AMK

AMKASYN

VARIABLE SPEED DRIVES

AZ-MC1
Multi-station multi-channel CNC contour control system

NC configuration
NC axis data
NC-AZ parameters

<MC1_KO.DOC>

AMK Arnold Müller, Antriebs- und Steuerungstechnik GmbH & Co.KG, D-73230 Kirchheim/Teck,
Tel.: 07021/50 05-0, Telefax: 07021/50 05-176

Contents

1 Configurability

The AMKASYN series of devices can be expanded to form a NC-controlled drive system with the AZ-MC1 option card. Apart from a user-configurable and parameterizable NC core, the AZ-MC1 card contains a programmable logic control (PLC) for implementing specific machine functions. Its configurability facilitates adaptation of the NC to different customer requirements. The selected configuration and parameterization is generated by means of a PC program and filed in data files. They must be loaded into the battery-buffered data memory of the NC. During the booting process the NC reads these data files and thus the extent of the NC is determined.

The following table shows an overview of the data and their associated files which have to be filed in the NC data memory to achieve a clear definition of the NC extent.

Item	Short explanation	File
1	Configuration data of the NC: Contour, line motion, axis assignment	<geo041.cfg>
2	Data on cycle time, WRK module, channel informations,...	<nc04.cfg>
3	Assignment of M functions, axis letters,..	<sda041.mds>
4	NC axis parameters: Software limit switches, resolutions,..	<ax041.mds>
5	Tool data sets: Length and radius correction	<wz041.mds>
6	Zero offset data block	<np041.mds>
7	PLC program (AWL)	<p01.sps>

The basic configuration of the NC is created according to customer requirements exclusively at AMK. The two files item 1 and item 2 contain the basic configuration and cannot be changed by the user. The files item 3 to 6 can be changed in parts by the user. The PLC program (Item 7) of the programmable logic control must be created by the user according to his requirements (see document NC-PLC interface description).

1.1 Tools for NC configuration

For projecting the basic configuration, the configuration tables contained in this description must be filled out (see Section Configuration table) and notified to AMK. For the data which can be changed by the user, the PC-based NC operator interface offers start-up menus. With them the axis data and assignments of M functions can be viewed and changed. Within the menus for part program creation, tool corrections and zero offsets associated with the relevant part can be changed (see description of NC operation, "NC programming" section).

2 Extent of configurability

Terms which represent the entire bandwidth of the configuration possibilities are explained below.

2.1 Axis groups

Axis groups are determined according to the requirements. The following axis groups can be configured according to application:

Axis group	Axis type	Remarks
Contour axes or coupled axes	Interpolation axis	In total max. 8 axes, including 3 contour axis, remaining are coupled axes
Line motion axes		2 axes but max. 8 interpolation axes
Transformation axes		2 cartesian axes, possibly with head orientation
Transformation machine axes		Machine axes belonging to transformation
Spindles	Speed controlled axis	2 axes
Synchronous axis	Slave axis	1 axis (2 master axes configurable)

2.1.1 Contour axes

The first three interpolation axes are designated as pure contour axes. The contour is controlled in the Cartesian system of coordinates X,Y,Z. The contour interpolator guides these axes so that the programmed contour speed results on the resulting path.

2.1.2 Coupled axes

Every 4th to 8th axis assigned to the contour is designated as coupled axis. All coupled axes are controlled by the interpolator provided they are programmed together with contour axes so that they arrive at the target point simultaneously with the contour axes.

2.1.3 Line motion axes

Line motion axes are moved independently of the contour. Programmed in the same NC program, the problem of the synchronization between contour and line motion axes must be given attention (see document: "NC programming instructions, M26")

2.1.4 Transformation axes

Transformation axes can be configured for programming kinematic arrangements, consisting of linear and rotary axes (handling systems such as Portal and Scara robots). They allow a movement to be programmed in Cartesian coordinates (see additional description NC for handling systems). The associated transformation machine axes must be configured for the movement of these axes as pure machine axes.

2.1.5 Transformation machine axes

These are the machine axes associated with the transformation axes. They are controlled by the NC interpolator like contour axes.

