



ECODRIVE DKC03.1 Drive Controller

Functional Description: PDP03VRS

DOK-ECODRV-PDP-03VRS**-FKB1-EN-P

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What is the purpose of this documentation?	<p>The following document describes the functions of the firmware FWA-ECODRV-PDP-03VRS-MS in connection with DriveTop 03V03</p> <p>The document serves:</p> <ul style="list-style-type: none">• to describe all functional characteristics• for setting parameters for the drive controller• for data security of the drive parameters• for error diagnosis and troubleshooting		
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1 System Overview

1.1 Ecodrive - The Economical Control Drive for Automation

ECODRIVE is a digital intelligent automation system which provides a cost effective way to control single and multiple axis control tasks.

ECODRIVE can be used to accomplish all kinds of control tasks in different fields. It is typically used in applications such as:

- Handling systems
- Packaging machinery
- Assembly systems

1.2 Ecodrive - A Family of Drive Controllers

An **ECODRIVE** consists of a drive controller and an MKD servomotor. There are presently four drive controllers available, each with different control interfaces.

- DKC01.1 with analog, stepping motor and Positioning interfaces
- DKC11.1 with Analog interface
- DKC02.1 with SERCOS interface
- DKC03.1 with PROFIBUS-DP interface

This description of functions refers to the DKC03.1. Separate documentation is available for the DKC01.1 and the DKC02.1.

1.3 Overview of Functions DKC03.1

DKC03.1 - Modes of Operation

Servo drive with integrated positioning control

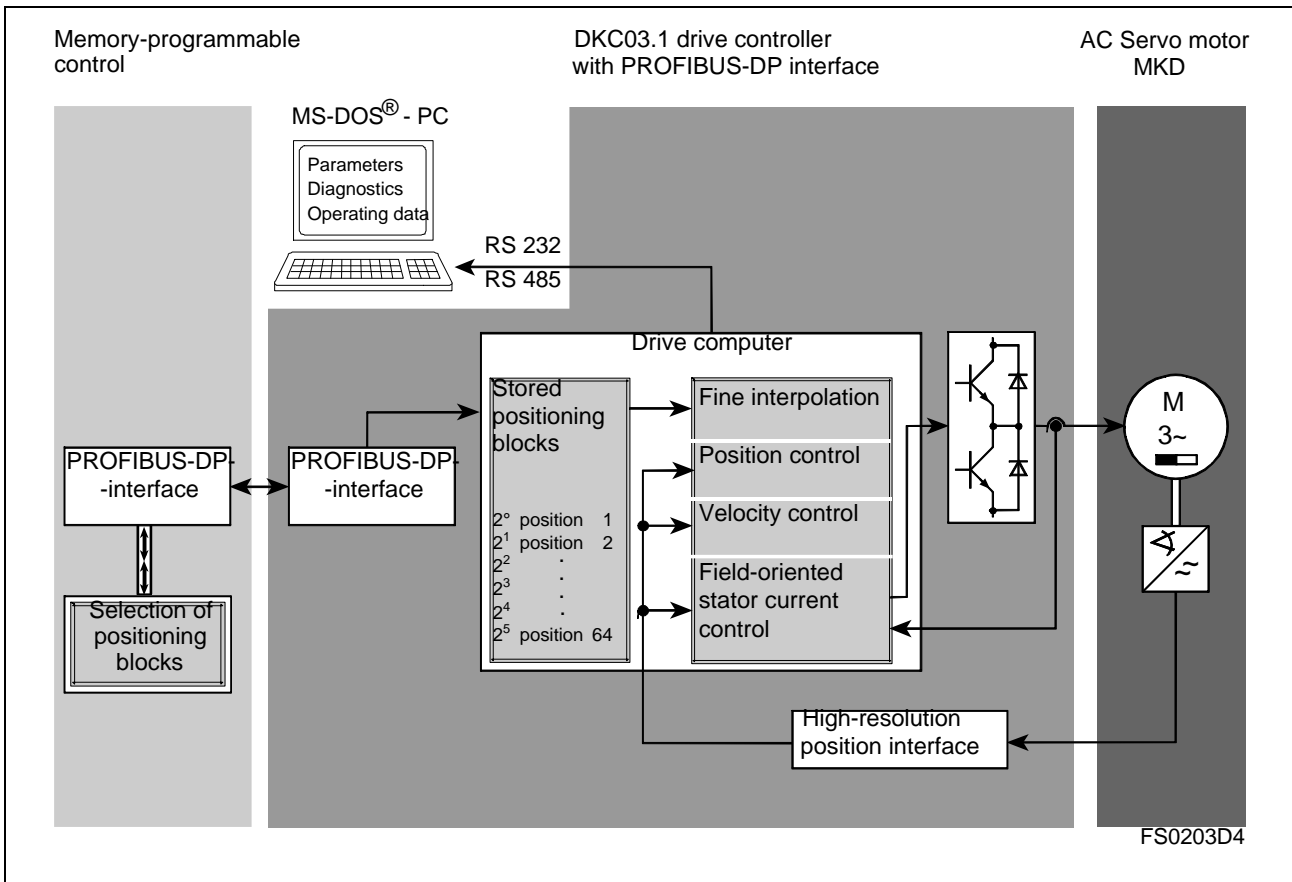


Fig. 1-1: Servo drive with integrated positioning control

- Up to 64 positioning blocks can be stored in the DKC03.1. They can be accessed via 6 bits in the profibus control word. The DKC03.1 executes position blocks independently.
- The drive controller can conform to mechanical transmission elements such as gear ratios or feed constants.
- All position, speed, and acceleration data can be scaled rotary or linear depending on the axial kinetics.
- An internal homing procedure can be used to create a reference position.
- The axis can be controlled via the jog function for set-up operation.
- The positioning velocity can be limited to a uniform value.
- Limit switch inputs and adjustable parameter position limits are available to set travel range limits.
- The drive controller status can be determined via status outputs.

General Features of DKC03.1

Direct Power Supply Connection

The drive controllers can be attached directly to three-phase power supplies with from 380 V to 480 V, without a transformer. Power rectifiers, intermediate circuit capacitors, brake resistances and bleeders are included as standard equipment.

Integrated Brake Activation

The optional brake in MKD motors is activated directly via the drive controller.

Actual Position Value Measurement

ECODRIVE measures the actual position value via the motor feedback system

- **Incremental position measurement (standard)**

The actual position value will be set at a random value when the power supply is first turned on. To give the actual position value a fixed reference point, the reference point must be set with a defined homing procedure.

- **Absolute position measurement (optional)**

After the power supply has been turned on, the absolute actual position value in relation to a fixed reference point is immediately available. Thus, completing the homing procedure is unnecessary.

Integrated Diagnostic Display

All internal state and error analysis is displayed via a two digit seven-segment display.

Easy Installation

The DriveTop installation and diagnostic program provides you with user-friendly installation via the serial RS-232 interface on a PC running Windows™ 3.1.

Notes

2 Safety Instructions for Electrical Drive Controllers

2.1 General Information

- The safety information in this user's manual must always be observed.
- Improper use of this device and disregard for the warnings which are given can lead to damaging the device, injury, or, in extreme cases, death.
- In case of damage due to neglecting the warnings in this user's manual, INDRAMAT GmbH does not assume any liability.
- If you do not understand the documentation in this language, request it in another language you will understand before proceeding with the startup procedure.
- The accurate and safe operation of this device requires proper transport, safe storage, assembly and installation as well as careful servicing and maintenance.
- Use only manufacturer-authorized replacement parts.
- Follow the safety instructions and specifications for the operations stated.
- The devices are designed for installation in machines that will be used in industrial applications.
- Installation is prohibited until it is shown that the machine in which the device is installed complies with EG Standard 89/ 392/ EWG (machine standards).
- Operation is allowed only when the national EMV regulations for the following applications are observed. In the EU, the EMV standard 89/ 336/ EWG must be observed.
- The technical data, connection requirements and the installation requirements are found within the user's manual and must be followed.

Qualified Personnel:

- Only qualified personnel should work on this device or work within the area of this device.
- Persons are qualified if they are sufficiently experienced with assembly, installation and operation of the product as well as all of the warnings and precautions as described in the user's manual.
- Furthermore, he or she must have been taught or authorized to turn on and off, ground, and designate the current carrying circuits and devices in accordance with generally accepted safety techniques. He/she must have appropriate safety equipment and be trained in first aid.

2.2 Protection against Contact with Electrical Components

Explanation:

Parts with a voltage greater than 50 volts can be dangerous for human contact. When electrical devices are in operation certain parts always have a dangerous voltage.



DANGER

High voltage!

Life threatening or serious bodily harm

- ⇒ The general assembly and safety instructions must be followed when working in high voltage area.
- ⇒ After the installation of the drive controller to all electrical devices, re-check the connection schematic.
- ⇒ Even if an operation will only last for a short period of time, or is for test purposes only, it should only be undertaken if protective earth conductor is securely attached to the points provided for it on the components.
- ⇒ Before servicing electrical components with a voltage higher than 50 volts, disconnect the device from the power source. Ensure that it will not be turned back on.
- ⇒ Wait for 5 minutes after the device has been turned off before handling it so that the capacitors can completely discharge.
- ⇒ Do not touch the components' electrical connector plugs while the device is on.
- ⇒ Before turning on the device, cover the parts which are under voltage in order to avoid them being touched.
- ⇒ An FI circuit breaker (earth leakage circuit breaker) cannot be used for AC-drives! The protection against indirect touching must be produced through other means, for example through an overload circuit breaker (according to EN 501787/ 1994 Section 5.3.2.3).
- ⇒ For flush mounting instruments, protect against indirect contact of electrical parts by installing a cover such as a switch gear cabinet, for example (according to EN 501787/ 1994).

**DANGER****High Leakage Current**

Possible Consequences

Life threatening or serious bodily harm

- ⇒ Before turning on the device, all components and the motor must be grounded or connected to ground points by protective conductors.
- ⇒ The leakage current is greater than 3.5 mA. It is required, therefore, that the device has a fixed connection to the mains power supply (EN 50178/1994 Section 5.12.11.1).
- ⇒ Always connect the protective conductor or connect to the ground before installation, even for testing purposes. The outer case can have a voltage across it if not grounded.

2.3 Protection of Safely Separated Low Voltages

Explanation:

The drive components' connections and interfaces for signal voltages in a voltage range of 5 to 30 volts are safely separated voltage loops which cannot be touched.

**WARNING****High electrical voltage through improper connection**

Possible Consequences

Life threatening or serious bodily harm

- ⇒ The signal voltage connection and interface of this device may only be connected to apparatuses, electrical components or wires which exhibit a sufficient safe separation from the active circuit according to standard IEC 364-4-41, 413.5 or according to DIN EN 50178, 12.94, Section 5.2.18.

2.4 Protection from Dangerous Motion

Explanation:

Dangerous motion can be produced through mistakes in the control of the connected motors.

Different situations can cause this:

- Errors in the software
- Production errors in the components
- Wiring errors
- Errors in the measuring and signal transmitter
- Errors in the servicing of the components

These errors may appear directly after the device is turned on or after any length of time.



Dangerous Motion

Possible Consequences

Life threatening, bodily harm or damage to device!

⇒ The monitors in the drive components prevent errors in the connected drives in almost all cases. In regards to personal safety this fact may not be relied upon by itself. Until the built-in monitors are active, faulty drive motion will in any case most likely occur, the magnitude of which depends on the nature of the malfunction and the operating conditions.

⇒ Ensure personal safety for the afore-mentioned reasons through monitoring or preventative measures enacted by the installation. These are provided according to specific conditions of the plant after a danger and error analysis by the plant constructor. These safety requirements which apply to the plant are included here.

In particular, the following must be closely observed:

- ⇒ Keep clear of the machine range. Possible measures to prevent people from accidentally entering this range: protective fencing, protective railing, protective covering, and/or light curtains
- ⇒ Sufficient strength of the fencing and covering against the maximum possible motion energy.
- ⇒ Mount emergency stop switches in the area and make them easily accessible. Ensure that the emergency stop switch works before installation.
- ⇒ Protect against unintentional operation through switching on the drives' power connection by including an emergency off circuit or using a reliable drive interlock.
- ⇒ Before reaching or moving into the danger area, bring the drives to a safe standstill. Keep the electrical equipment via the main switch voltage-free and ensure that it won't be turned back on:

- During maintenance and repair work
- During cleaning
- Before long periods of non-use

⇒ Avoid the operation of high frequency, remote control and broadcast equipment around the device electronics and their wiring. If there is no way to avoid using such devices, carefully check the system and equipment for any possible malfunctions before the initial installation. In special cases, a specific EMV test of the installation is necessary.

2.5 Protection During Assembly and Handling

Explanation:

Improper handling and assembly of certain drive components in unfavorable conditions can lead to injuries.



CAUTION

Possible bodily harm through improper handling!

Injury through pinching, sheering, cutting, trimming

- ⇒ Pay attention to the general installation and safety instructions for handling and assembly.
 - ⇒ Use suitable assembly and transportation procedures.
 - ⇒ Prevent pinching and squeezing through proper precautions.
 - ⇒ Use only the proper tools. Whenever prescribed, use specialty tools.
 - ⇒ Lifting devices and tools should be used in their proper manner.
 - ⇒ If necessary use appropriate protective equipment (such as protective eyewear, safety shoes, safety gloves, etc.)
 - ⇒ Do not stay under hanging loads.
 - ⇒ Clean up all liquids on the floor due to slipping danger.
-

Notes

3 Preparation for Startup Procedure

3.1 General Instructions for Startup Procedure

In this chapter the initial operation and diagnostic system DriveTop will be introduced. In general it is necessary to install DriveTop on the PC for the commissioning of the DKC to run. DriveTop follows this handbook to run concurrently offline. In the following chapters the document will refer often to this program.

Note: If you would just like to get a general overview of the functional properties of **ECODRIVE**, you can skip to chapter 3.

3.2 DriveTop Startup Procedure and Diagnostics

DriveTop is a Windows-based application used in the initial operation and diagnosis of **ECODRIVE** drives.

DriveTop has a user-friendly initial operation guide. The initial installer will be led through a series of function dialogs designed to enter all operational settings. There are help instructions for each of these dialogs that can be activated by pressing a key. This alleviates the need for much paper documentation in the initial installation.

The initial installation parameter setup is arranged so that the user only needs to deal with settings that are relevant for the selected application.

3.3 DriveTop-System Requirements

DriveTop is a Windows program and the minimum requirements on the PC are:

- IBM compatible 80386 / 40MHz or better (80486 recommended)
- 4MB RAM (8MB recommended)
- 5MB free hard drive space.
- A free serial port
- VGA graphics
- Mouse or compatible pointing instrument
- Windows 3.1

3.4 Installation of DriveTop

DriveTop comes on two 3.5" diskettes. (DOS format; 1.44MB)

Note: Please make a backup copy of the DriveTop installation diskettes. Install the software from these copies. Store the original diskettes in a safe place! For installation on your computer, use the installation programs on the diskettes. It will not work if you simply copy the material from the diskettes.

Starting the Installation Program

For installation of DriveTop do the following steps:

- Turn on the PC and start Windows.
- Place diskette 1 in the disk drive.
- Activate the Windows Program Manager.
- At the menu, click on "FILE" and choose "LOAD" from the drop-down menu.
- At the command prompt type "A:\INSTALL (if the DriveTop diskette is in drive A:)"
- The order of the installation programs is as follows.

After successful completion of the installation you will find the new program group icon **INDRAMAT** on your PC. Within this group you will find the DriveTop icon and an icon for the **ECODRIVE** Help system.

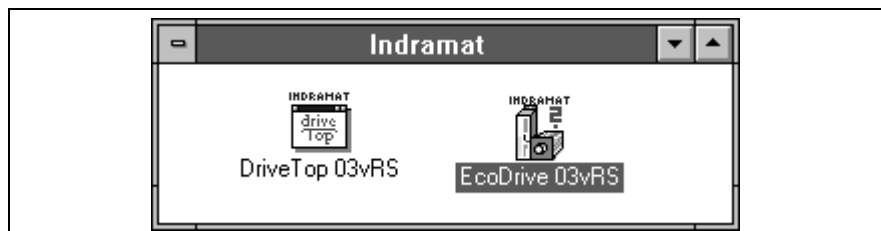


Fig. 3-1: INDRAMAT program file with the DriveTop and ECODRIVE Help icons

Setting Communications Parameters

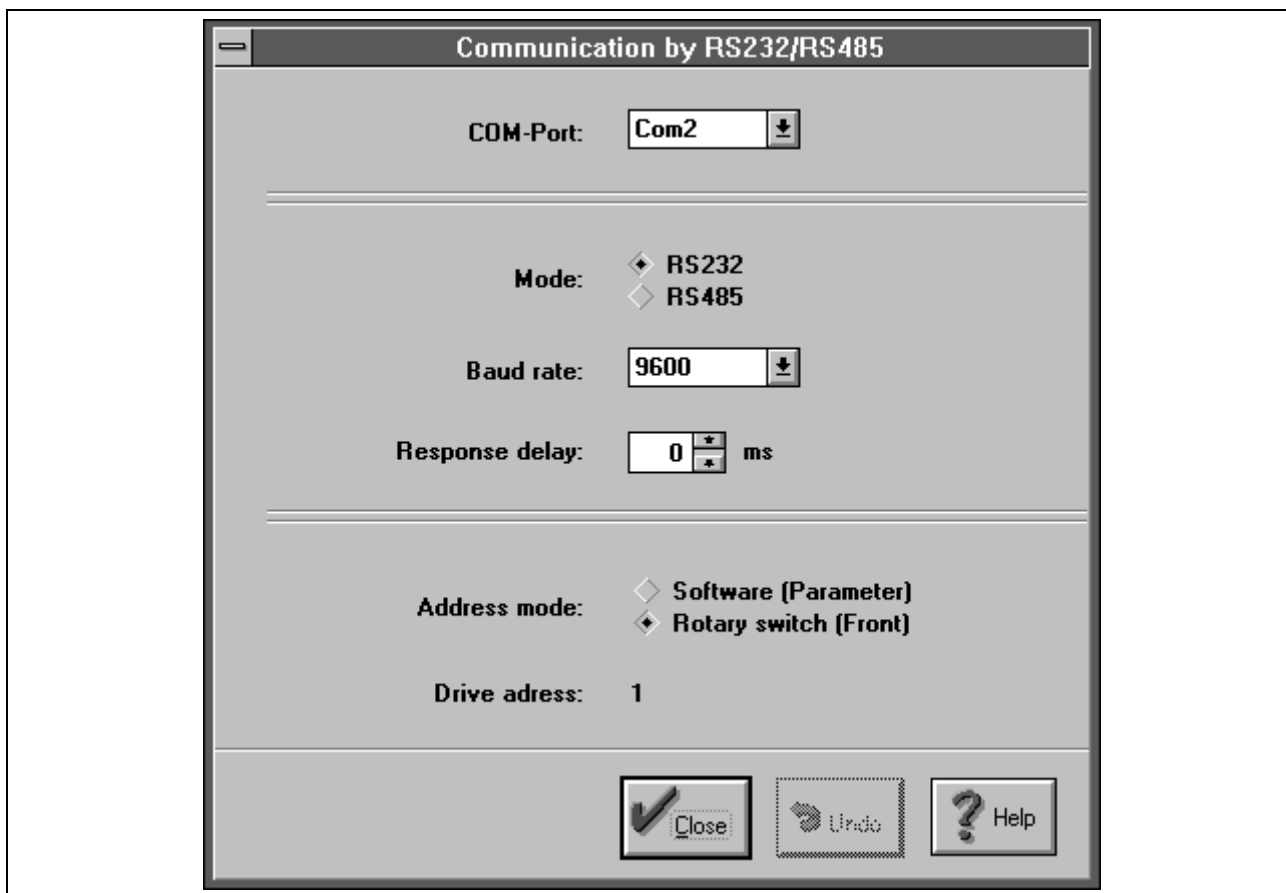


Fig. 3-2: Communications dialog box

COM Port

Most PCs have several serial interfaces (COM ports).

You can use the COM port setting to select the interface to be used for communicating with the drive controller. COM1 or COM2 are normally selected. If you want to use COM3 or COM4, the appropriate information must be entered in the DTOP.INI file for the interrupt to be used and the I/O addresses. These two interfaces will then be available for selection.

Mode

DriveTop can be connected with a drive controller via an RS232, or to a work group with up to 32 drives by an external RS232/RS485 interface converter.

Set the mode you want.

Baud Rate

The DKC drive controller can communicate at various baud rates:

- 9600 Baud
- 19200 Baud

Answer Delay

The answer delay defines the minimum time that must pass after the last character of a telegram has been received via the serial interface before the first character of the response can be sent back by the drive. This time span is required for RS485 operation for switching from send to receive mode or vice-versa. This parameter is not actually required for RS232 mode, but should nevertheless be set to 1ms.

Addressing Method

If multiple drives are to be connected via an RS485 interface to a common master (PC or PLC), each unit on the bus must have an individual address. There are two different methods to set the address.

Use switches S2 and S3 located on the drive to specify the effective RS485 address during *Address setup via rotary switch*.

If you are *Setting the address via software*, the switch setting of S2 and S3 is not the determining factor for the effective address. To specify the address using this method, enter an address number in the *Drive address* input field.

3.5 Connection of the PC with the Drive controller

A connection cable is required for data transfer between the drive controller and the PC. This cable can be ordered from **INDRAMAT** and can have either a 9-pin or 25-pin D-SUB plug. The pin diagram of the cable is shown in the following figure.

Also see **Chap.8.3 Communication via RS485 Interface**

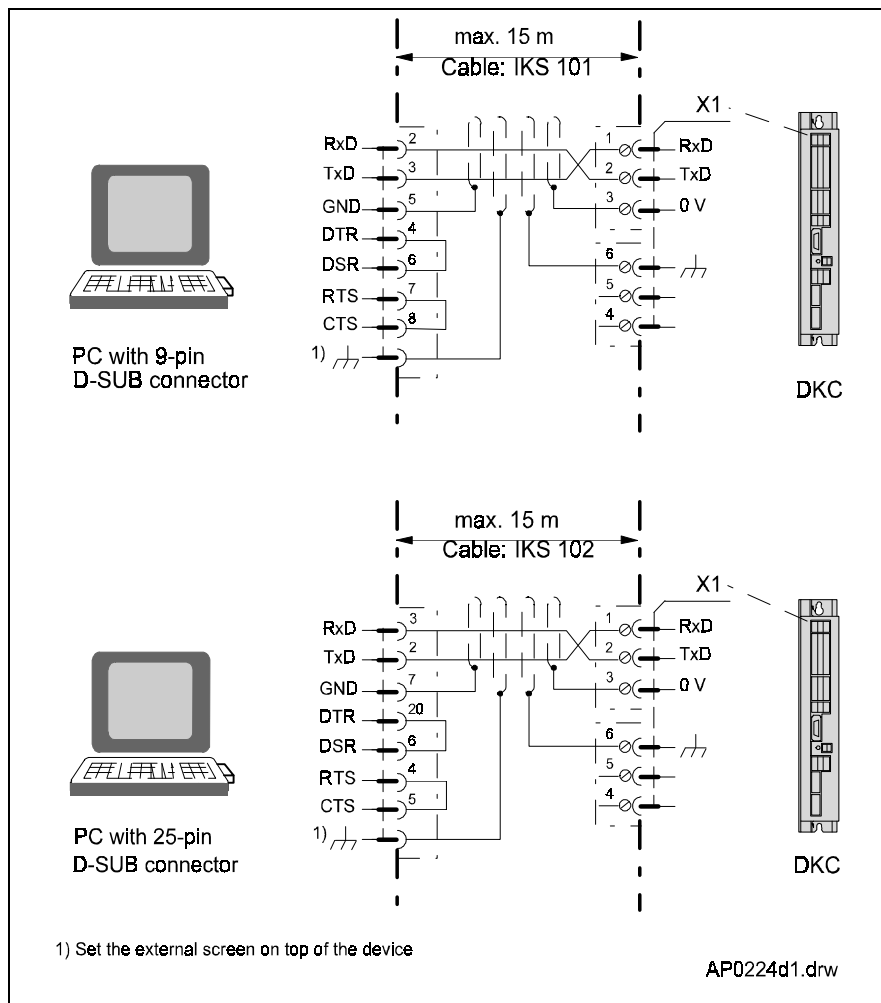


Fig. 3-3: Connection of a PC via the RS232 interface to the DKC

Note: Please pay attention so that the connection of the reference potential (OV/GND) is made on the inside of the cable's shield!

3.6 Minimal Installation for Operating a DKC with DriveTop

The minimal installation below may be used if you will be working with a DKC for the first attempts to set parameters.

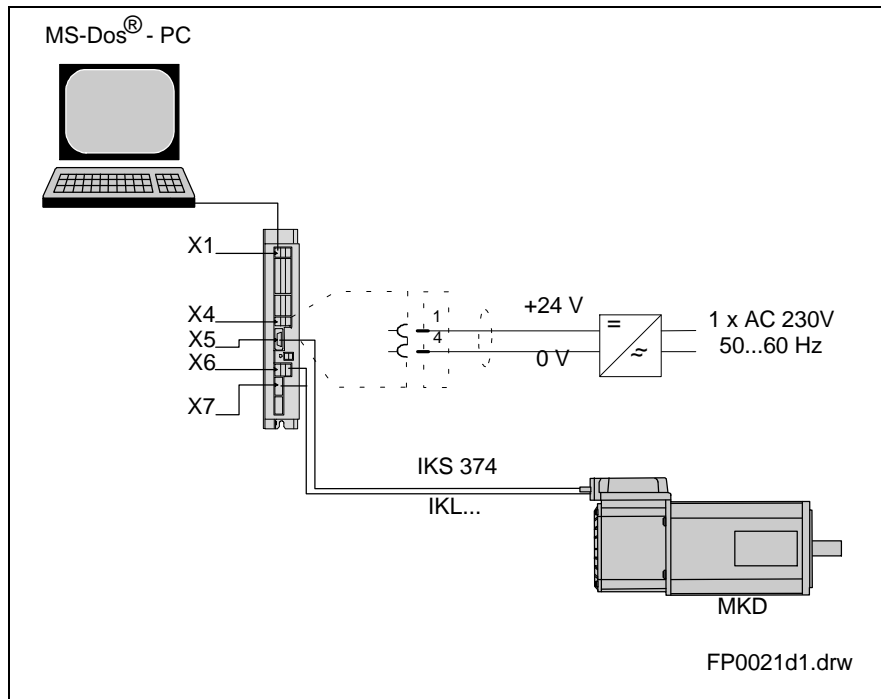


Fig. 3-4: Minimal installation for simple parameter setup

Simple parameter setup can be performed with this installation. To activate the drive and to carry out motion, additional installation is required.

Note: Detailed installation instructions are found in the Project Planning Manual.

3.7 DriveTop Startup

DriveTop can be started by double-clicking on the DriveTop icon.

Scanning for Connected Drives

After DriveTop starts running, it first searches for connected drives. Every drive address between 1 and 99 will be tested.

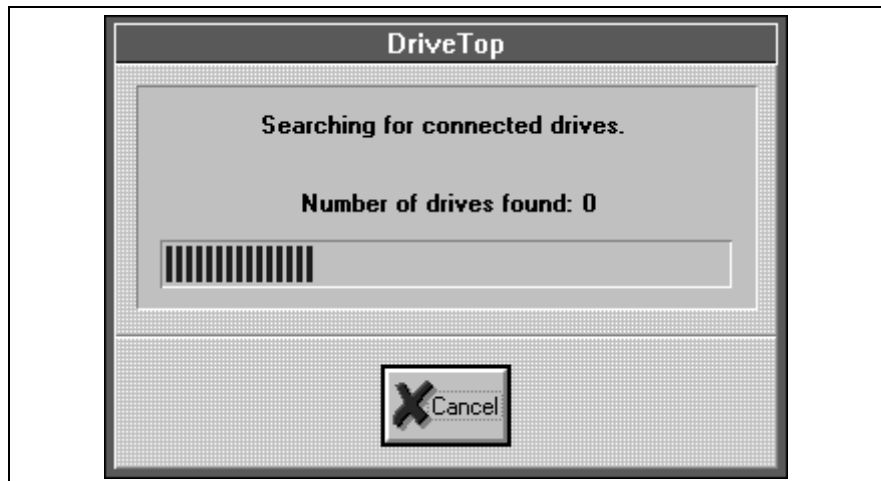


Fig. 3-5: Scanning for drive addresses

If one or more drive controllers are found, the parameter settings from the first drive found will be read.

Note: You can only find multiple drives if your PC is connected by an RS232/RS485 interface converter to several drives which are interfaced with a RS485. All drives must be set to the same baudrate.

If no drive is found then the following dialog box appears:



Fig. 3-6: Dialog box after failed scan

Reasons for this dialog box may be:

- The +24V control voltage for the DKC is not turned on or not connected.
- Problem in the connection between PC and the drive controller.

Now you can either retry establishing a connection, cancel out of the program, or go into offline mode.

Online and Offline Operation

Parameter Setup through Online Operation Startup Procedure

Online operation means the drive controller is in direct communication. In online operation, all the parameters that are in the current dialog screen of the startup sequence are written directly to the drive controller and become immediately operative. The user can also immediately test the results of the installation.

Parameter Setup through Offline Operation Startup Procedure

Offline operation means that there is no connection to the drive controller from the PC. The offline operation makes it easy for the initial installer to prepare parameter sets which can then be loaded complete onto the appropriate drive. There remains only a small amount of work left over for the initial operator which cannot be worked through offline because of the dependence of the machine.

Diagnostic Window

After a successful drive controller parameter scan, the following diagnostic window appears on the PC screen.

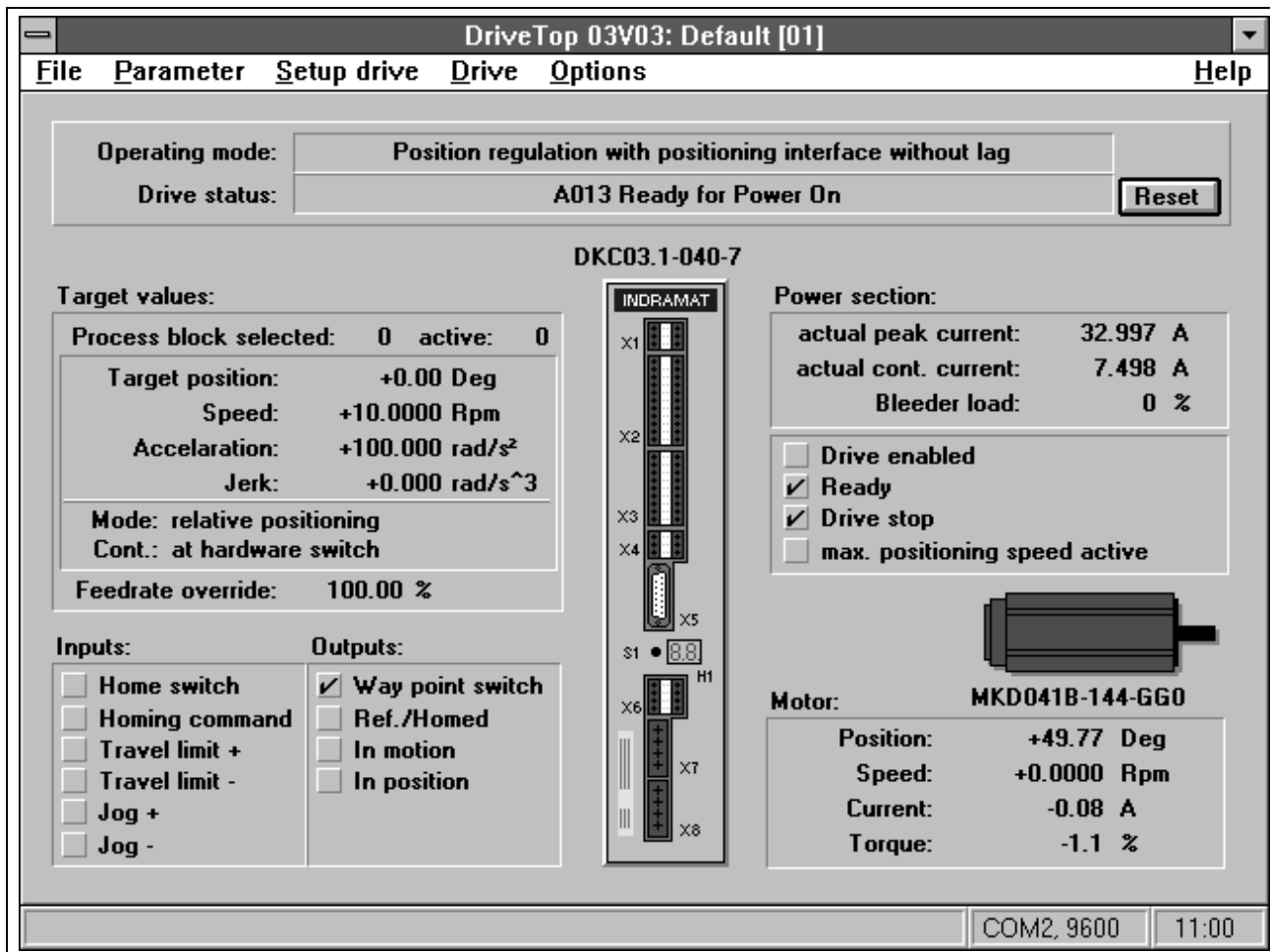


Fig. 3-7: Diagnostic Window

The diagnosis window displays the following information:

- Drive controller status and error messages
- Command value and actual value
- Power on status and status signals
- Model descriptions of installed components

Note: The diagnostic window appears only in online operation. In offline mode, a graphic with the **ECODRIVE** components is displayed instead of the diagnostic window.

Password Protection

General Information on Password Protection

A user-defined password can be used to prevent access to the drive parameters. No more changes are then possible to the parameters until a user with access to the password enters it to unlock the drive. The password protection itself is integrated into the drive.

You can call up the features for password protection from the via menu path **Options/Password protection**.

The default password in the drive is '007'. This can be used to unlock the drive, i.e., to turn password protection off.

A user password may consist of the letters from A-Z and a-z (upper and lower case letters are distinct!) and the numbers from 0-9. Passwords must be at least 3 characters long, and may be up to 10 characters in length.

Also see parameter **P-0-4025, Password**

Change Password

This dialog box is used to change the existing password or to restore the password '007' back to the drive. The dialog box can be called up from the **Options/Password protection/Change password** dialog box.

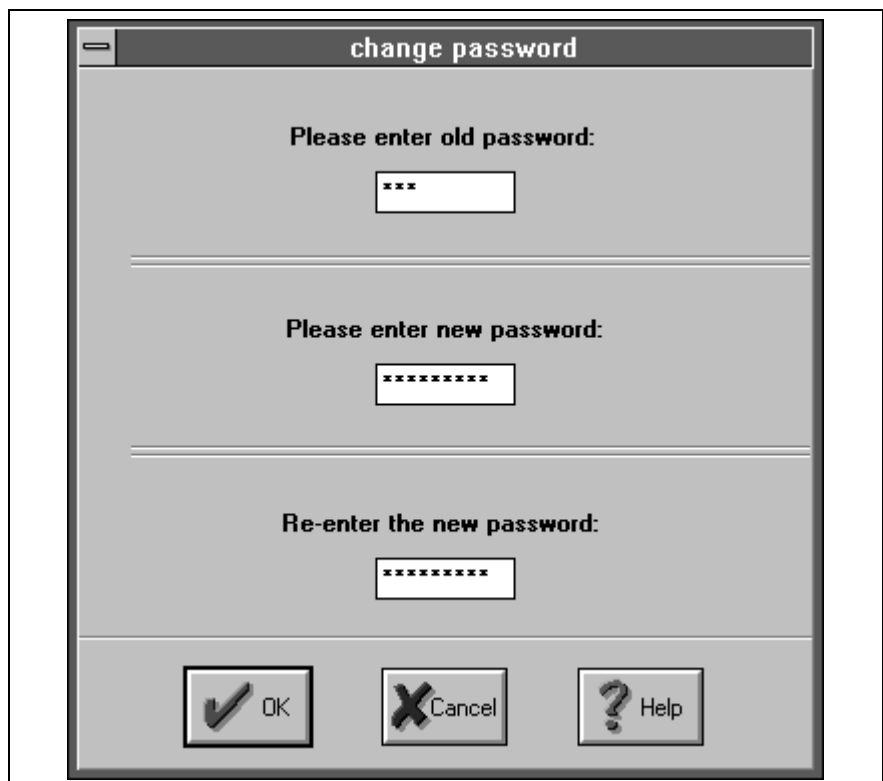


Fig. 3-8: The 'Change password' dialog box

Procedure: To enter a new password, all editing three fields must be filled in. Enter the current password in the first field (either '007' or an existing password defined by a user). Write the new password into both of the other two fields. Now when the close dialog box with the 'OK' key, if all the passwords are correct, the new password becomes active and protects the drive.

