Operating mode absolute interpolation according to SERCOS

Translation of the "Original Dokumentation"

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Product version:

Product	Firmware Version AMK part no.
KW-R05 (O806) KW-R06 (O835) KW-R07 (O807) KW-R16 (O872) KW-R17 (O873)	AE-R05/R06 V1.14 2016/39 (206648)
KW-R24-R (O954)	AE-R24-R V2.11 2016/46 (206643)
KW-R25 (O902)	AE-R25 V2.11 2016/46 (206644)
KW-R26 (O903)	AE-R26 V2.11 2016/46 (206645)
KW-R27 (O957)	AE-R26 V2.12 2018/40 (207284)
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1 Operating mode absolute interpolation according to SERCOS

Supported hardware:	KW-R06 / KW-R16 / KW-R07 / KW-R17 / KW-R24-R / KW-R25 / KW-R26 / KW-R27 / iX(-R3) / iC(-R3) / iDT5(-R3) / ihXT /

This function relieves an EtherCAT or SERCOS master in simple positioning tasks by the internal interpolator in the drive generating the position setpoints. The interpolator can work with the actual position value from the motor encoder or from an external encoder.

The target positions are specified absolutely. The interpolator can not process a relative target position or a modulo value. The target position setpoint takes place in the asynchronous task, not synchronized with the position controller cycle.

The operating mode interpolation is configured with the SERCOS operating modes (ID32 - ID35 or ID284 - ID286). The movement starts automatically when a new target position is specified in ID258 'Target position'. ID430 'Active target position' indicates the active target position of the interpolator.

The following parameters influence the positioning to ID258 'Target position':

- ID193 'Positioning jerk'
- ID260 'Positioning acceleration'
- ID359 'Positioning deceleration'
- ID259 'Positioning velocity'

ID437 'Positioning status' acknowledges reaching the target position within a configurable 'position window' (ID57).The following status messages are available for evaluation:

- 'drive accelerates'
- 'constant velocity'
- 'drive decelerates'
-

If the 'Positioning velocity' is higher than the configured velocity limit (ID38 'Positive velocity limit' or ID39 'Negative velocity limit'), the drive indicates the warning 'Positioning velocity outside of position limit values'. The velocity is limited to the velocity limit.

The controller can change 'Positioning velocity' and ID108 'Feedrate override' at any time (override).

If the 'Target position' is outside the position limit range (ID49 'Positive position limit' or ID50 'Negative position limit') the drive indicates the warning 'target position outside of position limit values'.

The drive does not stop and continues to the target position.

The movement can be stopped with 'Master control word' bit 13. ID437 'Positioning status' indicates the state.

1.1 Startup instructions

Follow these steps in sequence before you switch on controller enable (RF):

1. Match the ID258 to the actual value. Matching the setpoint with the actual value is necessary as the axis otherwise moves to the last set value.
2. Set the controller enable (RF).

The drive is in an error state. Follow these steps in sequence:

1. Execute the command 'Clear error'.
2. Match the ID258 to the actual value. Matching the setpoint with the actual value is necessary as the axis otherwise moves to the last set value.
3. Set the controller enable (RF).

Codes for the operating mode 'Interpolation'

Possible operating mode parameters ID32 - ID35 and ID284 - ID286

Controller cards with 2nd encoder connection (KW-R06 and KW-R07)

Code	Code [bin]	
0x0013	10011	Interpolation with actual position value from the motor encoder and following error compensation
0x0014	10100	Interpolation with actual position value from external encoder and following error compensation

Code	Code [bin]	
0x001B	11011	Interpolation with actual position value from the motor encoder without following error compensation
0x001C	11100	Interpolation with actual position value from external encoder without following error compensation

Controller cards and devices without 2nd encoder connection (KW-R16 / KW-R17 and iX / iC / iDT5 and KW-R24-R / KW-R25 / KW-R26 / KW-R27)

Code	Code [bin]	
0x0013	10011	Interpolation with actual position value from the motor encoder and following error compensation
0x001B	11011	Interpolation with actual position value from the motor encoder without following error compensation

1.2 Relevant parameters

Parameter
ID32 'Primary operating mode'
ID33 'Secondary operating mode 1'
ID34 'Secondary operating mode 2'
ID35 'Secondary operating mode 3'
ID38 'Positive velocity limit'
ID39 'Negative velocity limit'
ID49 'Positive position limit'
ID50 'Negative position limit'
ID57 'In position window'
ID108 'Feedrate override'
ID134 'Master control word'
ID193 'Positioning jerk'
ID258 'Target position'
ID259 'Positioning velocity'
ID260 'Positioning acceleration'
ID284 'Operation mode 4'
ID285 'Operation mode 5'
ID286 'Operation mode 6'
ID359 'Positioning deceleration'
ID430 'Active target position'
ID437 'Positioning status'

All listed parameters are process data (volatile) and must be specified by the controller at run time.

Configuration ID437 'Positioning status'

Bit no.	Condition	Meaning
0 (LSB)	0	Interpolator has not reached the target position
	1	Interpolator has reached the target position
1	0	Actual position value outside ID57 'In position window'
	1	Actual position value within ID57 'In position window'
2	0	Reserved
	1	Reserved
3	0	Interpolator not halted
	1	Interpolator with ID134 'Master control word' Bit 13 = 1 halted
4	0	No constant velocity
	1	Constant velocity
5	0	Drive doesn’t accelerate
	1	Drive accelerates

Bit no.	Condition	Meaning
6	0	Drive doesn’t decelerate
	1	Drive decelerates
7 - 12	0	Reserved
	1	Reserved
13	0	Warning positioning velocity ID38 'Positive velocity limit' ID39 'Negative velocity limit' Positioning velocity within position limit values
	1	Positioning velocity outside of position limit values
14	0	Warning target position ID49 'Positive position limit' ID50 'Negative position limit' Target position within position limit values
	1	Target position outside of position limit values
15	0	Reserved
	1	Reserved

1.3 Associated diagnostic messages

Diagnostic-number	Diagnostic text
2599	Error while activating the advanced operating mode