2.1.6 Spindles

Spindles are speed-controlled axes which are operated using M functions and S words. The "spindle M functions" are synchronized by the interpolator. I.e. after a 'spindle start' command (e.g.: "M03 S1000"), the NC program will be continued when the stated spindle speed (1000 rpm) is in the speed window (see drive parameters). Spindles can be configured additionally as interpolation axes (C axes). For example, this is required when it is used as master axes for thread tapping (see synchronous axes). The assignment of the aster axis is required for the "constant cutting speed" function.

2.1.7 Synchronous axes

Synchronous axes are switched by M functions from slave axis to master axis. The synchronous ratio can be programmed using the S word. The synchronous axis is controlled directly in the drive system. During this time the NC interpolator is switched off and set back to the current axis position for synchronous control by the cut-off command. The master axis is assigned to the slave axis in the drive parameters of the ancillary operating mode 3 or 5 of the slave axis (see under AW-specific drive parameters, Section 5.2.3).

2.2 Physical/logical axes

A NC machine consists of as many physical axes as are assigned to the NC drives. The number of the logical axes can be greater than the number of the assigned drives (physical axes), since several logical axes can be assigned to one physical axis. **The first logical axis is number 1.**

Example:

2 logical axes	**1 physical axis**
C axis (interpol. axis) and spindle	AW1
Z axis (interpol. axis) and slave axis	AW3

2.3 Axis names

Address letters are allocated for all axes combined in the axis groups. Contour, coupled and line motion axes are programmed with the selected name in the NC block. The letters "D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T" are reserved for the DIN usage and may not be assigned to any interpolation axis. Names for PLC axes (spindles, synchronous axes) are not relevant for programming, since they are always activated via M functions in combination with S words. Allowed axis names for interpolation axes are: **A,B,C,U,V,W,X,Y,Z**.

2.4 Axis attributes

The axis attributes "linear" and "rotary" shall be determined for interpolation axes. Programming and display is defined metrically [mm] for linear axes and in degrees for rotary axes.

2.5 Axis resolution

The NC possesses an internal standard resolution of 10000. With this resolution the accuracy of the calculated target positions is 0.1µm (1/10000mm). The internal resolution can be changed by configuration and can be stated separately for linear and rotary axes. The following table shows the relation between the resolution, the smallest internal unit and the corresponding travel range for linear and rotary axes.

Resolution	int. unit (linear axis)	int. unit (rotary axis)	Travel range (linear axis)	Travel range (rotary axis)
10000	[0.1µm]	[0.0001deg]	+- 214m	+-214748 degrees
1000	[1µm]	[0.001deg]	+-2140m	+-2147483 degrees
100	[10µm]	[0.01deg]		
10	[100µm]	[0.1deg]		
1	[1mm]	[1deg]		

2.6 Axis assignment

The target AW No. is assigned to each axis. In this case it is possible to assign the same AW to different axes (e.g.: C axis and spindle-> AW1, see Section Physical/logical axes).

2.7 Configuration table

The following table shall be filled out for designing the NC: The grey fields (e.g. logical axis numbers) do not have to be completed. They result from the basic configuration. Up 8 physical axes can be configured in the AMKASYN system. Up to 16 logical axes can be assigned to these. In 2-channel systems, a table must be created for each NC channel.

Machine name:		(max. 8 characters)	Channel number	1 or 2

	Name	Attribute	AW No.	Log. No.	Remarks
	X,Y,..	lin/rot.	1..8	1..16	
Contour axes					The first three axes are contour axes. Every further axis in the contour group is a coupled axis.
Coupled axes					Coupled axes are interpolated along with the contour, so that they reach the target position simultaneously. A maximum of 8 contour and coupled axes is possible.
Line motion1					Line motion axis moves independently of the contour.
Line motion2					
Spindle1					1st and 2nd speed-controlled axis
Spindle2					
Synchronous					Slave, assign to master axis in drive parameter

2.7.1 Example: 4-axis system

Drilling centre with a cross-table (X-Y), a feed axis (Z) and a drilling spindle (S), which can also be interpolated as contour axis (C).