Remove Password Protection

To remove a user password and permanently unprotect the drive enter '007' again as a new password.

Unlock drive

To change a parameter (when password protection is active), select the menu item **Options/password protection/unlock drive**. The following dialog box appears.



Fig. 3-9: Unlocking the drive

Procedure: Enter the current user password and close the dialog box with the OK key. The drive is now unlocked.

Lock drive

To lock the drive, select the menu item **Options/Password protection/Lock drive**. The following dialog box appears.



Fig. 3-10: Lock drive

Procedure: Press the 'OK' - key, and the drive will be locked.

Locking with RS - 485

If a user password is entered, the drive will be locked when starting or leaving DriveTop. If a new drive is selected with DriveTop (RS 485), both the old and the new drive will be locked.

3.8 DriveTop Menu Structure

Files

Load	You can choose from a list of available parameter-files. The data within these parameter files will be taken into the drive.
<hr/>	
Note: In offline operation the content of the parameter files can be viewed and changed.	
<hr/>	
Save	The current parameters of a connected drive will be stored in a parameter file in the PC.
<hr/>	
Note: Please do not overwrite the parameter file "DKC31.par" which comes with the product. You can use this parameter file at any time to restore the drive controller to its original state. For your own parameter data, you should use other file names.	
<hr/>	
Exit Alt+F4	The menu item "End" allows you to leave the DriveTop program.

Parameter

Scan	When DriveTop is started, all the parameter information is read from the connected drive. Due to speed reasons, in some dialog boxes only the contents of the parameters are read. Often it is convenient to move from one the drive controller to another without restarting the DriveTop program. In order to keep the parameter window valid, you must perform a new parameter scan after plugging the interface cable into the new drive controller.
List of All Parameters	In this menu you can examine a list of all of the parameters of the drive and make changes as necessary. This offers a "low-level" way to set parameters which must only be used in exceptional cases. Normally all the drive parameters settings are performed as part of the initial installation.
List of all Invalid Parameters	By switching from set parameter mode to operating mode, the current parameters will be checked for validity. All the incorrect parameters and those that will lead to limit violations will be placed in a list of invalid parameters, where they can be corrected.

Also see **S-0-0022, IDN List of Invalid Op. Data for Comm. Phase 3**

Mode The drive recognizes a parameter mode and a drive mode. You can use this menu to switch modes. A number of parameters can only be changed in set parameter mode. (Seven-segment display P2). Travel is only possible in operating mode.

Also see **S-0-0014, Interface Status**

Motor type You can use this menu item to read information about the type of connected motor. In offline operation this activity must be performed manually.

Also see **S-0-0141, Motor Type**

Drive Controller/Operating Mode Selection This menu item can be used to read information about the connected drive controller. From this information the input of the overload factors and the PWM frequency within which the drive should run are read. In offline operation, all of these activities must be performed manually by the user.

You can also select the desired operating mode from a list.

Also see **S-0-0140, Controller Type**

Additional Dialog Boxes for Setting Parameters Depending on the operating mode, other parameter dialog boxes are found in the parameter menu. These dialog boxes are self-explanatory and will not be discussed further.

Setup Drive

Hardware Connections You can use this menu item to open a help system where the connections to the device are displayed.

Parameter Setting The parameter settings in the initial installation lead the installer step-by-step through a series of individual dialog boxes. At the end of this process, all settings required for the application have been made.

Drive

Scan DriveTop can be physically connected to more than one drive controller at the same time with the help of a RS232/RS485 interface converter. DriveTop looks for connected drives under menu item "Scan".

Select If DriveTop is connected to more than one drive with the RS485 interface, then you can use this menu item to determine which device is using which connection.

Offline DriveTop can be operated online as well as offline.

Options

Language You can use this menu item to switch the language in which DriveTop operates, the language of the parameters and drive controller diagnostics.

Also see **P-0-0005, Language selection**

Password Protection Here you can:

- Enter your own password.
- Lock (protect) the drive so parameter settings cannot be changed by unauthorized users.
- Unlock the drive to make changes to parameters.

Also see **P-0-4025, Password**

Communication The Communications menu item allows you to make settings regarding data exchange between the drive controller and the PC.

- Selection of COM ports
- Determining the baud rate
- Setting addresses

Help

Contents This menu provides access to the online handbook. This handbook contains a wide range of information regarding the functional characteristics of the drive system, parameter descriptions, and diagnostic descriptions.

Using Help General Information Regarding Use of the Help System.

Information About... Information regarding the software version of DriveTop.

3.9 Printing Parameter Data

There is no direct way in DriveTop to print out parameter files.

Parameter files are stored as ASCII files and can be viewed and printed with almost any editor. If you need to print a parameter file, we suggest you use the "Notepad" editor. Notepad is a part of Windows 3.1 and is therefore available under within Windows 3.1. To print a parameter file, following these instructions:

Example: Parameter file "X_Axis.par:"

- From the Program Manager menu choose "Run - File..."
- At the command prompt enter "Notepad X_Axis.par" and click the "OK" icon.
- Click on "Print files." (The printing process will begin.)

4 Motor and Drive Controller Selection

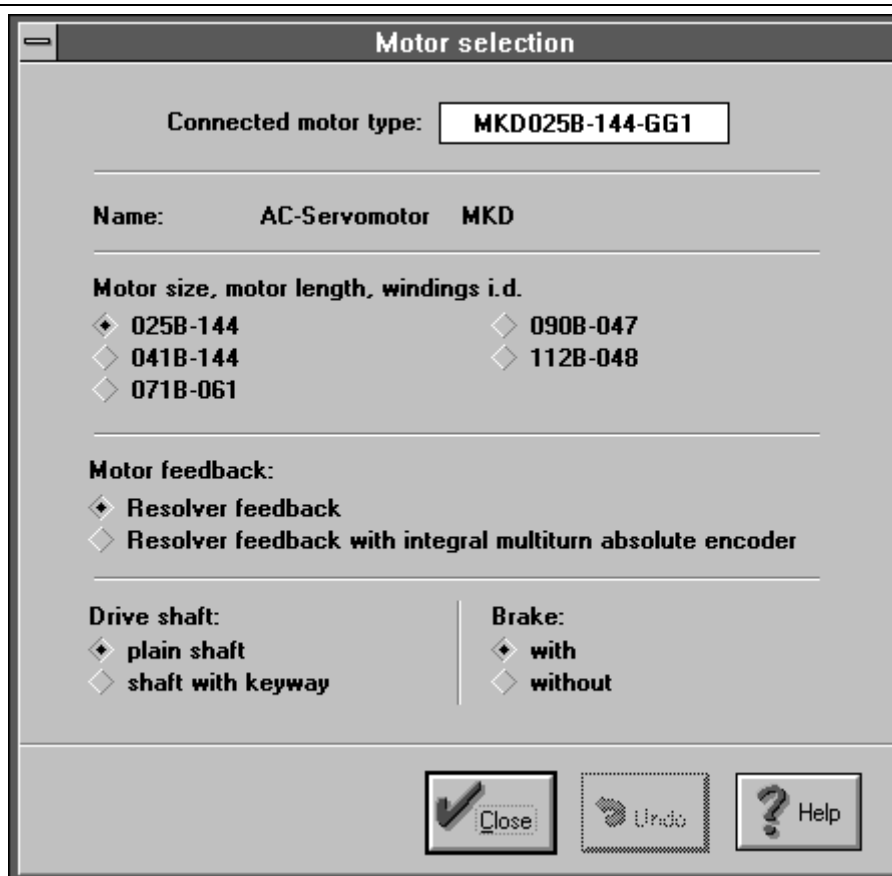
4.1 General Information on Selecting a Motor and Drive Controller

An **ECODRIVE**- drive system consists of a drive control device (DKC) and a Servomotor (MKD). A drive controller and motor suited to a particular application can be selected with the aid of selection documents (selection lists). These documents are available from **INDRAMAT**.

Specific information about the motor and the drive controller to be used for the axis in question is required for a startup procedure. During online operation, this information is read from the connected motor and drive controller and does not have to be entered by the user. In offline operation the drive controller and motor are not connected, and the user must enter this information directly.

4.2 Motor Selection

Specific information about the motor to be used for the specific application is needed for offline operation. DriveTop needs this information to be able to use motor-specific data to determine specific parameter settings. (motor current, velocity, standard control parameters, feedback type, etc.)



The image shows a 'Motor selection' dialog box. At the top, it says 'Connected motor type: MKD025B-144-GG1'. Below this, the 'Name' is 'AC-Servomotor MKD'. The next section is 'Motor size, motor length, windings i.d.' with three columns of options: 025B-144, 041B-144, 071B-061, 090B-047, and 112B-048. The 'Motor feedback' section has two options: 'Resolver feedback' and 'Resolver feedback with integral multiturn absolute encoder'. The 'Drive shaft' section has two options: 'plain shaft' and 'shaft with keyway'. The 'Brake' section has two options: 'with' and 'without'. At the bottom, there are three buttons: 'Close' (with a checkmark icon), 'Undo' (with a circular arrow icon), and 'Help' (with a question mark icon).

Fig. 4-1: Motor selection

Note: If incorrect information about the type of motor is entered here, the diagnostic message "UL" will appear in the drive controller after the parameter settings have been loaded. This means that the type of motor in the parameter settings is not identical with the type of motor that is actually connected. If this happens, do the following:

Also see **C700, Basic Load**

- Acknowledge the error by pushing the S1-button on the drive controller. If the drive controller does not discover any additional errors, "bb" is displayed.
- Reset the installation parameters and recalculate the parameters of the drive controller limits.

4.3 Drive Controller Selection

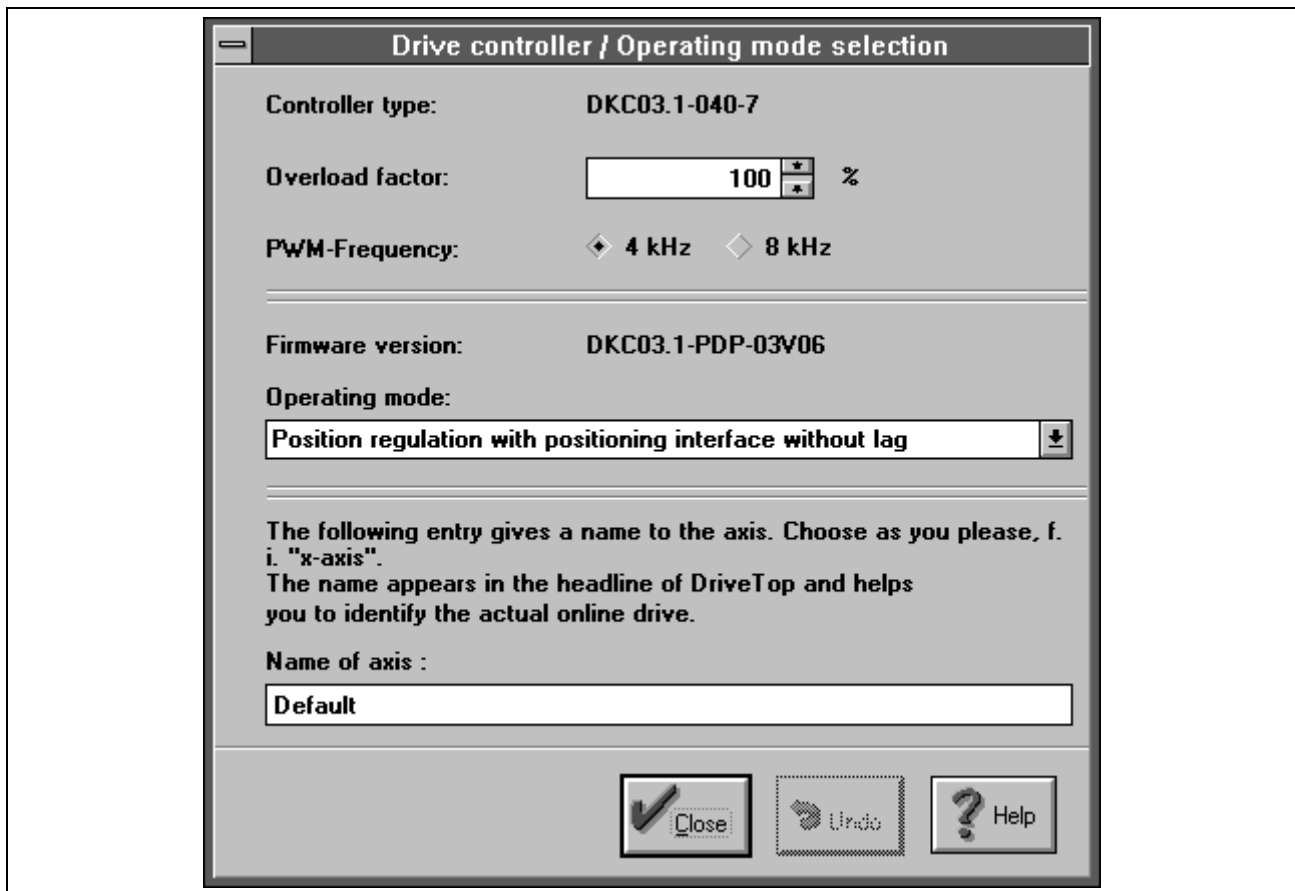


Fig. 4-2: Drive controllers

Selecting the Drive Controller

For offline operation, select the type of drive controller. There are three drive controllers which can be selected:

- **DKC03.1-040-7-FW**
- DKC01.1-030-3-FW
- DKC01.1-040-7-FW

The type of drive controller selected determines the availability of modes of operation and functions. This adjustment takes place automatically during online operation by reading the "drive controller type" parameter of the connected drive controller.

Selecting the Overload Factor

The overload factor is used to define the transient operating torque of the drive controller. The velocities and torques available with the different combinations of drive controllers and motors and power supply input voltages are listed in the DKC/MKD selection lists. The overload factor needed to obtain the drive controller data can be read off of the last column in each line of the selection list.

Note: The projected selection data is necessary for the correct adjustment

Also see **P-0-0006, Overload Factor**

Selecting the PWM Frequency

The clock frequency of the power output (PWM-frequency) of the drive controller can be set to either 4 kHz or 8 kHz. The PWM frequency determines the noise level of the motor, the permanent current carrying capacity of the drive controller, and also the available transient operating torque of the drive controller. The following rules apply to the settings:

- The 4 kHz PWM frequency should be used in standard applications to maintain the high transient operating torque of the drive controller.
- The 8 kHz setting should be used in applications where the environment requires a low noise level. It is important to note that when using the 8 kHz PWM frequency, the drive controller has a lower permanent current carrying capacity as well as reduced transient torque. All permanent current and permanent torque data are reduced by a factor of 0.9.

Also see **P-0-4019, Process Block Mode**

Setting the Operation Mode: Position Control with Positioning Interface

The operating mode "Position control with positioning interface" can be set in the Drive/operating modes dialog box.

Position Control with Following Error

When positioning in this mode, a speed-dependent difference between the command position and the actual position will be created (following error). This synchronized behavior during positioning is dependent on the Kv factor setting and results in "creeping" towards the desired position, especially with a small Kv factor.

Position Control without Following Error

In the position control without following error mode, a velocity feedforward ensures that the command position and actual position are always the same. Therefore there will not be any velocity-dependent differences between command position and actual position.

Selecting the Appropriate Position Control Mode

In general, the position control without following error is advantageous because in this mode the drive reaches the desired position the quickest (no Kv-factor-dependent creeping).

In less rigidly controlled mechanical systems, the surges in acceleration created by this mode cause undesirable mechanical vibrations. The position control with following error mode should nevertheless be used if the application allows this disadvantage.

Vibration will then be damped by reducing the Kv factor. Doing this creates a compromise between the positioning action and the load rigidity.

Notes

5 Control Communication Via the Profibus DP

5.1 Features of the Profibus Device

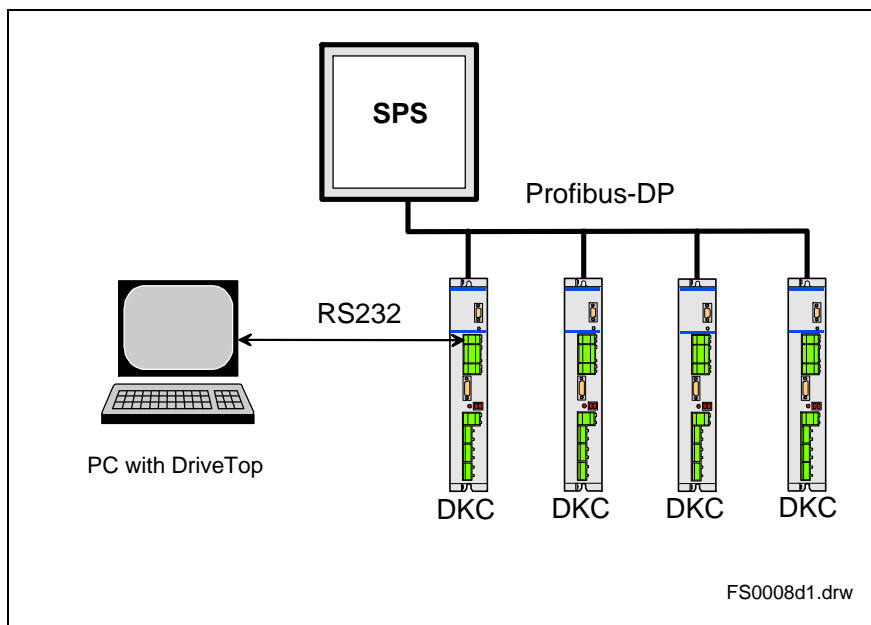


Fig. 5-1: Configuration with drives attached to the profibus

I/O signal transmission via the profibus DP

The DKC03.1 has a PROFIBUS DP interface for communication with a superordinate PLC. This standardized serial bus replaces the parallel transmission of digital I/O signals. The profibus connection has **16 inputs and 16 outputs**.

Parameters are set on the drives locally via an RS-232 interface and the PC-supported installation and setup program **DriveTop**. You can also use this system to save and open **parameter sets** conveniently. This includes **process blocks for positioning** in all modes, absolute and relative.

5.2 Drive Control Word

Enabling, commands and travel command from the control to the drive.

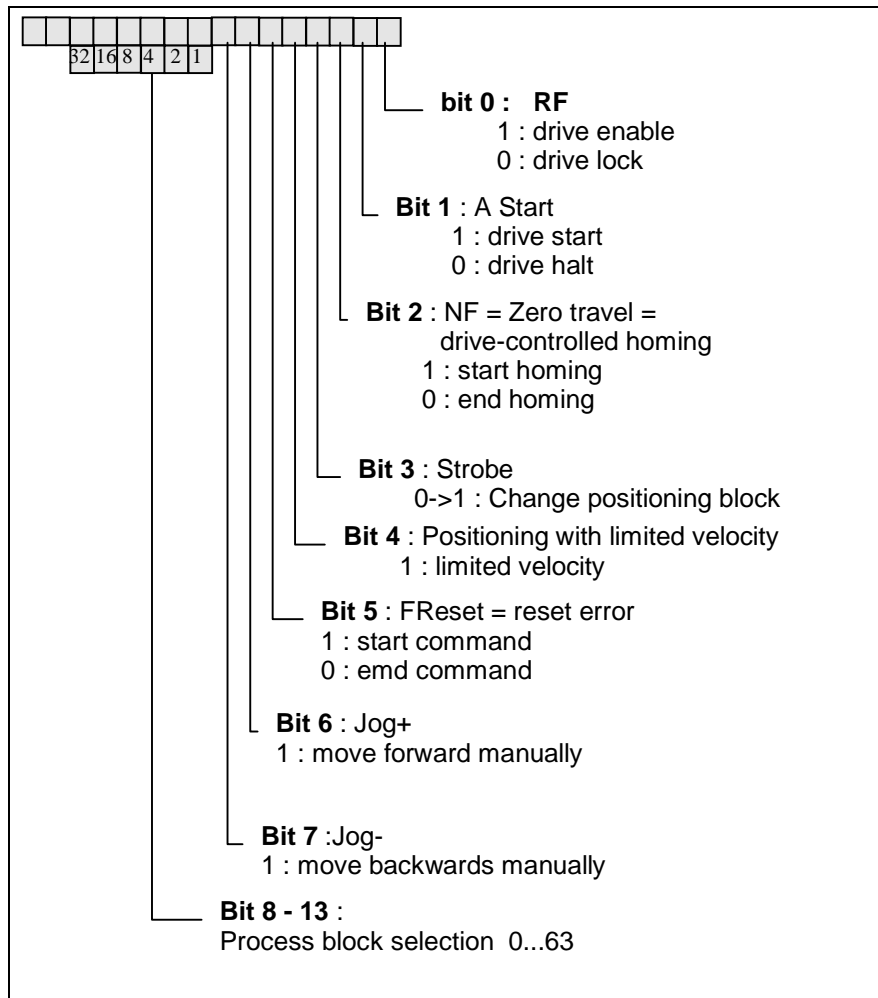


Fig. 5-2: Drive control word, from profibus to the drive

Bit	Abbr.	Effect of 1	Description
0	RF	Drive Enable	Chap. 7.13
1	AH/start	Begin motion	Chap. 7.13+6.4
2	NF	Zero travel/drive-controlled homing	Chap. 7.7
3	Strobe	Change process block with start = 1	Chap. 6.4 Part 1
4	Posit. w. lim Vel.	Positioning at limited velocity	Chap. 7.9 Part 2
5	FReset	See Trouble shooting guide	Descript of Diagnostic Mess. 1.1
6	Jog+	Jog travel in positive direction	Chap. 7.8
7	Jog-	Jog travel in negative direction	Chap. 7.8

Fig. 5-3: The drive control word to the profibus, lowest-order byte

5.3 Drive Status Word

Messages, acknowledgements and diagnostic messages from the drive to the control system

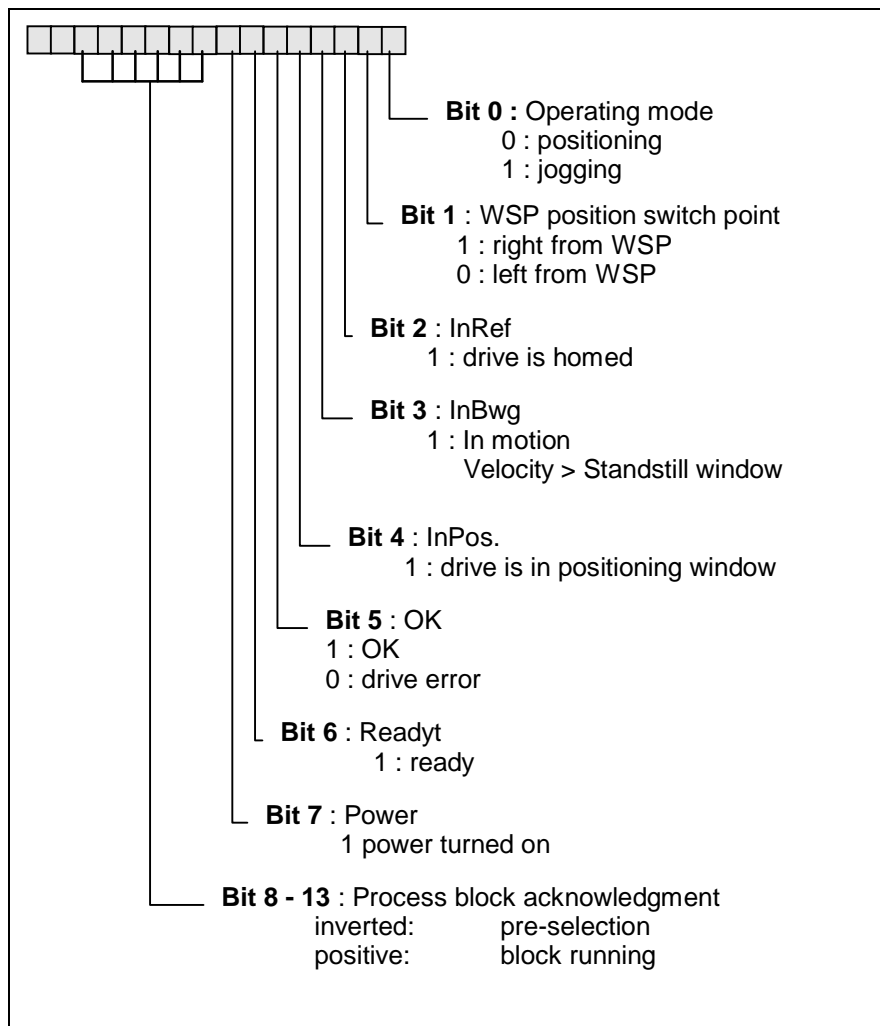


Fig. 5-4: Drive status word from drive to profibus, lowest-ordered bit

Bit	Abbr.	corr. Parameter	meaning for 1	Description
0		S-0-0135	1 = jog	Chap. 7.8
1	WSP	S-0-0059	right from position switch point	Chap. 7.6 Part 5
2	INREF	S-0-0403	Drive is homed	Chap. 7.6 Part 4
3	INBWG	S-0-0331	Drive is in motion Vel. > Standstill window. ¹⁾	Chap. 7.6 Part 3
4	INPOS	S-0-0182 Bit 6	Drive is in desired Position window. ²⁾	Chap. 7.6 Part 2
5	OK		Drive OK , no error	
6			ready	Chap. 7.6 Part 1
7			Power is on, bits 6 & 7 on: under torque	Chap. 5.4

Fig. 5-5: The drive status word to the profibus

5.4 Installation Procedure

Turn on the DKC03.1

Before switching on with the two-decimal address rotary switches S3 & S2, select a slave **address**.

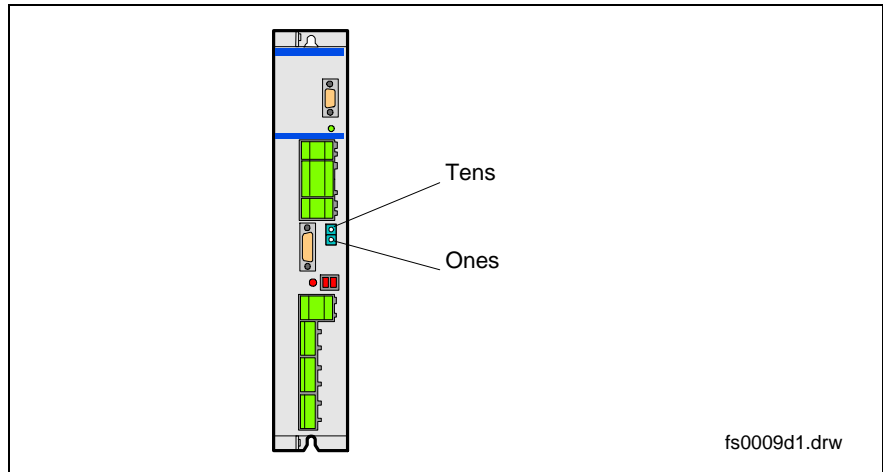


Fig. 5-6: DKC03.1, Switches for the bus address

Turn on the **control voltage**, but not the mains power supply.

If this is an initial installation, load the standard parameter set for DKC03.1 via the serial interface. To correct errors, do Basic load, fix invalid parameters in the *.PAR file and reload.

Turning the Power Supply On and Off.

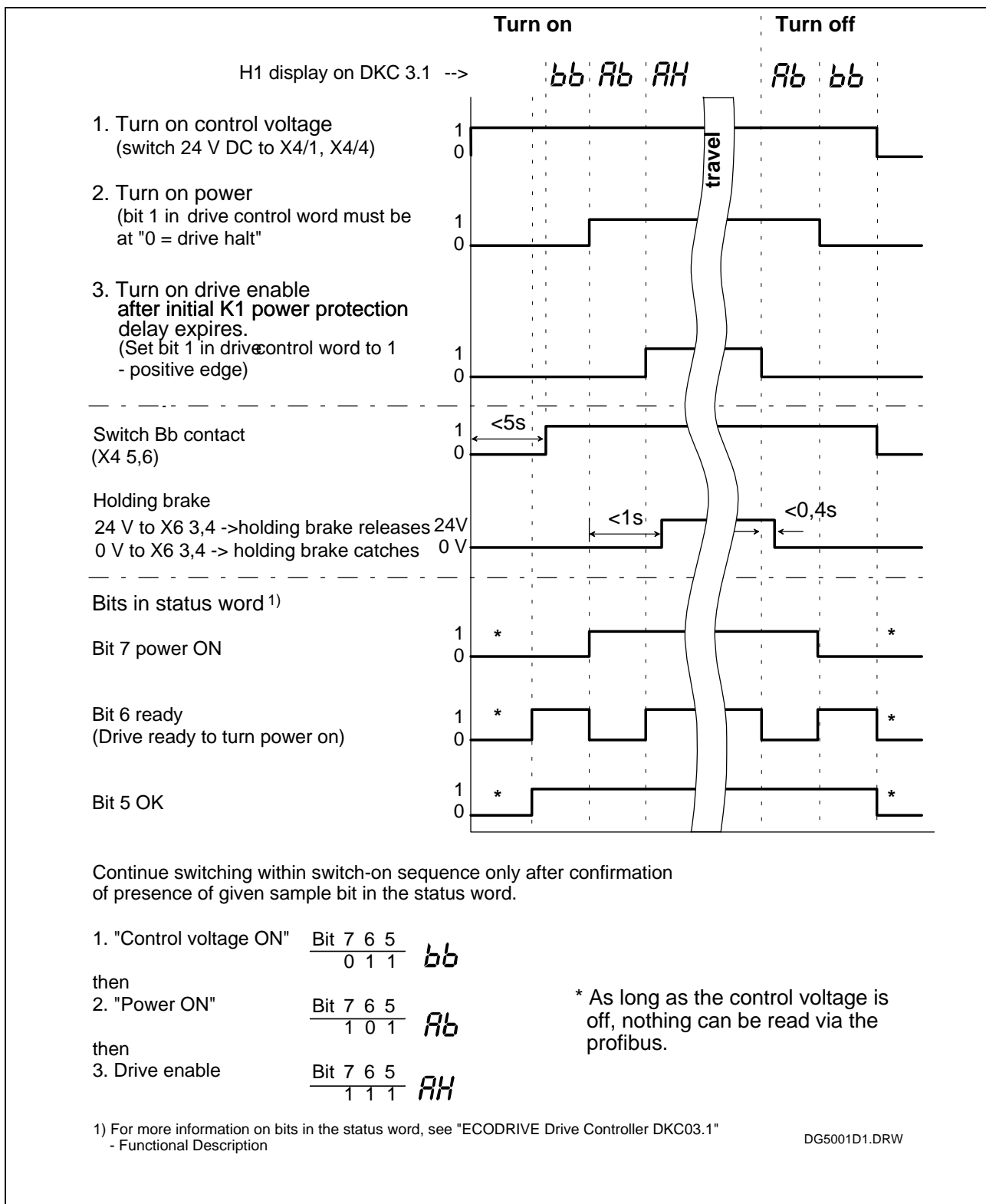


Fig. 5-7: Power supply

5.5 Control Functions That Can Be Initiated from the Profibus

- Positioning operation see Chap. 6.3
- Jogging, see Chap. 7.8
- Drive-controlled homing, see Chap. 7.7
- Error Reset

For a note on trouble shooting, see diagnostic description Chap 1.1.

5.6 Profibus Connection

Cable

Twisted pair with insulation.

Topology: **Line**, no branching. A master needs not be located at the beginning of the line.

Connections and Wiring

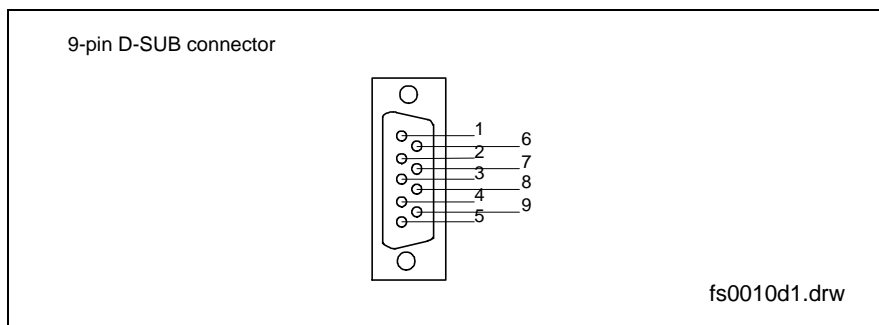


Fig. 5-8: Profibus, electrical connections

9p. Trapezoidal jack (Sub-D), female on the device. The longer side of the trapezoid is on the left side of the front panel. The cable is oriented towards the top.

The plug can contain a switchable **termination** (termination resistances). The termination should be turned on at the physical beginning and end of the profibus line, otherwise off.

Pin	Signal
1	free
2	free
3	RS-485_B
4	RTS
5	GND_Bus (galv. separated)
6	+5V_Bus (galv. separated)
7	free
8	RS-485_A
9	Cntr-N

Fig. 5-9: Pin assignment for profibus plug

Diagnostic message LED

A green diagnostic LED is located on the front panel to indicate "RUN" (the bus is running). Its name is H3.#

Address switch

2 x decimal coding switches are accessible from the front panel. They allow for addresses up to 99. For a description and illustration with the position of the switches, see the chapter "**Installation Procedure**".

Notes

6 DKC03.1 Drive Controller with Integrated Position Control

6.1 General Information for Operating with Position Control

Up to 64 different position blocks can be stored with the DKC03.1. The 6 bits in the Profibus control word can be used to select one of these positioning blocks and bring it to execution with a start signal. The following motion parameters can be placed in a position block:

- **P-0-4006 Process block Target Position**
- **P-0-4007, Process block Velocity**
- **P-0-4008, Process block Acceleration**
- **P-0-4009, Process block Jerk**
- **P-0--4019, Process block Mode**

Note: Positioning velocity can be affected by the Feedrate override function and by Positioning with limited velocity.

6.2 Positioning Block Input

Positioning block data is specified in the positioning block input dialog box.

