closed loop speed control with encoder feedback
- Speed setpoint input
- Configurable speed setpoint limits
- Configurable acceleration and deceleration ramps
- Configurable speed window that monitors the actual speed value for valid values
- Configurable standstill window that monitors the axis standstill
- Emergency off (deceleration at RF inactive)

Control loop structure: Siehe 'Speed control' auf Seite 23.

3.3.2 Relevant objects

Operating mode

Object	Name
0x2221/A	'AMK digital speed control' (keep default values!)
0x6060	'Modes of operation' = 3 'Profile velocity mode'

Control word and status word

Object	Name
0x6040	'Control word'
0x6041	'Status word'

Limits

Object	Name
0x6080	'Maximal motor speed'
0x221E	'Deceleration ramp RF inactive'
0x221C	'Acceleration ramp'
0x221D	'Deceleration ramp'
0x2026	'Positive velocity limit'
0x2027	'Negative velocity limit'
0x207C	'Zero velocity window'
0x209D	'Velocity window'
Torque and current control	
0x6072	'Maximal torque'
0x60E0	'Positive torque limit value'
0x60E1	'Negative torque limit value'

Setpoints

Object	Name
0x60FF	'Target velocity'
0x60B1[1)]	'Velocity offset'
Torque and current control	
0x60B2	'Torque offset'

1) This object is defined in the standard IEC 61800-7-201 EtherCAT (CoE) and is used in the operating mode 'Cyclic synchronous velocity mode' but also takes affect in the operating mode 'Profile velocity mode'. Therefore in the operating mode 'Profile velocity mode' the object 0x60B1 = 0 has to be set.

Actual values and real-time bit messages

Object	Name
0x20B6	'Diagnosis manufacturer status'
0x606C	'Velocity actual value'
0x214A	'Message speed: actual value = setpoint'
0x214B	'Message speed: actual value < minimal value'
0x214C	'Message speed: actual value < threshold'
Torque and current control	
0x6077	'Torque actual value'
0x214D	'Message torque: actual value ≥ threshold'
0x214E	'Message torque: actual value ≥ limit'

Controller

Object	Name
0x60F9/1	'Gain'
0x60F9/2	'Ti - integration time constant'
0x2066	'Differentiating time speed control TD'
Torque and current control	
0x228E/1	'Current path Q proportional gain'
0x228E/2	'Current path D proportional gain'
0x2276/1	'Current path Q integral-action time'
0x2276/2	'Current path D integral-action time'

Effects of the objects:

Siehe 'Overview control loops' auf Seite 20.
Siehe 'Speed control' auf Seite 23.
Siehe 'Torque and current control' auf Seite 21.

3.3.3 Profile specific description of objects

3.3.3.1 0x6040 'Control word'

Bit	Name	Value	Description
0 (LSB)	Switch on	-	Siehe '0x6040 'Control word'' auf Seite 298.
1	Enable voltage	-	
2	Quick stop	-	
3	Enable operation	-	
4-6	Operation mode specific	-	Reserved
7	Fault reset	-	Siehe '0x6040 'Control word'' auf Seite 298.
8	Halt [1)]	0	Execute movement
		1	The drive switches automatically into the speed control operation mode with setpoint zero speed and brakes down to a standstill according to the object 0x6084 'Profile deceleration'.
9-15	-	-	Reserved

1)

Operating mode changes are only executed if bit 8 'Halt' is not set in object 0x6040 'Control word'.

3.3.3.2 0x6041 'Status word'

Bit	Name	Value	Description
0 (LSB)	Ready to switch on	-	Siehe 0x6041 'Status word' auf Seite 299.
1	Switched on	-	
2	Operation enabled	-	
3	Fault	-	
4	Voltage enable	-	
5	Quick stop	-	
6	Switch on disabled	-	
7	Warning	-	
8	Manufacturer specific	-	
9	Remote	-	
10	Target reached	0	0x6040 Bit 8 'Halt' = 0: target speed not reached yet
			0x6040 Bit 8 'Halt' = 1: drive brakes
		1	0x6040 Bit 8 'Halt' = 0: target speed reached (0x209D 'Velocity window')
			0x6040 Bit 8 'Halt' = 1: standstill window reached (0x207C 'Zero velocity window')
11	Internal limit active	1	Limits exceeded: 0x2026 'Positive velocity limit' 0x2027 'Negative velocity limit' Siehe '0x6041 'Status word' ' auf Seite 299.
12	Speed	0	The actual speed value is not inside the standstill window (0x207C 'Zero velocity window')
		1	The actual speed value is inside the standstill window (0x207C 'Zero velocity window')
13	Maximal slippage error	-	Not supported yet
14-15	Manufacturer specific		Reserved

3.4 Profile position mode

3.4.1 Introduction

The operating mode 'Profile position mode' supports the following features:

- Operating mode active according to 0x2221/9 'AMK position control'
- Closed loop position control with encoder feedback
- Single positioning or positioning with override
- Position setpoints are processed relative (referred to the actual position) or absolute (referred to the homing point)
- Drive internal interpolator (IPO) with cycle time according to 0x22D6 'IPO mode'
- Before each positioning (0x6040 Bit 4 = 1) the acceleration values are checked and if changed, they will be given to the interpolator again but not if override (0x6040 Bit 5 = 1)
- Abort positioning with the 'Halt' command. The drive switches automatically into the speed control operation mode with setpoint zero speed and brakes down to a standstill according to the object 0x6084 'Profile deceleration'.

Control loop structure: Siehe 'Position control' auf Seite 25.

3.4.2 Relevant objects

Operating mode

Object	Name
0x2221/9	'AMK position control' (keep default values!)
0x6060	'Modes of operation' = 1 'Profile position mode'

Control word and statusword

Object	Name
0x6040	'Control word'
0x6041	'Status word'

Limits

Object	Name
0x6080	'Maximal motor speed'
0x221E	'Deceleration ramp RF inactive'
0x6081	'Profile velocity'
0x6083	'Profile acceleration'
0x6084	'Profile deceleration'
0x2254	'Additional acceleration value'
0x607D/1	'Negative position limit'
0x607D/2	'Positive position limit'
0x6067	'Position window'
Speed control	
0x2026	'Positive velocity limit'
0x2027	'Negative velocity limit'
0x207C	'Zero velocity window'
0x209D	'Velocity window'
Torque and current control	
0x6072	'Maximal torque'
0x60E0	'Positive torque limit value'
0x60E1	'Negative torque limit value'

Setpoints

Object	Name
0x60FC	'Position demand value'
0x607A	'Target position'

Actual values and real-time bit messages

Object	Name
0x20B6	'Diagnosis manufacturer status'
0x6064	'Position actual value'
0x2150	'Message in position'
0x2252	'At synchron speed window'
Speed control	
0x606C	'Velocity actual value'
0x214A	'Message speed: actual value = setpoint'
0x214B	'Message speed: actual value < minimal value'
0x214C	'Message speed: actual value < threshold'
Torque and current control	
0x6077	'Torque actual value'
0x214D	'Message torque: actual value ≥ threshold'
0x214E	'Message torque: actual value ≥ limit'

Controller

Object	Name
0x2068	'Position loop factor'
Speed control	
0x60F9/1	'Gain'
0x60F9/2	'Ti - integration time constant'
0x2066	'Differentiating time speed control TD'
Torque and current control	
0x228E/1	'Current path Q proportional gain'
0x228E/2	'Current path D proportional gain'
0x2276/1	'Current path Q integral-action time'
0x2276/2	'Current path D integral-action time'

Effects of the objects:

Siehe 'Overview control loops' auf Seite 20.
Siehe 'Position control' auf Seite 25.
Siehe 'Speed control' auf Seite 23.
Siehe 'Torque and current control' auf Seite 21.

3.4.3 Profile specific description of objects

3.4.3.1 0x6040 'Control word'

Bit	Name	Value	Description
0 (LSB)	Switch on	-	Siehe '0x6040 'Control word'' auf Seite 298.
1	Enable voltage	-	
2	Quick stop	-	
3	Enable operation	-	
4	New setpoint	0	Not take over a new target position
		1	Take over new target position (edge evaluation!)
5	Change set immediately	0	Single positioning: The new target position will be executed, after the previous position is reached.
		1	Positioning with override: The new target position is executed immediately (override).
6	absolute / relative	0	The target position is absolute and refers to the homing point.
		1	The target position is relative and refers to the actual position
7	Fault reset	-	Siehe '0x6040 'Control word'' auf Seite 298.
8	Halt [1)]	0	Execute positioning
		1	
9-15	-	-	Reserved

1)

Operating mode changes are only executed if bit 8 'Halt' is not set in object 0x6040 'Control word'.

3.4.3.2 0x6041 'Status word'

Bit	Name	Value	Description
0 (LSB)	Ready to switch on	-	Siehe '0x6041 'Status word' ' auf Seite 299.
1	Switched on	-	
2	Operation enabled	-	
3	Fault	-	
4	Voltage enable	-	
5	Quick stop	-	
6	Switch on disabled	-	
7	Warning	-	
8	Manufacturer specific	-	
9	Remote	-	
10	Target reached	0	0x6040 Bit 8 'Halt' = 0: target position is not reached yet
			0x6040 Bit 8 'Halt' = 1: drive brakes
		1	0x6040 Bit 8 'Halt' = 0: target position is reached
			0x6040 Bit 8 'Halt' = 1: standstill window is reached
11	Internal limit active	1	Limits exceeded: 0x607D/2 'Positive position limit' 0x607D/1 'Negative position limit' Siehe '0x6041 'Status word' ' auf Seite 299.
12	Setpoint acknowledgement	0	The interpolator does not take over the target position
		1	The interpolator take over the target position
13	Following error	0	No following error
		1	Following error
14-15	Manufacturer specific		Reserved

3.4.4 Procedure of the 'Single positioning' and the 'Positioning with override'

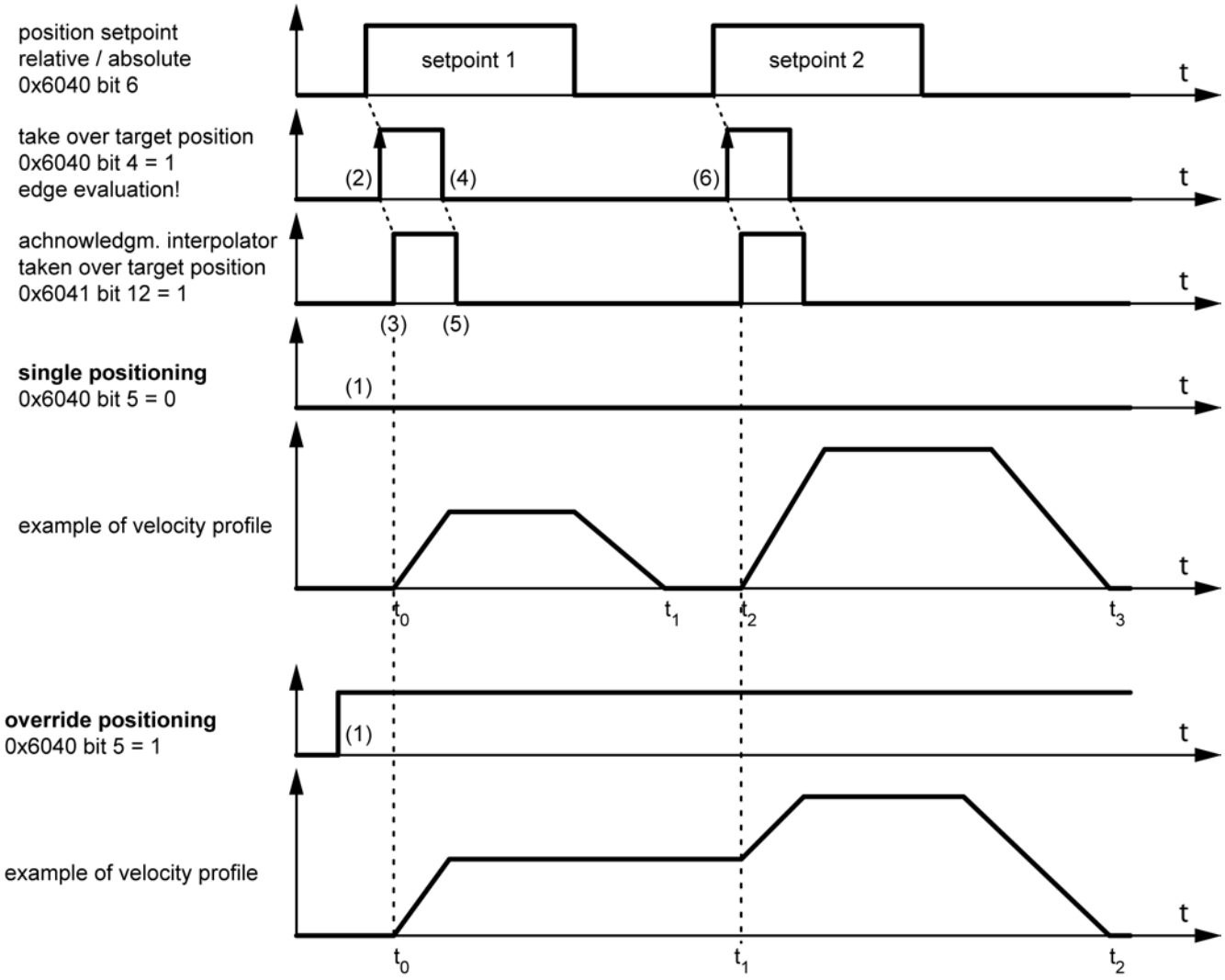
The operating mode 'Profile position mode' supports both variants of the positioning:

Single positioning

After the target position (setpoint 1) is reached and acknowledged the drive controls to this position until a new position (setpoint 2) is set.

Positioning with override

A new target position (setpoint 2) is set while the positioning to target position 1 (setpoint 1) is not finished. After the target position (setpoint 1) is reached the drive moves to the next position immediately without stop at target position 1.



Process:

1. Define the variant of positioning (object 0x6040): single positioning (bit 5 = 0) or override positioning (bit 5 = 1)
2. Set the target position (object 0x607A 'Target position')
3. Define if the target position is absolute or relativ (0x6040 bit 6)
4. Set the control signal 'take over the target position' (2)
5. The interpolator acknowledged if the target position is taken over (3). The positioning process is started (t_0)
6. The control signal 'take over target position' can be reset (4) (object 0x6040 bit 4 = 0)
7. The drive resets the acknowledgment 'interpolator has taken over the target position' (5) (object 0x6040 bit 12 = 0)
8. Variant **'Single positioning'**: At time t_1 the target position is reached and the acknowledgment 'target position reached' (object 0x6041 bit 10 = 1) is set. Now a new target position can be set (positioning profile between t_2 and t_3)
9. Variant **'Override positioning'**: A new target position (setpoint 2) (0x607A) and the profile velocity (0x6081) are set, while the previous positioning (setpoint 1) is not finished (t_1). The new target position is taken over from the interpolator with edge (6) and the positioning profile will be adapted. The transition to the new positioning profile is fluently without stop of the drive at target position 1. At time t_2 the target position (setpoint 2) is reached and the acknowledgment 'target position reached' (object 0x6041 bit 10 = 1) is set.

3.5 Homing mode

3.5.1 Introduction

The operating mode 'Homing mode' supports the following features:

- Operating mode active according to 0x2221/9 'AMK position control'
- Several homing methods selectable: (direction of rotation, homing signal zero pulse and / or cam, cam edge (object 0x6098)
- Homing cycle without movements for multiturn absolute encoders

- Abort of the homing cycle with the command 'Halt'. The drive switches automatically into the speed control operation mode with setpoint zero speed and brakes down to a standstill according to the object 0x6084 .

Control loop structure: Siehe 'Position control' auf Seite 25.

3.5.2 Relevant objects

Operating mode

Object	Name
0x2221/9	'AMK position control' (keep default values!)
0x6060	'Modes of operation' = 6 'Homing mode'
0x6098	'Homing method'

Control word and status word

Object	Name
0x6040	'Control word'
0x6041	'Status word'

Limits

Object	Name
0x6080	'Maximal motor speed'
0x221E	'Deceleration ramp RF inactive'
0x6081	'Profile velocity'
0x6083	'Profile acceleration'
0x6084	'Profile deceleration'
0x2254	'Additional acceleration value'
0x6067	'Position window'
Speed control	
0x2026	'Positive velocity limit'
0x2027	'Negative velocity limit'
0x207C	'Zero velocity window'
0x209D	'Velocity window'
Torque and current control	
0x6072	'Maximal torque'
0x60E0	'Positive torque limit value'
0x60E1	'Negative torque limit value'

Setpoints

Object	Name
0x609A	'Homing acceleration'
0x607C	'Home offset'
0x224D	'High homing velocity'

Actual values and real-time bit messages

Object	Name
0x20B6	'Diagnosis manufacturer status'
0x6064	'Position actual value'

Object	Name
0x2150	'Message in position'
Speed control	
0x606C	'Velocity actual value'
0x214A	'Message speed: actual value = setpoint'
0x214B	'Message speed: actual value < minimal value'
0x214C	'Message speed: actual value < threshold'
Torque and current control	
0x6077	'Torque actual value'
0x214D	'Message torque: actual value ≥ threshold'
0x214E	'Message torque: actual value ≥ limit'

3.5.3 Profile specific description of objects

3.5.3.1 0x6040 'Control word'

Bit	Name	Value	Description
0 (LSB)	Switch on	-	Siehe '0x6040 'Control word'' auf Seite 298.
1	Enable voltage	-	
2	Quick stop	-	
3	Enable operation	-	
4	Homing operation start	0	Homing cycle inactive
		0→1	Start homing cycle
		1	Homing active
		1→0	Abort homing cycle The drive switches automatically into speed control operation mode with setpoint zero speed and brakes down to a standstill according to the object 0x6084 .
5-6	-	-	Reserved
7	Fault reset	-	Siehe '0x6040 'Control word'' auf Seite 298.
8	Halt	0	Execute homing according to bit 4
		1	The drive will be switched into the last active operating mode of the controller.
9-15	-	-	Reserved

3.5.3.2 0x6041 'Status word'

Bit	Name	Value	Description
0 (LSB)	Ready to switch on	-	Siehe '0x6041 'Status word' ' auf Seite 299.
1	Switched on	-	
2	Operation enabled	-	
3	Fault	-	
4	Voltage enable	-	
5	Quick stop	-	
6	Switch on disabled	-	
7	Warning	-	
8	Manufacturer specific	-	
9	Remote	-	
10	Target reached	0	0x6040 Bit 8 'Halt' = 0: Homing point no reached yet
			0x6040 Bit 8 'Halt' = 1: drive brakes
		1	0x6040 Bit 8 'Halt' = 0: Homing point reached
			0x6040 Bit 8 'Halt' = 1: Standstill window reached
11	Internal limit active	1	Limits exceeded: 0x607D/2 'Positive position limit' 0x607D/1 'Negative position limit' Siehe '0x6041 'Status word' ' auf Seite 299.
12	Homing attained	0	Homing active
		1	Homing finished, 'Homing point known'
13	Homing error	0	No error
		1	Error while homing
14-15	Manufacturer specific		Reserved

3.5.4 Variants of the homing cycle function (0x6098 'Homing method')

Siehe '0x6098 'Homing method'' auf Seite 316.

3.6 Cyclic synchronous torque mode

3.6.1 Introduction

The operating mode 'Cyclic synchronous torque mode' is defined in the standard IEC 61800-7-201 EtherCAT and supports the following features:

- Data consistency is reached doe to cyclic torque setpoint setting synchronized to 0x2013 'Communication cycle period'
- Setpoint setting via object 0x6071 'Target torque' and 0x60B2 'Torque offset'

Control loop structure: Siehe 'Torque and current control' auf Seite 21.

3.6.2 Relevant objects

Operating mode and time base

Object	Name
0x2013	'Communication cycle period'
0x2221/4	'AMK secondary operation mode 3' = 0x430002
0x6060	'Modes of operation' =10 Cyclic synchronous torque mode

Control word and status word

Object	Name
0x6040	'Control word'
0x6041	'Status word'

Limits

Object	Name
0x6080	'Maximal motor speed'
0x221E	'Deceleration ramp RF inactive'
0x6072	'Maximal torque'
0x60E0	'Positive torque limit value'
0x60E1	'Negative torque limit value'

Setpoints

Object	Name
0x6071	'Target torque'
0x60B2	'Torque offset'

Actual values and real-time bit messages

Object	Name
0x20B6	'Diagnosis manufacturer status'
0x6077	'Torque actual value'
0x214D	'Message torque: actual value ≥ threshold'
0x214E	'Message torque: actual value ≥ limit'

Controller

Object	Name
0x228E/1	'Current path Q proportional gain'
0x228E/2	'Current path D proportional gain'
0x2276/1	'Current path Q integral-action time'
0x2276/2	'Current path D integral-action time'

Effects of the objects:

Siehe 'Overview control loops' auf Seite 20.
Siehe 'Torque and current control' auf Seite 21.

3.6.3 Profile specific description of objects

3.6.3.1 0x6040 'Control word'

Bit	Name	Value	Description
0 (LSB)	Switch on	-	Siehe '0x6040 'Control word" auf Seite 298.
1	Enable voltage	-	
2	Quick stop	-	
3	Enable operation	-	
4-6	Operation mode specific	-	Reserved
7	Fault reset	-	Siehe '0x6040 'Control word" auf Seite 298.
8	Halt	0	Reserved
9-15	-	-	Reserved

3.6.3.2 0x6041 'Status word'

Bit	Name	Value	Description
0 (LSB)	Ready to switch on	-	Siehe '0x6041 'Status word' ' auf Seite 299.
1	Switched on	-	
2	Operation enabled	-	
3	Fault	-	
4	Voltage enable	-	
5	Quick stop	-	
6	Switch on disabled	-	
7	Warning	-	
8	Manufacturer specific	-	
9	Remote	-	
10	Reserved	0	Reserved
11	Internal limit active	1	Limits exceeded: 0x60E0 'Positive torque limit value' 0x60E1 'Negative torque limit value' Siehe '0x6041 'Status word' ' auf Seite 299.
12	Drive follows the command value	1	Bit 12 is set to 1 fixed
13	Reserved	-	Reserved
14-15	Manufacturer specific		Reserved

3.7 Cyclic synchronous velocity mode

3.7.1 Introduction

The operating mode 'Cyclic synchronous velocity mode' is defined in the standard IEC 61800-7-201 EtherCAT and supports the following features:

- Closed loop speed control with encoder feedback
- Data consistency is reached doe to cyclic velocity setpoint setting synchronized to 0x2013 'Communication cycle period'
- Setpoint setting via object 0x60FF 'Target velocity'
- Speed feed-forward control with the object 0x60B1 'Velocity offset'
- Torque feed-forward control (basic load) with the object 0x60B2 'Torque offset'

Control loop structure: Siehe 'Speed control' auf Seite 23.

3.7.2 Relevant objects

Operating mode and time base

Object	Name
0x2013	'Communication cycle period'
0x2221/3	'AMK secondary operation mode 2' = 0x430043
0x6060	'Modes of operation' = 9 Cyclic synchronous velocity mode

Control word and status word

Object	Name
0x6040	'Control word'
0x6041	'Status word'

Limits

Object	Name
0x6080	'Maximal motor speed'
0x221E	'Deceleration ramp RF inactive'
0x2026	'Positive velocity limit'
0x2027	'Negative velocity limit'
0x207C	'Zero velocity window'
0x209D	'Velocity window'
Torque and current control	
0x6072	'Maximal torque'
0x60E0	'Positive torque limit value'
0x60E1	'Negative torque limit value'

Setpoints

Object	Name
0x60FF	'Target velocity'
0x60B1	'Velocity offset'
Torque and current control	
0x60B2	'Torque offset'

Actual values and real-time bit messages

Object	Name
0x20B6	'Diagnosis manufacturer status'
0x606C	'Velocity actual value'
0x214A	'Message speed: actual value = setpoint'
0x214B	'Message speed: actual value < minimal value'
0x214C	'Message speed: actual value < threshold'
Torque and current control	
0x6077	'Torque actual value'
0x214D	'Message torque: actual value ≥ threshold'
0x214E	'Message torque: actual value ≥ limit'

Controller

Object	Name
0x60F9/1	'Gain'
0x60F9/2	'Ti - integration time constant'
0x2066	'Current path D proportional gain'
Torque and current control	
0x228E/1	'Current path Q proportional gain'
0x228E/2	'Current path D proportional gain'
0x2276/1	'Current path Q integral-action time'
0x2276/2	'Current path D integral-action time'

Effects of the objects:

Siehe 'Overview control loops' auf Seite 20.
Siehe 'Speed control' auf Seite 23.
Siehe 'Torque and current control' auf Seite 21.

3.7.3 Profile specific description of objects

3.7.3.1 0x6040 'Control word'

Bit	Name	Value	Description
0 (LSB)	Switch on	-	Siehe '0x6040 'Control word'' auf Seite 298.
1	Enable voltage	-	
2	Quick stop	-	
3	Enable operation	-	
4-6	Operation mode specific	-	Reserved
7	Fault reset	-	Siehe '0x6040 'Control word'' auf Seite 298.
8	Halt	-	Reserved
9-15	-	-	Reserved

3.7.3.2 0x6041 'Status word'

Bit	Name	Value	Description
0 (LSB)	Ready to switch on	-	Siehe '0x6041 'Status word' ' auf Seite 299.
1	Switched on	-	
2	Operation enabled	-	
3	Fault	-	
4	Voltage enable	-	
5	Quick stop	-	
6	Switch on disabled	-	
7	Warning	-	
8	Manufacturer specific	-	
9	Remote	-	
10	Reserved	0	Reserved
11	Internal limit active	1	Limits exceeded: 0x2026 'Positive velocity limit' 0x2027 'Negative velocity limit' Siehe '0x6041 'Status word' ' auf Seite 299.
12	Drive follows the command value [1)]	0	Target velocity is unequal to the actual velocity
		1	Target velocity is equal to the actual velocity (0x214A 'Message speed: actual value = setpoint')
13	Reserved	0	Reserved
14-15	Manufacturer specific		Reserved

1) This signal depends on the settings in the object 0x209D 'Velocity window'

3.8 Cyclic synchronous position mode

3.8.1 Introduction

The operating mode 'Cyclic synchronous position mode' is defined in the standard IEC 61800-7-201 EtherCAT and supports the following features:

- Closed loop position control with encoder feedback
- Data consistency is reached doe to cyclic position setpoint setting, synchronized to 0x2013 'Communication cycle period'
- Setpoint setting via object 0x607A 'Target position'
- Speed feed-forward control with the object 0x60B1 'Velocity offset'
- Torque feed-forward control (basic load) with the object 0x60B2 'Torque offset'

Control loop structure: Siehe 'Position control' auf Seite 25.

3.8.2 Relevant objects

Operating mode and time base

Object	Name
0x2013	'Communication cycle period'
0x2221/2	'AMK secondary operation mode 1' = 0x430C04
0x6060	'Modes of operation' = 8 Cyclic synchronous position mode

Control word and status word

Object	Name
0x6040	'Control word'
0x6041	'Status word'

Limits

Object	Name
0x6080	'Maximal motor speed'
0x221E	'Deceleration ramp RF inactive'
0x607D/1	'Negative position limit'
0x607D/2	'Positive position limit'
0x6067	'Position window'
Speed control	
0x2026	'Positive velocity limit'
0x2027	'Negative velocity limit'
0x207C	'Zero velocity window'
0x209D	'Velocity window'
Torque and current control	
0x6072	'Maximal torque'
0x60E0	'Positive torque limit value'
0x60E1	'Negative torque limit value'

Setpoints

Object	Name
0x607A	'Target position'
Speed control	
0x60B1	'Velocity offset'
Torque and current control	
0x60B2	'Torque offset'

Actual values and real-time bit messages

Object	Name
0x20B6	'Diagnosis manufacturer status'
0x6064	'Position actual value'
0x2150	'Message in position'
0x2252	'At synchron speed window'
Speed control	
0x606C	'Velocity actual value'
0x214A	'Message speed: actual value = setpoint'
0x214B	'Message speed: actual value < minimal value'
0x214C	'Message speed: actual value < threshold'
Torque and current control	
0x6077	'Torque actual value'
0x214D	'Message torque: actual value ≥ threshold'
0x214E	'Message torque: actual value ≥ limit'

Controller

Object	Name
0x2068	'Position loop factor'
Speed control	
0x60F9/1	'Gain'
0x60F9/2	'Ti - integration time constant'
0x2066	'Differentiating time speed control TD'

Object	Name
Torque and current control	
0x228E/1	'Current path Q proportional gain'
0x228E/2	'Current path D proportional gain'
0x2276/1	'Current path Q integral-action time'
0x2276/2	'Current path D proportional gain'

Effects of the objects:

Siehe 'Overview control loops' auf Seite 20.
Siehe 'Position control' auf Seite 25.
Siehe 'Speed control' auf Seite 23.
Siehe 'Torque and current control' auf Seite 21.

3.8.3 Profile specific description of objects

3.8.3.1 0x6040 'Control word'

Bit	Name	Value	Description
0 (LSB)	Switch on	-	Siehe '0x6040 'Control word'' auf Seite 298.
1	Enable voltage	-	
2	Quick stop	-	
3	Enable operation	-	
4-6	Operation mode specific	-	Reserved
7	Fault reset	-	Siehe '0x6040 'Control word'' auf Seite 298.
8	Halt	-	Reserved
9-15	-	-	Reserved

3.8.3.2 0x6041 'Status word'

Bit	Name	Value	Description
0 (LSB)	Ready to switch on	-	Siehe '0x6041 'Status word' ' auf Seite 299.
1	Switched on	-	
2	Operation enabled	-	
3	Fault	-	
4	Voltage enable	-	
5	Quick stop	-	
6	Switch on disabled	-	
7	Warning	-	
8	Manufacturer specific	-	
9	Remote	-	
10	Reserviert	0	Reserved
11	Internal limit active	1	Limits exceeded: 0x607D/2 'Positive position limit' 0x607D/1 'Negative position limit' Siehe '0x6041 'Status word' ' auf Seite 299.
12	Drive follows the command value	0	Reserved
		1	Bit 12 is set to 1 fixed
13	Following error	0	Bit 13 is set to 0 fixed
14-15	Manufacturer specific		Reserved

3.9 AMK specific commands

0x2267 'System booting' and 0x22EF 'System reset'

The command is started if the value 0x1 is written in the object. The status of the command is displayed by the object being read.

Read value	Meaning
0x0	Basic state, no command active
0x3	Command complete
0x7	Command currently active
0xF	Command completed with error

The command is completed after the status is 0x3 or 0xF.

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

A simple and continuous measuring is possible with the 'Touch probe' function.

With simple measuring, the effect of an edge of the same kind is blocked after an active measurement edge has occurred. The probe function must be enabled again after each touch probe enable.

With continuous measuring, the actual position value is stored with each occurrence of an active measurement edge.

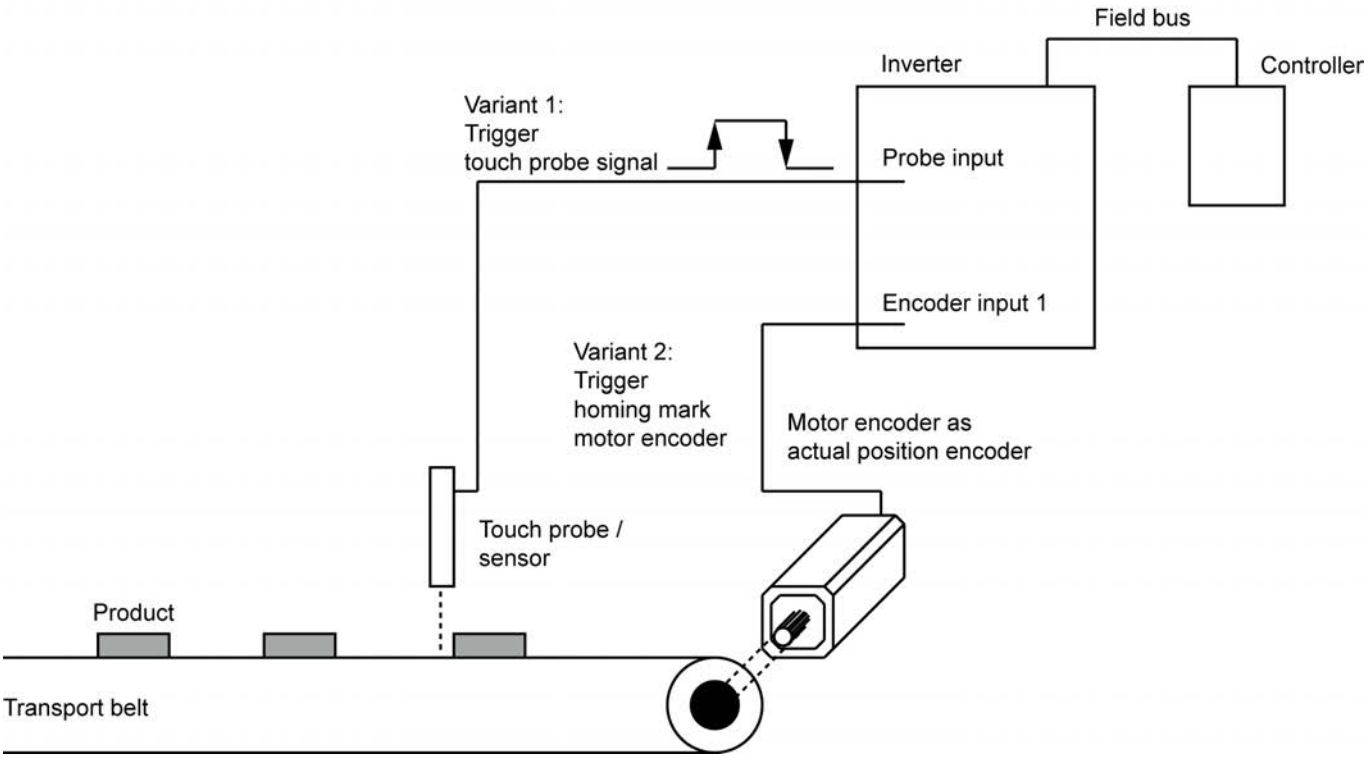
The homing mark of the encoder system (see example: version 2) or a touch probe signal (see example: version 1) can be used as trigger.

Two touch probes (MT1/MT2) can be connected to the probe inputs (BE3/ME1 - BE2/ME2) on the converter. The probe function can evaluate the positive or the negative edge of an input signal.

As soon as the parametrized measurement signal is detected, the probe function stores the actual position value and sets the corresponding acknowledgment bit.

The stored value can subsequently be read out and further processed by a controller via fieldbus.

Example:



Version 2:

For encoder systems without homing mark, an internal homing mark per encoder revolution is automatically generated.

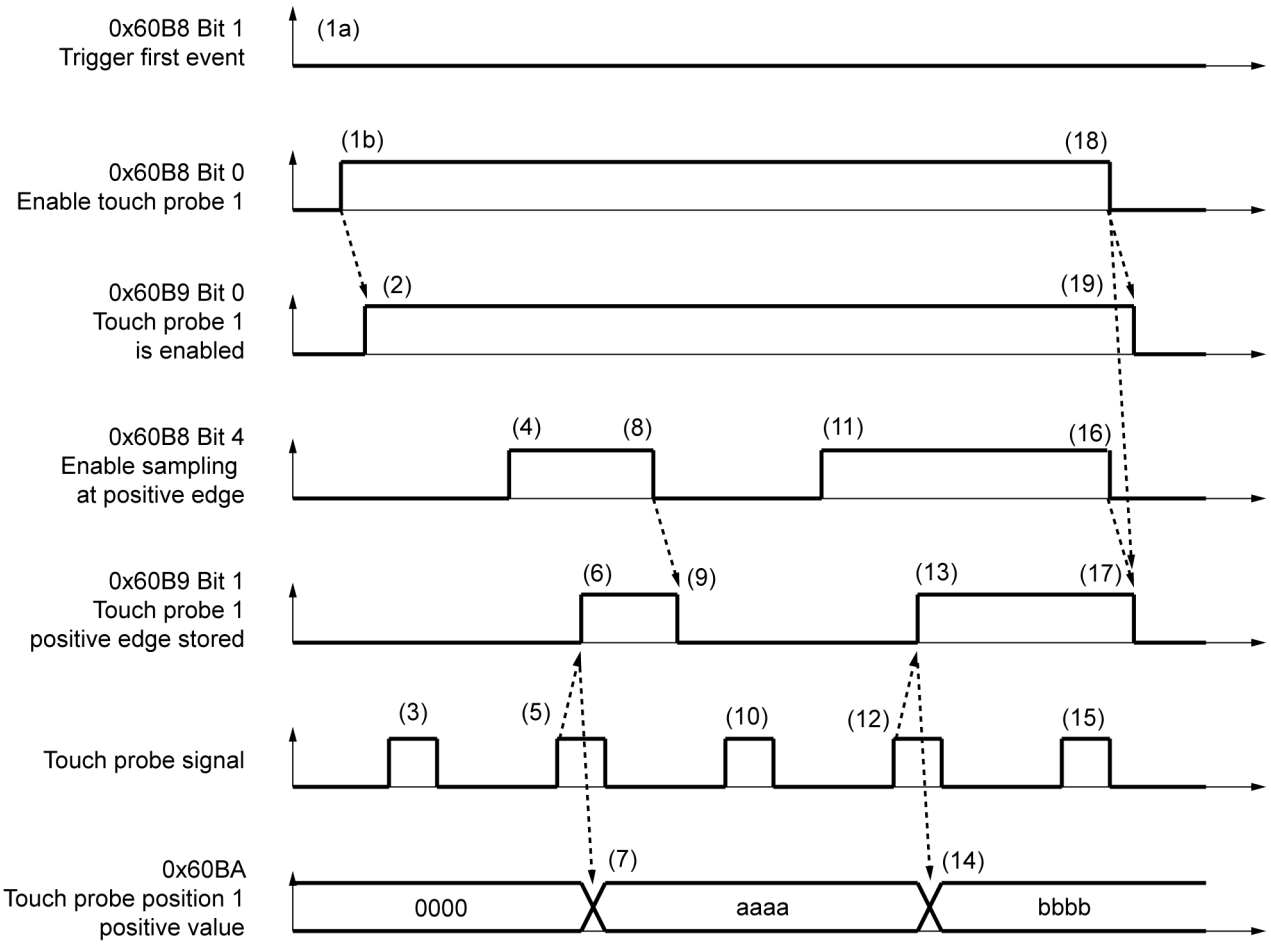
Overview of the touch probe inputs and the associated objects

Probe input 1 - BE3	Probe input 2 - BE2	Meaning
0x2274 'Dead time compensation measuring 1'	0x22AE 'Dead time compensation measuring 2'	Basic setting: Dead time compensation of the input circuitry on the probe input
0x60B8 'Touch probe function' Bit 0 = Probe function touch probe 1 ON/OFF	0x60B8 'Touch probe function' Bit 8 = Probe function touch probe 2 ON/OFF	Basic setting: 'Touch probe' Touch probe x activate / deactivate
0x60B8 'Touch probe function' Bit 1 = Measurement version touch probe 1	0x60B8 'Touch probe function' Bit 9 = Measurement version touch probe 2	Measurement version: 1. Individual measurement 2. Continuous measurement
0x60B8 'Touch probe function' Bit 2..3 = Trigger version	0x60B8 'Touch probe function' Bit 10..11 = Trigger version	Trigger version: 1. Measurement input: 2. Encoder homing mark
0x60B8 'Touch probe function' Bit 4 = Touch probe enable positive edge	0x60B8 'Touch probe function' Bit 12 = Touch probe enable positive edge	Control signal: For every measurement, the enable must be set again with a 0-1 edge in Bit 0.
0x60B8 'Touch probe function' Bit 5 = Touch probe enable negative edge	0x60B8 'Touch probe function' Bit 13 = Touch probe enable negative edge	Control signal: For every measurement, the enable must be set again with a 0-1 edge in Bit 0.
0x60B9 'Touch probe status' Bit 0	0x60B9 'Touch probe status' Bit 8	Status: Enable probe function
0x60B9 'Touch probe status' Bit 1	0x60B9 'Touch probe status' Bit 9	Status: Probe value positive edge stored
0x60B9 'Touch probe status' Bit 2	0x60B9 'Touch probe status' Bit 10	Status: Probe value negative edge stored
0x60D5 'Touch probe 1 positive edge counter'	0x60D7 'Touch probe 2 positive edge counter'	Status: 0 → 1 edge change on the probe input
0x60D6 'Touch probe 1 negative edge counter'	0x60D8 'Touch probe 2 negative edge counter'	Status: 1 → 0 edge change on the probe input
Code 401	Code 402	Basic setting: A binary input with connected touch probe must be assigned with the 'touch probe' function code.

3.9.1 Measurement variant 1: individual measurement

The probe function must be enabled again after each measurement.

Touch probe signal: positive edge



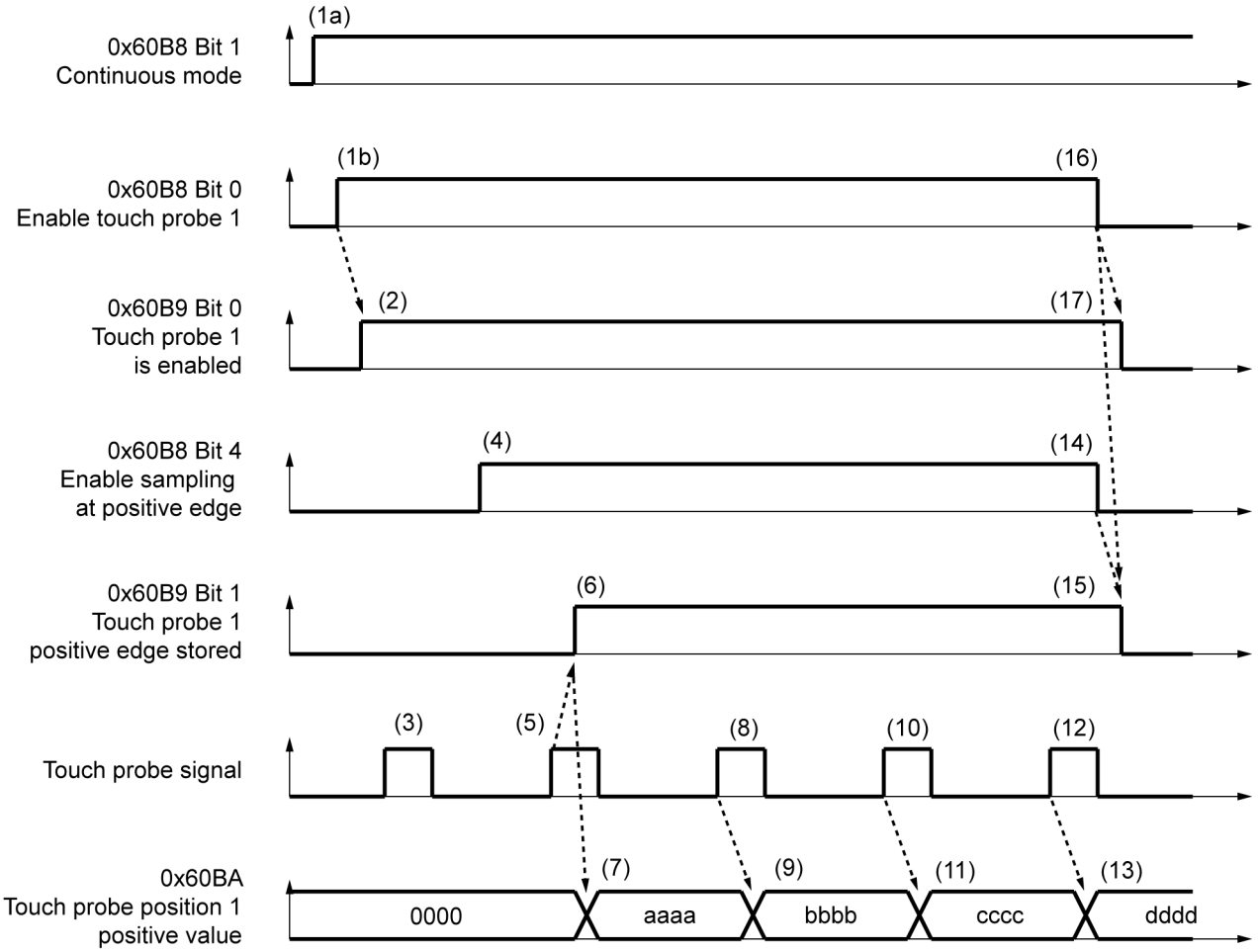
No.	Object	Meaning	
(1a)	0x60B8 Bit 1 = 0	Control signal: measurement variant individual measurement	Trigger first event
(1b)	0x60B8 Bit 0 = 1	Control signal: activate 'Measurement input 1' function	Enable touch probe 1
(2)	0x60B9 Bit 0 = 1	Status: 'Measurement input 1' function active	Status 'Touch probe 1 enabled' is set
(3)		External touch probe signal, positive edge (0 → 1) No touch probe enable. Measurement signal is ignored.	
(4)	0x60B8 Bit 4 = 1	Control signal: Touch probe enable, after every measurement, the new touch probe enable must be reset (1 → 0) and subsequently set again (0 → 1).	Enable sampling at positive edge
(5)		External touch probe signal, positive edge (0 → 1)	
(6)	0x60B9 Bit 1 = 1	Status signal: With a positive edge on the probe input 1, the bit is set and the probe value entered in object 0x60BA.	Status 'Touch probe 1 positive edge stored' is set
(7)	0x60BA	A positive edge at the probe input 1 stores the actual position value. The stored actual position value can be read at a later time by a PLC.	Value is saved
(8)	0x60B8 Bit 4 = 0	Control signal: touch probe enable reset	Sample positive edge is disabled
(9)	0x60B9 Bit 1 = 0	Status: Probe value stored is reset	Status 'Touch probe 1 positive edge stored' is reset

No.	Object	Meaning	
(10)		External touch probe signal, positive edge (0 → 1) No touch probe enable. Measurement signal is ignored.	
(11)	0x60B8 Bit 4 = 1	Control signal: Touch probe enable, after every measurement, the new touch probe enable must be reset (1 → 0) and subsequently set again (0 → 1).	Enable sampling at positive edge
(12)		External touch probe signal, positive edge (0 → 1)	
(13)	0x60B9 Bit 1 = 1	Status signal: With a positive edge on the probe input 1, the bit is set and the probe value entered in object 0x60BA.	Status 'Touch probe 1 positive edge stored' is set
(14)	0x60BA	A positive edge at the probe input 1 stores the actual position value. The stored actual position value can be read at a later time by a PLC.	Value is saved
(15)		External touch probe signal, positive edge (0 → 1) Again no touch probe enable. Measurement signal is ignored.	
(16)	0x60B8 Bit 4 = 0	Control signal: touch probe enable reset	Sample positive edge is disabled
(17)	0x60B9 Bit 1 = 0	Status: Probe value stored is reset	Status 'Touch probe 1 positive edge stored' is reset
(18)	0x60B8 Bit 0 = 0	Control signal: deactivate 'Measurement input 1' function	Status Bit is reset
(19)	0x60B9 Bit 0 = 0	Status: 'Measurement input 1' function is deactivated	Touch probe 1 is disabled

3.9.2 Measurement variant 2: continuous measurement

After enabling, the actual position value is stored with each measurement signal.

Touch probe signal: positive edge



No.	Object	Meaning	
(1a)	0x60B8 Bit 1 = 1	Control signal: continuous measurement	Continuous mode
(1b)	0x60B8 Bit 0 = 1	Control signal: activate 'Measurement input 1' function	Enable touch probe 1
(2)	0x60B9 Bit 0 = 1	Status: 'Measurement input 1' function active	Status 'Touch probe 1 enabled' is set
(3)		External touch probe signal, positive edge (0 → 1) No touch probe enable. Measurement signal is ignored.	
(4)	0x60B8 Bit 4 = 1	Control signal: touch probe enable (positive edge)	Enable sampling at positive edge
(5)		External touch probe signal, positive edge (0 → 1)	
(6)	0x60B9 Bit 1 = 1	Status signal: With a positive edge on the probe input 1, the bit is set and the probe value entered in object 0x60BA.	Status 'Touch probe 1 positive edge stored' is set
(7)	0x60BA	A positive edge at the probe input 1 stores the actual position value. The stored actual position value can be read at a later time by a PLC.	Value is saved
(8)		External touch probe signal, positive edge (0 → 1)	
(9)	0x60BA	A positive edge at the probe input 1 stores the actual position value. The stored actual position value can be read at a later time by a PLC.	Value is saved
(10)		External touch probe signal, positive edge (0 → 1)	
(11)	0x60BA	A positive edge at the probe input 1 stores the actual position value. The stored actual position value can be read at a later time by a PLC.	Value is saved
(12)		External touch probe signal, positive edge (0 → 1)	
(13)	0x60BA	A positive edge at the probe input 1 stores the actual position value. The stored actual position value can be read at a later time by a PLC.	Value is saved
(12)		External touch probe signal, positive edge (0 → 1)	
(13)	0x60B9 Bit 1 = 1	Status signal: With a positive edge on the probe input 1, the bit is set and the probe value entered in object 0x60BA.	Value is saved
(14)	0x60B8 Bit 4 = 0	Control signal: touch probe enable reset	Sample positive edge is disabled
(15)	0x60B9 Bit 1 = 0	Status: Probe value stored is reset	Status 'Touch probe 1 positive edge stored' is reset
(16)	0x60B8 Bit 0 = 0	Control signal: deactivate 'Measurement input 1' function	Status Bit is reset
(17)	0x60B9 Bit 0 = 0	Status: 'Measurement input 1' function is deactivated	Touch probe 1 is disabled

3.9.3 Relevant objects and function codes

A binary input with connected touch probe must be assigned with the 'touch probe' function code.

Function code	Meaning
Code 401	Function code touch probe for BE3 Measurement signal 1 for measurement function only on BE3 (0x2258/3 'Input port 3 bit 2')
Code 402	Function code touch probe for BE2 Measurement signal 2 for measurement function only on BE2 (0x2258/2 'Input port 3 bit 1'

Object	Meaning
0x2074 'Encoder increments'	'Encoder increments' sets the internal position resolution per motor revolution in an application-specific manner. This value is related to the actual position detection with the motor encoder (objects 0x2221.1, 0x2253). At analog encoder evaluation of sine and cosine signals, the incoming signals in the inverter are first converted into square-wave signals and the edges are evaluated (factor 4). In addition, the sine wave and the cosine signal are recorded analogously and from this the analogue angle (arctan) is determined within a sinus period. With this angle, the resolution can be increased by the factor PV (position refinement). Each quarter period is subdivided into a maximum of 2048 measuring steps, thereby refining the position.
0x2274 'Dead time compensation measuring 1'	Dead times can be compensated for with this object due to, for example, sensors and input circuits in connection with the touch probe function at the binary input BE3. The measured value is corrected by the configured dead time.
0x22AE 'Dead time compensation measuring 2'	Dead times can be compensated for with this object due to, for example, sensors and input circuits in connection with the touch probe function at the binary input BE2. The measured value is corrected by the configured dead time.

<table>
<tr><th>Object</th><th>Meaning</th></tr>
<tr><td>0x60B8 'Touch probe function'</td><td>With the object 'Touch probe function' the basic settings for the function 'Touch probe' can be configured.

Data description
<table>
<tr><th>Bit</th><th>Value</th><th>Description</th></tr>
<tr><td rowspan="2">0 (LSB)</td><td>0</td><td>Switch off touch probe 1</td></tr>
<tr><td>1</td><td>Enable touch probe 1</td></tr>
<tr><td rowspan="2">1</td><td>0</td><td>Trigger first event</td></tr>
<tr><td>1 1)</td><td>Continuous</td></tr>
<tr><td rowspan="4">3...2</td><td>00 2)</td><td>Trigger with touch probe 1 input</td></tr>
<tr><td>01 3)</td><td>Trigger with zero impulse signal or position encoder</td></tr>
<tr><td>10 4)</td><td>Touch probe source defined by object 0x60D0/1 'Touch probe 1 source'</td></tr>
<tr><td>11</td><td>Reserved</td></tr>
<tr><td rowspan="2">4</td><td>0</td><td>Switch off sampling at positive edge of touch probe 1</td></tr>
<tr><td>1</td><td>Enable sampling at positive edge at touch probe 1</td></tr>
<tr><td rowspan="2">5</td><td>0</td><td>Switch off sampling at negative edge of touch probe 1</td></tr>
<tr><td>1</td><td>Enable sampling at negative edge of touch probe 1</td></tr>
<tr><td>6...7</td><td>-</td><td>User defined</td></tr>
<tr><td rowspan="2">8</td><td>0</td><td>Switch off touch probe 2</td></tr>
<tr><td>1</td><td>Enable touch probe 2</td></tr>
<tr><td rowspan="2">9</td><td>0</td><td>Trigger first event</td></tr>
<tr><td>1 1)</td><td>Continuous</td></tr>
<tr><td rowspan="4">11...10</td><td>00 2)</td><td>Trigger with touch probe 2 input</td></tr>
<tr><td>01 3)</td><td>Trigger with zero impulse signal or position encoder</td></tr>
<tr><td>10 4)</td><td>Touch probe source defined by object 0x60D0/2 'Touch probe 2 source'</td></tr>
<tr><td>11</td><td>Reserved</td></tr>
<tr><td rowspan="2">12</td><td>0</td><td>Switch off sampling at positive edge of touch probe 2</td></tr>
<tr><td>1</td><td>Enable sampling at positive edge of touch probe 2</td></tr>
<tr><td rowspan="2">13</td><td>0</td><td>Switch off sampling at negative edge of touch probe 2</td></tr>
<tr><td>1</td><td>Enable sampling at negative edge of touch probe 2</td></tr>
<tr><td>14...15 (MSB)</td><td></td><td>User defined</td></tr>
</table>
1) Is currently supported for source 'Trigger with touch probe x input'. The switch in the mode 'Continuous' is possible only while the controller enable is inactive
2) ihXT Is not supported
3) Currently available only for single-turn encoder. The indicated position measured value is a multiple of the object 0x2074 'Encoder increments'. The adjustment of the actual position value on Modulo display is not allowed
4) Is currently not supported</td></tr>
</table>

<table>
<tr><th>Object</th><th>Meaning</th></tr>
<tr><td>0x60B9 'Touch probe status'</td><td>The object 'Touch probe status' indicates the status of the function 'Touch probe'.

Data description
<table>
<tr><th>Bit</th><th>Value</th><th>Description</th></tr>
<tr><td rowspan="2">0 (LSB)</td><td>0</td><td>Touch probe 1 is switched off</td></tr>
<tr><td>1</td><td>Touch probe 1 is enabled</td></tr>
<tr><td rowspan="2">1</td><td>0</td><td>Touch probe 1 no positive edge value stored</td></tr>
<tr><td>1</td><td>Touch probe 1 positive edge value stored</td></tr>
<tr><td rowspan="2">2</td><td>0</td><td>Touch probe 1 no negative edge value stored</td></tr>
<tr><td>1</td><td>Touch probe 1 negative edge value stored</td></tr>
<tr><td>3...5</td><td>0</td><td>Reserved</td></tr>
<tr><td>6...7</td><td>-</td><td>User defined</td></tr>
<tr><td rowspan="2">8</td><td>0</td><td>Touch probe 2 is switched off</td></tr>
<tr><td>1</td><td>Touch probe 2 is enabled</td></tr>
<tr><td rowspan="2">9</td><td>0</td><td>Touch probe 2 no positive edge value stored</td></tr>
<tr><td>1</td><td>Touch probe 2 positive edge value stored</td></tr>
<tr><td rowspan="2">10</td><td>0</td><td>Touch probe 2 no negative edge value stored</td></tr>
<tr><td>1</td><td>Touch probe 2 negative edge value stored</td></tr>
<tr><td>11...13</td><td>0</td><td>Reserved</td></tr>
<tr><td>14...15 (MSB)</td><td>-</td><td>User defined</td></tr>
</table>

Bit 1 and bit 2 are set to 0 when touch probe 1 is switched off (object 0x60B8 'Touch probe function' bit 0).
Bit 9 and bit 10 are set to 0 when touch probe 2 is switched off (object 0x60B8 'Touch probe function' bit 8).</td></tr>
<tr><td>0x60BA
'Touch probe position 1 positive value'</td><td>A positive edge at the probe input 1 stores the actual position value. The stored actual position value can be read at a later time by a PLC.</td></tr>
<tr><td>0x60BB
'Touch probe position 1 negative value'</td><td>A negative edge at the probe input 1 stores the actual position value. The stored actual position value can be read at a later time by a PLC.</td></tr>
<tr><td>0x60BC
'Touch probe position 2 positive value'</td><td>A positive edge at the probe input 2 stores the actual position value. The stored actual position value can be read at a later time by a PLC.</td></tr>
<tr><td>0x60BD
'Touch probe position 2 negative value'</td><td>A negative edge at the probe input 2 stores the actual position value. The stored actual position value can be read at a later time by a PLC.</td></tr>
<tr><td>0x60D5
'Touch probe 1 positive edge counter'</td><td>The 'Touch probe 1 positive edge counter' counts the edge change (0 → 1) at the probe input 1.</td></tr>
<tr><td>0x60D6
'Touch probe 1 negative edge counter'</td><td>The 'Touch probe 1 negative edge counter' counts the edge change (1 → 0) at the probe input 1.</td></tr>
<tr><td>0x60D7
'Touch probe 2 positive edge counter'</td><td>The 'Touch probe 2 positive edge counter' counts the edge change (0 → 1) at the probe input 2.</td></tr>
<tr><td>0x60D8
'Touch probe 2 negative edge counter'</td><td>The 'Touch probe 2 negative edge counter' counts the edge change (1 → 0) at the probe input 2.</td></tr>
</table>

Touch probe edge counter for continuous mode

The 'Touch probe edge counter for continuous mode' counts the edge change at the probe input.

Requirement:
Probe input 1:
0x60B8 bit 0 = 1 (Enable touch probe 1)
0x60B8 bit 1 = 1 (Continuous)

Probe input 2:
0x60B8 bit 8 = 1 (Enable touch probe 2)
0x60B8 bit 9 = 1 (Continuous)

Individual measurement:
Only Bit 0 is valid

Consecutive measurement:
16 Bit value with overflow

The counter is consecutive. Counter overflows must be accounted for by the user.