Machine name:	BOHRZNTR	(max. 8 characters)	Channel number	1

	Name	Attribute	AW No.	Log. No.	Remarks
	X,Y,..	lin/rot.	1..8	1..16	
Contour axes	X	lin	2	1	The first three axes are contour axes. Every further axis in the contour group is a coupled axis.
	Y	lin	3	2	
	Z	lin	4	3	
Coupled axes	C	rotary	1	4	Coupled axes are interpolated along with the contour, so that they reach the target position simultaneously. A maximum of 8 contour and coupled axes is possible.
Line motion1					Line motion axis moves independently of the contour.
Line motion2					
Spindle1	S		1	5	1st and 2nd speed-controlled axis
Spindle2					
Synchronous					Slave, assign to master axis in drive param.

2.7.2 Example: 4-axis system with line motion axis

Drilling centre with a cross-table (X-Y), a feed axis (Z) and a drilling spindle (S), which can also be interpolated as line motion axis (C) independently of the contour.

Machine name:	BOHRZNTR	(max. 8 characters)	Channel number	1

	Name	Attribute	AW No.	Log. No.	Remarks
	X,Y,..	lin/rot.	1..8	1..16	
Contour axes	X	lin	2	1	The first three axes are contour axes. Every further axis in the contour group is a coupled axis.
	Y	lin	3	2	
	Z	lin	4	3	
Coupled axes					Coupled axes are interpolated along with the contour, so that they reach the target position simultaneously. A maximum of 8 contour and coupled axes is possible.
Line motion1	C	rotary	1	4	Line motion axis moves independently of the contour.
Line motion2					
Spindle1	S		1	5	1st and 2nd speed-controlled axis
Spindle2					
Synchronous					Slave, assign to master in drive param.

3 Axis data block

The NC axis data block is filed in the file <ax041.mds>. It can be changed by the user in the NC start-up menu of the NC control panel (see description NC operation "Start-up, NC configuration" section). In contrast to this, drive parameters must be entered on the AZ control panel.
In the display the axes are arranged from left to right according to logical axis numbers. The first axis has the logical number 1.

The axis parameter data block is read by the NC only when booting. Therefore a change becomes valid only after the NC is switched on again.

3.1 Overview

The following overview applies for linear axes. For rotary axes the data in [mm] differ due to data in [degrees].

Name	Input format	Explanation section
-Axis name	e.g.: X,Y,Z	3.2.1
-Axis type	see below	3.2.2
Master axis	e.g.: 1	3.2.3
Reference point offset mm]	000000.000	3.2.4
Position resolution_1.Z [incr]	0000000000	3.2.5
Position resolution_1.N	0000000000	3.2.5
Position resolution_2.Z [incr]	0000000000	3.2.6
Position resolution_2.N	000000000	3.2.6
G60 window [mm]	000000.000	3.2.7
SW limit switch pos [mm]	000000.000	3.2.8
SW limit switch neg [mm]	000000.000	3.2.8
Feed limit [m/min]	000000.00	3.2.9
Max. feed [m/min]	000000.00	3.2.10
Acceleration stage1 [m/s²]	0000.00	3.2.11
Acceleration stage2 [m/s²]	0000.00	3.2.11
Switch-over Vb. [m/min]	00000000	3.2.11
Max.Vb. override [%]	0000.0	3.2.12

All parameters beginning with "-" cannot be changed.

3.2 Explanations

3.2.1 Axis name

In the input menu the axis name serves for selecting the parameters belonging to the axis. It is determined in the basic configuration and cannot be changed by the user.