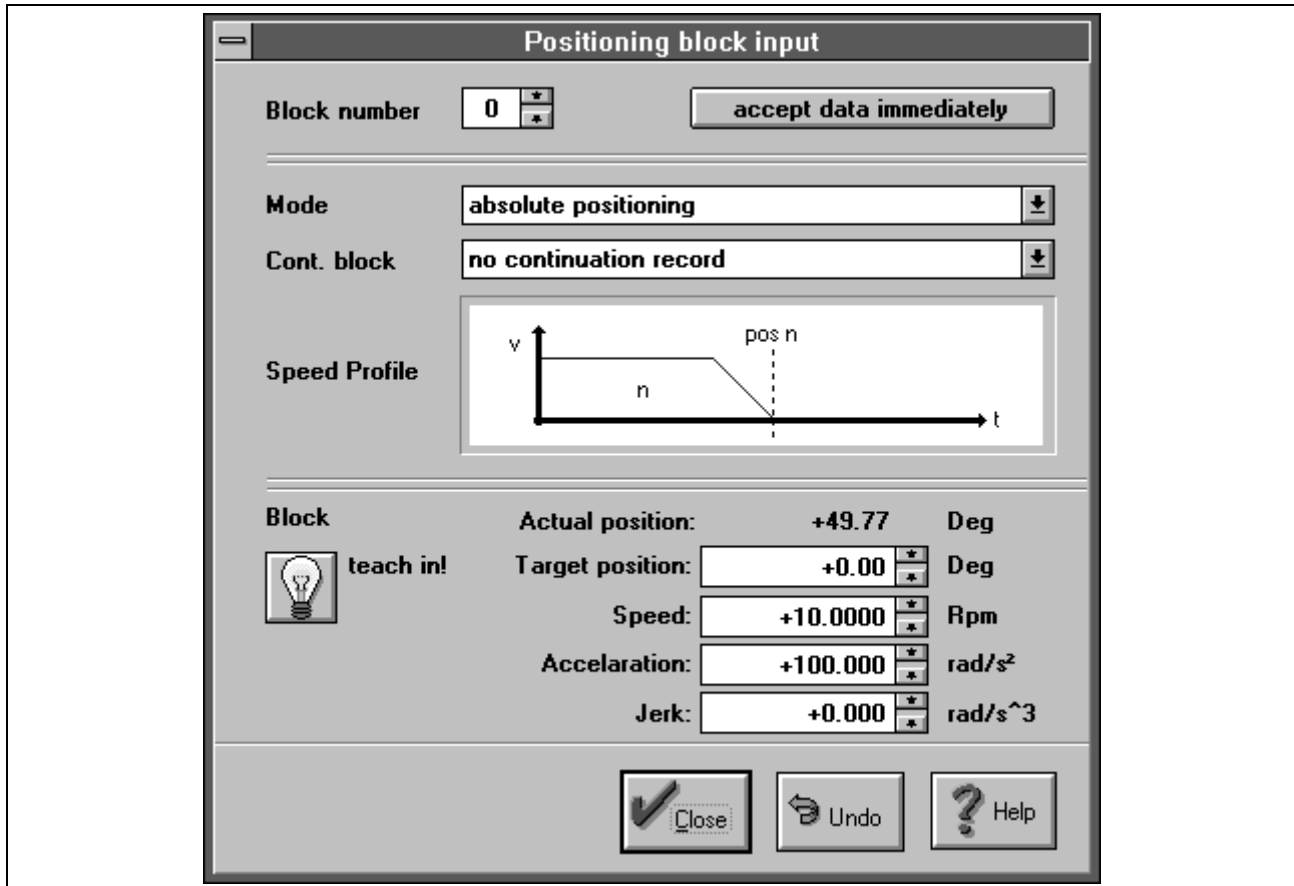


Fig. 6-1: Positioning Block Input

Block Number

Block numbers 0 to 63 designate the address of a positioning block by means of which the block can be accessed by the profibus.

Positioning Block Data

Target position

The position to which the drive should be moved is entered in the Target position input field. The desired position can be relative or absolute, depending on the positioning mode.

Also see **P-0-4006, Process Block Target Position**

Teach-in actual position

The Teach-in function places the current actual position in the target position of the block being handled.

Velocity

The positioning velocity at which the desired position will be reached is set here.

The Feedrate override function can be used to change this velocity dynamically during positioning. The function "**Positioning with limited velocity**" can be used for the same purpose.

Also see **P-0-4007, Process block Velocity** and **S-0-0259, Positioning velocity**

Acceleration

The positioning acceleration at which the drive accelerates and decelerates can be defined for every positioning block. When acceleration is determined, the following aspects are considered:

- Maximum torque of the axis in response of the motor/drive combination
- Inertial torque and frictional torque of the connected mechanical system

If the acceleration is physically impossible (too great) the error **F228 Excessive control deviation** will be generated.

Also see **P-0-4008, Process block acceleration**

Jerk

"Jerk" refers to changes in the acceleration of a motion over time. **ECODRIVE** allows you to limit the jerk of a motion. One reason for setting the jerk limit is to avoid vibration caused by acceleration or deceleration. This effect occurs especially in less rigid mechanical systems.

Setting the positioning jerk

In most cases the jerk limit is not required and should be turned off during the initial installation. The jerk limit can be deactivated by entering 0.

If unacceptable vibrations arise in the acceleration and braking phases of a positioning process, a number of steps can be taken to change the positioning jerk and thus minimize the cause of vibration in the mechanical system.

To do this, begin with the maximum jerk value and continue reducing it until an acceptable positioning motion arises.

Also see **S-0-4009, Process Block Jerk**

A rough approximation validating the jerk limit

$$\text{Jerk } \left[\frac{\text{mm}}{\text{s}^3} \right] > 2 \cdot \frac{\left(\text{acceleration } \left[\frac{\text{mm}}{\text{s}^2} \right] \right)^2 \cdot 60 \left[\frac{\text{s}}{\text{min}} \right]}{\text{speed } \left[\frac{\text{mm}}{\text{min}} \right]}$$

Fig. 6-2: Jerk limit with linear scaling

$$\text{Jerk } \left[\frac{\text{rad}}{\text{s}^3} \right] > 2 \cdot \frac{(\text{acceleration } \left[\frac{\text{rad}}{\text{s}^2} \right])^2 \cdot 60 \left[\frac{\text{s}}{\text{min}} \right]}{\text{speed } \left[\frac{\text{rev}}{\text{min}} \right] \cdot 2 \cdot \pi \left[\frac{\text{rad}}{\text{rev}} \right]}$$

Fig. 6-3: Jerk limit with rotary scaling

When this relation is exceeded, a "creeping" effect results.

Positioning mode

The positioning mode determines whether the pos. block is relative or absolute target position. In addition, a selection list can be used to determine whether and how the next positioning block should be executed (following block operation).

Data Receiving

The given positioning block data is initially not active. The data is not written to the drive until you exit the dialog box. During setup it is helpful if the data can be tested directly. For this case all the given positioning blocks can be loaded into the drive through the "accept data immediately" key without having to leave the dialog box.

6.3 Positioning Operation

Absolute Positioning

Absolute positioning blocks store the desired position as a firm (absolute) position in the machine coordinate system.

Example: Absolute positioning with a desired position = 700

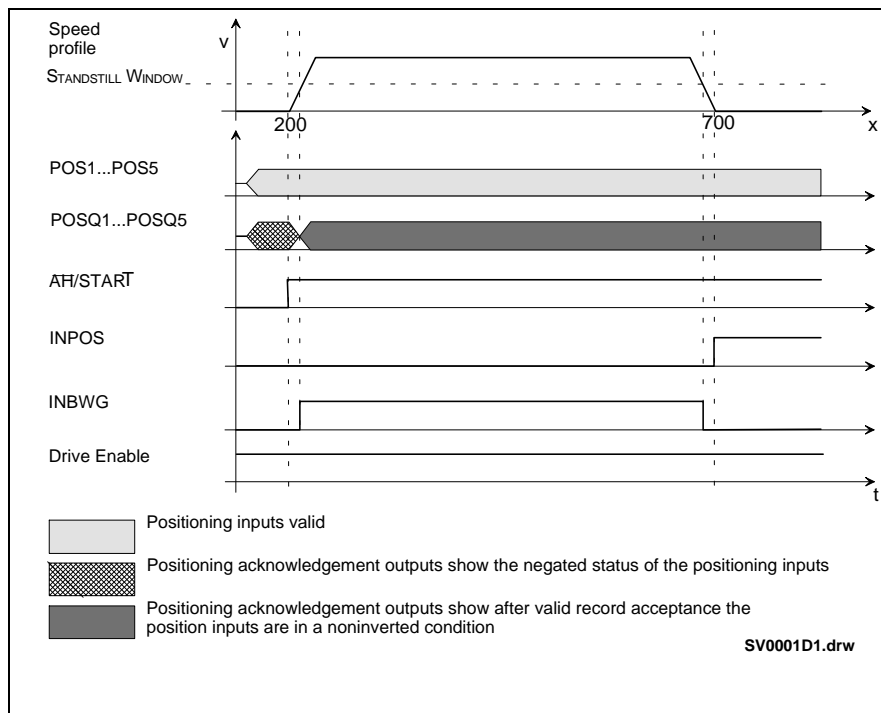


Fig. 6-4: Absolute positioning block

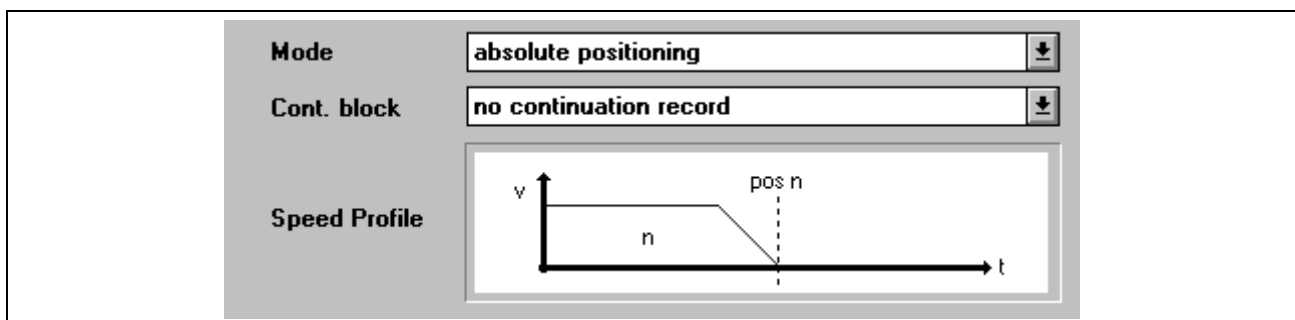


Fig. 6-5: Positioning block input with absolute target position

Requirements for Executing an Absolute Positioning block:

- The drive must be homed.
- The working area can be restricted with the position limit. Absolute positioning blocks will only be executed if the desired position lies within the admissible working area.

Relative Positioning

In a relative positioning block, the desired position is referred to as a relative distance from the actual position, or the last reached target pos.

A measurement string can be positioned through a string of relative positioning blocks.

Note: If relative positioning is used to start a string of position blocks, it is important to recognize that the string of distances will be lost under the following conditions:

- Cycling the drive enable signal
- Jogging between positioning blocks
- Continuous motion in the positive/negative direction between positioning blocks.
- Activation of a relative positioning block after an interrupted absolute positioning block.
- Homing
- Absolute encoder setting.

In these cases, the current relative positioning refers to the actual feedback position.

If a positioning block is rejected, the drive reacts as if this block had never been initialized.

If a string of relative positioning blocks is positioning continuously forwards or backwards (conveyor belt), then the scaling of the position data must be fixed in modulo format. (Modulo value = conveyor belt length).

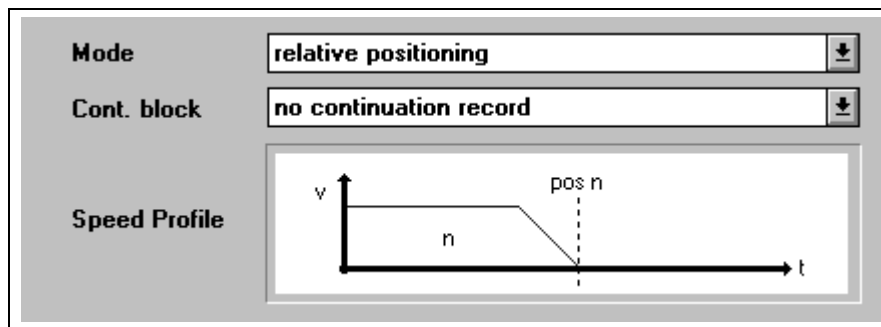


Fig. 6-6: Positioning block input with relative target position

Example: Relative positioning with a desired position = 700 (actual position = 200)

Relative positioning blocks will also be executed if the drive has not been homed. (In this case, however, the position limits have no effect).

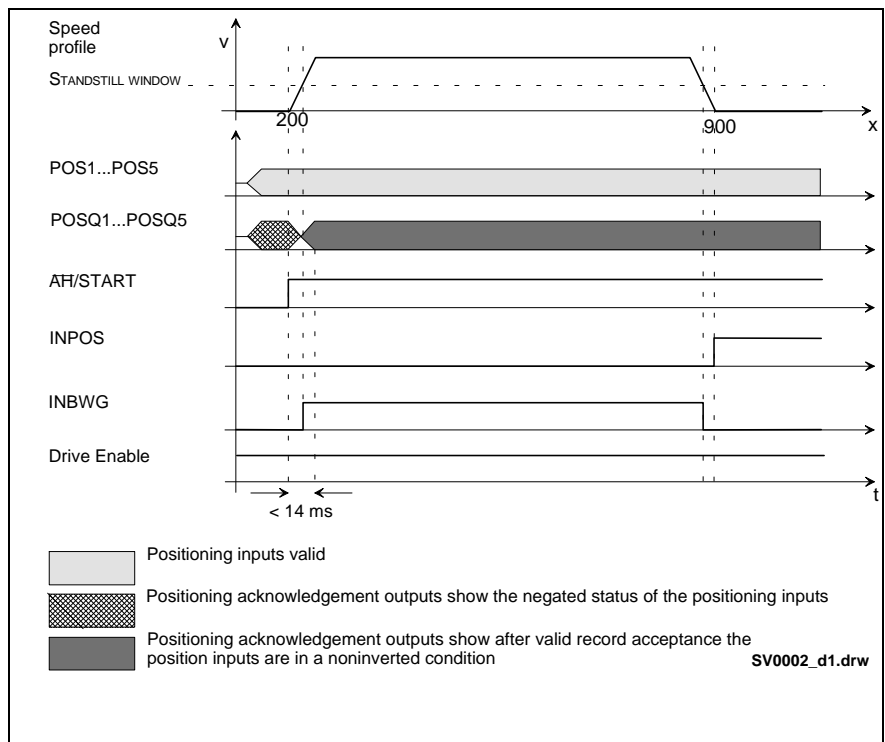


Fig. 6-7: Relative positioning block

Interruption of relative positioning blocks

Example: Interrupted relative positioning block with desired position = 600

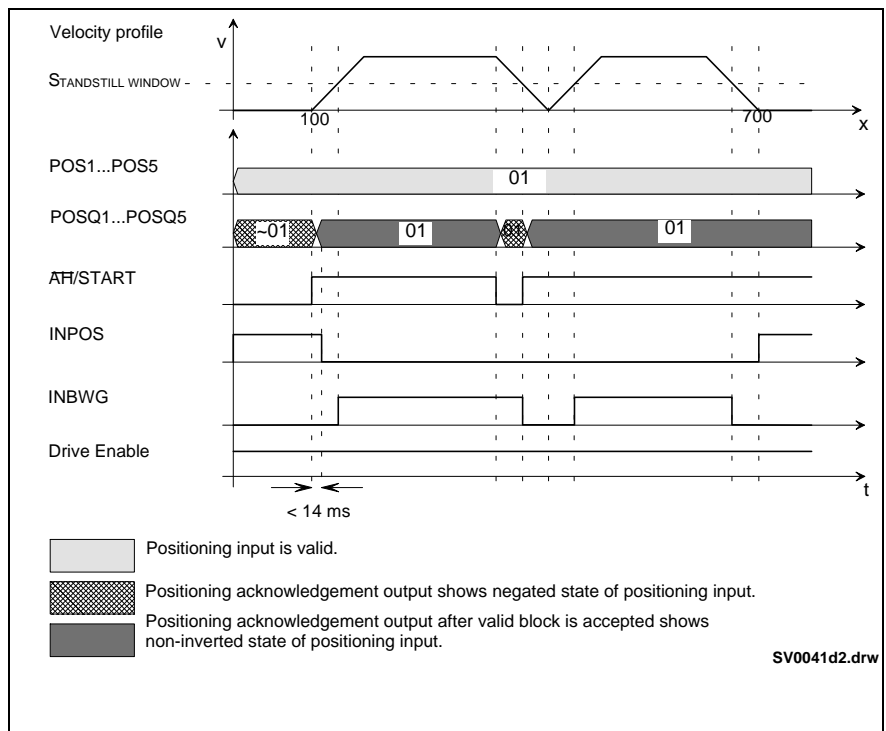


Fig. 6-8: Interruption of relative positioning blocks

Note: After the interruption of a relative positioning block, another relative positioning block will be started referring the actual position. The relation of the string of distances will be lost.

Relative Positioning Block after Jogging Operation.

Example: Interruption of the relative positioning block after the jogging operation with target position = 600

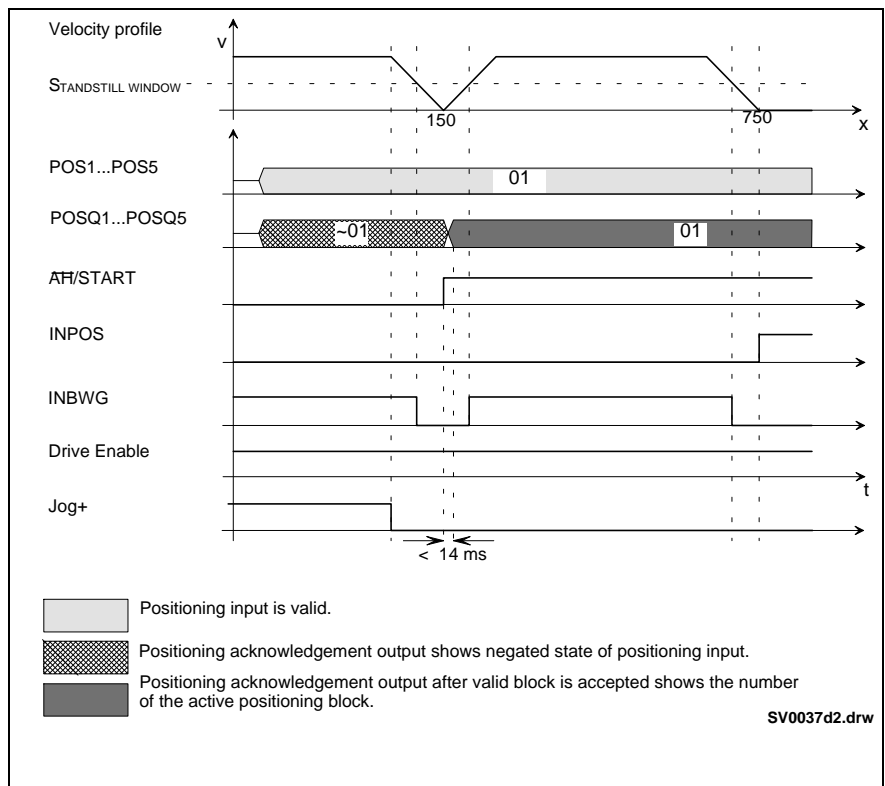


Fig. 6-9: Relative positioning block after the jogging operation

Relative Positioning Block after Activation of the Drive Enable

Example: Interruption of relative process block after activation of RF (=Drive enable) with target position = 600.

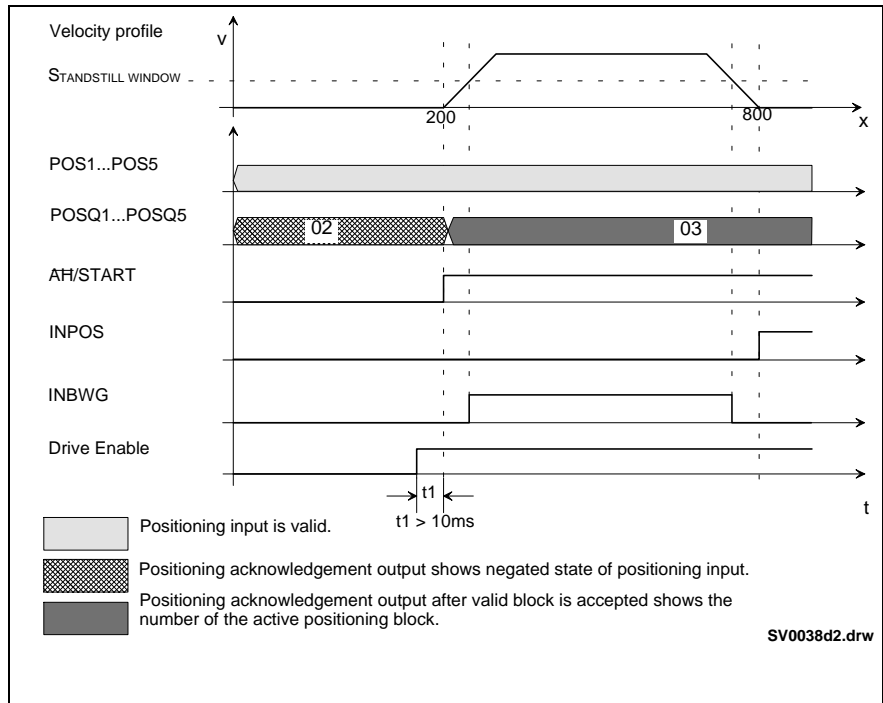


Fig. 6-10: Relative positioning block after activation of drive controller enable

Continuous Motion in Positive/Negative Direction

Should a motor move with a defined speed, acceleration and jerk, but without a specific desired position, then one of the process mode, "Motion in the positive direction" or "Motion in the negative direction" must be assigned. The drive moves continuously in the given direction until the start signal is removed (i.e. one of the position limits or travel limit switches is reached).

The input target position has no meaning in this positioning mode.

Also see **Chap.7.8 Jogging**

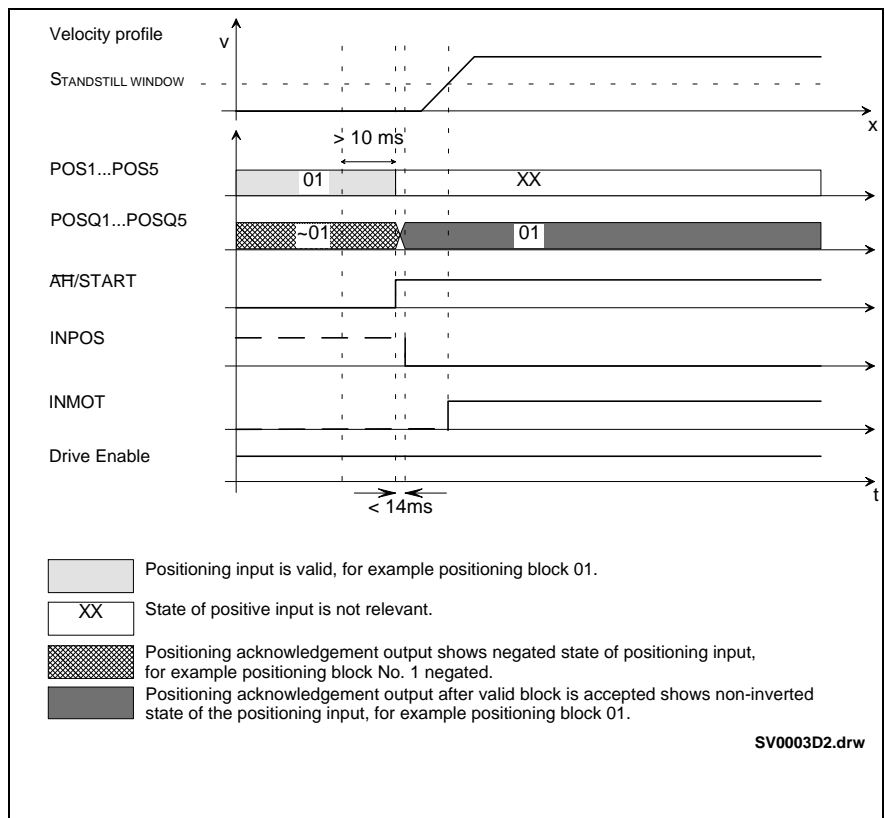


Fig. 6-11: Continuous motion in positive/negative direction

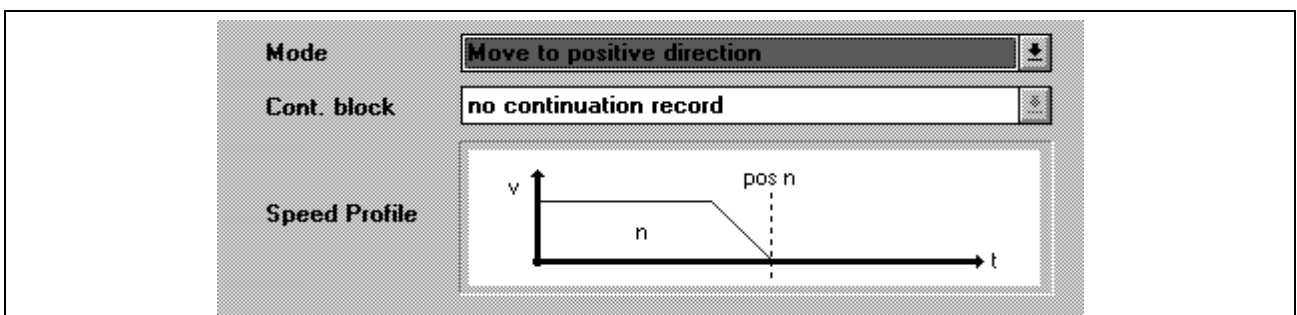


Fig. 6-12: Positioning block input for continuous travel without target position

Following Block Operation

General Information on Following Block Operation

Following block processing in **ECODRIVE** allows you to execute several positioning blocks in uninterrupted sequence, without a new start signal having been given.

Typical applications are positioning procedures in which a long path must be covered at a high velocity, and then, without any intervening time, positioning to the end position must take place at a low velocity.

- Picking up or setting down goods to be transported in handling robotics.
- Performing tasks in assembly facilities

A sequence chain consists of a starting block and one or more following blocks. The starting block is selected and activated as usual. The transition to a following block can take place in various ways.

Two different modes of block switching are possible:

- **Position-dependent block switching**
Switching to another block, to the block with the next higher block number upon traversing the programmed target position.
- **Switch-signal-dependent block switching**
The block switch to the block with the next higher number is initiated by an externally generated switching signal.

Following block operation is possible both with absolute and relative positioning blocks.

Selection and activation of a block with following block takes place in the usual manner. The following block is always the block with the next higher number. A following block can itself take a following block. Up to 63 following blocks can be set up after the starting block. The following block which would come after number 63 is block 0.

Also see **Chap.6.4 Starting Positioning blocks**

Position-Dependent Block Switching

In position-dependent block switching, the switching to the following block takes place at the starting block's target position. There are three possibilities for the block transition:

- Block transition with old positioning velocity (Mode 1)
- Block transition with new positioning velocity (Mode 2)
- Block transition with pause

Block switching Mode 1

In this mode the target position of the starting block is traversed at the velocity of the starting block. Then the positioning velocity switches to the velocity of the following block.

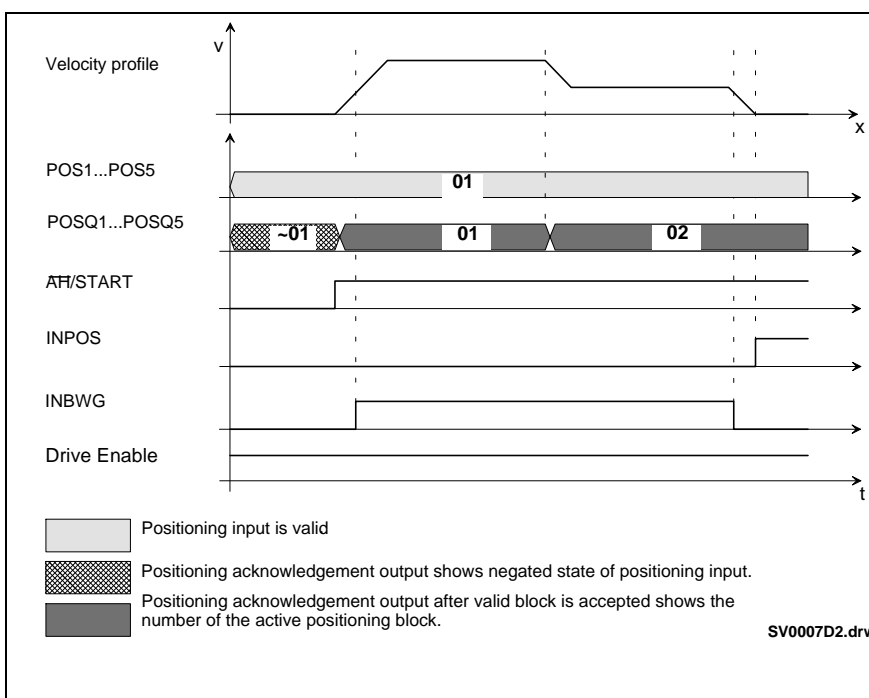


Fig. 6-13: Position-dependent block switching (Mode 1)

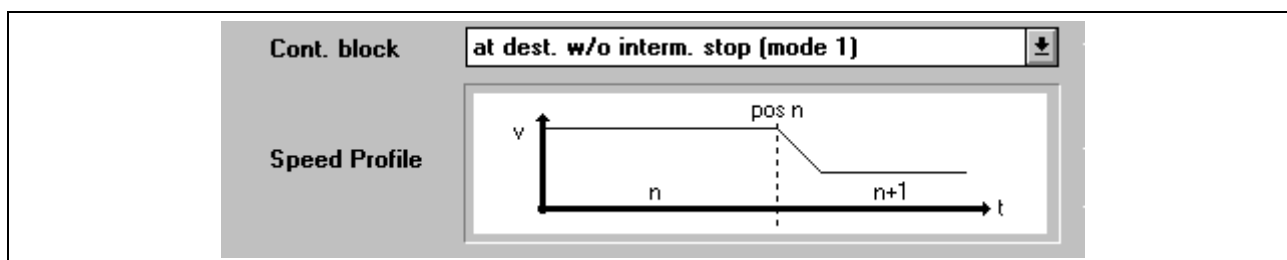


Fig. 6-14: Positioning block input with following block mode 1

Block switching Mode 2

In following block mode 2 with position-dependent block switching, the target position of the starting block is traversed at the positioning speed of the following block. The necessary braking or acceleration procedures to adjust to this velocity have already been performed in the starting block.

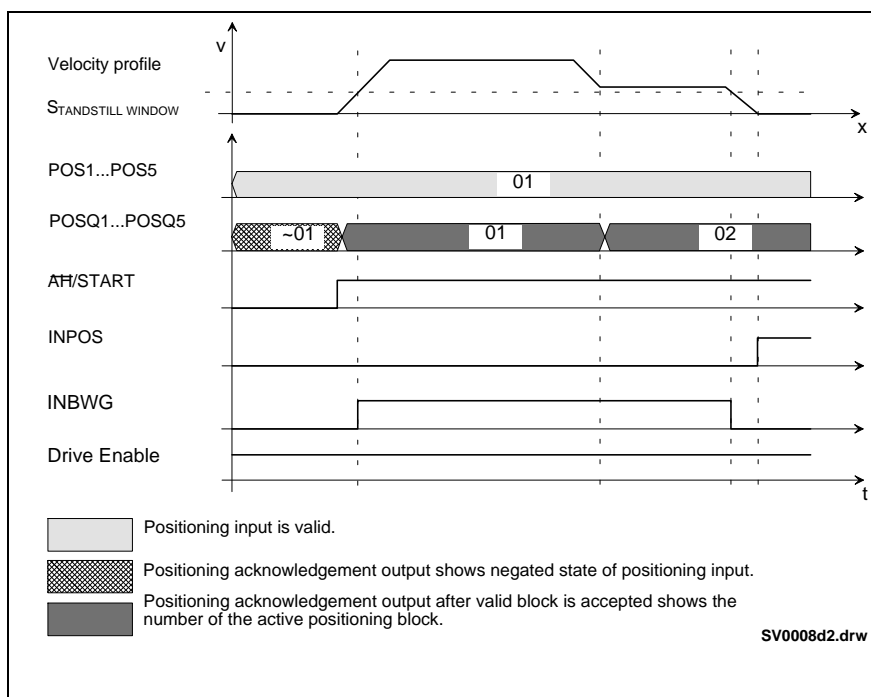


Fig. 6-15: Position-dependent block switching (Mode 2)

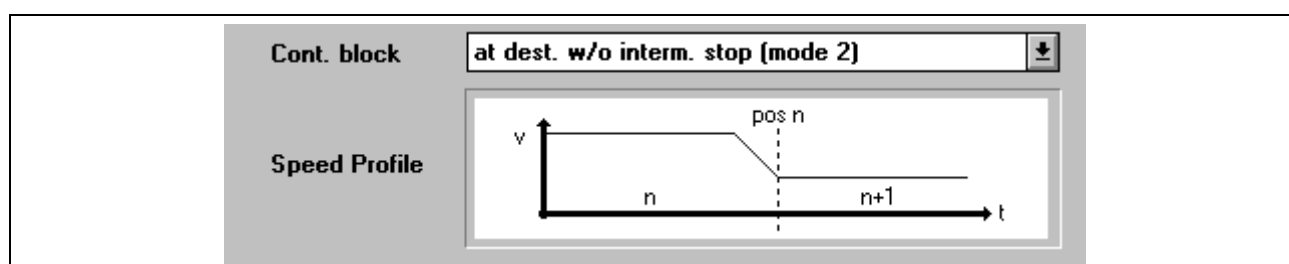


Fig. 6-16: Positioning block input with following block, Mode 2

Block Switching with Pause

In block switching with pause, the drive first positions to the target position of the starting block. When the actual position within the positioning window has reached the target position, the following block is automatically started without any new external start signal having been given.

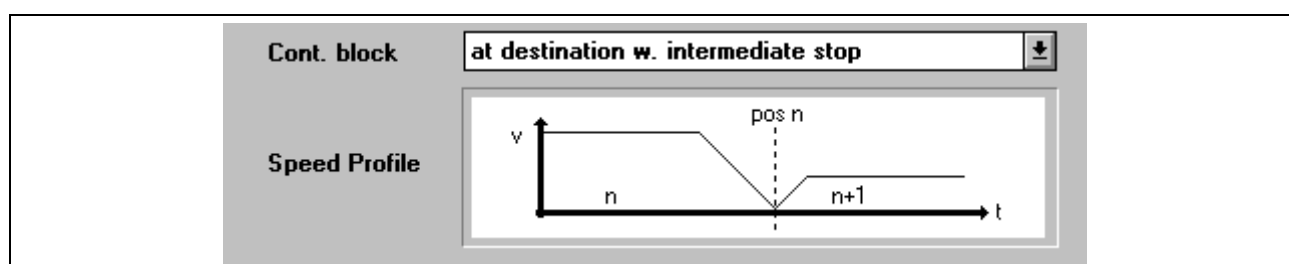


Fig. 6-17: Positioning block input with following block and pause

Switch-Signal-Dependent Block Switching

Switch-signal-dependent block switching enables transition to a following block based on an external switch signal. ECODRIVE's two limit switch inputs are available as switch signal inputs.

Note: If switch-signal dependent block switch is used, the function "Travel area limit with limit switch" cannot be used!

When a switch signal is created at input LIMIT+, control switches to the next block after the started block. A signal at input LIMIT- causes control to switch to the block after the next one, in respect to the starting block.