4 Object list and features of the objects

Abbreviations	Meaning
RW	Read / Write access
RO	Read Only
N	No, not supported
Y	Yes, supported
1)	Relationship between CoE objects and SERCOS ID

Object type	Range of values
UNSIGNED8	0 ... 255
UNSIGNED16	0 ... 65535
UNSIGNED32	0 ... 4294967295
INTEGER8	-128 ... +127
INTEGER16	-32768 ... +32767
INTEGER32	-2147483648 ... +2147483647

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
1000	'Device Type'	-	UNSIGNED32	VAR	RO	N	1	-
1001	'Error Register'	-	UNSIGNED8	VAR	RO	N	1	-
1003	'Pre-defined Error Field'	-	UNSIGNED32	ARRAY	RW	N	1	-
1008	'Manufacturer Device Name'	30	VISIBLE_ STRING	VAR	RO	N	1	-
1009	'Manufacturer Hardware Version'	-	VISIBLE_ STRING	VAR	RO	N	1	-
100A	'Manufacturer Software Version'	-	VISIBLE_ STRING	VAR	RO	N	1	-
1010/1	'Store parameters' - 'Save all parameters'	-	UNSIGNED32	ARRAY	RW	N	1	-
1010/2	'Store parameters' - 'Save communication parameters' is currently not supported	-	UNSIGNED32	ARRAY	RW	N	1	-
1010/3	'Store parameters' - 'Save application parameters' is currently not supported	-	UNSIGNED32	ARRAY	RW	N	1	-
1010/4	'Store parameters' - 'Save all parameters according 0x20C0 'List backup data''	-	UNSIGNED32	ARRAY	RW	N	1	-
1010/5	'Store parameters' - 'Save all parameters according 0x20C0 'List backup data' and system start up'	-	UNSIGNED32	ARRAY	RW	N	1	-

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
1011/1	'Restore parameters' - 'Set all parameters to default value'	-	UNSIGNED32	ARRAY	RW	N	1	-
1011/2	'Restore parameters' - 'Restore communication default parameters' is currently not supported	-	UNSIGNED32	ARRAY	RW	N	1	-
1011/3	'Restore parameters' - 'Restore application default parameters' is currently not supported	-	UNSIGNED32	ARRAY	RW	N	1	-
1011/4	'Restore parameters' - 'Restore all parameters according 0x20C0 'List backup data'' is currently not supported	-	UNSIGNED32	ARRAY	RW	N	1	-
1011/5	'Restore parameters' - 'Restore all parameters according 0x20C0 'List backup data' and system start up'	-	UNSIGNED32	ARRAY	RW	N	1	-
1018/1	'Identity object' - 'Vendor ID'	-	UNSIGNED32	ARRAY	RO	N	1	-
1018/2	'Identity object' - 'Product code'	-	UNSIGNED32	ARRAY	RO	N	1	-
1018/3	'Identity object' - 'Revision number'	-	UNSIGNED32	ARRAY	RO	N	1	-
1018/4	'Identity object' - 'Serial number'	-	UNSIGNED32	ARRAY	RO	N	1	-
10F1/1	'Error settings' - 'Local error reaction'	-	UNSIGNED32	ARRAY	RW	N	1	-
10F1/2	'Error settings' - 'Sync error counter limit'	-	UNSIGNED16	ARRAY	RW	N	1	-
1600	'1st receive PDO Mapping'	-	UNSIGNED32	ARRAY	RW	N	1	-
1A00	'1st transmit PDO Mapping'	-	UNSIGNED32	ARRAY	RW	N	1	-
1C00/1	'Sync manager communication type' - Sub-index 1	-	UNSIGNED8	ARRAY	RO	N	1	-

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
1C00/2	'Sync manager communication type' - Sub-index 2	-	UNSIGNED8	ARRAY	RO	N	1	-
1C00/3	'Sync manager communication type' - Sub-index 3	-	UNSIGNED8	ARRAY	RO	N	1	-
1C00/4	'Sync manager communication type' - Sub-index 4	-	UNSIGNED8	ARRAY	RO	N	1	-
1C12	'Sync Manager 2 PDO Assignment'	-	UNSIGNED32	ARRAY	RW	N	1	-
1C13	'Sync Manager 3 PDO Assignment'	-	UNSIGNED32	ARRAY	RW	N	1	-
2012	'NC cycle time'	1	UNSIGNED16	VAR	RW	N	0.001	ms
2013	'Communication cycle period'	2	UNSIGNED16	VAR	RW	N	0.001	ms
2014	'Limit switch control'	532	UNSIGNED16	VAR	RW	N	1	-
2015	'Clamping torque'	530	UNSIGNED16	VAR	RW	N	0.1	M_N
201A	'Configuration status bits'	26	UNSIGNED16	ARRAY	RW	N	1	-
2024	'Velocity command value'	36	INTEGER32	VAR	RW	Y	0.0001	1/min
2026	'Positive velocity limit'	38	INTEGER32	VAR	RW	Y	0.0001	1/min
2027	'Negative velocity limit'	39	INTEGER32	VAR	RW	Y	0.0001	1/min
202B	'Velocity polarity'	43	UNSIGNED16	VAR	RW	N	1	-
202C	'Scaling of velocity data'	44	UNSIGNED16	VAR	RW	N	1	-
2034	'Home reference position 1'	52	INTEGER32	VAR	RW	N	1	Increments
2037	'Closed loop polarity'	55	UNSIGNED16	VAR	RW	N	1	-
204C	'Position data scaling'	76	UNSIGNED16	VAR	RW	N	1	-
204F	'Rotational position resolution'	79	UNSIGNED32	VAR	RW	N	1	Increments
2055	'Torque polarity'	85	UNSIGNED16	VAR	RW	N	1	-
2056	'Torque data scaling'	86	UNSIGNED16	VAR	RW	N	1	-
2066	'Differentiating time speed control TD'	102	UNSIGNED16	VAR	RW	Y	0.1	ms
2068	'Position loop factor'	104	UNSIGNED16	VAR	RW	N	1	-
206D	'Motor peak current'	109	UNSIGNED32	VAR	RW	N	0.001	A
206E	'Inverter peak current'	110	UNSIGNED32	VAR	RO	N	0.001	A

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
2070	'Inverter nominal current'	112	UNSIGNED32	VAR	RO	N	0.001	A
2072	'Overload limit motor'	114	UNSIGNED16	VAR	RW	N	0.1	%
2074	'Encoder increments'	116	UNSIGNED32	VAR	RW	N	1	Increments
2079	'Load gear input revolution'	121	UNSIGNED32	VAR	RW	N	1	rev
207A	'Load gear output revolution'	122	UNSIGNED32	VAR	RW	N	1	rev
207B	'Feed constant'	123	UNSIGNED32	VAR	RW	N	0.0001	mm/U
207C	'Zero velocity window'	124	UNSIGNED32	VAR	RW	N	0.0001	1/min
207D	'Velocity threshold'	125	UNSIGNED32	VAR	RW	N	0.0001	1/min
207E	'Torque threshold'	126	UNSIGNED16	VAR	RW	N	0.1	$\%M_N$
2088	'Max acceleration'	136	UNSIGNED32	VAR	RW	Y	0.001	rev/s^2
2089	'Max deceleration'	137	UNSIGNED32	VAR	RW	Y	0.001	rev/s^2
208C	'Inverter type'	140	VISIBLE_ STRING	VAR	RO	N	1	-
208D	'Motor type'	141	VISIBLE_ STRING	VAR	RW	N	1	-
208E	'Application type'	142	VISIBLE_ STRING	VAR	RW	N	1	-
2090	'Status word'	144	UNSIGNED16	VAR	RO	Y	1	-
209D	'Velocity window'	157	UNSIGNED32	VAR	RW	N	0.0001	1/min
209E	'Power threshold'	158	UNSIGNED32	VAR	RW	N	1	W
20A0	'Acceleration data scaling type'	160	UNSIGNED16	VAR	RW	N	1	-
20B6	'Diagnosis manufacturer status'	182	UNSIGNED16	VAR	RO	Y	1	-
20C0	'List backup data'	192	DOMAIN	VAR	RO	N	1	-
20C2	'Acceleration setpoint'	194	INTEGER32	VAR	RW	Y	0.001	rev/s^2
20CE	'Drive on delay time'	206	UNSIGNED16	VAR	RW	N	0.1	ms
20CF	'Drive off delay time'	207	UNSIGNED16	VAR	RW	N	0.1	ms
20D1/1	'Adaption limits' - 'Lower adaption limit'	209	UNSIGNED32	ARRAY	RW	N	0.0001	1/min
20D1/2	'Adaption limits' - 'Upper adaption limit'	210	UNSIGNED32	ARRAY	RW	N	0.0001	1/min
20D3	'Proportional gain adaption'	211	UNSIGNED16	VAR	RW	N	0.1	%
20D4	'Integral-action time adaption'	212	UNSIGNED16	VAR	RW	N	0.1	%
2106	'Initial program load command'	262	UNSIGNED16	VAR	RW	N	1	-
2109	'Language'	265	UNSIGNED16	VAR	RW	N	1	-
210D	'ID memory mode'	269	UNSIGNED16	VAR	RW	N	1	-

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
2128	'Velocity feedforward gain'	296	UNSIGNED16	VAR	RW	N	1	%
2136	'Overload motor'	310	UNSIGNED16	VAR	RO	Y	1	-
2137	'Warning overtemperature inverter'	311	UNSIGNED16	VAR	RO	Y	1	-
2138	'Warning overtemperature motor'	312	UNSIGNED16	VAR	RO	Y	1	-
2139	'Warning cooler'	313	UNSIGNED16	VAR	RO	Y	1	-
2146	'Parameter checksum'	326	UNSIGNED32	VAR	RO	Y	1	-
214A	'Message speed: actual value = setpoint'	330	UNSIGNED16	VAR	RO	Y	1	-
214B	'Message speed: actual value < minimal value'	331	UNSIGNED16	VAR	RO	Y	1	-
214C	'Message speed: actual value < threshold'	332	UNSIGNED16	VAR	RO	Y	1	-
214D	'Message torque: actual value ≥ threshold'	333	UNSIGNED16	VAR	RO	Y	1	-
214E	'Message torque: actual value ≥ limit'	334	UNSIGNED16	VAR	RO	Y	1	-
214F	'Message torque: setpoint > limit'	335	UNSIGNED16	VAR	RO	Y	1	-
2150	'Message in position'	336	UNSIGNED16	VAR	RO	Y	1	-
2151	'Message power: actual value ≥ threshold'	337	UNSIGNED16	VAR	RO	Y	1	-
215C	'Acceleration feedforward gain'	348	UNSIGNED16	VAR	RW	N	1	%
2186	'Diagnostic number'	390	UNSIGNED16	VAR	RO	Y	1	-
2188	'Velocity setpoint filter'	392	UNSIGNED16	VAR	RW	N	1	µs
218E	'List status bits'	398	DOMAIN	VAR	RO	N	1	-
21DE	'Limit switch status'	478	UNSIGNED16	VAR	RO	Y	1	-
2210	'Temperature external'	33117	INTEGER16	VAR	RO	Y	0.1	°C
2211	'Nominal motor voltage'	32768	UNSIGNED16	VAR	RW	N	0.1	V
2212	'Magnetising current'	32769	UNSIGNED32	VAR	RW	N	0.001	A
2213	'Magnetising current 1'	32770	UNSIGNED32	VAR	RW	N	0.001	A
2214	'Nominal velocity'	32772	UNSIGNED32	VAR	RW	N	0.0001	1/min
2215	'Service bits'	32773	UNSIGNED32	VAR	RW	N	1	-
2216	'Rotor time constant'	32774	UNSIGNED16	VAR	RW	N	0.0001	s

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
2217	'Pole number motor'	32775	UNSIGNED8	VAR	RW	Y	1	-
2218	'Sinus encoder period'	32776	UNSIGNED16	VAR	RW	N	1	-
221C	'Acceleration ramp'	32780	INTEGER32	VAR	RW	N	0.1	ms
221D	'Deceleration ramp'	32781	UNSIGNED32	VAR	RW	N	0.1	ms
221E	'Deceleration ramp RF inactive'	32782	UNSIGNED32	VAR	RW	N	0.1	ms
221F	'Source RF'	32796	UNSIGNED16	VAR	RW	N	1	-
2220	'User list 1'	32798	DOMAIN	VAR	RW	N	1	-
2221/1	'AMK operation modes' - 'AMK main operation mode'	32800	UNSIGNED32	ARRAY	RW	N	1	-
2221/2	'AMK operation modes' - 'AMK secondary operation mode 1'	32801	UNSIGNED32	ARRAY	RW	N	1	-
2221/3	'AMK operation modes' - 'AMK secondary operation mode 2'	32802	UNSIGNED32	ARRAY	RW	N	1	-
2221/4	'AMK operation modes' - 'AMK secondary operation mode 3'	32803	UNSIGNED32	ARRAY	RW	N	1	-
2221/5	'AMK operation modes' - 'AMK secondary operation mode 4'	32804	UNSIGNED32	ARRAY	RW	N	1	-
2221/6	'AMK operation modes' - 'AMK secondary operation mode 5'	32805	UNSIGNED32	ARRAY	RW	N	1	-
2221/7	'AMK operation modes' - 'AMK secondary operation mode 6'	32806	UNSIGNED32	ARRAY	RW	N	1	-
2221/8	'AMK operation modes' - 'AMK digital torque control'	32807	UNSIGNED32	ARRAY	RW	N	1	-
2221/9	'AMK operation modes' - 'AMK position control'	32808	UNSIGNED32	ARRAY	RW	N	1	-
2221/A	'AMK operation modes' - 'AMK digital speed control'	32809	UNSIGNED32	ARRAY	RW	N	1	-
2222	'Parameter set assignment 1'	32813	UNSIGNED32	VAR	RW	N	1	-
2223	'Password'	32821	UNSIGNED32	VAR	RW	N	1	-
2224	'Velocity control command after ramp'	32823	INTEGER32	VAR	RO	Y	0.0001	1/min

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
2225	'Following distance'	32824	INTEGER32	VAR	RO	Y	1	Increments
2226	'Following error compensation value'	32826	INTEGER32	VAR	RO	Y	1	Increments
2227	'Magnetising current feedback'	32827	INTEGER16	VAR	RO	Y	0.01	A
2228/1	'Current feedbacks' - 'Current feedback phase U'	32828	INTEGER32	ARRAY	RO	Y	0.01	A
2228/2	'Current feedbacks' - 'Current feedback phase V'	32829	INTEGER32	ARRAY	RO	Y	0.01	A
2228/3	'Current feedbacks' - 'Current feedback phase W'	32830	INTEGER32	ARRAY	RO	Y	0.01	A
2229	'Resolver angle'	32831	UNSIGNED16	VAR	RO	Y	1	Increments
222A/1	'Encoder signals' - 'Encoder signal S2'	32832	INTEGER16	ARRAY	RO	Y	1	mV
222A/2	'Encoder signals' - 'Encoder signal S1'	32833	INTEGER16	ARRAY	RO	Y	1	mV
222B	'Torque current feedback'	32834	INTEGER16	VAR	RO	Y	0.1	A
222C	'Torque command value intern'	32835	INTEGER16	VAR	RO	Y	0.1	$\%M_N$
222E	'DC bus voltage monitoring'	32837	UNSIGNED16	VAR	RW	N	0.1	V
222F	'Diagnostic list'	32840	DOMAIN	VAR	RW	N	1	-
2230	'Encoder list motor'	32841	DOMAIN	VAR	RO	N	1	-
2231	'Encoder list customer'	32842	DOMAIN	VAR	RW	N	1	-
2233	'Output port 1'	32846	UNSIGNED16	VAR	RW	N	1	-
2234/1	'Output port 1 bits' - 'Output port 1 bit 0'	32847	UNSIGNED32	ARRAY	RW	N	1	-
2234/2	'Output port 1 bits' - 'Output port 1 bit 1'	32848	UNSIGNED32	ARRAY	RW	N	1	-
2234/3	'Output port 1 bits' - 'Output port 1 bit 2'	32849	UNSIGNED32	ARRAY	RW	N	1	-
2234/4	'Output port 1 bits' - 'Output port 1 bit 3'	32850	UNSIGNED32	ARRAY	RW	N	1	-
2234/5	'Output port 1 bits' - 'Output port 1 bit 4'	32851	UNSIGNED32	ARRAY	RW	N	1	-
2234/6	'Output port 1 bits' - 'Output port 1 bit 5'	32852	UNSIGNED32	ARRAY	RW	N	1	-

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
2234/7	'Output port 1 bits' - 'Output port 1 bit 6'	32853	UNSIGNED32	ARRAY	RW	N	1	-
2234/8	'Output port 1 bits' - 'Output port 1 bit 7'	32854	UNSIGNED32	ARRAY	RW	N	1	-
2235	'Output port 2'	32855	UNSIGNED16	VAR	RW	N	1	-
2236/1	'Output port 2 bits' - 'Output port 2 bit 0'	32856	UNSIGNED32	ARRAY	RW	N	1	-
2236/2	'Output port 2 bits' - 'Output port 2 bit 1'	32857	UNSIGNED32	ARRAY	RW	N	1	-
2236/3	'Output port 2 bits' - 'Output port 2 bit 2'	32858	UNSIGNED32	ARRAY	RW	N	1	-
2236/4	'Output port 2 bits' - 'Output port 2 bit 3'	32859	UNSIGNED32	ARRAY	RW	N	1	-
2236/5	'Output port 2 bits' - 'Output port 2 bit 4'	32860	UNSIGNED32	ARRAY	RW	N	1	-
2236/6	'Output port 2 bits' - 'Output port 2 bit 5'	32861	UNSIGNED32	ARRAY	RW	N	1	-
2236/7	'Output port 2 bits' - 'Output port 2 bit 6'	32862	UNSIGNED32	ARRAY	RW	N	1	-
2236/8	'Output port 2 bits' - 'Output port 2 bit 7'	32863	UNSIGNED32	ARRAY	RW	N	1	-
2237	'Output port 3'	32864	UNSIGNED16	VAR	RW	N	1	-
2238/1	'Output port 3 bits' - 'Output port 3 bit 0'	32865	UNSIGNED32	ARRAY	RW	N	1	-
2238/2	'Output port 3 bits' - 'Output port 3 bit 1'	32866	UNSIGNED32	ARRAY	RW	N	1	-
2238/3	'Output port 3 bits' - 'Output port 3 bit 2'	32867	UNSIGNED32	ARRAY	RW	N	1	-
2239	'Velocity command value intern'	32891	INTEGER32	VAR	RO	Y	0.0001	1/min
223A	'Position command value filter'	32894	UNSIGNED16	VAR	RW	N	1	ms
223B	'Position control differenting time'	32895	UNSIGNED16	VAR	RW	N	0.1	ms
223C	'Position command value intern'	32896	INTEGER32	VAR	RO	Y	1	Increments
223D	'Analog input A1'	32897	INTEGER16	VAR	RO	Y	0.01	V
223E	'Global service bits'	32901	UNSIGNED32	VAR	RW	N	1	-
223F	'Clear error'	32913	UNSIGNED16	VAR	RW	Y	1	-

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
2240	'Sum of additive velocities'	32914	INTEGER32	VAR	RO	Y	0.0001	1/min
2241	'Sum of additive torques'	32915	INTEGER16	VAR	RO	Y	0.1	$\%M_N$
2242	'Cyclic filter'	32916	UNSIGNED16	ARRAY	RW	N	1	-
2243	'Overload time motor'	32920	UNSIGNED16	VAR	RW	N	0.1	s
2244	'Residual distance erase window'	32922	UNSIGNED32	VAR	RW	N	1	Increments
2245	'Operation mode change parameter'	32924	UNSIGNED16	VAR	RW	N	1	-
2246	'AMK homing cycle parameter'	32926	UNSIGNED16	VAR	RW	N	1	-
2247/1	'Time filters' - 'Time filter 1'	32928	UNSIGNED16	ARRAY	RW	N	0.1	ms
2247/2	'Time filters' - 'Time filter 2'	32929	UNSIGNED16	ARRAY	RW	N	0.1	ms
2248	'Barrier frequency'	32932	UNSIGNED16	VAR	RW	N	1	Hz
2249	'Band width'	32933	UNSIGNED16	VAR	RW	N	1	Hz
224A	'Voltage standstill'	32935	UNSIGNED16	VAR	RW	N	0.1	V
224B	'Window'	32936	UNSIGNED32	VAR	RW	N	1	Increments
224C	'Customer variable 1'	32938	UNSIGNED16	VAR	RW	N	1	-
224D	'High homing velocity'	32940	UNSIGNED32	VAR	RW	N	0.0001	1/min
224E	'Service control'	32942	UNSIGNED32	VAR	RW	Y	1	-
224F	'Warning time'	32943	UNSIGNED16	VAR	RW	N	0.01	s
2251	'Message 4x32'	32948	UNSIGNED32	VAR	RW	N	1	-
2252	'At synchron speed window'	32952	UNSIGNED16	VAR	RW	N	1	Increments
2253	'Encoder type'	32953	UNSIGNED16	VAR	RW	N	1	-
2254	'Additional acceleration value'	32956	UNSIGNED16	VAR	RW	N	1	-
2255	'Offset resolver'	32959	UNSIGNED16	VAR	RW	N	1	-
2256/1	'Motor encoder gear' - 'Input motor encoder gear'	32960	UNSIGNED16	ARRAY	RW	N	1	rev
2256/2	'Motor encoder gear' - 'Output motor encoder gear'	32961	UNSIGNED16	ARRAY	RW	N	1	rev
2257	'Input port 3'	32977	UNSIGNED16	VAR	RO	N	1	-
2258/1	'Input port 3 bits' - 'Input port 3 bit 0'	32978	UNSIGNED32	ARRAY	RW	N	1	-
2258/2	'Input port 3 bits' - 'Input port 3 bit 1'	32979	UNSIGNED32	ARRAY	RW	N	1	-
2258/3	'Input port 3 bits' - 'Input port 3 bit 2'	32980	UNSIGNED32	ARRAY	RW	N	1	-
2258/4	'Input port 3 bits' - 'Input port 3 bit 3'	32981	UNSIGNED32	ARRAY	RW	N	1	-

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
2258/5	'Input port 3 bits' - 'Input port 3 bit 4'	32982	UNSIGNED32	ARRAY	RW	N	1	-
2259	'Torque filter time'	32989	UNSIGNED16	VAR	RW	N	1	ms
225A	'NK-shift'	32990	UNSIGNED16	VAR	RW	N	1	Increments
225B	'V/F start up'	32991	UNSIGNED16	VAR	RW	N	1	%
225C	'Dead time compensation 2'	32993	UNSIGNED16	VAR	RW	N	0.001	ms
225D	'Data signification'	32996	UNSIGNED32	VAR	RO	N	1	-
225E	'Overload limit inverter'	32999	UNSIGNED16	VAR	RW	N	0.1	%
225F	'Second period'	33076	UNSIGNED16	VAR	RW	N	1	-
2260	'Increase position value 2'	33098	INTEGER32	VAR	RO	Y	1	Increments
2261	'Actual power value'	33100	UNSIGNED32	VAR	RO	Y	1	W
2262	'Display overload inverter'	33101	UNSIGNED16	VAR	RO	Y	1	%
2263	'Display overload motor'	33102	UNSIGNED16	VAR	RO	Y	0.1	%
2264	'Position feedback modulo'	33104	UNSIGNED32	VAR	RO	Y	1	Increments
2265	'Torque setpoint at controller'	33113	INTEGER16	VAR	RO	Y	0.01	$\%M_N$
2266	'Temperature internal'	33116	INTEGER16	VAR	RO	Y	0.1	°C
2267	'System booting'	33730	UNSIGNED16	VAR	RW	Y	1	-
2268/1	'Variables' - 'Variable 0'	34000	INTEGER32	ARRAY	RW	Y	1	-
2268/2	'Variables' - 'Variable 1'	34001	INTEGER32	ARRAY	RW	Y	1	-
2268/3	'Variables' - 'Variable 2'	34002	INTEGER32	ARRAY	RW	Y	1	-
2268/4	'Variables' - 'Variable 3'	34003	INTEGER32	ARRAY	RW	Y	1	-
2268/5	'Variables' - 'Variable 4'	34004	INTEGER32	ARRAY	RW	Y	1	-
2268/6	'Variables' - 'Variable 5'	34005	INTEGER32	ARRAY	RW	Y	1	-
2268/7	'Variables' - 'Variable 6'	34006	INTEGER32	ARRAY	RW	Y	1	-
2268/8	'Variables' - 'Variable 7'	34007	INTEGER32	ARRAY	RW	Y	1	-
2268/9	'Variables' - 'Variable 8'	34008	INTEGER32	ARRAY	RW	Y	1	-
2268/A	'Variables' - 'Variable 9'	34009	INTEGER32	ARRAY	RW	Y	1	-
2268/B	'Variables' - 'Variable 10'	34010	INTEGER32	ARRAY	RW	Y	1	-
2268/C	'Variables' - 'Variable 11'	34011	INTEGER32	ARRAY	RW	Y	1	-
2268/D	'Variables' - 'Variable 12'	34012	INTEGER32	ARRAY	RW	Y	1	-
2268/E	'Variables' - 'Variable 13'	34013	INTEGER32	ARRAY	RW	Y	1	-

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
2268/F	'Variables' - 'Variable 14'	34014	INTEGER32	ARRAY	RW	Y	1	-
2268/10	'Variables' - 'Variable 15'	34015	INTEGER32	ARRAY	RW	Y	1	-
2268/11	'Variables' - 'Variable 16'	34016	INTEGER32	ARRAY	RW	Y	1	-
2268/12	'Variables' - 'Variable 17'	34017	INTEGER32	ARRAY	RW	Y	1	-
2268/13	'Variables' - 'Variable 18'	34018	INTEGER32	ARRAY	RW	Y	1	-
2268/14	'Variables' - 'Variable 19'	34019	INTEGER32	ARRAY	RW	Y	1	-
2269	'BUS address participant'	34023	UNSIGNED16	VAR	RW	N	1	-
226A	'BUS transmit rate'	34026	UNSIGNED16	VAR	RW	N	1	-
226B	'BUS failure character'	34027	UNSIGNED16	VAR	RW	N	1	-
226C	'Offset analog input 1'	34037	INTEGER16	VAR	RW	Y	0.01	V
226D	'OSC control'	34039	UNSIGNED16	VAR	RW	N	1	-
226F	'OSC actual values'	34041	DOMAIN	VAR	RO	N	1	-
2270	'OSC data list'	34042	DOMAIN	VAR	RW	N	1	-
2271	'TG control'	34043	UNSIGNED16	VAR	RW	N	1	-
2272	'TG configuration list'	34044	DOMAIN	VAR	RW	N	1	-
2273/1	'Inductances' - 'Inductance path D'	34045	UNSIGNED16	ARRAY	RW	N	0.01	mH
2273/2	'Inductances' - 'Inductance path Q'	34046	UNSIGNED16	ARRAY	RW	N	0.01	mH
2274	'Dead time compensation measuring 1'	34047	UNSIGNED16	VAR	RW	N	0.001	ms
2275	'PWM frequency'	34048	UNSIGNED16	VAR	RW	N	1	kHz
2276/1	'Integral times' - 'Current path Q integral-action time'	34050	UNSIGNED16	ARRAY	RW	N	0.1	ms
2276/2	'Integral times' - 'Current path D integral-action time'	34052	UNSIGNED16	ARRAY	RW	N	0.1	ms
2278	'EF type'	34055	UNSIGNED16	VAR	RO	Y	1	-
2279	'List SEEP 1'	34060	DOMAIN	VAR	RO	N	1	-
227A	'List SEEP 2'	34061	DOMAIN	VAR	RO	N	1	-
227B	'Fault statistics'	34062	DOMAIN	VAR	RO	N	1	-
227C	'Time meter power'	34063	UNSIGNED32	VAR	RO	Y	1	-
227D	'Home signal distance'	34070	INTEGER32	VAR	RO	Y	1	Increments
227E	'System name'	34071	VISIBLE_ STRING	VAR	RW	N	1	-

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
227F	'Data set name'	34072	VISIBLE_ STRING	VAR	RW	N	1	-
2280	'Scaling parameters'	34073	DOMAIN	VAR	RO	N	1	-
2281/1	'Homing and actual counters' - 'Homing counter 1'	34074	INTEGER16	ARRAY	RO	Y	1	Increments
2281/2	'Homing and actual counters' - 'Actual counter 1'	34075	INTEGER16	ARRAY	RO	Y	1	Increments
2281/3	'Homing and actual counters' - 'Homing counter 2'	34076	INTEGER16	ARRAY	RO	Y	1	Increments
2281/4	'Homing and actual counters' - 'Actual counter 2'	34077	INTEGER16	ARRAY	RO	Y	1	Increments
2282	'Event trace'	34088	VISIBLE_ STRING	VAR	RO	N	1	-
2283	'User list 2'	34090	DOMAIN	VAR	RW	N	1	-
2284	'Rise time SWC'	34094	UNSIGNED16	VAR	RW	N	0.001	A/s
2285	'Final value SWC'	34095	INTEGER16	VAR	RW	N	0.1	A
2286	'Standstill current motor'	34096	UNSIGNED32	VAR	RW	N	0.001	A
2287	'Delay time SWC'	34099	UNSIGNED16	VAR	RW	N	1	ms
2288	'Binary input word'	34100	UNSIGNED16	VAR	RO	Y	1	-
2289	'OSC configuration list 2'	34117	DOMAIN	VAR	RW	N	1	-
228A	'Memory address'	34146	UNSIGNED32	VAR	RW	N	1	-
228B	'Memory data'	34147	UNSIGNED16	VAR	RW	N	1	-
228C	'Kp voltage control gain'	34148	UNSIGNED16	VAR	RW	N	0.001	A/V
228D	'Tn voltage control integrating time'	34149	UNSIGNED16	VAR	RW	N	0.1	ms
228E/1	'Proportional gains' - 'Current path Q proportional gain'	34151	UNSIGNED16	ARRAY	RW	N	0.01	V/A
228E/2	'Proportional gains' - 'Current path D proportional gain'	34152	UNSIGNED16	ARRAY	RW	N	0.01	V/A
228F	'Maximum speed motor'	34153	UNSIGNED32	VAR	RO	N	0.0001	1/min
2290	'Part number motor'	34160	VISIBLE_ STRING	VAR	RW	N	1	-
2291	'Production date motor'	34161	UNSIGNED16	VAR	RW	N	1	-
2292	'Serial number motor'	34162	UNSIGNED32	VAR	RW	N	1	-
2293	'Terminal resistance'	34164	UNSIGNED16	VAR	RW	N	0.01	Ohm

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
2294	'Holding torque brake'	34165	UNSIGNED16	VAR	RW	N	0.1	Nm
2295	'Temperature sensor motor'	34166	UNSIGNED16	VAR	RW	N	1	-
2296	'Terminal inductance'	34167	UNSIGNED16	VAR	RW	N	0.1	mH
2297	'Time maximum current motor'	34168	UNSIGNED16	VAR	RW	N	0.1	s
2298	'Event filter'	34171	UNSIGNED16	VAR	RW	N	1	-
2299	'SWK monitoring'	34174	UNSIGNED16	ARRAY	RW	N	1	-
229A/1	'Threshold current adaptations' - 'Lower threshold current adaption'	34177	UNSIGNED16	ARRAY	RW	N	1	%
229A/2	'Threshold current adaptations' - 'Upper threshold current adaption'	34178	UNSIGNED16	ARRAY	RW	N	1	%
229B/1	'Gradients' - 'Gradient path Q proportional gain'	34179	UNSIGNED16	ARRAY	RW	N	1	%
229B/2	'Gradients' - 'Gradient path Q integral-action time'	34180	UNSIGNED16	ARRAY	RW	N	1	%
229C	'Limit position increment'	34182	UNSIGNED32	VAR	RW	N	1	Increments
229D	'Velocity threshold SL'	34183	UNSIGNED32	VAR	RW	N	0.0001	1/min
229E	'Starting current SL'	34184	UNSIGNED32	VAR	RW	N	0.001	A
229F	'Resistance rotor'	34185	UNSIGNED16	VAR	RW	N	0.01	Ohm
22A0/1	'Inductances' - 'Inductance stator'	34186	UNSIGNED16	ARRAY	RW	N	0.1	mH
22A0/2	'Inductances' - 'Inductance rotor'	34187	UNSIGNED16	ARRAY	RW	N	0.1	mH
22A0/3	'Inductances' - 'Main inductance'	34188	UNSIGNED16	ARRAY	RW	N	0.1	mH
22A1/1	'Bit lists sensorless' - 'Bit list sensorless'	34189	UNSIGNED16	ARRAY	RW	N	0.1	-
22A1/2	'Bit lists sensorless' - 'Bit list parameter finding'	34190	UNSIGNED16	ARRAY	RW	N	0.01	ms
22A3/1	'Velocity acquisition' - 'Velocity acquisition propotional gain'	34191	UNSIGNED16	ARRAY	RW	N	0.1	-
22A3/2	'Velocity acquisition' - 'Velocity acquisition integral-action time'	34192	UNSIGNED16	ARRAY	RW	N	0.01	ms

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
22A5	'Nominal current'	34193	UNSIGNED16	VAR	RW	N	0.1	A
22A6	'Peak current'	34194	UNSIGNED16	VAR	RW	N	0.1	A
22A7	'Peak current time'	34195	UNSIGNED16	VAR	RW	N	0.1	s
22A8	'Treshold external component'	34196	UNSIGNED16	VAR	RW	N	0.1	%
22A9	'Display external component'	34197	UNSIGNED16	VAR	RO	Y	0.1	%
22AA	'Actual power value bipolar'	34199	INTEGER32	VAR	RO	Y	1	W
22AB	'Bit mask port 3'	34202	UNSIGNED16	VAR	RW	N	1	-
22AC/1	'Voltages at x degree' - 'Voltage at 25 degree'	34203	UNSIGNED16	ARRAY	RW	N	0.001	V
22AC/2	'Voltages at x degree' - 'Voltage at 75 degree'	34204	UNSIGNED16	ARRAY	RW	N	0.001	V
22AC/3	'Voltages at x degree' - 'Voltage at 125 degree'	34205	UNSIGNED16	ARRAY	RW	N	0.001	V
22AE	'Dead time compensation measuring 2'	34210	UNSIGNED16	VAR	RW	N	0.001	ms
22AF/1	'Voltage path' - 'Voltage path Q'	34212	INTEGER16	ARRAY	RO	Y	0.1	V
22AF/2	'Voltage path' - 'Voltage path D'	34213	INTEGER16	ARRAY	RO	Y	0.1	V
22B0	'Temperature IGBT'	34215	INTEGER16	VAR	RO	Y	0.1	°C
22B1/1	'AMK test' - 'AMK test 1'	34217	INTEGER32	ARRAY	RW	Y	1	-
22B1/2	'AMK test' - 'AMK test 2'	34218	INTEGER32	ARRAY	RW	Y	1	-
22B1/3	'AMK test' - 'AMK test 3'	34219	INTEGER32	ARRAY	RW	Y	1	-
22B1/4	'AMK test' - 'AMK test 4'	34220	INTEGER32	ARRAY	RW	Y	1	-
22B2	'Friction torque'	34221	UNSIGNED16	VAR	RW	N	0.01	Nm
22B3	'Friction torque linear'	34222	UNSIGNED16	VAR	RW	N	0.01	Nm
22B4	'Holding torque'	34223	INTEGER16	VAR	RW	N	0.1	Nm
22B5	'Inertia'	34224	UNSIGNED32	VAR	RW	N	0.001	kg cm^2
22B6	'Mode load model'	34225	UNSIGNED32	VAR	RW	N	1	-
22B7	'List load model'	34226	DOMAIN	VAR	RW	N	1	-
22B8	'Angle feed forward SL'	34228	UNSIGNED16	VAR	RW	N	1	-
22B9	'Sliding factor SL'	34229	UNSIGNED16	VAR	RW	N	0.1	-
22BA	'List bus'	34230	DOMAIN	VAR	RW	N	1	-
22BB/1	'Feed forward control voltages' - 'Feed forward control voltage path Q'	34231	INTEGER16	ARRAY	RO	Y	0.1	V

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
22BB/2	'Feed forward control voltages' - 'Feed forward control voltage path D'	34232	INTEGER16	ARRAY	RO	Y	0.1	V
22BC	'Phase resistance'	34233	UNSIGNED16	VAR	RW	N	0.001	Ohm
22BD	'Voltage constant Ke'	34234	UNSIGNED16	VAR	RW	N	0.1	V/ (1000 1/min)
22BE	'Increase motor voltage'	34235	UNSIGNED16	VAR	RW	N	0.1	%
22BF	'Time motor brake on'	34236	UNSIGNED16	VAR	RW	N	1	ms
22C0	'Pulse duty factor motor brake'	34237	UNSIGNED16	VAR	RW	N	1	%
22C1	'List IR filter'	34238	DOMAIN	VAR	RW	N	1	-
22C2	'V/F integrator stop'	34239	UNSIGNED16	VAR	RW	N	1	%
22C3	'Voltage reserve'	34266	UNSIGNED16	VAR	RW	N	0.1	V
22C4/1	'Osci' - 'Osci 1'	34273	INTEGER32	ARRAY	RO	Y	1	-
22C4/2	'Osci' - 'Osci 2'	34274	INTEGER32	ARRAY	RO	Y	1	-
22C4/3	'Osci' - 'Osci 3'	34275	INTEGER32	ARRAY	RO	Y	1	-
22C4/4	'Osci' - 'Osci 4'	34276	INTEGER32	ARRAY	RO	Y	1	-
22C4/5	'Osci' - 'Osci 5'	34277	INTEGER32	ARRAY	RO	Y	1	-
22C4/6	'Osci' - 'Osci 6'	34278	INTEGER32	ARRAY	RO	Y	1	-
22C4/7	'Osci' - 'Osci 7'	34279	INTEGER32	ARRAY	RO	Y	1	-
22C4/8	'Osci' - 'Osci 8'	34280	INTEGER32	ARRAY	RO	Y	1	-
22C5	'OSC container length'	34284	UNSIGNED32	VAR	RW	N	1	Byte
22C6	'Time stop drive cmd'	34286	UNSIGNED16	VAR	RW	N	1	ms
22C7	'Torque feedback filter'	34298	UNSIGNED16	VAR	RW	N	1	ms
22C8/1	'Velocity control' - 'Velocity setpoint in control'	34299	INTEGER32	ARRAY	RO	Y	0.0001	1/min
22C8/2	'Velocity control' - 'Velocity actual value in control'	34300	INTEGER32	ARRAY	RO	Y	0.0001	1/min
22C9/1	'Torque setpoint filter' - 'Torque setpoint filter input'	34301	INTEGER16	ARRAY	RO	Y	0.1	$\%M_N$
22C9/2	'Torque setpoint filter' - 'Torque setpoint filter output'	34302	INTEGER16	ARRAY	RO	Y	0.1	$\%M_N$
22CA/1	'Motion tests' - 'Motion test 1'	33300	INTEGER16	ARRAY	RW	Y	1	-
22CA/2	'Motion tests' - 'Motion test 2'	33301	INTEGER16	ARRAY	RW	Y	1	-
22CA/3	'Motion tests' - 'Motion test 3'	33302	INTEGER16	ARRAY	RW	Y	1	-
22CA/4	'Motion tests' - 'Motion test 4'	33303	INTEGER16	ARRAY	RW	Y	1	-

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
22CB	'V/F input filter'	33141	UNSIGNED16	VAR	RW	N	0.1	ms
22CC	'Commutation valid'	33142	UNSIGNED16	VAR	RO	Y	1	-
22CD	'Communication monitor'	33143	UNSIGNED16	VAR	RW	Y	1	-
22CE	'Timeout communication monitor'	33144	UNSIGNED16	VAR	RW	N	1	ms
22CF	'OSC channel 1'	33145	DOMAIN	VAR	RO	N	1	-
22D0	'OSC channel 2 '	33146	DOMAIN	VAR	RO	N	1	-
22D1	'OSC channel 3'	33147	DOMAIN	VAR	RO	N	1	-
22D2	'OSC channel 4'	33148	DOMAIN	VAR	RO	N	1	-
22D3	'Saturation current'	33149	UNSIGNED16	VAR	RW	N	0.1	A
22D4	'Brake torque'	33150	UNSIGNED16	VAR	RW	N	0.1	$\%M_N$
22D5	'Max. angle difference encoder-SL'	33151	UNSIGNED16	VAR	RW	N	0.1	°
22D6	'IPO mode'	33170	UNSIGNED16	VAR	RW	N	1	-
22D7	'Active power (el.)'	33171	INTEGER16	VAR	RO	Y	1	W
22D8	'Reactive power (el.)'	33172	INTEGER32	VAR	RO	Y	1	Var
22D9	'Service list'	32919	DOMAIN	VAR	RW	N	1	-
22DA	'Damping factor position'	33174	INTEGER32	VAR	RW	N	0.1	%
22DB	'List glitch filter time'	33175	UNSIGNED16	ARRAY	RW	N	1	-
22DC/1	'Process data' - 'Process data 1'	33176	INTEGER32	ARRAY	RO	Y	1	-
22DC/2	'Process data' - 'Process data 2'	33177	INTEGER32	ARRAY	RO	Y	1	-
22DC/3	'Process data' - 'Process data 3'	33178	INTEGER32	ARRAY	RO	Y	1	-
22DC/4	'Process data' - 'Process data 4'	33179	INTEGER32	ARRAY	RO	Y	1	-
22DD	'Performance index sensorles'	33180	INTEGER32	VAR	RO	Y	1	-
22DE/1	'Actual current' - 'Actual current Ia'	33181	INTEGER32	ARRAY	RO	Y	0.001	A
22DE/2	'Actual current' - 'Actual current Ib'	33182	INTEGER32	ARRAY	RO	Y	0.001	A
22DF/1	'Voltage' - 'Voltage Ua'	33183	INTEGER16	ARRAY	RO	Y	0.1	V
22DF/2	'Voltage' - 'Voltage Ub'	33184	INTEGER16	ARRAY	RO	Y	0.1	V
22E0	'Magnetising current feedback'	33185	INTEGER32	VAR	RO	Y	0.001	A
22E1	'Torque current feedback'	33186	INTEGER32	VAR	RO	Y	0.001	A
22E2/1	'Actual current value phase' - 'Actual current value phase U'	33187	INTEGER32	ARRAY	RO	Y	0.001	A

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
22E2/2	'Actual current value phase' - 'Actual current value phase V'	33188	INTEGER32	ARRAY	RO	Y	0.001	A
22E2/3	'Actual current value phase' - 'Actual current value phase W'	33189	INTEGER32	ARRAY	RO	Y	0.001	A
22E3	'Park position'	32887	INTEGER32	VAR	RW	N	1	Increments
22E4	'Park speed'	32888	INTEGER32	VAR	RW	N	0.0001	1/min
22E5/1	'Display load model' - 'Display friction torque'	33196	UNSIGNED16	ARRAY	RO	Y	0.01	Nm
22E5/2	'Display load model' - 'Display friction torque linear'	33197	UNSIGNED16	ARRAY	RO	Y	0.01	Nm
22E5/3	'Display load model' - 'Display holding torque'	33198	INTEGER16	ARRAY	RO	Y	0.1	Nm
22E5/4	'Display load model' - 'Display of moment of inertia'	33199	UNSIGNED32	ARRAY	RO	Y	0.001	kg cm^2
22EB	'Source UE'	32795	UNSIGNED16	VAR	RW	N	1	-
22EC	'Slot assignment'	32882	UNSIGNED32	VAR	RW	N	1	-
22ED	'List parameter set'	32945	DOMAIN	VAR	RW	N	1	-
22EE	'Drive DB file'	32946	DOMAIN	VAR	RW	N	1	-
22EF	'System reset'	33732	UNSIGNED16	VAR	RW	Y	1	-
22F0	'Starting current'	34069	UNSIGNED32	VAR	RW	N	0.001	A
22F1	'User list 3'	34091	DOMAIN	VAR	RW	N	1	-
22F2	'Start marker'	34154	INTEGER32	VAR	RW	N	1	-
22F3	'Marker window'	34155	INTEGER32	VAR	RW	N	1	Increments
22F4	'Dead time compensation'	34157	INTEGER16	VAR	RW	N	1	-
22F5	'Encoder ratio'	34265	UNSIGNED16	VAR	RW	N	1	-
22F6	'Motion data list'	34285	DOMAIN	VAR	RW	N	1	-
2300	'Inverter on'	32904	UNSIGNED16	VAR	RW	N	1	-
2301	'Temperature inner room'	32810	UNSIGNED16	VAR	RO	N	0.1	°C
2302	'Address input port 1'	32873	UNSIGNED16	VAR	RW	N	1	-
2303/1	'Binary input Port 1 Bits' - 'Port1 bit 0'	32874	UNSIGNED32	ARRAY	RW	N	1	-
2303/2	'Binary input Port 1 Bits' - 'Port1 bit 1'	32875	UNSIGNED32	ARRAY	RW	N	1	-
2303/3	'Binary input Port 1 Bits' - 'Port1 bit 2'	32876	UNSIGNED32	ARRAY	RW	N	1	-
2303/4	'Binary input Port 1 Bits' - 'Port1 bit 3'	32877	UNSIGNED32	ARRAY	RW	N	1	-

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
2303/5	'Binary input Port 1 Bits' - 'Port1 bit 4'	32878	UNSIGNED32	ARRAY	RW	N	1	-
2303/6	'Binary input Port 1 Bits' - 'Port1 bit 5'	32879	UNSIGNED32	ARRAY	RW	N	1	-
2303/7	'Binary input Port 1 Bits' - 'Port1 bit 6'	32880	UNSIGNED32	ARRAY	RW	N	1	-
2303/8	'Binary input Port 1 Bits' - 'Port1 bit 7'	32881	UNSIGNED16	VAR	RW	N	1	-
2304	'Binary input word 1'	34101	UNSIGNED16	VAR	RW	Y	1	-
2305	'Binary output word 1'	34121	UNSIGNED16	VAR	RW	Y	1	-
2310	'DC bus voltage'	32836	UNSIGNED32	VAR	RO	Y	1	mV
2311	'VBNX'	33123	UNSIGNED16	VAR	RO	N	1	-
2312	'Rated frequency'	33173	UNSIGNED16	VAR	RO	Y	1	Hz
2313	'Line output'	34058	INTEGER32	VAR	RO	Y	1	W
2314	'Time filter line'	34059	UNSIGNED16	VAR	RW	N	1	ms
2316	'Nominal voltage effective'	34144	UNSIGNED16	VAR	RO	Y	0.1	V
2317	'Line current effective'	34145	UNSIGNED16	VAR	RO	Y	0.1	A
2318	'Setpoint DC-bus'	34170	UNSIGNED16	VAR	RW	Y	0.1	V
2319	'Line frequency'	34198	INTEGER16	VAR	RO	Y	0.1	Hz
231A	'DC gain KP'	34207	UNSIGNED16	VAR	RW	N	0.1	
231B	'Int. time DC control'	34208	UNSIGNED16	VAR	RW	N	0.001	ms
231C	'Diff. time DC control'	34209	UNSIGNED16	VAR	RW	N	0.001	ms
231D	'Bit bar'	34227	UNSIGNED16	VAR	RW	N	1	-
231E	'Net voltage'	34270	UNSIGNED16	VAR	RW	N	1	V
231F	'Upper limit DC bus voltage'	34287	UNSIGNED16	VAR	RW	N	0.1	V
2320	'Lower limit DC bus voltage'	34288	UNSIGNED16	VAR	RW	N	0.1	V
2321	'Setpoint line current wattless component'	34289	INTEGER16	VAR	RW	Y	0.1	% I_N
2322	'Upper limit line current wattless component'	34290	INTEGER16	VAR	RW	Y	0.1	% I_N
2323	'Lower limit line current wattless component'	34291	INTEGER16	VAR	RW	Y	0.1	% I_N
2324	'Upper limit line current energy component'	34292	INTEGER16	VAR	RW	Y	0.1	% I_N
2325	'Lower limit line current energy component'	34293	INTEGER16	VAR	RW	Y	0.1	% I_N
2326	'Output value DC-bus'	34294	UNSIGNED16	VAR	RO	Y	0.1	V

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
2327	'Line frequency'	34295	INTEGER16	VAR	RO	Y	0.01	Hz
2328	'Reactive power network'	34296	INTEGER32	VAR	RO	Y	1	VA
2330	'MAC address'	1019	DOMAIN	VAR	RO	N	1	-
2331	'IP address'	1020	DOMAIN	VAR	RW	N	1	-
2332	'Subnet mask'	1021	DOMAIN	VAR	RW	N	1	-
2333	'Default gateway'	1022	DOMAIN	VAR	RW	N	1	-
2335	'Factor derating'	32986	UNSIGNED16	VAR	RW	N	1	-
2336	'Treshold derating'	32987	UNSIGNED16	VAR	RW	N	0.1	%
2337	'Current setpoint ISQ'	34281	INTEGER16	VAR	RW	Y	1	-
2338	'Current setpoint ISD'	34282	INTEGER16	VAR	RW	Y	1	-
2339	'Commutation angle'	34283	UNSIGNED16	VAR	RW	Y	1	-
233A	'Nominal torque'	32771	UNSIGNED16	VAR	RW	Y	0.1	Nm
233B	'Delay software reset'	32988	UNSIGNED16	VAR	RW	N	1	ms
233C	'Brake mode'	34118	UNSIGNED16	VAR	RW	N	1	-
233D	'Torque constant Kt adaption'	34119	UNSIGNED32	VAR	RW	N	0.001	Nm/A
233E	'Offset commutation'	34243	UNSIGNED16	VAR	RW	N	1	Increments
233F	'Electrical field angle'	34244	UNSIGNED16	VAR	RO	Y	1	Increments
2340	'Sampling resolver'	34245	UNSIGNED16	VAR	RW	N	1	-
2341	'ZR-current T1-d'	34246	UNSIGNED16	VAR	RW	N	0.001	ms
2342	'ZR-current T2-d'	34247	UNSIGNED16	VAR	RW	N	0.001	ms
2343	'ZR-current T1-q'	34248	UNSIGNED16	VAR	RW	N	0.001	ms
2344	'ZR-current T2-q'	34249	UNSIGNED16	VAR	RW	N	0.001	ms
2345	'Customer variable 2'	34261	UNSIGNED32	VAR	RW	N	1	-
2346	'Motor encoder database image'	34262	UNSIGNED16	ARRAY	RO	N	1	-
2347	'DC bus monitor upper limit'	34303	UNSIGNED16	VAR	RW	N	10	V
2348	'Velocity feedforward factor 1'	33190	UNSIGNED16	VAR	RW	N	0.01	%
2349	'Velocity feedforward delay 1'	33191	UNSIGNED16	VAR	RW	N	0.001	ms
234A	'Delay target position value'	33192	UNSIGNED16	VAR	RW	N	0.001	ms
234B	'Tolerance limit estimator'	33194	UNSIGNED16	VAR	RW	N	1	-
234C	'Monitoring cycle estimator'	33195	UNSIGNED16	VAR	RW	N	1	ms
234D	'Motion service switch'	33304	UNSIGNED32	VAR	RW	N	1	-

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
234E/1	'Variable torque limits' - 'Variable positive torque limit'	33305	INTEGER16	ARRAY	RW	N	0.1	$\%M_N$
234E/2	'Variable torque limits' - 'Variable negative torque limit'	33306	INTEGER16	ARRAY	RW	N	0.1	$\%M_N$
234F	'Time constant variable torque limits'	33307	UNSIGNED16	VAR	RW	N	1	ms
2350	'Time zone'	32917	VISIBLE_ STRING	VAR	RW	N	1	-
2351	'List absolute position'	-	INTEGER32	ARRAY	RO	N	1	-
2352	'NTP server address'	34173	UNSIGNED32	VAR	RW	N	1	-
2353	'Friction torque motor'	33330	UNSIGNED16	VAR	RW	N	0.01	Nm
2354	'Friction torque load'	33331	UNSIGNED16	VAR	RW	N	0.01	Nm
2355	'Friction torque linear motor'	33332	UNSIGNED16	VAR	RW	N	0.01	Nm
2356	'Friction torque linear load'	33333	UNSIGNED16	VAR	RW	N	0.01	Nm
2357	'Inertia motor'	33334	UNSIGNED32	VAR	RW	N	0.001	kg cm^2
2358	'Inertia load'	33335	UNSIGNED32	VAR	RW	N	0.001	kg cm^2
2359	'Threshold variable torque limits'	33336	UNSIGNED32	VAR	RW	N	1	increments
235A	'Encoder service switch'	33337	UNSIGNED32	VAR	RW	N	1	-
235B	'Encoder status 1'	33338	UNSIGNED16	VAR	RW	N	1	-
235C	'Encoder status 2'	33339	UNSIGNED16	VAR	RO	Y	1	-
603F	'Error code'	-	UNSIGNED16	VAR	RO	Y	1	-
6040	'Control word'	-	UNSIGNED16	VAR	RW	Y	1	-
6041	'Status word'	-	UNSIGNED16	VAR	RO	Y	1	-
6060	'Modes of operation'	-	INTEGER8	VAR	RW	Y	1	-
6061	'Modes of operation display'	-	INTEGER8	VAR	RO	Y	1	-
6064	'Position actual value'	51	INTEGER32	VAR	RO	Y	1	Increments
6065	'Following error window'	159	UNSIGNED32	VAR	RW	Y	1	Increments
6067	'Position window'	57	UNSIGNED32	VAR	RW	Y	1	Increments
606C	'Velocity actual value'	40	INTEGER32	VAR	RO	Y	0.0001	1/min
6071	'Target torque'	80	INTEGER16	VAR	RW	Y	0.1	$\%M_N$
6072	'Maximal torque'	34264	UNSIGNED16	VAR	RW	Y	0.1	$\%M_N$
6075	'Motor rated current'	111	UNSIGNED32	VAR	RW	N	0.001	A
6077	'Torque actual value'	84	INTEGER16	VAR	RO	Y	0.1	$\%M_N$

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
6079	'DC link circuit voltage'	-	UNSIGNED32	VAR	RO	Y	1	mV
607A	'Target position'	47	INTEGER32	VAR	RW	Y	1	Increments
607C	'Home offset'	150	INTEGER32	VAR	RW	Y	1	Increments
607D/1	'Software position limit' - 'Negative position limit'	50	INTEGER32	ARRAY	RW	Y	1	Increments
607D/2	'Software position limit' - 'Positive position limit'	49	INTEGER32	ARRAY	RW	Y	1	Increments
607E	'Polarity'	-	UNSIGNED8	VAR	RW	N	1	-
6080	'Maximal motor speed'	113	UNSIGNED32	VAR	RW	Y	1	1/min
6081	'Profile velocity'	-	UNSIGNED32	VAR	RW	Y	0.0001	1/min
6083	'Profile acceleration'	136	UNSIGNED32	VAR	RW	Y	0.001	rev/s^2
6084	'Profile deceleration'	137	UNSIGNED32	VAR	RW	Y	0.001	rev/s^2
6089	'Position notation index'	-	INTEGER8	VAR	RW	N	1	-
608A	'Position dimension index'	-	UNSIGNED8	VAR	RW	N	1	-
608B	'Velocity notation index'	-	INTEGER8	VAR	RW	N	1	-
608C	'Velocity dimension index'	-	UNSIGNED8	VAR	RW	N	1	-
608D	'Acceleration notation index'	-	INTEGER8	VAR	RW	N	1	-
608E	'Acceleration dimension index'	-	UNSIGNED8	VAR	RW	N	1	-
608F/1	'Position encoder resolution' - 'Encoder increments'	-	UNSIGNED32	ARRAY	RW	N	1	Increments
608F/2	'Position encoder resolution' - 'Motor revolutions'	-	UNSIGNED32	ARRAY	RW	N	1	1/min
6090/1	'Velocity encoder resolution' - 'Encoder increments per second'	-	UNSIGNED32	ARRAY	RW	N	1	Increments
6090/2	'Velocity encoder resolution' - 'Motor revolutions per second'	-	UNSIGNED32	ARRAY	RW	N	1	1/min
6091/1	'Gear ratio' - 'Motor revolutions'	-	UNSIGNED32	ARRAY	RW	N	1	1/min
6091/2	'Gear ratio' - 'Shaft revolutions'	-	UNSIGNED32	ARRAY	RW	N	1	1/min
6092/1	'Feed constant' - 'Feed'	-	UNSIGNED32	ARRAY	RW	N	1	Increments
6092/2	'Feed constant' - 'Shaft revolutions'	-	UNSIGNED32	ARRAY	RW	N	1	1/min
6098	'Homing method'	-	INTEGER8	VAR	RW	Y	1	-

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
6099/1	'Homing speeds' - 'Speed during search for switch'	32940	UNSIGNED32	ARRAY	RW	Y	0.0001	1/min
6099/2	'Homing speeds' - 'Speed during search for zero'	41	UNSIGNED32	ARRAY	RW	Y	0.0001	1/min
609A	'Homing acceleration'	42	UNSIGNED32	VAR	RW	Y	0.001	rev/s^2
60B1	'Velocity offset'	-	INTEGER32	VAR	RW	Y	0.0001	1/min
60B2	'Torque offset'	-	INTEGER16	VAR	RW	Y	0.1	$\%M_N$
60B8	'Touch probe function'	-	UNSIGNED16	VAR	RW	Y	1	-
60B9	'Touch probe status'	-	UNSIGNED16	VAR	RO	Y	1	-
60BA	'Touch probe position 1 positive value'	130	INTEGER32	VAR	RO	Y	1	Increments
60BB	'Touch probe position 1 negative value'	131	INTEGER32	VAR	RO	Y	1	Increments
60BC	'Touch probe position 2 positive value'	132	INTEGER32	VAR	RO	Y	1	Increments
60BD	'Touch probe position 2 negative value'	133	INTEGER32	VAR	RO	Y	1	Increments
60D0/1	'Touch probe source' - 'Touch probe 1 source'	-	INTEGER16	ARRAY	RW	N	1	-
60D0/2	'Touch probe source' - 'Touch probe 2 source'	-	INTEGER16	ARRAY	RW	N	1	-
60D1	'Touch probe time stamp 1 positive value'	-	INTEGER32	VAR	RO	Y	1	-
60D2	'Touch probe time stamp 1 negative value'	-	INTEGER32	VAR	RO	Y	1	-
60D3	'Touch probe time stamp 2 positive value'	-	INTEGER32	VAR	RO	Y	1	-
60D4	'Touch probe time stamp 2 negative value'	-	INTEGER32	VAR	RO	Y	1	-
60D5	'Touch probe 1 positive edge counter'	-	UNSIGNED16	VAR	RO	Y	1	-
60D6	'Touch probe 1 negative edge counter'	-	UNSIGNED16	VAR	RO	Y	1	-
60D7	'Touch probe 2 positive edge counter'	-	UNSIGNED16	VAR	RO	Y	1	-
60D8	'Touch probe 2 negative edge counter'	-	UNSIGNED16	VAR	RO	Y	1	-

Index/Sub [Hex]	Name	ID-image[1)]	Data type	Object type	Access	Mapping	Scaling	Unit
60E0	'Positive torque limit value'	-	UNSIGNED16	VAR	RW	Y	0.1	$\%M_N$
60E1	'Negative torque limit value'	-	UNSIGNED16	VAR	RW	Y	0.1	$\%M_N$
60E2	'Modulo value'	103	UNSIGNED32	VAR	RW	Y	1	Increments
60E3	'Supported homing methods'	-	INTEGER16	ARRAY	RO	N	1	-
60F4	'Following error actual value'	189	INTEGER32	VAR	RO	Y	1	Increments
60F9/1	'Velocity control parameter set' - 'Gain'	100	UNSIGNED16	ARRAY	RW	Y	1	-
60F9/2	'Velocity control parameter set' - 'Ti - integration time constant'	101	UNSIGNED16	ARRAY	RW	Y	0.1	ms
60FC	'Position demand value'	-	INTEGER32	VAR	RO	Y	1	Increments
60FD	'Digital inputs'	34100	UNSIGNED32	VAR	RO	Y	1	-
60FE/1	'Digital outputs' - 'Physical outputs'	34120	UNSIGNED32	ARRAY	RW	Y	1	-
60FE/2	'Digital outputs' - 'Bit mask'	-	UNSIGNED32	ARRAY	RW	Y	1	-
60FF	'Target velocity'	36	INTEGER32	VAR	RW	Y	0.0001	1/min
6502	'Supported drive modes'	-	UNSIGNED32	VAR	RO	N	1	-

5 Object descriptions

0x1000 'Device Type'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x1000
Name	'Device Type'
Object type	UNSIGNED32
Data type	VAR

Reserved for AMK internal use!