3.2.2 Axis type

Information about the type of the axis:

0	- Contour axis
8	- Transformation machine axis
9	- Transformation axis
10	- Line motion axis
20	- Spindle 1
21	- Spindle 2
30	- Slave axis 1
31	- Slave axis 2

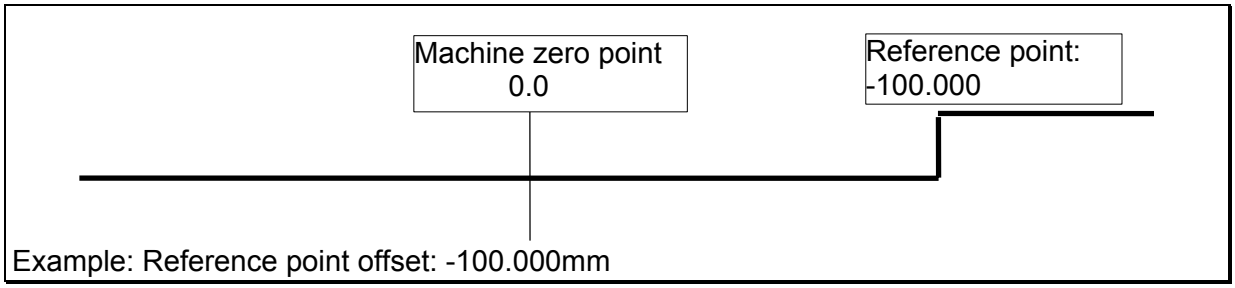
These data result from the basic configuration and cannot be changed by the user.

3.2.3 Master axis

This parameter has different meaning for spindles and contour axes:
Spindles:
Logical number of the axis which delivers the actual position values for the constant cutting speed.
Contour axes:
Logical number of the spindle which delivers the speed for the rotary feed. The parameter shall be defined in all axes which are possibly programmed with rotary feed.

3.2.4 Reference point offset

Offset of the machine zero point by the stated value after the homing cycle. I.e. the axis remains stationary at the reference point and assumes the value of the "Reference point offset" parameter. In the case of absolute value encoders, this reference point offset is offset without movement with the absolute value.



Example: Reference point offset: -100.000mm

Note:
The drive parameter ID150 "Reference point offset" refers to the end position of the axis with regard to the motor zero pulse after the homing cycle (see AMKASYN parameter description "Positioning parameters" section).

3.2.5 Position resolution 1 (position resolution_1.Z / position resolution_1.N)

Description of the conversion factor between the metrical distance to be travelled and the incremental setpoint setting of the NC for interpolation axes. Periodical speed ratios can also be taken into account by subdividing the resolution into numerator and denominator. If necessary the smallest common multiple should be determined.

Linear axes:
Description of the conversion factor between the metrical distance to be travelled and the incremental setpoint setting of the NC for NC axes. Normally is a question of the conversion of the spindle pitch [mm/rev.] to the motor resolution [incr/rev.] taking into account of a possible gear on the motor resolution [incr/rev]. The NC multiplies the distance of the axis in [0.1µm] stated in the NC program with the resolution parameterized here (position resolution_1.Z/position resolution_1.N).

Formula:	Position resolution_1.Z	= Motor resolution * Gear factor / spindle pitch
	Position resolution_1.N	= 1/NC resolution in [mm]
Units:	Motor encoder resolution	[incr/rev]
	Spindle pitch	[mm/rev]
	NC resolution (linear)	0.0001[mm] = 0.1[µm]
Example:	Motor encoder resolution	= 20000 incr/rev
	Spindle pitch	= 5 mm/rev
	Gear factor i	= 5:4
==>	Position resolution_1.Z	= 20000* (5/4) / 5 = 5000 [incr/mm]
	Position resolution_1.N	= 1/NC resolution = 10000

Fig.: Calculation of position resolution for linear axes

Rotary axes:
Description of the conversion factor between the angle in degrees to be travelled and the incremental setpoint setting of the NC for NC axes. The resolution (increments) per revolution of the rotary axis at the drive pinion stands in the numerator as a rule. The NC multiplies the travel of the axis in degrees stated in the NC program with the resolution parameterized here (position resolution_1.Z/position resolution_1.N).