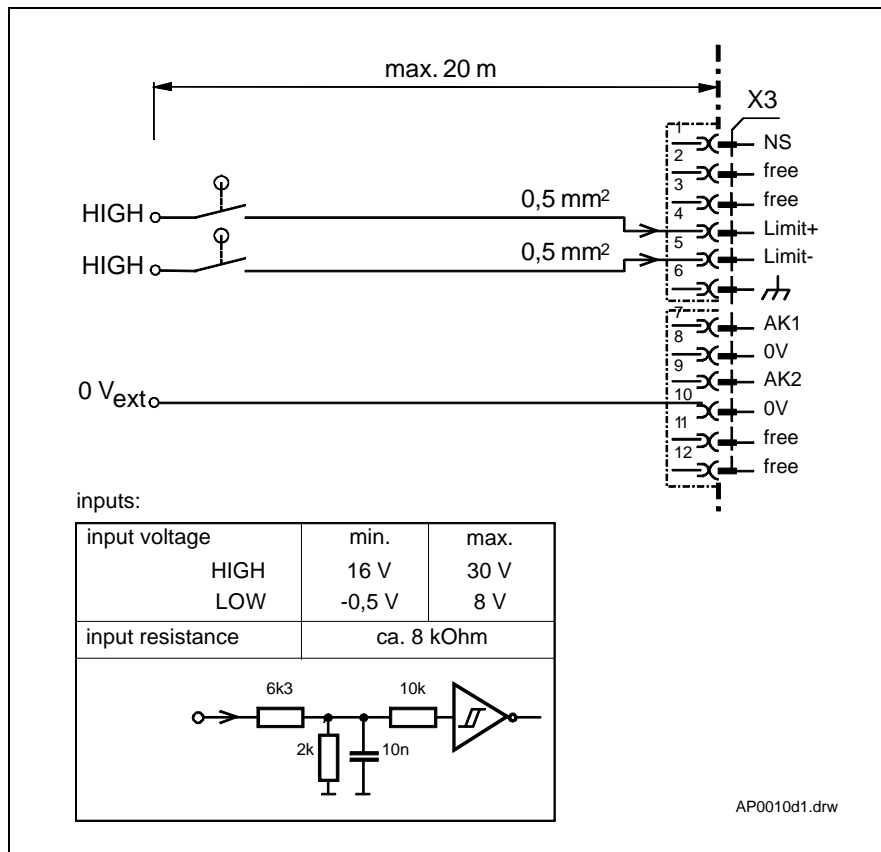


Fig. 6-18: Connection diagram Limit+/-

Limit-	Limit+	Drive Response
0	0	Drive goes to target position from block n
0	0->1	Block n+1 is started
0->1	0	Block n+2 is started
0->1	1	Block n+1 is started
1	0->1	Block n+1 is started

Fig. 6-19: Drive reaction with various switch signal sequences

n: the block currently being executed.

(n must be set in the appropriate parameter as a following block.)

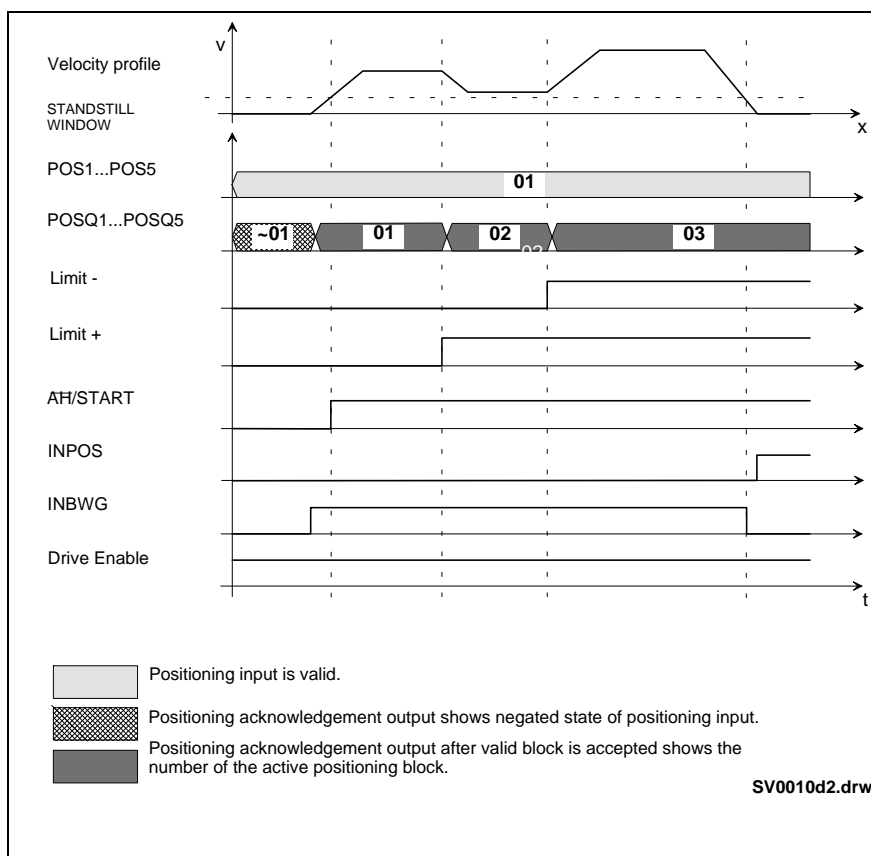


Fig. 6-20: Switch-signal-dependent block switching

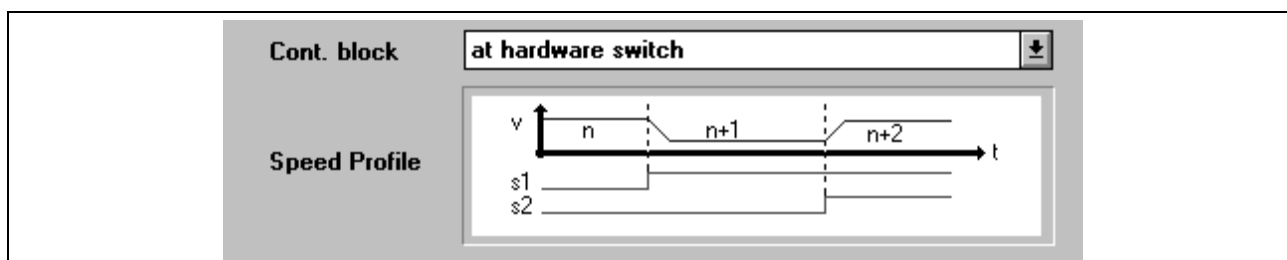


Fig. 6-21: Positioning block input with following block after switch signal

Absence of the switching signal for a block transition

The starting block of a switch-signal-dependent following block can be either an absolute or a relative positioning block. This means that if the switch signal for switching to the next block is not encountered before the target position is reached, the drive will stop.

If a switch signal is generated subsequently, the drive executes the following block.

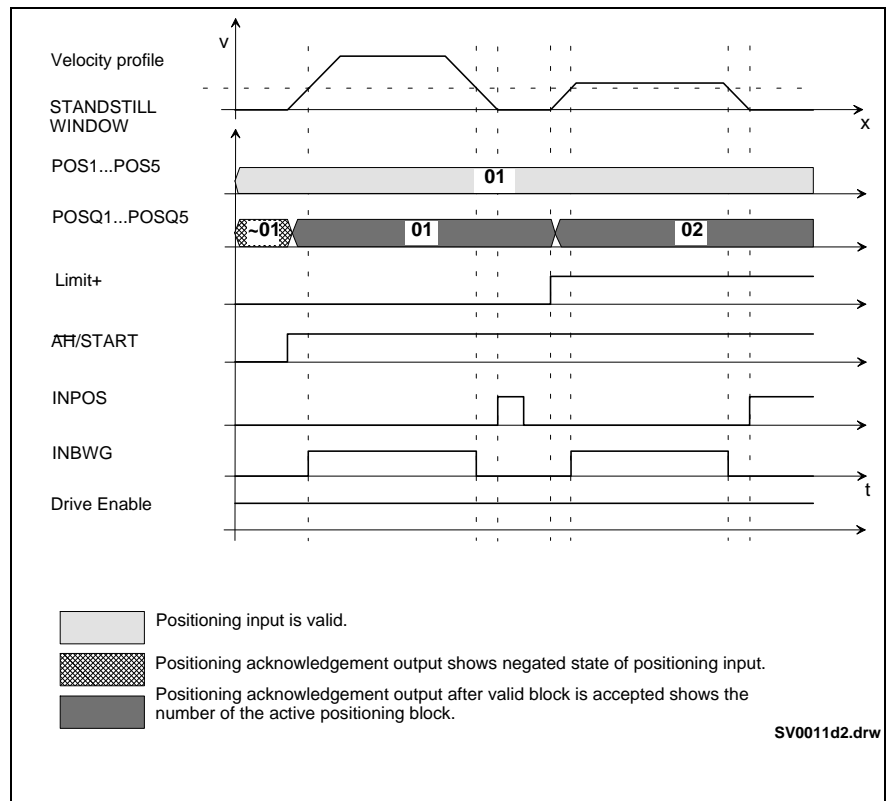


Fig. 6-22: Switch-signal-dependent block transition (reaction to absent switching-signal)

6.4 Choosing, Starting and Selecting a Positioning block

Choosing a Positioning Cblock

Six binary selection inputs in the profibus control word are available for selecting a positioning block with DKC03.1. The block number of the desired positioning block is written into the highest-ordered byte of the control word.

Starting Positioning Blocks

Positioning blocks are basically started by the drive control word. There are two possibilities.

- Creating a 0-1 edge at bit AH/start.
- Creating a 0-1 edge at the strobe bit while AH/start stays on. If you use strobe, process block change is also possible during the travel.

Interrupting Positioning Blocks

Positioning blocks can be interrupted during the block operation by removing the start signal (AH/START = 0).

Acquittance of Positioning Block Selection with Drive Enable Active

If the drive is in "Drive Halt" (AH/start-signal not active), the complement of the position input signals will be sent to the position acknowledgement outputs.

After the AH/start-signal has been activated, a check is made to see if the selected positioning block can be accepted. If the positioning block is accepted, the number of the accepted positioning block appears at the acknowledgement outputs, coded in binary.

For positioning blocks that are not executed, the complement of the number of the selected positioning block is generated.

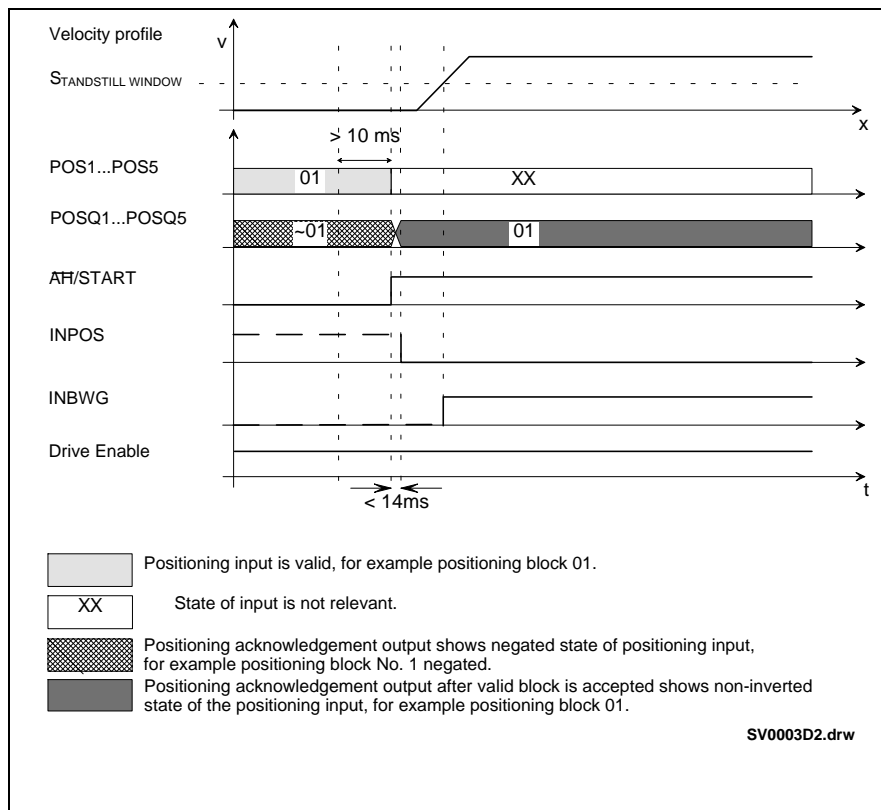


Fig. 6-23: Acknowledgement with an executable positioning block

Note: After the AH/start-signal has been activated, the acceptance of the new positioning block is acknowledged after 14 ms by means of block selection acknowledgement bits. At the same time as the block selection acknowledgement bits, the INPOS signal = 0 as long as the new target position has not yet been reached.

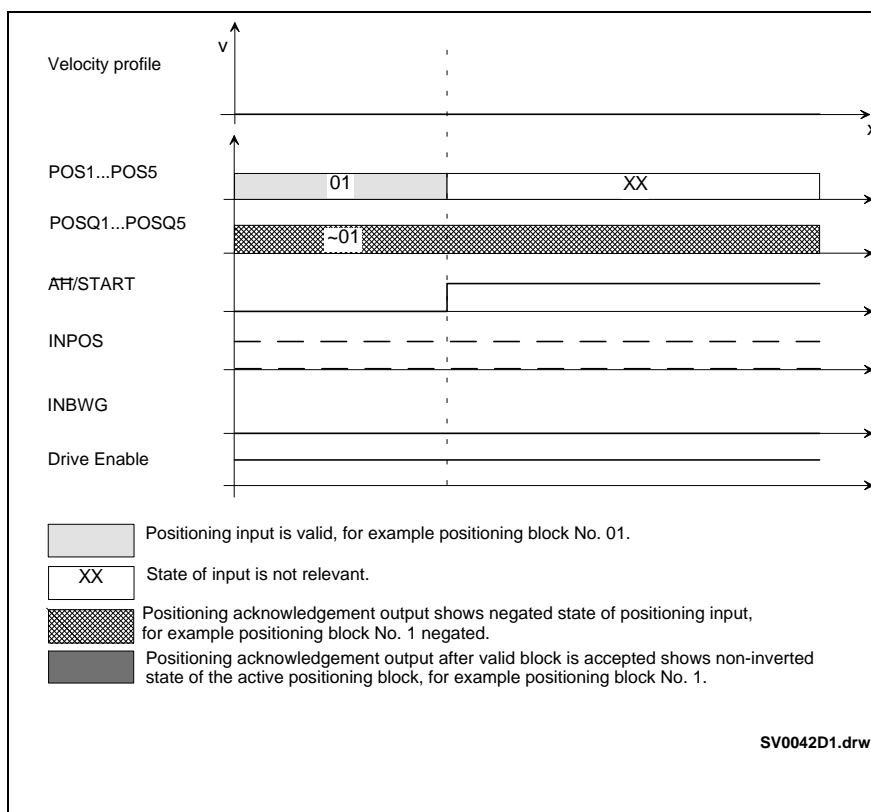


Fig. 6-24: Acknowledgement with a non-accepted positioning block

In following block operation, the number of the block that is presently being processed is acknowledged.

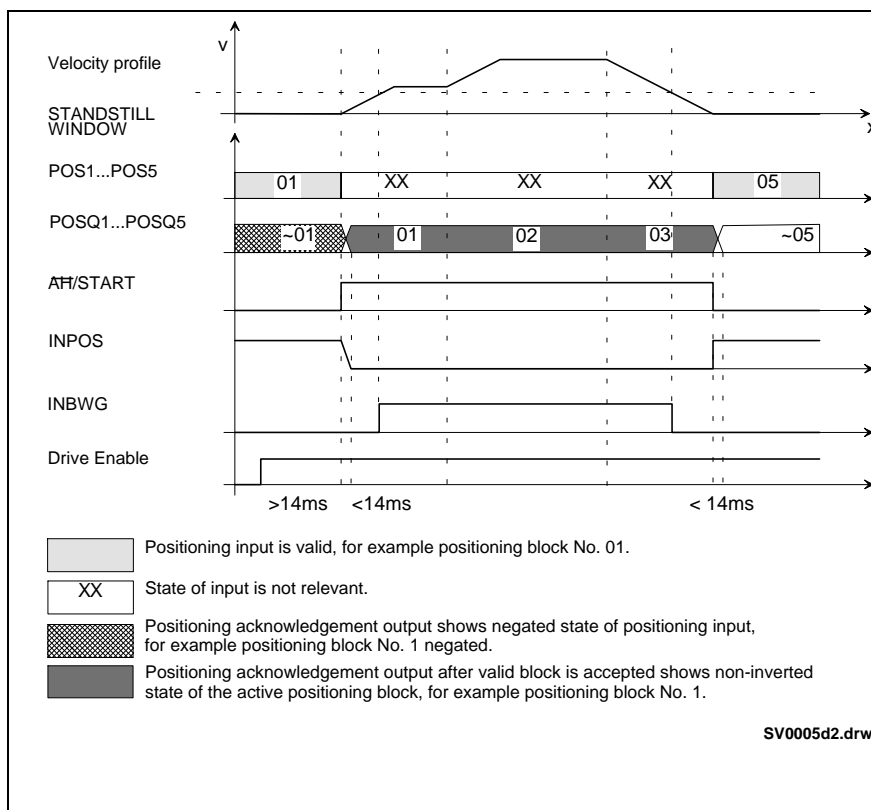


Fig. 6-25: Acknowledgement with following block operation

Acknowledgement When Drive Enable is Switched Off

After the Drive enable is switched off, the last positioning block accepted is sent to the acknowledgement outputs. If the drive is at the target position of the last accepted positioning block, the "IN-POS" message is generated as well.

The last accepted positioning block is saved in parameter **P-0-4052, Last accepted positioning block** when power is turned off, and when it is turned back on again, the last accepted positioning block is always generated. So, if an absolute value encoder and absolute positioning blocks are being used, there is a way to determine after control voltage has been turned off and back on whether the drive was "IN-POS".

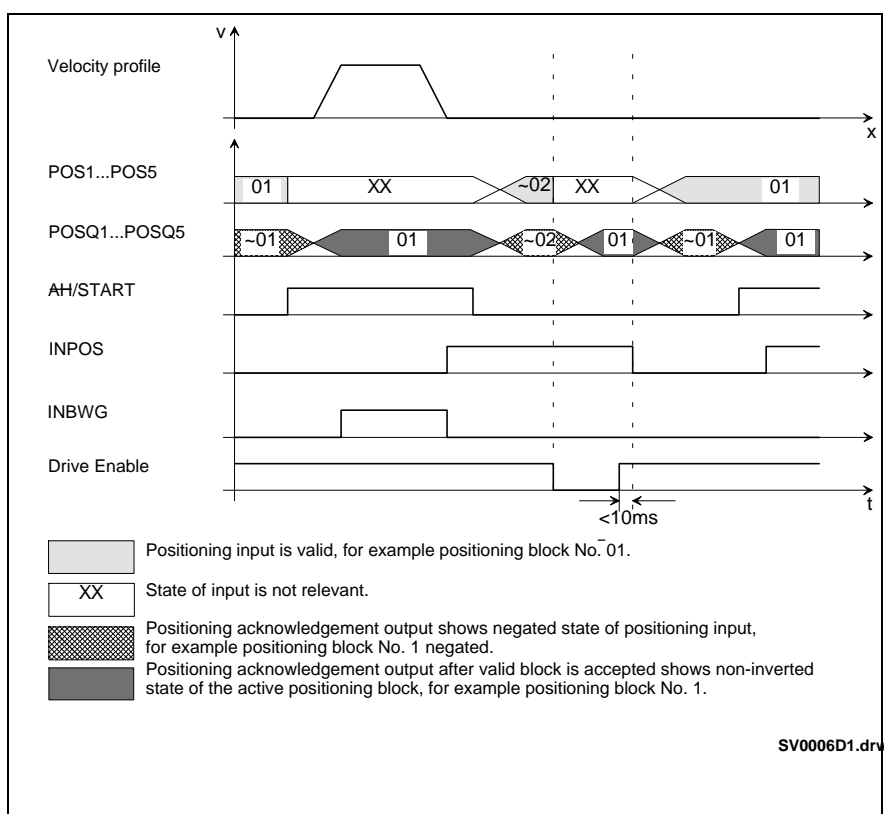


Fig. 6-26: Acknowledgement and "IN-POS" after turning off drive enable

6.5 Target Position Processing with Modulo Scaling

If the scaling of the position data is in modulo format, the target position can only be entered within the range from $-(\text{modulo value})$ to $+(\text{modulo value})$.

The path of travel of a positioning block can also have only the modulo value as a maximum amount.

Also see **S-0-0103, Modulo value**

Example 1:

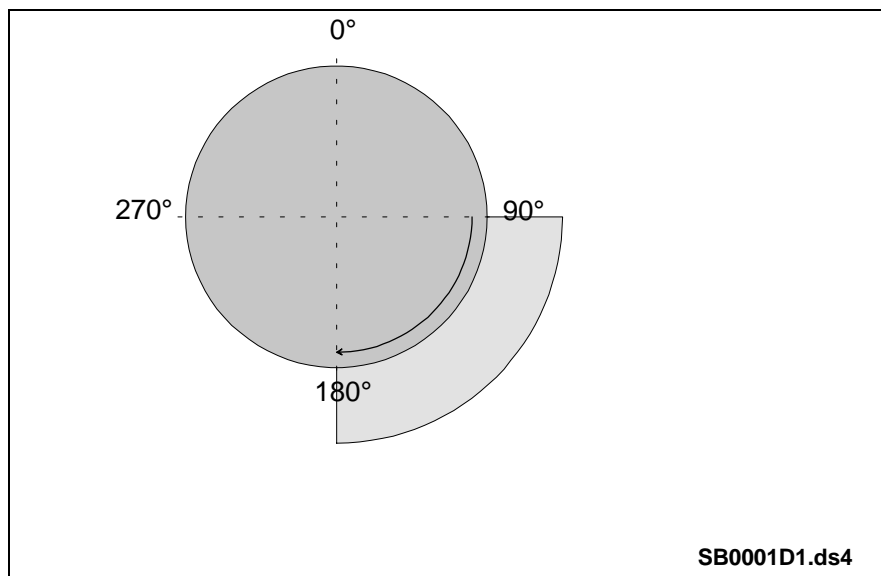


Fig. 6-27: Positioning with modulo scaling (positive direction)

In this case, the modulo value is 360° , and the drive is at 90° . By activating an absolute positioning block, with target position = 180° , or by activating a relative positioning block with target position = 90° , the drive will move from 90° to 180° .

Also see **Chap. 7.1 Processing Position Data**

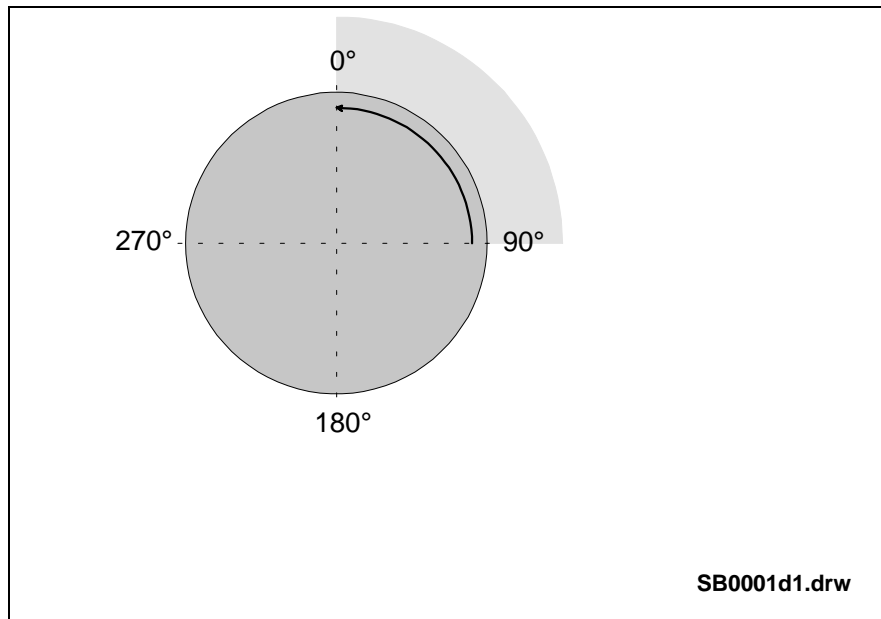
Example 2:

Fig. 6-28: Positioning with modulo scaling (negative direction)

By activating an absolute positioning block with a target position of 0° or by activating a relative positioning block with a target position of 270°, the drive moves back by 90°.

Note: You can force a certain rotation by setting the "command value mode for modulo format" (only negative, or always positive). (Also see **P-0-0013, Command Value Mode for Modulo Format**).

For relative travel in negative direction, negative values are also possible for the target position to be entered.

7 General Drive Functions

7.1 Scaling and Mechanical System Data

With ECODRIVE it is possible to process position, velocity, and acceleration data with respect to machine motions and mechanical transmission elements.

The Scaling/mechanical system dialog in DriveTop provides all the settings which are necessary to allow machine mechanical systems to work with the drive controller.

Linear Scaling

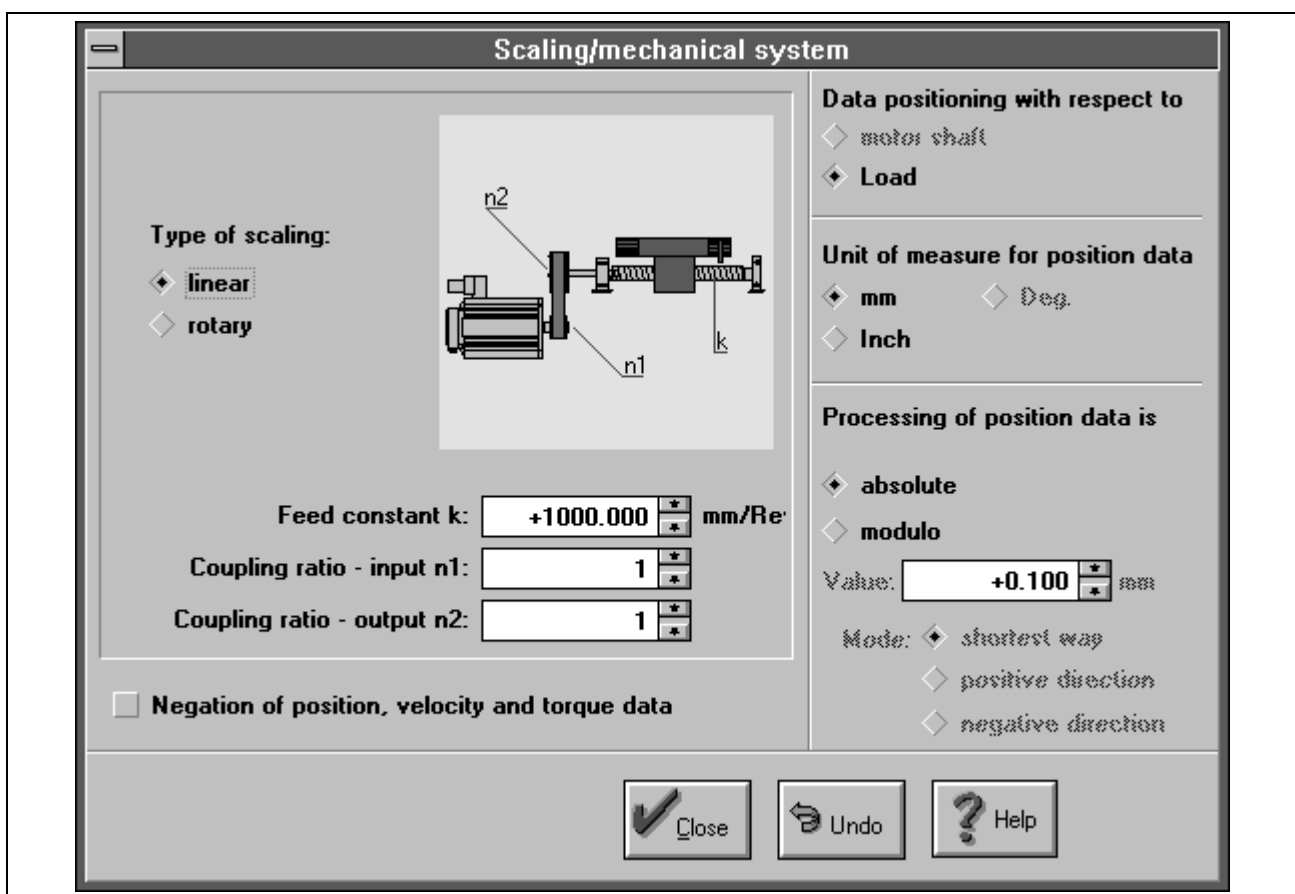


Fig. 7-1: Scaling/mechanical system

In applications where a linear carriage is to be moved, all output variables of the shaft should be entered and recorded in linear units. Linear scaling should be selected and the mechanical data of the shaft entered (S-0-0123, Feed constant; S-0-0121, Transmission input revolutions and S-0-0122, Transmission output revolutions).

A standard arrangement of a mechanical system with a circular rotation shaft is shown in the diagram. Other similar mechanical combinations can be derived from this standard configuration.

For rack and pinion mechanical systems, the feed constant equals the effective circumference of the pinion. It is calculated as follows:

$$\text{Feed constant} = \text{actual diameter} * \pi$$

Fig. 7-2: Calculating the feed constant for rack and pinion mechanical systems

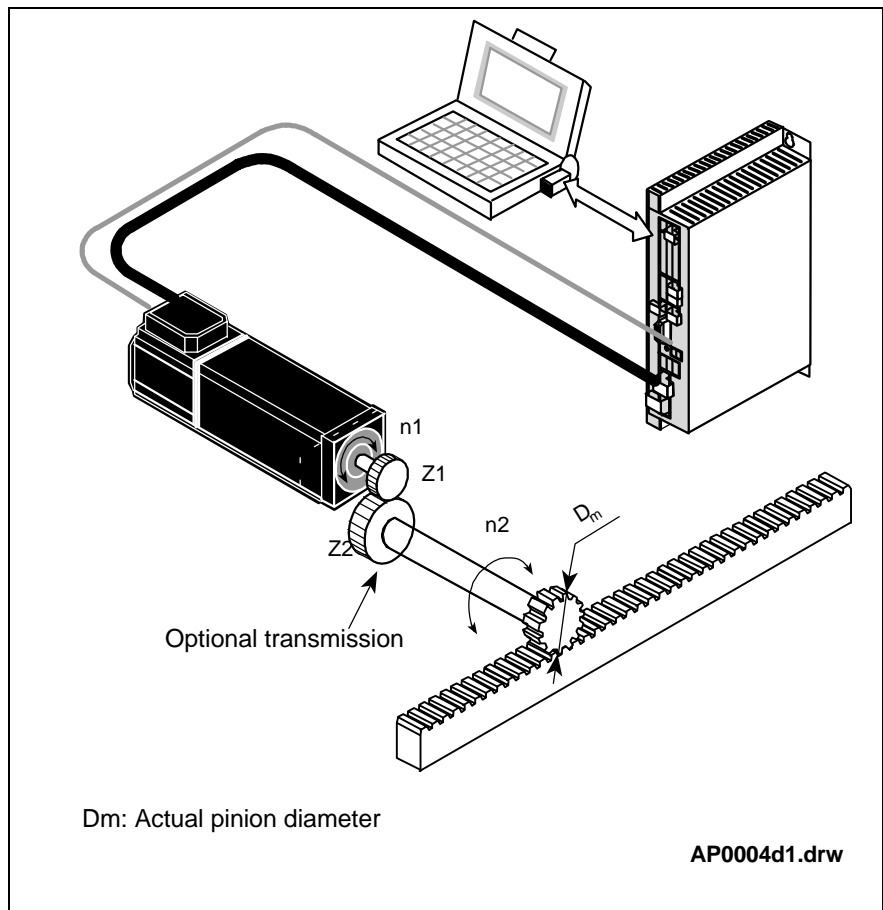


Fig. 7-3: Drive system with rack and pinion

The unit of the feed constant to be entered depends on the unit of measure which has been selected for the position data.

Data References

When using linear scaling, all output variables such as position, velocity, and acceleration are interpreted in reference to the load.

Unit of Measure

When using linear scaling, the unit of measure in which position data, velocity data, and acceleration data will be displayed can be adjusted between inch and mm.

The feed constant must be entered in the unit per revolution that has previously been selected.

Example:

Unit of Measure: mm

Unit for feed constant: mm/revolution

Negating Position, Velocity, and Torque Data

Position, velocity, and torque data can be negated in order to adapt the output variables to the logical direction of motion of an axis.

Negating this data has absolutely no effect on the control logic sense. Positive feedback in the velocity or position control loops cannot be caused by changing these polarities.

Rotary Scaling

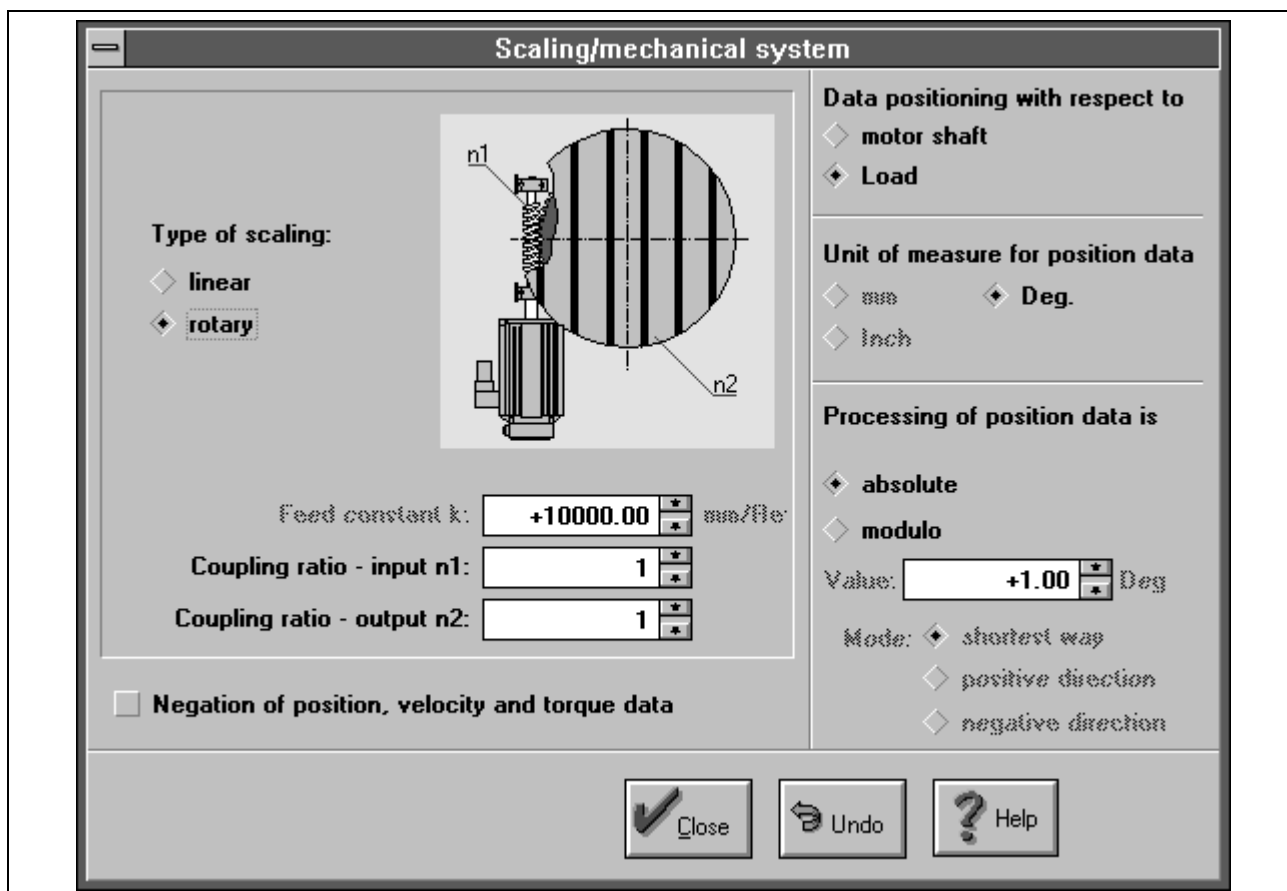


Fig. 7-4: Rotary scaling

For applications in which a rotary table or rotating shaft is to be driven, it is convenient to enter all output variables for the axis in rotary units, and for them to be displayed in these same units. For this, you should purpose select rotary scaling and enter the mechanical transmission data for the axis (coupling ratio input turns $n1$ and output turns $n2$). A standard arrangement for a typical mechanical system is shown in the figure. Other mechanical combinations (such as those with multi-leveled transmissions) can be derived from this standard arrangement. For example, a toothed gear or wheel transmission system can be configured by counting the input wheel $Z1$ and entering that value in the output turns $n2$ parameter, and counting the output wheel teeth $Z2$ and entering that value in the input turns $n1$ parameter.