0x1001 'Error Register'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x1001
Name	'Error Register'
Object type	UNSIGNED8
Data type	VAR

Reserved for AMK internal use!

0x1003 'Pre-defined Error Field'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x1003
Name	'Pre-defined Error Field'
Data type	ARRAY
Object type	UNSIGNED32

Reserved for AMK internal use!

0x1008 'Manufacturer Device Name'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x1008
Name	'Manufacturer Device Name'
Object type	VISIBLE_STRING
Data type	VAR

Object 0x1008 is a ASCII list with 40-byte user data, which clearly identifies each firmware.

Configuration object 0x1008'Manufacturer Device Name'

Element	Content	Meaning
1	e.g.: K	Device e.g.: KW
2	e.g.: W	
3	e.g.:	
4	LZ	Space
5	e.g.: 2	Version e.g.: 200
6	e.g.: 0	
7	e.g.: 0	
8	LZ	Space
9	e.g.: 0	Year e.g.: 01
10	e.g.: 1	
11	e.g.: 4	Week e.g.: 40
12	e.g.: 0	
13	LZ	Space
14	e.g.: 0	AMK parts no. e.g.: 023988
15	e.g.: 2	
16	e.g.: 3	
17	e.g.: 9	
18	e.g.: 8	
19	e.g.: 8	
20...24	0	

Instance	Controller	Software version (firmware)	Designation code
0	iX / iC	Controller module	GGG_vvv_yyww_tttttt
	ihXT		
	iDT5		
1	iX / iC	-	-
	ihXT	-	-
	iDT5	-	-
2	iX / iC	Monitor P1 (and safety board if present)	MON_vvv_S_vvv_tttttt
	ihXT		
	iDT5		
3	iX / iC	FPGA and motion controller software P2	FPG_vvv_P2_vvvvv
	ihXT		
	iDT5		

Key

GGG: Device:
FPG: FPGA version
MON: Monitor
S: Safety Firmware
P1: Communication Controller (Net x)
P2 Motion Controller: SVN number
vvv Version
yyww Year/week
tttttt AMK parts no.

Entry description

Access	read
PDO mapping	no
Range of values	STRING(40)
Scaling	1
Unit	-
Default value	0

0x1009 'Manufacturer Hardware Version'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x1009
Name	'Manufacturer Hardware Version'
Object type	VISIBLE_STRING
Data type	VAR

Reserved for AMK internal use!

0x100A 'Manufacturer Software Version'

Supported hardware: KE(N,S)-xEx / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x100A
Name	'Manufacturer Software Version'
Object type	VISIBLE_STRING
Data type	VAR

Reserved for AMK internal use!

0x1010 'Store parameters'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x1010
Name	'Store parameters'
Object type	ARRAY
Data type	UNSIGNED32

All changeable remanently objects can be stored via the object 0x1010 'Store parameters' in the non-volatile data storage.
'Store parameters' is activated if the word 'save' is written in the corresponding sub-index.

Data description	**MSB**			**LSB**
Signature ISO 8859 ('ASCII')	e	v	a	s
hex	65	76	61	73

By reading a sub-index you get the information, whether this is supported and how the system behaves.

Return bits

Bit	Name	Description
0 (LSB)	Object saves on command	Bit 0 = 0: Device does not saves objects on command Bit 0 = 1: Device saves objects on command
1	Object saves automatically	Bit 1 = 0: Device does not saves objects automatically Bit 1 = 1: Device saves objects automatically
2...31 (MSB)	Reserved	-

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-5
Scaling	1
Unit	-
Default value	5

Sub-index	1
Description	'Save all parameters'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

Sub-index	2
Description	'Save communication parameters' is currently not supported
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

Sub-index	3
Description	'Save application parameters' is currently not supported
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

Sub-index	4
Description	'Save all parameters according 0x20C0 'List backup data''
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

Sub-index	5
Description	'Save all parameters according 0x20C0 'List backup data' and system start up'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

0x1011 'Restore parameters'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x1011
Name	'Restore parameters'
Object type	ARRAY
Data type	UNSIGNED32

All objects are reset to their default values with object 0x1011 'Restore parameters'.
'Restore parameters' is activated if the word 'load' is written in the corresponding sub-index.

Data description	MSB			LSB
Signature ISO 8859 ('ASCII')	d	a	o	l
hex	64	61	6F	6C

By reading a sub-index you get the information, whether this is supported and how the system behaves.

Return bits

Bit	Name	Description
0 (LSB)	Load default objects	Bit 0 = 0: Device does not load default objects Bit 0 = 1: Device load default objects
1...31 (MSB)	Reserved	-

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-5
Scaling	1
Unit	-
Default value	5

Sub-index	1
Description	'Set all parameters to default value'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

Sub-index	2
Description	'Restore communication default parameters' is currently not supported
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

Sub-index	3
Description	'Restore application default parameters' is currently not supported
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

Sub-index	4
Description	'Restore all parameters according 0x20C0 'List backup data'' is currently not supported
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

Sub-index	5
Description	'Restore all parameters according 0x20C0 'List backup data' and system start up'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

0x1018 'Identity object'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x1018
Name	'Identity object'
Object type	ARRAY
Data type	UNSIGNED32

Reserved for AMK internal use!

0x10F1 'Error settings'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x10F1
Name	'Error settings'
Object type	RECORD
Data type	UNSIGNED16

The object 0x10F1 'Error settings' defines the behavior on error of the drive at a bus error and can be set by the master.

In sub-index 0x10F1/1 'Local error reaction' is the value1 'Disable SYNC Manager' permanently set. In error, the slave switches to the status 'ErrSaveOp' (SAFEOP with error bit in the AL status). In the event of a bus error, the internal counter is incremented by the value of 3. If the bus error corrected, the counter is decremented by the value 1. Reaches or exceeds the counter the specified value in sub-index 0x10F1/2 'Sync error counter limit', the slave is switched to SAFEOP and output in the AL status the value 0x1A. The internal counter is cleared.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Local error reaction'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	1
Min. value	0
Max. value	2

Sub-index	2
Description	'Sync error counter limit'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	6

0x1600 '1st receive PDO Mapping'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x1600
Name	'1st receive PDO Mapping'
Object type	ARRAY
Data type	UNSIGNED32

Reserved for AMK internal use!

0x1A00 '1st transmit PDO Mapping'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x1A00
Name	'1st transmit PDO Mapping'
Object type	ARRAY
Data type	UNSIGNED32

Reserved for AMK internal use!

0x1C00 'Sync manager communication type'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x1C00
Name	'Sync manager communication type'
Object type	ARRAY
Data type	UNSIGNED8

Reserved for AMK internal use!

0x1C12 'Sync Manager 2 PDO Assignment'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x1C12
Name	'Sync Manager 2 PDO Assignment'
Object type	ARRAY
Data type	UNSIGNED32

Reserved for AMK internal use!

0x1C13 'Sync Manager 3 PDO Assignment'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x1C13
Name	'Sync Manager 3 PDO Assignment'
Object type	ARRAY
Data type	UNSIGNED32

Reserved for AMK internal use!

0x2012 'NC cycle time'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2012
Name	'NC cycle time'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x2013 'Communication cycle period'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2013
Name	'Communication cycle period'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x2014 'Limit switch control'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2014
Name	'Limit switch control'
Object type	VAR
Data type	UNSIGNED16

The function hardware limit switch is configured by the object 0x2014. This function is available in position and speed control, if it is configured by binary input (code 33940,33941).

Configuration object 0x2014 'Limit switch control'

Bit no.	Condition	Meaning
0 (LSB)	0	Both hardware limit switches are not inverted
	1	Both hardware limit switches are inverted
1	0	Both hardware limit switches are disabled (signals are not evaluated)
	1	Both hardware limit switches are enabled (signals are evaluated)
2	0	The activation of the hardware limit switch generates the diagnosis message 0xFF12 as an error message During homing cycle this monitoring is switched off as long as homing cycle is still active.
	1	The activation of the hardware limit switch generates the diagnosis message 0xFF12 as an warning message During homing cycle this monitoring is switched off as long as homing cycle is still active.
3-15	0	Reserved
	1	Reserved

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2015 'Clamping torque'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2015
Name	'Clamping torque'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x201A 'Configuration status bits'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x201A
Name	'Configuration status bits'
Object type	ARRAY
Data type	UNSIGNED16

The list 'Configuration status bits' configures a maximum of 16 real-time bit messages (application specific) that are issued in object 0x2090 'Status word'.

Configuration object 0x201A 'Configuration status bits'

Sub-index	Meaning
1	Freely configurable status bit 0, e.g. system-ready message, SRM
2	Freely configurable status bit 1
3	Freely configurable status bit 2
4	Freely configurable status bit 3
5	Freely configurable status bit 4
6	Freely configurable status bit 5
7	Freely configurable status bit 6
8	Freely configurable status bit 7
9	Freely configurable status bit 8
10	Freely configurable status bit 9
11	Freely configurable status bit 10
12	Freely configurable status bit 11
13	Freely configurable status bit 12
14	Freely configurable status bit 13
15	Freely configurable status bit 14
16	Freely configurable status bit 15

Configurable status bits: Siehe '0x218E 'List status bits" auf Seite 125.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2024 'Velocity command value'

Supported hardware:	KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2024
Name	'Velocity command value'
Object type	VAR
Data type	INTEGER32

In the speed control operating mode, the controller cyclically writes the speed setpoint values in 0x2024 according to 0x2013 'Communication cycle period'.

Entry description

Access	read/write
PDO mapping	yes
Range of values	INTEGER32
Scaling	0.0001
Unit	1/min
Default value	1000.0000
Min. value	-3000.0000
Max. value	3000.0000

0x2026 'Positive velocity limit'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2026
Name	'Positive velocity limit'
Object type	VAR
Data type	INTEGER32

Object 0x2026 limits the speed setpoint value in the positive rotational direction. If a larger speed setpoint is specified than defined in object 0x2026, the real-time bit in the object 0x214F 'Message torque: setpoint > limit' is set.
The precision is limited to $|1\ min^{-1}|$.

Entry description

Access	read/write
PDO mapping	yes
Range of values	INTEGER32
Scaling	0.0001
Unit	1/min
Default value	5000.0000
Min. value	0
Max. value	30000.0000

0x2027 'Negative velocity limit'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2027
Name	'Negative velocity limit'
Object type	VAR
Data type	INTEGER32

Object 0x2027 limits the speed setpoint in the negative rotational direction. If a larger speed setpoint (amount) is specified than defined in object 0x2027 , the real-time bit in the object 0x214F 'Message torque: setpoint > limit' is set.
The precision is limited to $|1\ min^{-1}|$.

Entry description

Access	read/write
PDO mapping	yes
Range of values	INTEGER32
Scaling	0.0001
Unit	1/min
Default value	-5000.0000
Min. value	-30000.0000
Max. value	0

0x202B 'Velocity polarity'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x202B
Name	'Velocity polarity'
Object type	VAR
Data type	UNSIGNED16

In object 0x202B, the polarities of the speeds can be switched based on the application. The polarities are not switched within, but rather outside (at the input and output) of a controlled section.

A positive setpoint and positive polarity result in a right hand rotation with a view of the motor shaft (A-bearing side) for rotary motors.

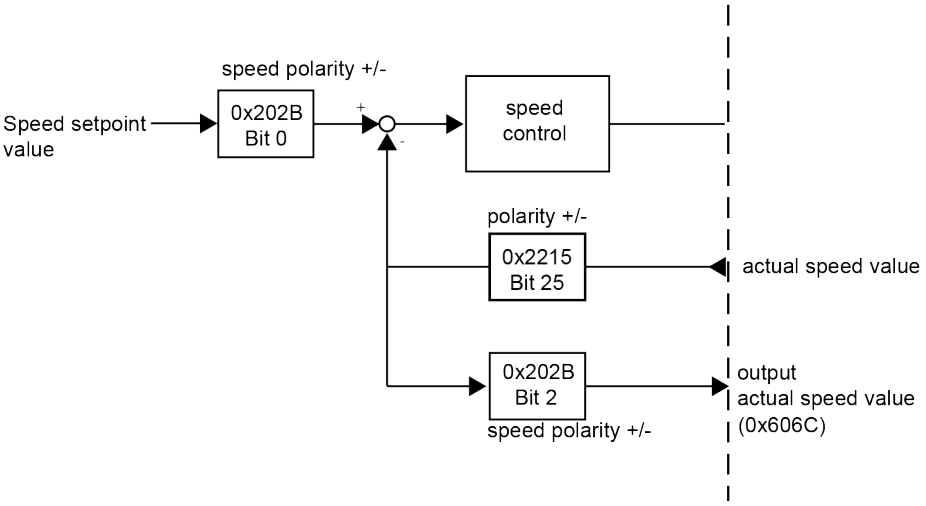
Configuration object 0x202B 'Velocity polarity'

Bit no.	Condition	Meaning
0	0	0x60FF 'Target velocity', positive polarity
	1	0x60FF 'Target velocity' negative polarity
1	0	0x60B1 'Velocity offset', positive polarity
	1	0x60B1 'Velocity offset', negative polarity
2	0	0x606C 'Velocity actual value', positive polarity Does not act on the control loop, but rather on the display 0x606C! 0x2215 'Service bits' Bit 25 = 1 can be set so that the polarity of the actual speed value acts on the closed loop control.
	1	0x606C 'Velocity actual value', negative polarity Does not act on the control loop, but rather on the display 0x606C! 0x2215 'Service bits' Bit 25 = 1 can be set so that the polarity of the actual speed value acts on the closed loop control.
3-15	0	Reserved
	1	Reserved

Do you want to reverse the direction of the motor rotation without interfering with the control structure?

Siehe '0x2215 'Service bits'' auf Seite 130.

Effect of the speed polarity



Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0
Min. value	0
Max. value	7

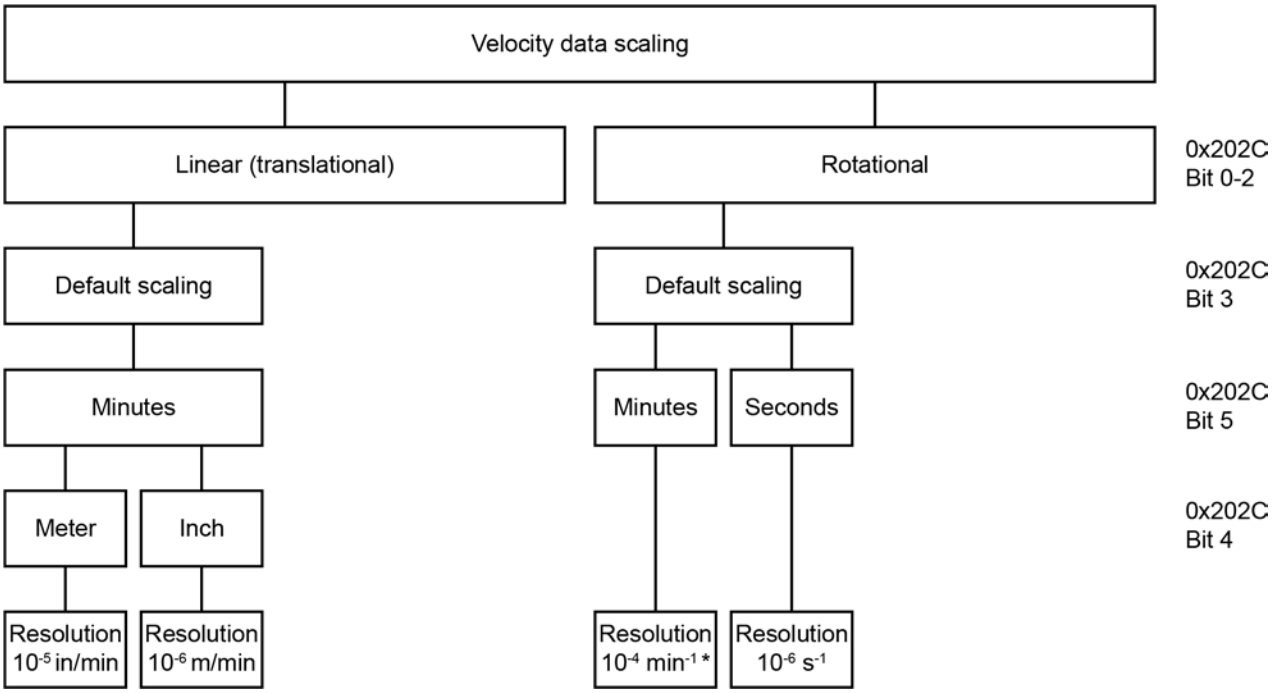
0x202C 'Scaling of velocity data'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x202C
Name	'Scaling of velocity data'
Object type	VAR
Data type	UNSIGNED16

The scaling type of velocity data is set by object 0x202C 'Scaling of velocity data'



* Default setting: Default scaling, rotational 0.0001 1/min

Configuration Objekt 0x202C 'Scaling of velocity data'

Bit no.	Condition	Meaning
0-1	00 (LSB)	Reserved
	01	Linear scaling
	10	Rotational scaling (default scaling)
2	0	Reserved
	1	Reserved
3	0	Default scaling
	1	Reserved
4	0	Dimensional unit for linear scaling: • Meter [m] Dimensional unit for rotational scaling: • Revolutions
	1	Dimensional unit for linear scaling: • Inch [in]
5	0	Time unit: Minute [min]
	1	Time unit: Seconds [s]
6	0	Data relation to the motor shaft
	1	Reserved
7-15	0	Reserved
	1	Reserved

The set scaling of the velocity data refers to all following objects:

0x60FF	'Target velocity'	0x209D	'Velocity window'
0x60B1	'Velocity offset'	0x221A	'Speed relative to 10V at A1'
0x2026	'Positive velocity limit'	0x221B	'Speed offset for A1'
0x2027	'Negative velocity limit'	0x2224	'Velocity control command after ramp'
0x606C	'Velocity actual value'	0x2239	'Velocity command value intern'
0x6099/2	'Speed during search for zero'	0x2240	'Sum of additive velocities'
0x207C	'Zero velocity window'	0x224D	'High homing velocity'
0x207D	'Velocity threshold'	0x229D	'Velocity threshold SL'

This object is used by the following function:
'Scaling'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	2

0x2034 'Home reference position 1'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2034
Name	'Home reference position 1'
Object type	VAR
Data type	INTEGER32

The setpoint 'Home reference position 1' describes the distance between the machine zero point and the homing point relative to the actual position encoder. When homing, the actual position value according 0x6064 'Position actual value' is calculated from the objects 0x2034, 0x607C 'Home offset'.

Entry description

Access	read/write
PDO mapping	no
Range of values	INTEGER32
Scaling	1
Unit	Increments
Default value	0
Min. value	-2147483648
Max. value	2147483647

0x2037 'Closed loop polarity'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2037
Name	'Closed loop polarity'
Object type	VAR
Data type	UNSIGNED16

With the object 'Closed loop polarity', the polarities of the position data can be inverted. The polarities are not switched within, but rather outside (at the input and output) of a controlled section.

A positive setpoint and positive polarity result in a right hand rotation with a view of the motor shaft (A-bearing side) for rotary motors. The actual position is shown positively. With a positive setpoint and negative polarity, the motor rotates to the left and the actual position is shown positively.

Do you want to reverse the direction of the motor rotation without interfering with the control structure?
Siehe '0x2215 'Service bits'' auf Seite 130.

Configuration 0x2037 'Closed loop polarity'

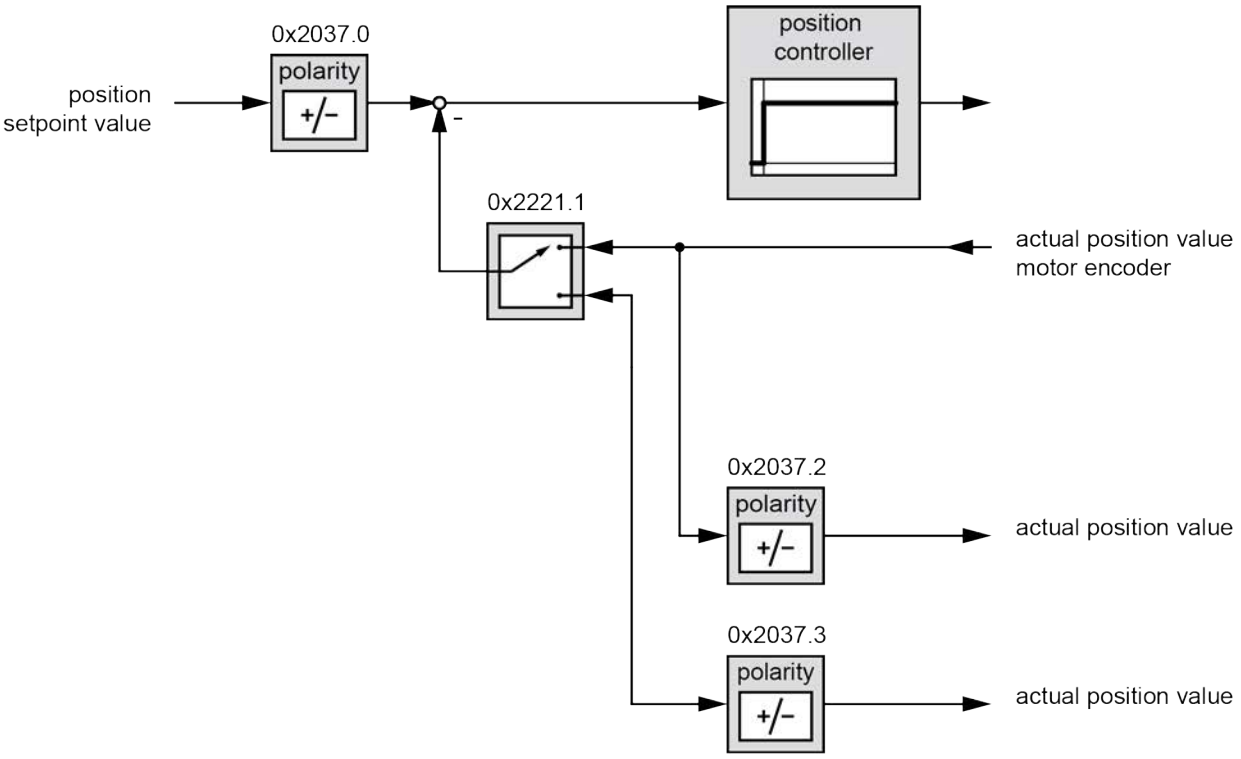
Bit no.	Condition	Meaning
0	0	Position setpoint, positive polarity
	1	Position setpoint, negative polarity
1	0	Reserved
	1	Reserved
2	0	Actual position value of the motor encoder, positive polarity
	1	Actual position value of the motor encoder, negative polarity
3	0	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	1	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
4-15		Reserved

Setpoints and actual values must always be defined equally in pairs, otherwise the closed loop switches from 'negative feedback' to 'positive feedback.'

Only the following bit combinations are permissible:

0000h positive polarity, independent of the actual position encoder
0005h negative polarity, actual position encoder = motor encoder

Effect of the position polarity



Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0
Min. value	0
Max. value	15

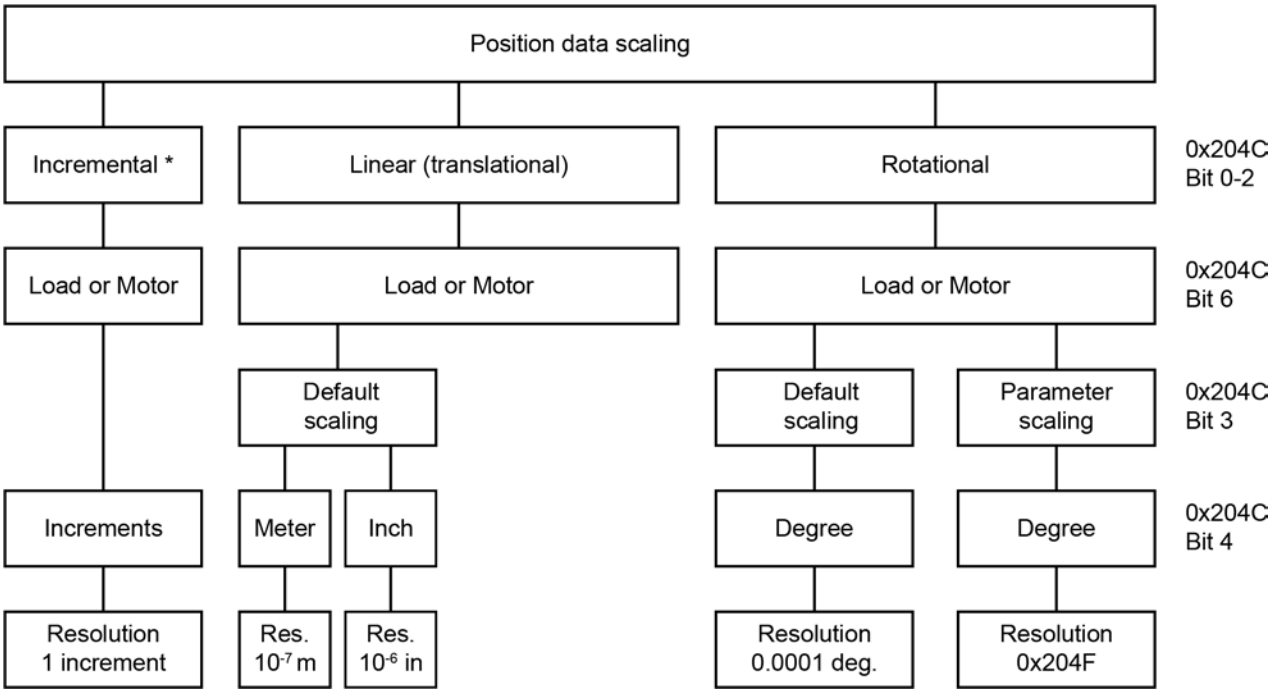
0x204C 'Position data scaling'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x204C
Name	'Position data scaling'
Object type	VAR
Data type	UNSIGNED16

The scaling type of position data is set by object 0x204C 'Position data scaling'



* Default setting: Default scaling, incremental

Configuration 0x204C 'Position data scaling'

Bit no.	Condition	Meaning
0-1	00 (LSB)	Incremental scaling (default scaling)
	01	Linear scaling
	10	Rotational scaling
2	0	Reserved
	1	Reserved
3	0	Scaling type: Default scaling
	1	Scaling type: Parameter scaling

Bit no.	Condition	Meaning
4	0	Dimensional unit for linear scaling: • Meter [m] Dimensional unit for rotational scaling: • Angular degree
	1	Dimensional unit for linear scaling: • Inch [in]
5	0	Reserved
	1	Reserved
6	0	Data relation to the motor shaft
	1	Data relation to the load (object 0x2079 'Load gear input revolution'and object 0x207A 'Load gear output revolution' are included in the calculation)
7	0	Absolute processing format
	1	Modulo processing format (object 0x60E2 'Modulo value')
8-15	0	Reserved
	1	Reserved

The set scaling of the position data refers to all following objects:

0x607A	'Target position'	0x60F4	'Following error actual value'
0x607D/2	'Positive position limit'	0x2225	'Following distance'
0x607D/1	'Negative position limit'	0x2226	'Following error compensation value'
0x6064	'Position actual value'	0x2244	'Residual distance erase window'
0x2034	'Home reference position 1'	0x2252	'At synchron speed window'
0x6067	'Position window'	0x2260	'Increase position value 2'
0x60E2	'Modulo value'	0x2264	'Position feedback modulo'
0x60BA	'Touch probe position 1 positive value'	0x227D	'Home signal distance'
0x60BB	'Touch probe position 1 negative value'		
0x607C	'Home offset'		

This object is used by the following function:
'Scaling'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0
Min. value	0
Max. value	255

0x204F 'Rotational position resolution'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x204F
Name	'Rotational position resolution'
Object type	VAR
Data type	UNSIGNED32

0x204F 'Rotational position resolution' is needed to determine the resolution in 0x204C 'Position data scaling' and is effective with parameter scaling selected.

This object is used by the following function:
'Scaling'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	Increments
Default value	3600000
Min. value	1
Max. value	4294967295

0x2055 'Torque polarity'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2055
Name	'Torque polarity'
Object type	VAR
Data type	UNSIGNED16

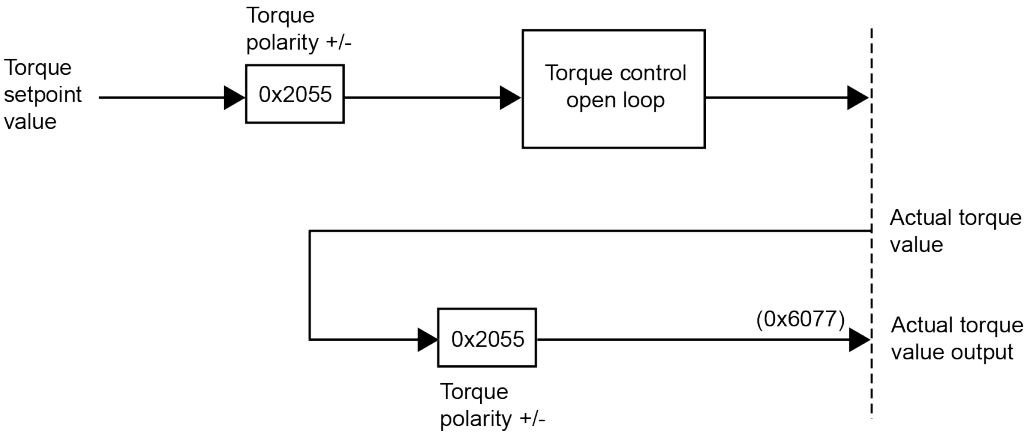
With the object 0x2055 'Torque polarity', the polarities of the torque data can be inverted. The polarities are not switched within, but rather outside (at the input and output) of a controlled section.

A positive setpoint and positive polarity result in a right hand rotation with a view of the motor shaft (A-bearing side) for rotary motors.

Configuration object 0x2055 'Torque polarity'

Bit no.	Condition	Meaning
0	0	Object 0x6071 'Target torque', positive polarity
	1	Object 0x6071 'Target torque', negative polarity
1	0	Object 0x60B2 'Torque offset', positive polarity
	1	Object 0x60B2 'Torque offset', negative polarity
2	0	Object 0x6077 'Torque actual value', positive polarity
	1	Object 0x6077 'Torque actual value', negative polarity
3-15	0	Reserved
	1	Reserved

Effect of the torque polarity



Do you want to reverse the direction of the motor rotation without interfering with the control structure?
Siehe '0x2215 'Service bits'' auf Seite 130.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0
Min. value	0
Max. value	7

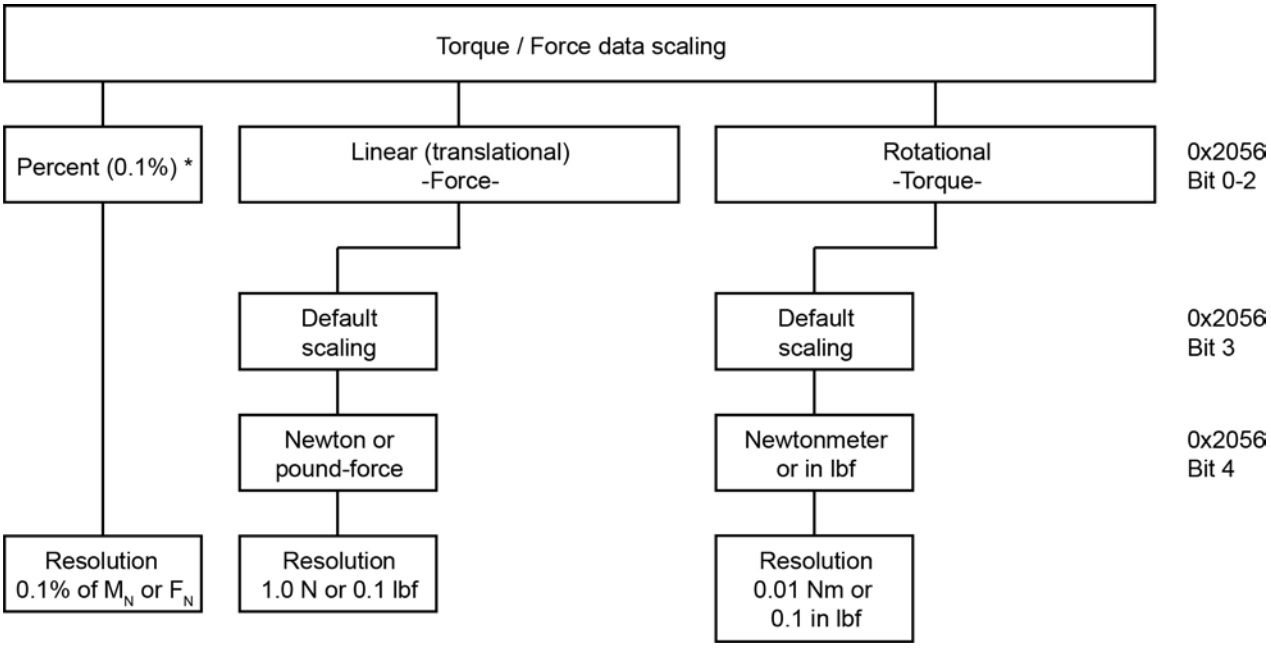
0x2056 'Torque data scaling'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2056
Name	'Torque data scaling'
Object type	VAR
Data type	UNSIGNED16

The scaling type of torque- / force data is set by object 0x2056 'Torque data scaling'.



* Default setting: Default scaling, percentage 0.1 %M_N

Configuration object 0x2056 'Torque data scaling'

Bit no.	Condition	Meaning
0-1	00 (LSB)	Percentage scaling (0.1 %M_N) (default scaling)
	01	Linear scaling (force)
	10	Rotational scaling (torque)
2	0	Reserved
	1	Reserved

Bit no.	Condition	Meaning
3	0	Default scaling
	1	Reserved
4	0	Unit for linear scaling: • Newton [N] Unit for rotational scaling: • Newtonmeter [0.01 Nm]
	1	Unit for linear scaling: • Pound-force [0.1 lbf] Unit for rotational scaling: • Inch pound-force [0.1 in lbf]
5	0	Reserved
	1	Reserved
6	0	Data relation to the motor shaft
	1	Reserved
7-15	0	Reserved
	1	Reserved

The set scaling of the torque data refers to all following objects:

0x6071	'Target torque'	0x207E	'Torque threshold'
0x60B2	'Torque offset'	0x2015	'Clamping torque'
0x60E0	'Positive torque limit value'	0x2218	'Sinus encoder period'
0x60E1	'Negative torque limit value'	0x222C	'Torque command value intern'
0x6077	'Torque actual value'	0x2241	'Sum of additive torques'
0x6072	'Maximal torque'	0x2265	'Torque setpoint at controller'

This object is used by the following function:
'Scaling'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2066 'Differentiating time speed control TD'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

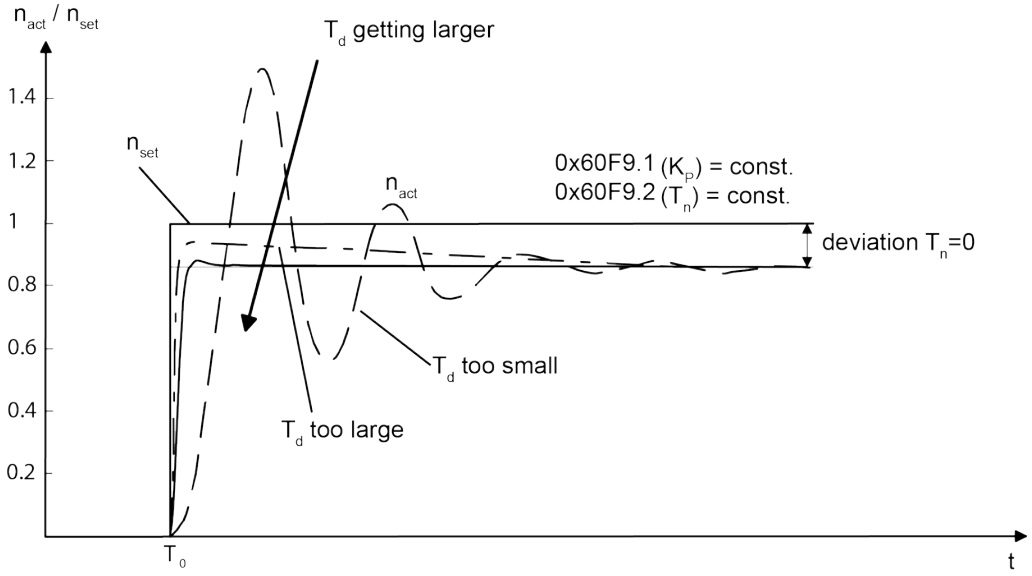
Object description

Index	0x2066
Name	'Differentiating time speed control TD'
Object type	VAR
Data type	UNSIGNED16

The 'Differentiating time speed control TD' (differential portion) of the speed controller must be optimised by the user. The D-portion works as an attenuator in the PID controller. With object 0x2066 = 0, the differential portion in the speed controller is ineffective.

The following figure shows the course of the actual speed value of the speed control loop for an erratic change of the speed setpoint depending on object 0x2066.

Transfer function of the speed controller circuit, effect object 0x2066 'Differentiating time speed control TD' (T_d)



Formula: dependencies

kddzl = object 0x2066 x kpdzl

Condition: 1 ≤ kddzl ≤ 32767

Legend:

kddzl:	internal system factor
kpdzl:	internal system factor

Siehe '0x60F9 'Velocity control parameter set'' auf Seite 330.

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	0.1
Unit	ms
Default value	0
Min. value	0
Max. value	32767

0x2068 'Position loop factor'

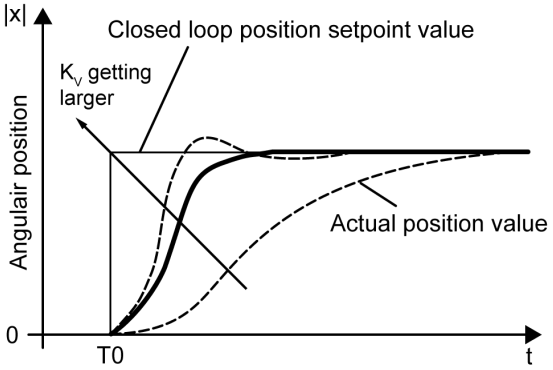
Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2068
Name	'Position loop factor'
Object type	VAR
Data type	UNSIGNED16

Proportional gain K_V of the P-position controller. The following figure shows the course of the actual position value for an erratic change of the position setpoint.

Transfer function of the position control loop, effect object 0x2068 'Position loop factor'



The following conditions are to be met:

Formula: System-internal limitation of the position controller gain K_V

LA = Factor position resolution (depends on encoder)

Motor encoder as an actual position encoder:
LA = object 0x2074 'Encoder increments'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	400
Min. value	20
Max. value	30000

0x206D 'Motor peak current'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x206D
Name	'Motor peak current'
Object type	VAR
Data type	UNSIGNED32

The 'Motor peak current' is only to be entered then if it is specified in the AMK motor data sheet. Object 0x206D is only effective if object 0x2296 'Terminal inductance' is ≠ 0.

The i^2t-monitor motor must be activated in object 0x2215 'Service bits' Bit 14 .

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	0.001
Unit	A
Default value	5.000
Min. value	0
Max. value	1000.000

0x206E 'Inverter peak current'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x206E
Name	'Inverter peak current'
Object type	VAR
Data type	UNSIGNED32

The maximum current of the converter is set by the factory in the SEEP of the converter and is transferred from the SEEP to the object 0x206E of the controller card during the initial system start-up. The value is read-only. Any input is ineffective. The 'Inverter peak current' is the current limit of the converter and limits the maximum torque of the motor from the perspective of the converter.

Entry description

Access	read
PDO mapping	no
Range of values	UNSIGNED32
Scaling	0.001
Unit	A
Default value	0

0x2070 'Inverter nominal current'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2070
Name	'Inverter nominal current'
Object type	VAR
Data type	UNSIGNED32

The 'Inverter nominal current' is the permissible continuous current of the converter and is transferred from the SEEP to the object 0x2070 of the controller card during the initial system start-up. The value is read-only. Any input is ineffective.

Entry description

Access	read
PDO mapping	no
Range of values	UNSIGNED32
Scaling	0.001
Unit	A
Default value	0

0x2072 'Overload limit motor'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2072
Name	'Overload limit motor'
Object type	VAR
Data type	UNSIGNED16

'Overload limit motor' specifies when the 0xFF09 'Motor overload warning' warning is issued. If the i^2t motor overload reaches an overload value of 100% (Object 0x2263 'Display overload motor'), the error message 0xFF0A 'Motor overload error' is issued, the drive is shut down (deceleration according to object 0x221E 'Deceleration ramp RF inactive') and controller enable '(RF) is withdrawn.

Siehe '0x6075 'Motor rated current'' auf Seite 304.

Object 0x2136 is issued simultaneously with the warning. If the value in object 0x2072 is fallen below again, object 0x2136 is reset until the value is exceeded again.

Siehe '0x218E 'List status bits'' auf Seite 125.

The i^2t motor monitoring is only effective if it was activated via object 0x2215 'Service bits' bit 14 = 1.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	%
Default value	50.0

0x2074 'Encoder increments'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2074
Name	'Encoder increments'
Object type	VAR
Data type	UNSIGNED32

'Encoder increments' sets the internal position resolution per motor revolution in an application-specific manner. This value is related to the actual position detection with the motor encoder (objects 0x2221.1, 0x2253).

At analog encoder evaluation of sine and cosine signals, the incoming signals in the inverter are first converted into square-wave signals and the edges are evaluated (factor 4). In addition, the sine wave and the cosine signal are recorded analogously and from this the analogue angle (arctan) is determined within a sinus period. With this angle, the resolution can be increased by the factor PV (position refinement). Each quarter period is subdivided into a maximum of 2048 measuring steps, thereby refining the position.

Formula: Determination of the motor encoder resolution for sine encoders (I-type encoder)

0x2074 = 4 x 0x2218 x PV

PV = position refinement = (1 ... 2048, integer!)

Object 0x2218 'Sinus encoder period'

Example:

0x2218 = 50 (type plate), PV = 100 selected

0x2074 = 20000 incr./motor revolution

Formula: Motor encoder resolution for the use of absolute encoders (S-, T-, E-, F-, U-, V-type encoder)

0x2074 = 4 x 0x2218 x PV

PV = position refinement = 1 ... 2048, integer!

Objects 0x2218 'Sinus encoder period'

Example:

0x2218 = 1024 (type plate), PV = 20 selected

0x2074 = 81920 incr./motor revolution

Formula: Motor encoder resolution for the use of absolute encoders (P-, Q-, Y-type encoder)

0x2074 = PV x MPU/2048

PV = position refinement = 1, 2, 3 ... integer!

MPU = determine the MPU value from the nameplate or from the motor data sheet:

Periodes / revolution (data sheet or type plate)	MPU (measuring steps / revolution - digital resolution)	0x2074 example value
16 P./Rev.	262144 Inkrements	0x2074 = 262144, with PV = 2048
32 P./Rev.	524288 Inkrements	0x2074 = 524288, with PV = 2048

A position refinement factor of 2048 corresponds to the real resolution of the encoder.

If required, you can use higher values to adapt the encoder resolution to the application.
A position refinement factor > 2048 does not improve the resolution of the encoder system.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	Increments
Default value	20480
Min. value	200
Max. value	33554432

0x2079 'Load gear input revolution'

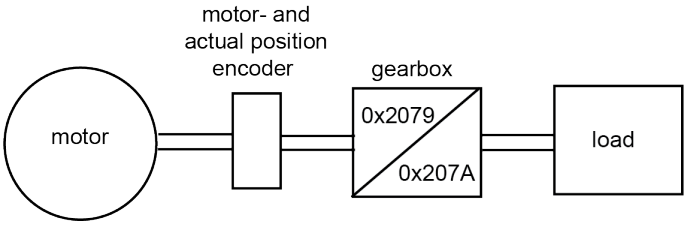
Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2079
Name	'Load gear input revolution'
Object type	VAR
Data type	UNSIGNED32

The drive factors 0x2079 'Load gear input revolution' and 0x207A 'Load gear output revolution' only function in the position control operating mode when a mechanical drive is present between the motor shaft and the load.

Arrangement



Example:
0x2079 = 3
0x207A = 2
3 motor revolutions cause 2 revolutions on the load.

Formula: Transmission ratio:

Among other things, the transmission ratio of the drive is used to calculate the K_V factor effective in the P position controller.

Position setpoint and actual position values are only offset with the drive factors 0x2079 and 0x207A when 'data relation to the load' is selected in 0x204C 'Position data scaling' and actual position source of the motor encoder is selected in 0x221.1 'AMK main operation mode'.

This object is used by the following function:
'Scaling'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	Revolutions
Default value	10
Min. value	1
Max. value	30000

0x207A 'Load gear output revolution'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x207A
Name	'Load gear output revolution'
Object type	VAR
Data type	UNSIGNED32

Siehe '0x2079 'Load gear input revolution'' auf Seite 101.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	Revolutions
Default value	10
Min. value	1
Max. value	30000

0x207B 'Feed constant'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x207B
Name	'Feed constant'
Object type	VAR
Data type	UNSIGNED32

The 'Feed constant' describes the correlation of a rotational movement that is converted into a linear movement via a spindle system. The feed constant specifies the distance travelled by a motor revolution.

For linear motors, the pole period [mm] from the linear motor data sheet is to be entered in 0x207B.

Example:

Spindle system with 10 mm spindle pitch

0x207B = 100000

The distance of the feed screw for each motor revolution is 10 mm.

This object is used by the following function:

'Scaling'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	0.0001
Unit	mm/Revolutions
Default value	10.0000
Min. value	0
Max. value	429496.7295

0x207C 'Zero velocity window'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x207C
Name	'Zero velocity window'
Object type	VAR
Data type	UNSIGNED32

If the amount of the actual speed value within the standstill window $|n_{actual}| < 0x207C$, the real-time bit will be set $n_{actual} < n_{min}$ (0x214B 'Message speed: actual value < minimal value').

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	0.0001
Unit	1/min
Default value	50.0000
Min. value	0
Max. value	60000.0000

0x207D 'Velocity threshold'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x207D
Name	'Velocity threshold'
Object type	VAR
Data type	UNSIGNED32

If the amount of the actual speed value (0x606C) is below the speed threshold n_x (0x207D), the real-time bit is set 0x214C 'Message speed: actual value < threshold'.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	0.0001
Unit	1/min
Default value	1000.0000
Min. value	0
Max. value	30000.0000

0x207E 'Torque threshold'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x207E
Name	'Torque threshold'
Object type	VAR
Data type	UNSIGNED16

If the amount of the actual torque value (0x6077) exceeds the torque threshold n_x (0x207E), the real-time bit is set 0x214D 'Message torque: actual value ≥ threshold'.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	$\%M_N$
Default value	100.0
Min. value	0
Max. value	1000.0

0x2088 'Max acceleration'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2088
Name	'Max acceleration'
Object type	VAR
Data type	UNSIGNED32

The positive acceleration is an input variable of the internal interpolator and defines the linear part of the positive acceleration for drive-controlled positioning. The acceleration values may not exceed the maximum possible physical acceleration of the drive (current limiting in the inverter).

This object is used by the following functions:

'Internal drive interpolator'

'Drive moves into parking position'

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED32
Scaling	0.001
Unit	rev/s^2
Default value	100.000
Min. value	1.000
Max. value	60000.000

0x2089 'Max deceleration'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2089
Name	'Max deceleration'
Object type	VAR
Data type	UNSIGNED32

The negative acceleration is an input variable of the internal interpolator and defines the linear part of the negative acceleration for drive-controlled positioning. The acceleration values may not exceed the maximum possible physical acceleration of the drive (current limiting in the inverter).

This object is used by the following functions:

'Internal drive interpolator'

'Drive moves into parking position'

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED32
Scaling	0.001
Unit	rev/s^2
Default value	-100.000
Min. value	-60000.000
Max. value	-1.000

0x208C 'Inverter type'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x208C
Name	'Inverter type'
Object type	VAR
Data type	VISIBLE_STRING

The name of the control device from the SEEP is shown in 0x208C.

Configuration 0x208C 'Inverter type' for the example KW 2

Element	Content	Meaning
1	e.g. K	Name of the closed loop control device
2	e.g. W	Name of the closed loop control device

Element	Content	Meaning
3	e.g.	Name of the closed loop control device
4	e.g. 2	Name of the closed loop control device
5	e.g.	Name of the closed loop control device
6	e.g.	Name of the closed loop control device
7	e.g.	Name of the closed loop control device
8	e.g.	Name of the closed loop control device
9	e.g.	Name of the closed loop control device
10	e.g.	Name of the closed loop control device
11	e.g.	Name of the closed loop control device
12	e.g.	Name of the closed loop control device

Entry description

Access	read
PDO mapping	no
Range of values	STRING(12)
Scaling	1
Unit	-
Default value	-

0x208D 'Motor type'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x208D
Name	'Motor type'
Object type	VAR
Data type	VISIBLE_STRING

The motor name can be stored in 0x208D. For example, the motor name is entered if a motor is selected from the motor database in AIPEX PRO.

Configuration 0x208D 'Motor type' for the example motor DT4-1-10-E00

Element	Content	Meaning
1	e.g. D	Motor type code
2	e.g. T	Motor type code
3	e.g. 4	Motor type code
4	e.g. -	Motor type code
5	e.g. 1	Motor type code
6	e.g. -	Motor type code
7	e.g. 1	Motor type code
8	e.g. 0	Motor type code
9	e.g. -	Motor type code
10	e.g. E	Motor type code
11	e.g. O	Motor type code
12	e.g. O	Motor type code
....	...	...
20		Motor type code

Entry description

Access	read/write
PDO mapping	no
Range of values	STRING(1)
Scaling	1
Unit	-
Default value	-

0x208E 'Application type'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x208E
Name	'Application type'
Object type	VAR
Data type	VISIBLE_STRING

The type of application can be described and stored in 0x208E. This object can be freely set by the customer.

Configuration 0x208E 'Application type'

Element	Content	Meaning
1	e.g. A	User-specific content ...
2	e.g. B	
3	e.g. W	
4	e.g. I	
5	e.g. C	
6	e.g. K	
7	e.g. L	
8	e.g. E	
9	e.g. R	
10	e.g. -	
11	e.g. 3	
...	...	
16	...	

Entry description

Access	read/write
PDO mapping	no
Range of values	STRING(1)
Scaling	1
Unit	-
Default value	-

0x2090 'Status word'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2090
Name	'Status word'
Object type	VAR
Data type	UNSIGNED16

0x2090 'Status word' shows the status of a maximum of 16 real-time bit messages. The status word content can be configured via 0x201A 'Configuration status bits' in an application-specific manner. With the help of 0x2090 'Status word', the configured signals are transmitted in real-time from the drive to the controller. For this purpose, 0x2090 'Status word' must be incorporated into the drive telegram as a cyclical date.

Siehe '0x201A 'Configuration status bits'' auf Seite 85.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x209D 'Velocity window'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x209D
Name	'Velocity window'
Object type	VAR
Data type	UNSIGNED32

If the amount of the difference between the speed setpoint and actual speed value is smaller than 0x209D, the real-time bit 0x214A 'Message speed: actual value = setpoint' is set.

Speed setpoint: 0x60FF 'Target velocity' + 0x60B1 'Velocity offset' + internal speed control with feedforeward value.

Actual speed value: 0x606C 'Velocity actual value'

Siehe '0x2221 'AMK operation modes'' auf Seite 140.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	0.0001
Unit	1/min
Default value	100.0000
Min. value	1.0000
Max. value	60000.0000

0x209E 'Power threshold'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x209E
Name	'Power threshold'
Object type	VAR
Data type	UNSIGNED32

If the specified power of the inverter exceeds the value specified in 0x209E, the real-time bit 0x2151 'Message power: actual value ≥ threshold' is set.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	W
Default value	100
Min. value	1
Max. value	1000000

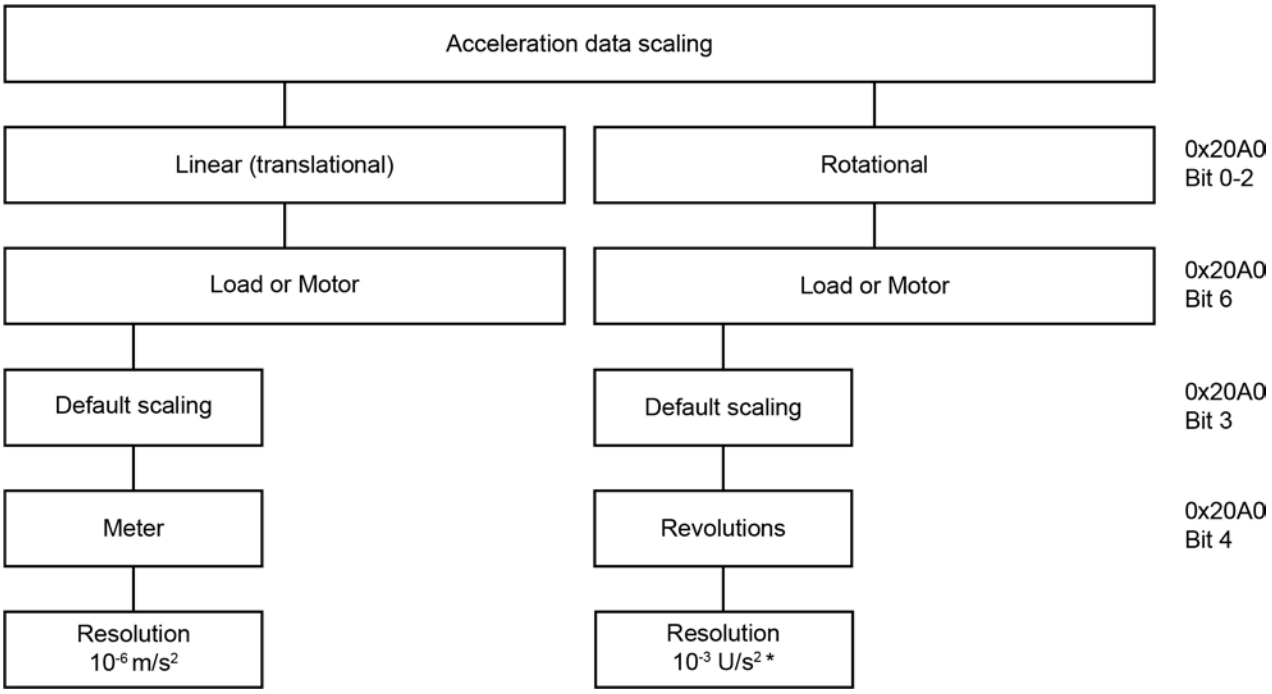
0x20A0 'Acceleration data scaling type'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x20A0
Name	'Acceleration data scaling type'
Object type	VAR
Data type	UNSIGNED16

The scaling type acceleration data is set by object 0x20A0 'Acceleration data scaling type'



* Default setting: Default scaling, rotational 0.001 U/s^2

Configuration 0x20A0 'Acceleration data scaling type'

Bit no.	Condition	Meaning
	00 (LSB)	Reserved
	01	Linear scaling
	10	Rotational scaling (default scaling)
2	0	Reserved
	1	Reserved
3	0	Default scaling
	1	Reserved

Bit no.	Condition	Meaning
4	0	Unit for linear scaling: • Meter [m] Unit for rotational scaling: • Revolutions [U] for default scaling
	1	Unit for linear scaling: • Inch [in]
5	0	Time unit: Seconds [s^2]
	1	Reserved
6	0	Data relation to the motor shaft
	1	Data relation to the load
7-15	0	Reserved
	1	Reserved

The set scaling of the acceleration data refers to all following objects:

0x609A	'Homing acceleration'	0x2089	'Max deceleration'
0x2088	'Max acceleration'		

This object is used by the following function:
'Scaling'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	2

0x20B6 'Diagnosis manufacturer status'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x20B6
Name	'Diagnosis manufacturer status'
Object type	VAR
Data type	UNSIGNED16

The following objects are available for the evaluation of the diagnostic message:

- 0x2186 'Diagnostic number'
- 0x222F 'Diagnostic list'
- 0x2282 'Event trace'

Configuration 0x20B6 'Diagnosis manufacturer status'

Bit no.	Condition	Meaning
0	0	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Message inactive **KE(N,S)-xEx / KW-R24 /** Reserved
	1	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Message active: Position threshold value negatively exceeded. |0x6064 'Position actual value'| > |0x607D/1 'Negative position limit'| Siehe '0x218E 'List status bits'' auf Seite 125. **KE(N,S)-xEx / KW-R24 /** Reserved
1-6	0	Reserved
	1	Reserved
7	0	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Message inactive **KE(N,S)-xEx / KW-R24 /** Reserved
	1	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Message active: Position threshold value positively exceeded. |0x6064 'Position actual value'| > |0x607D/2 'Positive position limit'| Siehe '0x218E 'List status bits'' auf Seite 125. **KE(N,S)-xEx / KW-R24 /** Reserved
8	0	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Message inactive **KE(N,S)-xEx / KW-R24 /** Reserved
	1	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Message active: homing point known **KE(N,S)-xEx / KW-R24 /** Reserved
9	0	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Message inactive **KE(N,S)-xEx /** Reserved
	1	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Message active: acknowledgement, that the control bit 'controller enable (RF)' was set **KE(N,S)-xEx /** Reserved

Bit no.	Condition	Meaning
10	0	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Message inactive **KE(N,S)-xEx /** Reserved
	1	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Message active: Acknowledgement controller enable **KE(N,S)-xEx /** Reserved
11	0	**KE(N,S)-xEx / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Message inactive
	1	**KE(N,S)-xEx / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Message active: acknowledgement, that the control bit DC bus ON (UE) was set
12	0	**KE(N,S)-xEx / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Message inactive
	1	**KE(N,S)-xEx / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Message active: Acknowledgement DC bus ON (QUE)
13	0	**KE(N,S)-xEx / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Message inactive
	1	**KE(N,S)-xEx / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Message active: Warning present
14	0	**KE(N,S)-xEx / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Message inactive
	1	**KE(N,S)-xEx / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Message active: Error present
15	0	**KE(N,S)-xEx / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Message inactive
	1	**KE(N,S)-xEx / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Message active: System ready message (SBM)

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x20C0 'List backup data'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x20C0
Name	'List backup data'
Object type	VAR
Data type	DOMAIN

The 'List backup data' contains all objects that can be stored permanently in the system. A controller can evaluate this list to create backup copies of the parameter set.

Entry description

Access	read
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x20C2 'Acceleration setpoint'

Supported hardware:	KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x20C2
Name	'Acceleration setpoint'
Object type	VAR
Data type	INTEGER32

The 'Acceleration setpoint' effects in the drive feed-forward function and can be set by a controller.

This object is used by the following functions:
'Load model'
'Scaling'

Entry description

Access	read/write
PDO mapping	yes
Range of values	INTEGER32
Scaling	0.001
Unit	rev/s^2
Default value	0
Min. value	-60000.000
Max. value	60000.000

0x20CE 'Drive on delay time'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x20CE
Name	'Drive on delay time'
Object type	VAR
Data type	UNSIGNED16

The 'Drive on delay time' defines the time between the output signal for controlling the motor holding brake and the acknowledgement controller enable (QRF) (brake opens).