Formula:	Position resolution_1.Z	= Motor resolution * Gear factor [per 360degrees]
	Position resolution_1.N	= 1/NC resolution in [degrees]
Units:	Motor encoder resolution	[incr/rev]
	NC resolution (rotary)	0.001[degrees]
Example:	Motor encoder resolution	= 20000 incr/rev
	Gearing	= 1:4
==>	Position resolution_1.Z	= 20000*4 = 80000 [incr/360degrees]
	Position resolution_1.N	= 360*1/NC resolution = 360000

Fig.: Calculation of position resolution for rotary axes

Synchronous axes (master axis 1):
Input of the reference variables for determining the synchronous ratio:

Position resolution_1.Z - Increments/mm of the slave axis
Position resolution_1.N - Increments/rev of the master axis 1

In the case of periodic resolutions, the smallest common multiple must be determined.

3.2.6 Position resolution 2 (position resolution_2.Z / position resolution_2.N)

The 2nd resolution that can be input applies for spindles, rotary axes and synchronous axes.

Spindles:

The value of the gear ratio (i = Z : N) must be entered in the parameters position resolution_2.Z and position resolution_2.N.

Rotary axes:

Entry of the modulo value (increments per 360 degrees) in the parameter position resolution_2.Z of the data block of the rotary axis. If the interpolation rotary axis is also operated as a spindle, then it is set to its modulo value (value between 0..360 degrees) after switching over from spindle operation to interpolation operation.

Linear axes:

Entry of the modulo value (increments per 360 degrees) in the parameter position resolution_2.Z of the data block of the linear axis. If a 1 stands in this parameter, then the coordinate of this axis can be set to zero by NC command without a travel movement taking place.

Synchronous axes (master axis 2):

Entry of the reference variables for determining the synchronous ratio

Position resolution_2.Z - Increments/mm of the slave axis

Position resolution_2.N - Increments/rev of the master axis 2

In the case of periodical resolutions (e.g. incr/mm) the smallest common multiple must be determined.

3.2.7 In-position programming window (G60)

With a G60 in a NC program block, the next NC block is processed only if all axes programmed in the block stand in the stated in-position programming window.

3.2.8 SW limit switch pos/neg

Workspace to which the travel of the axes is limited. The software limit switches are active only after the homing cycle. Software limit switches of a synchronous axis are copied automatically from the data block of the associated interpolation axis.

Note: For the handwheel, the position limits in the drive must be set correspondingly (see drive parameters Section 4.2.4 Handwheel)

3.2.9 Feed/speed limitation

Value in m/min to which the feed is limited with feed limitation switched on. The feed limitation can be activated by a command of the programmable logic control (PLC). In the case of spindles the speed limitation in rpm must be entered. This is a safety-supporting function.

3.2.10 Max. feed

Maximum feed speed of the axis in m/min. In the case of a contour interpolation the contour is limited to the max. feed speed of the slowest axis participating in the contour (also coupled axes). If a contour or coupled axis alone is moved, then the max. feed set for it applies.

3.2.11 Acceleration stages

Adjusting the acceleration behaviour of the interpolator.
Parameter: Acceleration stage1 a1 in [m/s²]
Acceleration stage2 a2 in [m/s²]
Switch-over feed in [m/min]