Mechanical transmission ratio = $n1/n2 = Z2/Z1$

Data References

The position, velocity and acceleration data which is displayed can be referenced to either the load side or the motor side in the rotary scaling mode. Normally the load side is selected.

Processing Position Data

Position data can be processed in absolute or modulo format.

Absolute format

Motion in one direction will show a continually ascending or descending position value when processing in absolute format. In other words, the position data is displayed as an absolute position over many revolutions of the motor or the load. It overflows at the end of the position data presentation area.

Maximum Presentation Range with Absolute Position Data Processing

The maximum presentation range with absolute position data processing is 4096 motor revolutions.

Modulo Format

Position data for shafts or rotary tables which are to be moved continuously in one direction is normally processed in modulo format. This means that the position data overflows at a defined location (at the modulo value).

If modulo processing is selected, a "modulo value" must be entered. The position data will then always fall within this modulo range. The modulo value of a simple rotary table is usually set at 360° . This means that after one revolution of the round table, the position counter will begin again at 0° .

Different modes of modulo processing can be selected:

Also see **Chapter 6.5 Target positioning Processing in Modulo Scaling**

- **Shortest Path**
The given target position is always approached via the shortest path. If the distance in a given direction between the actual position and the target position is larger than half of the modulo value, the drive will approach the target position from the opposite direction.
- **Positive Direction**
The given target position is always approached in the positive direction.
- **Negative Direction**
The given target position is always approached in the negative direction.

Border Conditions for Modulo Processing

Several border conditions, which are checked in the general parameter test that is performed when switching from Set parameter mode to Operating mode, must be met for proper modulo processing. If necessary, violations of these conditions are displayed with the diagnosis: **C227 Modulo range error**.

- The contents of parameter **S-0-0103, Modulo value**, may not be greater than one half the maximum travel range. The maximum travel range is 4096 revolutions (in reference to the motor shaft).
- For rotary scaling and position data referenced at the load, the product of S-0-0103 Modulo value * 4 and **S-0-0121 Input revolutions of load gear** must be less than 2^{63} .

7.2 Drive limits

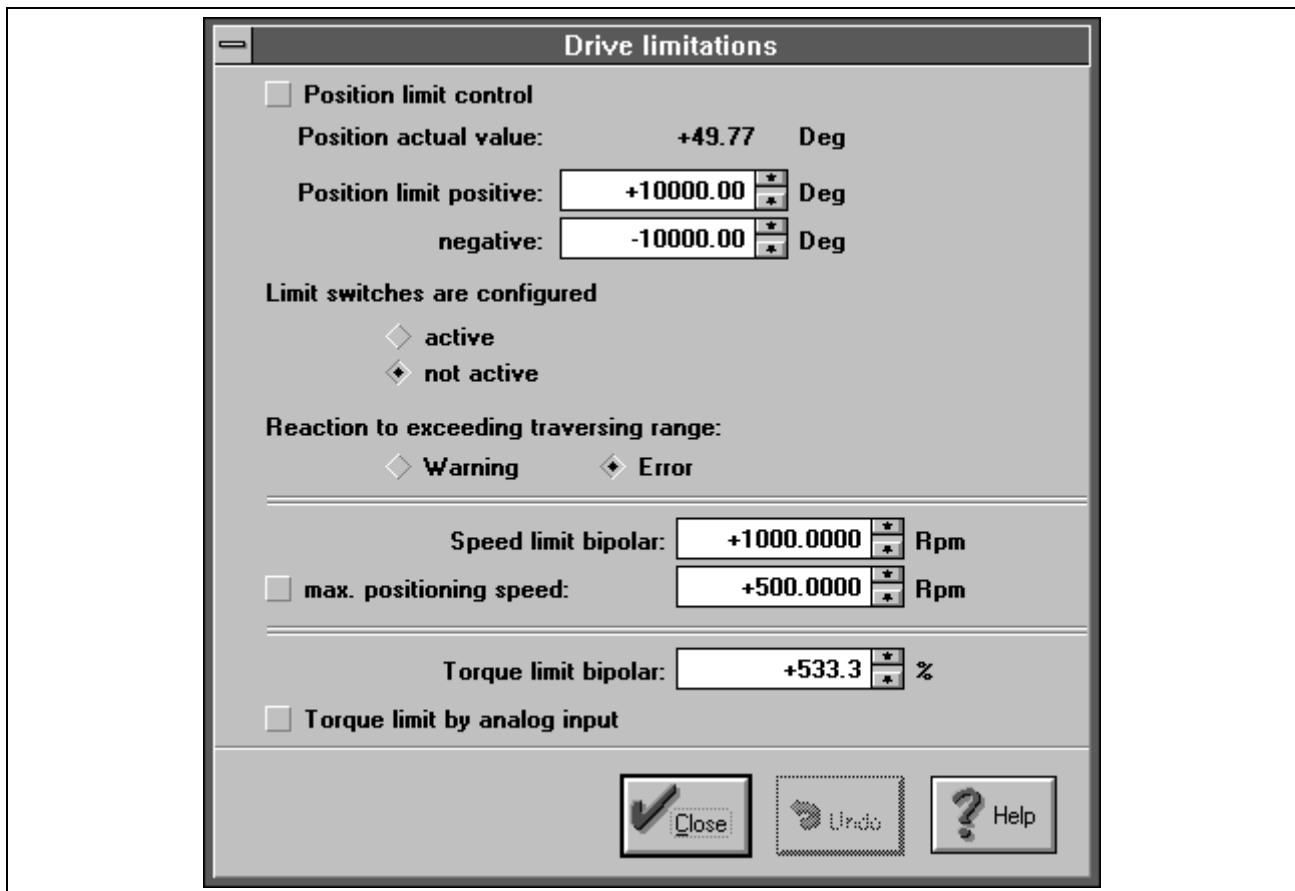


Fig. 7-5: Drive limits

Transverse Range Limits

ECODRIVE provides two internal methods to monitor the travel range of an axis:

- Travel limit switches
- Position limits

A message indicating the travel range has been exceeded is generated if a directional travel limit switch is tripped, or when a position feedback value referenced to the machine zero point exceeds one of the position limit values.

Activation and Parameters for Position Limit Monitoring

The drive must be homed before the position limit can be monitored.

The position limit monitor can be activated or deactivated. In particular, the position limit monitor must be deactivated in applications with continually rotating shafts.

The positive and negative position limits can be independently entered. The current position feedback value is displayed to assist with orientation.

Activating and Setting Parameters for Limit Switches

Travel limit switches are available to limit the travel range. These limit switches can be activated and deactivated. The logic to be used with the limit switch can be selected when actively using the limit switches (limit switch inputs may be configured to be either active high or active low).

Connecting the Travel Limit Switch

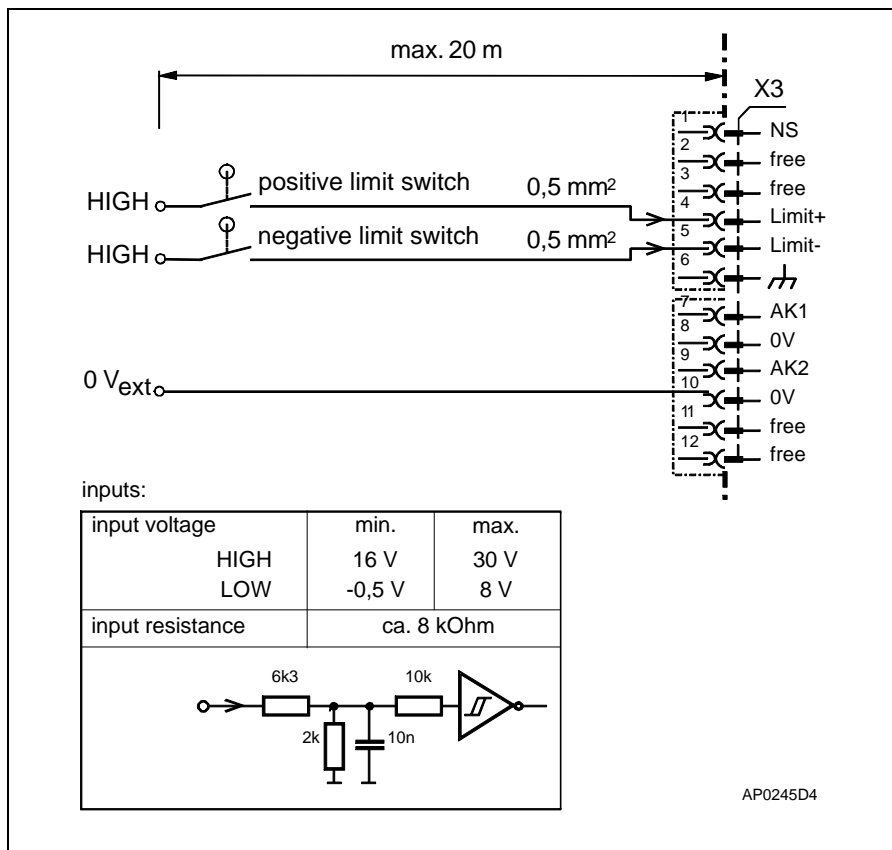


Fig. 7-6: Connecting the travel limit switch

Reaction to Transverse Range Violations

The drive has several responses to going beyond the travel range. The following responses can be selected:

Transverse Range Violations as a Warning Response

The drive reacts to going beyond the transverse range by switching the velocity command value to zero without turning off the drive enable and without opening the bb-contact. The warning is automatically recalled when command values are given which lead into the proper transverse range.

Transverse Range Violations as an Error Response

The drive responds to going beyond the transverse range by switching the velocity command value to zero, automatically turning off the drive enable, and opening the bb-contact. To resume operation, clear the error, turn on the mains power supply, and enable the drive again. As long as the transverse range is exceeded, only command values which lead back into the proper transverse range will be accepted. Command values outside of this range result in another error.

Also see: **Error handling**

Limiting the Velocity

The maximum velocity to be reached by the drive can be set with parameter **S-0-0091, Bipolar velocity limit value**. If the requested velocity is greater than this limit, the drive will automatically contain the velocity at the limit value.

Also see **Chap. 7.9 Positioning at Limited Velocity**

Torque Limit

In order to protect the components of the machine, it may be necessary to reduce the maximum torque of the drive. The method available for doing this is:

- Permanently limiting torque via parameters

Limiting Torque via Parameter

The maximum torque to be produced by the drive can be set with parameter **S-0-0092, Bipolar torque limit value**. This value is entered as a percentage. One hundred percent corresponds to the motor's continuous stall torque.

If process commands are started which are not physically possible with the limits set for them, error **F228, Excessive control deviation** will be generated during the travel.

7.3 Error Handling

Many functions are monitored in connection with operating modes and parameter settings of a drive. If a condition is recognized which will not allow proper functioning of the drive, an error message is generated and the drive will automatically respond to the error.

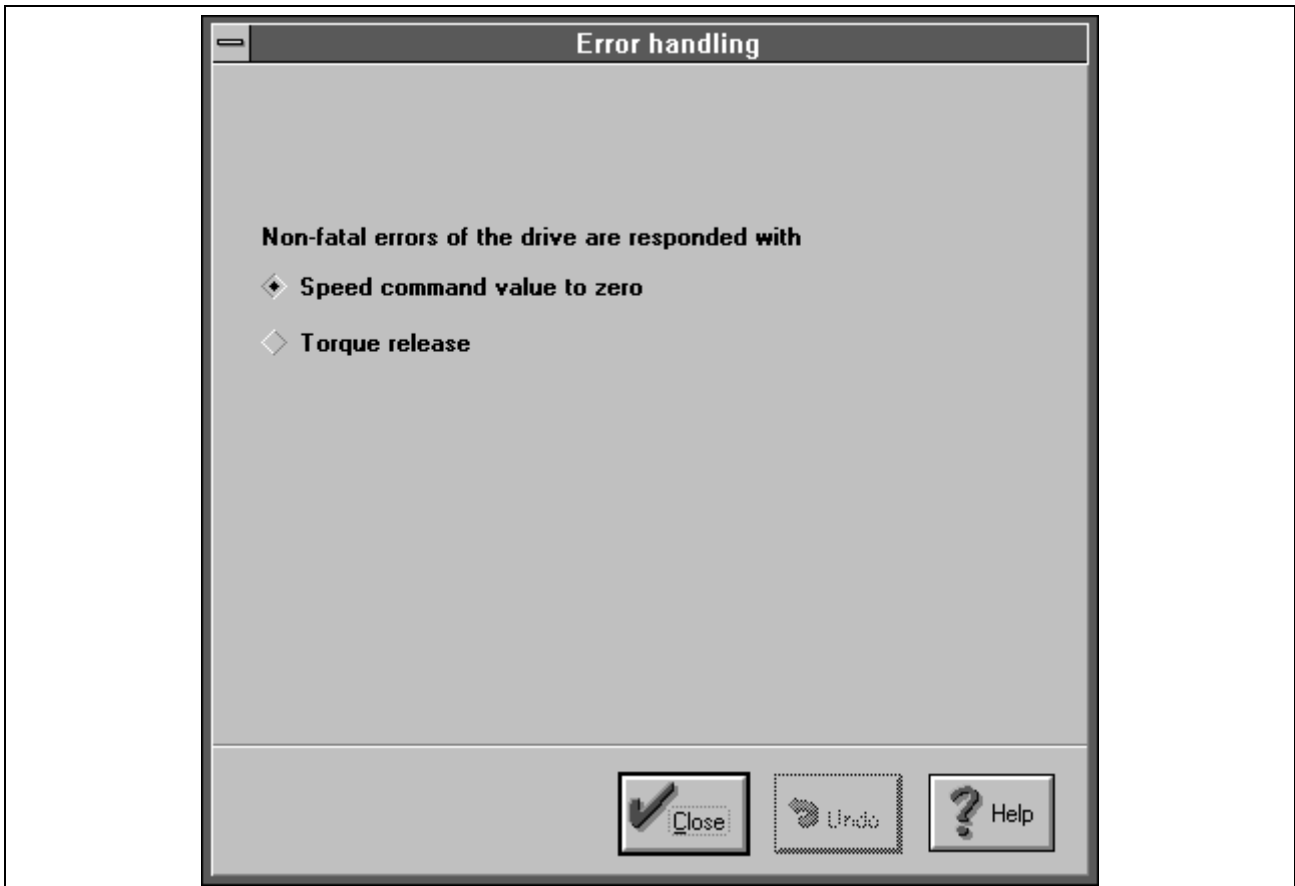


Fig. 7-7: Error handling

Error Classes

Errors are divided into different classes:

Error Class	Seven-Segment Display Message	Drive Error Response
Fatal	F8/xx	Switch to torque-free state
Transverse range	F6/xx	Velocity command value set to zero
Interface	F4/xx	may be selected
Non-fatal	F2/xx	may be selected

Fig. 7-8: Error classes

Drive Error Response

If the drive is in control mode and an error is detected, an error response is automatically carried out. An alternating indicator is visible on the H1 display (Fx/xx).

If the error allows for a variable response, either **Switching to torque-free state** or **Setting the velocity control value to zero** can be selected as the error response. After the drive has responded to the error, it will automatically switch to torque-free operation and open the ready-for-operation relay.

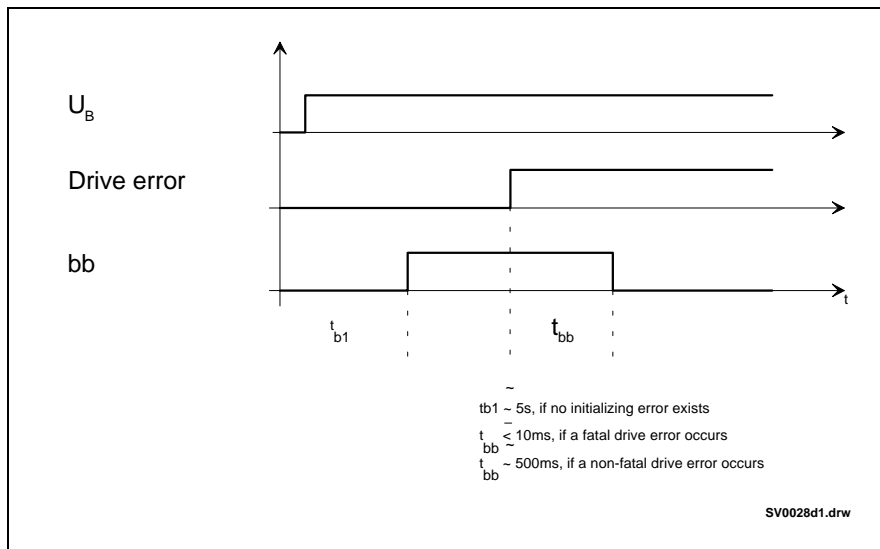


Fig. 7-9: Bb timing when switching on the supply voltage

7.4 Control Loop Settings

General Information for Control Loop Settings

The control loop settings in a digital drive controller are important for the performance characteristics of the servo axis. Determining the regulator circuit settings requires expert knowledge.

It is usually not necessary to "optimize" the control settings.

For this reason, all INDRAMAT digital drive controllers have motor-specific control parameters.

For some exceptions, however, it may be necessary to adjust the control loop settings for a specific application. The following section gives a few simple but important rules for setting the control loop parameters in cases such as these.

In any case the prescribed methods should only be viewed as a guideline leading to a robust control setting. Specific aspects of some applications may require settings which deviate from these guidelines.

Loading Default Parameters

The **Load default parameters** function is used to activate factory-set control parameters. The parameters are specified for a matched moment of inertia relationship of $J_{\text{motor}} = J_{\text{load}}$. These parameters will work with standard applications.

Default values are available for the following parameters:

- **S-0-0106, Proportional Gain 1 Current Regulator 1**
- **S-0-0107, Current Regulator 1 Integral Action Time**
- **S-0-0100, Velocity Loop Proportional Gain**
- **S-0-0101, Velocity Loop Integral Action Time**
- **P-0-0004, Smoothing Time Constant**
- **S-0-0104, Position Loop Kv Factor (Closed-Loop Control)**
- **P-0-1003, Velocity Feedback Value Filter Time Base**

Executing the Basic Load Feature After Changing Motor or Drive

The drive controller will recognize if it is operating with a motor type for the first time. The drive controller will read "UL" on the 7-digit display.

Pressing the S1 key on the drive controller or the reset button in the DRIVETOP diagnostic display will activate the standard control parameters in the drive.

Also see **C700, Basic load**

Executing the Basic Load Feature as a Command in the "Control Loop Setting" Dialog

The standard control loop parameters can be activated in the "Control loop setting" dialog. This can create a stable default condition if the basic tuning values have been lost while changing the control settings.

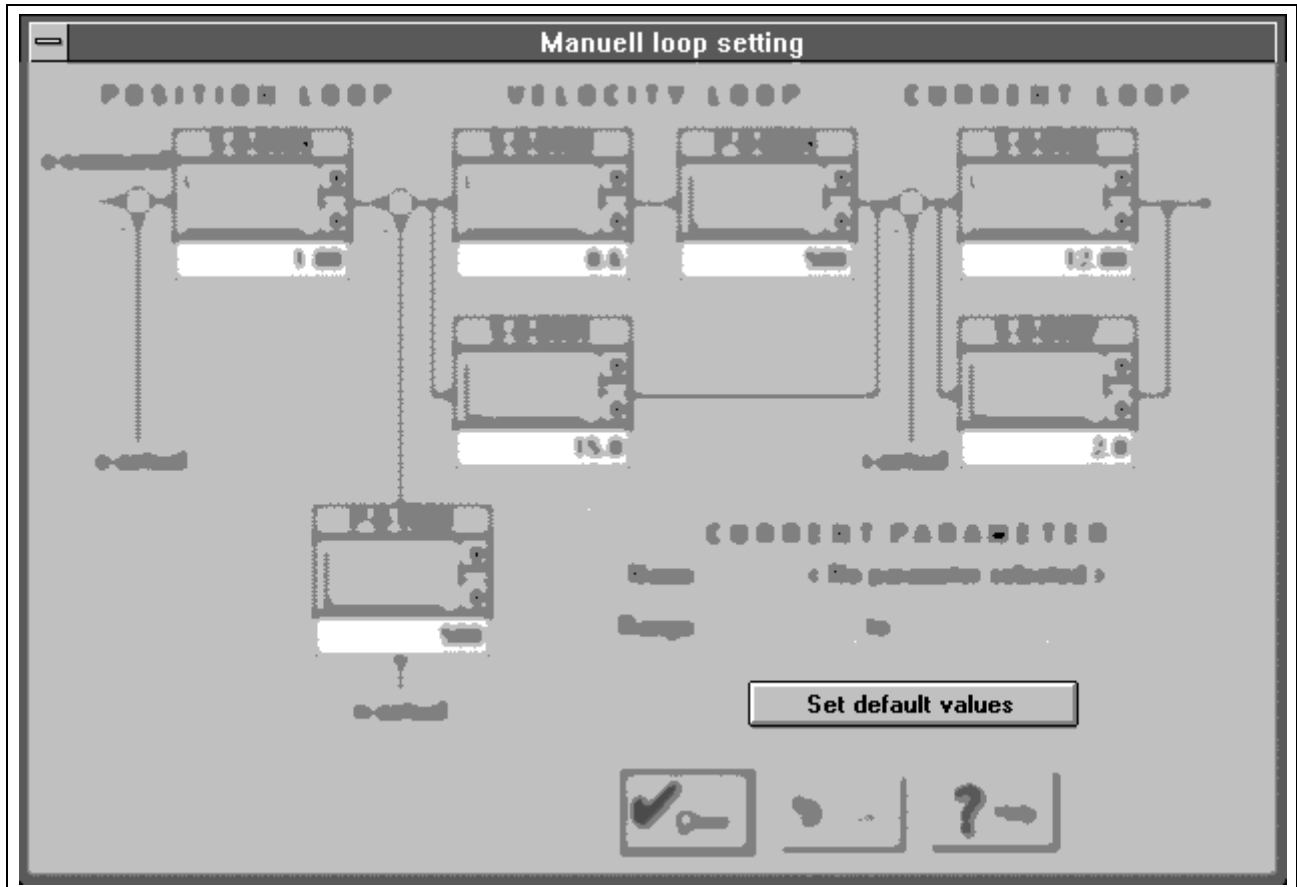


Fig. 7-10: Setting standard control parameters

Setting the Current Regulator

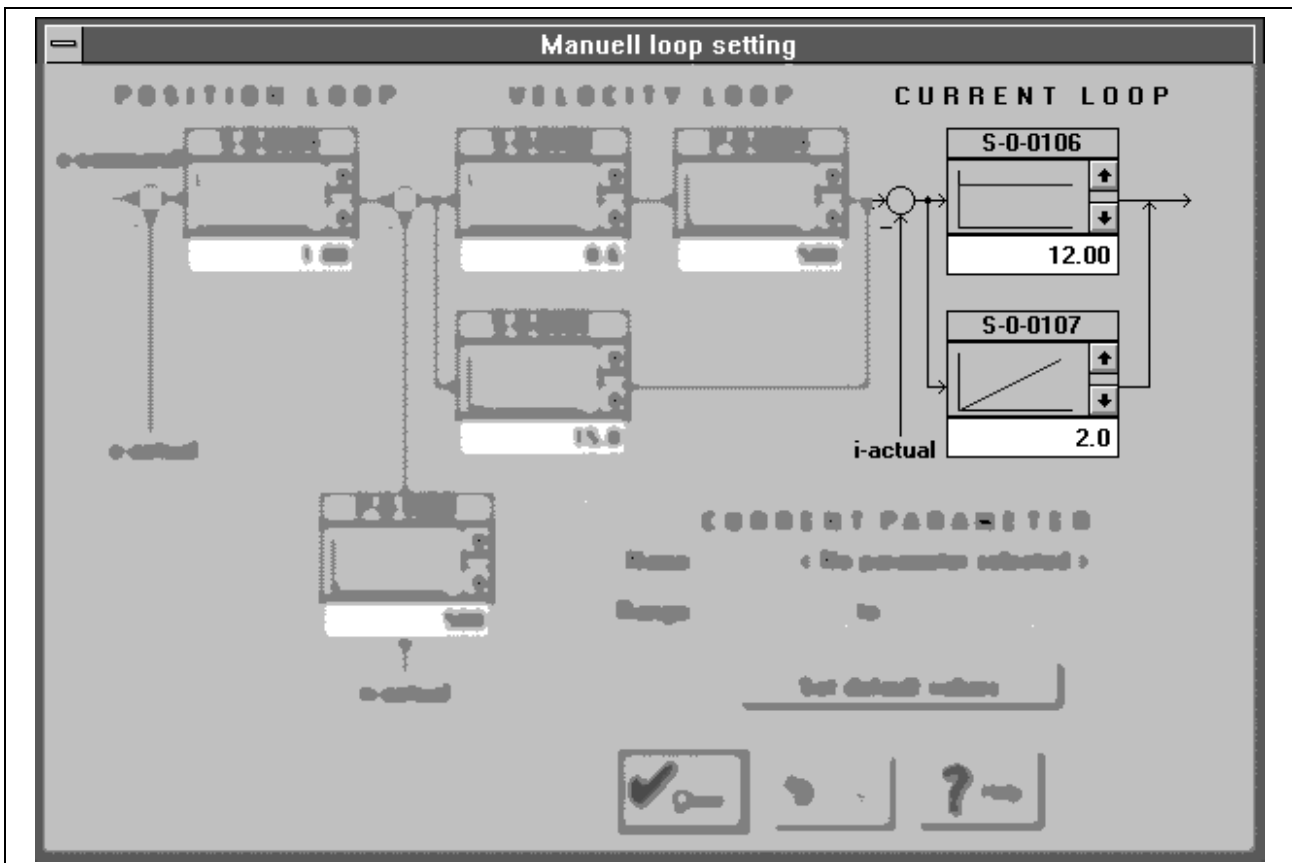


Fig. 7-11: Control loop settings: current loop

The parameters for the current control loop are set by **INDRAMAT** and cannot be adjusted for specific applications. The parameter values predefined by the manufacturer are set during the Basic load command (Set default values).

The parameters for the current regulator are set via:

- **S-0-0106, Proportional Gain 1 Current Regulator**
- **S-0-0107, Current Regulator 1 Integral Action Time**

Note: Any change to an INDRAMAT-defined value is unacceptable and can lead to motor and drive controller damage.

Setting the Speed Controller (Velocity Loop)

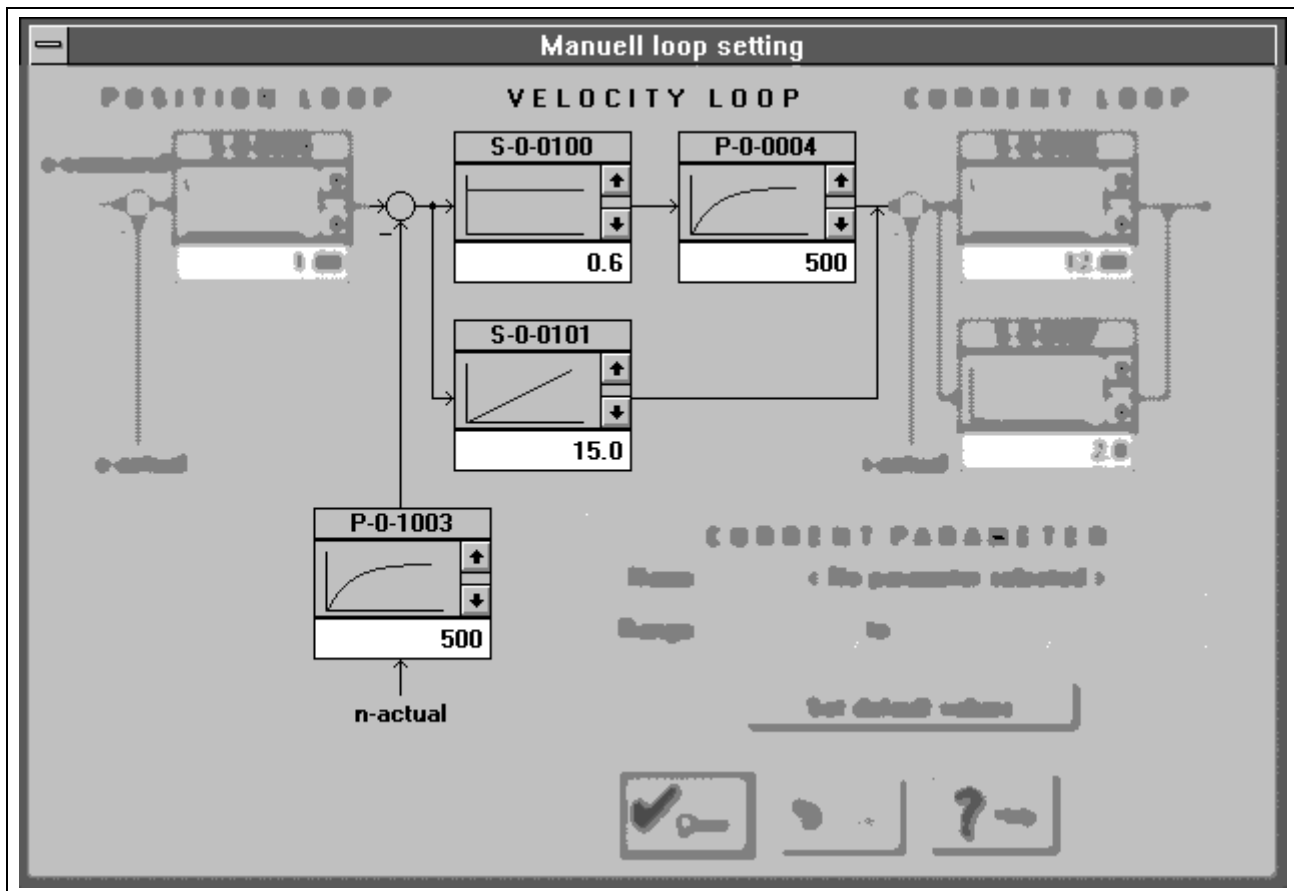


Fig. 7-12: Control loop settings: the velocity loop

The velocity loop is set via the parameters

- **S-0-0100, Velocity Loop Proportional Gain**
- **S-0-0101, Velocity Loop Integral Action Time**
- **P-0-0004, Smoothing Time Constant**
- **P-0-1003, Velocity Feedback Value Filter Time Base**

These can be set either by executing the Basic load function once or by completing the following procedure.

Preparations for Setting the Velocity Loop

A number of preparations must be made in order to set the velocity loop:

- The mechanical system must be set up in its final form in order to have true relationships while setting the parameters.
- The drive must be properly connected as described in the user manual.
- The safety limit switches must be checked for proper functionality (if applicable).

Begin the adjustment procedure by settings the following parameters to the indicated values:

S-0-0100, Velocity regulator proportional amplifier = default value of the connected motor.

S-0-0101, Velocity Loop Integral Action Time = 0 ms

P-0-0004, Velocity Loop Smoothing Time Constant = Minimum value (500µs)

P-0-1003, Velocity Feedback Value Filter Time Constant = 500µs

S-0-0104, Position Loop Kv Factor = 1.0 x 1000/min

Determining the Critical Proportional Gain and P-0-0004, Smoothing Time Constant

- After turning on the controller enable, let the drive move at a slow speed (10..20 rpm).
- Increase **S-0-0100, Velocity loop proportional gain** until unstable operating behavior begins (continuous limit cycle oscillation).
- Determine the frequency of the oscillation by measuring the actual velocity with an oscilloscope. When the frequency of the oscillation is substantially higher than 500Hz, raise **P-0-0004, Smoothing time constant** until the oscillation goes away. After this, raise **S-0-0100, Velocity loop proportional gain** until it becomes unstable again.
- Reduce **S-0-0100, Velocity loop proportional gain** until the oscillation goes away on its own.

The value found using this process is called the "**Critical velocity loop proportional gain.**"

Determining the Critical Integral Action Time

- Set **S-0-0100, Velocity loop proportional amplification** = 0.5 x critical proportional amplification. Set S-0-0101 to its own default value.
- Lower **S-0-0101, Velocity control integral action time** until unstable operating behavior results.
- Raise **S-0-0101, Velocity control integral action time** until continuous oscillation stops.

The value found using this process is called the "**Critical integral action time.**"

Determining the Velocity Loop Setting

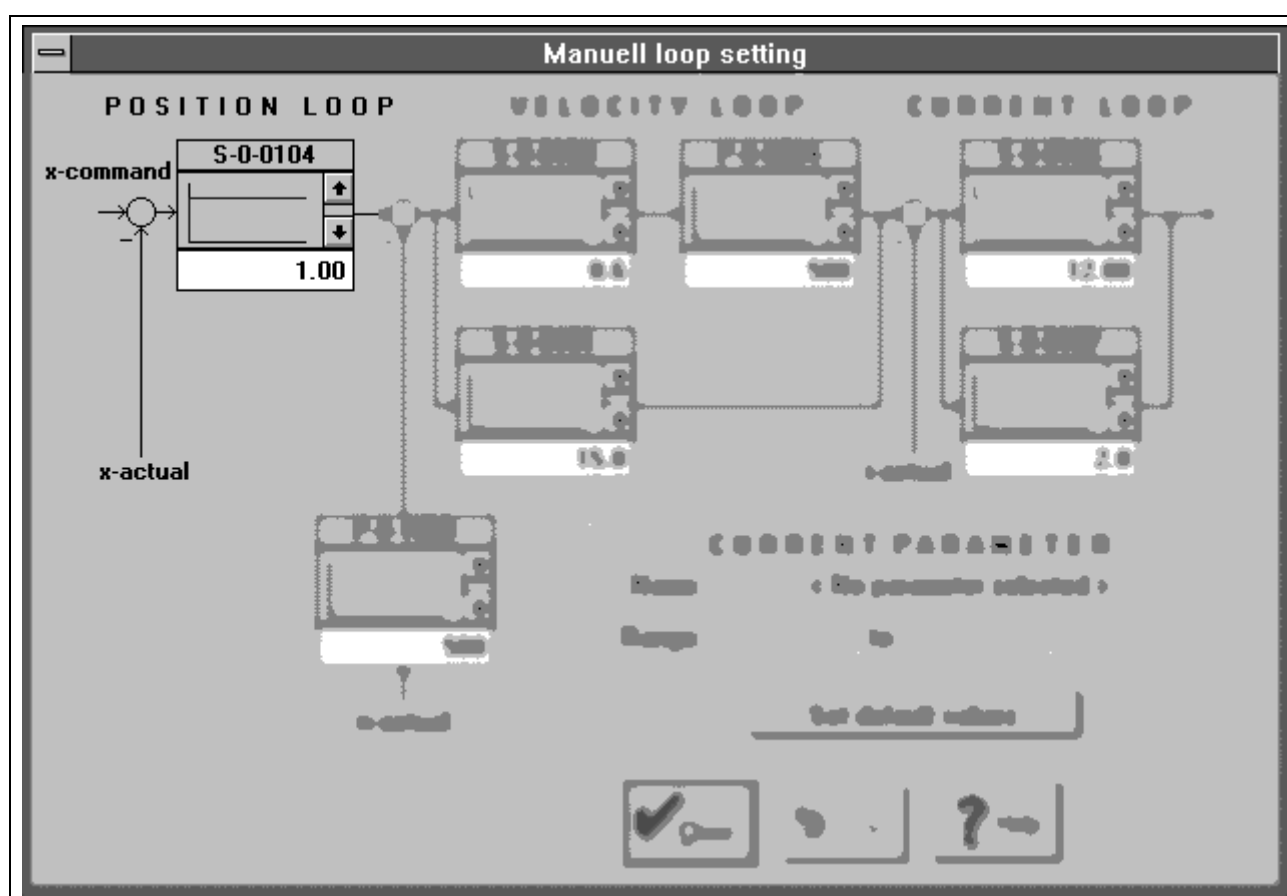
The critical value which is determined can be used to derive a control setting with the following characteristics:

- It is independent of changes to the axis since there is a large enough safety margin to the stability boundaries.
- It provides a safe reproduction of the characteristics in production machines.