This object is used by the following function:
'Controlling motor holding brake'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	ms
Default value	0

0x20CF 'Drive off delay time'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x20CF
Name	'Drive off delay time'
Object type	VAR
Data type	UNSIGNED16

The 'Drive off delay time' defines the time between the output signal for controlling the motor holding brake and the dropout of the acknowledgement controller enable (QRF) (brake is applied).

This object is used by the following function:
'Controlling motor holding brake'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	ms
Default value	0

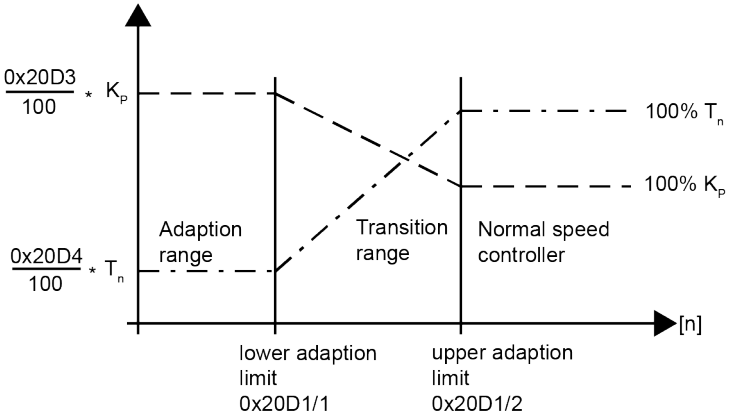
0x20D1 'Adaption limits'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x20D1
Name	'Adaption limits'
Object type	ARRAY
Data type	UNSIGNED32

In the area between the lower and upper adaptation limit, the adaptive control parameters 0x20D3 'Proportional gain adaption' and 0x20D4 'Integral-action time adaption' are linearly adapted to the standard control parameters 0x60F9/1 'Gain' and 0x60F9/2 'Ti - integration time constant', i.e. the control behaviour in this area changes independently of the actual speed value if 0x20D1/1 is smaller than 0x20D1/2. Nothing is adapted if 0x20D1/1 is the same as 0x20D1/2.



Below the lower adaptation limit, K_P and T_n work according to 0x20D3 and 0x20D4 and above the upper adaptation limit K_P and T_n work according to 0x60F9/1 and 0x60F9/2. Linear adaptation takes place in between.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Lower adaption limit'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	0.0001
Unit	1/min
Default value	0
Min. value	0
Max. value	30000.0000

Sub-index	2
Description	'Upper adaption limit'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	0.0001
Unit	1/min
Default value	0
Min. value	0
Max. value	30000.0000

0x20D3 'Proportional gain adaption'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x20D3
Name	'Proportional gain adaption'
Object type	VAR
Data type	UNSIGNED16

Siehe '0x22D1 'OSC channel 3" auf Seite 250.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	%
Default value	100.0
Min. value	0
Max. value	500.0

0x20D4 'Integral-action time adaption'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x20D4
Name	'Integral-action time adaption'
Object type	VAR
Data type	UNSIGNED16

Siehe '0x22D1 'OSC channel 3" auf Seite 250.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	%
Default value	100.0
Min. value	0
Max. value	500.0

0x2106 'Initial program load command'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2106
Name	'Initial program load command'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x2109 'Language'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2109
Name	'Language'
Object type	VAR
Data type	UNSIGNED16

0x2109 defines the language of the object and diagnosis texts. The system must be re-started again if the language is changed.
Available languages:

0: German (default)
1: English
2: French

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0
Min. value	0
Max. value	2

0x210D 'ID memory mode'

Supported hardware:	KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x210D
Name	'ID memory mode'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x2128 'Velocity feedforward gain'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2128
Name	'Velocity feedforward gain'
Object type	VAR
Data type	UNSIGNED16

The speed feed forward is effective in the 'position control with following error compensation' operating mode (0x221/x Bit9 = 1) and reduces the speed-dependent following error.

This object is used by the following function:
'Following error compensation (SAK)'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	%
Default value	100
Min. value	100
Max. value	400

0x2136 'Overload motor'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2136
Name	'Overload motor'
Object type	VAR
Data type	UNSIGNED16

With this object, the 'Overload motor' warning is assigned an object. The warning can be assigned to a real-time bit.
Siehe '0x2072 'Overload limit motor'' auf Seite 99.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2137 'Warning overtemperature inverter'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2137
Name	'Warning overtemperature inverter'
Object type	VAR
Data type	UNSIGNED16

With this object, the 'Warning overtemperature inverter' warning is assigned an object. The warning can be assigned to a real-time bit.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2138 'Warning overtemperature motor'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2138
Name	'Warning overtemperature motor'
Object type	VAR
Data type	UNSIGNED16

With this object, the 'Warning overtemperature motor' warning is assigned an object. The warning can be assigned to a real-time bit.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2139 'Warning cooler'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2139
Name	'Warning cooler'
Object type	VAR
Data type	UNSIGNED16

With this object, the 'Warning cooler' warning is assigned an object. The warning can be assigned to a real-time bit. The diagnostic message 0x4110 'Excess ambient temperature' is generated and the code 33021 is set, which can be issued to a binary output.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2146 'Parameter checksum'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2146
Name	'Parameter checksum'
Object type	VAR
Data type	UNSIGNED32

If the object 'Parameter checksum' is read via the service channel, a checksum is formed via all of the objects listed in 0x20C0 'List backup data'. A controller can detect whether the data set was changed by comparing the checksum in the system start-up.s ist ein Informationsbaustein

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

0x214A 'Message speed: actual value = setpoint'

Supported hardware:	KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x214A
Name	'Message speed: actual value = setpoint'
Object type	VAR
Data type	UNSIGNED16

If the amount of the difference between the speed setpoint and actual speed value is less than 0x209D 'Velocity window', the real-time bit 0x214A 'Message speed: actual value = setpoint' is set.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x214B 'Message speed: actual value < minimal value'

Supported hardware:	KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x214B
Name	'Message speed: actual value < minimal value'
Object type	VAR
Data type	UNSIGNED16

If the amount of 0x606C 'Velocity actual value' is < 0x207C 'Zero velocity window', the real-time bit 0x214B 'Message speed: actual value < minimal value' is set.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x214C 'Message speed: actual value < threshold'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x214C
Name	'Message speed: actual value < threshold'
Object type	VAR
Data type	UNSIGNED16

If the amount of 0x606C 'Velocity actual value' is < 0x207D 'Velocity threshold', the real-time bit 0x214C 'Message speed: actual value < threshold' is set.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x214D 'Message torque: actual value ≥ threshold'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x214D
Name	'Message torque: actual value ≥ threshold'
Object type	VAR
Data type	UNSIGNED16

If the amount of 0x6077 'Torque actual value' is ≥ 0x207E 'Torque threshold', the real-time bit 0x214D 'Message torque: actual value ≥ threshold' is set.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x214E 'Message torque: actual value ≥ limit'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x214E
Name	'Message torque: actual value ≥ limit'
Object type	VAR
Data type	UNSIGNED16

If the amount of 0x6077 'Torque actual value' is ≥ 0x60E0 'Positive torque limit value', 0x60E1 'Negative torque limit value' or 0x6072 'Maximal torque', the real-time bit 0x214E 'Message torque: actual value ≥ limit' is set.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x214F 'Message torque: setpoint > limit'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x214F
Name	'Message torque: setpoint > limit'
Object type	VAR
Data type	UNSIGNED16

If 0x60FF 'Target velocity' is > 0x2026 'Positive velocity limit', 0x2027 'Negative velocity limit', the real-time bit 0x214F 'Message torque: setpoint > limit' is set.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2150 'Message in position'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2150
Name	'Message in position'
Object type	VAR
Data type	UNSIGNED16

If the amount of the difference between the position setpoint and actual position value is less than 0x6067 'Position window', the real-time bit is set in 0x2150 'Message in position'.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2151 'Message power: actual value ≥ threshold'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2151
Name	'Message power: actual value ≥ threshold'
Object type	VAR
Data type	UNSIGNED16

If the specified power of the inverter ≥ 0x209E, the real-time bit 0x2151 'Message power: actual value ≥ threshold' is set.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x215C 'Acceleration feedforward gain'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x215C
Name	'Acceleration feedforward gain'
Object type	VAR
Data type	UNSIGNED16

The acceleration feedforward is effective in the 'position control with follow error compensation' operating mode (0x2221/x bit 9 = 1) and reduces the follow-error for positive or negative acceleration.

This object is used by the following function:
'Following error compensation (SAK)'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	%
Default value	0
Min. value	0
Max. value	400

0x2186 'Diagnostic number'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2186
Name	'Diagnostic number'
Object type	VAR
Data type	UNSIGNED16

If a diagnostic message appears (warning or error), the diagnostic number is written in 0x2186. The first occurred event (warning or error) is always entered. A warning message is not overwritten by a subsequent error message.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2188 'Velocity setpoint filter'

Supported hardware:	KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2188
Name	'Velocity setpoint filter'
Object type	VAR
Data type	UNSIGNED16

The 'Velocity setpoint filter' works as a mean value filter in the actual speed value feedback and influences the control and display value 0x606C 'Velocity actual value'.

Example:
With a setpoint cycle time of 500 µs and the actual value detection in 62.5 µs, the actual speed value is formed as a mean value over 8 values.

Siehe 'Overview control loops' auf Seite 20.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	µs
Default value	1000
Min. value	0
Max. value	5000

0x218E 'List status bits'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x218E
Name	'List status bits'
Object type	VAR
Data type	DOMAIN

All objects and codes that are contained in the 'List status bits' can be configured as a real-time or status bit, e.g. in the objects 0x201A 'Configuration status bits' and 0x2090 'Status word' or be assigned to a binary output.

Siehe 'Codes for the configuration of the binary outputs' auf Seite 352.

Configuration 0x2018E 'List status bits'

Sub-index	Content	Meaning
1		Supported status bits
2		Supported status bits
...	...	...
n		

Entry description

Access	read
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x21DE 'Limit switch status'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x21DE
Name	'Limit switch status'
Object type	VAR
Data type	UNSIGNED16

0x21DE shows the status of the limit switches. The limit switches can be configured via binary inputs (code 33940, 33941).

Configuration 0x21DE 'Limit switch status'

Bit no.	Condition	Meaning
0 (LSB)	0	Hardware limit switch positive low (0 VDC)
	1	Hardware limit switch positive high (24 VDC)
1	0	Hardware limit switch negative low (0 VDC)
	1	Hardware limit switch negative high (24 VDC)
2-15	0	Reserved
	1	Reserved

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2210 'Temperature external'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2210
Name	'Temperature external'
Object type	VAR
Data type	INTEGER16

0x2210 indicates the temperature of a connected KTY temperature sensor (e.g. motor temperature sensor).
The temperature sensor type is defined in 0x2295 'Temperature sensor motor'.

This object must not be evaluated if a PTC temperature sensor is used.

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER16
Scaling	0.1
Unit	°C
Default value	0

0x2211 'Nominal motor voltage'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

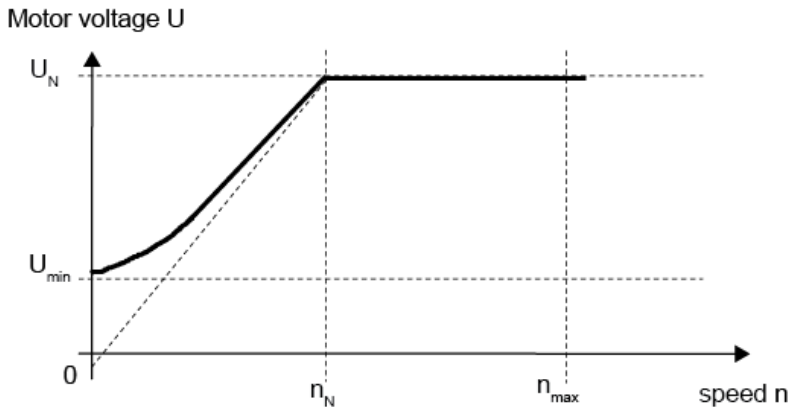
Index	0x2211
Name	'Nominal motor voltage'
Object type	VAR
Data type	UNSIGNED16

0x2211 describes the motor voltage for the speed n ≤ nominal speed in the voltage / frequency control operating mode and is to be taken from the respective type plate or data sheet of the motor. The voltage / frequency control operating mode is activated in 0x2253 'Encoder type'.

Note that the ramp times in 0x221C 'Acceleration ramp', 0x221D 'Deceleration ramp' and 0x221E 'Deceleration ramp RF inactive' may not be less than the physically achievable speed ramps of the system.

Siehe '0x225B 'V/F start up" auf Seite 183.

Depiction: U = f(n) in voltage / frequency control



U_N: 0x2211 'Deceleration ramp RF inactive'

U_{min}: 0x224A 'Voltage standstill'

n_N: 0x2214 'Nominal velocity'

n_{max}: 0x6080 'Maximal motor speed'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	V
Default value	350.0
Min. value	0
Max. value	1000.0

0x2212 'Magnetising current'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

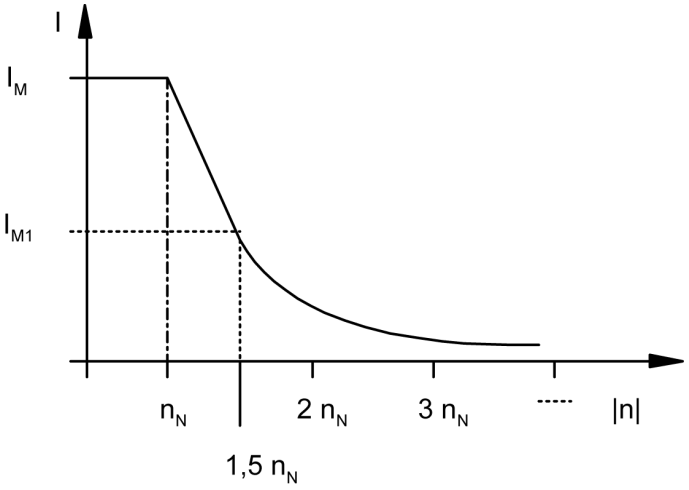
Index	0x2212
Name	'Magnetising current'
Object type	VAR
Data type	UNSIGNED32

The values of the magnetising current depend on the motor and are to be taken from the respective type plate or data sheet of the motor. The motor used is to be defined in 0x2253 'Encoder type'.

Asynchronous motor

The magnetising current is the flux-forming component of the motor current in asynchronous motors. The magnetising current is constant up until the nominal speed and is automatically reduced for speeds greater than the nominal speed (field weakening).

Correction of the magnetising current characteristic for asynchronous motors



Synchronous motor without field weakening

Synchronous motors without field weakening are only operable up to the nominal speed.
0x2212 is ineffective for synchronous motors.

Field weakening synchronous motor

Field weakening synchronous motors can also be operated well above the nominal speed. For field weakening synchronous motors, 0x2212 indicates the maximum field weakening current above the nominal speed. For field weakening synchronous motors, the voltage controller must also be configured in 0x228C 'Kp voltage control gain' and 0x228D 'Tn voltage control integrating time'.

NOTICE	
Material Damage!	**Material damage from excessive DC bus voltage!** If the PWM is blocked in the case of an error with synchronous motors that are operated in field weakening, the still rotating motor induces a voltage that is higher than that of the supplying DC bus. Due to the induced voltage, a current flows into the DC bus via the free-wheeling diodes in the inverter so that the voltage in the DC bus may rise above the permissible value and can therefore destroy the power supply. **Steps to prevent:** • Ensure that the current regeneration of the power supply is active. • Use an appropriately sized brake resistor at the feed-in.

Asynchronous motor with voltage control

Enter 0x2212 'Magnetising current' from the motor data sheet. In the field weakening area, the magnetising current is automatically set internally in the device.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	0.001
Unit	A
Default value	1.500
Min. value	0
Max. value	1000.000

0x2213 'Magnetising current 1'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

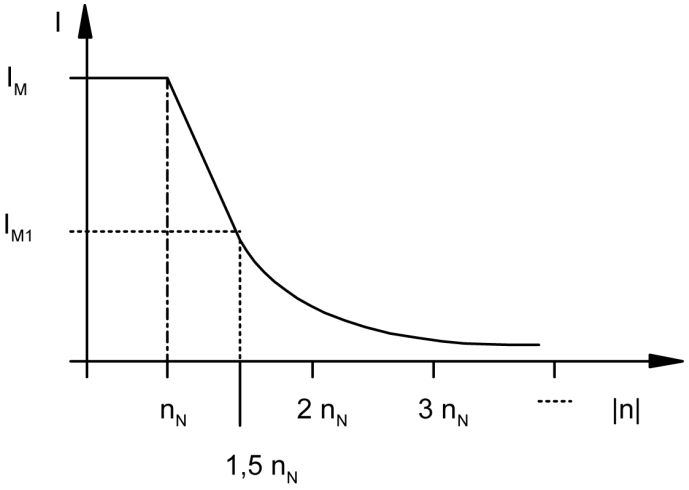
Index	0x2213
Name	'Magnetising current 1'
Object type	VAR
Data type	UNSIGNED32

The values of the magnetising current depend on the motor and are to be taken from the respective type plate or data sheet of the motor. The motor used is to be defined in 0x2253 'Encoder type'.

Asynchronous motors

If no specification is available for the magnetising current, set the value to 50 % x ID32769 'Magnetising current'.
A correction of the magnetising current characteristic is performed in the field weakening area. The magnetising current is linearly reduced from IM to IM1 according 0x2212 and 0x2213 between the nominal speed (0x2214) and the speed 1.5-times the nominal speed. For speeds greater than 1.5-times the nominal speed, the magnetising current is proportionately reduced to 1/n.

Correction of the magnetising current characteristic for asynchronous motors



If 0x2213 = 0x2212 or 0x2213 = 0 is set, the correction is eliminated and the magnetising current is proportionately reduced to 1/n for speeds above the nominal speed.

Synchronous motor without field weakening

Synchronous motors without field weakening are only operable up to the nominal speed.
0x2213 is ineffective for synchronous motors.

Field weakening synchronous motor

Field weakening synchronous motors can also be operated well above the nominal speed. For field weakening synchronous motors, 0x2213 indicates the minimum field weakening current, which acts in the basic speed range up to the nominal speed.
For field weakening synchronous motors, the voltage controller must also be configured in 0x228C 'Kp voltage control gain' and 0x228D 'Tn voltage control integrating time'.

NOTICE	
Material Damage!	**Material damage from excessive DC bus voltage!** If the PWM is blocked in the case of an error with synchronous motors that are operated in field weakening, the still rotating motor induces a voltage that is higher than that of the supplying DC bus. Due to the induced voltage, a current flows into the DC bus via the free-wheeling diodes in the inverter so that the voltage in the DC bus may rise above the permissible value and can therefore destroy the power supply. **Steps to prevent:** • Ensure that the current regeneration of the power supply is active. • Use an appropriately sized brake resistor at the feed-in.

Asynchronous motor with voltage control

0x2213 has no significance with this motor model

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	0.001
Unit	A
Default value	1.000
Min. value	0
Max. value	1000.000

0x2214 'Nominal velocity'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2214
Name	'Nominal velocity'
Object type	VAR
Data type	UNSIGNED32

The nominal speed depends on the motor and is to be taken from the respective type plate or data sheet of the motor.

The nominal velocity refers to a nominal motor voltage of 350 VAC.
If the nominal voltage is different, adjust the nominal voltage to 350 VAC.

Example third-party engine

Nominal voltage U_N = 400 VAC

Nominal velocity n_N = 1750 1/min

ID32772 'Nominal velocity' = 1750 1/min / 400 VAC x 350 VAC

ID32772 'Nominal velocity' = 1400 1/min

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	0.0001
Unit	1/min
Default value	3000.0000
Min. value	10.0000
Max. value	30000.0000

0x2215 'Service bits'

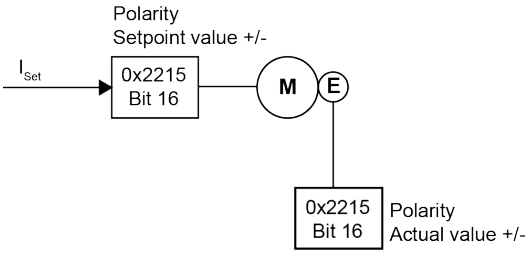
Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2215
Name	'Service bits'
Object type	VAR
Data type	UNSIGNED32

Configuration 0x2215 'Service bits'

Bit no.	Condition	Meaning
0	0	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 / Monitoring of the sine encoder signals inactive KW-R24-R / Monitoring of the resolver signals inactive KW-R24 / Reserved
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 / Monitoring of the sine encoder signals active The minimum and maximum level of sine and cosine tracks are monitored. In case of error the diagnostic message 0x7300 'Sensor' is generated. KW-R24-R / Monitoring of the resolver signals active KW-R24 / Reserved
1	0	Reserved
	1	Reserved
2	0	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Motor deceleration control with RF withdrawal inactive
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Motor deceleration control with RF withdrawal When braking the motor, no acceleration may be detected by the system, otherwise it is immediately de-energised with the diagnostic message 2339 'Ramp down error'
3	0	Reserved
	1	Reserved
4	0	Reserved
	1	Reserved
5	0	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Operating mode after RF withdrawal (operating mode from before RF withdrawal is retained) When resetting the controller enable, the drive switches to the operating mode that was active before the RF withdrawal, provided no system booting has taken place in the meantime. A system booting is triggered, for example, by the "Clear error" function in the absence of a system ready message or by a parameter change in the database. A system booting generally switches the drive to the 'AMK main operation mode' (0x2221/1).
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Operating mode after RF withdrawal (digital speed control with setpoint zero) When resetting the controller enable, the drive switches to the "digital speed control with setpoint zero" operating mode (system-internal automatic operating mode change).
6-12	0	Reserved
	1	Reserved
13	0	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Monitoring acknowledgment, motor holding brake inactive
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Monitoring acknowledgment of motor holding brake (for brakes with acknowledgment bit) This object is used by the following function: 'Controlling motor holding brake'

Bit no.	Condition	Meaning
14	0	i^2t monitoring of motor inactive
	1	i^2t monitoring of motor If the value in 0x2072 'Overload limit motor'is exceeded, the warning message 0xFF09 'Motor overload warning' is generated and warning bit code 33074 'Collective warning' is set. As soon as 0x2263 'Display overload motor' = 100 % is reached, the controller enable is withdrawn internally, the drive is braked according to 0x221E 'Deceleration ramp RF inactive' until coming to a standstill, the acknowledgement QRF is set to zero and the error message 0xFF0A 'Motor overload error' is generated. Siehe '0x206D 'Motor peak current'' auf Seite 98. Siehe '0x2297 'Time maximum current motor'' auf Seite 218. Formula for calculating the overload time t_x with a current I_x:
15	0	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 / Function 'Correction modulo value' inactive KW-R24 / KW-R24-R / KW-R25 / Reserved
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 / Function 'Correction modulo value' active KW-R24 / KW-R24-R / KW-R25 / Reserved
16	0	With the positive setpoint, the motor rotates clockwise when looking at the motor shaft (A-bearing side)
	1	Rotational direction of the motor is negated In order to invert the rotational direction without having to change the coordinate representation of setpoint and actual values, the polarity of the setpoint and actual values is inverted by setting bit 16 = 1.  iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 / With an absolute encoder, the actual position value results with a set negation bit: Actual position value = MaxPos - Pos MaxPos: Absolute range of the encoder, e.g. 4096 rotations Pos: current position of the encoder
17	0	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 / Low-movement software commutation with breakaway inactive KW-R24 / KW-R24-R / Reserved
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 / Low-movement software commutation with breakaway active Bit 17 is only active if bit 28 = 1 is set. Before the Low-movement software communication is executed according to the description in bit 28, the drive moves clockwise for 1 round (breakaway for adhered axes) KW-R24 / KW-R24-R / Reserved

Bit no.	Condition	Meaning
18	0	Reduced DC bus voltage increase inactive
	1	Reduced DC bus voltage increase When braking the motor, the torque is automatically reduced so that the shutdown threshold of the DC bus voltage is not reached and the error message 0x3210 'DC link over-voltage' is not generated. In the U/f control the slope of the speed ramp is changed linear depending on the DC bus voltage. The derating increases linear beginning at a DC bus voltage of 650 VDC. Up from 780 VDC bus level the ramp is stopped completely.
19	0	Reserved
	1	Reserved
20	0	Reserved
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Drive is braking if $n_{act} > n_{set}$ If the actual speed value exceeds the value in 0x207D 'Velocity threshold'the controller enable is switched off drive internal and the drive is braking according 0x221E 'Deceleration ramp RF inactive' until standstill. The diagnosis message 2326 is generated.
21	0	Reserved
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Drive coasts down if $n_{act} > n_{set}$ If the actual speed value exceeds the value in 0x207D 'Velocity threshold' the controller enable is switched off drive internal and the drive coasts down. The diagnosis message 2326 is generated.
22-24	0	Reserved
	1	Reserved
25	0	Inversion of the actual speed value inactive
	1	Inversion of the actual speed value The inverted actual speed value is not only used for the display, but also for the speed control. Siehe '0x202B 'Velocity polarity'' auf Seite 87.
26	0	Voltage feedforward inactive for synchronous machines
	1	Voltage feedforward active for synchronous machines The voltage feedforward in synchronous machines improves the dynamic properties and can be switched on independently of the application. Relevant objects: (from the motor data sheet) 0x2273/1 'Inductance path D' 0x2273/2 'Inductance path Q' 0x22BC 'Phase resistance' 0x22BD 'Voltage constant Ke'
27	0	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / PI controller for current control active
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Model-based current controller active KW-R24 / Reserved

Bit no.	Condition	Meaning
28	0	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Software commutation (The axis must be able to move freely! This function can not be used for hanging axes with load.) (maximal movement of ±0.5 x pole period (distance between two poles) possible) The software commutation establishes for synchronous motors a relationship between the rotor position and the coordinate system of the motor model. The software commutation function controls the current of the motors phases depending on the actual rotor position. The calculation of the phase currents is done by an algorithm which is implemented in the firmware, wherefore it is called software commutation. Related objects: 0x2284 'Rise time SWC' 0x2285 'Final value SWC' 0x2287 'Delay time SWC' 0x2299 'SWK monitoring' In case of failure the diagnosis message 0x7122 'Motor error or commutation malfunction' will be generated. KW-R24 / Reserved
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Low-movement software commutation active (The axis must be able to move freely! This function can not be used for hanging axes with load.) The maximal movement is reduced around 90 % to the software commutation in Bit 28 = 0. Related objects: 0x2284 'Rise time SWC' 0x2285 'Final value SWC' 0x2287 'Delay time SWC' In case of failure the diagnosis message 0x7122 'Motor error or commutation malfunction' will be generated. KW-R24 / Reserved
29	0	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Dynamic braking at encoder failure inactive KW-R24 / Reserved
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Dynamic braking at encoder failure active (Function only for synchronous motors) Parallel to encoder evaluation the rotor position is determined sensorless. At encoder failure the motor is not running down but will be braked down in torque operation mode with the torque value entered in 0x22D4 'Brake torque'. If 0x22D4 = 0 the motor is braked down in speed operation mode according 0x221E 'Deceleration ramp RF inactive'. With 0x22D5 'Max. angle difference encoder-SL' the sensorless evaluated rotor angle can be monitored. **iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /**  This function must not be used for motors with E- or F-type encoder! KW-R24 / Reserved

Bit no.	Condition	Meaning
30	0	Overcurrent switch off (Default) If the drive detects an overcurrent the output stage will be locked immediately, the drive coasts down even if only a short pulse with overcurrent appeared. The devices are short-circuit-proof. The diagnosis message 0x2110 'Short circuit/earth leakage' is generated.
	1	Error tolerant overcurrent switch off The error tolerant overcurrent switch off should avoid from immediately switch off and cost down of the drive. If the drive detects an overcurrent, the output stage is switched off immediately for 0.5 ms and switched on again afterwards. Case 1: If the drive detects within 5 ms an overcurrent once again a shortcut is assumed and the output stage is switched off immediately. The drive coasts down. Case 2: If no overcurrent is detected for min. 5 ms the drive brakes automatically according to 0x221E 'Deceleration ramp RF inactive' until standstill. The diagnosis message 0x2110 'Short circuit/earth leakage' is generated.
31	0	Reserved for AMK internal use!
	1	Reserved for AMK internal use!

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0000 0000 0000 0000 0001 0000 0000 0101 (LSB)
Min. value	0000 0000 0000 0000 0000 0000 0000 0000
Max. value	1111 1111 1111 1111 1111 1111 1111 1111

0x2216 'Rotor time constant'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2216
Name	'Rotor time constant'
Object type	VAR
Data type	UNSIGNED16

The rotor time constant T_R is to be taken from the type plate or data sheet of the motor. The rotor time constant is the electrical time constant of the rotor. For synchronous motors (motor types DT, DTK, DP, DS...), the value 0.01 must be entered in 0x2216.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.0001
Unit	s
Default value	0.0360
Min. value	0.0050
Max. value	1.5000

0x2217 'Pole number motor'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2217
Name	'Pole number motor'
Object type	VAR
Data type	UNSIGNED8

The 'Pole number motor' describes the poles of a motor and is to be taken from the type plate or data sheet of the motor.

⚠ WARNING

Risk of injury from uncontrolled movements of the motor shaft

If the number of motor poles is entered incorrectly, the motor is not controllable and can carry out uncontrolled movements as soon as the controller enable is set!

Steps to prevent:

- Check the entered number of motor poles before setting the controller enable.
- Takes precautionary measures to ensure that no persons are in the total possible range of movement of the motor when the controller enable is set for the first time after the input of the 'Pole number motor'.

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED8
Scaling	1
Unit	-
Default value	4
Min. value	2
Max. value	400

0x2218 'Sinus encoder period'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2218
Name	'Sinus encoder period'
Object type	VAR
Data type	UNSIGNED16

The 'Sinus encoder period' is to be taken from the type plate and data sheet of the motor or the encoder and gives the number of sine periods per rotation of the encoder, which is connected to the sine encoder input connection X131.

For linear motors, the number of sine periods per pole period must be entered in 0x2218.

If the sine encoder division is entered incorrectly, the motor is not controllable and can carry out uncontrolled movements as soon as the controller enable is set!

EnDat encoder:

1st Linear measuring stick type: LC481, LC483

For EnDat linear measuring sticks, 0x2218 must be calculated from the encoder's signal periods and 0x207B according to the following relationship:

Example:

0x207B = 24 mm (linear motor pole period from the linear motor data sheet)
Signal period (encoder) = 16 µm (encoder data sheet)
PV (position refinement factor = 100 (see 0x2074)

0x2218 = 1500 signal periods / pole period
0x2074 = 600000 increments / pole period

Special cases:

1. 0x2218 is smaller than the minimum value:
   e. g.: 0x207B = 5 mm, signal period = 1 mm --> 0x2218 = 5
2. The distance between the two pole pairs is not to be divided by the length of the signal period without a remainder.
   e. g. 0x207B = 24 mm, signal period = 5 mm --> 0x2218 = 4.8

Solution:

0x207B refers to 0x2217 'Pole number motor'. This is assuming that the 'Pole number motor' in the aforementioned special case was 2. For the solution approach, 0x207B should not be based on 0x2217 = 2, but rather on, e.g., 0x2217 =20. The pole period in 0x207B must also be multiplied by a factor of 10 because of the motor with the assumed number of poles by a factor of 10.

1. 0x207B = 5 * 10 = 50 mm (instead of 5 mm), signal period = 1 mm --> 0x2218 = 50
2. 0x207B = 24 * 10 =240 mm (instead of 24 mm), signal period = 5 mm --> 0x2218 = 48

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	1024
Min. value	8
Max. value	65000

0x221C 'Acceleration ramp'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x221C
Name	'Acceleration ramp'
Object type	VAR
Data type	INTEGER32

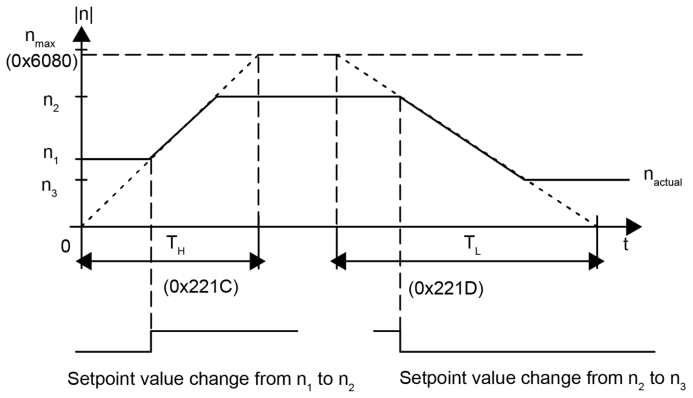
This object is only effective in the speed control operating mode (with analogue or digital setpoint).

By setting bit 6 = 1 in the operating mode parameter (0x2221/1ff), a ramp generator (acceleration / deceleration) acts on the speed controller input. The entered times apply for acceleration and deceleration between the speed 0 U/min and ±0x6080 'Maximal motor speed'.

The following figure shows the effect of the acceleration and deceleration time objects. The following applies to the speed setpoint specification:

$|n_2| > |n_1|$ →acceleration ramp
$|n_3| < |n_2|$ →deceleration ramp

Acceleration and deceleration times refer to the maximum speed



Entry description

Access	read/write
PDO mapping	no
Range of values	INTEGER32
Scaling	0.1
Unit	ms
Default value	100.0
Min. value	1.0
Max. value	1200000.0

0x221D 'Deceleration ramp'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x221D
Name	'Deceleration ramp'
Object type	VAR
Data type	UNSIGNED32

Siehe '0x221C 'Acceleration ramp'' auf Seite 137.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	0.1
Unit	ms
Default value	100.0
Min. value	1.0
Max. value	1200000.0

0x221E 'Deceleration ramp RF inactive'

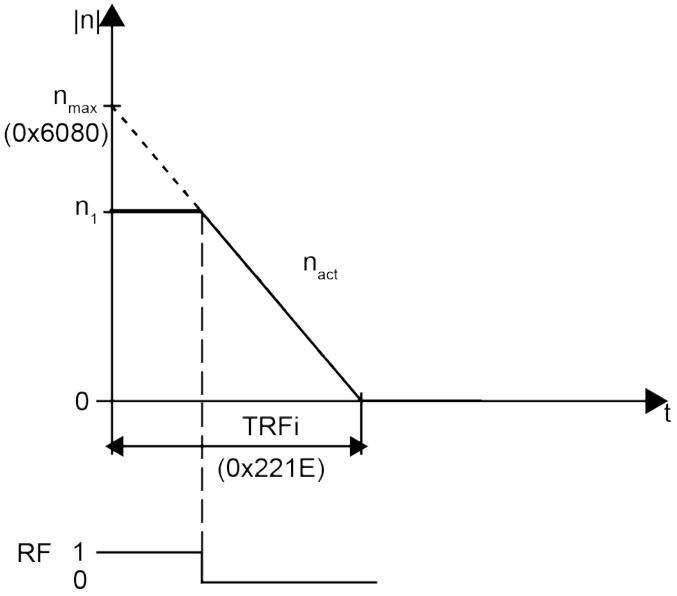
Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x221E
Name	'Deceleration ramp RF inactive'
Object type	VAR
Data type	UNSIGNED32

When removing the controller enable, the motor is braked to a standstill according to the ramp 0x221E 'Deceleration ramp RF inactive' and then is torque-free. The time entered is valid for deceleration from maximum speed (0x6080) to speed 0.

Deceleration time for RF inactive



TRFi: Deceleration time RF inactive (0x221E)

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED32
Scaling	0,1
Unit	ms
Default value	100.0
Min. value	1.0
Max. value	1200000.0

0x221F 'Source RF'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x221F
Name	'Source RF'
Object type	VAR
Data type	UNSIGNED16

0x221F determines the source for the signal 'controller enable' (RF).

Code	Designation	Description
0	Controller enable (RF) via binary input	Controller enable is configured for a binary input on the basic device. If this input is set, the RF control signal in the device is triggered.
5	Controller enable via EtherCAT	The RF signal is expected via the EtherCAT interface.
25	RF via EtherCAT AND-linked with the binary input RF	like code 5 but AND-linked with the binary input RF

Changes in 0x221F 'Source RF' are first effective with the next system start-up (mains OFF / ON).

The controller enable can be automatically removed within the system in the case of an error or, if available, from the functional safety.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2220 'User list 1'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2220
Name	'User list 1'
Object type	VAR
Data type	DOMAIN

The 'User list 1' is a data set in the remanent memory area that is freely available to the user.

Configuration 0x2220 'User list 1'

Sub-index	Content	Meaning
1		
2		
3		
...		
n		

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2221 'AMK operation modes'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

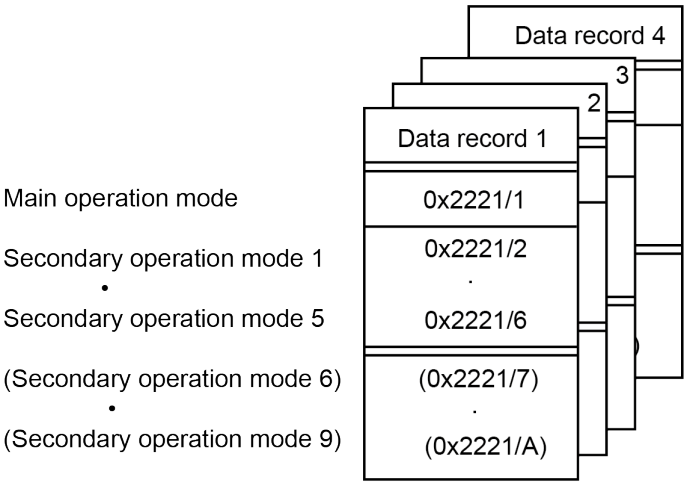
Index	0x2221
Name	'AMK operation modes'
Object type	ARRAY
Data type	UNSIGNED32

In every data set, the freely configurable operating mode 0x2221/1 'AMK main operation mode' and the 5 secondary operating modes 0x2221/2 'AMK secondary operation mode 1' to 0x2221/6 are available for application-specific use.

The secondary operating modes 0x2221/7 'AMK secondary operation mode 6' to 0x2221/A 'AMK digital speed control' are pre-configured at the factory and may not be changed by the user, because the drive-controlled movement functions, such as homing cycle, deceleration after controller enable removal, are only properly executed if the factory setting is maintained.

After mains ON and an activated controller enable, the 'AMK main operation mode' is active. The last used operating mode is always active after a system booting by 0x2267 or the command 'Clear Error' and activated controller enable.

organisation in data sets



Configuration 0x2221/1 - 0x2221/A 'AMK operation modes'

High word			Low word	
Bit 31				Bit 0 (LSB)
0 0 0 0	**X X X X**	**X X X X X X X X**	X X X X X X X X	X X X X X X X X
reserved	**Advanced operating mode**	**Setpoint source**	Operating mode, extensions, options	

Meaning of the bits 0x2221/1 - 0x2221/A

Bit no.	Condition	Meaning
0-3	0x0	No operating mode defined
	0x1	Reserved
	0x2	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Torque control
	0x3	Speed control
	0x4	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Position control **KW-R24 /** Reserved
	0x5	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	0x6	Reserved
	0x7	Reserved
4	0	Torque limiting per 0x60E0, 0x60E1, (0x6072)
	1	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
5	0	Reserved
	1	Reserved
6	0	Setpoint ramp inactive
	1	Setpoint ramp in the speed control operating mode (0x221C, 0x221D) active
7	0	Speed fine interpolator (FIPO) inactive
	1	Speed fine interpolator (FIPO) in the speed control operating mode inactive (does not work with analogue setpoint setting!) The speed fine interpolator supplies 1 speed setpoint/250µs, synchronised to 0x2013'Communication cycle period'.

Bit no.	Condition	Meaning
8	0	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Position controller type P-controller **KW-R24 /** Reserviert
	1	Reserved
9 [2)]	0	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Following error compensation (SAK) inactive **KW-R24 /** Reserviert
	1	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Following error compensation in the position control operating mode for setpoints from the drive-internal interpolator **KW-R24 /** Reserviert
10 [1)]	0	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Position fine interpolator (FIPO) inactive **KW-R24 /** Reserviert
	1	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Position fine interpolator (FIPO) active in the position control operating mode The position fine interpolator supplies 1 position setpoint/250µs, synchronised to 0x2013'Communication cycle period'. **KW-R24 /** Reserviert
11 [2)]	0	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	1	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
12	0	Reserved
	1	Reserved
13	0	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Modulo value is formed from the active actual position value source (see bit 14). **KW-R24 /** Reserved
	1	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Modulo value is formed according to 0x60E2. **KW-R24 /** Reserved
14	0	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Actual position value source of motor encoder 0x2253, 0x2074  The actual position value source must be set in the 'AMK main operation mode' and automatically applies for the operating modes. **KW-R24 /** Reserved
	1	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved

Bit no.	Condition	Meaning
15	0	Reserved
	1	Reserved
16-23	0x01	**iX(-R3) / iC(-R3) / iDT5(-R3) /** Analogue input A1 (Speed control) **ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	0x03	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	0x3C 0x41	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /** Cyclical setpoint setting via real-time Ethernet • 0x60FF 'Target velocity' • 0x607A 'Target position' • 0x6071 'Target torque' Plus the feed forward values via real-time Ethernet • 0x60B1 'Velocity offset' • 0x60B2 'Torque offset'
	0x43	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Cyclical setpoint setting via real-time Ethernet • 0x60FF 'Target velocity' • **iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** : 0x607A 'Target position' • 0x6071 'Target torque' Plus the feed forward values via real-time Ethernet • 0x60B1 'Velocity offset' • 0x60B2 'Torque offset'
	0x44	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Internal interpolator
	0x48	Reserved for AMK internal use: Setpoint setting through internal modules
24-27	0x00	Default operating mode
	0x01	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Interpolation with internal interpolator according to SERCOS **KW-R24 /** Reserviert
28-31	0	Reserved
	1	Reserved

1) This object is used by the following function:
   'Fine interpolator position (FIPO)'
2) This object is used by the following function:
   'Following error compensation (SAK)'

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-A
Scaling	1
Unit	-
Default value	10

Sub-index	1
Description	'AMK main operation mode'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	00430043

Sub-index	2
Description	'AMK secondary operation mode 1'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	00430043

Sub-index	3
Description	'AMK secondary operation mode 2'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	00430043

Sub-index	4
Description	'AMK secondary operation mode 3'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	00430043

Sub-index	5
Description	'AMK secondary operation mode 4'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	00430043

Sub-index	6
Description	'AMK secondary operation mode 5'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	00430043

Sub-index	7
Description	'AMK secondary operation mode 6'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	00430043

Sub-index	8
Description	'AMK digital torque control'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	00480002

Sub-index	9
Description	'AMK position control'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	00440404

Sub-index	A
Description	'AMK digital speed control'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	00480043

0x2222 'Parameter set assignment 1'

Supported hardware:	KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2222
Name	'Parameter set assignment 1'
Object type	VAR
Data type	UNSIGNED32

The data set assignment defines a main data set and 3 alternative data sets.
Default setting: 0x2222 = 0x 03 02 01 00
The following applies:
Data set number 0x00 Main data set
Data set number 0x01: 1st alternative data set
Data set number 0x02: 2nd alternative data set
Data set number 0x03: 3rd alternative data set

Siehe '0x2221 'AMK operation modes'' auf Seite 140.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	03 02 01 00

0x2223 'Password'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2223
Name	'Password'
Object type	VAR
Data type	UNSIGNED32

If a password is entered that deviates from the default value, objects can only be accessed as read-only with the PC software 'AipexLite.exe.' In order to be able to write objects, the password must be entered in advance. The password protection does not work for the PC software 'AIPEX PRO.'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

0x2224 'Velocity control command after ramp'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2224
Name	'Velocity control command after ramp'
Object type	VAR
Data type	INTEGER32

Siehe 'Overview control loops' auf Seite 20.

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER32
Scaling	0.0001
Unit	1/min
Default value	0

0x2225 'Following distance'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2225
Name	'Following distance'
Object type	VAR
Data type	INTEGER32

0x2225 shows the same content as 0x60F4 'Following error actual value'.

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	Increments
Default value	0
Min. value	-2147483648
Max. value	2147483647

0x2226 'Following error compensation value'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2226
Name	'Following error compensation value'
Object type	VAR
Data type	INTEGER32

0x2226 shows the compensation value (pre-control value) for the active following error compensation (0x2221/x 'AMK operation modes' Bit 9 = 1).

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	Increments
Default value	0
Min. value	-2147483648
Max. value	2147483647

0x2227 'Magnetising current feedback'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2227
Name	'Magnetising current feedback'
Object type	VAR
Data type	INTEGER16

0x2227 shows the actual value of the magnetising current (isd).

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER16
Scaling	0.01
Unit	A
Default value	0
Min. value	-100.00
Max. value	100.00

0x2228 'Current feedbacks'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2228
Name	'Current feedbacks'
Object type	ARRAY
Data type	INTEGER32

0x2228 'Current feedbacks' shows the actual current value of the motor phases U / V / W.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	yes
Range of values	1-3
Scaling	1
Unit	-
Default value	3

Sub-index	1
Description	'Current feedback phase U'
Access	read
PDO Mapping	yes
Range of values	INTEGER32
Scaling	0.01
Unit	A
Default value	0

Sub-index	2
Description	'Current feedback phase V'
Access	read
PDO Mapping	yes
Range of values	INTEGER32
Scaling	0.01
Unit	A
Default value	0

Sub-index	3
Description	'Current feedback phase W'
Access	read
PDO Mapping	yes
Range of values	INTEGER32
Scaling	0.01
Unit	A
Default value	0

0x2229 'Resolver angle'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2229
Name	'Resolver angle'
Object type	VAR
Data type	UNSIGNED16

0x2229 shows continuously the commutation angle.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	Increments
Default value	0

0x222A 'Encoder signals'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x222A
Name	'Encoder signals'
Object type	ARRAY
Data type	INTEGER16

0x222A 'Encoder signals' displays the value of the encoder signal S2 and of the analog encoder track 1.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	yes
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Encoder signal S2'
Access	read
PDO Mapping	yes
Range of values	INTEGER16
Scaling	1
Unit	mV
Default value	0

Sub-index	2
Description	'Encoder signal S1'
Access	read
PDO Mapping	yes
Range of values	INTEGER16
Scaling	1
Unit	mV
Default value	0

0x222B 'Torque current feedback'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x222B
Name	'Torque current feedback'
Object type	VAR
Data type	INTEGER16

0x222B displays the actual value of the current which is responsible for the active torque.

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER16
Scaling	0.1
Unit	A
Default value	0
Min. value	-1000.0
Max. value	1000.0

0x222C 'Torque command value intern'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x222C
Name	'Torque command value intern'
Object type	VAR
Data type	INTEGER16

Reserved for AMK internal use!

0x222E 'DC bus voltage monitoring'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x222E
Name	'DC bus voltage monitoring'
Object type	VAR
Data type	UNSIGNED16

0x222E defines the lower permissible voltage for the DC bus.
A device-specific value is to be entered in the SEEP memory at the factory for the DC bus voltage monitoring. (Typically 385 VDC)
The following applies:
0x222E = 0 (The factory-set, device-specific value is the voltage for which the DC bus voltage is monitored.)
0x222E ≠ 0 (The entered value is the voltage [0.1 V] for which the DC bus voltage is monitored.)

The controller enable can only be switched on if the current DC bus voltage is higher than the value in 0x222E. The DC bus voltage is monitored during the active controller enable.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	V
Default value	0

0x222F 'Diagnostic list'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x222F
Name	'Diagnostic list'
Object type	VAR
Data type	DOMAIN

The 'Diagnostic list' contains all of the diagnostic messages that a device generates. In addition, the error messages of the connected bus slaves are saved in the devices that are configured as bus masters if they were transferred from the bus slaves to the master. The assignment of a diagnostic message to the participants is ensured through the bus participant address (element 2). The command 'Clear error' or mains on / off clears the entries in the diagnostic list.

Every diagnostic message fills the structure 'ERROR STRUCT,' as shown in table 'Configuration 0x222F' element 1 to 14. The first diagnostic message is entered in 0x222F in element 1-14, the second diagnostic message in element 15-28 and so on. The current list length depends on the number of generated diagnostic messages.

Configuration 0x222F 'Diagnostic list'

List element	Content	Meaning
1	2 byte	Bus participant address of the reporting participant
2	2 byte	4-digit diagnostic number
3	2 byte	Function number (module)
4	2 byte	Error classification (class)
5	4 byte	Error code
6		
7	4 byte	Error additional info 1
8		
9	4 byte	Error additional info 2
10		
11	4 byte	Error additional info 3
12		
13	4 byte	Time allocation (system time)
14		
...	...	...
n		

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2230 'Encoder list motor'

Supported hardware:	KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2230
Name	'Encoder list motor'
Object type	VAR
Data type	DOMAIN

In encoders with an internal memory, AMK saves motor parameters at the factory. The 'Encoder list motor' specifies which objects are saved in the encoder and cannot be changed by the user.

The objects listed in 'Encoder list motor' are only read in the following cases and overwrite the current values in the data set:

- Initially loaded systems
  It is checked during the system booting whether the motor parameters listed in 0x2230 correspond to their initially loaded values (0x2290 'Encoder list motor' is ignored). Only when the motor parameters from the 'Encoder list motor' have their initially loaded values will the parameter values be read from the encoder and overwrite the originally loaded values in all data sets.

Configuration 0x2230 'Encoder list motor'

List element	Content	Meaning
1		
2		
...		
n	...	...

Entry description

Access	read
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2231 'Encoder list customer'

Supported hardware: KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2231
Name	'Encoder list customer'
Object type	VAR
Data type	DOMAIN

The 'Encoder list customer' determines which of the user's parameter values are saved in the encoder database. The list can be freely configured, whereby only those objects may be entered whose values can be changed. The entry of objects with a non-changeable value leads to an error message when saving in the system. The usable memory capacity for the user data in the encoder is 60 words. The sum of all data from the 'user encoder list' may not exceed this memory capacity, otherwise the diagnostic message 0x7300 'Sensor' info 15 is generated. The number of objects that can be saved depends on the object characteristics.

After the objects have been written in the encoder, mains off / on must be carried out.

The user data is automatically loaded after the motor data for initial system loading and overwrites this.

Example:

Object	Designation	Data set	Value	Size	Scale	Content
0x6075	'Motor rated current'	0	5.50 A	2 words	0.001 A	5500
0x2074	'Encoder increments'	3	65536	2 words	Increments	65536
0x60E0	'Positive torque limit value'	2	100 % MN	1 word	0.1 % M_N	1000
0x60E1	'Negative torque limit value'	1	100 % MN	1 word	0.1 % M_N	1000
0x221C	'Acceleration ramp'	1	2000 ms	2 words	0.1 ms	20000
0x221D	'Deceleration ramp'	3	1000 ms	2 words	0.1 ms	10000

Configuration 0x2231 'Encoder list customer' for example

List element	Content	Meaning
1	0x6075	Object from example
2	0	Data set
3	0x2074	Object from example
4	3	Data set
5	0x60E0	Object from example
6	2	Data set
7	0x60E1	Object from example
8	1	Data set
9	0x221C	Object from example
10	1	Data set
11	0x221D	Object from example
12	3	Data set
...	0	-
n	0	-

Encoder memory configuration for example

Memory capacity	Content
Word 1	0x6075 + data set 0
Word 2 and 3	5500
Word 4	0x2074 + data set 3
Word 5 and 6	65536
Word 7	0x60E0 + data set 2
Word 8	1000
Word 9	0x60E1 + data set 1
Word 10	1000
Word 11	0x221C + data set 1
Word 12 and 13	20000
Word 14	0x221D + data set 3
Word 15	10000

Siehe '0x223E 'Global service bits'' auf Seite 158.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2233 'Output port 1'

Supported hardware: iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2233
Name	'Output port 1'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x2234 'Output port 1 bits'

Supported hardware: iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2234
Name	'Output port 1 bits'
Object type	ARRAY
Data type	UNSIGNED32

Reserved for AMK internal use!

0x2235 'Output port 2'

Supported hardware: iX(-R3) / iC(-R3) / iDT5(-R3) /

Object description

Index	0x2235
Name	'Output port 2'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x2236 'Output port 2 bits'

Supported hardware: iX(-R3) / iC(-R3) / iDT5(-R3) /

Object description

Index	0x2236
Name	'Output port 2 bits'
Object type	ARRAY
Data type	UNSIGNED32

Reserved for AMK internal use!

0x2237 'Output port 3'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) /

Object description

Index	0x2237
Name	'Output port 3'
Object type	VAR
Data type	UNSIGNED16

With 0x2237, the standard binary outputs are assigned objects. With the objects, the physical binary outputs can be assigned real-time bit messages or messages of the plc user program.

Structure and use of the output port - function assignment via object - controller can read the image and evaluate status

0x2237 'Output port 3'	Binary output[1)]	Function assignment[2)]	Image[3)]
544	BA1	0x2238/1	0x60FE/1 Bit 15
	BA2	0x2238/2	0x60FE/1 Bit 16
	BA3	0x2238/3	0x60FE/1 Bit 17

1) The availability of physical binary outputs depends on the hardware used. If no physical binary outputs are available, the controller can read the statuses of the 'virtual binary outputs'.
2) Real-time bits can be assigned to the binary outputs:
   Siehe Codes for the configuration of the binary outputs auf Seite 352.
   The statuses of the binary outputs are, if available, issued via the binary outputs on the hardware side.
3) A controller can read the statuses of the binary outputs by accessing and reading the object 0x60FE 'Digital outputs'.

Structure and use of the output port 3 - Controller can set outputs by writing the image

0x2237 'Output port 3'	Binary output[1)]	Function assignment[2)]	Image[3)]
0	BA1	0x2238/1 = 33942	0x60FE/1 Bit 15
	BA2	0x2238/2 = 33942	0x60FE/1 Bit 16
	BA3	0x2238/3 = 33942	0x60FE/1 Bit 17

1) The availability of physical binary outputs depends on the hardware used. If no physical binary outputs are available, the controller can read and write the memory capacities as 'virtual binary outputs.'
2) No real-time bits may be assigned to the binary outputs, because only the controller has reading and writing access to the binary outputs.
3) A controller can read and write the statuses of binary outputs with 0x60FE 'Digital outputs'.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	544

0x2238 'Output port 3 bits'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) /

Object description

Index	0x2238
Name	'Output port 3 bits'
Object type	ARRAY
Data type	UNSIGNED32

Siehe '0x218E 'List status bits'' auf Seite 125.
Siehe '0x2237 'Output port 3'' auf Seite 155.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-3
Scaling	1
Unit	-
Default value	3

Sub-index	1
Description	'Output port 3 bit 0'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

Sub-index	2
Description	'Output port 3 bit 1'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	33031

Sub-index	3
Description	'Output port 3 bit 2'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	33029

0x2239 'Velocity command value intern'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2239
Name	'Velocity command value intern'
Object type	VAR
Data type	INTEGER32

Reserved for AMK internal use!

0x223A 'Position command value filter'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x223A
Name	'Position command value filter'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x223B 'Position control differenting time'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x223B
Name	'Position control differenting time'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x223C 'Position command value intern'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x223C
Name	'Position command value intern'
Object type	VAR
Data type	INTEGER32

Reserved for AMK internal use!

0x223D 'Analog input A1'

Supported hardware: iX(-R3) / iC(-R3) / iDT5(-R3) /

Object description

Index	0x223D
Name	'Analog input A1'
Object type	VAR
Data type	INTEGER16

0x223D indicates the analogue voltage at the analogue input A1 of the controller card and can be read via an external controller.

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER16
Scaling	0.01
Unit	V
Default value	0
Min. value	-10.00
Max. value	10.00

0x223E 'Global service bits'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x223E
Name	'Global service bits'
Object type	VAR
Data type	UNSIGNED32

Configuration 0x223E 'Global service bits'

Bit no.	Condition	Meaning
0	0	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved **KE(N,S)-xEx /** Mains monitoring ON
	1	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved **KE(N,S)-xEx /** Mains monitoring OFF For devices with current regeneration, the regeneration is automatically disconnected internally, because no regeneration is possible without mains monitoring. (Bit 4 is not changed, we recommend however setting bit 4 =1 if the mains monitoring is switched off)
1	0	Reserved
	1	Reserved
2	0	Reserved
	1	Reserved
3	0	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved **KE(N,S)-xEx /** Reserved
	1	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved **KE(N,S)-xEx /** Reserved
4	0	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved **KE(N,S)-xEx /** Regeneration active with signal QUE
	1	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved **KE(N,S)-xEx /** Regeneration inactive
5	0	Reserved
	1	Reserved
6	0	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 /** Encoder database inactive **KE(N,S)-xEx / KW-R24 / KW-R24-R /** Reserved
	1	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 /** Encoder database active Siehe '0x2230 'Encoder list motor'' auf Seite 152. Siehe '0x2231 'Encoder list customer'' auf Seite 153. **KE(N,S)-xEx / KW-R24 / KW-R24-R /** Reserved

Bit no.	Condition	Meaning
7	0	**KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Monitoring connection at binary output BA3 regarding cable breakage inactive **KE(N,S)-xEx / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /** Reserved
	1	**KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Monitoring connection at binary output BA3 (e.g. motor holding brake) regarding cable breakage active This object is used by the following function: 'Controlling motor holding brake' **KE(N,S)-xEx / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /** Reserved
8	0	Reserved
	1	Reserved
9	0	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** If the existing hardware does not support the temperature model, the error message 0xFF03 'IGBT over current' info 1 = 3 is suppressed. The temperature model takes care of the heat sink and the IGBT temperature **KE(N,S)-xEx /** DC bus is discharged via external brake resistor after SBM withdrawal
	1	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** If the existing hardware does not support the temperature model, an error message 0xFF03 'IGBT over current' info 1 = 3 is generated. **KE(N,S)-xEx /** DC bus is not discharged in the event of SBM withdrawal In the case of an error, the DC bus is not discharged via an external brake resistor to the power supply.
10	0	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved **KE(N,S)-xEx /** Prerequisite: Bit 9 = 1 DC bus is not discharged, even after additional UE withdrawal
	1	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved **KE(N,S)-xEx /** Prerequisite: Bit 9 = 1 DC bus is discharged via an external brake resistor in the event of UE withdrawal
11	0	Reserved
	1	Reserved
12	0	**KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Liquid-cooled inverter (switch-off temperature of device rear wall according to SEEP value) **KE(N,S)-xEx / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /** Reserved
	1	**KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Air-cooled inverter (Coldplate design with external air cooling) Switch-off temperature of device rear wall according to SEEP value + 15 °C (not active for -F devices with integrated air-cooling) **KE(N,S)-xEx / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /** Reserved

Bit no.	Condition	Meaning
13	0	**KE(N,S)-xEx / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	1	**KE(N,S)-xEx / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
14	0	Reserved
	1	Reserved
15	0	Reserved
	1	Reserved for AMK internal use! Special function
16	0	Reserved
	1	Reserved
17	0	**KE(N,S)-xEx / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	1	**KE(N,S)-xEx / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
18-32	0	Reserved
	1	Reserved

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0000 0010 0100 0000 (LSB)

0x223F 'Clear error'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x223F
Name	'Clear error'
Object type	VAR
Data type	UNSIGNED16

The command 'Clear error' is started if the value 0x1 is written in 0x223F and causes an error message to be reset. If the cause of the error is remedied, the system changes to the error-free state (SBM = 1).