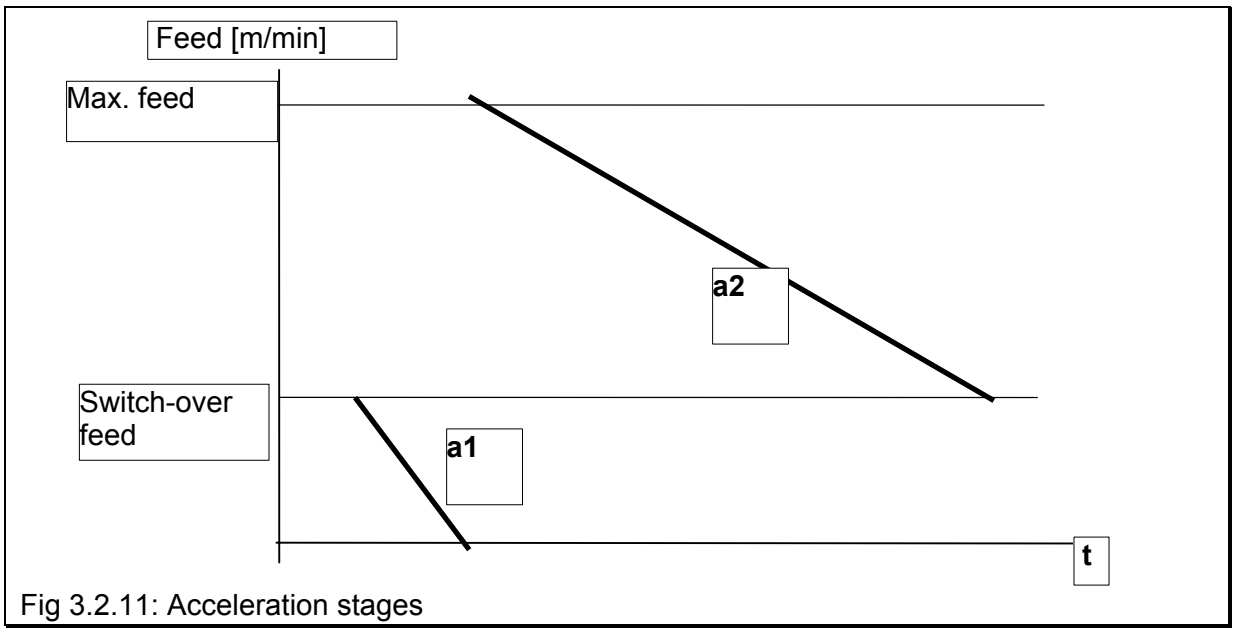


Fig 3.2.11: Acceleration stages

In the case of a contour interpolation the contour is limited with the acceleration of the slowest axis participating in the contour (also coupled axes). If a contour or coupled axis alone is moved, then its set acceleration stages apply for it.

3.2.12 Max. feed override

Maximum permissible override value in 0.1% of the programmed feed speed.
In the case of contour axes the lowest override of all axes applies.

4 Multi-channel NC

The AZ-MC1-2 can be designed as 2-channel NC by configuration. The assignment of the axes within the 8 physical axes in the AMKASYN system is arbitrary. Each NC channel receives its own configuration data. The following points must be observed in the 2-channel version:

1. The integrated PLC is responsible for both NC channels.
2. The group RF (controller enable) input at the AZ applies for both channels.
3. In the basic system, all drives shut down as standard when an error of any drive occures.
4. The global status of the 2nd channel has a subscriber address added by 1 of the SBUS subscriber number of the NC.

Re 1) The integrated PLC has 2 separate transfer interfaces to the two NC channels (see also document "NC-PLC interface description"). If the PLC goes into an error state in which all PLC outputs in the process output map are deleted, then the NC will react with an EMERGENCY STOP for both NC channels.

Re 2) If the group RF input is used as limit switch for all axes, then the drives of both channels are switched inactive, if one axis moves onto a limit switch. The same applies for an EMERGENCY OFF button which acts on the group RF. If this behaviour is not wanted, then it is also possible to work with single controller enables. Another possibility is to use two binary inputs which are processed by the PLC to form group controller enables for the relevant NC channel.

Re 3) Mutual influencing of the NC channels in the case of drive errors can be avoided with the special function "Shutting down only the faulty drive" (see also AMKASYN parameter description: ID32796). This has the consequence that also in the relevant NC channel, only the faulty drive is shut down. Shutting down further drives must then be arranged if necessary by the PLC.

Re 4) In the case of linked systems with 2-channel NCs, it must be observed that in a 2-channel NC the SBUS subscriber address has an even number and the next higher (uneven) number remains free for the 2nd channel.

5 Drive parameters

The drive parameters are described in detail in the document "AMKASYN parameters". The subsets of the drive parameters listed here must be observed for a fail-free NC operation. They are entered on the AZ control panel.

5.1 Global AZ parameters

The global AZ parameters are present only once in the AZ system in contrast to the AW-specific parameters.