The following table shows many of the most frequently used application types and the corresponding control loop settings.

Application Type:	Velocity loop proportional gain:	Velocity loop integral action time:	Remarks:
Feed axis on standard machine machine	$K_p = 0.5 \times K_{pcrit}$	$T_n = 2 \times T_{ncrit}$	Good load rigidity and good drive characteristics
Feed axis on perforating machine or punch machines	$K_p = 0.8 \times K_{pcrit}$	$T_n = 0$	High proportional amplification; no I-gain to achieve short transient periods.
Feed drive on cut-off device	$K_p = 0.5 \times K_{pcrit}$	$T_n = 0$	relatively undynamic control setting without I-piece to avoid bracing the material to be separated with the separation device.

Fig. 7-13: Application-specific velocity control loop settings



Fir. 7-14: Control loop setting: position loop

Setting the position loop is done with parameter

- **S-0-0104, Position loop Kv factor (closed-loop control)**

This can be set by either executing the Basic load function once, or by following this process:

Preparations for Setting the Position Control Circuit

A number of preparations must be made in order to set the position controller:

- The mechanical system must be set up in its final form in order to have true relationships while setting the parameters.
- The drive must be properly connected as described in the user manual.
- The safety limit switches must be checked for proper functionality (if applicable)
- **Position control** operating mode must be selected in the drive controller.
- The underlying velocity controller must be properly installed. The beginning value selected for the K_v factor should be relatively small ($K_v = 1$).

Determining the Critical Position Loop Gain

- Run the axis at a low velocity, for example by jogging the connected NC control system (10...20 rpm).
- Raise the K_v -factor until it begins to be unstable.
- Reduce the K_v factor until the continuous oscillation disappears by itself.

The K_v factor determined through this process is the "**Critical position control loop gain**".

Position Loop Setting

In most applications, an appropriate position control setting will lie between 50% and 80% of the critical position control loop gain.

This means:

S-0-0104, Position loop Kv factor (closed-loop control)
$$= 0.5..0.8 \times K_{vCrit}$$

7.5 Loop Monitoring

The following loop monitors are provided to ensure that the drive controller functions properly:

- Velocity loop monitoring
- Position loop monitoring

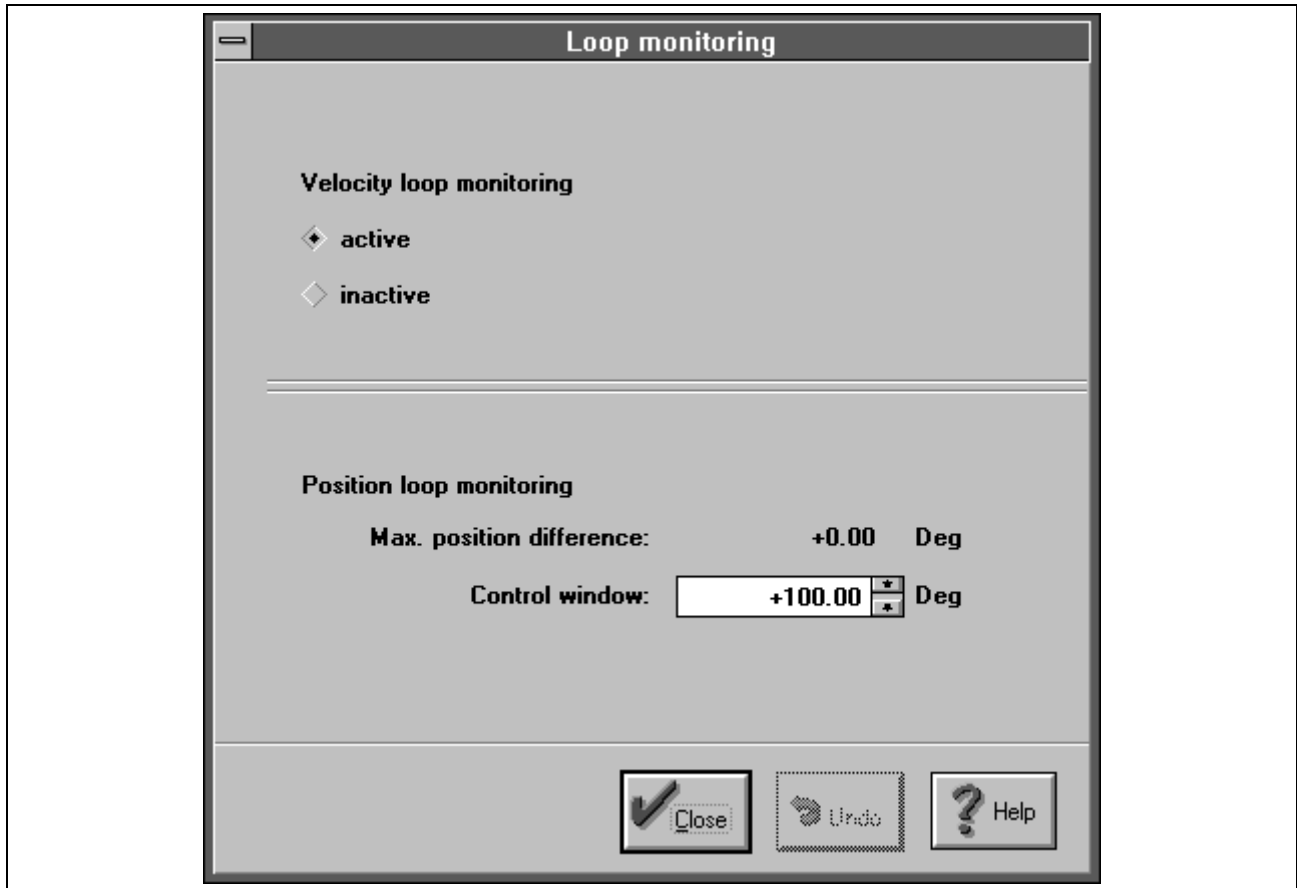


Fig. 7-15: Loop monitoring

Velocity Loop Monitoring

Velocity loop monitoring is also useful in Position control operating mode.

Primary Mode of Operation for the Velocity Loop Monitor

The velocity loop monitor functions according to the following principle:

As soon as the peak current limit (peak torque limit) is active, the difference between the velocity command value and the velocity actual value is checked to see if it is greater than 10% of **S-0-0113 Maximum motor velocity**. If this is the case, the velocity loop monitor checks to see if the drive controller is accelerating in the given direction. If, over a time period of 20ms, an acceleration in the opposite direction is detected, the velocity loop monitor will generate error **F878 Error in the velocity control loop**.

Possible reasons for triggering the velocity loop monitor:

- Faulty wiring in the motor power cables
- Defect in the power supply of the drive controller
- Defect in the feedback system
- Insufficient gain in the velocity regulator parameters

Deactivating the Velocity Loop Monitor



DANGER

Drive controller errors or faulty wiring can lead to uncontrollable axis motion.

⇒ The velocity loop monitor should be activated under normal circumstances and should only be deactivated in certain exceptional cases.

The velocity loop monitor can be deactivated for specific applications in which the drive controller is specifically operated at its power limit (for example moving to a positive stop and similar situations).

Position Loop Monitoring

The position loop monitor helps to diagnose errors in the position control loop.

Basic Mode of Operation for the Position Loop Monitor

An estimated position feedback value is generated from the position command value. If the difference between the measured and the estimated position feedback value is greater than the value entered in the monitoring window, the drive will execute its error handling routine according to the parameters which have been set (Also see Error Handling).

Possible reasons for triggering the position loop monitor:

- Exceeding the torque or acceleration capability of the drive.
- Blockage of the axis mechanical system
- Disruptions in the position feedback
- Exceeding **S-0-0113, Maximum velocity of the motor** by entering too great a transversing velocity or setting too great a position command value difference.
- Incorrect controller parameters

Also see **F228, Excessive Control Deviation**

Requirements for Setting the Position Loop Monitor Correctly

- Be sure that the velocity- and position control loops are set properly.
- The axis in question should be checked regarding its mechanics, and should be in its final condition.

Setting the Position Loop Monitor

A typical processing or load cycle should be entered into the connected control system. In so doing the maximum intended velocity and acceleration should be reached.

The maximum variance between the measured and estimated position feedback values is continuously displayed in parameter **P-0-0098, Maximum model deviation**. (**Note:** the contents of this parameter are not saved online; this means that when the power supply is turned on, its contents equal zero).

The value determined for the maximum deviation helps to suggest how to set the monitoring window. The contents of parameter **S-0-0159, Maximum position deviation**, multiplied by a safety factor should be written to the "Monitoring window" parameter. A safety factor between 1.5 and 2.0 is recommended.

7.6 Status Messages

The current status of the drive can be determined by a superordinate control through different status messages and evaluated for technical control purposes. Four status messages are available in addition to the potential free operating condition contact (Bb) which indicates readiness for use in closed state.

Also see **Chapter 5.3 Drive Status Word**

Ready for Operation (bb)

The drive indicates that no internal error is present through the operating condition contact "Bb". After the supply voltage is switched on, the drive controller initializes itself. If the initialization is successful, the Bb-contact will close after several seconds. After this the power supply can be switched on and the drive can be put into operation.

When an internal error occurs, the Bb-contact opens. The time delay between the occurrence of the error and the opening of the Bb-contact depends on the type of error. For fatal errors the contact is opened immediately, while for non-fatal errors the internal error handling routine is executed first.

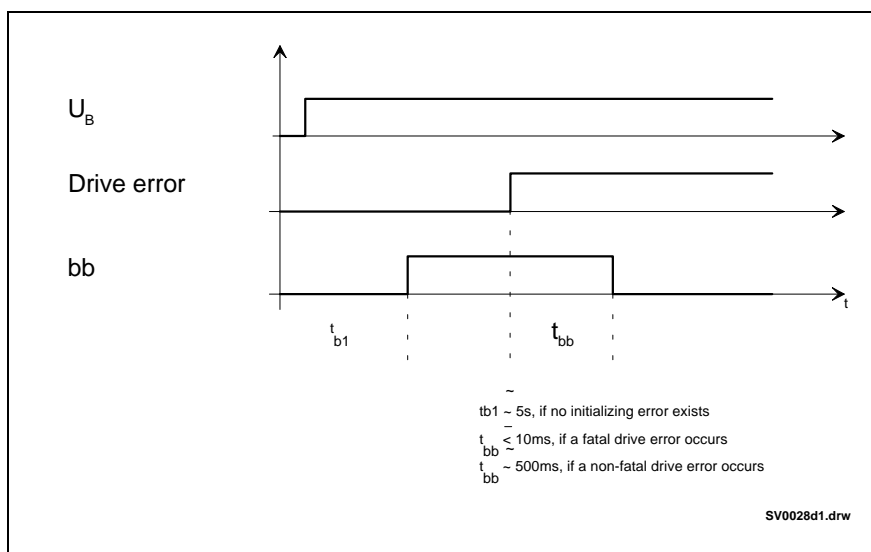


Fig. 7-16: Bb timing when switching on the supply voltage

In Position (INPOS)

The message "INPOS" refers to positioning operation and drive-controlled homing procedures.

The message "INPOS" is given by the drive if the following requirements has been satisfied:

- The difference between the target position and the actual position is less than the value set in parameter **S-0-0057, Position window**.

This message can help a superordinate control system determine the correct completion of a positioning command.

Note: The INPOS message defaults to being inactive during jogging and when the controller enable is switched off.

Also see **Acknowledgement when Controller Enable is Switched Off**

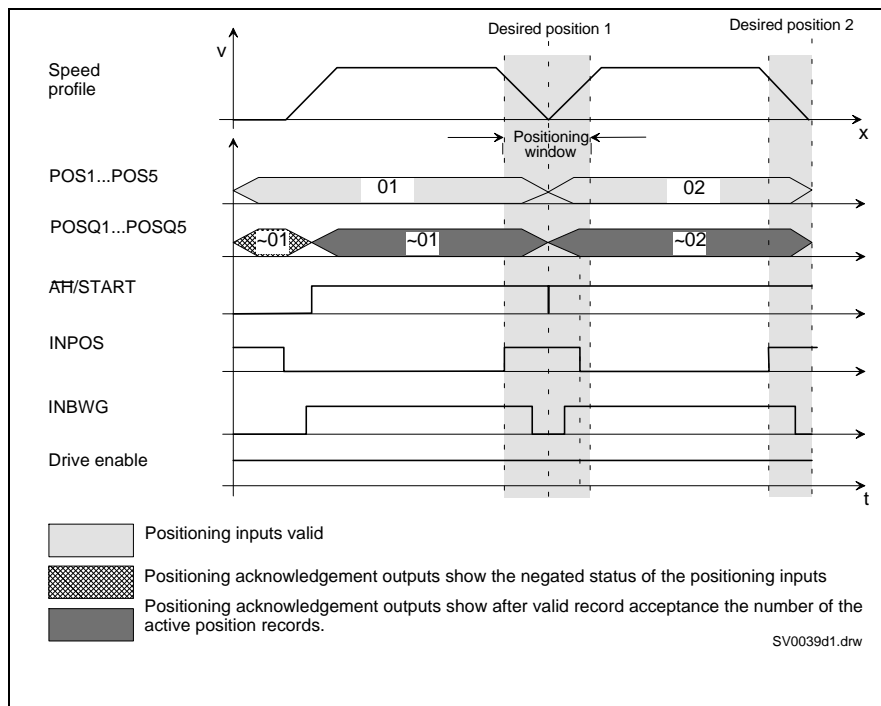


Fig. 7-17: INPOS message response during positioning procedures

Note: After a positioning command is started, the INPOS message is set to zero at the same time as the output of the command selection acceptance POSQ, as long as the target position has not yet been reached.

In Motion (INBWG)

The INBWG message is given if the drive is moving at a velocity greater than the value set in parameter **S-0-0124, Standstill window parameter**.

Note: If an very small value is selected for the standstill window, the drive may display INBWG even though it is not in motion. This can be explained by the limited resolution of the actual velocity. Entering larger values will solve this problem. (Standstill window = 20 rpm)

Also see **S-0-0331, Status nfeedback = 0**

In Reference (INREF)

The INREF message shows that the internal position feedback value refers to the machine zero point. The INREF message has the following properties:

- When motors with resolver feedback are used, the INREF message is only given after successful execution of the drive internally controlled homing procedure.
- In applications with motors with the resolver feedback and absolute encoder option, the INREF message is given after the supply voltage is switched on. This requires that the "Set absolute measurement" command has previously been executed once.

Also see **S-0-0403, Status position feedback value**

Position Switch Point (WSP)

The DKC has a function for actualizing a position switch point. A bit in the profibus status word is sent to a position set by parameter, which can be sent to a PLC for further processing. This enables position-dependent switching functions to be activated. The logic of the position switch point is as follows:

Actual position > Position switch point function:

Path switch point output = 1

Actual position < Position switch point function:

Path switch point output = 0

The path switch point signal can be negated to adapt to the superordinate control system.

Also see: **S-0-0059, Position Switch Flag Parameter**

Note: The position switch point function is only active in drive controllers which have been homed, because the absolute relationship to the machine's zero point can only be known in a drive in which the homing procedure has been carried out.

Position Switch Point When Using Motors With Resolver Feedback (Standard)

Before using the position switch point function, the drive-controlled homing procedure must be executed.

Position Switch Point When Using Motors with Resolver Feedback and Absolute Encoder (Option)

If a switch signal is required within the travel region of an axis, it is usually realized with a cam-actuated switch attached to the machine mechanical system.

Using a motor with absolute encoder (optional) **ECODRIVE** saves the expenditure for a mechanical cam switch. When using a motor with absolute encoder, the position reference is available as soon as the supply voltage is turned on. Consequently, the position switch point signal is also valid and can be used as a replacement for a mechanical cam.

Profibus status word

Messages, acknowledgements and diagnostic messages from the drive to the control system

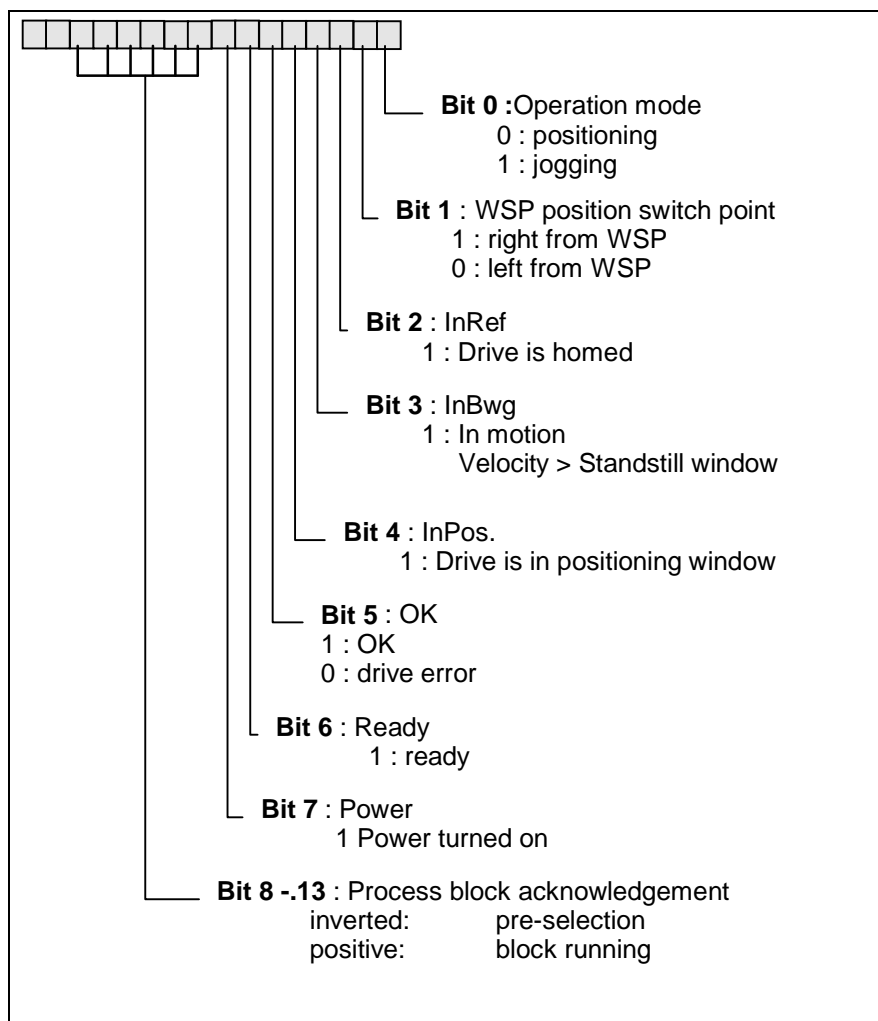


Fig. 7-18: Profibus status word, from the drive to the profibus

7.7 Drive-controlled homing procedure

The measuring relationship to the machine zero point can be derived in "Position control with positioning interface" operating modes using the drive-internal homing procedure.

Homing When Using a Motor With Resolver Feedback (Standard)

Absolute positioning sets and position limit value monitoring can only be used after the drive controlled homing procedure is successfully executed.

The homing procedure should be used in the following situations when using a motor with resolver feedback:

- After turning on the control voltage
- Whenever there is a transition from operating mode to set parameter mode and back to the operating mode.

The status message INREF signals to a connected control system that the drive controller has established a measurement relationship, or, in other words, that the homing procedure was successfully executed. This message must be processed immediately for applications which require a measurement relationship.

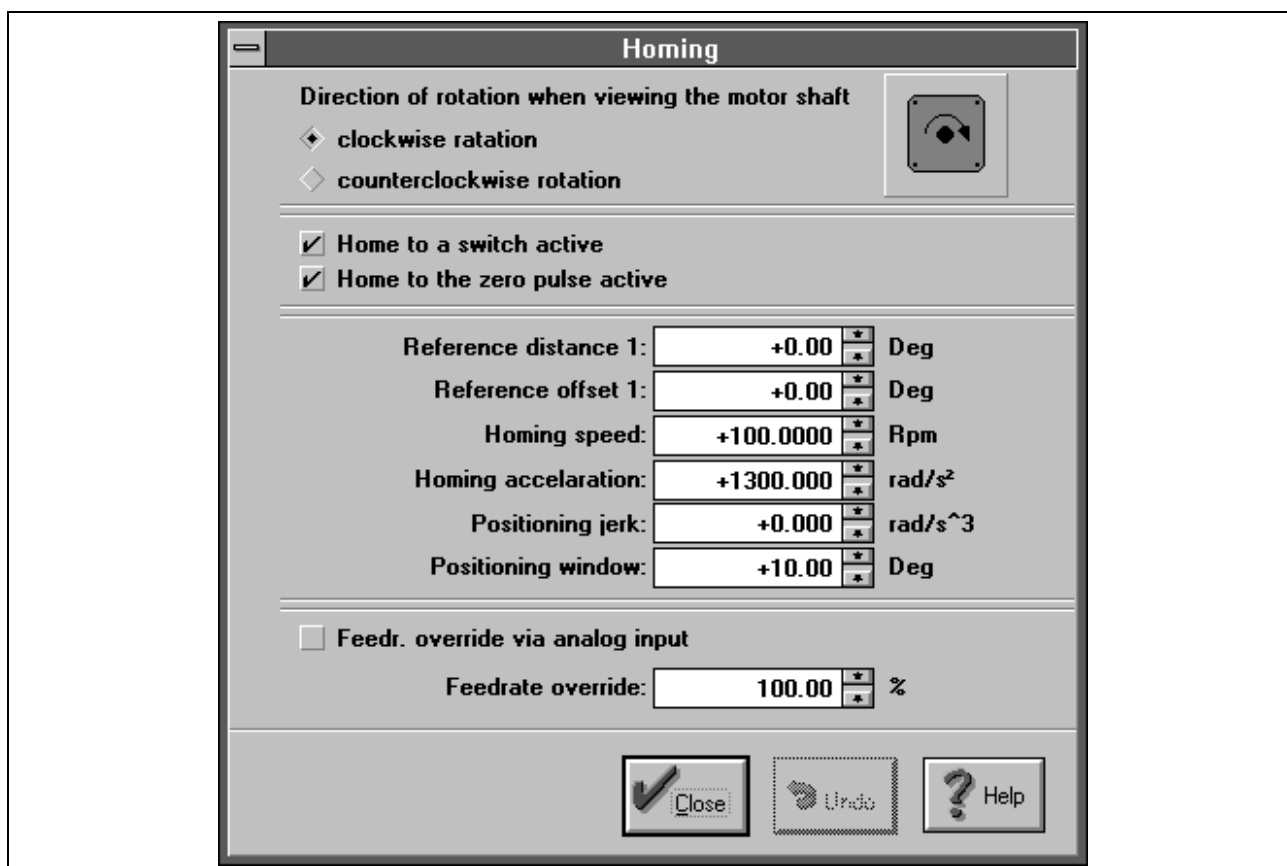


Fig. 7-19: Drive-controlled homing procedure for motors with resolver feedback

Direction of Motion During the Homing Procedure

The user must determine the direction of motion for the drive-controlled homing procedure in conjunction with the machine mechanical system, the placement of the home switch and/or the determination of the home point. This determination always occurs in relation to the motor shaft without regard to the axis mechanical system.

Homing with Evaluation of the Home Switch

The drive moves at the specified acceleration and velocity in the home direction until it receives the home switch signal. This point is the home point (or reference point). Then the drive brakes, reverses and moves back to the home point.

If the axis is located at the home switch cam at the start of the drive-controlled homing procedure, it will move away from the cam and head back towards the home switch cam until the edge of the home point switching signal is received.

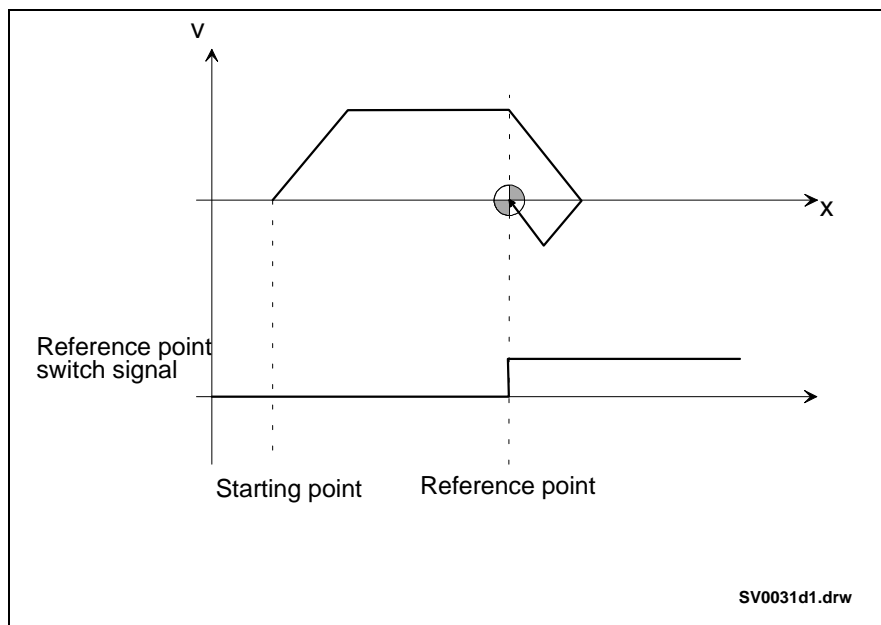


Fig. 7-20: Homing with evaluation of the home switch

Homing with Evaluation of the Position Encoder Reference Mark

The drive controller moves at the specified acceleration and velocity in the home direction and positions itself on the next home referencing mark of the motor encoder. This point is the home point.

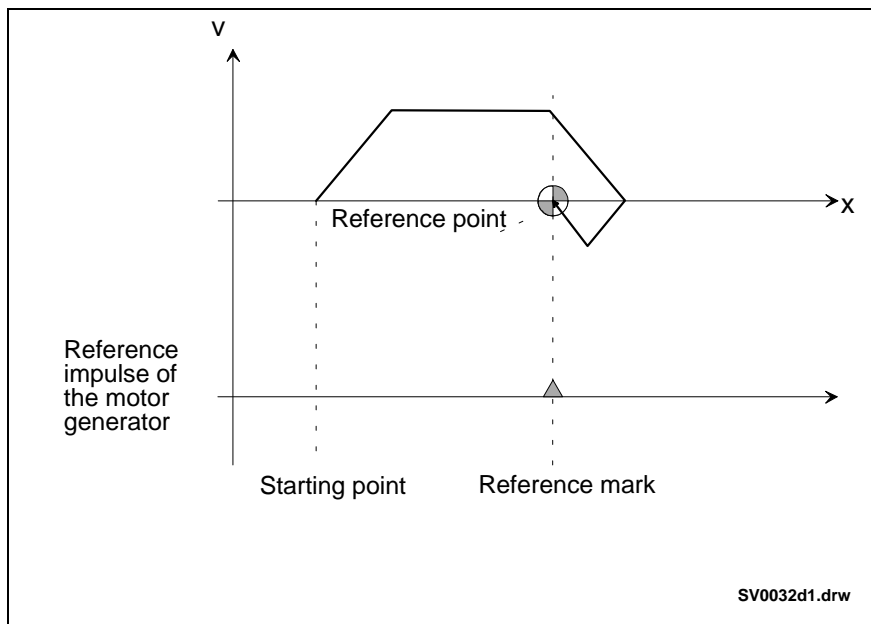


Fig. 7-21: Homing with evaluation of the position encoder homing mark

Note: Multiple home referencing marker pulses per motor revolution will appear with MKD motors:

- MKD025/MKD041: 3 home referencing marks
- MKD071/MKD090/MKD112: 4 home referencing marks

Homing with Evaluation of the Home Switch and the Reference Mark

The drive moves in the home direction until it receives the home switch signal. The drive controller then positions itself on the next motor encoder homing mark which appears. This point is the home point.

If the axis is on the home switch cam at the start of the drive controlled homing procedure, it will first move away from the cam until the home switch signal is removed, reverse direction and head back again in the direction of the home switch cam to find the home point.

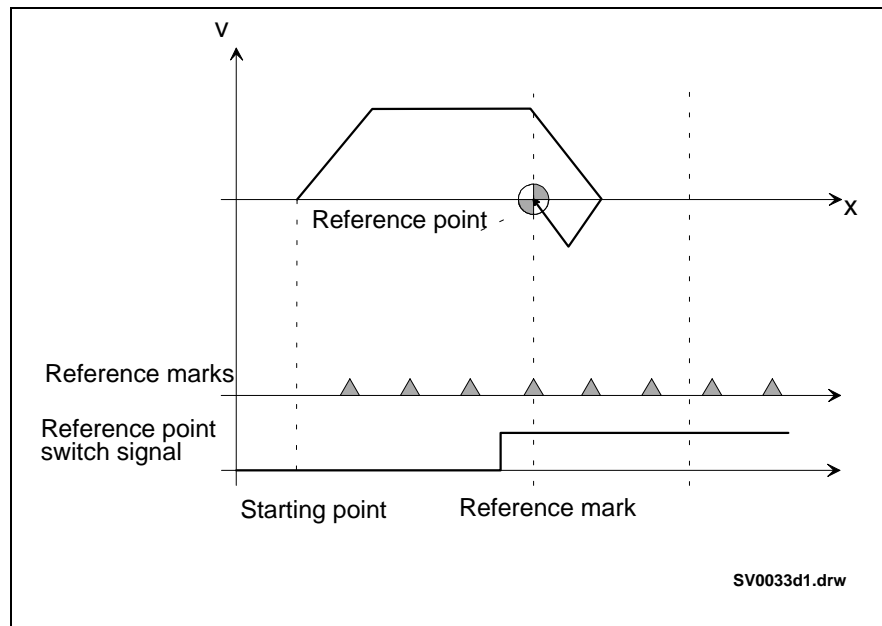


Fig. 7-22: Homing with evaluation of the home switch and the reference home mark

Note: **S-0-0041, Homing velocity** may not be greater than 1000 rpm (in reference to the motor shaft); if it is greater, there will be no way to calculate the position of the home switch signal and the home reference of the motor encoder unambiguously.

Homing to the Current Actual Value

The drive does not move. The actual position value is set equal to the value of parameter **Reference S-0-0052, Reference distance 1** immediately after the homing procedure is activated.

Homing Parameters

- | | |
|-----------------------------|--|
| Reference distance 1 | When the internal homing procedure is finished, the drive positions itself on the home point and enters the value of parameter S-0-0052, Reference distance 1 into the current actual position value. |
| Reference Offset 1 | <p>The home point can be offset in relation to the home reference of the motor encoder using this parameter.</p> <p>When the motor is attached to a specific mechanical system, the home reference mark of the motor encoder is in an arbitrary position with respect to the desired home point. Zero should initially be entered into parameter S-0-0150, Reference offset 1 when setting up. After the first homing attempt, calculate the difference between the desired home point and the position where the drive controller stops at the end of the first homing procedure.</p> <p>This value should be entered in the Reference offset 1 parameter. The sign is significant. After another homing procedure, the drive controller will be in the desired home position.</p> |

**Homing velocity,
Homing Acceleration and
Positioning Jerk**

These parameters determine the motion profile of the drive controller while executing the drive-controlled homing procedure. These parameters must be set for each specific application.

Position window

The drive must be positioned on the home point at the end of the homing process. If the drive controller moves around the home point within the positioning window, the drive controller will recognize the successful completion of the homing procedure and will display the INREF (In Reference) message.

Note: Parameter **S-0-0057, Position Window** is also used in connection with the positioning sets.

Effects on velocity during drive-controlled homing

The velocity at which the drive moves during the homing procedure can be controlled with the **Feedrate override feature**. The value in the "Feedrate override" parameter determines at what proportional velocity the drive should move with respect to the programmed **S-0-0041, Homing velocity**. In other words, at 100% the drive controller will move at precisely the homing velocity value.

Detailed information on this can be found in the chapter "Feedrate Override Feature."

The feature **Positioning at limited velocity** also limits the velocity for homing.

Home Switch Configuration

The home switch cam should be configured as shown in the figure shown below to ensure that the homing procedure can be started from any position in the transverse range.

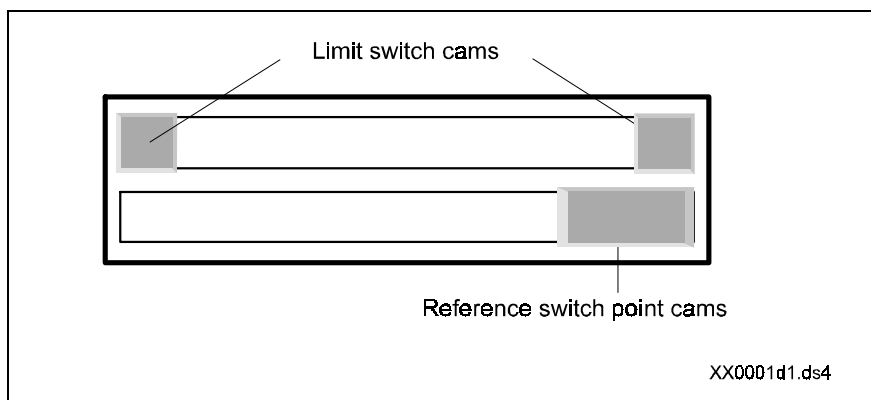


Fig. 7-23: Configuration of the home switch cams

Connecting the Home Switch Input

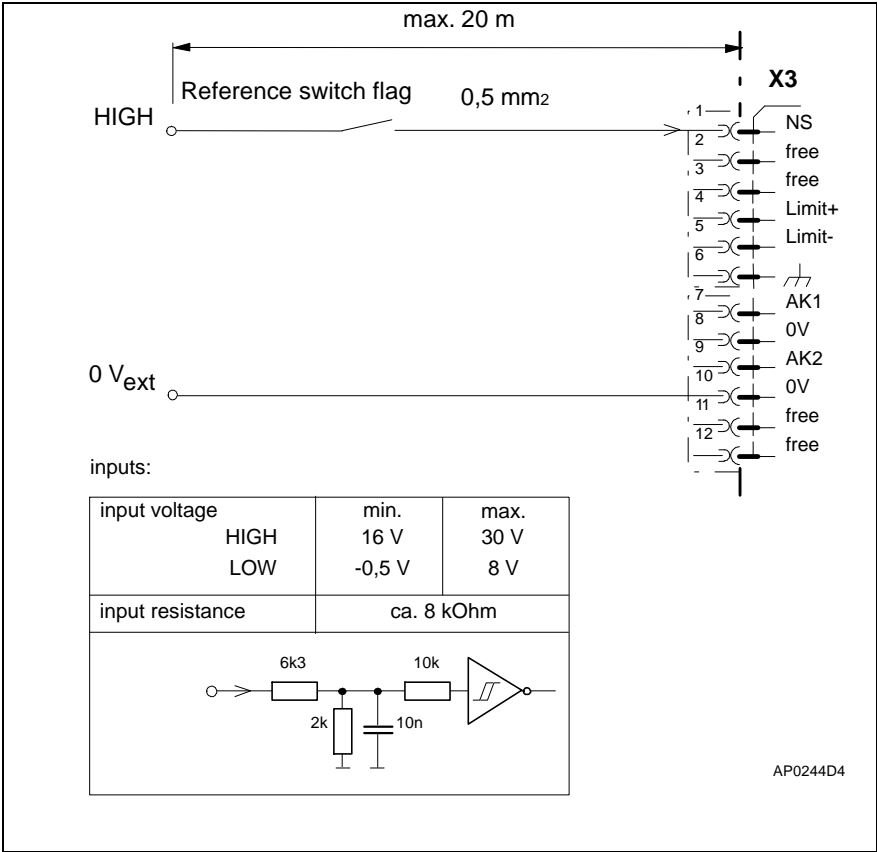


Fig. 7-24: Connecting the home switch input

Initiating the Drive-Controlled Homing Procedure

The homing procedure can be initiated by the following series of signals:

The homing procedure is selected at the NF signal input. Activating the START signal begins the homing procedure. After successful completion of the procedure, the message **INREF (In Reference)** is generated. Afterwards, deactivating the NF signal and the AH/START signal can terminate the homing procedure.