The status of the command is displayed by the object being read.

Read value	Meaning
0x0	Basic state, no command active
0x3	Command complete
0x7	Command currently active
0xF	Command completed with error

The command is completed after the status is 0x3 or 0xF.

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0
Min. value	0
Max. value	1

0x2240 'Sum of additive velocities'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2240
Name	'Sum of additive velocities'
Object type	VAR
Data type	INTEGER32

The display value 0x2240 'Sum of additive velocities' shows the sum from 0x60B1 'Velocity offset' and the internal speed feedforward values.

Siehe 'Overview control loops' auf Seite 20.

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER32
Scaling	0.0001
Unit	1/min
Default value	0
Min. value	-214748.4
Max. value	214748.4

0x2241 'Sum of additive torques'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2241
Name	'Sum of additive torques'
Object type	VAR
Data type	INTEGER16

The display value 0x2241 'Sum of additive torques' shows the sum from 0x60B2 'Torque offset' and the internal speed feedforward values.

Siehe 'Overview control loops' auf Seite 20.

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER16
Scaling	0.1
Unit	$\%M_N$
Default value	0
Min. value	-3276.8
Max. value	3276.7

0x2242 'Cyclic filter'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2242
Name	'Cyclic filter'
Object type	ARRAY
Data type	UNSIGNED16

0x2242 'Cyclic filter' works in the speed control and position control operating modes.

Configuration 0x2242 'Cyclic filter'

Sub-index	Content	Meaning
1		Percentage scaling [0.1 $\%M_N$]
2		Sensitivity [0.1 $\%M_N$]
3		Offset display [1)]
4		n. harmonic (e.g. number of poles of the motor)
5		Sine proportion of the n. harmonic [1)]
6		Cosine proportion of the n. harmonic [1)]
7		m. harmonic (e.g. harmonics per motor revolution)
8		Sine proportion of the m. harmonic [1)]
9		Cosine proportion of the m. harmonic [1)]
10		Reserved
11		Reserved
12		Reserved
13		Reserved
14		Reserved
15		Reserved
16		Reserved

1) Is currently not operated

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2243 'Overload time motor'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2243
Name	'Overload time motor'
Object type	VAR
Data type	UNSIGNED16

For new applications, the I^2t monitoring motor must be parameterised with the objects 0x206D and 0x2297. 0x2243 'Overload time motor' exists for compatibility reasons.

0x2243 is only effective if 0x2297 'Time maximum current motor' = 0x206D = 0.

The I^2t-monitoring motor is adjusted to the motor's thermal time constant with 0x2243. The motor manufacturer's specifications apply for the thermal time constant. The monitoring must be activated with 0x2215 bit 14 = 1.

0x2243 describes the maximum time t in seconds with which the motor may be operated with 2-times the nominal current.

If the motor overload time in the data sheet is not based on 2-times the nominal current, the setting for 0x2243 results as follows:

Formula: Setting value for 0x2243

Example 1:

The motor may be operated 20 seconds with 1.5-times the nominal current. How is 0x2243 to be set?

Formula: Setting at 1.5-times the nominal current for 20 seconds

If the setting value for 0x2243 has been determined, the following formula can be used to calculate the permissible operating time of the motor with any common overcurrent ratio.

For $i > I_N$, the following correlation applies for the permissible operating time t of the motor.

Formula: Permissible operating time of the motor for any overcurrent

t: Permissible operating time
i: Actual current (overcurrent)
I_N: 0x6075 'Motor rated current'

Example 2:

0x2243 = 2 seconds. How long may the motor be operated at 1.2-times the nominal current?

Formula: Permissible operating time at 1.2-times the nominal current, 0x2072 = 50%

The motor may consequently be operated for 13.6 seconds at 1.2-times the nominal current.

In the event of an overload (overload threshold according to 0x2072), the warning message 0xFF09 'Motor overload warning' is generated as soon as half of the previously calculated time t has expired.

As long as this warning message is present, the user has the option of responding to the overload.

After the motor overload time t has expired, the motor overload display (0x2263) reaches the value 100% and the error message 0xFF0A 'Motor overload error' is generated.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	s
Default value	5.0
Min. value	0
Max. value	90.0

0x2244 'Residual distance erase window'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2244
Name	'Residual distance erase window'
Object type	VAR
Data type	UNSIGNED32

If an axis is moved manually with an inactive controller enable, this change of position produces a position control deviation. With controller enable ON, an internal decision takes place (regardless of the content in 0x2244) regarding whether the position control deviation is cleared or whether the position control deviation is again compensated for by a balancing movement:

|position control deviation| ≤ 0x2244: The position control deviation is reduced by a return movement.

|position control deviation| > 0x2244: The position control deviation is cleared (without axis movement).

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	Increments
Default value	100000000

0x2245 'Operation mode change parameter'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2245
Name	'Operation mode change parameter'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x2246 'AMK homing cycle parameter'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2246
Name	'AMK homing cycle parameter'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x2247 'Time filters'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

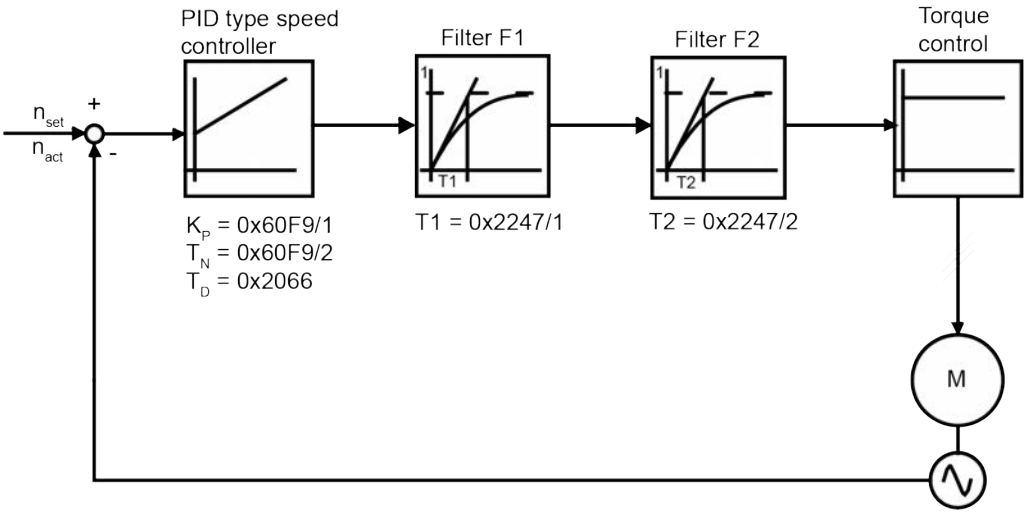
Object description

Index	0x2247
Name	'Time filters'
Object type	ARRAY
Data type	UNSIGNED16

0x2247/1 'Time filter 1' and 0x2247/2 'Time filter 2' define the filter time constants for two freely programmable PT_1 torque filters F1 and F2. The filters are arranged in line at the output of the speed controller. The use of the filter times, which are adapted to the system, stabilises the control loop and therefore allows, among other things, a higher closed-loop gain K_P. The filters are used, for example, in controlling inert masses. Values between 0.2 ms and 1 ms have been proven depending on the application.

The value 0 in 0x2247/1 and 0x2247/2 'Time filter 2' annuls the effect of the filters.

PT_1 filter model



The 3dB cut-off frequencies are:

und

The closed-loop gain of the control loop is reduced from the frequency f1 by 6 dB/octave and from f2 by 12 dB/octave (with f1 < f2).

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Time filter 1'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	ms
Default value	0
Min. value	0
Max. value	2000.0

Sub-index	2
Description	'Time filter 2'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	ms
Default value	0
Min. value	0
Max. value	2000.0

0x2248 'Barrier frequency'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2248
Name	'Barrier frequency'
Object type	VAR
Data type	UNSIGNED16

For structural reasons, the operation of machines can lead to resonant frequencies. In order to be able to filter out these frequencies, a configurable band filter is offered at the output of the speed controller (area 40 Hz to 2 kHz).

If a non-zero value is written in 0x2248, the filter is active and the entered value defines the cut-off frequency of the band filter.

The bandwidth of the band filter is set in 0x2249.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	Hz
Default value	0
Min. value	0
Max. value	4000

0x2249 'Band width'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

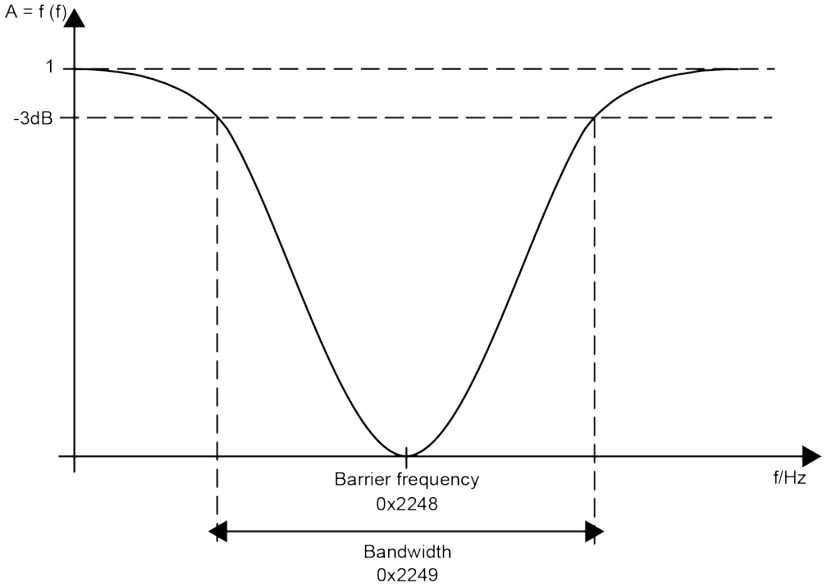
Object description

Index	0x2249
Name	'Band width'
Object type	VAR
Data type	UNSIGNED16

0x2249 marks the 3dB bandwidth of the filter configured in 0x2248.

If, for example, the resonance frequency of a machine is at 800Hz (0x2248 'Barrier frequency' = 800Hz) and the bandwidth is parameterised with 100Hz (0x2249 'Band width' = 100Hz), frequencies of 800Hz ±50 Hz will be filtered out at the output of the speed controller.

Forward characteristic of the band filter



Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	Hz
Default value	0
Min. value	0
Max. value	200

0x224A 'Voltage standstill'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x224A
Name	'Voltage standstill'
Object type	VAR
Data type	UNSIGNED16

The 'Voltage standstill' describes the motor voltage for the speed n=0 (standstill) in the voltage / frequency control operating mode (U/f-control). This operating mode is activated in 0x2253 'Encoder type'.

Siehe '0x225B 'V/F start up'' auf Seite 183.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	V
Default value	0
Min. value	0
Max. value	1000.0

0x224B 'Window'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x224B
Name	'Window'
Object type	VAR
Data type	UNSIGNED32

Reserved for AMK internal use!

0x224C 'Customer variable 1'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x224C
Name	'Customer variable 1'
Object type	VAR
Data type	UNSIGNED16

This variable is available as a free memory location and can be used per data set in an application-specific manner.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0000 0000 0000 0000 (LSB)
Min. value	0000 0000 0000 0000 (LSB)
Max. value	1111 1111 1111 1111 (LSB)

0x224D 'High homing velocity'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x224D
Name	'High homing velocity'
Object type	VAR
Data type	UNSIGNED32

During the homing cycle command with 'range cams' cam evaluation, the 'High homing velocity' sets the speed at which the drive moved away from the cam signal in the opposite direction of the cam signal if the homing cycle is started and the drive is on the cam. If the drive is moved away from the cam, the drive reverses and homes with 0x6099/2 'Speed during search for zero'.

Siehe '0x2246 'AMK homing cycle parameter'' auf Seite 165.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	0.0001
Unit	1/min
Default value	100.0000
Min. value	0
Max. value	3000.0000

0x224E 'Service control'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x224E
Name	'Service control'
Object type	VAR
Data type	UNSIGNED32

Reserved for AMK internal use!

0x224F 'Warning time'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x224F
Name	'Warning time'
Object type	VAR
Data type	UNSIGNED16

The 'Warning time' is the time between a warning message and a subsequent error message that shuts down the device.
Siehe '0x2266 'Temperature internal'' auf Seite 189.

The 'Warning time' works with:
Warning message 0xFF05 'Device over temperature warning', followed by the error message 0x4210 'Excess temperature device'
Warning message 0xFF06 'Motor temperature warning', followed by the error message 0x4310 'Excess temperature drive'

If 0x224F = 0, a warning time of 4 seconds is considered internally.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.01
Unit	s
Default value	4.00
Min. value	0
Max. value	60.00

0x2251 'Message 4x32'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

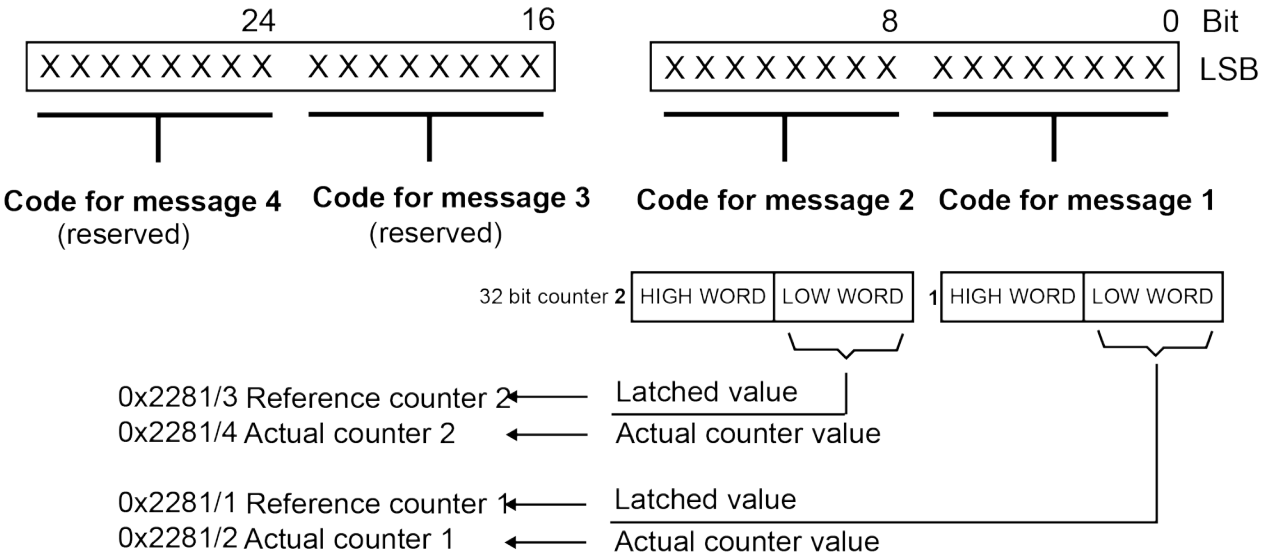
Object description

Index	0x2251
Name	'Message 4x32'
Object type	VAR
Data type	UNSIGNED32

Measurement functions can be configured with 0x2251.

Configuration 0x2251 'Message 4x32'

Code	Designation	Description
0x00	No function	No function
0x03	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved	
0x23	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved	
0x24	Actual position value according to 0x2253: Edge at the binary input stores the current actual position value as a reference counter	'Probe function actual position encoder with touch probe signal'



This object is used by the following functions:

'Probe function actual position encoder with touch probe signal'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

0x2252 'At synchron speed window'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2252
Name	'At synchron speed window'
Object type	VAR
Data type	UNSIGNED16

In the position control operating mode, the real-time bit is set 'position synchronously' if the amount of the position control difference in the drive is less than or equal to the window according to 0x2252.

|position control difference| ≤ 0x2252 → Position synchronous

Position control difference = position setpoint – actual position value

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	Increments
Default value	1000
Min. value	0
Max. value	65535

0x2253 'Encoder type'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2253
Name	'Encoder type'
Object type	VAR
Data type	UNSIGNED16

Values for iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 /

Default value: 0000

Values for KW-R24-R /

Default value: 0018

Values for KW-R24 /

Default value: 0020

0x2253 defines the type of motor and the actual value encoder for the different control loops and are to be derived from the respective type plate or data sheet of the motor.

Motor encoder	Bit 0-3 (Nibble 0)	Motor encoder (rotor position for the commutation) at the same time also speed encoder and position encoder
Motor model	Bit 4-7 (Nibble 1)	Asynchronous motor, synchronous motor, U/F/ operation, ...
Speed encoder	Bit 8-11 (Nibble 2)	like motor encoder (not changeable)
Position encoder	Bit 12-15 (Nibble 3)	like motor encoder (not changeable)

Configuration 0x2253 'Encoder type'

Bit no.	Condition	Meaning
0-3 **Motor encoder** (Nibble 0)	0x0	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 /** I encoder **KW-R24-R /** Reserved
	0x1	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /** H encoder, connected to the sine encoder input **KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	0x2	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 /** T, V encoder [1) 2)] **KW-R24-R /** Reserved
	0x3	Reserved
	0x4	Reserved
	0x5	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 /** I encoder **KW-R24-R /** Reserved
	0x6	Reserved

Bit no.	Condition	Meaning
	0x7	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 /** S, U encoder [2)] **KW-R24-R /** Reserved
	0x8	**KW-R24-R /** Resolver **iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 /** Reserved
	0x9	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	0xA	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 /** E or F encoder Linear encoder LC183 and LC483 **KW-R24-R /** Reserved
	0xB	Reserved
	0xC	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 /** P or Q encoder **KW-R24-R /** Reserved
	0xD	**KW-R26 / KW-R27 /** Y encoder **iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 /** Reserved
4-7 **Motor model** (Nibble 1)	0x0	Asynchronous motor
	0x1	Non-field weakening synchronous motor
	0x2	U/f control
	0x3	Field weakening synchronous motor
	0x5	Sensorless operation of an asynchronous motor (Nibble 0 has to be set to the value 0)
	0x6	Asynchronous motor with voltage control (control of the magnetising current)
8-11 **Speed encoder** (Nibble 2)	0x0	like motor encoder
	0x1	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	0x2	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	0x3	Reserved
	0x4	Reserved
	0x5	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	0x6	Reserved
	0x7	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	0x8	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	0x9	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	0xA	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved

Bit no.	Condition	Meaning
	0xB	Reserved
	0xC	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
12-15 **Position encoder** (Nibble 3)	0x0	like motor encoder
	0x1	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	0x2	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	0x3	Reserved
	0x4	Reserved
	0x5	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	0x6	Reserved
	0x7	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	0x8	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	0x9	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	0xA	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved
	0xB	Reserved
	0xC	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Reserved

1) Also applies for the linear scale "LinCoder L230" from the company Sick/Stegmann with the Hiperface interface.
2) When switching on the power supply, or when doing a homing cycle, the encoder must not turn because the digital position is read twice and plausibility checked. If the difference between both read positions is out of the internal defined range, the diagnosis message 0x7300 'Sensor' info 1 = 7 is issued.

Encoder evaluation

E-, F-encoder:

The encoder evaluation (type E / F) is a combination of analogue and digital evaluation. The absolute value is generated in the encoder after mains on and send to the inverter via EnDat 2.1 protocol. The absolute value is evaluated in the inverter only once, during operation only the SIN/COS tracks are evaluated for the motor control. The multiturn encoder (type F) not need a homing. For singleturn encoder (type E) a homing cycle must be executed to built a relation between the machine position and the encoder signal. The necessary homing mark is built in the drive controller.

In addition to the absolute value, the E and F encoders deliver the analog signals at the correct time and position to the absolute value.

During the absolute value evaluation in the inverter, in addition to the absolute value, the analog signals are evaluated in the correct time and position, thereby improving the accuracy of the absolute value.

.

H-encoder:

The Hall encoder generates directly a SIN/COS signal with 1 period/revolution. Out of them the drive controller calculates the position angle of the rotor.

Per revolution the drive controller generates one homing mark to evaluate during the function homing cycle.

I-encoder:

The encoder evaluation (type I) is an analogue evaluation of the SIN/COS tracks and a homing signal.

The rotary rotor field of the permanent magnets of a synchronous motor is not aligned to the rotary stator rotary field. At synchronous motors with I-type encoder the alignment is done automatically with the function software commutation after the first switch on of the controller enable (RF) after mains on

.

The function software commutation automatically writes values in ID34174. As the function changes parameter values, the device will automatically startup the device at the next RF change. A device startup causes the temporarily changed parameter to be reset to its initial value. Temporary parameters must therefore be written cyclically or only after the software commutation function, followed by another RF change, on the application side.

P-, Q-encoder:

The encoder evaluation (type P / Q) is a complete digital evaluation. The absolute position is send via EnDat 2.1 commands cyclic synchronous from the encoder, triggered by the trigger signal (CLOCK) of the drive controller.

Any available SIN/COS signals are not evaluated!

R-encoder:

The evaluation electronic for the encoder signals scans the high frequency output signals of the encoder by an A/D converter at this time, where the exciter signal has his maximum. The scan cycle is known, because the evaluation electronic is generating also the exciter signal. The evaluation electronic scans the peak values of the encoder signal, in this way the exciter signal is eliminated. A SIN/COS signal with 1 period/revolution remains. Out of them the drive controller calculates the angle position of the rotor. To become a position relation between the machine and the encoder signals a homing cycle function must be executed. The necessary homing mark of the encoder (1/revolution) is built in the drive controller.

S-, T-, U-, V-encoder:

The encoder evaluation (type S / T / U / V) is a combination of analogue and digital evaluation. The absolute value is generated in the encoder after mains on and send to the inverter via Hiperface protocol. The absolute value is evaluated in the inverter only once, during operation only the SIN/COS tracks are evaluated for the motor control. The multiturn encoder (type T / V) not need a homing. For singleturn encoder (type S / U) a homing cycle must be executed to built a relation between the machine position and the encoder signal. The necessary homing mark of the encoder is built in the drive controller.

Y-encoder:

The Hiperface DSL protocol transmits digital data between an encoder and the drive controller by modulating the data into the supply line of the encoder. The absolute positions are send serial and cyclic synchronous from the encoder triggered by the trigger signal of the drive controller.

Meaning for KW-R24 /

ID32953 = 0x0020: U/f control

ID32953 = 0x0050: Sensorless

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2254 'Additional acceleration value'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2254
Name	'Additional acceleration value'
Object type	VAR
Data type	UNSIGNED16

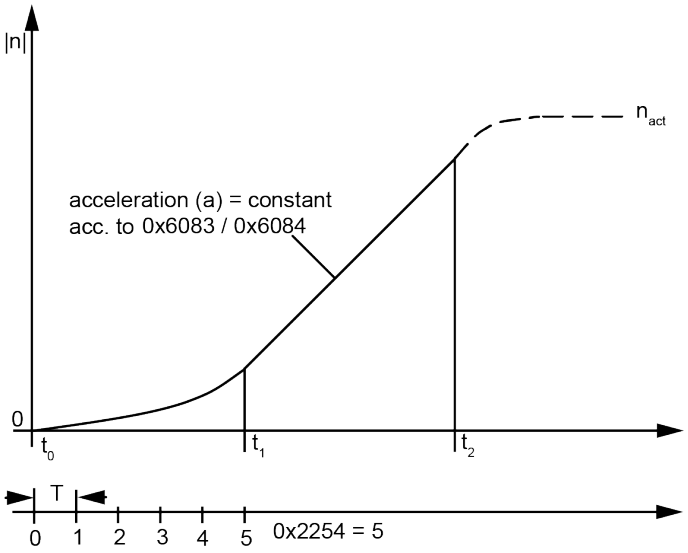
0x2254 works with the internal interpolator for drive-controlled positionings. The acceleration coefficient describes the number of interpolator cycles until reaching the constant acceleration according to 0x6083 'Profile acceleration' and 0x6084 'Profile deceleration'. The interpolator cycle time (Ti) is 1 ms. This results in the following time (T1) until the transition to the nominal acceleration :

Formula: Interpolator settling time to nominal acceleration

T1 = Ti x 0x2254 with Ti = 1 ms (interpolator cycle time)

The acceleration that is realisable by the interpolator depends directly on the acceleration value (BB):

Velocity curve, acceleration coefficient



T = 1ms

Time	Meaning
$t_0 \leq t < t_1$	Smooth increase in acceleration to nominal acceleration (range of constant acceleration). The time period is determined by the acceleration coefficient.
$t_1 \leq t < t_2$	Constant acceleration according to 0x6083 'Profile acceleration' and 0x6084 'Profile deceleration'
$t_2 \leq t$	Smooth reduction of acceleration to zero. Mirror image trend currently $t_0 \leq t < t_1$.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	10
Min. value	4
Max. value	255

0x2255 'Offset resolver'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2255
Name	'Offset resolver'
Object type	VAR
Data type	UNSIGNED16

⚠ WARNING

Risk of injury from uncontrolled movements of the motor shaft

If the offset is entered incorrectly, the motor is not controllable and can carry out uncontrolled movements as soon as the controller enable is set!

With 'Initial program loading' the offset is reset to the default value of 0. A previously determined commutation offset is lost. There is no remanent storage in the encoder.

Steps to prevent:

- Check the entered offset before setting the controller enable.
- Takes precautionary measures to ensure that no persons are in the total possible range of movement of the motor when the controller enable is set for the first time after the input of the offset.

The value 'Offset resolver' adjusts the zero position of the resolver to a constructively determined field position of a synchronous motor (magnet pole). AMK rotation synchronous motors with resolvers are adjusted so that no offset resolver must be entered (0x2255 =0).
The value range 0 to 65535 corresponds to a mechanical revolution (360°) or a pole period with linear motors.
For linear motors, for example, it is not possible to mount the resolver in a defined position to the pole period.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2256 'Motor encoder gear'

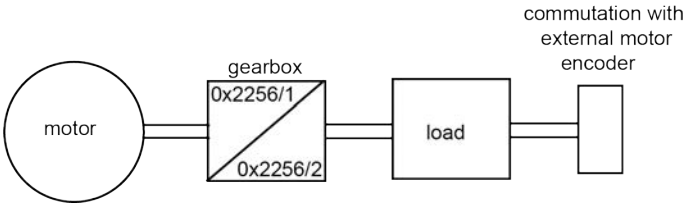
Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2256
Name	'Motor encoder gear'
Object type	ARRAY
Data type	UNSIGNED16

The gear ratio is parametrized in 0x2256/1 'Input motor encoder gear' and 0x2256/2 'Output motor encoder gear' if a motor encoder gear acts between the motor shaft and the motor encoder. The motor encoder gear ratio influences the commutation, but not the speed and position control.

Arrangement



The result of the following calculation must be in integers for synchronous motors, otherwise an error message will be generated. Positions after decimal points are permissible for asynchronous motors.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Input motor encoder gear'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	Revolutions
Default value	1
Min. value	1
Max. value	65535

Sub-index	2
Description	'Output motor encoder gear'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	Revolutions
Default value	1
Min. value	1
Max. value	65535

0x2257 'Input port 3'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) /

Object description

Index	0x2257
Name	'Input port 3'
Object type	VAR
Data type	UNSIGNED16

With 0x2257, the standard binary inputs are assigned objects. With the objects, the physical binary inputs can be assigned standard functions or functions of the plc user program.

Structure and use of the input port 3
Function assignment via objects
Controller can read the image and evaluate status

0x2257	Binary input[1)]	Function assignment[2)]	Image[3)]
32	BE1	0x2258/1	0x2288 Bit 0
	BE2	0x2258/2	0x2288 Bit 1
	BE3	0x2258/3	0x2288 Bit 2
	BE4	0x2258/4	0x2288 Bit 3
	BE5	0x2258/5	0x2288 Bit 4

1) The availability of physical binary inputs depends on the hardware used.
2) Functions can be assigned to the binary inputs:
3) A controller can read the statuses of binary inputs with 0x2288 'Binary input word'.

Entry description

Access	read
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2258 'Input port 3 bits'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) /

Object description

Index	0x2258
Name	'Input port 3 bits'
Object type	ARRAY
Data type	UNSIGNED32

Digital input functions of the inverter can be assigned to the digital input port 3 (bit 0-4) and the status of the input can be evaluated via the plc. 0x2257 'Input port 3' determines which physical digital inputs the input port maps.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-5
Scaling	1
Unit	-
Default value	5

Sub-index	1
Description	'Input port 3 bit 0'
Device	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) /
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	32904

Sub-index	2
Description	'Input port 3 bit 1'
Device	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) /
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	32913

Sub-index	3
Description	'Input port 3 bit 2'
Device	KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) /
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	32905

Sub-index	4
Description	'Input port 3 bit 3'
Device	iX(-R3) / iC(-R3) / iDT5(-R3) /
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

Sub-index	5
Description	'Input port 3 bit 4'
Device	iX(-R3) / iC(-R3) / iDT5(-R3) /
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

0x2259 'Torque filter time'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2259
Name	'Torque filter time'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x225A 'NK-shift'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x225A
Name	'NK-shift'
Object type	VAR
Data type	UNSIGNED16

The cam offset works with the homing cycle function.
See documentation Function descriptions (Part no. 203878).

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	Increments
Default value	0
Min. value	0
Max. value	65535

0x225B 'V/F start up'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x225B
Name	'V/F start up'
Object type	VAR
Data type	UNSIGNED16

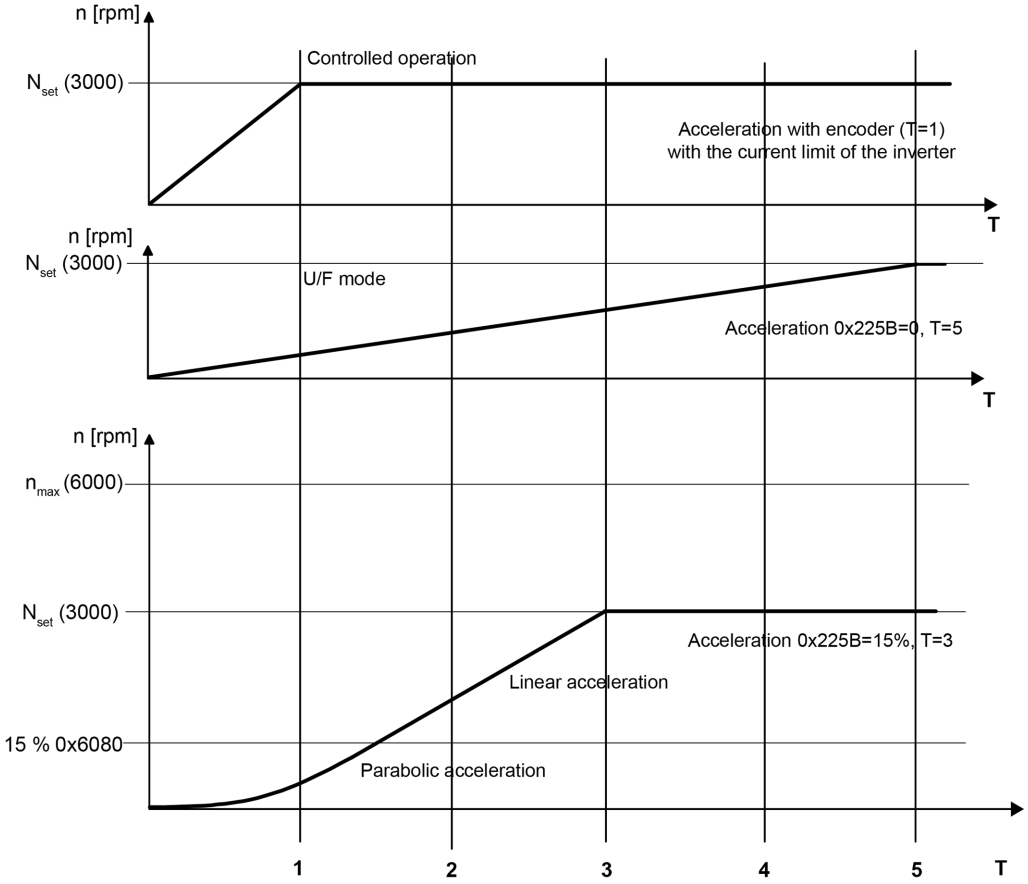
0x225B works in the voltage / frequency control (V/f operation) when operating a motor. The U/f operation allows a speed-controlled motor operation without encoder feedback.

In V/f-operation mode, starting up from standstill can frequently cause a problem, because when the axis "breaks loose" a high current can flow that may cause an overload of the inverter (shutdown "short circuit").
To securely avoid the overload in the V/f-start up (without soft start), the velocity ramp must be set flatly during start up. A flat velocity ramp leads however to undynamic behaviour of the axis.

Using 0x225B, you can start up in parabola form (soft start) in the lower speed range. As of the speed specified in 0x225B 'V/F start up', acceleration is linear up to the nominal speed. The value to be entered in 0x225B is the relative speed in relation to 0x6080 'Maximal motor speed'. In the speed range from standstill to the speed according to 0x225B , start up is according to a parabola, and then linear according to 0x221C 'Acceleration ramp'.

If the drive is not at standstill, then acceleration is immediately with the linear ramp (0x221C). 0x207C 'Zero velocity window' serves as the decision criterion for the standstill.

Startup behaviour in V/f operation



Controlled operation:
T=1 is the time with which the motor accelerates as quickly as possible in the controlled operation, limited by 0x60E0 'Positive torque limit value' and 0x60E1 'Negative torque limit value' The thereby resulting minimum startup time is determined by the motor and the employed inverter.

V/f operation with linear start:
During V/f operation with linear startup time, the startup needs to be adjusted by a factor of T=5.

V/f operation with soft start:
A time of T=3 is achieved by the parabola-formed startup.

Axis run-down:
The axis run-down is not influenced by 0x225B . It corresponds to a T=2 compared to the one in the regulated drive.

The effective acceleration time results as follows:

Operation

The specification of the setpoint frequency takes place via the speed setting in controlled operation. The setpoint source is set via the operating mode. The speed ramp according to 0x221C, 0x221D and 0x221E is effective if it is activated in the operating mode (0x221...) with bit 6. The ramp times may not be less than the physically achievable speed ramps of the system. Too steep of ramps lead to the message 0x2110 'Short circuit/earth leakage' or to the message 0xFF03 'IGBT over current'. The setpoint according to the ramp is shown as the actual speed value.

The following functions are ineffective during U/f operation:

- I^2t-monitoring for converter
- Torque limiting (0x60E0, 0x60E1, 0x6072). The current limit is enabled up to the maximum converter current limit.
- Torque display
- Power display

The following objects are relevant for the U/F operating mode:

Object	Designation	Description
0x2253	'Encoder type'	Motor model selection 0x0020 must be entered for U/f operation.
0x224A	'Voltage standstill'	Applied voltage at a standstill (frequency = 0) In this way, the voltage drop at the coil can be compensated for.
0x2211	'Nominal motor voltage'	Voltage at the nominal speed
0x2214	'Nominal velocity'	Until the 'Nominal velocity' is reached, the voltage is increased to 'Nominal motor voltage' (0x2211). For higher speeds, the voltage is kept constant.
0x2217	'Pole number motor'	Number of poles of the motor (type plate).
0x221C	'Acceleration ramp'	Time for the acceleration from a speed of zero to the maximum speed
0x221D	'Deceleration ramp'	Time for braking from the maximum speed to standstill
0x221E	'Deceleration ramp RF inactive'	Deceleration time for removal of the controller enable (controlled deceleration)
0x225B	'V/F start up'	Speed threshold for the transition from the parabolic arc start-up to a linear acceleration movement

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	%
Default value	0
Min. value	0
Max. value	100

0x225C 'Dead time compensation 2'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x225C
Name	'Dead time compensation 2'
Object type	VAR
Data type	UNSIGNED16

Meaning for KW-R24-R / KW-R25 / KW-R26 / KW-R27 /

In 0x225C 'Dead time compensation 2', a feedforward time can be set for the dead time compensation for 32 bit position setpoints. The dead time compensation only works if the following error compensation (SAK) in 0x2221 'AMK operation modes' bit 9 = 1 is active.

This object is used by the following function:
'Following error compensation (SAK)'

Meaning for iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /
Reserved for AMK internal use!

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.001
Unit	ms
Default value	0
Min. value	0
Max. value	0.100

0x225D 'Data signification'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x225D
Name	'Data signification'
Object type	VAR
Data type	UNSIGNED32

Reserved for AMK internal use!

0x225E 'Overload limit inverter'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x225E
Name	'Overload limit inverter'
Object type	VAR
Data type	UNSIGNED16

The i^2t monitoring for the converter is always automatically active. The 'Overload limit inverter' determines when the 'device overload warning' is generated. At the same time as the warning, the real-time bit (code 33016) is generated. If the value in 0x225E is fallen below again, the real-time bit is reset until the value is exceeded again. Upcoming warnings can be cleared by the user. If the i^2t-monitoring (0x2262 'Display overload inverter') achieves an overload value of 100%, the error message 'device overload error' is generated.

0xFF07 'Device overload warning'

0xFF08 'Device overload error'

In the case of an error, the SBM is withdrawn and the drive coasts to a stop.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	%
Default value	500

0x225F 'Second period'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x225F
Name	'Second period'
Object type	VAR
Data type	UNSIGNED16

0x225F = 0 Output cycle = 1 second (1 second on, 1 second off)
0x225F ≠ 0 Output cycle= value in 0x225F * 10 ms

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2260 'Increase position value 2'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2260
Name	'Increase position value 2'
Object type	VAR
Data type	INTEGER32

0x2260 specifies the 32 bit position growth per 0x2013 'Increase position value 2'.
Siehe '0x2221 'AMK operation modes'' auf Seite 140.

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	Increments
Default value	0

0x2261 'Actual power value'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2261
Name	'Actual power value'
Object type	VAR
Data type	UNSIGNED32

The 'Actual power value' is a variable calculated from the actual torque value and actual speed value in the converter.

Formula: Active power of the motor

0x233A 'Nominal torque'
0x2214 'Nominal velocity'

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED32
Scaling	1
Unit	W
Default value	0

0x2262 'Display overload inverter'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2262
Name	'Display overload inverter'
Object type	VAR
Data type	UNSIGNED16

0x2262 shows the current overload of the converter according to i^2t-calculation.

0x2262 = 0: Converter works in nominal operation or below the nominal rating
0x2262 > 0: Converter works in the overload operation, shutdown at 100%

Siehe '0x225E 'Overload limit inverter'' auf Seite 185.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	%
Default value	0

0x2263 'Display overload motor'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2263
Name	'Display overload motor'
Object type	VAR
Data type	UNSIGNED16

0x2263 shows the current overload of the motor according to I^2t-calculation.

0x2263 = 0: Motor works in nominal operation or below the nominal rating
0x2263 > 0: Motor works in the overload operation, shutdown at 100%

The I^2t-monitor motor must be activated in 0x2215 'Service bits' Bit 14.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	0.1
Unit	%
Default value	0

0x2264 'Position feedback modulo'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2264
Name	'Position feedback modulo'
Object type	VAR
Data type	UNSIGNED32

The modulo actual position value is between 0 and the modulo end value set in 0x60E2 'Modulo value' and always has a positive sign.

Siehe '0x60E2 'Modulo value'' auf Seite 328.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED32
Scaling	1
Unit	Increments
Default value	0
Min. value	0
Max. value	4294567295

0x2265 'Torque setpoint at controller'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2265
Name	'Torque setpoint at controller'
Object type	VAR
Data type	INTEGER16

Siehe 'Overview control loops' auf Seite 20.

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER16
Scaling	0.01
Unit	$\%M_N$
Default value	0

0x2266 'Temperature internal'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2266
Name	'Temperature internal'
Object type	VAR
Data type	INTEGER16

0x2266 shows the temperature of the cold plate (heat sink of the IGBT and at the same time of the rear wall of the device). The triggering thresholds are device-specific, are set in the SEEP at the factory and cannot be changed by the user.

If critical temperatures occur for the devices, the warning 0xFF05 'Device over temperature warning' is generated as well as the error message 0x4210 'Excess temperature device' after the warning time[1)] (0x224F) has expired.

1) Siehe '0x224F 'Warning time'' auf Seite 170.

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER16
Scaling	0.1
Unit	°C
Default value	0

0x2267 'System booting'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2267
Name	'System booting'
Object type	VAR
Data type	UNSIGNED16

A system booting causes a re-calculation of the data management. Changed parameter values are active.

The command is started if the value 0x1 is written in the object.

The status of the command is displayed by the object being read.

Read value	Meaning
0x0	Basic state, no command active
0x3	Command complete
0x7	Command currently active
0xF	Command completed with error

The command is completed after the status is 0x3 or 0xF.

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2268 'Variables'

Supported hardware: iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2268
Name	'Variables'
Object type	ARRAY
Data type	INTEGER32

This object can be used specific to the application in order to store data.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	yes
Range of values	1-14
Scaling	1
Unit	-
Default value	14

Sub-index	1
Description	'Variable 0'
Access	read/write
PDO Mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	-
Default value	0

Sub-index	2
Description	'Variable 1'
Access	read/write
PDO Mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	-
Default value	0

Sub-index	3
Description	'Variable 2'
Access	read/write
PDO Mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	-
Default value	0

Sub-index	4
Description	'Variable 3'
Access	read/write
PDO Mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	-
Default value	0

Sub-index	5
Description	'Variable 4'
Access	read/write
PDO Mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	-
Default value	0

Sub-index	6
Description	'Variable 5'
Access	read/write
PDO Mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	-
Default value	0

Sub-index	7
Description	'Variable 6'
Access	read/write
PDO Mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	-
Default value	0

Sub-index	8
Description	'Variable 7'
Access	read/write
PDO Mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	-
Default value	0

Sub-index	9
Description	'Variable 8'
Access	read/write
PDO Mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	-
Default value	0

Sub-index	A
Description	'Variable 9'
Access	read/write
PDO Mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	-
Default value	0

Sub-index	B
Description	'Variable 10'
Access	read/write
PDO Mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	-
Default value	0

Sub-index	C
Description	'Variable 11'
Access	read/write
PDO Mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	-
Default value	0

Sub-index	D
Description	'Variable 12'
Access	read/write
PDO Mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	-
Default value	0

Sub-index	E
Description	'Variable 13'
Access	read/write
PDO Mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	-
Default value	0

Sub-index	F
Description	'Variable 14'
Access	read/write
PDO Mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	-
Default value	0

Sub-index	10
Description	'Variable 15'
Access	read/write
PDO Mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	-
Default value	0

Sub-index	11
Description	'Variable 16'
Access	read/write
PDO Mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	-
Default value	0

Sub-index	12
Description	'Variable 17'
Access	read/write
PDO Mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	-
Default value	0

Sub-index	13
Description	'Variable 18'
Access	read/write
PDO Mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	-
Default value	0

Sub-index	14
Description	'Variable 19'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

0x2269 'BUS address participant'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2269
Name	'BUS address participant'
Object type	VAR
Data type	UNSIGNED16

0x2269 specifies the participant address in the bus system.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x226A 'BUS transmit rate'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x226A
Name	'BUS transmit rate'
Object type	VAR
Data type	UNSIGNED16

0x226A 'BUS transmit rate' defines the fieldbus-specific supported functionality.
Adjustable tolerance at fail telegrams in the bus:

The monitoring of fail telegrams is complete inactive, if 0x226B 'BUS failure character' is parameterized

At fail telegram the position setpoint is interpolated further on with the last valid position increase or with the actual speed setpoint.

Configuration 0x226A 'BUS transmit rate'

Bit no.	Condition	Meaning
0-7	0	Only 1 telegram failure (missing telegram) is tolerated before an error message is generated (default)
	1...255	Number of tolerated telegram failures (missing telegrams) before an error message is generated
8	0	Monitoring for telegram and synchronisation failure active, after 'operational' bus status is reached.
	1	Monitoring for telegram and synchronisation failure active, after QRF (for KW) / QUE (for KE) is reached
9-15	0	Reserved
	1	Reserved

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x226B 'BUS failure character'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x226B
Name	'BUS failure character'
Object type	VAR
Data type	UNSIGNED16

The 'BUS failure character' defines the behavior of a slave bus participant in the event of a failure of the fieldbus and affects with the following diagnostic messages:

ACC Bus: 2685,2686, 2691, 2693, 2694

EtherCAT / VARAN: 2561, 2595

The following error class is displayed:

ACC:128

EtherCAT / VARAN: 2048

Tolerance at fail telegrams: Siehe '0x226A 'BUS transmit rate" auf Seite 194.

Configuration 0x226B 'BUS failure character'

Code	Designation	Description
0	-	No response
1	-	Warning message **KE(N,S)-xEx /** The system remains active, warning message is generated

Code	Designation	Description
2	-	Error message, SBM is withdrawn **iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** The controller enable (RF) is withdrawn drive-internally error message is generated **KE(N,S)-xEx /** DC bus ON (UE) is withdrawn internally, error message is generated
3	-	**iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Drive moves into parking position [1)]
11	-	**KE(N,S)-xEx / iX(-R3) / iC(-R3) / iDT5(-R3) / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** At the binary output port 3, the bit mask is output according to 0x22AB 'Bit mask port 3'. The bit encoding for the output port 3 is masked in 0x22AB 'Bit mask port 3'. The controller enable is not withdrawn and the drive generates a warning message.  Prerequisite: 0x2237 'Output port 3' = 0 0x2238/1 'Output port 3 bit 0' = 33942 0x2238/2 'Output port 3 bit 1' = 33942 0x2238/3 'Output port 3 bit 2' = 33942 The status of the binary outputs remains active until the error is cleared and the states will be overwritten by 0x60FE 'Digital outputs'.
12	-	**KE(N,S)-xEx / iX(-R3) / iC(-R3) / iDT5(-R3) / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** Same as code 11, but the drive generates an error message instead of a warning (SBM = 0).

1) This object is used by the following function:
'Drive moves into parking position'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	2

0x226C 'Offset analog input 1'

Supported hardware: iX(-R3) / iC(-R3) / iDT5(-R3) /

Object description

Index	0x226C
Name	'Offset analog input 1'
Object type	VAR
Data type	INTEGER16

The 'Offset analog input 1' compensates for the offset error of the analogue input circuit, regardless of the active operating mode. 0x226C is added to the analogue input voltage 1.

Entry description

Access	read/write
PDO mapping	yes
Range of values	INTEGER16
Scaling	0.01
Unit	V
Default value	0
Min. value	-10.00
Max. value	10.00

0x226D 'OSC control'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x226D
Name	'OSC control'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x226F 'OSC actual values'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x226F
Name	'OSC actual values'
Object type	VAR
Data type	DOMAIN

Reserved for AMK internal use!

0x2270 'OSC data list'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2270
Name	'OSC data list'
Object type	VAR
Data type	DOMAIN

Reserved for AMK internal use!

0x2271 'TG control'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2271
Name	'TG control'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x2272 'TG configuration list'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2272
Name	'TG configuration list'
Object type	VAR
Data type	DOMAIN

Reserved for AMK internal use!

0x2273 'Inductances'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2273
Name	'Inductances'
Object type	ARRAY
Data type	UNSIGNED16

0x2273 'Inductances' acts with the voltage feedforward in the current controller. The value is specified in the motor data sheet.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Inductance path D'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	0.01
Unit	mH
Default value	0

Sub-index	2
Description	'Inductance path Q'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	0.01
Unit	mH
Default value	0

0x2274 'Dead time compensation measuring 1'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) /

Object description

Index	0x2274
Name	'Dead time compensation measuring 1'
Object type	VAR
Data type	UNSIGNED16

Dead times can be compensated for with this object due to, for example, sensors and input circuits in connection with the touch probe function at the binary input BE3. The measured value is corrected by the configured dead time.

This object is used by the following function:
'Touch probe'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.001
Unit	ms
Default value	0
Min. value	0
Max. value	32.767

0x2275 'PWM frequency'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2275
Name	'PWM frequency'
Object type	VAR
Data type	UNSIGNED16

0x2275 sets the frequency of the PWM in the converter. Only 8 kHz PWM frequency is permissible for all devices.
Exception: additional 4 kHz for KW100, KW150 and KW200

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	kHz
Default value	8

0x2276 'Integral times'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2276
Name	'Integral times'
Object type	ARRAY
Data type	UNSIGNED16

0x2276 'Integral times' works in the current controller and is to be derived from the respective type plate or data sheet of the motor.
Siehe '0x229A 'Threshold current adaptations'' auf Seite 220.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Current path Q integral-action time'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	ms
Default value	0
Min. value	0
Max. value	300.0

Sub-index	2
Description	'Current path D integral-action time'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	ms
Default value	0
Min. value	0
Max. value	300.0

0x2278 'EF type'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2278
Name	'EF type'
Object type	VAR
Data type	UNSIGNED16

Meaning for KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /

0x2278 'EF type' indicates whether all conditions for monitoring the power output stage enable EF are met. For safety reasons, the content of 0x2278 'EF type' must be read following the component exchange and evaluated to determine whether all of the conditions for the certified use of the EF logic are met.

Value range of 0x2278 'EF type'

Code	Designation	Description
2		Not all of the conditions for using the certified EF logic in the device are met. The EF logic cannot be used.
4		All of the conditions in the device are met so that the EF logic guarantees the certified properties.

Meaning for iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Reserved for AMK internal use!

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2279 'List SEEP 1'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2279
Name	'List SEEP 1'
Object type	VAR
Data type	DOMAIN

Reserved for AMK internal use!

0x227A 'List SEEP 2'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x227A
Name	'List SEEP 2'
Object type	VAR
Data type	DOMAIN

Reserved for AMK internal use!

0x227B 'Fault statistics'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x227B
Name	'Fault statistics'
Object type	VAR
Data type	DOMAIN

The 'Fault statistics' is managed for the product's entire life cycle and is stored in the SEEP of the device.

Configuration 0x227B 'Fault statistics'

Sub-index	Content	Meaning
1	n	**KE(N,S)-xEx /** Mains **iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /** EF logic
2	n	Brake transistor
3	n	Logic voltage
4	n	Overload i^2t
5	n	Encoder error
6	n	Earth contact, short-circuit
7	n	Device over-temperature
8	n	Motor / brake resistor over-temperature

n indicates how often this error has occurred

Entry description

Access	read
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x227C 'Time meter power'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x227C
Name	'Time meter power'
Object type	VAR
Data type	UNSIGNED32

0x227C indicates the number of operating hours of the device. The value of the operating hour counter is stored in the device SEEP and remains preserved when replacing the controller module.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0
Min. value	0
Max. value	200000

0x227D 'Home signal distance'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

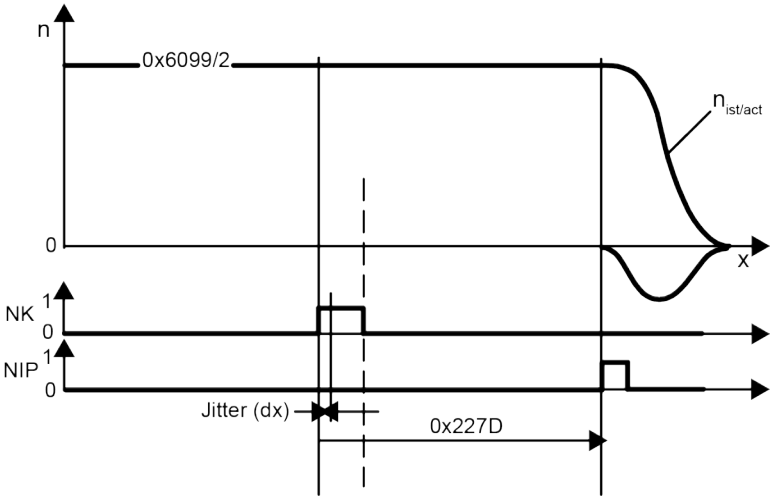
Object description

Index	0x227D
Name	'Home signal distance'
Object type	VAR
Data type	INTEGER32

After every homing cycle, the 'Home signal distance' indicates the distance between the encoder zero pulse and an external cam.
0x227D is cleared by the following results, i.e. set to the value 0:

- Homing cycle only for cam or encoder homing mark (zero pulse)
- System booting
- Data set change
- Command for resetting the homing point known
- Every homing cycle completed with an error

Example: homing signal distance for homing cycle with cam and encoder homing mark (zero pulse evaluation), without 'Home offset' (0x607C = 0).



Due to the discreet sampling of the cam signal, a blur (dx) results, whose size depends on the interpolator guide speed and the sampling time.
The value 0 in 0x227D signals an invalid value, i.e. a non-current homing signal distance.

Siehe '0x225A 'NK-shift" auf Seite 182.

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	Increments
Default value	0
Min. value	-2147483648
Max. value	2147483647

0x227E 'System name'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x227E
Name	'System name'
Object type	VAR
Data type	VISIBLE_STRING

Any name can be assigned to the device in 0x227E. The system name is used in the networked systems, e.g. for device identification.

Configuration 0x227E 'System name'

Element	Content	Meaning
1	e.g. A	1st character of the system name
2	e.g. n	2nd character of the system name
3	e.g. t	3rd character of the system name
4	e.g. r	4th character of the system name
5	e.g. i	5th character of the system name
6	e.g. e	6th character of the system name
7	e.g. b	7th character of the system name
8	e.g. 1	8th character of the system name
...	...	...
n		Last character of the system name

Entry description

Access	read/write
PDO mapping	no
Range of values	STRING(1)
Scaling	1
Unit	-
Default value	-

0x227F 'Data set name'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x227F
Name	'Data set name'
Object type	VAR
Data type	VISIBLE_STRING

In 0x227F, any name can be assigned to the data set (all objects of a device).

Configuration 0x227F 'Data set name'

Element	Content	Meaning
1	e.g. D	1st character of the data set name
2	e.g. o	2nd character of the data set name
3	e.g. k	3rd character of the data set name
4	e.g. u	4th character of the data set name
5	e.g. P	5th character of the data set name
6	e.g. r	6th character of the data set name
7	e.g. o	7th character of the data set name
8	e.g. j	8th character of the data set name
9	e.g. e	9th character of the data set name
10	e.g. k	10th character of the data set name
11	e.g. t	11th character of the data set name
...	...	...
16		16th character of the data set name

Entry description

Access	read/write
PDO mapping	no
Range of values	STRING(1)
Scaling	1
Unit	-
Default value	-

0x2280 'Scaling parameters'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2280
Name	'Scaling parameters'
Object type	VAR
Data type	DOMAIN

'Scaling parameters' contains all objects that must be set for an active weighting before writing a new data set in the drive.

Entry description

Access	read
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2281 'Homing and actual counters'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) /

Object description

Index	0x2281
Name	'Homing and actual counters'
Object type	ARRAY
Data type	INTEGER16

Meaning for KW-R24-R / KW-R25 / KW-R26 / KW-R27 /

The 'Homing counter 1' stores the position information from 0x228/2 'Actual counter 1' at the point where the homing signal occurs.

The 'Actual counter 1' cyclically saves (each 250 µs) the position information.

The 'Homing counter 2' stores the position information from 0x2281/4 'Actual counter 2' at the point where the homing signal occurs.

The 'Actual counter 2' cyclically saves (each 250 µs) the position information.

This object is used by the following functions:

'Probe function actual position encoder with touch probe signal'

Meaning for iX(-R3) / iC(-R3) / iDT5(-R3) /

Reserved for AMK internal use!

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	yes
Range of values	1-4
Scaling	1
Unit	-
Default value	4

Sub-index	1
Description	'Homing counter 1'
Access	read
PDO Mapping	yes
Range of values	INTEGER16
Scaling	1
Unit	Increments
Default value	0

Sub-index	2
Description	'Actual counter 1'
Access	read
PDO Mapping	yes
Range of values	INTEGER16
Scaling	1
Unit	Increments
Default value	0

Sub-index	3
Description	'Homing counter 2'
Access	read
PDO Mapping	yes
Range of values	INTEGER16
Scaling	1
Unit	Increments
Default value	0

Sub-index	4
Description	'Actual counter 2'
Access	read
PDO Mapping	yes
Range of values	INTEGER16
Scaling	1
Unit	Increments
Default value	0

0x2282 'Event trace'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2282
Name	'Event trace'
Object type	VAR
Data type	VISIBLE_STRING

The 'Event trace' is organized as the circular buffer. Every new entry overwrites the oldest entry. The newest entry is at the beginning of the list and the oldest event is at the end.

Configuration 0x2282 'Event trace'

Element	Content	Meaning
1		
2		
...		
n		

Siehe '0x2298 'Event filter'' auf Seite 219.

Entry description

Access	read
PDO mapping	no
Range of values	STRING(1)
Scaling	1
Unit	-
Default value	-

0x2283 'User list 2'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2283
Name	'User list 2'
Object type	VAR
Data type	DOMAIN

The 'User list 2' is a data set in the remanent memory area that is freely available to the user.

Configuration 0x2283 'User list 2'

	Content	Meaning
1		
2		
3		
...		
32		

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2284 'Rise time SWC'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2284
Name	'Rise time SWC'
Object type	VAR
Data type	UNSIGNED16

0x2284 determines the slope of the current increase for the software commutation. The default value 0 corresponds to a current increase of $I_{N,Motor}$/200 ms. The system can start to vibrate for values greater than 200 ms.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.001
Unit	A/s
Default value	0

0x2285 'Final value SWC'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2285
Name	'Final value SWC'
Object type	VAR
Data type	INTEGER16

0x2285 defines the end value of the current for the software commutation.

The software commutation is dependent on the motor encoder type used, primarily for linear motor use. When using linear distance measuring systems without an absolute value, it is not possible to determine the in-phase current of the motor windings from the encoder signals. In this case, it is achieved by means of the software commutation.

With the software commutation, the current increase as well as the current end value of the commutation current are important. For strong linear motors in highly dynamic applications, flatter current increases are usually necessary. It should also be possible to limit the commutation current to smaller values for the initial commissioning.
The current increase is determined via the object 0x2284 and the current end value in 0x2285.

Positive value in 0x2285:

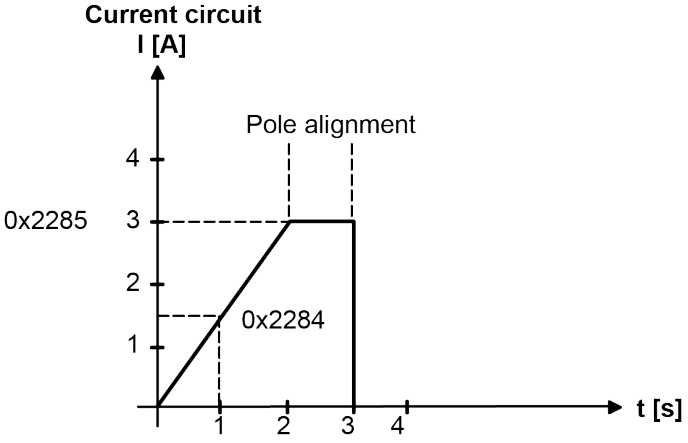
SW commutation according to the current increase and end value.

Negative value in 0x2285 and 0x2215 bit 28 = 0:

After the current increase, the current angle is shifted by ± 45° in order to 'break away' ironless linear motors from a position between two poles. This process requires an additional 2.5 seconds for the commutation time. The commutation time results from 0x2284 'Rise time SWC'.