ID1 NC cycle time
Explanation : Position interpolation points are output by the NC in the grid of the NC cycle time. The fine interpolator in the drive interpolates these values in the 0.5ms grid.
Entry value : 8ms

ID2 SERCOS cycle time
Explanation : Interrupt cycle in NC, clock for time base and operation of the serial interface.
Entry value : 1ms

ID32882 Slot assignment
Explanation : Statement of the assignment of the 4 slots in the AZ system. The codes of the option cards must be entered in 4 consecutive bytes.
The NC card has the code 80. In the example an AZ-EA24 is plugged in slot 1 and an AZ-MC1 card in slot 3.
Example : 03008000

ID32941 SERCOS service
Explanation : If the NC is operated on a fibre optic cable ring (FOC), then the luminous intensity of the FOC transmitter must be stated in this parameter.
Example : 0000000x with x = 0..7

ID32949 SBUS subscriber address
Explanation : If the NC is operated on a fibre optic cable ring (FOC), then the subscriber address must be entered in hexadecimal form in this parameter.
It must be observed that 2 subscribers to the ring do not have the same subscriber address.
Example : xx000000 with xx = 1..20HEX

5.2 AW-specific parameters

The AW-specific parameters must be entered separately for each drive (AW No.).

5.3 Interpolation axes

ID32800 Main operating mode
Explanation : Position control, setpoint source AZ-MC1
Entry value : 3E0404

ID32922 Residual distance erase window
Explanation : Influencing the behaviour of the drive after switching on 'Inverter ON RF' if the axis was moved with inactive RF (see also parameter description 206). If the actual value lies outside the window after switching on the RF, the residual distance is deleted, otherwise the axis is moved back to its position before removing the RF.
Entry value : e.g. 20000

ID00159 Excess error
Explanation : Value * 16384 (*256 for AW software 2.04) results in number of the increments for maximum permissible following error between setpoint and actual values.
Entry value : According to requirement

5.3.1.1 Hanging IPO axes

In the case of hanging interpolation axes, the brake may not be activated with the signal "QRF" (general RF acknowledgement), but must be activated with the axis specific QRF signal. This must be assigned to a binary output. The outputs DA1..DA4 on the AZ (see below) or any outputs of an AZ-EA8 or AZ-EA24 option card can be used (see also description of AMKASYN parameters, binary outputs assignment section).

ID32846 Output port 1 address
ID32855 Output port 2 address
ID32864 Output port 3 address
Explanation : Select one out of the three available outputs ports. Allocate to this the code for „AZ outputs DA1 ... DA4“.
Entry value : 544

ID32847 Output port 1 source Bit0
.. ..
ID32868 Output port 3 source Bit3
Explanation : If the Dax outputs on AZ is selected, only bit 0..3 can be used. If the output port 1 address is selected, then enter the bit source in ID32847(DA1).. ID32850(DA4). In the following entry in ID32847, the QRF signal of AW4 is hanshaked through output DA1.
Entry value : ID32847: „33031.4“

5.3.2 Speed-controlled axes

ID124 Standstill window
Explanation : If the command M05 (spindle STOP) is output for a spindle, then the NC program is continued only, if the spindle speed is below the standstill window.
Entry value : 50 (example)

ID157 Speed window
Explanation : If a spindle is started with a speed, the NC program is continued if the spindle speed is within the speed window.
Entry value : 200 (example)

ID32786 Config. AW message 32
Explanation : Should an NC axis be programmable with rotary feed, then the reference variable "Actual speed" of the reference axis of the NC must be made available. Configure the 32-bit AW message with the actual speed value of the rotary axis for this purpose.
Entry value : 40

5.3.3 Synchronous axes

These are for example slave axes for thread tapping. 2 master axes each are configurable. The detection of which master axis delivers the setpoint values for the synchronous mode is determined in the auxiliary operating mode (NBAx) 3 and 5 of the synchronous axis as follows:

Master1 via NBA3 (e.g. spindle 1)
Master2 via NBA5 (e.g. spindle 2)