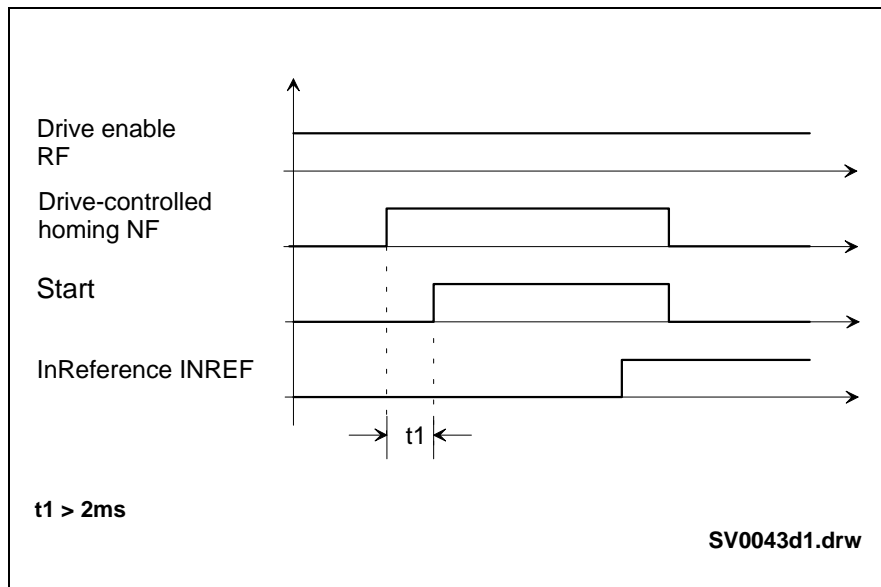


Fig. 7-25: Drive-controller homing procedure

Homing When Using a Motor With Integrated Absolute Encoder Function (Optional)

When using a motor with an integrated absolute encoder function (optional), the measurement relationship is available immediately after turning on the supply voltage, assuming that the command "Set absolute measurement" was executed during the initial installation.

This enables execution of absolute process commands without a homing procedure immediately after the supply voltage is switched on.

The status message **INREF (In Reference)** signals to the connected control system that the drive has a measurement relationship to the machine zero point.

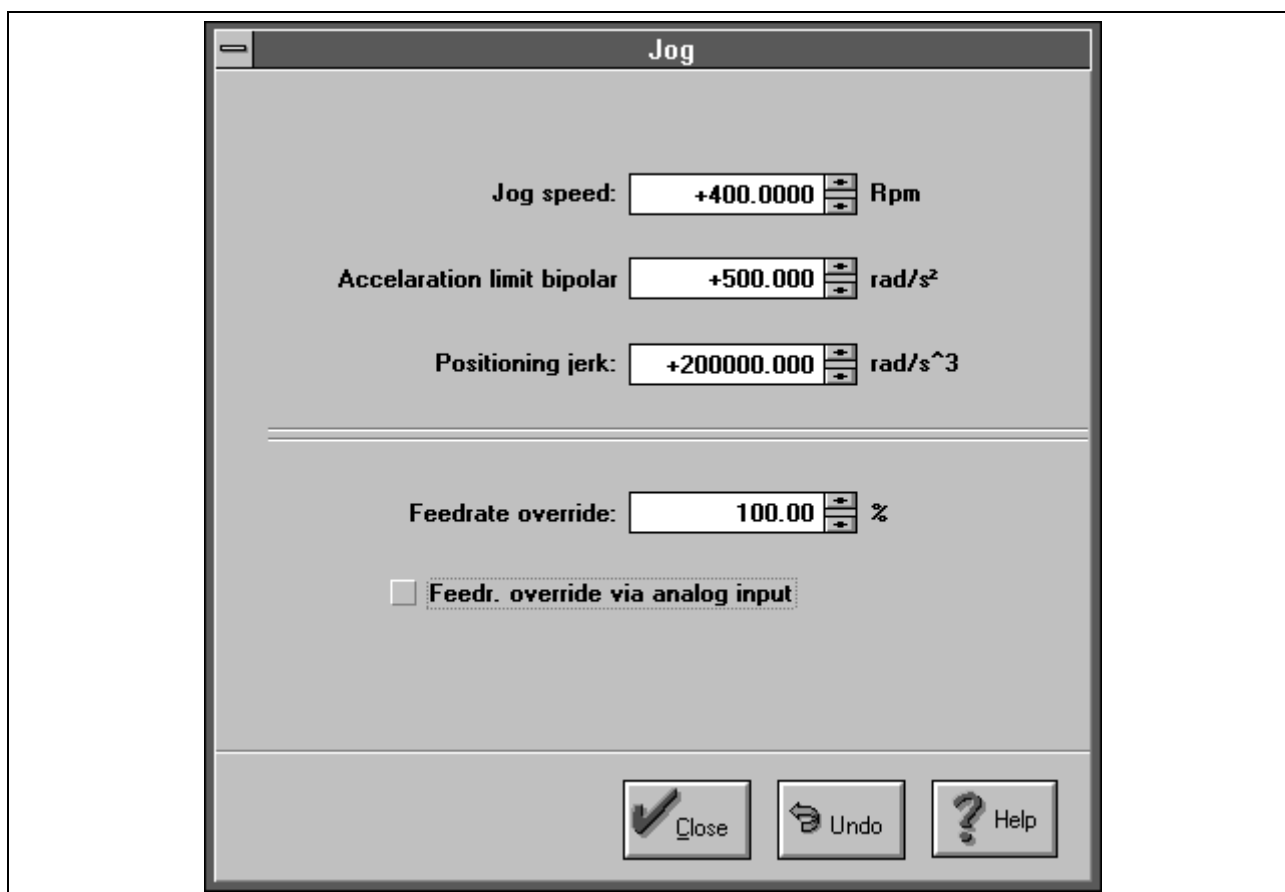


Fig. 7-26: Drive-controlled homing procedure with a motor with integrated absolute encoder function

Setting the Absolute Position

The relationship to the machine mechanical system (the machine zero point) must be established when an axis is initially installed with a motor with an absolute value encoder (optional). This is done by following these steps:

- Move the motor to a position known in relation to the machine zero point either via the jogging function or manually.
- Enter the value in parameter **S-0-0052, Reference distance 1** which should be given as the actual position value of this known position.
- Enter 0 in parameter "**S-0-0150 Reference offset 1**".
- Press the "Absolute encoder set" button.

After command **P-0-0012, C3 Set absolute measurment** is executed, the current actual position is set equal to the value found in parameter **S-0-0052, Reference distance 1**, as long as the controller enable is currently deactivated. If the controller enable is active, the calculation for accepting the homing position is made. The actual acceptance of the homing value in the actual position value will not occur until after the controller enable is deactivated.

Moving Towards the Home Position

If a motor with an integrated absolute encoder is being used, then "drive-controlled homing" means travel in the homing position.

The velocity, acceleration, and jerk with which motion to the home position should be carried out can be entered via the appropriate homing motion parameters.

The drive moves to the home position when the "NF" signal is set and the start signal is given. This requires that the drive controller has been homed, or, in other words, that the "Set absolute measure" command has been successfully executed.

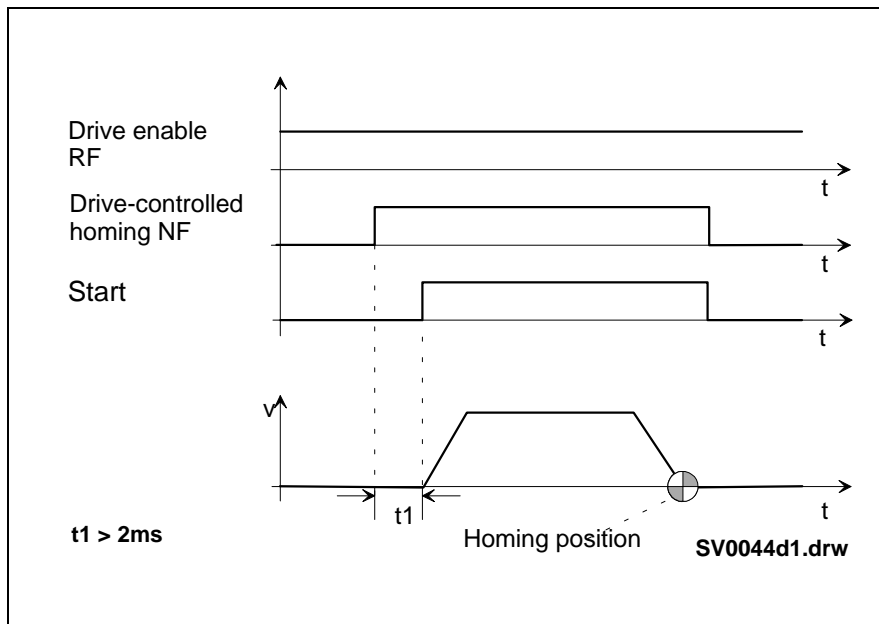


Fig. 7-27: Moving towards the home position

Absolute Encoder Monitoring

To ensure the safety of the absolute encoder function, the DKC has a monitoring system which can recognize errors in determining the absolute actual position value. The current actual position is saved when the DKC supply voltage is turned off. When it is turned on again, the actual position which was saved is compared to the current motor position as read from the motor encoder. If the difference between the two position values is greater than the value entered in parameter **P-0-0097, Absolute encoder monitoring window**, error message **F276, Absolute encoder out of allowed window** will be generated.

Various circumstances can trigger that absolute encoder monitor:

- The axis was moved while the drive was turned off.
- The motor encoder is showing a function error.
- Changing motors

Setting the Absolute Encoder Monitoring Window

The value for the absolute encoder monitoring window must be determined specifically for each application. It should be selected such that possible motion of the axis while the power is turned off are taken into account so that the monitor is not unnecessarily activated.

7.8 Jogging

The axis can be moved with the jog function in the "Position control with step motor interface" and "Position control with positioning interface" operating modes. The parameters relevant to the jog function can be entered in the "Jog" dialog.

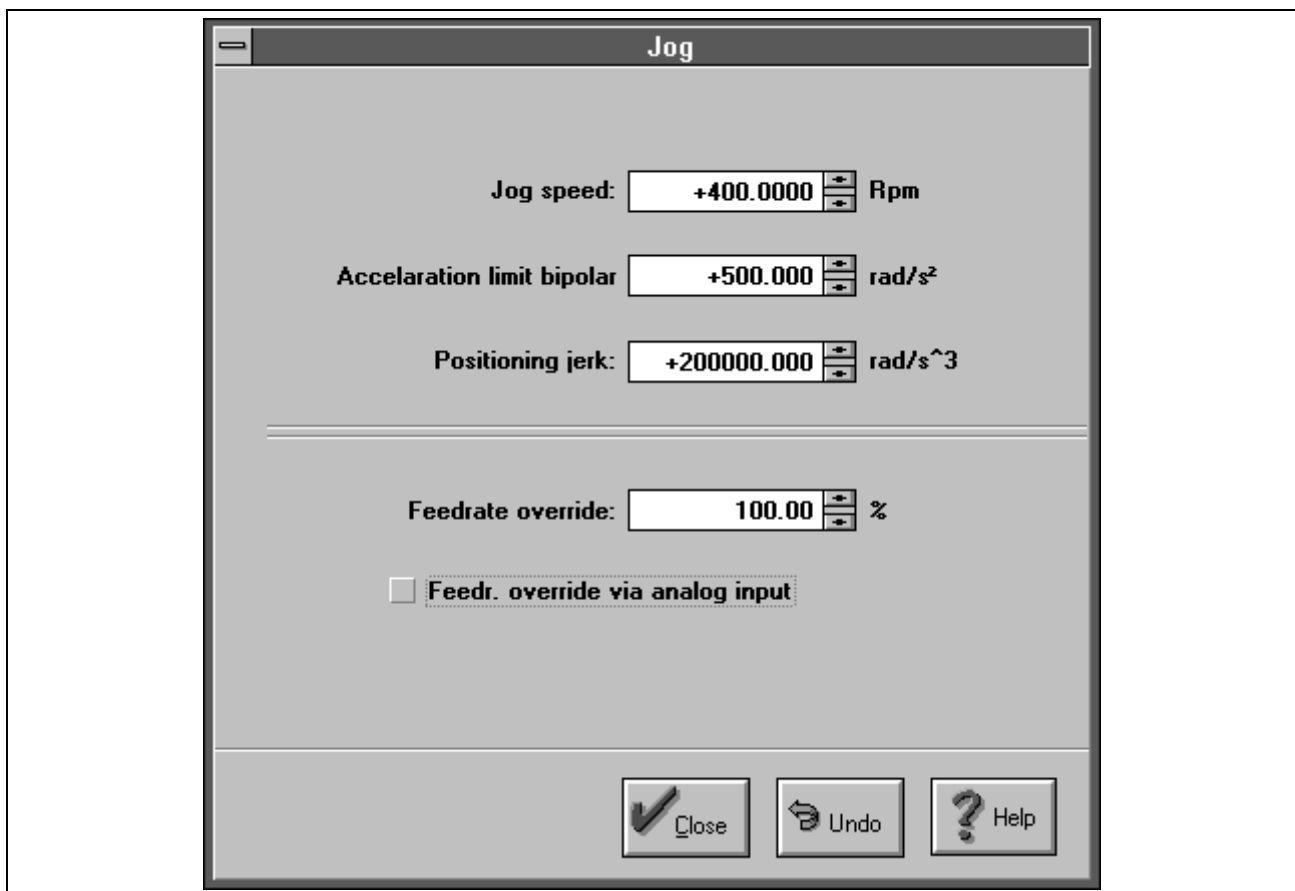


Fig. 7-28: Entering the jogging parameters

Also see **S-0-4030, Jogging velocity**

Jog+	Jog-	Drive	Display
0	0	stops	AH
0->1	0	moves forward	JF
0	0->1	moves backwards	Jb
1	1	stops	AH

Fig. 7-29: Boolean truth table for jogging operation

Feedrate Override Feature While Jogging

Note: The speed at which the drive moves while jogging can be controlled with the **Feedrate override feature**. The feature **Positioning with limited velocity** also has an immediate effect on the jogging velocity.

For more details, please refer to the chapter "**Feedrate Override Function**".

7.9 Positioning at Limited Velocity

Function

By moving at limited velocity = **Slow travel** you can uniformly limit all positioning drive travel to a selectable maximum velocity **S-0-0259, Positioning velocity**. Travel which is slower than this will not be affected (this is different than the proportional reduction with Feedrate override).

The limit works with

- Travel with process blocks
- Jogging
- Homing/zero travel

The limit becomes **effective immediately**, even for the travel in progress. The same applies to deactivation.

Applications

The velocity limit is useful for

- Set-up operation, test travel
- Reduced velocity in dangerous ranges,

but only in combination with other monitoring, since:



WARNING

⇒ **The function "Limited velocity" does not in and of itself provide any personal protection.**

Example

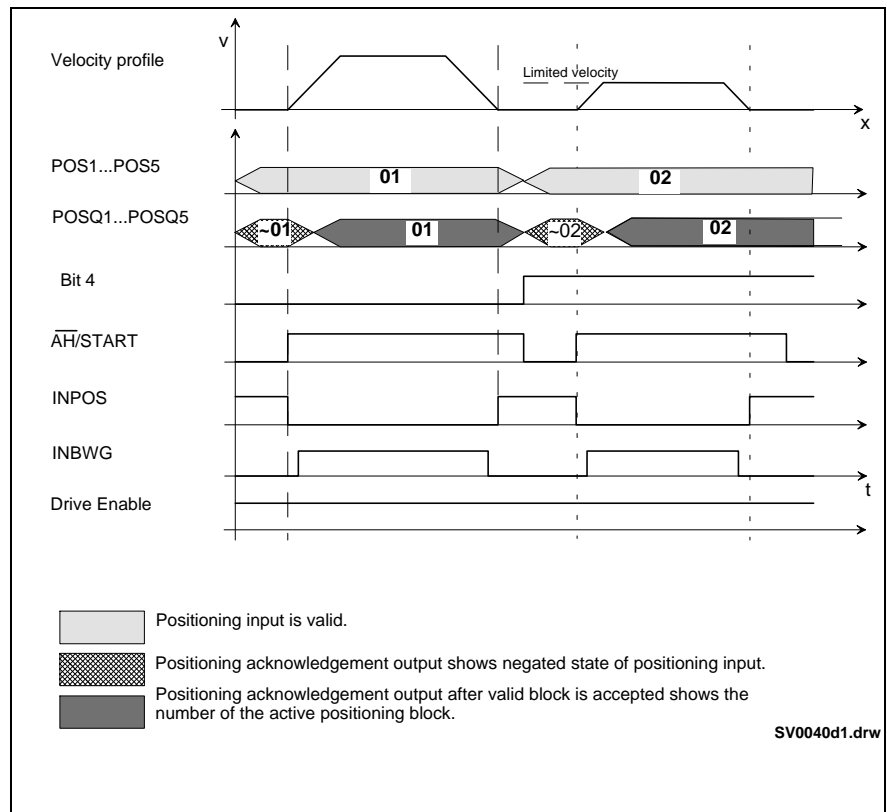


Fig. 7-30: Travel with and without limited velocity

The value of the acceleration remains the same. The travel time increases when the velocity is lower, while acceleration times and paths decrease. Axes which had equal travel times at full velocity will arrive at different times at a reduced velocity.

Parameter

The amount to which the velocity is limited is **S-0-0259, Positioning velocity**. This parameter depends from the as the basis of scaling for velocities, whether rotary or linear.

Activation

For **ECODRIVE with Profibus**, limited velocity is **activated by setting bit 4** (value 10hex) in the drive control word. This bit affects the drive in conjunction with bit 6 of the function parameter.

bit 4 = 1 Limited velocity

bit 4 = 0 Full velocity, as pre-selected

The limitation becomes **effective immediately**. Even a positioning procedure currently in progress will be limited in velocity.

7.10 Feedrate Override Feature

The velocity of the positioning sets, the homing velocity, and the jogging velocity are influenced by the feedrate override feature. Parameter **S-0-0108, Feedrate override**, determines at what velocity travel will take place, as a percentage of the programmed velocity. In other words, at 100% the drive will move precisely at programmed velocity.

7.11 Analog Output

DKC drive controllers operate digitally. This means that all output variables are available as digital information from the DKC. The DKC has two analog diagnostic outputs to make values for velocity, speed currents, etc. visible via an oscilloscope.

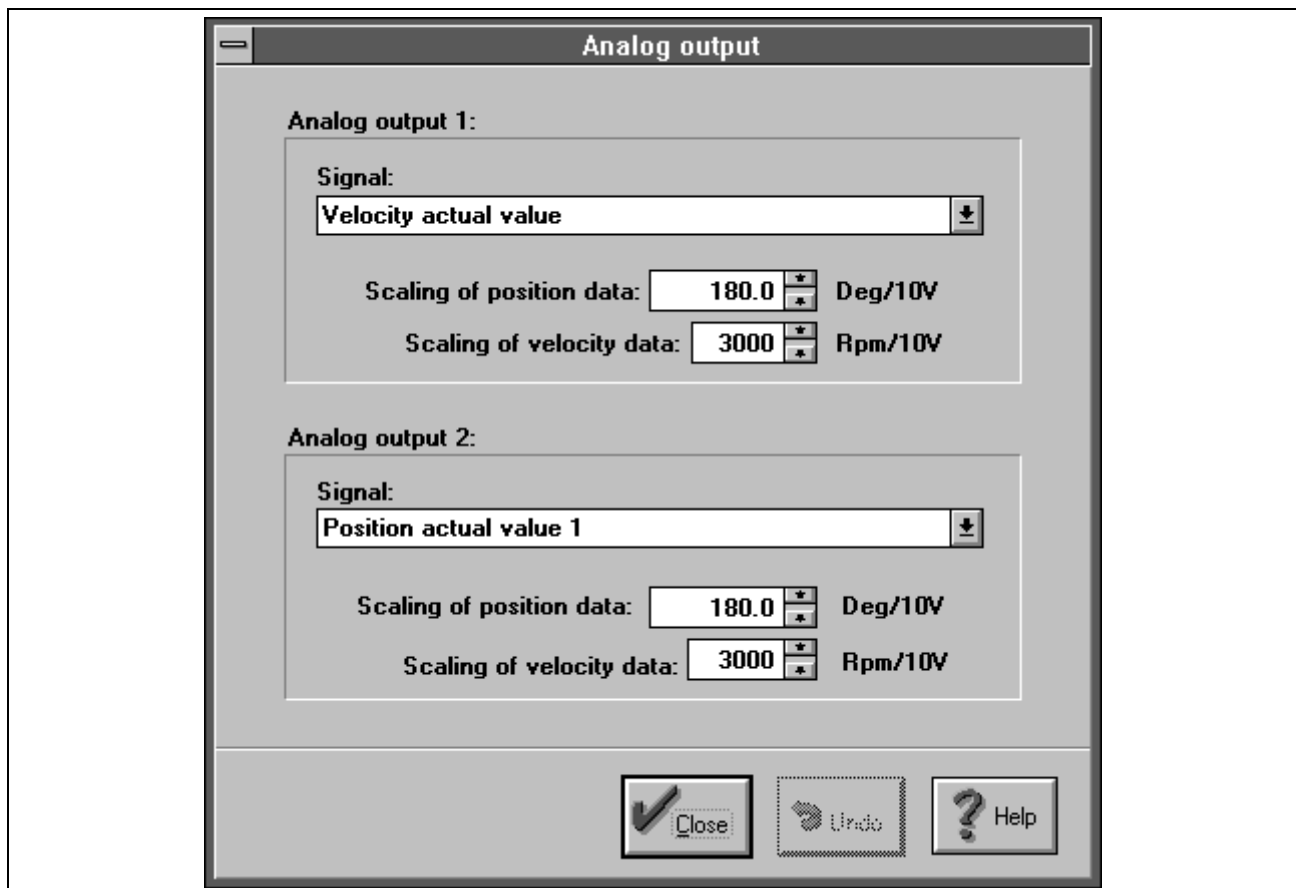


Fig. 7-31: Analog output

The selection of the output signals includes the following values:

Number:	Signal selection:	Scaling:
0x0	Zero point	0V
0x1	Torque-producing command current	P-0-0136
0x2	Velocity feedback actual value (after mixing and filtering)	P-0-0040
0x3	S-0-0036, Velocity command value	P-0-0040
0x4	Position command value difference	P-0-0040
0x5	S-0-0051, Position feedback value 1	P-0-0042
0x6	S-0-0053, Position feedback value 2	P-0-0042
0x7	S-0-0189, Following error	P-0-0042
0x8	Sine signal of motor feedback	1: 1
0x9	Cosine signal of motor feedback	1: 1
0xa	P-0-0139	1:1
0xb	P-0-0140	1:1
0xd	Velocity command value	P-0-0040
0x10	Sine signal external feedback	1: 1
0x11	Cosine signal external feedback	1: 1
0x12	Torque-producing current actual value	P-0-0136
0x13	Magnetization current actual value	P-0-0136
0x14	Velocity feedback value of the motor feedback	P-0-0040
0X16	Continuous bleeder load	10V = 100%

Fig. 7-32: Signal selection for analog output

Note: Velocity and position data always refer to the motor shaft! The scalable output signals can reach overload if the scale is selected such that the current signal value exceeds the $\pm 10V$ limit. The exceeded value is emulated in the displayable range ($\pm 10V$) and makes it possible to examine signals with a higher resolution.

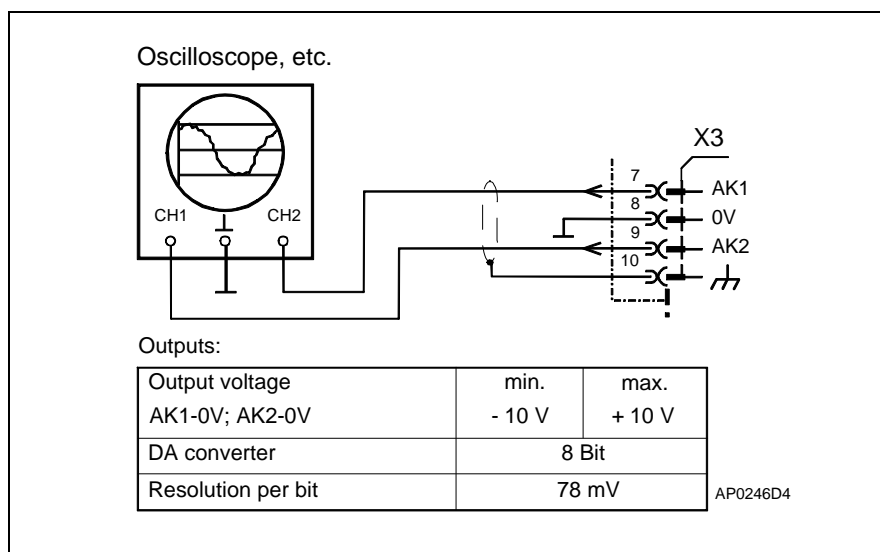


Fig. 7-33: Connections for analog outputs

7.12 Motor brake

Servo axes must be secured against undesired motion when the power is off, if this motion could cause damage.

INDRAMAT motors offer optionally available integrated holding brakes. **ECODRIVE** DKC drive controllers have an integrated brake control.

Note: INDRAMAT motors have optional holding brakes, which are not designed to be operating brakes. In a closed state, holding brakes become worn after approximately 20000 motor revolutions. It is therefore important to pay close attention to the proper function of the holding brake when installing a drive with an integrated brake. Proper release of the brake can be checked by a "clack-noise" when activating the controller enable.

Connecting the Motor Brake

A regulated voltage DC is required for the brake's power supply.
(24V / +/-10%)

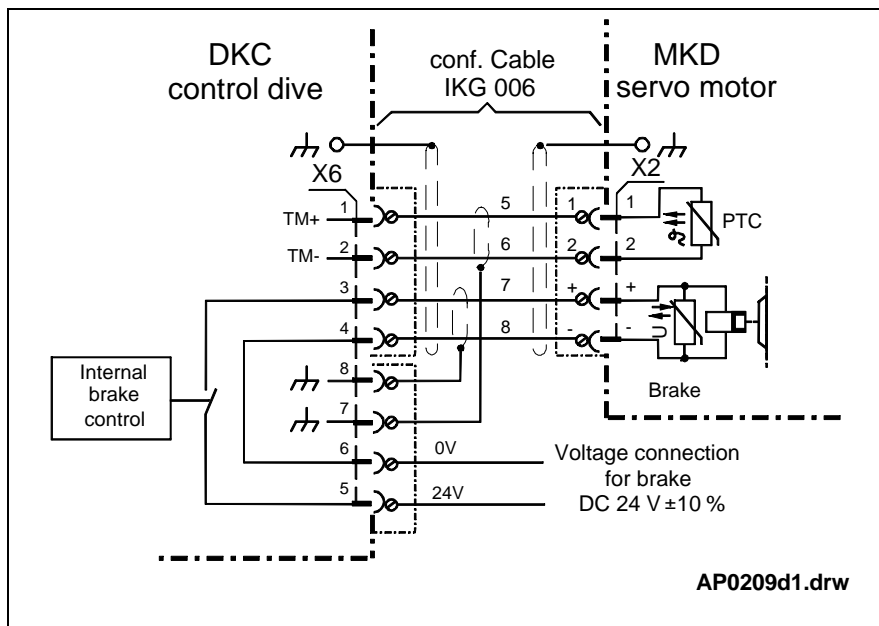


Fig. 7-34: Connecting the motor brake

Brake Reaction After Switching Off the Controller Enable and in Error Conditions

The brake is controlled via the drive controller. The diagrams below show the chronological reaction of the brake control after the controller enable is turned off and in error conditions.

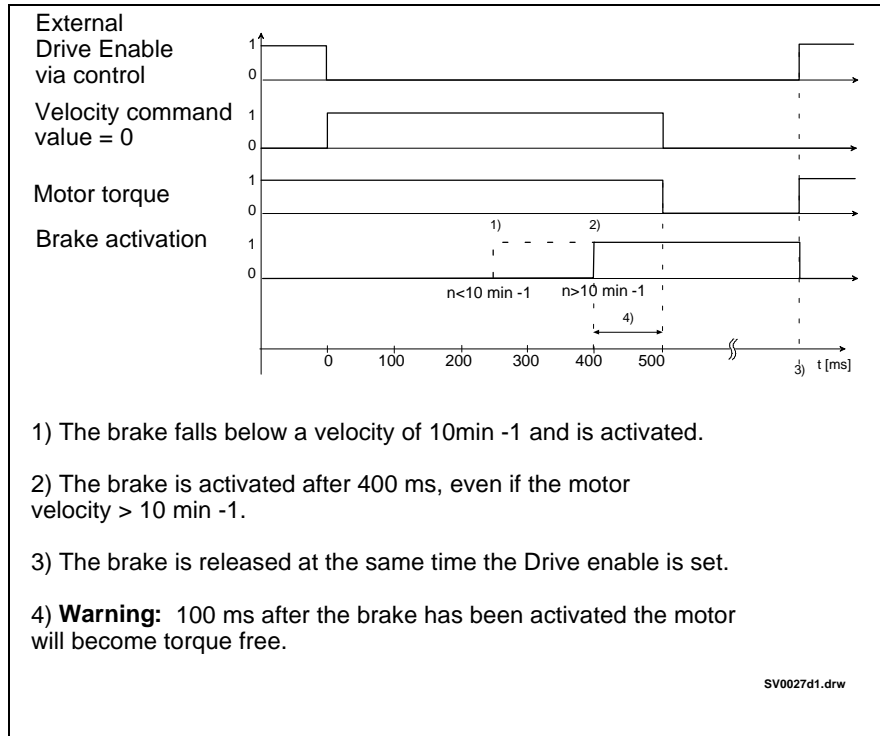


Fig. 7-35: Brake: Reaction after removal of controller enable

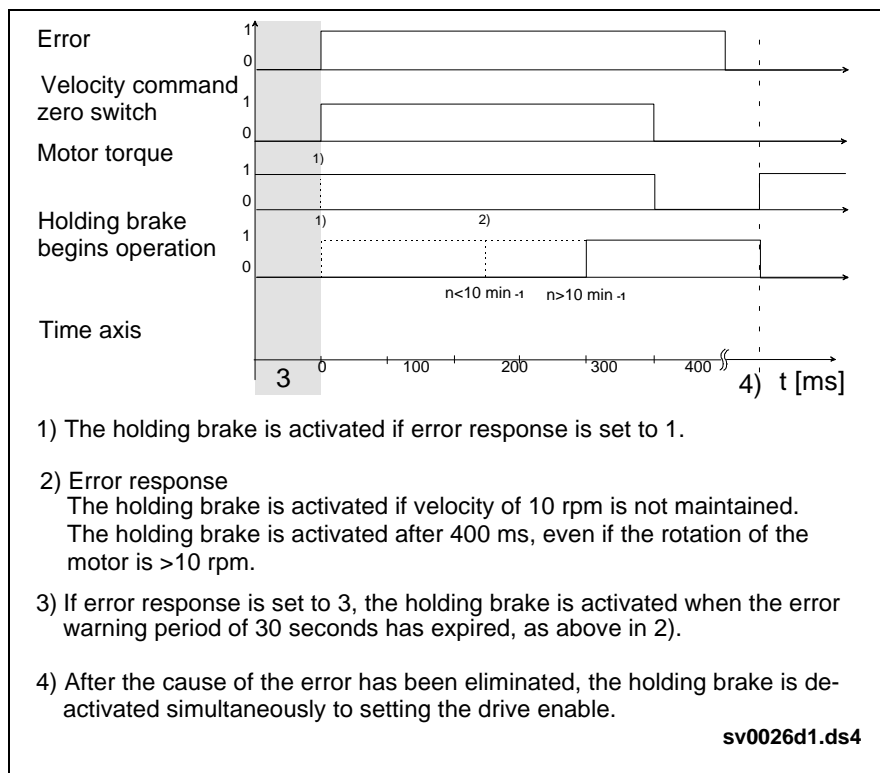


Fig. 7-36: Brake: Reaction in error conditions

7.13 Activating the Drive

Controller Enable

The drive is activated via the drive enable signal.

Requirements for Activating the Drive Controller

The drive must be ready for operation and the power supply must be turned on for the drive to be activated. (state display: "Ab")

If the drive enable is set while missing power supply, the drive will register **F226 Under Voltage Error**.

Drive Stop/Start

Drive Controller Stop/Start During Positioning Operation

If the drive halt signal is active (bit drive start = 0), the drive will remain in position control at the current position. If the drive is in motion when the drive halt is activated, the motor will brake at the programmed acceleration to a standstill.

The drive can be moved in drive halt state by the jog bits in the **Drive control word**.

When the start signal is activated, the previously selected **Positioning set** is started.

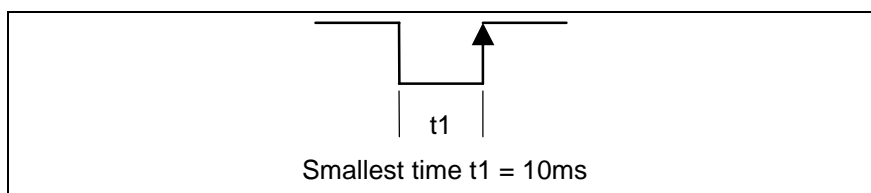


Fig. 7-37: Smallest time

Drive Controller Stop/Start During a Drive-Controlled Homing Procedure

If the drive-controlled homing signal is activated (Bit NF in the Profibus control word = 1) and then the Drive start signal is activated, the drive will perform the internal **Homing procedure**.

E-Stop Function

The E-Stop function (Emergency Stop) makes it possible to bring the drive to a standstill locally on the drive. When **P-0-0008, E-Stop Function Activation** = 1 is activated, a voltage (24V) must be present on the E-Stop input so that the drive can operate.

Parameter **P-0-0008, E-Stop function activation**, activates the E-Stop input. The E-Stop input itself is always 0-active. The **polarity** of the E-Stop input cannot be selected; it can only be operative (with P-0-0008 = 1) or non-operative (with P-0-0008 = 0).

Initiating the E-Stop feature causes the non-fatal error **F234, Emergencia Stop** in the drive.