Example:

0x2284 'Rise time SWC' = 1.5 A/s
0x2285 'Final value SWC' = 3 A



Entry description

Access	read/write
PDO mapping	no
Range of values	INTEGER16
Scaling	0.1
Unit	A
Default value	0

0x2286 'Standstill current motor'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2286
Name	'Standstill current motor'
Object type	VAR
Data type	UNSIGNED32

The 'Standstill current motor' is to be derived from the motor data sheet and works with the i^2t-monitoring of the motor.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	0.001
Unit	A
Default value	0
Min. value	0
Max. value	1000000

0x2287 'Delay time SWC'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2287
Name	'Delay time SWC'
Object type	VAR
Data type	UNSIGNED16

The 'Delay time SWC' indicates the time between the rotor alignment and the determination of the commutation position. When aligning the rotor, it may occur for larger motors that the rotor is still rotating when the commutation position is to be determined (overshooting over the setpoint position). Then an error message 0x7122 'Motor error or commutation malfunction' is generated. With the 'Delay time SWC', the waiting time for determining the commutation position of the motor can be adjusted.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	ms
Default value	0
Min. value	0
Max. value	4000

0x2288 'Binary input word'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) /

Object description

Index	0x2288
Name	'Binary input word'
Object type	VAR
Data type	UNSIGNED16

The 'Binary input word' is the image of the binary inputs of the input port 3 (0x2257 'Input port 3').
Siehe '0x2257 'Input port 3'' auf Seite 180.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2289 'OSC configuration list 2'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2289
Name	'OSC configuration list 2'
Object type	VAR
Data type	DOMAIN

Reserved for AMK internal use!

0x228A 'Memory address'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x228A
Name	'Memory address'
Object type	VAR
Data type	UNSIGNED32

Reserved for AMK internal use!

0x228B 'Memory data'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x228B
Name	'Memory data'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x228C 'Kp voltage control gain'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x228C
Name	'Kp voltage control gain'
Object type	VAR
Data type	UNSIGNED16

The 0x228C 'Kp voltage control gain' and 0x228D 'Tn voltage control integrating time' work for synchronous machines in field weakening and for asynchronous motors with voltage control. The values are motor-specific and are to be taken from the respective type plate or data sheet of the motor.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.001
Unit	A/V
Default value	0.500
Min. value	0
Max. value	65.535

0x228D 'Tn voltage control integrating time'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x228D
Name	'Tn voltage control integrating time'
Object type	VAR
Data type	UNSIGNED16

The 0x228C 'Kp voltage control gain' and 0x228D 'Tn voltage control integrating time' work for synchronous machines in field weakening and for asynchronous motors with voltage control. The values are motor-specific and are to be taken from the respective type plate or data sheet of the motor.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	ms
Default value	5.0
Min. value	0
Max. value	300.0

0x228E 'Proportional gains'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x228E
Name	'Proportional gains'
Object type	ARRAY
Data type	UNSIGNED16

0x228E/1 'Current path Q proportional gain' and 0x228E/2 'Current path D proportional gain' work in the current controller and are to be derived from the respective type plate or data sheet of the motor. If no values are specified in the motor data sheet, the current controller values can be set manually or with the automatic current controller tuning.

Siehe '0x229A 'Threshold current adaptations'' auf Seite 220.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Current path Q proportional gain'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	0.01
Unit	V/A
Default value	0

Sub-index	2
Description	'Current path D proportional gain'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	0.01
Unit	V/A
Default value	0

0x228F 'Maximum speed motor'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x228F
Name	'Maximum speed motor'
Object type	VAR
Data type	UNSIGNED32

The 'Maximum speed motor' defines the speed that the motor can physically achieve and is specified in the motor's data sheet.

Entry description

Access	read
PDO mapping	no
Range of values	UNSIGNED32
Scaling	0.0001
Unit	1/min
Default value	100000.0000
Min. value	1.0000
Max. value	100000.0000

0x2290 'Part number motor'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2290
Name	'Part number motor'
Object type	VAR
Data type	VISIBLE_STRING

The 'Part number motor' can be entered in 0x2290.

Configuration Aufbau 0x2290 'Part number motor' for the example parts no. A1182AD

Element	Content	Meaning
1	e.g. A	1st position in the part number of the motor
2	e.g. 1	2nd position in the part number of the motor
3	e.g. 1	3rd position in the part number of the motor
4	e.g. 8	4th position in the part number of the motor
5	e.g. 2	5th position in the part number of the motor
6	e.g. A	6th position in the part number of the motor
7	e.g. D	7th position in the part number of the motor
8	0	8th position in the part number of the motor
9	0	9th position in the part number of the motor
10		10th position in the part number of the motor

Entry description

Access	read/write
PDO mapping	no
Range of values	STRING(1)
Scaling	1
Unit	-
Default value	-

0x2291 'Production date motor'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2291
Name	'Production date motor'
Object type	VAR
Data type	UNSIGNED16

The 'Production date motor' is assumed from the encoder database.
Format: jjww

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2292 'Serial number motor'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2292
Name	'Serial number motor'
Object type	VAR
Data type	UNSIGNED32

The 'Serial number motor' is assumed from the encoder database.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

0x2293 'Terminal resistance'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2293
Name	'Terminal resistance'
Object type	VAR
Data type	UNSIGNED16

The terminal resistance (R_{tt}) is only relevant for synchronous motors and is to be derived from the respective type plate or data sheet of the motor.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.01
Unit	Ohm
Default value	0

0x2294 'Holding torque brake'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2294
Name	'Holding torque brake'
Object type	VAR
Data type	UNSIGNED16

If the motor contains an 'electronic nameplate' and an integrated motor holding brake, 0x2294 'Holding torque brake' will be read automatically. Otherwise the holding torque of the brake must be entered by hand.

If 0x2294 = 0
The controlling of motor holding brake is deactivated

This object is used by the following function:
'Controlling motor holding brake'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	Nm
Default value	0

0x2295 'Temperature sensor motor'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2295
Name	'Temperature sensor motor'
Object type	VAR
Data type	UNSIGNED16

The connected temperature sensor is defined in 0x2295.

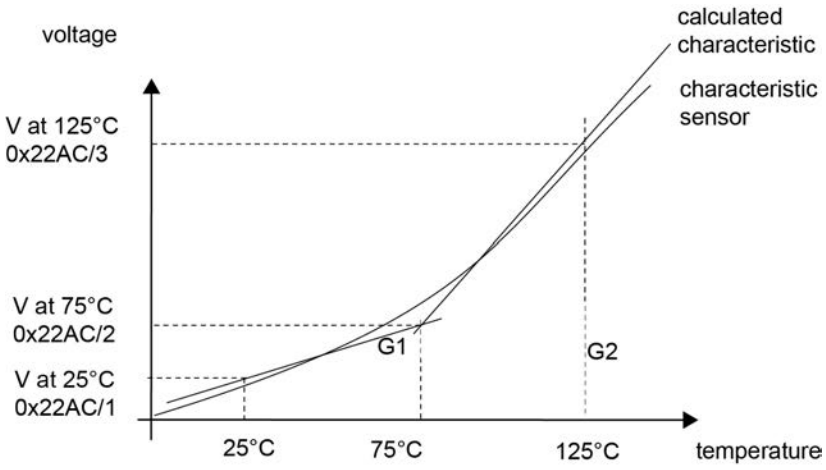
Input format

T T T	A	X
|	|	|
|	|	Sensor type:
|	|	0: without
|	|	1: THW [1] temperature sensor (bimetal switch)
|	|	2: iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / No sensor (monitoring inactive)
|	|	3: PTC [1]
|	|	4: KTY 83 [2]
|	|	5: KTY 84 with 825 ohm series resistor [2]
|	|	6: KTY 84 [2]
|	|	7: iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / PT1000 [2]
|	|	8: Reserved
|	|	9: User-defined [2]
|	Number of sensors 0..9	
Switch-off temperature 0..654 °C		

1) Shutdown at approximately 140 °C (value dependent on PTC / THW type)
NTC type is not supported
2) Shutdown at a maximum of 140 °C or at the specified shutdown temperature (TTT)

The temperature is determined using a characteristic curve. The characteristic curve is formed by 3 support points through which two lines are placed. The following values are stored in the firmware.

Type	Sensor	Voltage at 25 °C 0x22AC/1	Voltage at 75 °C 0x22AC/2	Voltage at 125 °C 0x22AC/3
4	KTY 83	1.250 V	1.781 V	2.421 V
5	KTY 84 with 825 ohm Series resistor	1.785 V	2.099 V	2.481 V
6	KTY 84	0.754 V	1.067 V	1.450 V
7	PT1000	1.371 V	1.613 V	1.849 V
9	User-defined	0.000 V	0.000 V	0.000 V



If the shutdown temperature is reached or exceeded, the warning 0xFF06 'Motor temperature warning' is generated and, after the expired 0x224F 'Warning time', the error message 0x4310 'Excess temperature drive' is generated.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2296 'Terminal inductance'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2296
Name	'Terminal inductance'
Object type	VAR
Data type	UNSIGNED16

The 'Terminal inductance' (L_{tt}) is only relevant for synchronous motors and is to be derived from the respective type plate or data sheet of the motor. If 0x2296 ≠ 0, 0x206D 'Motor peak current' works.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	mH
Default value	0

0x2297 'Time maximum current motor'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2297
Name	'Time maximum current motor'
Object type	VAR
Data type	UNSIGNED16

0x2297 determines how long a motor can be operated with the maximum current specified in 0x206D 'Motor peak current'. If 0x2297 and 0x206D do not equal 0, 0x2243 'Overload time motor' is ineffective. The motor overload time is calculated internally from 0x206D and 0x2297.

The I^2t-monitor motor must be activated in 0x2215 'Service bits' Bit 14.

For new applications, the I^2t monitoring motor must be parameterised with the objects 0x206D and 0x2297.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	s
Default value	0

0x2298 'Event filter'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2298
Name	'Event filter'
Object type	VAR
Data type	UNSIGNED16

Certain event classes can be filtered out with the 'Event filter'. Each event class is represented by a bit in 0x2298. Bits that are assigned the value 1 in 0x2298 are not registered in 0x2282 'Event trace'.
The following event classes can be filtered out:

Configuration 0x2298 'Event filter'

Bit no.	Condition	Meaning
0	0	'Error' event class is entered in 0x2282 , e.g. error messages
	1	'Error' event class is not entered in 0x2282 , e.g. error messages
1	0	'Warning' event class is entered in 0x2282 , e.g. warning messages
	1	'Warning' event class is not entered in 0x2282 , e.g. warning messages
2	0	Reserved
	1	Reserved
3	0	Reserved
	1	Reserved
4	0	'Clear error' event class is entered in 0x2282
	1	'Clear error' event class is not entered in 0x2282
5	0	'System' event class is entered in 0x2282 , e.g. power on, firmware update...
	1	'System' event class is not entered in 0x2282 , e.g. power on, firmware update...
6	0	'External access' event class is entered in 0x2282 , e.g. access to the parameter data or, for controllers, access to the file system via FTP
	1	'External access' event class is not entered in 0x2282 , e.g. access to the parameter data or, for controllers, access to the file system via FTP
7-15	0	Reserved
	1	Reserved

Siehe '0x2282 'Event trace'' auf Seite 207.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2299 'SWK monitoring'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2299
Name	'SWK monitoring'
Object type	ARRAY
Data type	UNSIGNED16

Configuration 0x2299 'SWK monitoring'

Sub-index	Content	Meaning
1	130 (Default)	Maximum slope [%] 1)
2	90 (Default)	Minimum slope [%] 1) 2)
3	50 (Default)	Maximum offset to the setpoint [incr.] (absolute value)
4	50 (Default)	Maximum deviation [incr.] (absolute value)
5	0	Determined slope [%] 1)
6	0	Determined offset to the setpoint [incr.]
7	0	Determined deviation [incr.]
8	10 (Default)	Factor for the deflection [value 10 corresponds to the factor 1 = 100%]
9-32	-	Reserved

1) 100% corresponds to an slope of 1
2) If the minimum incline is equal to value 0, the incline and the direction of rotation is not monitored any longer.

In the case of an error, the software commutation generates the diagnostic message 0x7122 'Motor error or commutation malfunction'.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x229A 'Threshold current adaptations'

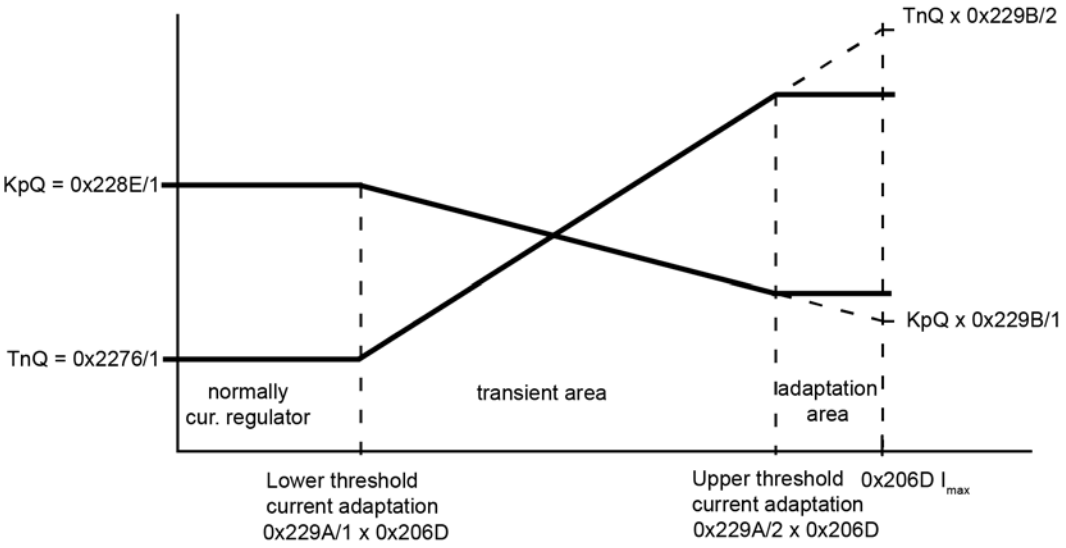
Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x229A
Name	'Threshold current adaptations'
Object type	ARRAY
Data type	UNSIGNED16

0x229A/1 'Lower threshold current adaption' and 0x229A/2 'Upper threshold current adaption' works in the current controller and is specified in the motor data sheet.

Adaption of the current control parameter



Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Lower threshold current adaption'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	%
Default value	100
Min. value	0
Max. value	100

Sub-index	2
Description	'Upper threshold current adaption'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	%
Default value	100
Min. value	0
Max. value	100

0x229B 'Gradients'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x229B
Name	'Gradients'
Object type	ARRAY
Data type	UNSIGNED16

0x229B/1 'Gradient path Q proportional gain' and 0x229B/2 'Gradient path Q integral-action time' works in the current controller and is specified in the motor data sheet.

Siehe '0x229A 'Threshold current adaptations'' auf Seite 220.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Gradient path Q proportional gain'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	%
Default value	100
Min. value	1
Max. value	100

Sub-index	2
Description	'Gradient path Q integral-action time'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	%
Default value	100
Min. value	100
Max. value	400

0x229C 'Limit position increment'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x229C
Name	'Limit position increment'
Object type	VAR
Data type	UNSIGNED32

0x229C sets the maximum relative position increase of the 32-bit position setpoint for the position controller per 0x2013. If the relative position increase is larger than the value in 0x229C, the diagnostic message 0xFF04 'Position growth too large' is generated.

The relative position increase is the sum from the setpoint sources 0x607A 'Target position' and the internal interpolator (IPO).

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	Increments
Default value	2147483647

0x229D 'Velocity threshold SL'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x229D
Name	'Velocity threshold SL'
Object type	VAR
Data type	UNSIGNED32

Reserved for AMK internal use!

0x229E 'Starting current SL'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x229E
Name	'Starting current SL'
Object type	VAR
Data type	UNSIGNED32

Reserved for AMK internal use!

0x229F 'Resistance rotor'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x229F
Name	'Resistance rotor'
Object type	VAR
Data type	UNSIGNED16

Meaning for KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /

This object affects at the function 'sensorless speed control of an asynchronous motor'.

The characteristic value relates to the equivalent circuit diagram of the motor and can be calculated and automatically parameterised by the startup-software. Alternatively the characteristic value can be taken from the motor data sheet and can be parameterised manually.

Meaning for iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Reserved for AMK internal use!

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.01
Unit	Ohm
Default value	0
Min. value	0
Max. value	200.00

0x22A0 'Inductances'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22A0
Name	'Inductances'
Object type	ARRAY
Data type	UNSIGNED16

Meaning for KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /

This object affects at the function 'sensorless speed control of an asynchronous motor'.

The characteristic value relates to the equivalent circuit diagram of the motor and can be calculated and automatically parameterised by the startup-software. Alternatively the characteristic value can be taken from the motor data sheet and can be parameterised manually.

Meaning for iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Reserved for AMK internal use!

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-3
Scaling	1
Unit	-
Default value	3

Sub-index	1
Description	'Inductance stator'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	mH
Default value	0
Min. value	0
Max. value	2000.0

Sub-index	2
Description	'Inductance rotor'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	mH
Default value	0
Min. value	0
Max. value	2000.0

Sub-index	3
Description	'Main inductance'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	mH
Default value	0
Min. value	0
Max. value	2000.0

0x22A1 'Bit lists sensorless'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22A1
Name	'Bit lists sensorless'
Object type	ARRAY
Data type	UNSIGNED16

Meaning for KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /

This object affects at the function 'sensorless speed control of an asynchronous motor'.

Configuration 0x22A1/1 'Bit list sensorless'

Bit no.	Condition	Meaning
0 (LSB)	0	The sensorless operation mode starts at standstill of the motor.
	1	The sensorless operation mode starts at standstill or during the motor is turning (detected actual speed value)

Bit no.	Condition	Meaning
1-15	0	Reserved
	1	Reserved

Meaning for iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Reserved for AMK internal use!

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Bit list sensorless'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x22A3 'Velocity acquisition'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22A3
Name	'Velocity acquisition'
Object type	ARRAY
Data type	UNSIGNED16

Meaning for KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /

This object affects at the function 'sensorless speed control of an asynchronous motor'.

The controller for the speed measurement is adjusted by the AMK PC software 'AIPEX PRO Startup'.

Meaning for iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Reserved for AMK internal use!

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Velocity acquisition propotional gain'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	-
Default value	0
Min. value	0
Max. value	16777215

Sub-index	2
Description	'Velocity acquisition integral-action time'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	0.01
Unit	ms
Default value	0
Min. value	0
Max. value	16777215

0x22A5 'Nominal current'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22A5
Name	'Nominal current'
Object type	VAR
Data type	UNSIGNED16

The default value 0 means that internally the 'Nominal current' is set to equal to 0x2070 'Inverter nominal current'.
The objects 0x22A5 to 0x22A8 are the database of the i^2t-monitoring for external components, e.g. choke ALN45-SI and ALN60-SI or motor cable.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	A
Default value	0

0x22A6 'Peak current'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22A6
Name	'Peak current'
Object type	VAR
Data type	UNSIGNED16

The default value 0 means that internally the 'Peak current' is set to equal to 0x206E 'Inverter peak current'.
The objects 0x22A5 to 0x22A8 form the database of the i^2t-monitoring for external components, e.g. choke ALN45-SI and ALN60-SI or motor cable.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	A
Default value	0

0x22A7 'Peak current time'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22A7
Name	'Peak current time'
Object type	VAR
Data type	UNSIGNED16

The default value 0 means that internally the 'Peak current time' is set to equal to 10s.
The objects 0x22A5 to 0x22A8 form the database of the i^2t-monitoring for external components, e.g. choke ALN45-SI and ALN60-SI or motor cable.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	s
Default value	0

0x22A8 'Treshold external component'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22A8
Name	'Treshold external component'
Object type	VAR
Data type	UNSIGNED16

The default value means that internally the 'Treshold external component' is set to 50 %.
The objects 0x22A5 to 0x22A8 form the database of the i^2t-monitoring for external components, e.g. motor cable.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	%
Default value	500

0x22A9 'Display external component'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22A9
Name	'Display external component'
Object type	VAR
Data type	UNSIGNED16

0x22A9 'Display external component' indicates the current overload of the external component according to the I^2t-monitoring.

0x22A9 = 0 : Nominal operation or below nominal operation

0x22A9 > 0 : Overload operation, shutdown at 100% with the diagnostic message 1112 info 0: 'Overload error external component'.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	0.1
Unit	%
Default value	0

0x22AA 'Actual power value bipolar'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22AA
Name	'Actual power value bipolar'
Object type	VAR
Data type	INTEGER32

0x22AA contains the signed actual power value
Motor-driven energy flow: positive sign
Generator-driven energy flow: negative sign

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	W
Default value	0

0x22AB 'Bit mask port 3'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) /

Object description

Index	0x22AB
Name	'Bit mask port 3'
Object type	VAR
Data type	UNSIGNED16

The 'Bit mask port 3' masks bits of the binary output port 3. The masked bits are set depending on 0x226B 'Bit mask port 3'.

Example:
0x22AB = 0x5 --> 0101 binary --> Output BA1 and BA3 are set.

Prerequisite:
0x2237 'Output port 3' = 0
0x2238/1 'Output port 3 bit 0' = 0 (BA1)
0x2238/2 'Output port 3 bit 1' = 0 (BA2)
0x2238/3 'Output port 3 bit 2' = 0 (BA3)

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x22AC 'Voltages at x degree'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22AC
Name	'Voltages at x degree'
Object type	ARRAY
Data type	UNSIGNED16

0x22AC/1, 0x22AC/2 and 0x22AC/3 are 3 support points that form the temperature characteristic curve of the motor temperature sensor.

0x22AC/1 voltage at 25 °C = 1.25 mA * R(25 °C)
R(25 °C): Resistance of the temperature sensor at 25 °C

0x22AC/2 voltage at 75 °C = 1.25 mA * R(75 °C)
R(75 °C): Resistance of the temperature sensor at 75 °C

0x22AC/3 voltage at 125 °C = 1.25 mA * R(125 °C)
R(125 °C): Resistance of the temperature sensor at 125 °C

Siehe '0x2295 'Temperature sensor motor'' auf Seite 216.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-3
Scaling	1
Unit	-
Default value	3

Sub-index	1
Description	'Voltage at 25 degree'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	0.001
Unit	V
Default value	0
Min. value	0
Max. value	3.500

Sub-index	2
Description	'Voltage at 75 degree'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	0.001
Unit	V
Default value	0
Min. value	0
Max. value	3.500

Sub-index	3
Description	'Voltage at 125 degree'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED16
Scaling	0.001
Unit	V
Default value	0
Min. value	0
Max. value	3.500

0x22AE 'Dead time compensation measuring 2'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) /

Object description

Index	0x22AE
Name	'Dead time compensation measuring 2'
Object type	VAR
Data type	UNSIGNED16

Dead times can be compensated for with this object due to, for example, sensors and input circuits in connection with the touch probe function at the binary input BE2. The measured value is corrected by the configured dead time.

This object is used by the following function:
'Touch probe'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.001
Unit	ms
Default value	0
Min. value	0
Max. value	32767

0x22AF 'Voltage path'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22AF
Name	'Voltage path'
Object type	ARRAY
Data type	INTEGER16

0x22AF/1 indicates the current controller output voltage (effective value) in the Q-path.
0x22AF/2 indicates the current controller output voltage (effective value) in the D-path.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	yes
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Voltage path Q'
Access	read
PDO Mapping	yes
Range of values	INTEGER16
Scaling	0.1
Unit	V
Default value	0

Sub-index	2
Description	'Voltage path D'
Access	read
PDO Mapping	yes
Range of values	INTEGER16
Scaling	0.1
Unit	V
Default value	0

0x22B0 'Temperature IGBT'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22B0
Name	'Temperature IGBT'
Object type	VAR
Data type	INTEGER16

0x22B0 contains the IGBT temperature calculated from the temperature model.

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER16
Scaling	0.1
Unit	°C
Default value	0

0x22B1 'AMK test'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22B1
Name	'AMK test'
Object type	ARRAY
Data type	INTEGER32

Reserved for AMK internal use!

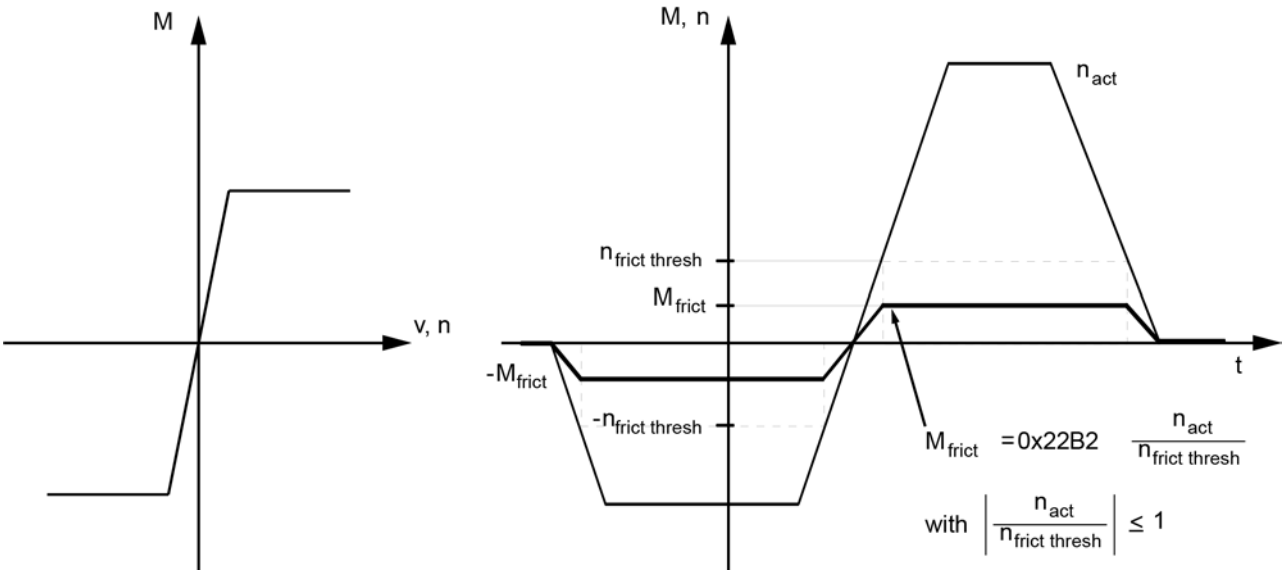
0x22B2 'Friction torque'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22B2
Name	'Friction torque'
Object type	VAR
Data type	UNSIGNED16

The object 'Friction torque' represents a constant static friction. The torque is fed forward depending on the rotating direction.
The friction torque is fully effective at $n_{act} \geq n_{frict\ thresh}$.
Within the range $n_{act} < n_{frict\ thresh}$, the friction torque is linear.



This object is used by the following function:
'Load model'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.01
Unit	Nm
Default value	0

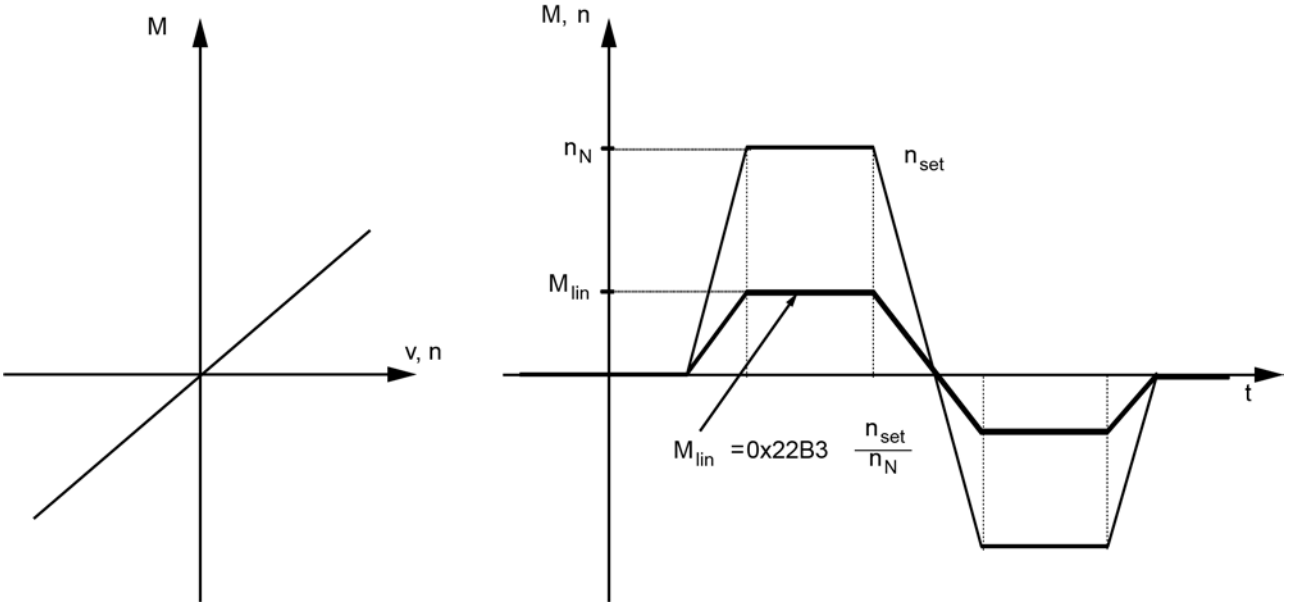
0x22B3 'Friction torque linear'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22B3
Name	'Friction torque linear'
Object type	VAR
Data type	UNSIGNED16

The object 'Friction torque linear' represents a fluid friction. Fluid friction is the name of the friction which occurs with perfectly lubricated sliding surfaces. The friction is proportional to the speed with which the surfaces slide on each other.



This object is used by the following function:
'Load model'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.01
Unit	Nm
Default value	0

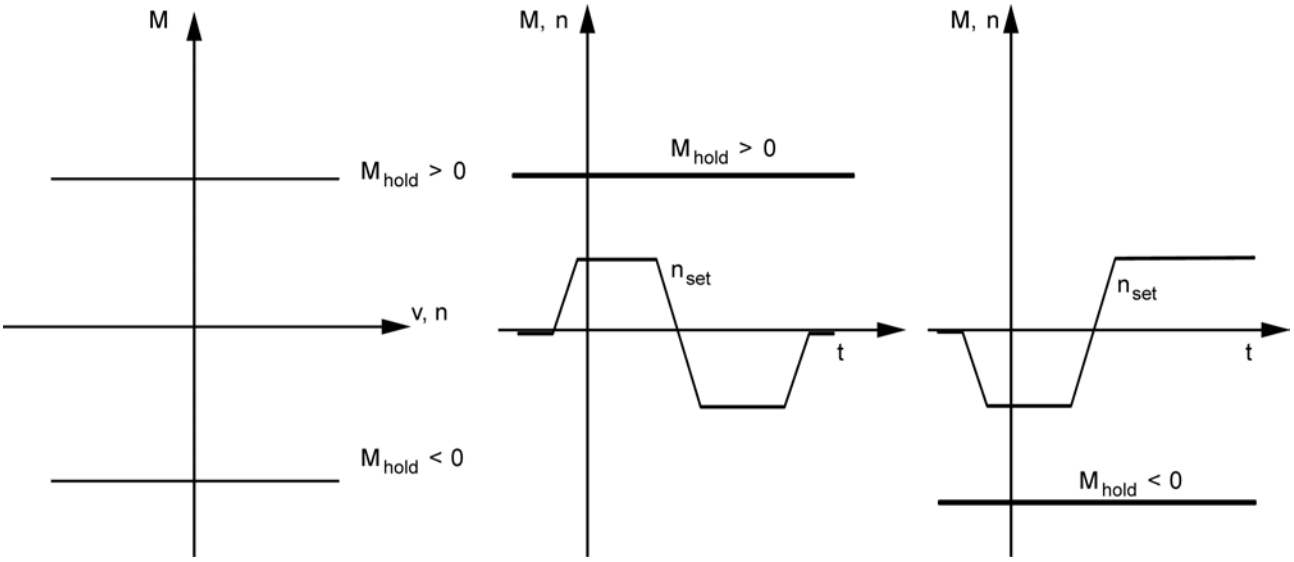
0x22B4 'Holding torque'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22B4
Name	'Holding torque'
Object type	VAR
Data type	INTEGER16

The object 'Holding torque' represents a holding torque, a hanging axle for example. The feed forward of the holding torque does not depend on the speed.



This object is used by the following function:
'Load model'

Entry description

Access	read/write
PDO mapping	no
Range of values	INTEGER16
Scaling	0.1
Unit	Nm
Default value	0

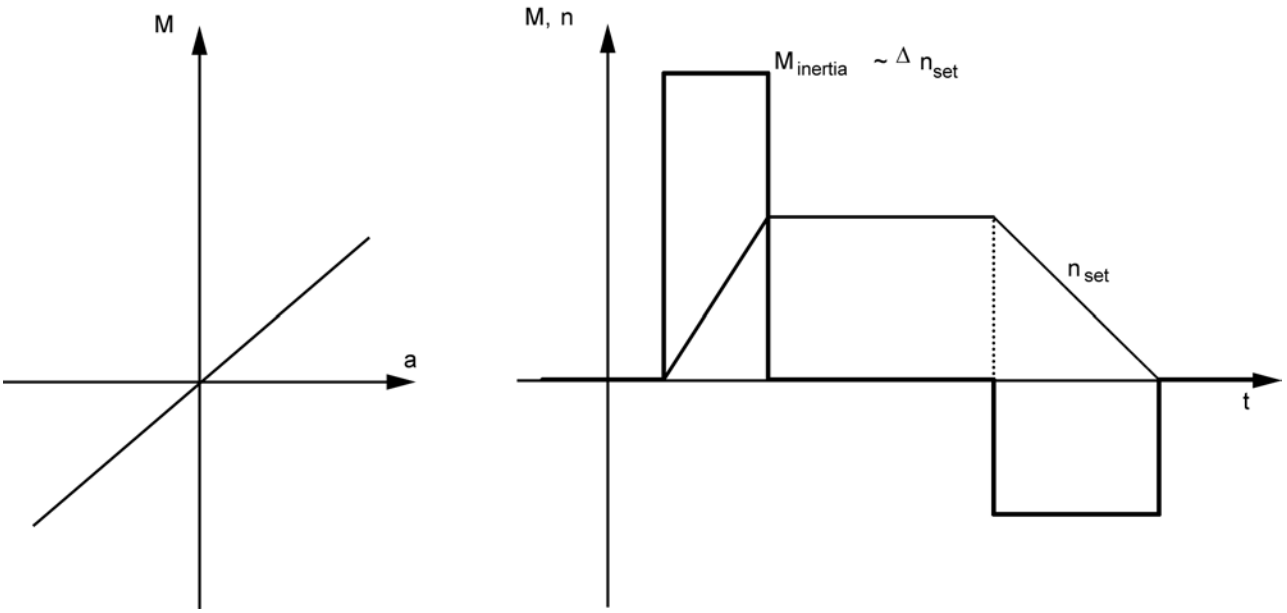
0x22B5 'Inertia'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22B5
Name	'Inertia'
Object type	VAR
Data type	UNSIGNED32

The object 'Inertia' represents the motor inertia additional a moment of inertia mounted on the motor shaft.
Inertia takes effect during acceleration and deceleration.



This object is used by the following function:
'Load model'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	0.001
Unit	kg cm^2
Default value	0

0x22B6 'Mode load model'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22B6
Name	'Mode load model'
Object type	VAR
Data type	UNSIGNED32

Configuration 0x22B6 'Mode load model'

Bit no.	Condition	Meaning
0 [2)]	0	The acceleration feed-forward control values are calculated internally in the device
	1	The acceleration feed-forward control values are calculated externally by a controller and are written in 0x60B2 'Torque offset' [1)]
1 [2)]	0	The speed feed-forward control values are calculated internally in the device
	1	The speed feed-forward control values are calculated externally by a controller and are written in 0x60B1 'Velocity offset'
2 [2)]	0	The acceleration feed-forward control values are calculated internally in the device
	1	The acceleration feed-forward control values are calculated externally by a controller and are written in 0x20C2
3 [2)]	0	Source for speed and acceleration feed-forward values: according parameter setting in bit 0-2
	1	Source for speed and acceleration feed-forward values: calculation via differentiation of the position setpoint values (0x607A 'Target position')

Bit no.	Condition	Meaning
4 [3]	0	Source for speed feed-forward values: 0x60B1 'Velocity offset'
	1	Source for speed feed-forward values: Differentiation of the position setpoints The following error compensation 'SAK' must be switched off (0x2221/1 Bit 9 = 0), otherwise the feed-forward acts twice!
5 [4]	0	0x22DA 'Damping factor position' inactive
	1	0x22DA 'Damping factor position' active
6-12	0	Reserved
	1	Reserved
13 [2]	0	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Inertia in according to 0x22B5 'Inertia'
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Inertia in according to 0x2357 'Inertia motor' and 0x2358 'Inertia load'
14 [2]	0	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Friction torque linear in according to 0x22B3 'Friction torque linear'
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Friction torque linear in according to 0x2355 'Friction torque linear motor' and 0x2356 'Friction torque linear load'
15 [2]	0	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Friction torque in according to 0x22B2 'Friction torque'
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Friction torque in according to 0x2353 'Friction torque motor' and 0x2354 'Friction torque load'
16 [2]	0	Load model active
	1	Load model inactive
17	0	Reserved
	1	Reserved
18	0	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Automatic holding torque inactive KW-R24 / Reserved
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Automatic holding torque active If the function 'Automatic holding torque' is active, the static holding torque from the function 'Load model' Objekt 0x22B4 'Holding torque'must be = 0, otherwise the feed-forward acts twice from the second setting of controller enable. KW-R24 / Reserved
19	0	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Cogging feed-forward control via torque setpoint value path (available in position and velocity control) KW-R24 / Reserved
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Cogging feed-forward control via sum of additive moments (available in position, velocity and torque control) KW-R24 / Reserved
20-27	0	Reserved
	1	Reserved
28	0	Reserved
	1	Reserved
29-31	0	Reserved
	1	Reserved

1) Not for new applications. Use bit 2 = 1.
2) This object is used by the following function:
   'Load model'
3) This object is used by the following function:
   'D-term position controller, damping'
4) This object is used by the following function:
   'Speed feed-forward control'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0000 0000 0000 0000 0000 0000 0000 0000

0x22B7 'List load model'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22B7
Name	'List load model'
Object type	VAR
Data type	DOMAIN

Reserved for AMK internal use!

0x22B8 'Angle feed forward SL'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22B8
Name	'Angle feed forward SL'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x22B9 'Sliding factor SL'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22B9
Name	'Sliding factor SL'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x22BA 'List bus'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x22BA
Name	'List bus'
Object type	VAR
Data type	DOMAIN

Reserved for AMK internal use!

0x22BB 'Feed forward control voltages'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22BB
Name	'Feed forward control voltages'
Object type	ARRAY
Data type	INTEGER16

0x22BB/1 shows the voltage feedforward value (Q-path) in the current controller.
0x22BB/2 shows the voltage feedforward value (D-path) in the current controller.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	yes
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Feed forward control voltage path Q'
Access	read
PDO Mapping	yes
Range of values	INTEGER16
Scaling	0.1
Unit	V
Default value	0

Sub-index	2
Description	'Feed forward control voltage path D'
Access	read
PDO Mapping	yes
Range of values	INTEGER16
Scaling	0.1
Unit	V
Default value	0

0x22BC 'Phase resistance'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22BC
Name	'Phase resistance'
Object type	VAR
Data type	UNSIGNED16

0x22BC is the strand resistance of the motor coil and works in the current controller. If no strand resistance is specified in the motor data sheet, it can be calculated from the terminal resistance R_{tt} (0x2293):

Motor coil is interconnected in the star: $R_s = 0.5 \times R_{tt}$
Motor coil is interconnected in the triangle: $R_s = 1.5 \times R_{tt}$

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.001
Unit	Ohm
Default value	0

0x22BD 'Voltage constant Ke'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22BD
Name	'Voltage constant Ke'
Object type	VAR
Data type	UNSIGNED16

The 'Voltage constant Ke' is to be taken from the respective type plate or data sheet of the motor.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	V/(1000 1/min)
Default value	0

0x22BE 'Increase motor voltage'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22BE
Name	'Increase motor voltage'
Object type	VAR
Data type	UNSIGNED16

With 0x22BE, the motor voltage at the PWM output can be limited or increased from 100% - 150% so that the superimposed control has enough control reserve to ensure a stable control. If too large a value is entered in 0x22BE, the control behaviour will become unstable and the drive switches off with an overcurrent error.

0x22BE	Meaning
100 %	The output voltage is below the DC bus voltage so as to provide enough control reserve.
115.5%	The output voltage uses the entire voltage reserve for sufficiently robust control behaviour. Peak value voltage between the phases ($\hat{U}_L$) = DC bus voltage (U_Z)
115.5 - 150%	The PWM is overridden, the output voltage is distorted, a stable control behaviour cannot be guaranteed and must be assessed on the application side. Overcurrent shutdowns may occur.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	%
Default value	115.5
Min. value	100.0
Max. value	150.0

0x22BF 'Time motor brake on'

Supported hardware: iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22BF
Name	'Time motor brake on'
Object type	VAR
Data type	UNSIGNED16

The 'Time motor brake on' determines how long the motor brake is provided with a constant 24 V DC for opening. After the 'Time motor brake on' has expired, the opened brake is supplied with a pulsed voltage.

This object is used by the following function:
'Controlling motor holding brake'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	ms
Default value	0
Min. value	0
Max. value	5000

0x22C0 'Pulse duty factor motor brake'

Supported hardware: iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22C0
Name	'Pulse duty factor motor brake'
Object type	VAR
Data type	UNSIGNED16

The 'Pulse duty factor motor brake' determines the clock ratio T_{On}/T with which the opened brake is supplied (T = 2 ms, not changeable)

This object is used by the following function:
'Controlling motor holding brake'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	%
Default value	0
Min. value	0
Max. value	100

0x22C1 'List IR filter'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22C1
Name	'List IR filter'
Object type	VAR
Data type	DOMAIN

Reserved for AMK internal use!

0x22C2 'V/F integrator stop'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22C2
Name	'V/F integrator stop'
Object type	VAR
Data type	UNSIGNED16

The 'V/F integrator stop' works with the function U/f operation (0x2253=0x20) and specifies a variable percentage value of the maximum current converter. If the adjustable percentage value of the maximum current converter is achieved, the speed curve is limited internally in the device, which will not be shut down with an error message (0x2110 'Short circuit/earth leakage' or 0xFF03 'IGBT over current'). The acceleration and deceleration times are extended by the internal limiting.

0x22C2 = 0 no internal limiting

0x22C2 = 100 Limiting from 100% 0x206E 'Inverter peak current'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	%
Default value	0
Min. value	0
Max. value	100

0x22C3'Voltage reserve'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22C3
Name	'Voltage reserve'
Object type	VAR
Data type	UNSIGNED16

0x22C3 works for asynchronous motors with voltage regulation (0x2253 motor model with nibble 1 = 0x6) and for field weakening synchronous motors (nibble 1 = 0x3). The voltage reserve determines from which motor voltage the field weakening begins. The field weakening begins if the motor voltage is greater than the maximum inverter output voltage minus the voltage reserve.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	V
Default value	30.0
Min. value	0
Max. value	100.0

0x22C4 'Osci'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22C4
Name	'Osci'
Object type	ARRAY
Data type	INTEGER32

Reserved for AMK internal use!

0x22C5 'OSC container length'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22C5
Name	'OSC container length'
Object type	VAR
Data type	UNSIGNED32

The 'OSC container length' defines the available memory for the oscilloscope function in AIPEX PRO.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	Byte
Default value	4096
Min. value	4096
Max. value	32600

0x22C6 'Time stop drive cmd'

Supported hardware:	KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22C6
Name	'Time stop drive cmd'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x22C7 'Torque feedback filter'

Supported hardware:	KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22C7
Name	'Torque feedback filter'
Object type	VAR
Data type	UNSIGNED16

The 'Torque feedback filter' filters the value that is issued in 0x6077 'Torque actual value'.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	ms
Default value	0
Min. value	0
Max. value	32767

0x22C8 'Velocity control'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22C8
Name	'Velocity control'
Object type	ARRAY
Data type	INTEGER32

Siehe 'Speed control' auf Seite 23.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	yes
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Velocity setpoint in control'
Access	read
PDO Mapping	yes
Range of values	INTEGER32
Scaling	0.0001
Unit	1/min
Default value	0
Min. value	-10.0000
Max. value	10.0000

Sub-index	2
Description	'Velocity actual value in control'
Access	read
PDO Mapping	yes
Range of values	INTEGER32
Scaling	0.0001
Unit	1/min
Default value	0
Min. value	-10.0000
Max. value	10.0000

0x22C9 'Torque setpoint filter'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22C9
Name	'Torque setpoint filter'
Object type	ARRAY
Data type	INTEGER16

Siehe 'Speed control' auf Seite 23.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	yes
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Torque setpoint filter input'
Access	read
PDO Mapping	yes
Range of values	INTEGER16
Scaling	0.1
Unit	$\%M_N$
Default value	0
Min. value	-300.0
Max. value	300.0

Sub-index	2
Description	'Torque setpoint filter output'
Access	read
PDO Mapping	yes
Range of values	INTEGER16
Scaling	0.1
Unit	$\%M_N$
Default value	0
Min. value	-300.0
Max. value	300.0

0x22CA 'Motion tests'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22CA
Name	'Motion tests'
Object type	ARRAY
Data type	INTEGER16

Reserved for AMK internal use!

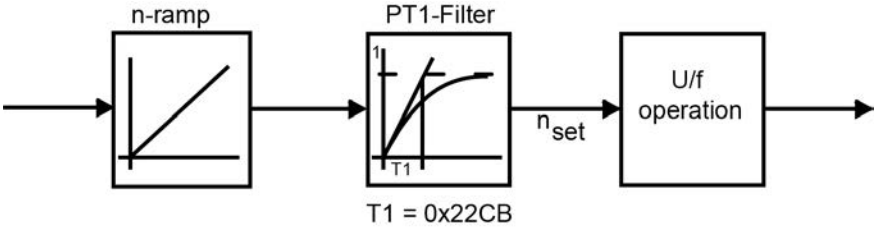
0x22CB 'V/F input filter'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22CB
Name	'V/F input filter'
Object type	VAR
Data type	UNSIGNED16

The 'V/F input filter' effects in the operation mode U/f control and configures the filter time of a PT1-Filter.



Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	ms
Default value	0
Min. value	0
Max. value	2000.0

0x22CC 'Commutation valid'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22CC
Name	'Commutation valid'
Object type	VAR
Data type	UNSIGNED16

The real-time bit 'Commutation valid' is set after the software commutation is executed successfully and a valid commutation angle is determined. The software commutation is not executed after RF is set, if the real-time bit 'Commutation valid' is still set. The real-time bit is reset at encoder error or power off.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x22CD 'Communication monitor'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22CD
Name	'Communication monitor'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x22CE 'Timeout communication monitor'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22CE
Name	'Timeout communication monitor'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x22CF 'OSC channel 1'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22CF
Name	'OSC channel 1'
Object type	VAR
Data type	DOMAIN

Reserved for AMK internal use!

0x22D0 'OSC channel 2 '

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22D0
Name	'OSC channel 2 '
Object type	VAR
Data type	DOMAIN

Reserved for AMK internal use!

0x22D1 'OSC channel 3'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22D1
Name	'OSC channel 3'
Object type	VAR
Data type	DOMAIN

Reserved for AMK internal use!

0x22D2 'OSC channel 4'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22D2
Name	'OSC channel 4'
Object type	VAR
Data type	DOMAIN

Reserved for AMK internal use!

0x22D3 'Saturation current'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22D3
Name	'Saturation current'
Object type	VAR
Data type	UNSIGNED16

This object recognises the saturation effects inside of a motor. The current is shown at which the line inductance L_s is decreased to 30 % of the initial value. If 0x22D3 = 0 L_s is accepted as a constant.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	A
Default value	0
Min. value	0
Max. value	3000.0

0x22D4 'Brake torque'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22D4
Name	'Brake torque'
Object type	VAR
Data type	UNSIGNED16

If the sensorless calculation of the rotor position is active (0x2215 Bit 29) and the encoder becomes failure, the motor will be braked down in torque operation mode with the torque setpoint of 0x22D4. If 0x22D4 = 0, the motor will be braked down in speed operation mode according to 0x221E.

To make sure that braking in speed control is working well, the speed controller gain, must not be set too strong. If the application requires a strong speed controller, the braking in torque control is preferred

Siehe '0x2215 'Service bits'' auf Seite 130.
Siehe '0x221E 'Deceleration ramp RF inactive'' auf Seite 138.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	$\%M_N$
Default value	0
Min. value	0
Max. value	3000.0

0x22D5 'Max. angle difference encoder-SL'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22D5
Name	'Max. angle difference encoder-SL'
Object type	VAR
Data type	UNSIGNED16

0x22D5 defines the maximum allowed deviation between the electrical rotor angle of the encoder and the sensorless calculated rotor angle.

0x22D5 = 0:	The additional encoder monitoring is not active.
0x22D5 > 0:	Is the actual deviation between the electrical rotor angle of the encoder and the sensorless calculated rotor angle higher than the value in 0x22D5, the error message 0xFF11 'Error angle observer specific', Info1 = 1 is generated and the motor will be braked down according 0x221E. Thereby the sensorless calculated rotor angle is used for the brake down control.

If the sensorless calculated rotor position is activated in 0x2215 'Service bits' Bit 29, it can be used as additional monitoring of the encoder to detect encoder errors earlier.

Siehe '0x2215 'Service bits'' auf Seite 130.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	°
Default value	0
Min. value	0
Max. value	180.0

0x22D6 'IPO mode'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22D6
Name	'IPO mode'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x22D7 'Active power (el.)'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22D7
Name	'Active power (el.)'
Object type	VAR
Data type	INTEGER16

0x22D7 shows the electrical active power:
positive value = motor operation mode
negative value = generator operation mode

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER16
Scaling	1
Unit	W
Default value	0

0x22D8 'Reactive power (el.)'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22D8
Name	'Reactive power (el.)'
Object type	VAR
Data type	INTEGER32

0x22D8 shows the electrical reactive power (inductive or capacitive):
positive value = inductive consumer
negative value = capacitive consumer

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	Var
Default value	0

0x22D9 'Service list'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22D9
Name	'Service list'
Object type	VAR
Data type	DOMAIN

Reserved for AMK internal use!

0x22DA 'Damping factor position'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22DA
Name	'Damping factor position'
Object type	VAR
Data type	INTEGER32

On applications with inert masses, low-frequency control oscillations (following errors, actual speed value and torque) can occur. On possibility for damping these oscillations is a D term in the position controller

The D term is a component of the speed feed-forward controls and is not formed in the position controller. For successful damping, the oscillation of following errors and actual speed value must be in phase or offset by 180 °.

This object is used by the following function:

'D-term position controller, damping'

Entry description

Access	read/write
PDO mapping	no
Range of values	INTEGER32
Scaling	0.1
Unit	%
Default value	0
Min. value	-500.0
Max. value	500.0

0x22DB 'List glitch filter time'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) /

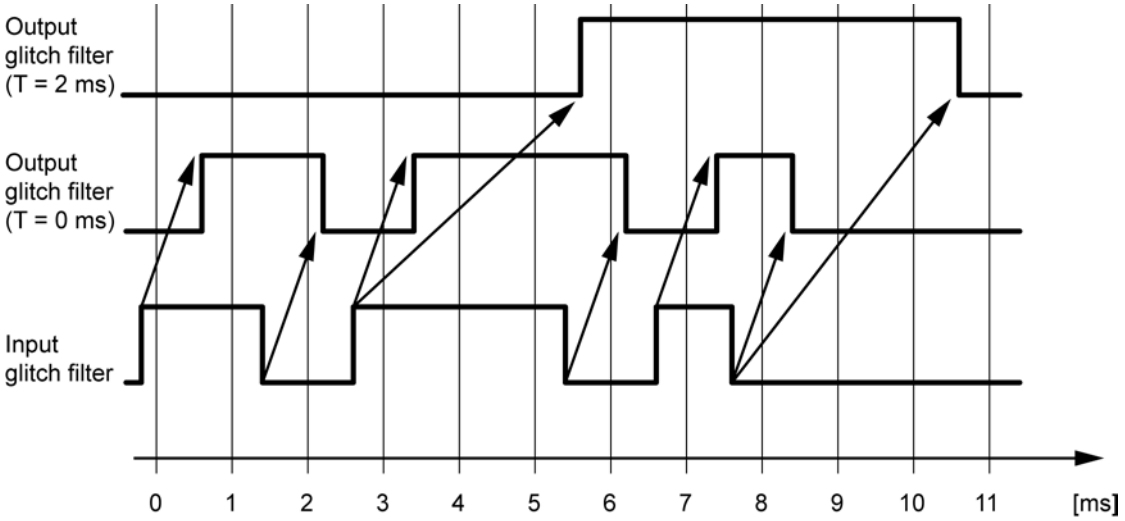
Object description

Index	0x22DB
Name	'List glitch filter time'
Object type	ARRAY
Data type	UNSIGNED16

The glitch filter filters out misstate binary signals. For each input a time can be parameterized, how long the signal state must be constant before the signal will pass the filter and can be evaluated.

Example:

If the glitch filter time is parameterized to value 2, the signal state of this input must be constant at least 2 ms, before the signal will pass the filter and can be evaluated. If the input signal changes the state e.g. for 1 ms this signal change will not pass the glitch filter.



The glitch filter effects next behind the binary input for both directions. Positive and negative edge is not differentiated. For inputs parameterized as measuring inputs (probe function) the glitch filters have no function, no diagnosis message is generated.

Configuration 0x22DB 'List glitch filter time'

List element	Content	Meaning
1	Adjustable glitch filter time for each binary input: range of values: 1-100 [ms]	BI 1 Port 3, binary input device 1)
2		BI 1 Port 3, binary input device 1)
3		BI 1 Port 3, binary input device 1)
4		BI 1 Port 3, binary input device 1)
5		BI 1 Port 3, binary input device 1)
6		Reserved
7		Reserved
8		Reserved
9		I1 port 1, binary input option 1)
10		I2 port 1, binary input option 1)
11		I3 port 1, binary input option 1)
12		I4 port 1, binary input option 1)
13		I5 port 1, binary input option 1)
14		I6 port 1, binary input option 1)
15		I7 port 1, binary input option 1)
16		I8 port 1, binary input option 1)
17		I9 port 1, binary input option 1)
18		I10 port 1, binary input option 1)
19		I11 port 1, binary input option 1)
20		I12 port 1, binary input option 1)
21		Reserved
22		Reserved
...		Reserved
n		Reserved

1) The availability depends on the device type

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x22DC 'Process data'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22DC
Name	'Process data'
Object type	ARRAY
Data type	INTEGER32

Reserved for AMK internal use!

0x22DD 'Performance index sensorles'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22DD
Name	'Performance index sensorles'
Object type	VAR
Data type	INTEGER32

Reserved for AMK internal use!

0x22DE 'Actual current'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22DE
Name	'Actual current'
Object type	ARRAY
Data type	INTEGER32

0x22DE/1 displays the actual current value Ia. The current Ia is the a-component in the stator oriented coordinate system.
0x22DE/2 displays the actual current value Ib. The current Ib is the b-component in the stator oriented coordinate system.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	yes
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Actual current Ia'
Access	read
PDO Mapping	yes
Range of values	INTEGER32
Scaling	0.001
Unit	A
Default value	0

Sub-index	2
Description	'Actual current Ib'
Access	read
PDO Mapping	yes
Range of values	INTEGER32
Scaling	0.001
Unit	A
Default value	0

0x22DF 'Voltage'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22DF
Name	'Voltage'
Object type	ARRAY
Data type	INTEGER16

0x22DF/1 displays the voltage Ua. The voltage Ua is the a-component in the stator oriented coordinate system.
0x22DF/2 displays the voltage Ub. The voltage Ub is the b-component in the stator oriented coordinate system.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	yes
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Voltage Ua'
Access	read
PDO Mapping	yes
Range of values	INTEGER16
Scaling	0.1
Unit	V
Default value	0

Sub-index	2
Description	'Voltage Ub'
Access	read
PDO Mapping	yes
Range of values	INTEGER16
Scaling	0.1
Unit	V
Default value	0

0x22E0 'Magnetising current feedback'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22E0
Name	'Magnetising current feedback'
Object type	VAR
Data type	INTEGER32

0x22E0 displays the actual current value of the magnetizing current.

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER32
Scaling	0.001
Unit	A
Default value	0

0x22E1 'Torque current feedback'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22E1
Name	'Torque current feedback'
Object type	VAR
Data type	INTEGER32

0x22E1 displays the actual current value of the torque current.

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER32
Scaling	0.001
Unit	A
Default value	0

0x22E2 'Actual current value phase'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22E2
Name	'Actual current value phase'
Object type	ARRAY
Data type	INTEGER32

0x22E2 displays the actual current value of phases U / V / W.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	yes
Range of values	1-3
Scaling	1
Unit	-
Default value	3

Sub-index	1
Description	'Actual current value phase U'
Access	read
PDO Mapping	yes
Range of values	INTEGER32
Scaling	0.001
Unit	A
Default value	0

Sub-index	2
Description	'Actual current value phase V'
Access	read
PDO Mapping	yes
Range of values	INTEGER32
Scaling	0.001
Unit	A
Default value	0

Sub-index	3
Description	'Actual current value phase W'
Access	read
PDO Mapping	yes
Range of values	INTEGER32
Scaling	0.001
Unit	A
Default value	0

0x22E3 'Park position'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22E3
Name	'Park position'
Object type	VAR
Data type	INTEGER32

Park position where the drive will move to in case of bus failure, if 0x226B = 0x3 is parameterized.

This object is used by the following function:
'Drive moves into parking position'

Entry description

Access	read/write
PDO mapping	no
Range of values	INTEGER32
Scaling	1
Unit	Increments
Default value	0

0x22E4 'Park speed'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22E4
Name	'Park speed'
Object type	VAR
Data type	INTEGER32

Velocity to drive into the park position in case of bus failure and 0x226B = 0x3 is parameterized.

This object is used by the following function:
'Drive moves into parking position'

Entry description

Access	read/write
PDO mapping	no
Range of values	INTEGER32
Scaling	0.0001
Unit	1/min
Default value	0

0x22E5 'Display load model'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22E5
Name	'Display load model'
Object type	RECORD
Data type	UNSIGNED16

Reserved for AMK internal use!

0x22EB 'Source UE'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x22EB
Name	'Source UE'
Object type	VAR
Data type	UNSIGNED16

For devices with an external main contactor, the source of the 'DC bus on' signal (UE) must be set via 0x22EB. The following sources are possible:

Code	Designation	Description
0	UE via binary input	UE is configured for a binary input on the basic device. If this input is set, the UE control signal in the device is triggered and the DC bus is charged.
5	UE via fieldbus	UE is expected via fieldbus
8	UE automatically derived from SBM	The UE signal is automatically derived from the state of SBM.
25	UE via fieldbus AND-linked with the binary input UE	like code 5 but AND-linked with the binary input UE

Changes in 0x22EB 'Source UE' are first effective with the next system start-up (mains OFF / ON). The command 0x2267 'System booting' is not sufficient.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x22EC 'Slot assignment'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /

Object description

Index	0x22EC
Name	'Slot assignment'
Object type	VAR
Data type	UNSIGNED32

Reserved for AMK internal use!