ID32805 Auxiliary operating mode 3
Explanation : Operating mode for synchronous axis, xx source or setpoint value master 1
Entry value : xx0C04
Example : 240C04 Position control with trailing error compensation
|_____Actual position value of AW1

ID32805 Auxiliary operating mode 5
Explanation : Operating mode for synchronous axis, xx source or setpoint value master 2
Entry value : xx0C04
Example : 250C04 Position control with trailing error compensation
|_____Actual position value of AW2

ID32892 Setpoint value divider
Explanation : Setpoint value divider for synchronous axis, multiplier is notified by NC command.
Entry value : 655360

5.3.4 Handwheel

The following parameters must be observed for all axes which should be operated with handwheel:

ID32804 Auxiliary operating mode 4
Explanation : Operating mode for handwheel, xx source of the setpoint pulses, no trailing error compensation for softer running.
Entry value : xx0404
Example : 030404 Position control without trailing error compensation
|_____Actual position value of AZ pulse input

ID32892 Setpoint value divider
Explanation : Setpoint value divider for synchronous axis, multiplier is notified by NC command.
Entry value : 655360

ID32773 Non-specific service switch
Explanation : Activating the position limit monitoring.
Entry value : Bit 3 = 1
Example : 00000008

ID00049 Position limit positive
Explanation : Positive position limit as positive software limit switch for handwheel
Entry value : Max. distance in positive direction in increments.

ID00050 Position limit negative
Explanation : Negative position limit as negative software limit switch for handwheel
Entry value : Max. distance in negative direction in increments.

ID32948 AZ message configuration
Explanation : Source code for a pulse encoder input for use for superimposed NC program / handwheel movement (see also NC-PLC description).
Entry value : Code of the 4 possible sources in each byte.

5.3.5 Homing cycle

See also description of AMKASYN parameters, positioning parameters section.

ID00041 Homing speed
Explanation : Speed of the homing cycle in [rpm]
Entry value : 200 (example)

ID00147 Homing parameter
Explanation : Starting direction, data via reference mark
Entry value : see AMKASYN parameter description

ID00150 Reference offset 1
Explanation : Distance in [incr] which the drive still covers after reaching the ref. pulse. The offset should not be 0, since otherwise the drive would have to stop abruptly after reaching the zero pulse.
Entry value : 1000

ID32926 AMK homing parameter
Explanation : Pulse or cam evaluation, cam edge,..
Entry value : see AMKASYN parameter description

5.3.6 Spindle positioning

See also description of AMKASYN parameters, positioning parameters section.

ID00136/137 Acceleration positive / negative
Explanation : Acceleration ramp for spindle positioning
Entry value : 100 [rev/ss]

ID32956 Acceleration coefficient
Explanation : Number of IPO cycles (10ms) up to reaching the ramp according to ID136/137
Entry value : 10 (corresponds to 100ms)

ID00154 Spindle positioning type
Explanation : Direction of rotation of positioning
Entry value : 8000

ID32925 AMK spindle positioning parameter
Explanation : Conditions for positioning
Entry value : 2000

6 Impressum

Title **AMKASYN NC configuration, Axis data, parameters**

Objective **Description of the configuration and the axis data**

Part-Number **27877**

History

Date
1999/27

Disclaimer We reserve the right to change the contents of the documentation and the availability of products at any time without prior notice.

Service Tel.: **+49/(0)7021 / 5005-191, Fax –193**

Business Hours:
Mo-Fr 7.30 - 16.30, On weekends and holidays calls are forwarded to an emergency response number by the automated answering system.

To assure a fast and accurate response to solve customer problems we ask for your cooperation in providing us with the following information:

- Nameplate data
- Software version
- System configuration and application
- Description of problem and presumed cause of failure
- Diagnostic message (error code)

Publisher AMK Arnold Müller Antriebs- und Steuerungstechnik GmbH & Co. KG
Gaußstraße 37 – 39, 73230 Kirchheim/Teck

Tel.: 07021/5005-0, Fax: 07021/5005-176
E-Mail: info@amk-antriebe.de

For further information www.amk-antriebe.de