0x22ED 'List parameter set'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22ED
Name	'List parameter set'
Object type	VAR
Data type	DOMAIN

Reserved for AMK internal use!

0x22EE 'Drive DB file'

Supported hardware:	KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22EE
Name	'Drive DB file'
Object type	VAR
Data type	DOMAIN

Reserved for AMK internal use!

0x22EF 'System reset'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22EF
Name	'System reset'
Object type	VAR
Data type	UNSIGNED16

A system reset is a device restart as compared to 24 VDC OFF / ON, except that the system reset, the 24 VDC are still active (software reset).

The command is started if the value 0x1 is written in the object.

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x22F0 'Starting current'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22F0
Name	'Starting current'
Object type	VAR
Data type	UNSIGNED32

When starting a sensorless synchronous motor, the current is applied here. The current determines the available torque .

If 0x22F0 = 0, the nominal current of 0x6075 is used as the starting current.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	0.001
Unit	A
Default value	0
Min. value	0
Max. value	1000.000

0x22F1 'User list 3'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /

Object description

Index	0x22F1
Name	'User list 3'
Object type	VAR
Data type	DOMAIN

The 'User list 3' is a data set in the remanent memory area that is freely available to the user.

Configuration 0x22F1 'User list 3'

List element	Content	Meaning
1		
2		
3		
...		
n		

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x22F2 'Start marker'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 /

Object description

Index	0x22F2
Name	'Start marker'
Object type	VAR
Data type	INTEGER32

0x22F2 works with the pulse width measurement function and indicates the start position of the window in which a valid printing mark must be located. This object must be re-specified for each mark by a higher-ranking controller.

Entry description

Access	read/write
PDO mapping	no
Range of values	INTEGER32
Scaling	1
Unit	-
Default value	0

0x22F3 'Marker window'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 /

Object description

Index	0x22F3
Name	'Marker window'
Object type	VAR
Data type	INTEGER32

0x22F3 works with the pulse width measurement function and indicates the width of the window in which a valid printing mark must be located. The sign of the value determines the drive or mark search direction. This object must be re-specified for each mark by a higher-ranking controller.

Entry description

Access	read/write
PDO mapping	no
Range of values	INTEGER32
Scaling	1
Unit	Increments
Default value	0

0x22F4 'Dead time compensation'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 /

Object description

Index	0x22F4
Name	'Dead time compensation'
Object type	VAR
Data type	INTEGER16

Reserved for AMK internal use!

0x22F5 'Encoder ratio'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 /

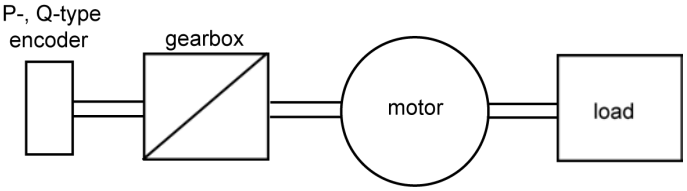
Object description

Index	0x22F5
Name	'Encoder ratio'
Object type	VAR
Data type	UNSIGNED16

Meaning for KW-R25 / KW-R26 / KW-R27 /

The 'Encoder ratio' works with P and Q-encoders where an encoder gear ratio must be taken into consideration (e.g. for encoder gears or encoder belts). The value in 0x22F5 influences the commutation, the position and speed factors.

Arrangement



The following ratios of 'motor revolutions' to 'encoder revolutions' are allowed:

Encoder ratios Motor revolutions: Encoder revolutions	Parameterisation
1:1	0101
2:1	0201
4:1	0401
8:1	0801
16:1	1601
32:1	3201
64:1	6401
1:2*)	0102
1:4*)	0104
1:8*)	0108
1:16*)	0116
1:32*)	0132
1:64*)	0164

*) Conversions are only possible for multi-turn absolute encoders (Q encoder)

Meaning for KW-R24-R /

Reserved for AMK internal use!

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	101
Min. value	101
Max. value	6401

0x22F6 'Motion data list'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x22F6
Name	'Motion data list'
Object type	VAR
Data type	DOMAIN

Reserved for AMK internal use!

0x2300 'Inverter on'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2300
Name	'Inverter on'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x2301 'Temperature inner room'

Supported hardware: ihXT /

Object description

Index	0x2301
Name	'Temperature inner room'
Object type	VAR
Data type	UNSIGNED16

0x2301 shows the inner room air temperature closed to the IGBT. Up from 83 °C the warning 0xFF05 'Device over temperature warning' (info 1 = 1, info 2 = info 3 = 0) and up from 87 °C the error message 0x4210 'Excess temperature device' (info 1 = 1, info 2 = info 3 = 0) is generated.

Entry description

Access	read
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0,1
Unit	°C
Default value	0
Min. value	-3276.8
Max. value	3276.8

0x2302 'Address input port 1'

Supported hardware: ihXT /

Object description

Index	0x2302
Name	'Address input port 1'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x2303 'Binary input Port 1 Bits'

Supported hardware: ihXT /

Object description

Index	0x2303
Name	'Binary input Port 1 Bits'
Object type	ARRAY
Data type	UNSIGNED32

Reserved for AMK internal use!

0x2304 'Binary input word 1'

Supported hardware: ihXT /

Object description

Index	0x2304
Name	'Binary input word 1'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x2305 'Binary output word 1'

Supported hardware: ihXT /

Object description

Index	0x2305
Name	'Binary output word 1'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x2310 'DC bus voltage'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2310
Name	'DC bus voltage'
Object type	VAR
Data type	UNSIGNED32

0x2310 displays the actual value of the DC bus voltage.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED32
Scaling	1
Unit	mV
Default value	0
Min. value	0
Max. value	4096
Note	[mv] internal calculation to [V], [UNSIGNED32] to [UNSIGNED16]

0x2311 'VBNX'

Supported hardware:	KE(N,S)-xEx /

Object description

Index	0x2311
Name	'VBNX'
Object type	VAR
Data type	UNSIGNED16

Extended mains phase failure signal VBNX to trigger an UPS. (extend the display of a mains failure)

The signal VBNX is generated from the internal BNX signal. Short mains voltage failure <100 ms are displayed. Even the mains voltage failure disappears the VBNX signal is set at least for 22 ms.

Entry description

Access	read
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2312 'Rated frequency'

Supported hardware:	KES-xEx

Object description

Index	0x2312
Name	'Rated frequency'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x2313 'Line output'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x2313
Name	'Line output'
Object type	VAR
Data type	INTEGER32

0x2313 'Line output' shows the mains active power. Positive values indicate the active power taken from the mains (motor operation). Negative values indicate the active power fed back into the mains (generator operation). Generator operation is only possible for devices with current regeneration.

Siehe '0x2314 'Time filter line" auf Seite 268.

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	W
Default value	0

0x2314 'Time filter line'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x2314
Name	'Time filter line'
Object type	VAR
Data type	UNSIGNED16

For a 'quiet' display of the active power (0x2314 'Time filter line'), a proportional part with a delay of the 1st order (PT1 part) can be configured through the input of a filter time. The value 0 is internally set to 10 ms.

Siehe '0x2313 'Line output" auf Seite 268.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	ms
Default value	10
Min. value	10
Max. value	65535

0x2316 'Nominal voltage effective'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x2316
Name	'Nominal voltage effective'
Object type	VAR
Data type	UNSIGNED16

0x2316 'Nominal voltage effective' displays the effective value of the mains voltage.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	0.1
Unit	V
Default value	0

0x2317 'Line current effective'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x2317
Name	'Line current effective'
Object type	VAR
Data type	UNSIGNED16

0x2317 'Line current effective' zeigt den Effektivwert des Netzstroms an.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	0.1
Unit	A
Default value	0

0x2318 'Setpoint DC-bus'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x2318
Name	'Setpoint DC-bus'
Object type	VAR
Data type	UNSIGNED16

0x2318 'Setpoint DC-bus' describes the setpoint to which the DC bus voltage of a KES is regulated. If the manually entered value in 0x2318 is smaller than the calculated value of the equation UZK_min, the DC bus voltage is regulated to the calculated value (UZK_min).

Valid control range:

minimum setpoint = UZK_min = $\sqrt{2} * U_{\text{external conductor}} + 25\ V$

maximum setpoint = 720 V

Equation for the minimum setpoint of the DC bus: UZK_min = $\sqrt{2}$ * $U_{external\ conductor}$ + 25 V
for 3x 400 VAC: UZK_min 590 VDC.
for 3x 480 VAC: UZK_min 704 VDC.

Depending on 0x2318, the operating range of the mains input voltage is defined in the firmware:
0x2318 ≤ 650 VDC = operating range 3 x 320 VAC ... 3 x 530 VAC
0x2318 > 650 VDC = operating range 3 x 360 VAC ... 3 x 530 VAC
The operating range defines the voltage range in which the devices can operate without error.

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	0.1
Unit	V
Default value	0

0x2319 'Line frequency'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x2319
Name	'Line frequency'
Object type	VAR
Data type	INTEGER16

0x2319 'Line frequency' indicates the actual mains frequency:
positive value = clockwise
negative value = counter-clockwise

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER16
Scaling	0.1
Unit	Hz
Default value	0

0x231A 'DC gain KP'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x231A
Name	'DC gain KP'
Object type	VAR
Data type	UNSIGNED16

With the objects 0x231A 'DC gain KP', 0x231B 'Int. time DC control' and 0x231C 'Diff. time DC control', the DC bus voltage controller can be adapted to the application.
If all 3 objects = 0, the internal default values apply:

	0x231A	0x231B	0x231C
KES 120	426.6	21.33 ms	0.188 ms
KES 60	512	21.33 ms	0.188 ms

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.1
Unit	-
Default value	0

0x231B 'Int. time DC control'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x1000
Name	'Device Type'
Object type	VAR
Data type	UNSIGNED16

With the objects 0x231A 'DC gain KP', 0x231B 'Int. time DC control' and 0x231C 'Diff. time DC control', the DC bus voltage controller can be adapted to the application.

If all 3 objects = 0, the internal default values apply:

	0x231A	0x231B	0x231C
KES 120	426.6	21.33 ms	0.188 ms
KES 60	512	21.33 ms	0.188 ms

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.001
Unit	ms
Default value	0

0x231C 'Diff. time DC control'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x231C
Name	'Diff. time DC control'
Object type	VAR
Data type	UNSIGNED16

With the objects 0x231A 'DC gain KP', 0x231B 'Int. time DC control' and 0x231C 'Diff. time DC control', the DC bus voltage controller can be adapted to the application.

If all 3 objects = 0, the internal default values apply:

	0x231A	0x231B	0x231C
KES 120	426.6	21.33 ms	0.188 ms
KES 60	512	21.33 ms	0.188 ms

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.001
Unit	ms
Default value	0

0x231D 'Bit bar'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x231D
Name	'Bit bar'
Object type	VAR
Data type	UNSIGNED16

Meaning for KW-R24 /

Reserved for AMK internal use!

Meaning for iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 /

Configuration 0x231D 'Bit bar'

Bit no.	Condition	Meaning
0	0 → 1	Positive edge: No function
	1 → 0	Negative edge: Recorded cogging feed-forward control data are stored remanently in the parameter set
1	0	Recording the cogging torque inactive
	1	Recording of the cogging torque active
2	0	Feed-forward control of the cogging torque inactive
	1	Feed-forward control of the cogging torque active
3-15	0	Reserved
	1	Reserved

Meaning for KES-xEx (not for KE(N)_xEx) /

Configuration 0x231D 'Bit bar'

Bit no.	Condition	Meaning
0	0	Phasing of the PWM for the hardware sync signal = 0°
	1	Phasing of the PWM for the hardware sync signal = 180°
1-7	0	Reserved
	1	Reserved

Bit no.	Condition	Meaning
8	0	Standard device
	1	Solar inverter Monitoring the discharge of the DC bus is inactive KES-xEx / The following objects are effective: 0x231E 'Net voltage' (voltage tolerance compared to the connected supply network ± 10 %) 0x231F 'Upper limit DC bus voltage' 0x2320 'Lower limit DC bus voltage' 0x2321 'Setpoint line current wattless component' 0x2322 'Upper limit line current wattless component' 0x2323 'Lower limit line current wattless component' 0x2324 'Upper limit line current energy component' 0x2325 'Lower limit line current energy component' 0x2326 'Output value DC-bus' 0x2327 'Line frequency' 0x2328 'Reactive power network'
9	0	MPP tracking inactive
	1	MPP tracking active: Prerequisite: Bit 8 = 1 KES-xEx / The following objects are effective: 0x2326 'Output value DC-bus'
10	0	KES_xEx inactive
	1	KES_xEx The solar inverter together with the controller solar meets the requirements according to "Technical Guideline TR3 for generator units" (e.g. Chapter 4.7, Fail safe behavior in the mains. Requirements: Bit 8 = 1!
11-15	0	Reserved
	1	Reserved

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0000 0000 0000 0000

0x231E 'Net voltage'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x231E
Name	'Net voltage'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x231F 'Upper limit DC bus voltage'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x231F
Name	'Upper limit DC bus voltage'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x2320 'Lower limit DC bus voltage'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x2320
Name	'Lower limit DC bus voltage'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x2321 'Setpoint line current wattless component'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x2321
Name	'Setpoint line current wattless component'
Object type	VAR
Data type	INTEGER16

Reserved for AMK internal use!

0x2322 'Upper limit line current wattless component'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x2322
Name	'Upper limit line current wattless component'
Object type	VAR
Data type	INTEGER16

Reserved for AMK internal use!

0x2323 'Lower limit line current wattless component'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x2323
Name	'Lower limit line current wattless component'
Object type	VAR
Data type	INTEGER16

Reserved for AMK internal use!

0x2324 'Upper limit line current energy component'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x2324
Name	'Upper limit line current energy component'
Object type	VAR
Data type	INTEGER16

Reserved for AMK internal use!

0x2325 'Lower limit line current energy component'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x2325
Name	'Lower limit line current energy component'
Object type	VAR
Data type	INTEGER16

Reserved for AMK internal use!

0x2326 'Output value DC-bus'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x2326
Name	'Output value DC-bus'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x2327 'Line frequency'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x2327
Name	'Line frequency'
Object type	VAR
Data type	INTEGER16

Display of mains frequency

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER16
Scaling	0.01
Unit	Hz
Default value	0

0x2328 'Reactive power network'

Supported hardware: KE(N,S)-xEx /

Object description

Index	0x2328
Name	'Reactive power network'
Object type	VAR
Data type	INTEGER32

Reserved for AMK internal use!

0x2330 'MAC address'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2330
Name	'MAC address'
Object type	VAR
Data type	DOMAIN

In 0x2330 'MAC address' the MAC address of the device is displayed.

Configuration 0x2330 'MAC address'

List element	Content	Meaning
1		
2		
...		
n		

Entry description

Access	read
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2331 'IP address'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2331
Name	'IP address'
Object type	VAR
Data type	DOMAIN

0x2331 'IP address' sets the IP address.

Configuration 0x2331 'IP address'

List element	Content	Meaning
1		
2		
...		
n		

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2332 'Subnet mask'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2332
Name	'Subnet mask'
Object type	VAR
Data type	DOMAIN

0x2332 'Subnet mask' sets the Subnet mask.

Configuration 0x2332 'Subnet mask'

	Content	Meaning
1		
2		
...		
n		

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2333 'Default gateway'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2333
Name	'Default gateway'
Object type	VAR
Data type	DOMAIN

0x2333 'Default gateway' sets the Gateway address.

Configuration 0x2333 'Default gateway'

List element	Content	Meaning
1		
2		
...		
n		

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x2335 'Factor derating'

Supported hardware:	KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2335
Name	'Factor derating'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x2336 'Treshold derating'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2336
Name	'Treshold derating'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x2337 'Current setpoint ISQ'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2337
Name	'Current setpoint ISQ'
Object type	VAR
Data type	INTEGER16

Reserved for AMK internal use!

0x2338 'Current setpoint ISD'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2338
Name	'Current setpoint ISD'
Object type	VAR
Data type	INTEGER16

Reserved for AMK internal use!

0x2339 'Commutation angle'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2339
Name	'Commutation angle'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x233A 'Nominal torque'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x233A
Name	'Nominal torque'
Object type	VAR
Data type	UNSIGNED16

The nominal torque depends on the motor and is to be taken from the respective type plate or data sheet of the motor.

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	0.1
Unit	Nm
Default value	2.0
Min. value	0
Max. value	2000.0

0x233B 'Delay software reset'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x233B
Name	'Delay software reset'
Object type	VAR
Data type	UNSIGNED16

After a firmware update or parameter download, a software reset is executed automatically when switching from the bus status BOOT to bus status INIT.

The software reset can be delayed with 0x233B 'Delay software reset'.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	ms
Default value	1000
Min. value	0
Max. value	65535

0x233C 'Brake mode'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x233C
Name	'Brake mode'
Object type	VAR
Data type	UNSIGNED16

With the object 'Brake mode' the operation mode of the motor holding brake can be select.

Data description

Bit	Value	Description
0	0	Automatic mode via binary output Observe the device-specific control!
	1	Manually mode 0x60FE/1 'Digital outputs'

Features and functionality in manual braking mode:

- Software commutation is not available.
- Opening and closing of the brake must be ensured by the user when controller enable (RF) on / off.
- The brake is automatically closed in the event of a error reaction 'Drive coast to stop'.
- If an error occurs with controller enable (RF) is on, which leads to the termination of the system runs up of the axis, the brake is automatically closed.
- If STO active or EF inactive, the brake is automatically closed. The brake can not be opened.
- The brake is automatically closed at bus errors.
- Deceleration of the drive in case of an error by RF withdrawal, the brake must be closed by the user.
- The monitoring of a brake with acknowledgment output signal is not available for the manual mode (Object 0x2215 Bit 13 'Service bits').

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x233D 'Torque constant Kt adaption'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x233D
Name	'Torque constant Kt adaption'
Object type	VAR
Data type	UNSIGNED32

The torque constant Kt can vary by physical influences with permanently energized synchronous machines. The value is initialized with torque setpoint / power supply current. The adaption is made on the assumption that the mechanical output power is equivalent to the electric power of the drive.

The display value is only valid for synchronous machines.

Application:

The motor constant is estimated systematically by a special estimation algorithm and provided in 0x233D 'Torque constant Kt adaption'. A controller could calculate a torque which, for example, adapts to changes caused by a temperature drift or saturation effects of the magnets. For the calculation, the controller multiplies 0x233D 'Torque constant Kt adaption' [Nm / A] by 0x222B 'Torque current feedback' [0,1 A] or 0x22E1 'Torque current feedback' [0,001 A]. The estimation algorithm operates from a threshold of ± 50 rpm and operates exclusively in the operation modes of speed or current control (torque control).

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	0.001
Unit	Nm/A
Default value	0
Min. value	0
Max. value	4294967.295

0x233E 'Offset commutation'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x233E
Name	'Offset commutation'
Object type	VAR
Data type	UNSIGNED16

⚠ WARNING

Risk of injury from uncontrolled movements of the motor shaft

If the offset is entered incorrectly, the motor is not controllable and can carry out uncontrolled movements as soon as the controller enable is set!

With 'Initial program loading' the offset is reset to the default value of 0. A previously determined commutation offset is lost. There is no remanent storage in the encoder.

Steps to prevent:

- Check the entered offset before setting the controller enable.
- Takes precautionary measures to ensure that no persons are in the total possible range of movement of the motor when the controller enable is set for the first time after the input of the offset.

The 0x233E 'Offset commutation' is calculated in the run-up with the commutation angle stored in the encoder.
The 'Offset commutation' is added to the actual commutation angle of the encoder.
If the motor negation bit 0x2215 'Service bits' bit 16 is set, the commutation offset is subtracted from the commutation angle.
Only positive values in the range 0 - 65535 [increments] can be specified as 'Offset commutation'.
The value 65535 corresponds to a displacement by one mechanical revolution of the motor (360°).

Areas of application:
Foreign motors where the determination of the commutation angle deviates from the method by AMK.
Advantage:
With 'Offset commutation', the commutation angle of the foreign motor can be adapted to the AMK inverter, without changing the manufacturer-specific value in the encoder.
The 'Offset commutation' works for the following encoder types EnDat and Hiperface (AMK designations E, F, S, T, P, Q, U, V).

Another area of application is the 'fine tuning' of the commutation angle. An existing deviation from the optimum commutation angle can be compensated by small offset values.

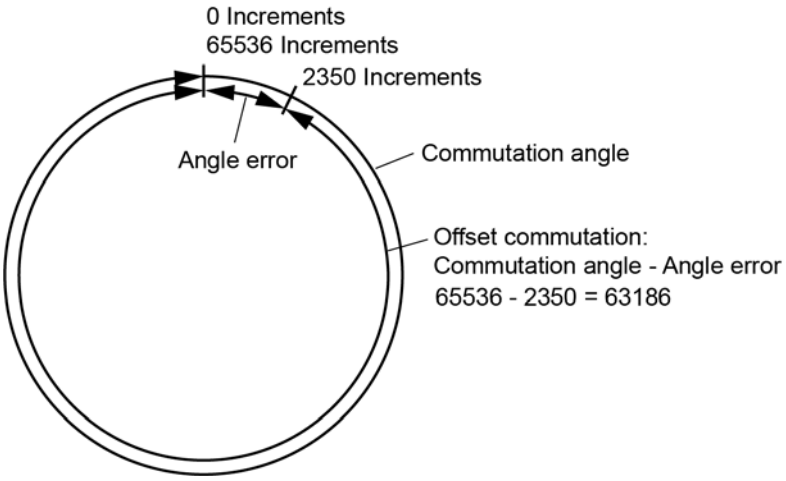
Example: Calculation of the commutation angle from offset commutation and the encoder position

0x2229 'Resolver angle' from encoder position: 451 increments

Example	Object	Value
1	0x2215 'Service bits' Bit 16	0
	0x233E 'Offset commutation'	0 [Increments]
	0x2229 'Resolver angle'	451 [Increments]
2	0x2215 'Service bits' Bit 16	0
	0x233E 'Offset commutation'	13000 [Increments]
	0x2229 'Resolver angle'	13451 [Increments]
3	0x2215 'Service bits' Bit 16	1
	0x233E 'Offset commutation'	0 [Increments]
	0x2229 'Resolver angle'	65085 [Increments]
4	0x2215 'Service bits' Bit 16	1
	0x233E 'Offset commutation'	13000 [Increments]
	0x2229 'Resolver angle'	52085 [Increments]

Example: Compensate errors in the commutation angle

Mechanical motor revolution (360°)



The electrically-aligned synchronous motor shows e.g. a commutation angle of 0x2229 = 2350 increments (angle error). To compensate this value to 0, the commutation offset is calculated as follows:

Offset commutation	= Commutation angle - Angle error
	= 65536 Increments - 2350 Increments
	= 63186 Increments

Check:

Commutation angle	= Commutation offset + Commutation error
	= 63186 Increments + 2350 Increments
	= 65536 Increments → Correspond the modulo value 0

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	Increments
Default value	0
Min. value	0
Max. value	65535

0x233F 'Electrical field angle'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x233F
Name	'Electrical field angle'
Object type	VAR
Data type	UNSIGNED16

0x233F shows the electrical field angle.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	Increments
Default value	0
Min. value	0
Max. value	65535

0x2340 'Sampling resolver'

Supported hardware: KW-R24-R / KW-R26 / KW-R27 /

Object description

Index	0x2340
Name	'Sampling resolver'
Object type	VAR
Data type	UNSIGNED16

Reserved for AMK internal use!

0x2341 'ZR-current T1-d'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2341
Name	'ZR-current T1-d'
Object type	VAR
Data type	UNSIGNED16

Time constant T1 d-component

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.001
Unit	ms
Default value	2.000
Min. value	0.100
Max. value	5.000

0x2342 'ZR-current T2-d'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2342
Name	'ZR-current T2-d'
Object type	VAR
Data type	UNSIGNED16

Time constant T2 d-component

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.001
Unit	ms
Default value	2.000
Min. value	0.100
Max. value	5.000

0x2343 'ZR-current T1-q'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2343
Name	'ZR-current T1-q'
Object type	VAR
Data type	UNSIGNED16

Time constant T1 q-component

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.001
Unit	ms
Default value	2.000
Min. value	0.100
Max. value	5.000

0x2344 'ZR-current T2-q'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2344
Name	'ZR-current T2-q'
Object type	VAR
Data type	UNSIGNED16

Time constant T2 q-component

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.001
Unit	ms
Default value	2.000
Min. value	0.100
Max. value	5.000

0x2345 'Customer variable 2'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2345
Name	'Customer variable 2'
Object type	VAR
Data type	UNSIGNED32

This variable is available as a free memory location and can be used per data set in an application-specific manner.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0000 0000 0000 0000 (LSB)
Min. value	0000 0000 0000 0000 (LSB)
Max. value	1111 1111 1111 1111 (LSB)

0x2346 'Motor encoder database image'

Supported hardware: KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2346
Name	'Motor encoder database image'
Object type	ARRAY
Data type	UNSIGNED16

Reserved for AMK internal use!

0x2347 'DC bus monitor upper limit'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2347
Name	'DC bus monitor upper limit'
Object type	VAR
Data type	UNSIGNED16

0x2347 defines the upper limit of permissible voltage for the DC bus. If this value is exceeded, warning 1059 'DC bus overvoltage' (0x2320) is output. Bit 7 'warning' is set in object 0x6041.

The following applies:

0x2347 = 0 (The DC-bus monitor upper limit is deactivate by factory-set.)

0x2347 ≠ 0 (The entered value is the upper limit of the voltage [0.1 V] for which the DC bus voltage is monitored.)

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	10
Unit	V
Default value	0

0x2348 'Velocity feedforward factor 1'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2348
Name	'Velocity feedforward factor 1'
Object type	VAR
Data type	UNSIGNED16

Siehe 'Speed control' auf Seite 23.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.01
Unit	%
Default value	0

0x2349 'Velocity feedforward delay 1'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2349
Name	'Velocity feedforward delay 1'
Object type	VAR
Data type	UNSIGNED16

Siehe 'Speed control' auf Seite 23.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.001
Unit	ms
Default value	0

0x234A 'Delay target position value'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x234A
Name	'Delay target position value'
Object type	VAR
Data type	UNSIGNED16

Siehe 'Position control' auf Seite 25.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.001
Unit	ms
Default value	0

0x234B 'Tolerance limit estimator'

Supported hardware: KW-R26 / KW-R27 /

Object description

Index	0x234B
Name	'Tolerance limit estimator'
Object type	VAR
Data type	UNSIGNED16

Maximum number of controller cycles in which estimated positions are tolerated by the encoder software.
A controller cycle lasts 62.5 µs.

Plausibility check
The ratio between 0x234B 'Tolerance limit estimator' and 0x234C 'Monitoring cycle estimator' must meet the following condition:

Monitoring function Hiperface DSL encoder
The monitoring function counts the number of position failures that occur within a defined period of time.
The number of failures and the monitoring period can be parameterized.
Errors in the position evaluation can be caused, for example, by EMI problems or vibrations.
Within the monitoring period, individual position errors are automatically bridged by the encoder software (Hiperface DSL Interface). This task is done by the 'estimator', which further interpolates the position value by means of the last valid position change.

Behavior in the event of an error:
As soon as the monitoring function detects that the parameterized limits are exceeded, the drive switches off with the error message 0x7300 'Sensor'.

The monitoring function is parameterized with the following IDs:

- 0x234B 'Tolerance limit estimator'
- 0x234C 'Monitoring cycle estimator'

Example default setting

0x234B 'Tolerance limit estimator' = 6

6 controller cycles with estimated positions are permissible, which corresponds to a bridging time of 6 x 62.5 µs = 375 µs.

0x234C 'Monitoring cycle estimator' = 10 ms

At the default setting, a bridging time of 6 x 62.5 µs = 375 µs is tolerated within 10 ms.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	6
Min. value	1
Max. value	65535

0x234C 'Monitoring cycle estimator'

Supported hardware: KW-R26 / KW-R27 /

Object description

Index	0x234C
Name	'Monitoring cycle estimator'
Object type	VAR
Data type	UNSIGNED16

Cyclic monitoring window in [ms] in which the maximum number of estimated positions may occur by the encoder software.

Plausibility check

The ratio between 0x234B 'Tolerance limit estimator' and 0x234C 'Monitoring cycle estimator' must meet the following condition:

Siehe '0x234B 'Tolerance limit estimator'' auf Seite 288.

Monitoring function Hiperface DSL encoder.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	ms
Default value	1
Min. value	1
Max. value	65535

0x234D 'Motion service switch'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x234D
Name	'Motion service switch'
Object type	VAR
Data type	UNSIGNED32

Configuration 0x234D 'Motion service switch'

Bit no.	Condition	Meaning
0	0	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Function to avoid slip-stick effects inactive
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Function to avoid slip-stick effects active
1	0	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Advanced position increase monitor inactive
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Advanced position increase monitor aktive
2-31	0	Reserved
	1	Reserved

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0000 0000 0000 0000 0000 0000 0000 0000 (LSB)
Min. value	0000 0000 0000 0000 0000 0000 0000 0000
Max. value	1111 1111 1111 1111 1111 1111 1111 1111

0x234E 'Variable torque limits'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x234E
Name	'Variable torque limits'
Object type	ARRAY
Data type	INTEGER16

This object is used by the following function:
'Anti Slip-Stick'

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Variable positive torque limit'
Access	read/write
PDO Mapping	yes
Range of values	INTEGER16
Scaling	0.1
Unit	$\%M_N$
Default value	0
Min. value	-3000.0
Max. value	3000.0

Sub-index	2
Description	'Variable negative torque limit'
Access	read/write
PDO Mapping	yes
Range of values	INTEGER16
Scaling	0.1
Unit	$\%M_N$
Default value	0
Min. value	-3000.0
Max. value	3000.0

0x234F 'Time constant variable torque limits'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x233B
Name	'Delay software reset'
Object type	VAR
Data type	UNSIGNED16

0x234F 'Time constant variable torque limits' describes the temporal transition behavior of the torque limits between normal mode and the variable values.

This object is used by the following function:
'Anti Slip-Stick'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	ms
Default value	0
Min. value	0
Max. value	65535

0x2350 'Time zone'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2350
Name	'Time zone'
Object type	VISIBLE_STRING
Data type	VAR

Reserved for AMK internal use!

KE(N,S)-xEx / : Not supported in XML file AMK_ECcoe_103_206799.

0x2351 'List absolute position'

Supported hardware: KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2351
Name	'List absolute position'
Object type	ARRAY
Data type	INTEGER32

Reserved for AMK internal use!

0x2352 'NTP server address'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2352
Name	'NTP server address'
Object type	VAR
Data type	UNSIGNED32

Reserved for AMK internal use!

KE(N,S)-xEx / : Not supported in XML file AMK_ECcoe_103_206799.

0x2353 'Friction torque motor'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2353
Name	'Friction torque motor'
Object type	VAR
Data type	UNSIGNED16

This object 'Friction torque motor' represents a constant static friction torque of the motor. The torque of the motor is feed forward controlled.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.01
Unit	Nm
Default value	0

0x2354 'Friction torque load'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2354
Name	'Friction torque load'
Object type	VAR
Data type	UNSIGNED16

This object 'Friction torque load' represents a constant static friction torque of the load. The torque of the load is feed forward controlled.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.01
Unit	Nm
Default value	0

0x2355 'Friction torque linear motor'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2355
Name	'Friction torque linear motor'
Object type	VAR
Data type	UNSIGNED16

This object 'Friction torque linear motor' represents a linear friction torque of the motor. The torque of the motor is feed forward controlled.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.01
Unit	Nm
Default value	0

0x2356 'Friction torque linear load'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2356
Name	'Friction torque linear load'
Object type	VAR
Data type	UNSIGNED16

This object 'Friction torque linear load' represents a linear friction torque of the load. The torque of the load is feed forward controlled.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	0.01
Unit	Nm
Default value	0

0x2357 'Inertia motor'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2357
Name	'Inertia motor'
Object type	VAR
Data type	UNSIGNED32

This object 'Inertia motor' represents the inertia of the motor. The torque of the motor is feed forward controlled.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	0.001
Unit	kg cm^2
Default value	0

0x2358 'Inertia load'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2358
Name	'Inertia load'
Object type	VAR
Data type	UNSIGNED32

This object 'Inertia load' represents the inertia of the load. The torque of the load is feed forward controlled.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	0.001
Unit	kg cm^2
Default value	0

0x2359 'Threshold variable torque limits'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x2359
Name	'Threshold variable torque limits'
Object type	VAR
Data type	UNSIGNED32

This object'Threshold variable torque limits' is the limit value of the position increase per bus cycle, from which the standard torque limits 0x60E0 'Positive torque limit value' / 0x60E1 'Negative torque limit value' act. For increases smaller than the threshold, the transition is made to the variables torque limits 0x234E/1 'Variable positive torque limit' / 0x234E/2 'Variable negative torque limit'.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	Increments
Default value	5
Min. value	1
Max. value	2147483647

0x235A 'Encoder service switch'

Supported hardware: KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x235A
Name	'Encoder service switch'
Object type	VAR
Data type	UNSIGNED32

Configuration 0x235A 'Encoder service switch'

Bit no.	Condition	Meaning
0	0	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 / Function for monitoring the commutation angle inactive
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 / Function for monitoring the commutation angle active
1	0	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 / Function 'Read encoder memory' inactive
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 / Function 'Read encoder memory' active, encoder memory is read out once during system booting and copied to the list ID34091 'User list 3'
2-15	0	Reserved
	1	Reserved
16	0	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 / Plug & Play motor replacement inactive
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 / Plug & Play motor replacement active
17-31	0	Reserved
	1	Reserved

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

0x235B 'Encoder status 1'

Supported hardware: KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x235B
Name	'Encoder status 1'
Object type	VAR
Data type	UNSIGNED16

Configuration 0x235B 'Encoder status 1'

Bit no.	Condition	Meaning
0	0	AMK motor encoder data base not initialized
	1	AMK motor encoder data base initialized
1	0	Absolute position not set
	1	Absolute position set
2-15	0	Reserved
	1	Reserved

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x235C 'Encoder status 2'

Supported hardware: KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x235C
Name	'Encoder status 2'
Object type	VAR
Data type	UNSIGNED16

Configuration 0x235C 'Encoder status 2'

Bit no.	Condition	Meaning
0	0	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 / Function for monitoring the commutation angle deactivated or for more than 5 min. no check possible
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 / Function for monitoring the commutation angle activated
1	0	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 / Function deactivated or data from the encoder memory not up-to-date
	1	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT / KW-R25 / KW-R26 / KW-R27 / Encoder memory is read out once during system booting (Data in list 0x22F1 'User list 3'
2-15	0	Reserved
	1	Reserved

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x603F 'Error code'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x603F
Name	'Error code'
Object type	VAR
Data type	UNSIGNED16

The object 0x603F 'Error Code' contains the latest error code appeared, according DSP 402 chapter 6.2 'Error codes'.
List of error codes: Siehe Error codes 'Emergency Message' auf Seite 337.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x6040 'Control word'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6040
Name	'Control word'
Object type	VAR
Data type	UNSIGNED16

Data description

Bit	Name	Description
0 (LSB)	Switch On	
1	Enable Voltage	
2	Quick Stop	
3	Enable Operation	
4-6	Operation Mode Specific	The meaning depends on the operating mode
7	Fault Reset	Execute command 'clear error (FL)' and refresh the bits in object 0x6041 'Status word'
8	Halt [1)]	The meaning depends on the operating mode
9-15	-	Reserved

1)

Operating mode changes are only executed if bit 8 'Halt' is not set in object 0x6040 'Control word'.

Bit 0-3 and bit 7 execute the following commands in the drive according to the status machine:

Siehe "State machine' diagram' auf Seite 17.

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x6041 'Status word'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6041
Name	'Status word'
Object type	VAR
Data type	UNSIGNED16

Data description

Bit	Name	Value	Description
0 (LSB)	Ready To Switch On	-	
1	Switched On	-	
2	Operation Enabled	-	
3	Fault	-	
4	Voltage Enable	1	The DC bus is on
5	Quick Stop	0	
6	Switch On Disabled		
7	Warning	1	Warning message in the drive active (0x2186 'Diagnostic number')
8	Manufacturer Specific		Reserved
9	Remote	1	Bit 9 is set automatically, that means, the PDO data exchange is allowed and commands are executed from the drive via objects.
10	Target Reached		The meaning depends on the operating mode
11	Internal Limit Active	1	This bit will be set, as soon as the relevant limits are exceeded for this operation mode.
12-13	Operation Mode Specific		The meaning depends on the operating mode
14-15	Manufacturer Specific		Reserved

Bit 0-3, 5 and Bit 6 displays the actual condition of the drive according to the state machine:
Siehe 'State according the state machine' auf Seite 18.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x6060 'Modes of operation'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6060
Name	'Modes of operation'
Object type	VAR
Data type	INTEGER8

Operating mode changes are only executed if bit 8 'Halt' is not set in object 0x6040 'Control word'.

Data description

Value	Description
1	Profile position mode
3	Profile velocity mode
6	Homing mode [1)]
8	Cyclic synchronous position mode [2)]
9	Cyclic synchronous velocity mode [2)]
10	Cyclic synchronous torque mode [2)]

1) Subset functions according to DSP 402
2) Defined in IEC 61800-7: IEC61800-7_CiA_ETG_GuidlineV0_2_4_Draft.pdf

Entry description

Access	read/write
PDO mapping	yes
Range of values	INTEGER8
Scaling	1
Unit	-
Default value	0

0x6061 'Modes of operation display'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6061
Name	'Modes of operation display'
Object type	VAR
Data type	INTEGER8

The object 0x6061 acknowledges the active operating mode according to 0x6060 'Modes of operation'

Data description

Value	Description
1	Profile position mode (pp)
3	Profile velocity mode (pv)
6	Homing mode (hm)
8	Cyclic synchronous position mode (csp)
9	Cyclic synchronous velocity mode (csv)
10	Cyclic synchronous torque mode (cst)

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER8
Scaling	1
Unit	-
Default value	0

0x6064 'Position actual value'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6064
Name	'Position actual value'
Object type	VAR
Data type	INTEGER32

0x6064 contains the actual position of the actual position encoder according to 0x2253 'Encoder type'. The position value can be cyclically evaluated by the control system according to 0x2013 'Communication cycle period' or be transferred via the service channel.

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	Increments
Default value	0

0x6065 'Following error window'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6065
Name	'Following error window'
Object type	VAR
Data type	UNSIGNED32

If the difference between the position setpoint and the actual position value (following error) is larger than the value in 0x6065 'Following error window', the controller release for the drive is withdrawn, the motor runs down, the SBM status is reset and the diagnostic message 0x8611 'Following error' is issued.

The maximum computational following error (SA) of a feed drive results from:

With 0x207B 'Feed constant' and 0x2074 'Encoder increments' the following error is converted from [mm] to [Incr.]:

The maximum computational following error (SA) of a rotary drive results from:

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED32
Scaling	1
Unit	Increments
Default value	1000000
Min. value	0
Max. value	217483647

0x6067 'Position window'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6067
Name	'Position window'
Object type	VAR
Data type	UNSIGNED32

If the difference between the position setpoint value and actual position value is smaller (amount) than the value in 0x6067 'Position window' ($|x_{set} - x_{actual}| < 0x6067$), the real-time bit is set in 0x2150 'Message in position'.

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED32
Scaling	1
Unit	Increments
Default value	1000
Min. value	0
Max. value	65535

0x606C 'Velocity actual value'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x606C
Name	'Velocity actual value'
Object type	VAR
Data type	INTEGER32

0x606C contains the actual speed value of the speed encoder according to 0x2253 'Encoder type'. The actual speed value can be cyclically evaluated by the controller according to 0x2013 'Communication cycle period' or can be transferred via the service channel.

In 'open loop' applications, 0x606C shows the actual speed value that is calculated from the rotating field.

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER32
Scaling	0.0001
Unit	1/min
Default value	0
Min. value	-30000.0000
Max. value	30000.0000

0x6071 'Target torque'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6071
Name	'Target torque'
Object type	VAR
Data type	INTEGER16

In the torque control operating mode, the controller cyclically writes the torque setpoint value in 0x6071 according to 0x2013 'Communication cycle period'.

Actual values can not be determined with any accuracy, because of measurement and component tolerances. That means for the control loop, that the real acting limit, actual or setpoint values can differ up to 3 % of the rated torque (proportional to 0x6075 'Motor rated current').

Entry description

Access	read/write
PDO mapping	yes
Range of values	INTEGER16
Scaling	0.1
Unit	$\%M_N$
Default value	10.0
Min. value	-1000.0
Max. value	1000.0

0x6072 'Maximal torque'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6072
Name	'Maximal torque'
Object type	VAR
Data type	UNSIGNED16

0x6072 'Maximal torque' has priority over the limits 0x60E0 'Positive torque limit value' and 0x60E1 'Negative torque limit value'.

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	0.1
Unit	$\%M_N$
Default value	0

0x6075 'Motor rated current'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6075
Name	'Motor rated current'
Object type	VAR
Data type	UNSIGNED32

The 'Motor rated current' is used as a reference size for all torque data and may amount to a maximum of 80 % of the 0x206E 'Inverter peak current' (0x6075 ≤ 0x206E × 80 %). 'Motor rated current' is on the motor type plate and in the motor data sheet.

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED32
Scaling	0.001
Unit	A
Default value	2.500
Min. value	0
Max. value	1000.000

0x6077 'Torque actual value'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6077
Name	'Torque actual value'
Object type	VAR
Data type	INTEGER16

0x6077 contains the actual torque value and can be cyclically evaluated by the controller or transferred via the service channel. The actual torque is proportional to the actual current value.

Actual values can not be determined with any accuracy, because of measurement and component tolerances. That means for the control loop, that the real acting limit, actual or setpoint values can differ up to 3 % of the rated torque (proportional to 0x6075 'Motor rated current').

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER16
Scaling	0.1
Unit	$\%M_N$
Default value	0

0x6079 'DC link circuit voltage'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6079
Name	'DC link circuit voltage'
Object type	VAR
Data type	UNSIGNED32

0x6079 'DC link circuit voltage' describes the instantaneous DC link current voltage at the drive controller.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED32
Scaling	1
Unit	mV
Default value	0

0x607A 'Target position'

Supported hardware:	KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x607A
Name	'Target position'
Object type	VAR
Data type	INTEGER32

In the position control operating mode, the controller cyclically writes the position setpoint values in 0x607A according to 0x2013 'Communication cycle period'.

Entry description

Access	read/write
PDO mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	Increments
Default value	0
Min. value	-2147483648
Max. value	2147483647

0x607C 'Home offset'

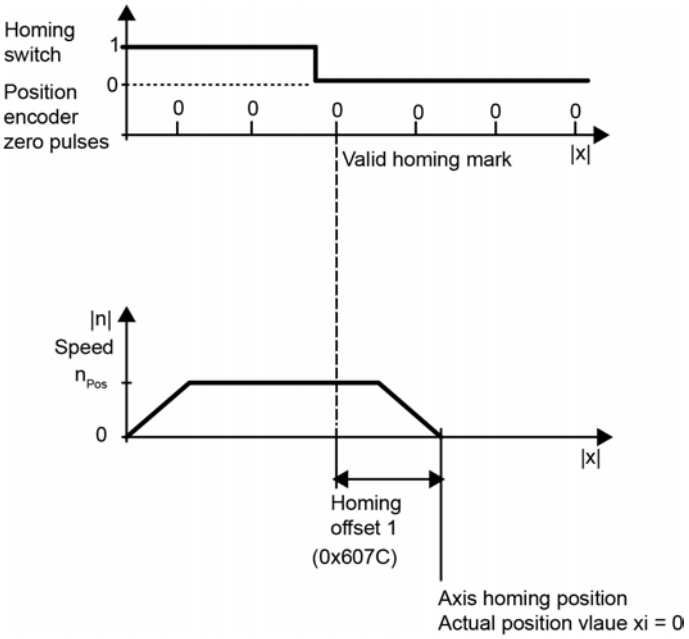
Supported hardware:	KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x607C
Name	'Home offset'
Object type	VAR
Data type	INTEGER32

0x607C defines an offset between the valid encoder homing mark and the desired zero position of the axis for the homing cycle. In this position, the internal position counter is set to '0'. For multi-turn absolute encoders, 0x607C 'Home offset' is added to the read actual position value with the proper sign.

Homing offset and zero pulses of the position encoder



Entry description

Access	read/write
PDO mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	Increments
Default value	0
Min. value	-2147483648
Max. value	2147483647

0x607D 'Software position limit'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x607D
Name	'Software position limit'
Object type	ARRAY
Data type	INTEGER32

The position limit values ('Software position limit') refer relative to the homing point, shifted by the value 0x607C 'Home offset'.

0x607D/1 describes the maximum traverse distance in the negative direction.

If the 'Negative position limit' is fallen below, the shortfall is displayed in 0x20B6 'Diagnosis manufacturer status' bit 0 and via the real-time bit (code 33013 '|0x6064 'Position actual value'| > |0x607D/1 'Negative position limit'|').

Real-time bit messages do not create an axis stop! No error status is generated. The master controller must evaluate the real-time bit message and initiate appropriate responses, e.g. stop the drive in a controlled manner!

0x607D/2 describes the maximum traverse distance in the positive direction.

If the 'Positive position limit' is exceeded, the exceedance is displayed in 0x20B6 'Diagnosis manufacturer status' bit 7 and via the real-time bit (code 33015 '|0x6064 'Position actual value'| > |0x607D/2 'Positive position limit'|').

Real-time bit messages do not create an axis stop! No error status is generated. The master controller must evaluate the real-time bit message and initiate appropriate responses,
e. g. stop the drive in a controlled manner!

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	yes
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Negative position limit'
Access	read/write
PDO mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	Increments
Default value	-2147483648
Min. value	-2147483648
Max. value	2147483647

Sub-index	2
Description	'Positive position limit'
Access	read/write
PDO mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	Increments
Default value	2147483647
Min. value	-2147483648
Max. value	2147483647

0x607E 'Polarity'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x607E
Name	'Polarity'
Object type	VAR
Data type	UNSIGNED8

Position demand value and position actual value are multiplied by 1 or -1 depending on the value of the polarity flag.

Data description

Bit	Value	Description
0 (LSB)...5	0	Reserved
	1	Reserved
6	0	Position: Polarity multiplied by 1
	1	Position: Polarity multiplied by -1
7 (MSB)	0	Velocity: Polarity multiplied by 1
	1	Velocity: Polarity multiplied by -1

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED8
Scaling	1
Unit	-
Default value	0

0x6080 'Maximal motor speed'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6080
Name	'Maximal motor speed'
Object type	VAR
Data type	UNSIGNED32

NOTICE	
Material Damage!	**Material damage from high speeds!** 0x6080 must be set so that the input speed value plus 25% does not cause any damage in the process.

If the actual speed value increases to the value in 0x6080 x 1.25, the output stage is automatically internally blocked and the motor runs down. The user must set the value for 0x6080 depending on the process without exceeding the motor's maximum speed in the process. For sine encoders, the limit frequency at the sine encoder input may not be exceeded. The limit frequency for the sine encoder input can be found in the respective device description.

Formula: Determination of n_{max} for sine encoder input

Example:

Encoder division 0x2218 = 1024 (I-encoder) limit frequency at the sine encoder input = 200 kHz

Observe the manufacturer's specified maximum encoder speed!

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED32
Scaling	1
Unit	1/min
Default value	6000.0000
Min. value	1.0000
Max. value	30000.0000

0x6081 'Profile velocity'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6081
Name	'Profile velocity'
Object type	VAR
Data type	UNSIGNED32

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED32
Scaling	0.0001
Unit	1/min
Default value	0

0x6083 'Profile acceleration'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6083
Name	'Profile acceleration'
Object type	VAR
Data type	UNSIGNED32

The positive acceleration is an input variable of the internal interpolator and defines the linear part of the positive acceleration for drive-controlled positioning. The acceleration values may not exceed the maximum possible physical acceleration of the drive (current limiting in the inverter).

This object is used by the following functions:

'Internal drive interpolator'

'Drive moves into parking position'

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED32
Scaling	0.001
Unit	rev/s^2
Default value	100.000
Note	The units are calculated internal from rev/s^2 to ms

0x6084 'Profile deceleration'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6084
Name	'Profile deceleration'
Object type	VAR
Data type	UNSIGNED32

The negative acceleration is an input variable of the internal interpolator and defines the linear part of the negative acceleration for drive-controlled positioning. The acceleration values may not exceed the maximum possible physical acceleration of the drive (current limiting in the inverter).

This object is used by the following functions:

'Internal drive interpolator'

'Drive moves into parking position'

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED32
Scaling	0.001
Unit	rev/s^2
Default value	100.000

0x6089 'Position notation index'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6089
Name	'Position notation index'
Object type	VAR
Data type	INTEGER8

The object 0x6089 'Position notation index' is used to scale the objects.

Mandatory, if one of the following objects is supported:

- 0x6064 'Position actual value'
- 0x60FC 'Position demand value'
- 0x607A 'Target position'
- 0x6067 'Position window'
- 0x6065 'Following error window'
- 0x607C 'Home offset'
- 0x607D 'Software position limit'
- 0x60FF 'Target velocity'

Entry description

Access	read/write
PDO mapping	no
Range of values	INTEGER8
Scaling	1
Unit	-
Default value	0

0x608A 'Position dimension index'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x608A
Name	'Position dimension index'
Object type	VAR
Data type	UNSIGNED8

The object 0x608A 'Position dimension index' is used to scale the objects.
Mandatory, if one of the following objects is supported:

- 0x6064 'Position actual value'
- 0x60FC 'Position demand value'
- 0x607A 'Target position'
- 0x6067 'Position window'
- 0x6065 'Following error window'
- 0x607C 'Home offset'
- 0x607D 'Software position limit'
- 0x60FF 'Target velocity'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED8
Scaling	1
Unit	-
Default value	-

0x608B 'Velocity notation index'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x608B
Name	'Velocity notation index'
Object type	VAR
Data type	INTEGER8

The object 0x608B 'Velocity notation index' is used to scale the objects.
Mandatory, if one of the following objects is supported:

- 0x606C 'Velocity actual value'
- 0x6081 'Profile velocity'
- 0x6099 'Homing speeds'

Entry description

Access	read/write
PDO mapping	no
Range of values	INTEGER8
Scaling	1
Unit	-
Default value	0

0x608C 'Velocity dimension index'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x608C
Name	'Velocity dimension index'
Object type	VAR
Data type	UNSIGNED8

The object 0x608C 'Velocity dimension index' is used to scale the objects.
Mandatory, if one of the following objects is supported:

- 0x606C 'Velocity actual value'
- 0x6081 'Profile velocity'
- 0x6099 'Homing speeds'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED8
Scaling	1
Unit	-
Default value	-

0x608D 'Acceleration notation index'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x608D
Name	'Acceleration notation index'
Object type	VAR
Data type	INTEGER8

The object 0x608D 'Acceleration notation index' is used to scale the objects.
Mandatory, if one of the following objects is supported:

- 0x6083 'Profile acceleration'
- 0x6084 'Profile deceleration'
- 0x609A 'Homing acceleration'

Entry description

Access	read/write
PDO mapping	no
Range of values	INTEGER8
Scaling	1
Unit	-
Default value	0

0x608E 'Acceleration dimension index'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x608E
Name	'Acceleration dimension index'
Object type	VAR
Data type	UNSIGNED8

The object 0x608E 'Acceleration dimension index' is used to scale the objects.
Mandatory, if one of the following objects is supported:

- 0x6083 'Profile acceleration'
- 0x6084 'Profile deceleration'
- 0x609A 'Homing acceleration'

Entry description

Access	read/write
PDO mapping	no
Range of values	UNSIGNED8
Scaling	1
Unit	-
Default value	-

0x608F 'Position encoder resolution'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x608F
Name	'Position encoder resolution'
Object type	ARRAY
Data type	UNSIGNED32

0x608F 'Position encoder resolution' defines the ratio of encoder increments per motor revolution.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Encoder increments'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	Increments
Default value	1

Sub-index	2
Description	'Motor revolutions'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	1/min
Default value	1

0x6090 'Velocity encoder resolution'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6090
Name	'Velocity encoder resolution'
Object type	ARRAY
Data type	UNSIGNED32

0x6090 'Velocity encoder resolution' defines the ratio of encoder increments/sec. per motor revolutions/sec..

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Encoder increments per second'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	Increments
Default value	
Min. value	
Max. value	

Sub-index	2
Description	'Motor revolutions per second'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	1/min
Default value	
Min. value	
Max. value	

0x6091 'Gear ratio'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6091
Name	'Gear ratio'
Object type	ARRAY
Data type	UNSIGNED32

The 0x6091 'Gear ratio' defines the ratio of feed in position units per driving shaft revolutions.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Motor revolutions'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	1/min
Default value	1

Sub-index	2
Description	'Shaft revolutions'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	1/min
Default value	1

0x6092 'Feed constant'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6092
Name	'Feed constant'
Object type	ARRAY
Data type	UNSIGNED32

The 0x6092 'Feed constant' defines the ratio of feed in position units per driving shaft revolutions.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Feed'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	Increments
Default value	1

Sub-index	2
Description	'Shaft revolutions'
Access	read/write
PDO Mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	1/min
Default value	1

0x6098 'Homing method'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6098
Name	'Homing method'
Object type	VAR
Data type	INTEGER8

The object 'Homing method' defines the kind of homing cycle.

Data description

Entry description

Access	read/write
PDO mapping	yes
Range of values	INTEGER8
Scaling	1
Unit	-
Default value	0

0x6099 'Homing speeds'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6099
Name	'Homing speeds'
Object type	ARRAY
Data type	UNSIGNED32

'Homing speeds' defines the speeds used during homing

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	yes
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Speed during search for switch'
Access	read/write
PDO mapping	yes
Range of values	UNSIGNED32
Scaling	0.0001
Unit	1/min
Default value	0.0000

Sub-index	2
Beschreibung	'Speed during search for zero'
Zugriff	read/write
PDO Mapping	yes
Wertebereich	UNSIGNED32
Skalierung	0.0001
Einheit	1/min
Defaultwert	0.0000

0x609A 'Homing acceleration'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x609A
Name	'Homing acceleration'
Object type	VAR
Data type	UNSIGNED32

The 'Homing acceleration' acts at all homing methods.

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED32
Scaling	0.001
Unit	rev/s^2
Default value	100.000

0x60B1 'Velocity offset'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60B1
Name	'Velocity offset'
Object type	VAR
Data type	INTEGER32

The 'Velocity offset' is added with 0x60FF 'Target velocity'.

This object is used by the following functions:
'Speed feed-forward control'
'Load model'

Entry description

Access	read/write
PDO mapping	yes
Range of values	INTEGER32
Scaling	0.0001
Unit	1/min
Default value	0

0x60B2 'Torque offset'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60B2
Name	'Torque offset'
Object type	VAR
Data type	INTEGER16

The 'Torque offset' is added with 0x6071 'Target torque'.

This object is used by the following function:
'Load model'

Entry description

Access	read/write
PDO mapping	yes
Range of values	INTEGER16
Scaling	0.1
Unit	$\%M_N$
Default value	0

0x60B8 'Touch probe function'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60B8
Name	'Touch probe function'
Object type	VAR
Data type	UNSIGNED16

With the object 'Touch probe function' the basic settings for the function 'Touch probe' can be configured.

Data description

Bit	Value	Description
0 (LSB)	0	Switch off touch probe 1
	1	Enable touch probe 1
1	0	Trigger first event
	1 [1)]	Continuous
3...2	00 [2)]	Trigger with touch probe 1 input
	01 [3)]	Trigger with zero impulse signal or position encoder
	10 [4)]	Touch probe source defined by object 0x60D0/1 'Touch probe 1 source'
	11	Reserved
4	0	Switch off sampling at positive edge of touch probe 1
	1	Enable sampling at positive edge at touch probe 1
5	0	Switch off sampling at negative edge of touch probe 1
	1	Enable sampling at negative edge of touch probe 1
6...7	-	User defined
8	0	Switch off touch probe 2
	1	Enable touch probe 2
9	0	Trigger first event
	1 [1)]	Continuous
11...10	00 [2)]	Trigger with touch probe 2 input
	01 [3)]	Trigger with zero impulse signal or position encoder
	10 [4)]	Touch probe source defined by object 0x60D0/2 'Touch probe 2 source'
	11	Reserved
12	0	Switch off sampling at positive edge of touch probe 2
	1	Enable sampling at positive edge of touch probe 2
13	0	Switch off sampling at negative edge of touch probe 2
	1	Enable sampling at negative edge of touch probe 2
14...15 (MSB)		User defined

1) Is currently supported for source 'Trigger with touch probe x input'. The switch in the mode 'Continuous' is possible only while the controller enable is inactive
2) ihXT Is not supported
3) Currently available only for single-turn encoder. The indicated position measured value is a multiple of the object 0x2074 'Encoder increments'. The adjustment of the actual position value on Modulo display is not allowed
4) Is currently not supported

This object is used by the following function:
'Touch probe'

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x60B9 'Touch probe status'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60B9
Name	'Touch probe status'
Object type	VAR
Data type	UNSIGNED16

The controller must 'Touch probe status' evaluated to detect when the measurements are valid.

The object 'Touch probe status' indicates the status of the function 'Touch probe'.

Data description

Bit	Value	Description
0 (LSB)	0	Touch probe 1 is switched off
	1	Touch probe 1 is enabled
1	0	Touch probe 1 no positive edge value stored
	1	Touch probe 1 positive edge value stored
2	0	Touch probe 1 no negative edge value stored
	1	Touch probe 1 negative edge value stored
3...5	0	Reserved
6...7	-	User defined
8	0	Touch probe 2 is switched off
	1	Touch probe 2 is enabled
9	0	Touch probe 2 no positive edge value stored
	1	Touch probe 2 positive edge value stored
10	0	Touch probe 2 no negative edge value stored
	1	Touch probe 2 negative edge value stored
11...13	0	Reserved
14...15 (MSB)	-	User defined

Bit 1 and bit 2 are set to 0 when touch probe 1 is switched off (object 0x60B8 'Touch probe function' bit 0).
Bit 9 and bit 10 are set to 0 when touch probe 2 is switched off (object 0x60B8 'Touch probe function' bit 8).

This object is used by the following function:
'Touch probe'

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x60BA 'Touch probe position 1 positive value'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60BA
Name	'Touch probe position 1 positive value'
Object type	VAR
Data type	INTEGER32

A positive edge at the probe input 1 stores the actual position value. The stored actual position value can be read at a later time by a PLC.

This object is used by the following function:
'Touch probe'

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	Increments
Default value	0
Min. value	-2147483648
Max. value	2147483647

0x60BB 'Touch probe position 1 negative value'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60BB
Name	'Touch probe position 1 negative value'
Object type	VAR
Data type	INTEGER32

A negative edge at the probe input 1 stores the actual position value. The stored actual position value can be read at a later time by a PLC.

This object is used by the following function:
'Touch probe'

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	Increments
Default value	0
Min. value	-2147483648
Max. value	2147483647

0x60BC 'Touch probe position 2 positive value'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60BC
Name	'Touch probe position 2 positive value'
Object type	VAR
Data type	INTEGER32

A positive edge at the probe input 2 stores the actual position value. The stored actual position value can be read at a later time by a PLC.

This object is used by the following function:
'Touch probe'

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	Increments
Default value	0
Min. value	-2147483648
Max. value	2147483647

0x60BD 'Touch probe position 2 negative value'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60BD
Name	'Touch probe position 2 negative value'
Object type	VAR
Data type	INTEGER32

A negative edge at the probe input 2 stores the actual position value. The stored actual position value can be read at a later time by a PLC.

This object is used by the following function:
'Touch probe'

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	Increments
Default value	0
Min. value	-2147483648
Max. value	2147483647

0x60D0 'Touch probe source'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60D0
Name	'Touch probe source'
Object type	ARRAY
Data type	INTEGER16

The object 0x60D0 'Touch probe source' defines the source of the touch probe functions.

Data description

Bit	Description
-32768 ... -1	Manufacturer-specific
0	Reserved
1	Digital input 1 (Touch probe input)
2	Digital input 2 (Touch probe input)
3	Reserved
4	Reserved
5	Hardware Zero impulse signal of position encoder
6	Software Zero impulse of position encoder
7 - 32767	Reserved

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Touch probe 1 source'
Access	read/write
PDO Mapping	no
Range of values	INTEGER16
Scaling	1
Unit	-
Default value	manufacturer-specific

Sub-index	2
Description	'Touch probe 2 source'
Access	read/write
PDO Mapping	no
Range of values	INTEGER16
Scaling	1
Unit	-
Default value	manufacturer-specific

...

Sub-index	FE
Description	'Touch probe 254 source'
Access	read/write
PDO Mapping	no
Range of values	INTEGER16
Scaling	1
Unit	-
Default value	manufacturer-specific

0x60D1 'Touch probe time stamp 1 positive value'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60D1
Name	'Touch probe time stamp 1 positive value'
Object type	VAR
Data type	INTEGER32

Reserved for AMK internal use!

0x60D2 'Touch probe time stamp 1 negative value'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60D2
Name	'Touch probe time stamp 1 negative value'
Object type	VAR
Data type	INTEGER32

Reserved for AMK internal use!

0x60D3 'Touch probe time stamp 2 positive value'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60D3
Name	'Touch probe time stamp 2 positive value'
Object type	VAR
Data type	INTEGER32

Reserved for AMK internal use!

0x60D4 'Touch probe time stamp 2 negative value'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60D4
Name	'Touch probe time stamp 2 negative value'
Object type	VAR
Data type	INTEGER32

Reserved for AMK internal use!

0x60D5 'Touch probe 1 positive edge counter'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60D5
Name	'Touch probe 1 positive edge counter'
Object type	VAR
Data type	UNSIGNED16

The 'Touch probe 1 positive edge counter' counts the edge change (0 → 1) at the probe input 1.

This object is used by the following function:
'Touch probe'

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x60D6 'Touch probe 1 negative edge counter'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60D6
Name	'Touch probe 1 negative edge counter'
Object type	VAR
Data type	UNSIGNED16

The 'Touch probe 1 negative edge counter' counts the edge change (1 → 0) at the probe input 1.

This object is used by the following function:
'Touch probe'

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x60D7 'Touch probe 2 positive edge counter'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60D7
Name	'Touch probe 2 positive edge counter'
Object type	VAR
Data type	UNSIGNED16

The 'Touch probe 2 positive edge counter' counts the edge change (0 → 1) at the probe input 2.

This object is used by the following function:
'Touch probe'

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x60D8 'Touch probe 2 negative edge counter'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60D8
Name	'Touch probe 2 negative edge counter'
Object type	VAR
Data type	UNSIGNED16

The 'Touch probe 2 negative edge counter' counts the edge change (1 → 0) at the probe input 2.

This object is used by the following function:
'Touch probe'

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	0

0x60E0 'Positive torque limit value'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60E0
Name	'Positive torque limit value'
Object type	VAR
Data type	UNSIGNED16

The 'Positive torque limit value' limits the maximum torque in the positive direction. It must be possible for the drive to realise the entered values.

The following applies for calculating the maximum possible limits:

Legend:

0x...:	0x60E0 or 0x60E1
0x206E:	'Inverter peak current'
0x6075:	'Motor rated current'
0x2212:	'Magnetising current'

For synchronous motors 0x2212 must be set to 0 in the calculation formula!

If the specified torque setpoint requires a higher torque than the torque limit permits, the real-time bit 0x214E 'Message torque: actual value ≥ limit' '|Md| ≥ $|Md_{Limit}|$' is set.

Actual values can not be determined with any accuracy, because of measurement and component tolerances. That means for the control loop, that the real acting limit, actual or setpoint values can differ up to 3 % of the rated torque (proportional to 0x6075 'Motor rated current').

Siehe 'Overview control loops' auf Seite 20.

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	0.1
Unit	$\%M_N$
Default value	120.0

0x60E1 'Negative torque limit value'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60E1
Name	'Negative torque limit value'
Object type	VAR
Data type	UNSIGNED16

The 'Negative torque limit value' limits the maximum torque in the negative direction. It must be possible for the drive to realise the entered values.

The following applies for calculating the maximum possible limits:

Legend:

0x...:	0x60E0 or 0x60E1
0x206E:	'Inverter peak current'
0x6075:	'Motor rated current'
0x2212:	'Magnetising current'

For synchronous motors 0x2212 must be set to 0 in the calculation formula!

If the specified torque setpoint requires a higher torque than the torque limit permits, the real-time bit 0x214E 'Message torque: actual value ≥ limit' '|Md| ≥ $|Md_{Limit}|$' is set.

Actual values can not be determined with any accuracy, because of measurement and component tolerances. That means for the control loop, that the real acting limit, actual or setpoint values can differ up to 3 % of the rated torque (proportional to 0x6075 'Motor rated current').

Siehe 'Overview control loops' auf Seite 20.

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	0.1
Unit	$\%M_N$
Default value	120.0
Note	Object 0x60E1 is internally multiplied by '-1' and must be set positive.

0x60E2 'Modulo value'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60E2
Name	'Modulo value'
Object type	VAR
Data type	UNSIGNED32

The modulo value function must not be set and used in conjunction with Q- and Y-encoder.

The modulo value defines the end value of position data in modulo format. Values that are processed by modulo are between zero and the modulo end value. If the modulo end value is reached, the position data runs over and start at '0'. A linear relationship results in a serrated-form position data curve.

Siehe '0x204C 'Position data scaling'' auf Seite 92.
Siehe '0x2221 'AMK operation modes'' auf Seite 140.

Entry description

Access	read/write
PDO mapping	yes
Range of values	UNSIGNED32
Scaling	1
Unit	Increments
Default value	20000

0x60E3 'Supported homing methods'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60E3
Name	'Supported homing methods'
Object type	ARRAY
Data type	INTEGER16

This object 0x60E3 'Supported homing methods' defines the supported homing methods of the drive.

Data description

Bit	Description
0 (LSB) -7	Supported homing methods Siehe '0x6098 'Homing method'' auf Seite 316.
8-15	Reserved

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-254
Scaling	1
Unit	-
Default value	manufacturer-specific

Sub-index	1
Description	'1st supported homing method'
Access	read
PDO Mapping	no
Range of values	INTEGER16
Scaling	1
Unit	-
Default value	manufacturer-specific

Sub-index	2
Description	'2nd supported homing method'
Access	read
PDO Mapping	no
Range of values	INTEGER16
Scaling	1
Unit	-
Default value	manufacturer-specific

...

Sub-index	FE
Description	'254th supported homing method'
Access	read
PDO Mapping	no
Range of values	INTEGER16
Scaling	1
Unit	-
Default value	manufacturer-specific

0x60F4 'Following error actual value'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60F4
Name	'Following error actual value'
Object type	VAR
Data type	INTEGER32

The difference between the position setpoint and the actual position value is shown as a follow error (control deviation of the position controller) in 0x60F4 in the position control operating mode.

The following applies:

Position setpoint: 0x607A 'Target position' + internal interpolator (IPO) + pulse encoder input
Actual position value: 0x6064 'Position actual value'

Siehe 'Overview control loops' auf Seite 20.

Entry description

Access	read
PDO mapping	yes
Range of values	INTEGER32
Scaling	1
Unit	Increments
Default value	0

0x60F9 'Velocity control parameter set'

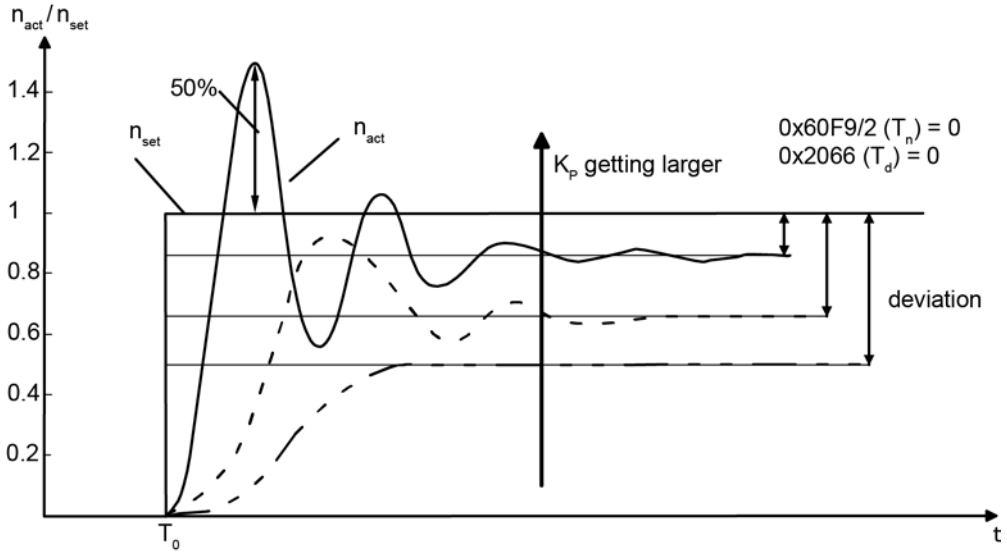
Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60F9
Name	'Velocity control parameter set'
Object type	ARRAY
Data type	UNSIGNED16

The 0x60F9/1 'Gain' of the speed controller must be optimised for the application.

Transfer function of the speed controller circuit, effect 0x60F9/1 'Gain' (K_P)



Course of the actual speed of the speed controller circuit for an erratic change of the speed setpoint depending on KP (0x60F9/1).

Formula: Parameter dependencies 0x60F9/1

Condition :1 ≤ kpdzl ≤ 32767

Formula: Torque dependency

Legend:

kpdzl:	internal system factor
0x60F9 :	'Gain'
0x206E:	'Inverter peak current'
0x6075:	'Motor rated current'
0x2212:	'Magnetising current' (Only with asynchronous motor, with synchronous motor = 0)
0x233A:	'Nominal torque'
Δn:	Speed controller input variable $\Delta n = n_{set} - n_{actual}$

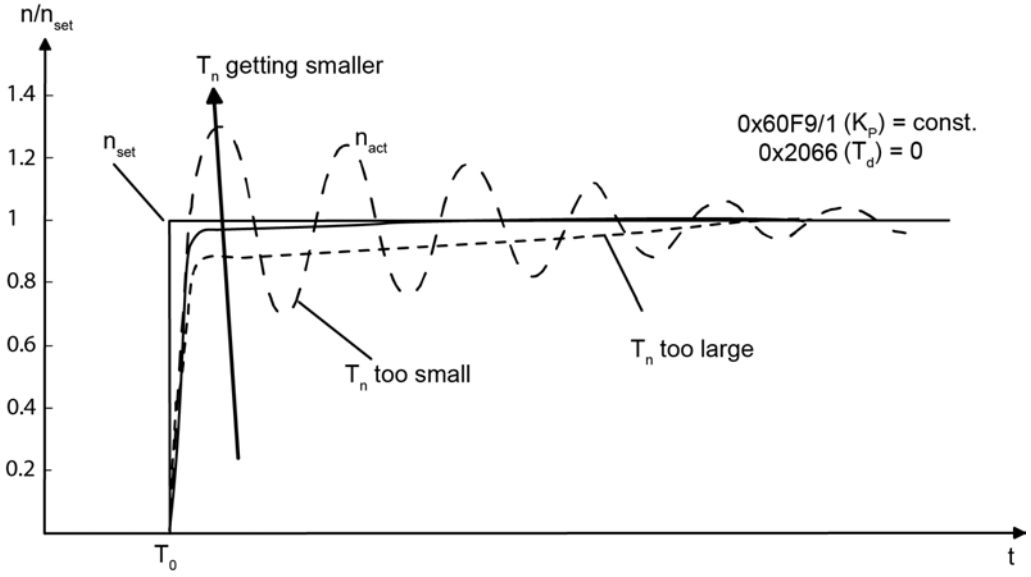
The 0x60F9/2 'Ti - integration time constant' (integral portion) of the speed controller must be optimised by the user.

With the integral portion in the controller, the control deviation resulting from the P-controller is compensated for.

With 0x60F9/2 = 0 ms, the reset time, i.e. the integral part of the speed controller, is ineffective. The speed controller then works as a pure P-controller.

The following figure shows the course of the actual speed of the speed controller circuit for an erratic change of the speed setpoint depending on 0x60F9/2 'Ti - integration time constant'.

Transfer function of the speed controller circuit, effect 0x60F9/2 'Ti - integration time constant' (T_n)



Formula: Parameter dependency 0x60F9/2

Condition:1 ≤ kidzl ≤ 32767

Legend:

kidzl:	internal system factor
0x60F9/1 :	'Gain'
0x60F9/2 :	'Ti - integration time constant'
0x206E:	'Inverter peak current'
0x6075:	'Motor rated current'
0x2212:	'Magnetising current' (Only with asynchronous motor, with synchronous motor = 0)

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	yes
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Gain'
Access	read/write
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	1
Unit	-
Default value	200

Sub-index	2
Description	'Ti - integration time constant'
Access	read/write
PDO mapping	yes
Range of values	UNSIGNED16
Scaling	0.1
Unit	ms
Default value	10.0

0x60FC 'Position demand value'

Supported hardware: KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60FC
Name	'Position demand value'
Object type	VAR
Data type	INTEGER32

Reserved for AMK internal use!

0x60FD 'Digital inputs'

Supported hardware: KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) /

Object description

Index	0x60FD
Name	'Digital inputs'
Object type	VAR
Data type	UNSIGNED32

The status of the digital inputs can be read with the object 0x60FD bit 16 bis 31. The cam signal is fixed defined to bit 2. The signals at bit 0, 1, 2 can be assigned to any binary input of the device.

Data description

Bit	Name	Description
0 (LSB)	Negative limit switch	Code 33941 hardware limit switch, negative direction
1	Positive limit switch	Code 33940 hardware limit switch, positive direction
2	homing switch	
3	Reserved	
4...15	Reserved	
16	Binary input BI1[1)]	
17	Binary input BI2[1)]	
18	Binary input BI3[1)]	
19	Binary input BI4[1)]	
20	Binary input BI5[1)]	
21-31 (MSB)	Binary input BI6 - 16[1)]	

1) The physical availability of the binary inputs depends on the hardware that is used.

Entry description

Access	read
PDO mapping	yes
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

0x60FE 'Digital outputs'

Supported hardware:	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60FE
Name	'Digital outputs'
Object type	ARRAY
Data type	UNSIGNED32

The status of digital outputs on the drive can be read or write with the object 0x60FE/1 in bit 16 to 31. To write the digital outputs via fieldbus, the object 0x2237 'Output port 3' = 0 must be set.

Data description

Bit	Name	Description
0 (LSB)	Set brake[2)]	Bit 0 = 0: Brake close Bit 0 = 1: Brake open
1...15	Reserved	-
16	Binary output BO1[1)]	
17	Binary output BO2[1)]	
18	Binary output BO3[1)]	
19	Binary output BO4[1)]	
20-31(MSB)	Binary output BO5-16[1)]	

1) The physical availability of binary outputs depends on the hardware that is used.
2) With iX inverters, the state of bit 0 is read in system-internal and the output for controlling the motor holding brake is set appropriately.

Entry description

Sub-index	0
Description	number of sub-entries
Access	read
PDO mapping	no
Range of values	1-2
Scaling	1
Unit	-
Default value	2

Sub-index	1
Description	'Physical outputs'
Access	read/write
PDO Mapping	yes
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

Sub-index	2
Description	'Bit mask' defines, which output is used. 0: Output is not used 1: Output can be used
Access	read/write
PDO Mapping	yes
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

0x60FF 'Target velocity'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x60FF
Name	'Target velocity'
Object type	VAR
Data type	INTEGER32

In the speed control operating mode, the controller cyclically writes the speed setpoint values in 0x60FF according to 0x2013 'Communication cycle period'.

Entry description

Access	read/write
PDO mapping	yes
Range of values	INTEGER32
Scaling	0.0001
Unit	1/min
Default value	1000.0000

0x6502 'Supported drive modes'

Supported hardware: KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

Object description

Index	0x6502
Name	'Supported drive modes'
Object type	VAR
Data type	UNSIGNED32

This object 0x6502 'Supported drive modes' gives an overview of the implemented operating modes in the device.
A drive can support more then one and several distinct modes of operation.

Data description

Bit	Description
0 (LSB) - 7	Profile position mode
1	Reserved
2	Profile velocity mode
3	Reserved
4	Reserved
5	Homing mode
6	Reserved
7 - 15	Reserved
16 - 31 (MSB)	Manufacturer-specific

Entry description

Access	read
PDO mapping	no
Range of values	UNSIGNED32
Scaling	1
Unit	-
Default value	0

6 Diagnosis

6.1 Error codes 'Emergency Message'

Error code	Meaning	Defined by
0x2110	'Short circuit/earth leakage'	DS 402
0x2331	'Earth leakage phase U'	DS 402
0x2332	'Earth leakage phase V'	DS 402
0x2333	'Earth leakage phase W'	DS 402
0x3100	'Mains voltage'	DS 301
0x3110	'Mains over-voltage'	DS 402
0x3120	'Mains under-voltage'	DS 402
0x3130	'Phase failure'	DS 402
0x3131	'Phase failure L1'	DS 402
0x3132	'Phase failure L2'	DS 402
0x3133	'Phase failure L3'	DS 402
0x3200	'DC link voltage'	DS 301
0x3210	'DC link over-voltage'	DS 402
0x3220	'DC link under-voltage'	DS 402
0x3330	'Field circuit'	DS 402
0x4110	'Excess ambient temperature'	DS 402
0x4130	'Temperature supply air'	DS 402
0x4210	'Excess temperature device'	DS 402
0x4310	'Excess temperature drive'	DS 402
0x4410	'Excess temperature supply'	DS 402
0x5111	'U1 = supply +/- 15V'	DS 402
0x5113	'U3 = supply +5 V'	DS 402
0x5120	'Supply intermediate circuit'	DS 402
0x5400	'Power section'	DS 402
0x5410	'Output stages'	DS 402
0x5420	'Chopper'	DS 402
0x5510	'Working memory'	DS 402
0x5530	'Non-volatile data memory'	DS 402
0x6010	'Software reset (watchdog)'	DS 402
0x6100	'Internal software'	DS 301
0x6200	'User software'	DS 301
0x6320	'Parameter error'	DS 402
0x7111	'Failure brake chopper'	DS 402
0x7122	'Motor error or commutation malfunction'	DS 402
0x7300	'Sensor'	DS 402
0x8500	'Position controller'	DS 402
0x8600	'Positioning controller'	DS 402
0x8611	'Following error'	DS 402
0xFF00	'Manufacturer specific'	DS 402
0xFF01	'n > nmax'	DS 402
0xFF02	'EF (STO) inactive'	DS 402
0xFF03	'IGBT over current'	DS 402
0xFF04	'Position growth too large'	DS 402
0xFF05	'Device over temperature warning'	DS 402
0xFF06	'Motor temperature warning'	DS 402
0xFF07	'Device overload warning'	DS 402

Error code	Meaning	Defined by
0xFF08	'Device overload error'	DS 402
0xFF09	'Motor overload warning'	DS 402
0xFF0A	'Motor overload error'	DS 402
0xFF10	'EF (STO switch) logic'	DS 402
0xFF11	'Error angle observer specific'	DS 402
0xFF12	'Limit switch'	DS 402

6.2 Diagnostic messages

0x2110 'Short circuit/earth leakage'

Description	• Short-circuit between a phase of the output terminals and PE • Output terminal overcurrent		
Defined by	DS 402		
Class			
Drive Behaviour	Coast to stop		
Device Behaviour	Single treatment		
Additional Error Information (AMK Service)			
Error Removal	• Defective motor connection cable or a defective motor		

0x2331 'Earth leakage phase U'

Description	• Short-circuit between two phases of the output terminals		
Defined by	DS 402		
Class			
Drive Behaviour	Coast to stop		
Device Behaviour	Single treatment		
Additional Error Information (AMK Service)			
Error Removal	• Defective motor connection cable or a defective motor		

0x2332 'Earth leakage phase V'

Description	• Short-circuit between two phases of the output terminals		
Defined by	DS 402		
Class			
Drive Behaviour	Coast to stop		
Device Behaviour	Single treatment		
Additional Error Information (AMK Service)			
Error Removal	• Defective motor connection cable or a defective motor		

0x2333 'Earth leakage phase W'

Description	• Short-circuit between two phases of the output terminals		
Defined by	DS 402		
Class			
Drive Behaviour	Coast to stop		
Device Behaviour	Single treatment		
Additional Error Information (AMK Service)			
Error Removal	• Defective motor connection cable or a defective motor		

0x3100 'Mains voltage'

Description	• Line overvoltage 460 V + 15% or line undervoltage 380 V - 20% present longer than 1 sec.		
Defined by	DS 301		
Class			
Drive Behaviour	Controlled braking		
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Check mains voltage		

0x3110 'Mains over-voltage'

Description	• Mean value of the line voltage is above 530 V (smoothing approx. 6.4 s) • The system is transferred into error 0x5400 'Power section' after the end of the warning time (Object 0x224F 'Warning time').		
Defined by	DS 402		
Class	Warning → Error		
Drive Behaviour			
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Check mains voltage		

0x3120 'Mains under-voltage'

Description	• Mean value of the line voltage is below 350 V (smoothing approx. 6.4 s) • The system is transferred into error 0x5400 'Power section' after the end of the warning time (Object 0x224F 'Warning time'		
Defined by	DS 402		
Class	Warning → Error		
Drive Behaviour			
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Check mains voltage		

0x3130 'Phase failure'

Description	• Connections of the corresponding phases are confused at the terminals		
Defined by	DS 402		
Class			
Drive Behaviour			
Device Behaviour	System run-up aborted		
Additional Error Information (AMK Service)			
Error Removal	• Line connection L1, L2 or L3 not correct		

0x3131 'Phase failure L1'

Description	• Error in the power feed because of a faulty connection or fuse defect		
Defined by	DS 402		
Class			
Drive Behaviour			
Device Behaviour	System run-up aborted		
Additional Error Information (AMK Service)			
Error Removal	• Line connection L1 not correct or fuse defect		

0x3132 'Phase failure L2'

Description	• Error in the power feed because of a faulty connection or fuse defect		
Defined by	DS 402		
Class			
Drive Behaviour			
Device Behaviour	System run-up aborted		
Additional Error Information (AMK Service)			
Error Removal	• Line connection L2 not correct or fuse defect		

0x3133 'Phase failure L3'

Description	• Error in the power feed because of a faulty connection or fuse defect		
Defined by	DS 402		
Class			
Drive Behaviour			
Device Behaviour	System run-up aborted		
Additional Error Information (AMK Service)			
Error Removal	• Line connection L3 not correct or fuse defect		

0x3200 'DC link voltage'

Description	• Short circuit DC bus voltage		
Defined by	DS 301		
Class	Error		
Drive Behaviour			
Device Behaviour	System run-up aborted		
Additional Error Information (AMK Service)			
Error Removal			

0x3210 'DC link over-voltage'

Description	• DC bus voltage increases above the set limit.		
Defined by	DS 402		
Class	Error		
Drive Behaviour			
Device Behaviour	RF setting aborted		
Additional Error Information (AMK Service)			
Error Removal	• Check object 0x2347 'DC bus monitor upper limit' • Check power supply		

0x3220 'DC link under-voltage'

Description	• DC bus error • Missing DC bus voltage at state 'SWITCHED ON' or when switching to the state 'SWITCHED ON'		
Defined by	DS 402		
Class	Error		
Drive Behaviour			
Device Behaviour	System run-up aborted		
Additional Error Information (AMK Service)			
Error Removal	• Check power supply • Check cabling		

0x3330 'Field circuit'

Description	• Multiple inadmissibly high currents in the regeneration branch		
Defined by	DS 402		
Class	Error		
Drive Behaviour			
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Power defect, check line voltage system		

0x4110 'Excess ambient temperature'

Description	• The air inlet temperature is more than 45 °C		
Defined by	DS 402		
Class	Warning		
Drive Behaviour			
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Check cooling system		

0x4130 'Temperature supply air'

Description	• Device thermal overload • Fan on the device does not run		
Defined by	DS 402		
Class	Warning		
Drive Behaviour			
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Check cooling system		

0x4210 'Excess temperature device'

Description	• The temperature acquisition at the braking resistor has responded		
Defined by	DS 402		
Class	Error		
Drive Behaviour			
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Check braking resistor • Check your energy management		

0x4310 'Excess temperature drive'

Description	• The thermal overload limit of the motor is reached		
Defined by	DS 402		
Class	Error		
Drive Behaviour			
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Check cooling system		

0x4410 'Excess temperature supply'

Description	• Power supply unit thermally overloaded		
Defined by	DS 402		
Class	Warning		
Drive Behaviour			
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Check your energy management		

0x5111 'U1 = supply +/- 15V'

Description	• Internal supply voltage is outside the permitted limit		
Defined by	DS 402		
Class			
Drive Behaviour	Coast to stop		
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Hardware defect		

0x5113 'U3 = supply +5 V'

Description	• Internal logic supply voltage is outside the permitted limit		
Defined by	DS 402		
Class			
Drive Behaviour	Coast to stop		
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Hardware defect		

0x5120 'Supply intermediate circuit'

Description	• Shifting of Y-point		
Defined by	DS 402		
Class	Warning		
Drive Behaviour			
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• 'Clear error' inadmissible, first clear cause of fault		

0x5400 'Power section'

Description	• Mains failure of one or several phases		
Defined by	DS 402		
Class	Error		
Drive Behaviour	Controlled braking		
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Check terminals		

0x5410 'Output stages'

Description	• Short-circuit / overload digital outputs		
Defined by	DS 402		
Class	Error		
Drive Behaviour	Coast to stop		
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Check monitored digital outputs • Fix short-circuit / overload		

0x5420 'Chopper'

Description	• Brake acknowledgment does not correspond to the expected value • Plausibility monitoring, object 0x2215.13 = 1 ('Service bits') is active		
Defined by	DS 402		
Class			
Drive Behaviour	Controlled braking		
Device Behaviour			
Additional Error Information (AMK Service)			

Error Removal	• Wire break Inverter / Brake
	• Check connection cables for damage
	• Brake defect
	• Recheck objects:
	  • 0x20CE 'Drive on delay time'
	  • 0x20CF 'Drive off delay time'		

0x5510 'Working memory'

Description	• RAM memory error, is checked during system initialization		
Defined by	DS 402		
Class			
Drive Behaviour	System run-up aborted		
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Hardware defect		

0x5530 'Non-volatile data memory'

Description	• Fault access to non-volatile memory chips		
Defined by	DS 402		
Class			
Drive Behaviour	System run-up aborted		
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Hardware defect		

0x6010 'Software reset (watchdog)'

Description	• Watchdog error		
Defined by	DS 402		
Class			
Drive Behaviour	System run-up aborted		
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• External fault, system OFF/ON, (HW reset)		

0x6100 'Internal software'

Description	• Software error or following error by fault parameter configuration		
Defined by	DS 301		
Class			
Drive Behaviour	System run-up aborted		
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Check system • Check parameter configuration		

0x6200 'User software'

Description	• Watchdog in motion controller		
Defined by	DS 301		
Class			
Drive Behaviour	Controlled braking		
Device Behaviour	System run-up aborted		
Additional Error Information (AMK Service)			
Error Removal	• Check motion controller software		

0x6320 'Parameter error'

Description	• Error in parameter configuration		
Defined by	DS 402		
Class			
Drive Behaviour			
Device Behaviour	System run-up aborted		
Additional Error Information (AMK Service)			
Error Removal	• Check data set		

0x7111 'Failure brake chopper'

Description	• Error in braking transistor function		
Defined by	DS 402		
Class			
Drive Behaviour			
Device Behaviour	System run-up aborted		
Additional Error Information (AMK Service)			
Error Removal	• Check indices for brake function		

0x7122 'Motor error or commutation malfunction'

Description	• A fault has occurred during the evaluation of the commutation angle		
Defined by	DS 402		
Class	Error		
Drive Behaviour	Coast to stop		
Device Behaviour	Controller enable (RF) is withdrawn		
Additional Error Information (AMK Service)			

Error Removal	• Object 0x2215.28 = 0 ('Service bits')
	  • The commutation was not able to evaluate a position
	  • Motor must be able to move freely
	  • Motor current to small
	  • Wrong direction of rotation
	  • RF was withdrawn during the SW commutation
	  • Check limit values in object 0x2299 'SWK monitoring'
	• Object 0x2215.28 = 1 ('Service bits')
	  • Motor phases mixed up or mechanical movement to negative direction
	  • Axis would 'bolt' or mechanical movement to positive direction
	  • Axis is blocked to positive direction or encoder does not work correctly
	  • Motor phases mixed up or mechanical movement to positive direction
	  • Axis would 'bolt' or mechanical movement to negative direction
	  • Axis is blocked to negative direction or encoder does not work correctly		

0x7300 'Sensor'

Description	• Motor encoder defective		
Defined by	DS 402		
Class			
Drive Behaviour	Coast to stop		
Device Behaviour	System run-up aborted		
Additional Error Information (AMK Service)			
Error Removal	• Check encoder cable for damage • Check encoder error bit		

0x8500 'Position controller'

Description	• Fault in command functions		
Defined by	DS 402		
Class			
Drive Behaviour	Coast to stop		
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Check object for command function • Check controller enable signal (RF) before starting • Check limits for drive interpolation		

0x8600 'Positioning controller'

Description	• Direction of rotation monitoring recognizes defect on activating RF (only motor operation) • Setpoint stop active • Limit switch monitoring		
Defined by	DS 402		
Class			
Drive Behaviour			
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Encoder tracks reversed polarity, output terminal phase sequence • Check limit switch, replace if necessary • Check signal wiring, replace if necessary		

0x8611 'Following error'

Description	• Position control difference has exceeded the increment number defined by means of object 0x6065 'Following error window'		
Defined by	DS 402		
Class			
Drive Behaviour	Controlled braking		
Device Behaviour			
Additional Error Information (AMK Service)			

Error Removal	• Recheck objects:
	  • 0x2026 'Positive velocity limit'
	  • 0x2027 'Negative velocity limit'
	  • 0x2068 'Position loop factor'
	  • 0x6065 'Following error window'
	  • 0x60E0 'Positive torque limit value'
	  • 0x60E1 'Negative torque limit value'
	  • 0x60F9/1 'Gain'
	  • 0x60F9/2 'Ti - integration time constant'		

0xFF00 'Manufacturer specific'

Description	• Configuration error		
Defined by	DS 402		
Class			
Drive Behaviour			
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Check all objects		

0xFF01 'n > nmax'

Description	• Safety shutdown in the inverter • Actual speed was more than 1.25 * object 0x6080 'Maximal motor speed'		
Defined by	DS 402		
Class			
Drive Behaviour	Coast to stop		
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Motor encoder faulty		

0xFF02 'EF (STO) inactive'

Description	• STO (safe torque off) and controller enable RF is active		
Defined by	DS 402		
Class			
Drive Behaviour			
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Check STO state		

0xFF03 'IGBT over current'

Description	• IGBT monitoring in PWM device detects overcurrent		
Defined by	DS 402		
Class			
Drive Behaviour			
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Check drive load / motor sizing • Check overload by measuring motor torque • Reduce load (torque limit) optimize gain settings		

0xFF04 'Position growth too large'

Description	• Inverter cannot process the cyclic 32-bit position setpoint growth per 500 µs (sampling time)		
Defined by	DS 402		
Class			
Drive Behaviour	Controlled braking		
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Wrong 32-bit input of setpoint by user • Fault of the bus system		

0xFF05 'Device over temperature warning'

Description	• Device shuts down after object 0x224F 'Warning time' with error 0x4210 'Excess temperature device'		
Defined by	DS 402		
Class	Warning		
Drive Behaviour			
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Check cooling system		

0xFF06 'Motor temperature warning'

Description	• Motor overtemperature warning or PTC resistor interruption • Device shuts down after object 0x224F 'Warning time' with error 0x4310 'Excess temperature drive'		
Defined by	DS 402		
Class	Warning		
Drive Behaviour			
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Check cooling system		

0xFF07 'Device overload warning'

Description	• Current actual values infringe the overload threshold object 0x225E 'Overload limit inverter'of the I^2t calculation • Switching off the drive with 0xFF08 'Device overload error' at 100% overload		
Defined by	DS 402		
Class	Warning		
Drive Behaviour			
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Motor incorrectly connected • Check motor parameters • No or incorrect encoder channel connected • Incorrect number of encoder periods defined		

0xFF08 'Device overload error'

Description	• Current actual values infringe the overload threshold object 0x225E 'Overload limit inverter'of the I^2t calculation		
Defined by	DS 402		
Class	Error		
Drive Behaviour	Coast to stop		
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Motor incorrectly connected • Check motor parameters • No or incorrect encoder channel connected • Incorrect number of encoder periods defined		

0xFF09 'Motor overload warning'

Description	• The thermal overload limit of the motor is reached • Shutting down the drive with error 0xFF0A 'Motor overload error' after the time object 0x224F 'Warning time'		
Defined by	DS 402		
Class	Warning		
Drive Behaviour			
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Check the mechanical system		

0xFF0A 'Motor overload error'

Description	• The thermal overload limit of the motor is reached		
Defined by	DS 402		
Class	Error		
Drive Behaviour			
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Check the mechanical system		

0xFF10 'EF (STO switch) logic'

Description	• The selected EF (STO switch) monitor has responded		
Defined by	DS 402		
Class			
Drive Behaviour	Coast to stop		
Device Behaviour			
Additional Error Information (AMK Service)			
Error Removal	• Check EF (STO switch) wiring		

0xFF11 'Error angle observer specific'

Description	• Error angle observer
Defined by	DS 402
Class	Error
Drive Behaviour	Controlled braking
Device Behaviour	
Additional Error Information (AMK Service)	

Error Removal	• Check encoder and encoder wiring
	• Recheck objects:
	  • 0x2273/1 'Inductance path D'
	  • 0x2273/2 'Inductance path Q'
	  • 0x2293 'Terminal resistance'
	  • 0x2296 'Terminal inductance'
	  • 0x22BC 'Phase resistance'
	  • 0x22D5 'Max. angle difference encoder-SL'
	• If possible to increase objects 0x22F0 'Starting current' for further torque. The torque ramps setting slower for less torque by the acceleration
	• Recheck objects:
	  • 0x2066 'Differentiating time speed control TD'
	  • 0x221C 'Acceleration ramp'
	  • 0x221D 'Deceleration ramp'
	  • 0x221E 'Deceleration ramp RF inactive'
	  • 0x22F0 'Starting current'
	  • 0x60F9/1 'Gain'
	  • 0x60F9/2 'Ti - integration time constant'

0xFF12 'Limit switch'

Description	• Limit switch monitoring
Defined by	DS 402
Class	
Drive Behaviour	Controlled braking
Device Behaviour	
Additional Error Information (AMK Service)	
Error Removal	• Check the limit switch contacts • Check limit switch wiring

7 Appendix

7.1 Codes for the configuration of the binary outputs

Codes for the configuration of the binary outputs

Code	Designation	Description	KW-R24 /	KW-R24-R / KW-R25 / KW-R26 / KW-R27 /	KE (N,S)-xEx /	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /
0	Function inactive	No function assigned to the binary output	■	■	■	■
310	Warning: Motor overload	Maximum load integral i^2t of the motor according to 0x2072 'Overload limit motor'	■	■	-	■
311	Warning: excess converter temperature Note: same as code 33017	Temperature of the device rear wall or value according to the temperature model is too high, diagnostic message 0xFF05 'Device over temperature warning'	■	■	-	-
312	Warning: excess motor temperature Note: same as code 33018	Value at the sensor input X12 or according to 0x2295 is too high, diagnostic message 0xFF09 'Motor overload warning'	■	■	-	-
313	Warning: excess air temperature Note: same as code 33021	Diagnosis 0x4110 'Excess ambient temperature'	■	■	-	-
330	$n_{actual} = n_{target}$	$\lvert n_{target} - n_{actual} \rvert <$ 0x209D 'Velocity window'	■	■	-	■
331	$n_{actual} < n_{min}$	$\lvert n_{actual} \rvert <$ 0x207C 'Zero velocity window'	■	■	-	■
332	$n_{actual} < n_x$	$\lvert n_{target} - n_{actual} \rvert <$ 0x207D 'Velocity threshold'	■	■	-	■
333	$M_d \geq M_{dx}$	$M_{actual} \geq$ 0x207E 'Torque threshold'	■	■	-	■
334	$M_{Target} \geq M_{Limit}$	$M_{Target} \geq$ 0x60E0 'Positive torque limit value' or $M_{Target} \leq$ 0x60E1 'Negative torque limit value'	■	■	-	■
335	$n_{Target} \geq n_{Limit}$	$n_{Target} \geq$ 0x2026 'Positive velocity limit' or $n_{Target} \leq$ 0x2027 'Negative velocity limit'	■	■	-	■
336	In Position	$\lvert x_{targetl} - x_{actual} \rvert <$ 0x6067 'Position window'	-	■	-	■
337	$P \geq P_x$	$P_{actual} \geq$ 0x209E 'Power threshold'	■	■	-	■
400	Cam	Cam, cam signal, homing switch	-	■	-	■
403	Homing point known	Homing point is valid	-	■	-	■
409	Measured value 1 positive edge detected (MT1)	Actual position value is stored in 0x60BA 'Touch probe position 1 positive value'	-	■	-	■
410	Measured value 1 negative edge detected (MT1)	Actual position value is stored in 0x60BB 'Touch probe position 1 negative value'	-	■	-	■

Code	Designation	Description	KW-R24 /	KW-R24-R / KW-R25 / KW-R26 / KW-R27 /	KE (N,S)-xEx /	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /
411	Measured value 2 positive edge detected (MT2)	Actual position value is stored in 0x60BC 'Touch probe position 2 positive value'	-	■	-	■
412	Measured value 2 negative edge detected (MT2)	Actual position value is stored in 0x60BD 'Touch probe position 2 negative value'	-	■	-	■
33013	X_{actual} ≤ -Soft end position limit switch	0x607D/1 'Negative position limit' reached	-	■	-	■
33014	Position synchronization	|position control difference| ≤ 0x2252 'At synchron speed window'	-	■	-	■
33015	X_{actual} ≥ +Soft end position limit switch	0x607D/2 'Positive position limit' reached	-	■	-	■
33016	Warning: Converter overcurrent	Maximum load integral i^2t of the converter according to 0x225E 'Overload limit inverter', diagnostic message 0xFF07 'Device overload warning'	■	■	■	■
33017	Warning: excess converter temperature	Temperature of the device rear wall or value according to the temperature model is too high, diagnostic message 0xFF05 'Device over temperature warning'	■	■	■	■
33018	Warning: excess motor temperature	Value at the sensor input X12 or according to 0x2295 'Temperature sensor motor' is too high, diagnostic message 0xFF09 'Motor overload warning'	■	■	-	■
33021	Warning: excess air temperature	Diagnosis 0x4110 'Excess ambient temperature'	■	■	-	■
33022	Warning: excess temperature of external components	KE(N,S)-xEx / KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / Power supply KE(N,S): Brake resistor	■	■	■	■
33029	System ready message (SBM)	System ready message	■	■	■	■
33030	Acknowledgement DC bus ON (QUE)	Acknowledgement DC bus charged	■	■	■	■
33031	Acknowledgement controller enable (QRF)	Acknowledgement that the drive is operating in control loop	■	■	-	■
33032	Controller enable (RF) set	Control input of controller enable set	■	■	-	■
33034	Commanding (KMD) active	Drive function is active	■	■	-	■
33035	Interpolator (IPO) active	Internal interpolator is active	-	■	-	■
33036	Homing point known	Homing point is valid	-	■	-	■
33048	Residual distance deleted	| dx | > 0x2244 'Residual distance erase window'	-	■	-	■

Code	Designation	Description	KW-R24 /	KW-R24-R / KW-R25 / KW-R26 / KW-R27 /	KE (N,S)-xEx /	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /
33052	Control of the motor holding brake	Controlling motor holding brake BA3 = 0: Motor holding brake is closed by the drive BA3 = 1: Motor holding brake is opened by the drive This object is used by the following function: 'Controlling motor holding brake'	■	■	-	■
33058	Parameter set 0 active	Valid from QRF message	■	■	-	■
33059	Parameter set 1 active	Valid from QRF message	■	■	-	■
33060	Parameter set 2 active	Valid from QRF message	■	■	-	■
33061	Parameter set 3 active	Valid from QRF message	■	■	-	■
33062	Main operating mode active	0x2221/1 'AMK main operation mode' is active	■	■	-	■
33063	Secondary operating mode 1 active	0x2221/2 'AMK secondary operation mode 1' is active	■	■	-	■
33064	Secondary operating mode 2 active	0x2221/3 'AMK secondary operation mode 2' is active	■	■	-	■
33065	Secondary operating mode 3 active	0x2221/4 'AMK secondary operation mode 3' is active	■	■	-	■
33066	Secondary operating mode 4 active	0x2221/5 'AMK secondary operation mode 4' is active	■	■	-	■
33067	Secondary operating mode 5 active	0x2221/6 'AMK secondary operation mode 5' is active	■	■	-	■
33068	AMK secondary operating mode 6 active	0x2221/7 'AMK secondary operation mode 6' is active	■	■	-	■
33069	AMK secondary operating mode 7 active	0x2221/8 'AMK digital torque control' is active	■	■	-	■
33070	AMK secondary operating mode 8 active	0x2221/9 'AMK position control' is active	-	■	-	■
33071	AMK secondary operating mode 9 active	0x2221/A 'AMK digital speed control' is active	■	■	-	■
33074	Collective warning active	Collective warning (all warning messages OR linked) The warning bit is generated for each warning and remains active until the error is deleted by the user.	■	■	■	■
33075	Fan triggering	Signal for triggering a fan at the compact power supply; the signal is switched on at 78% of the shutdown temperature. If the temperature is fallen below, the fan runs for another 1 minute. AMK service (shutdown temperature [0.1%] SEEP 0x2279 Element 39) (special lift feature)	-	-	■	-

Code	Designation	Description	KW-R24 /	KW-R24-R / KW-R25 / KW-R26 / KW-R27 /	KE (N,S)-xEx /	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /
33076	Second cycle output	The output changes cyclically between 1 second ON and 1 second OFF	■	■	■[4)]	■
33079	Output 24 V DC	Configurate the binary output as voltage supply (note the max. current load of the devices!)	■	■	-	■
33123	VBNX	For the uninterruptible power supply triggering (extend mains failure display)	-	-	■	-
33131	Stop acknowledgement for positive setpoint processing	Positive setpoint settings in position or speed control are not carried out	■	■	-	■
33132	Stop acknowledgement for negative setpoint processing	Negative setpoint settings in position or speed control are not carried out	■	■	-	■
33133	Power output stage enable control signal (EF AND EF2)	The input signal EF AND EF2 is mirrored at the binary output, which, for example, can be read by a PLC.	■	■	-	-
33135	Power output stage enable control signal (EF2)	KW-R24 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / The input signal EF2 is mirrored at the binary output, which, for example, can be read by a PLC. Internal generated STO signal (2nd channel)	■	■	-	■
33136	Power output stage enable control signal (EF or STO)	The input signal EF or STO is mirrored at the binary output, which, for example, can be read by a PLC.	■	■	-	■
33142	Acknowledgment software commutation	The function software commutation for synchronous motors with I- or square-wave encoders has been successfully executed, the motor is commutated. If an encoder error, the bit is cleared. The software commutation runs automatically after a 0 → 1 edge of the signal controller enable (RF).	■	■		■
33919	'Warning: overload of external mains components'		-	-	■	-
33920	'Warning: BRN readiness of the mains regeneration'	This output is logically 1 when the regeneration in compact power supply (S) is briefly inactive due to the mains voltage or overcurrent error. The pulse duration is at least 22 ms.	-	-	■	-
33921	PWM inactive	Display status if the power output stage is energized or free of current = 0 PWM is active, pulses are enabled, power output stage is energized = 1 PWM is inactive, pulses are disabled, power output stage is free of current	■	■	-	■

Code	Designation	Description	KW-R24 /	KW-R24-R / KW-R25 / KW-R26 / KW-R27 /	KE (N,S)-xEx /	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /
33922	Encoder signal invalid	Display status if the encoder signal is valid or an encoder failure occurs = 0 Encoder signal valid = 1 Encoder signal is invalid, encoder failure	-	■	-	■
33923	Deceleration ramp after RF inactive	Display status if deceleration after internal switch off RF is active = 0 normal operation = 1 Deceleration active, according to 0x221E 'Deceleration ramp RF inactive'	■	■	-	■
33924	Dynamic braking (Regenerative braking if encoder failure)	Display status if the function 'Dynamic braking' is active: = 0 normal operation = 1 Dynamic braking is active Siehe '0x2215 'Service bits" auf Seite 130.	-	■	-	■
33925	Status of a connected brake	= 0 brake closed = 1 brake opened Siehe 'Codes for the configuration of the binary inputs' auf Seite 357. Code 33906	■	■	-	■ 6)
33930	Input bit 0 port 3 3)	The status of the input bits at the device can be assigned to a binary output	■	■	-	■ 5)
33931	Input bit 1 port 3 3)		■	■	-	■ 5)
33932	Input bit 2 port 3 3)		■	■	-	■ 5)
33933	Input bit 3 port 3 3)		■	■	-	■ 5)
33934	Input bit 4 port 3 3)		■	■	-	■ 5)
33935	Input bit 5 port 3 3)		■	■	-	■ 5)
33936	Input bit 6 port 3 3)		■	■	-	■ 5)
33937	Input bit 7 port 3 3)		■	■	-	■ 5)
33942	Access via plc	The output can be written by a plc controller	■	■	■	■

3) Available depending on the hardware
5) Not available for ihXT
6) only for: iX(-R3) / iC(-R3) / iDT5(-R3) /ihXT /

7.2 Codes for the configuration of the binary inputs

Codes for the configuration of the binary inputs

Code	Designation	Description	KW-R24 /	KW-R24-R / KW-R25 / KW-R26 / KW-R27 /	KE (N,S)-xEx /	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /
0	Function inactive	No function assigned to the binary input	■	■	■	■
400	Homing switch (cam)	For cam see 32905	-	■	-	■
401	Touch probe (MT1)	Measurement signal 1 for touch probe function only at BE3 (0x2258/3 'Input port 3 bit 2')	-	■	-	■
402	Touch probe (MT2)	Measurement signal 2 for touch probe function only at BE2 (0x2258/2 'Input port 3 bit 1')	-	■	-	■
32903	DC bus ON (UE)	Charge DC bus	■	■	■	■
32904	Controller enable (RF)	Activate control	■	■	-	■
32905	Homing switch (cam)	Cam signal, e.g. for the homing cycle	-	■	-	■
32912	Reset "homing point known"	Clear "homing point known"	-	■	-	■
32913	Clear error (FL)	Existing errors in the drive are reset	■	■	■	■
33700	Activate main operating mode	Change operating mode to the main operating mode (0x2221/1 'AMK main operation mode')	■	■	-	■
33701	Activate secondary operating mode 1	Change operating mode to the auxiliary operating mode 1 (0x2221/2 'AMK secondary operation mode 1')	■	■	-	■
33702	Activate secondary operating mode 2	Change operating mode to the auxiliary operating mode 2 (0x2221/3 'AMK secondary operation mode 2')	■	■	-	■
33703	Activate secondary operating mode 3	Change operating mode to the auxiliary operating mode 3 (0x2221/4 'AMK secondary operation mode 3')	■	■	-	■
33704	Activate secondary operating mode 4	Change operating mode to the auxiliary operating mode 4 (0x2221/5 'AMK secondary operation mode 4')	■	■	-	■
33705	Activate secondary operating mode 5	Change operating mode to the auxiliary operating mode 5 (0x2221/6 'AMK secondary operation mode 5')	■	■	-	■
33708	Stop / cancel CMD	The drive changes to the operating mode of digital speed control with the setpoint 0 regardless of the current operating mode	■	■	-	■
33709	Dig. Speed control N = 0 U/min	CMD digital speed control Speed setpoint N-setpoint= 0, ramp active	■	■	-	■
33710	Dig. Speed control N = 0x2024	CMD digital speed control Speed setpoint N-setpoint 0x2024, ramp active	■	■	-	■
33711	Homing cycle	CMD homing cycle for homing point (Xi=0)	-	■	-	■
33721	Dig. Torque control M = 0 %Nm	CMD digital torque control Torque setpoint M-setpoint = 0	■	■	-	■

Code	Designation	Description	KW-R24 /	KW-R24-R / KW-R25 / KW-R26 / KW-R27 /	KE (N,S)-xEx /	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /
33722	Dig. Torque control M = 0x6071	CMD digital torque control Torque setpoint M-setpoint = 0x6071	■	■	-	■
33727	Extended I/O control	This object is used by the following function: 'Binary I/O control'	-	-	-	■[1)]
33730	System booting	Complete parameter calculation for inactive controller enable. The recalculation otherwise takes place only after the mains is on, error cleared and RF is activated after changing the parameter.	-	-	■	-
33735	Control of the motor holding brake	Manual control of the motor holding brake via digital input 0 → 1 edge: Open motor holding brake 1 → 0 edge: Close motor holding brake This object is used by the following function: 'Controlling motor holding brake'	■	■	-	■
33906	Acknowledgement signal of the motor holding brake (QBR)	Acknowledgement motor holding brake (QBR) QBR = 1: Motor holding brake closed QBR = 0: motor holding brake opened (QBR is supplied by the motor holding brake) This object is used by the following function: 'Controlling motor holding brake'	■	■	-	■
33909	Stop positive setpoint processing	If the configured binary input falls to zero volts (low active), the setpoint block takes place in the position or speed control within 2 ms. If the input is set, the setpoint enable takes place within 2 ms.	■	■	-	■
33910	Stop negative setpoint processing	If the configured binary input falls to zero volts (low active), the setpoint block takes place in the position or speed control within 2 ms. If the input is set, the setpoint enable takes place within 2 ms.	■	■	-	■
33917	Analog speed control	Selection of the analogue input with the analogue speed control (0x2221/1 - 0x2221/A 'AMK operation modes')	-	-	-	■

Code	Designation	Description	KW-R24 /	KW-R24-R / KW-R25 / KW-R26 / KW-R27 /	KE (N,S)-xEx /	iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /
33938	Extended I/O control	This object is used by the following function: 'Binary I/O control'	-	-	-	■[1)]
33939	Extended I/O control	This object is used by the following function: 'Binary I/O control'	-	-	-	■[1)]
33940	Hardware limit switch positive direction	The drive is braking according 0x221E 'Deceleration ramp RF inactive' until standstill and switch off the controller enable signal, if a signal is active on this input. The controller enable signal must be set again, that the drive can be moved off the hardware limit switch in opposite direction.	-	■	-	■
33941	Hardware limit switch negative direction	The hardware limit switch function is not active if the function homing cycle with hardware limit switch evaluation (ID147 bit 9) is active! Siehe '0x21DE 'Limit switch status'' auf Seite 125. Siehe '0x2014 'Limit switch control'' auf Seite 84.	-	■	-	■

1) Not available for ihXT

Glossary

A

A1
Analog input 1

ACC
AMK CAN Communication (CAN bus interface with standard CANopen protocol DS301 and additional hardware synchronization signal)

AIPEX
AMK startup and parameterizing software (PC software): Programming, parameterization, configuration, diagnosis, oscilloscope, status information

ARRAY
List with equal format elements

ASCII
American Standard Code for Information Interchange

AT
Drive telegram from slave to master

B

BAx
Digital output on controller card (BA1, BA2, BA3)

BEx
Digital input on controller card (BE1, BE2, BE3)

BIN
Binary (digital)

C

CoE
CAN application protocol over EtherCAT

CRC
Cyclic redundancy check (Checksum)

CMD
Commanding

CiA 402
CAN in Automation / CAN bus Draft Standard Proposal 402 Device Profile (Commanding protocol for drives)

CAN
Controller Area Network

D

DO
Digital output

Default
Factory setting

DEZ
Decimal

DRIVE
Drive-specific parameter (Value is valid inside only one parameter set)

DSP 402
CAN bus Draft Standard Proposal 402 Device Profile (Commanding protocol for drives)

DZR
Speed control

DI
Digital input

E

EtherCAT
Real-time Ethernet bus

EnDat 2.2
Motor encoder interface protocol of the company Heidenhain

EnDat 2.1
Motor encoder interface protocol of the company Heidenhain

E-encoder
Absolute encoder, singleturn, EnDAT 2.1 with additional sine and cosine track

EF
Power output stage enable

EF2
Power output stage enable

F

F-encoder
Absolute encoder, multiturn, EnDAT 2.1 with additional sine and cosine track

FIPO
Fine interpolator

Firmware
System software, loaded by AMK

FL
Command (Causes a new system run-up)

FORMAL
Formal parameter

Formal parameter
Formal parameters don't have remanent values in parameter handling

FSoE
Fail-Safe over EtherCAT

FTP
File transfer protocol

G

GLOBAL
Global parameter; valid for all parameter sets

H

Homing switch
Cam

H-encoder
Encoder with Hall sensors (Contains one sine and cosine track per rotation or per pair of poles on linear measuring systems)

Hiperface
Motor encoder interface protocol of the company Sick Stegmann

HEX
Hexadecimal, 0x...

Hiperface DSL
Motor encoder interface protocol of the company Sick Stegmann

I

INTEGER 32
Data range -2147483648 .. 2147483647

ihXT
AMKASMART Servo motors with integrated inverter

iX
AMKASMART decentralized inverter

INTEGER 8
Data range -128 .. +127

IPO
Interpolator

INTEGER 16
Data range -32768 .. +32767

IGBT
Power electronic component, e. g. transistor

i²t
Integral of the squared current over time

iC
AMKASMART decentralized inverter with power supply

I/O
Input / output

iDT
AMKASMART Servo motors with integrated inverter

ID
Parameter identification numbers acc. to SERCOS Standard

Instance
Parameters, depending on the fieldbus, are instanced. For each bus, different values can be parameterized (bus depending participant address, transmission rate etc.). Field bus interfaces and slots where field bus option cards can be installed are allocated to instances (see product documentation)

I-encoder
Incremental encoder, optical encoder with sine and cosine track and zero pulse

K

KTY
Type of a temperature sensor

KW
AMKASYN compact inverter

KP
Proportional gain (speed control, PID controller)

KES
AMKASYN compact power supply with sinusoidal voltage and current

Kv
Position loop factor

KE
AMKASYN compact power supply with recovery

KW-Rxx
AMKASYN controller card for installation into compact inverter

L

LSB
Least Significant Bit

LR
Position control

M

MDT
Master Data Telegram from master to slave

MPU
Measuring steps of the encoder per revolution (digital value for P- and Q-encoders)

MST
Master synchronization telegram

MPP
Maximum Power Point

Modulo
Modulo processing of position setpoint and actual values

M(N)
Nominal torque

MSB
Most Significant Bit

N

NK
Cam switch

NIP
Zero pulse of encoder

O

OSC
Oscilloscope

P

PWM
Pulse width modulation

PGT
Periphery basic clock Fetch cycle in the basic device to which the drive controller is synchronized (The cycle time is according to ID2)

P-encoder
Absolute encoder singleturn, EnDAT 2.2 light

PDO
Process Data Object

PDK_xxxxxx_abcdefgh
Product documentation; xxxxxx - AMK part no. , abcdefgh - name

Parameter
Identification number acc. to SERCOS standard

PTC
PTC resistor

Q

Q-encoder
Absolute encoder multiturn, EnDAT 2.2 light

QRF
Acknowledgment controller enable; the drive is controlled in the activated operation mode

QUE
Acknowledgment DC bus on; shows that DC bus is loaded

QBR
Acknowledgment motor holding brake

R

RW
Read Write

Resolver
Absolute angle encoder singleturn (1 sine and cosine track per rotation)

RF
Command 'Controller enable'; the drive is energized and will be controlled depending on the selected operation mode. Controller enable can only be set if the device is error-free (SBM = TRUE) and acknowledgement DC bus on is set (QUE = TRUE).Acknowledgement controller enable (QRF) is set.

RO
Read Only

S

S-encoder
Absolute encoder, singleturn, RS485 Hiperface with sine and cosine track

SAK
Following distance error compensation

SBM
System ready message; shows that the device is error-free In case of error. SBM will be reset

SEEP
Device-internal memory, serial EEPROM

SS1
Safe Stop 1 (Safety function acc. to DIN EN 61800-5-2)

Sensorless
Operation mode without encoder

SERCOS
Standardized digital interface for communication between controller and field bus participants.

SW
Software

SoE
Servodrive Profile (SERCOS) over EtherCAT (Acc. to IEC 61800-7-300)

SDO
Service Data Object

STO
Safe torque off (Safety function acc. to DIN EN 61800-5-2)

SWC
Software commutation

T

Td
Differentiating time in speed control (PID controller)

T-encoder
Absolute encoder, multiturn, RS485 Hiperface with sine and cosine track

Tn
Integral-action time in speed control (PID controller)

TR
Rotor time constant

U

UNSIGNED 32
Data range 0 .. 4294967295

UNSIGNED 16
Data range 0 .. 65535

UNSIGNED 8
Data range 0 .. 255

UE
Command 'DC bus on' control signal to load the DC bus e.g. in KE. DC bus on can only be set if the device is error-free (SBM = TRUE). After the DC bus is loaded, the acknowledgement message QUE is set.

V/f
Voltage / frequency control (open loop)

U/f
Voltage / frequency control (open loop)

UPS
Uninterruptible power supply

U-encoder
Absolute encoder, singleturn, RS485 Hiperface with sine and cosine track

V

V-encoder
Absolute encoder, multiturn, RS485 Hiperface with sine and cosine track

VBNX
Extended mains phase failure signal VBNX to trigger an UPS

Y

Y-encoder
Absolute encoder, singleturn or multiturn, RS485 Hiperface DSL

Your opinion is important!

With our documentation we want to offer you the highest quality support in handling the AMKmotion products.
That is why we are now working on optimizing our documentation.
Your comments or suggestions are always of interest to us.
We would be grateful if you take a bit of time and answer our questions. Please return a copy of this page to us.

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Thank you for your assistance.
Your AMKmotion documentation team

1. How would you rate the layout of our AMKmotion documentation?

   (1) very good (2) good (3) satisfactory (4) less than satisfactory (5) poor

2. Is the content structured well?

   (1) very good (2) good (3) moderate (4) hardly (5) not at all

3. How easy is it to understand the documentation?

   (1) very easy (2) easy (3) moderately easy (4) difficult (5) extremely difficult

4. Did you miss any topics in the documentation?

   (1) no (2) if yes, which ones:

5. How would you rate the overall service at AMKmotion?

   (1) very good (2) good (3) satisfactory (4) less than satisfactory (5) poor

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