Controller Enable, Drive Halt and E-Stop Signal Connections

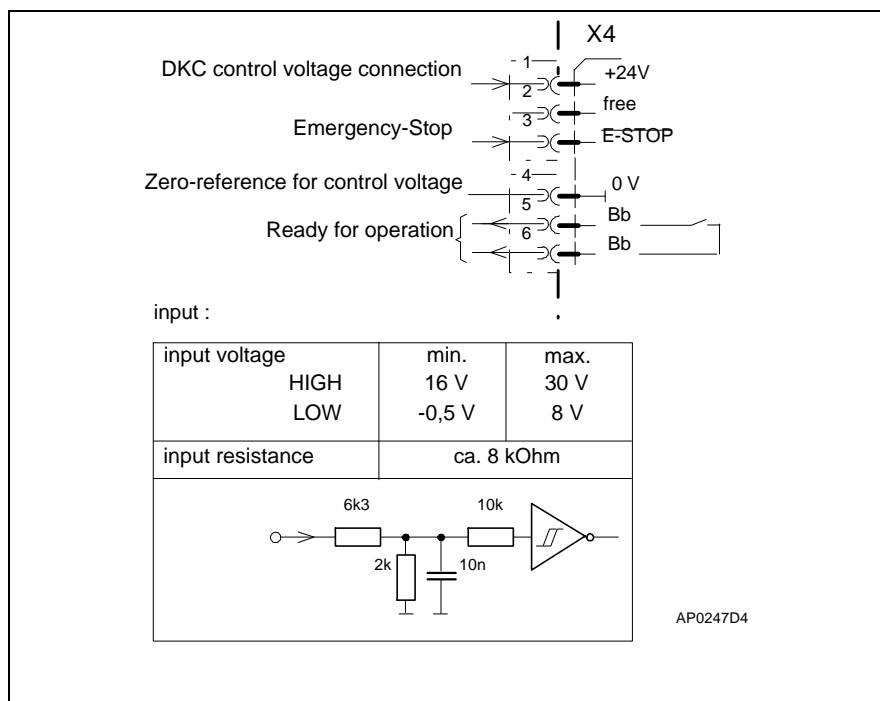


Fig. 7-38: Bb and E-Stop connections

8 Serial Communication

8.1 General Information for Serial Communication

The DKC01.1/DKC11.1 contains one serial interface port. Parameter and diagnostic information can be exchanged through this interface. You can choose to operate the interface either in **RS232 mode** or in **RS485 mode**.

8.2 Communication via the RS232 Interface

The RS232 interface is specifically designed to connect a PC with the **DRIVETOP** installation program. The maximum cable length possible is 15 m.

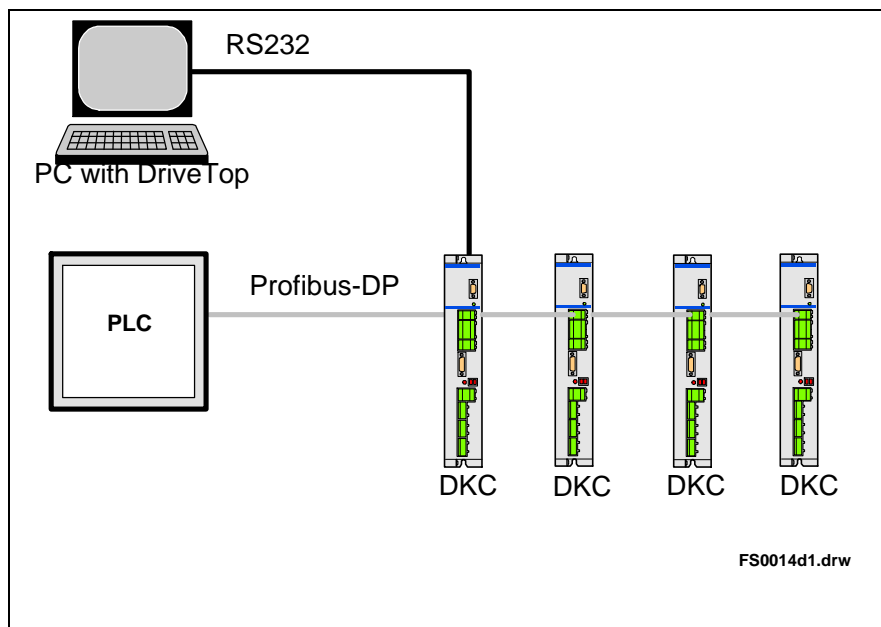


Fig. 8-1: : Communication via the RS-232 interface

8.3 Communication via the RS485 Interface

Communication via the RS485 interface allows the realization of a serial bus with the following specifications:

- Up to 32 drives can be connected with a bus master.
- Transmission rate: 9600 and 19200 baud
- Maximum cable length: 1000m
- Half duplex operation via 2 wire transmission line

Types of data exchange via RS485:

- Parameter
- Commands
- Diagnostics

Operating of Multiple Drives with DRIVETOP

Operational Advantages:

- Startup of several DKCs without reconnection of the interface cable (central connection for diagnostics and setting parameters).
- Realization of a central PC-supported visualization unit

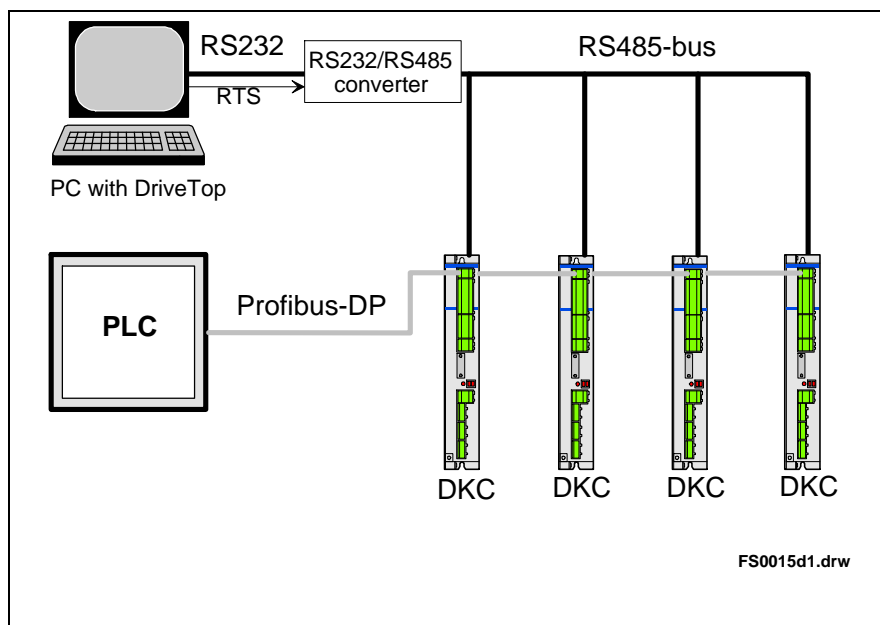


Fig. 8-2: Operating multiple drives with DRIVETOP

Diagnostic Messages and Setting Parameters via a PLC

Operational Advantages:

- You can change parameters via a PLC (for example to adjust the positioning commands).
- Expanded diagnostic possibilities for the PLC through processing of the error codes.

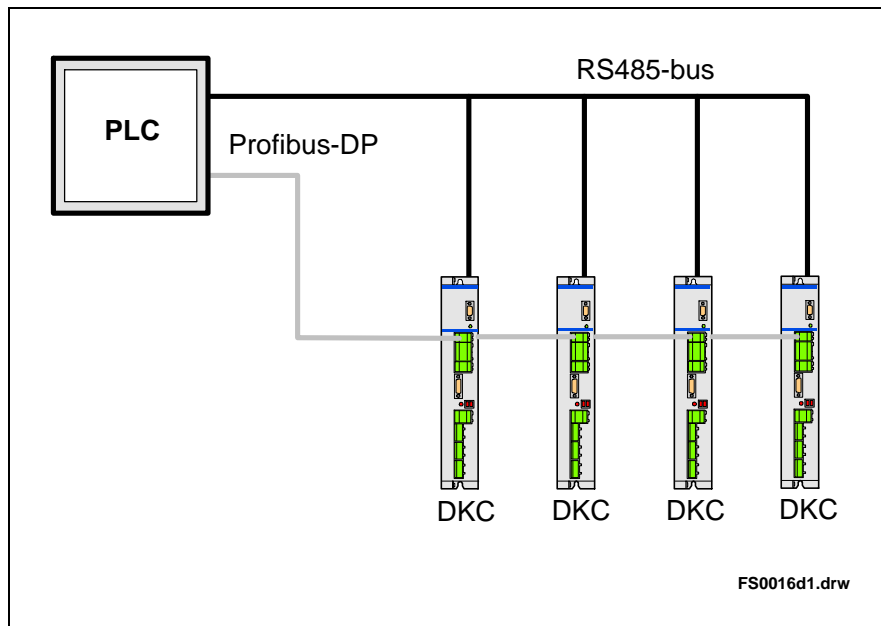


Fig. 8-3: Diagnostics and setting parameters via a PLC

Diagnostics and Setting Parameters of Drive Groups Through an Operator Interface

Operational Advantages:

- Implementation of a central visual display unit

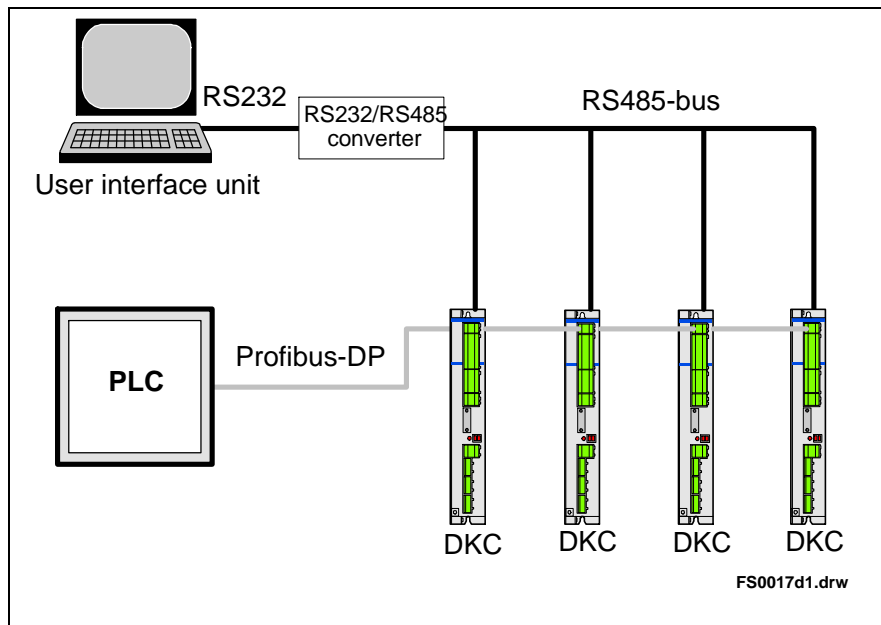


Fig. 8-4: Diagnostics and setting parameters for drive groups through an operator interface

8.4 Communication Procedures

Communication Parameters

The data exchange over the serial interface is controlled by three parameters:

- **P-0-4022, Drive Address**
- **P-0-4021, Baud Rate (RS232/485)**
- **P-0-4050, Answer Delay RS232/485**

RS232 Interface

P-0-4022, Drive Address

With an RS232 interface, there is no need to determine the drive address explicitly, since in this case only one drive can be connected at a time.

RS485 Interface

If multiple drives are connected via the RS485 interface, then the data exchange must be organized by the allocation of drive addresses to the individual units on the bus.

P-0-4021, Baud Rate (RS232/485)

The baud rate of the serial interface is set by parameter. The following settings are possible:

- 0: 9600 Baud
- 1: 19200 Baud



⇒ All the devices on the bus must be set to the same baud rate.

P-0-4050, Answer Delay RS232/485

The RS485 interface operates in half duplex mode with 1 twisted pair. The direction of the data must be switched during the data exchange. The switch of the data direction happens in less than half a milli-second for the DKC devices. In order for the connected terminal devices (PC or SPS) to be given enough time for the data direction switch to occur, the answer delay/SPS time of the drive can be set in this parameter.

The input is in ms. The maximum setting is 200ms.

The default value for the answer delay is set at 1ms by the manufacturer. From past experience, most PCs will function without any problems with this setting.

If communication problems appear, for example a "TIMEOUT display" in DriveTop, then the value for the answering delay can be gradually set to a higher value until no more problems occur. For a safe margin, the limit value so determined should be multiplied by 1.5 and then entered as the answering delay.

Setting the Drive Address

Setting the drive address by coding switch

In the case where communication takes place via the RS485 bus, each of the bus communication devices must be provided with a unique bus address, which is set with the coding switch. In order to avoid access conflicts, each drive address may only be used once.

The DKC03.1 has 2 **coding switches** for addresses 0..99. The switches determine the bus address for the profibus. The profibus address is evaluated only when the device is turned on.

Setting the drive address by parameter

If the address of the RS-485 interface needs to be different from the profibus address, the desired address must be entered via **DriveTop** im parameter **P-0-4022, Drive address**. Valid addresses range from 0 to 99.

To assign address selection to the coding switch again, enter the value 256 into **P-0-4022, Drive address**.

Original State after Establishing the Control Voltage

After turning on the control voltage, all drives connected via the RS485 bus are in the "passive mode".

In passive mode, there is no possibility of communication. To reach the active mode, a drive must be targeted and contacted with a "Change drive" command.

Communication with a Specific Bus Unit

In order to establish communication with a unit on a bus, a CHANGE DRIVE command must be issued with the target to the specific drive address on the bus. With every CD command, the contacted drive will be activated and all other drives will be switched into the passive mode. The contacted drive reports with its prompt. From this point the communication continues with the activated drive, until communication is switched to another drive through a subsequent CHANGE DRIVE command.

Example:

BCD:04 (CR)

Command for switching communication to drive 4

A04:>

Response of the contacted drive. All other drives operate passively.

Parameter Structure

All parameters of the drive are stored in a standard parameter structure. Each parameter consists of 7 elements. The table below defines the individual elements and the access possibilities. The following sections will reference each diagrammed parameter structure.

Element-No.	Data Block Element	Access Possibilities
1	ID number	Read
2	Name	Read
3	Attribute	Read
4	Unit	Read
5	Min. input value	Read
6	Max. input value	Read
7	Operating Data	Read / Write

Fig. 8-5: Parameter Structure

Note: the Supplement contains a description of parameters with detailed specifications of the features of all the available parameters.

Writing To a Parameter

The general form for writing to a parameter is as follows:

A01:> ***ID number of the parameter, data block element number, w, operational datum (Carriage Return)***

After a completed writing operation, the unit responds again with its prompt.

For example, to write to the datum value of parameter **P-0-0004, Smoothing time constant** the following input is required:

A01:>***P-0-0004,7,w,500 (Carriage Return)***

A01:> The drive writes the value 500 as the operating datum (data block element 7).

Reading a Parameter

Reading a parameters takes place as follows:

A01:> *ID number of the parameter, data block element number, r (carriage return)*

The drive responds with the contents of the contacted data block element again.

For example, to access the operating data of parameter **P-0-0004, Smoothing time constant** the following entry would be required:

A01:>*P-0-0004,7,r (Carriage Return)*

1000

The drive returns 1000 as the operating data (data block element 7).

Writing to a List Parameter

There is a number of list parameters in the drive. These lists must be accessed in a somewhat different manner for write operations.

A01:> *ID number of the parameter, data block element number, w> (carriage return)*

?List element 1 (carriage return)

?List element 2 (carriage return)

...

?List element x (carriage return)

?< (Carriage Return)

It is important to end the input with the <- symbol. Only then will the data be written to the drive.

Reading a List Parameter

Reading a list parameter is done in the same manner as with a normal parameter. The drive responds, however, with an answer of all the list elements.

Executing Parameter Commands

A number of commands can be processed in the DKC. The execution of commands takes place automatically within the controller. There are commands for:

- **Switching between operating and set parameter modes**
S-0-0127, C1 Communications phase 3 transition check
S-0-0128, C2 Communications phase 4 transition check
P-0-4023, C4 Transition to Phase 2
- **S-0-0262, Basic Load Command**
- **S-0-0099, Reset class 1 diagnostics**
- **S-0-0148 Drive-Controlled Homing Procedure Command**
- **P-0-0012, Command Set Absolute Measurement**

S-0-0099, Reset Class 1 Diagnostics 1 and **S-0-0148, C6 Command Drive-Controlled Homing Procedure** are also available via the Profibus.

A command can be started, interrupted or ended via the serial interface. The status of the command execution can also be read via this interface.

The general form for executing a command is as follows:

A01: > *ID number of the parameter, 7, w, 11 (carriage return)*

Requesting the Status of a Command

The actual status of a command can be requested. Using the request for the command status is especially important when it is necessary to establish that the drive side of the command process is completed before the connected control (or the PC) ends a command.

The general form for requesting the status of a parameter command is as follows:

A01: > *ID number of the parameter, 1, w, 0 (carriage return)*

The drive responds to the request to write to the ID number of the command parameter by returning the current command status. For example:

11 (meaning the command in the drive is set and enabled)

Possible status messages:

- Command is set in the drive
- Command execution terminated in the drive
- Command is not yet completed
- Command execution is not possible (error)
- Command successfully completed
- Command operation interrupted in the drive
- Command is not set in the drive

The command status will be transmitted in the form of a bit list. The meaning of each bit is displayed below.

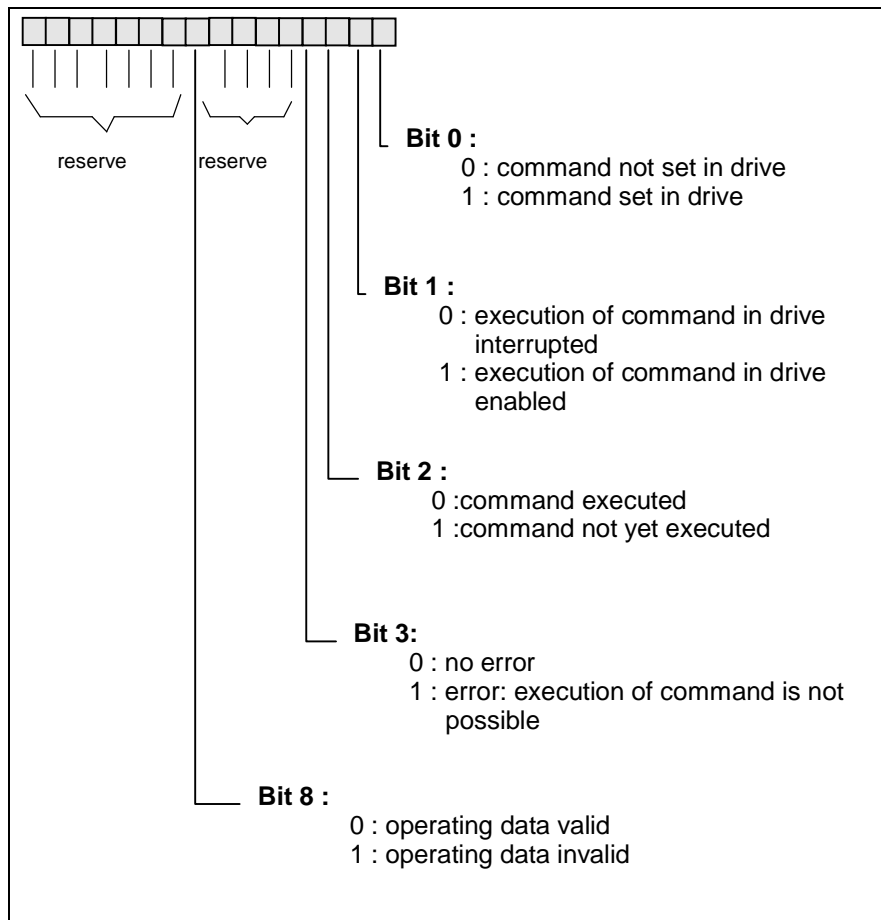


Fig. 8-6: Command reception (data status)

Ending a Parameter Command

The general form for ending a parameter command is as follows:

A01:> ***ID number of the parameter, 7, w, 0 (carriage return)***

Error Messages

If illegal parameter access is attempted or for example writing access to a read-only data block element is attempted, an error message is issued by the drive.

List of the possible error codes	Error code:	Error description:
	#1001	ID number missing
	#1009	Invalid access to element 1
	#2001	Name is missing
	#2002	Transmitted name is too short
	#2003	Transmitted name is too long
	#2004	Name cannot be written to
	#2005	Name is currently not editable
	#3002	Transmitted attribute is too short
	#3003	Transmitted attribute is too long
	#3004	Attribute cannot be changed
	#3005	Attribute is currently write-protected
	#4001	Unit missing
	#4002	Transmitted unit is too short
	#4003	Transmitted unit is too long
	#4004	Unit cannot be changed
	#4005	Unit cannot currently be changed
	#5001	Min. value missing
	#5002	Transmitted min. value is too short
	#5003	Transmitted min. value is too long
	#5004	Min. value cannot be changed
	#5005	Min. value cannot currently be changed
	#6001	Max. value missing
	#6002	Transmitted max. value is too short
	#6003	Transmitted max. value is too long
	#6004	Max. value cannot be changed
	#6005	Max. value is currently write-protected
	#7002	Transmitted data is too short
	#7003	Transmitted data is too long
	#7004	Data cannot be changed
	#7005	Data cannot currently be changed
	#7006	Data < min. value
	#7007	Data > max. value
	#7008	Datum is not correct
	#9001	Input is not identifiable
	#9002	Parameter type error
	#9003	Invalid data set number
	#9004	Invalid data block number
	#9005	Data element number is not defined
	#9006	Error in read-write recognition (r/w)
	#9007	Invalid character in the data

8.5 Application Examples

Changing Positioning Block Data

Assumption:

- Multiple drives are connected over a RS485 interface to a PLC. The drive in question has the address 1.
- The drive operates in positioning mode. It will use 4 positioning blocks.
- The target positions of the positioning block data should be changed via the RS485 interface.

Integrating Communication to the Desired axis

BCD:01 (CR)

Command for Switching to Drive **A01**:>

Response of the contacted drive. All other drives operate passively.

Note: There is no immediate echo character by character. Instead the drive transmits the complete input sequence back after reception of the CR.

The resident memory mode is deactivated

Normally the parameter will be stored through writing in an EEPROM so that the data remains after the supply voltage is turned off.

If an application requires frequent changes of the parameters during operation, for example changing the target position of positioning data sets, there is a danger of eventually exceeding the maximum allowable number of writing cycles of the EEPROM. In order to avoid this possibility, the resident memory must be turned off.

The resident memory mode must be turned off after each time the power supply of the connected controller is turned on and is valid until the next time the power supply is turned off. While non-resident mode is active, all parameter data is written to RAM memory only.

Turning off the resident memory: **A01:> S-0-0269,7,w,1 (CR)**

Writing the List of the Target Positions in the Drive

The target positions of all the axes are stored in the form of a list in parameter **P-0-4006, Process command target position**. In order to change one or more of these values, all of the relevant values of this list must be written. If four target positions are to be used, then all 4 positions must be written even if only one of the positions should be changed.

A01:> P-0-4006, 7,w,> (CR)

?100.0 (CR)

?200.0 (CR)

?300.0 (CR)

?400.0 (CR)

?<(CR)

Target position command 0

Target position command 1

Target position command 2

Target position command 3

(CR)

As soon as the target positions have been written, they take effect in the drive.

8.6 Connections

RS485 Connection

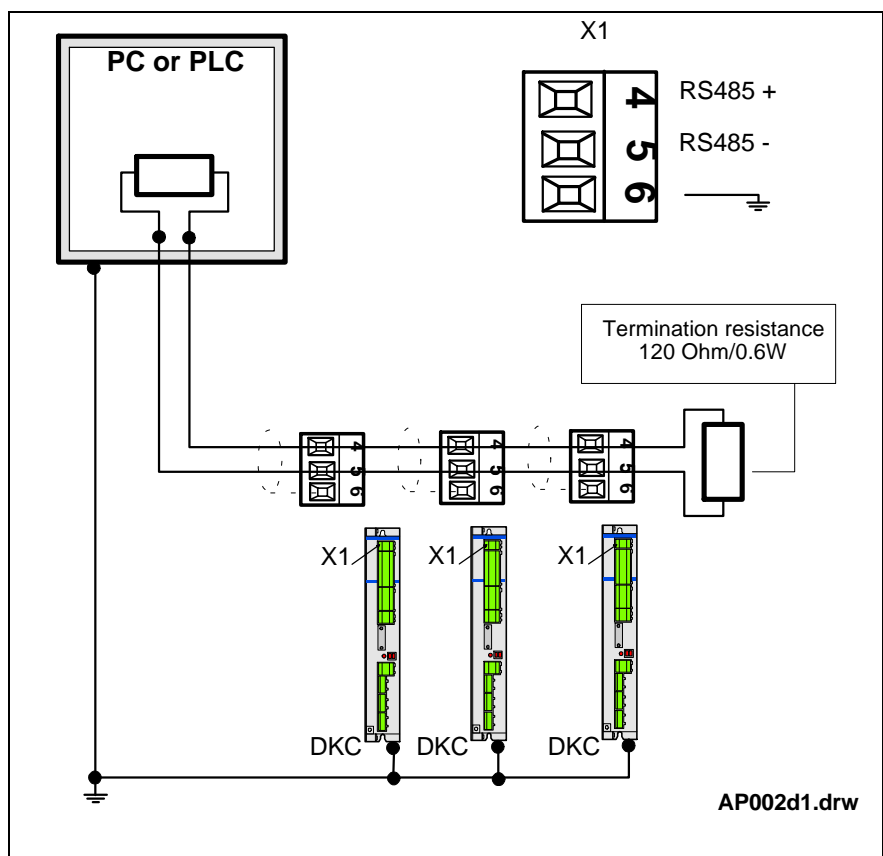


Fig. 8-7: RS485 Connection

Note: Up to 32 drives can be connected. Note that the total maximum cable length is 1000m. The terminal resistance is manufactured with each end of the transmission path containing a double core housing case.

RS 232 Connection

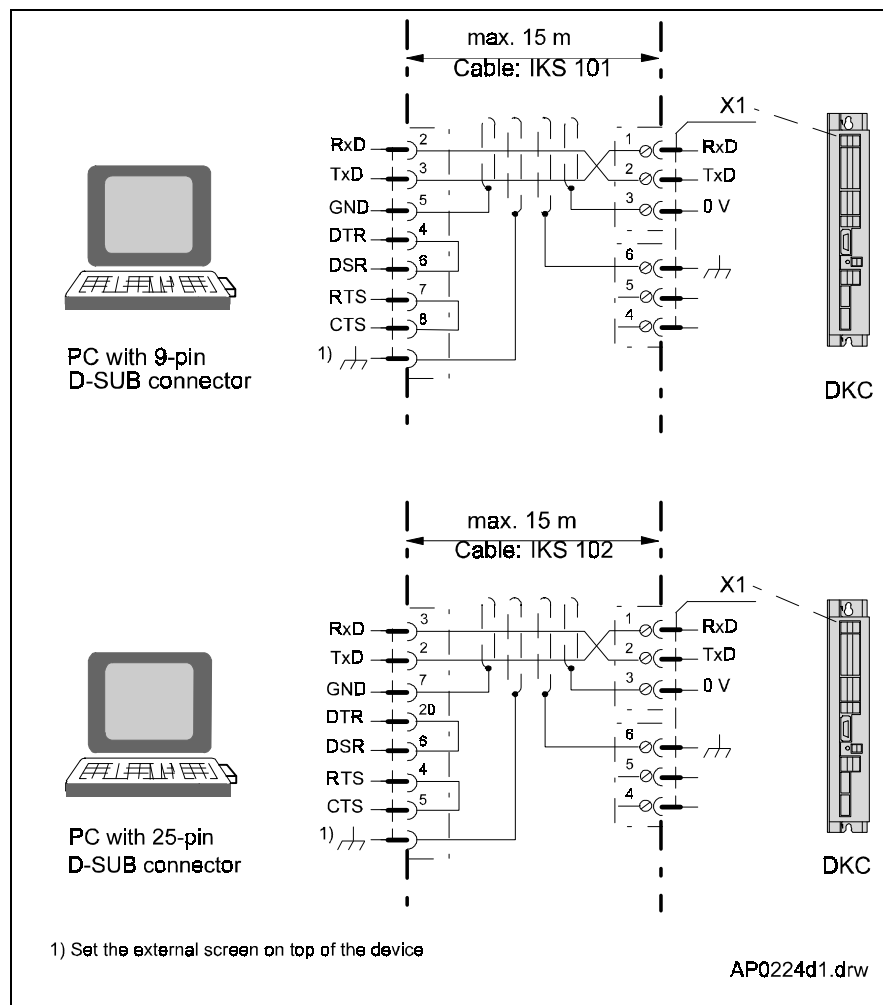


Fig. 8-8: RS 232 Connection

Note: Only point-to-point connections are possible, and the maximum cable length is 15m. The PC and drive control device must share a common central ground. Please pay close attention so that the connection of the reference potential (OV/GND) is made on the inner shield of the cable !

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ECODRIVE DKC03.1 Drive Controller

Supplement A Parameter Description PDP 03VRS

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4-1

1 General Information

Using This Manual

All standard and product-specific parameters are listed in this chapter in ascending numerical order.

It serves as a supplement to the information in the Functional Description, and provides a complete description of all parameters used in ECODRIVE firmware.

Note: The parameter description is especially useful when you are using the drive controller's serial interface (RS483/232). You do not require a detailed knowledge of the meaning of individual parameters if you are using DriveTop to set parameters during installation.

The description of the individual parameters is divided into two subsections.

1) General description

This part offers information on the function or meaning of the parameters, and help on setting the parameters.

2) The Attributes section contains a description of the meaning of each parameter, and help for setting and editing parameter values.

This includes the list of characteristics and characteristic values used to classify the parameter. They are necessary for a complete description of the parameter.

However, if you would just like a quick overview of the meaning of the parameter, they are not necessary.

Definitions

The following abbreviations are used:

Data length:

2-byte - the data length for the operating data is 2 bytes.

4-byte - the data length for the operating data is 4 bytes.

1-byte variable - this is a piece of operating data of variable length (list). The length of a data unit is 1 byte.

2-byte variable - this is a piece of operating data of variable length (list). The length of a data unit is 2 bytes.

4-byte variable - this is a piece of operating data of variable length (list). The length of a data unit is 4 bytes.

Format:

BIN - the display format for the operating data should be binary.

HEX - the display format for the operating data should be hexadecimal.

DEC_OV - the display format for the operating data should be decimal without

a plus or minus sign.

DEC_MV - the display format for the operating data should be decimal with

a plus or minus sign.

ASCII - the operating data is an ASCII string.

IDN - the operating data is an ID number.

Editability:

No - the operating data cannot be edited.

P2 - the operating data can only be edited in communications phase 2.

P23 - the operating data can only be edited in communications phase 2 and 3.

P234 - the operating data can be edited in any communications phase.

P3 - the operating data can only be edited in communications phase 3.

P4 - the operating data can only be edited in communications phase 4.

Memory:

fixed - the operating data is programmed in the drive (fixed value).

no - the operating data is not buffered in the drive, the value after turning on the drive controller is not defined.

Param.E²prom - the operating data is buffered in parameter E²prom (DSM) on the drive controller main circuit board.

Ampl.E²prom - the operating data is buffered in the drive controller's E²prom.

Feedb.E²prom - the operating data is buffered in the motor feedback data memory's E²prom (for MDD and MKD motors only).

Validity check:

no - the operating data is not checked for validity.

Phase2 - the operating data is checked in the "Communications phase 3 transition check" command.

Phase3 - the operating data is checked in the "Communications phase 4 transition check" command.

Extreme value check:

no - the operating data is not checked for its extreme values when it is written to.

yes - the operating data is checked for its extreme values when it is written to.

Combination check:

no - the operating data is not checked (bitwise) for a valid combination with other parameter values when it is written to.

yes - The operating data is checked (bitwise) for a valid combination with other parameter values when it is written to.

Cyc. transmittable:

In SERCOS devices only

2 Standard Parameters

S-0-0014, Interface Status

Description:
The current communications phase can be polled (queried) using the first three bits (0, 1, 2).

2 The drive is in Parameter mode.
4 The drive is in Operate mode.

Parameter structure:

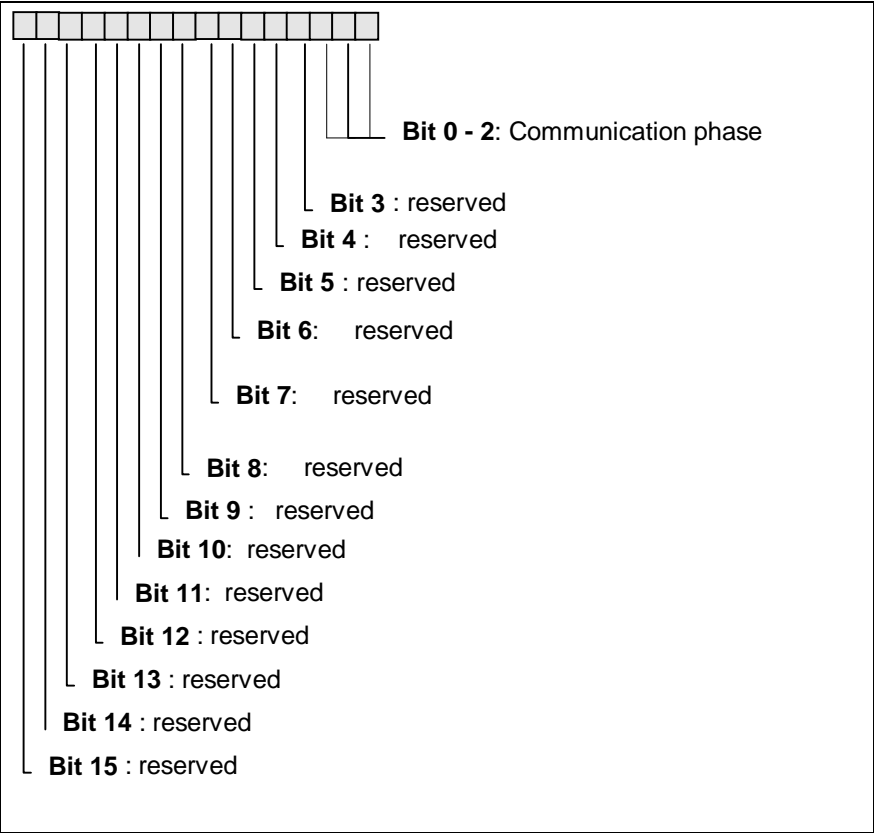


Fig. 2-1: S-0-0014, Interface Status

S-0-0014 - Attributes

Name in German:	Schnittstellen-Status		
Name in English:	Interface status		
ID number:	S-0-0014	Editability:	no
Function:	Parameter	Memory:	no
Data length:	2 bytes	validity check:	no
Format:	BIN	Extreme value check:	no
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	

S-0-0021, IDN List of Invalid Operating Data for Comm. Phase 2

Description:

Before the drive executes the delayed phase switch from 2 to 3 that was initiated by command **S-0-0127, Communications phase 3 transition check**, it will check to see if all communication parameters are complete and correct. If the drive identifies one or more IDNs as invalid, it will write the operating data that is still needed or is invalid to this ID No. list. This is displayed to the drive by command error diagnostic message **C101, Communication parameters incomplete**.

S-0-0021 - Attributes

Name in German:	IDN-Liste ungültige Betriebsdaten Phase 2		
Name in English:	IDN List of invalid op. data for comm. ph2		
ID number:	S-0-0021	Editability:	no
Function:	Parameter	Memory:	no
Data length:	2-byte variable	validity check:	no
Format:	IDN	Extreme value check:	no
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	--

S-0-0022, IDN List of Invalid Operating Data for Comm. Phase 3

Description:

Before the drive executes the delayed phase switch from 3 to 4 that was initiated by command **S-0-0128, Communications phase 4 transition check**, it will check the parameters for the following items:

- Validity of the parameter
- The parameter value is found within the valid input range
- "Compatibility" with other parameters.

If a parameter check turns out negative, this operating data will be entered in this ID No. list.

The drive then responds to the transition command with the messages:

- C201 Invalid Parameter (->S-0-0022) or
- C202 Limit Error Parameter (->S-0-0022) or
- C203, Parameter Calculation Error (->S-0-0022)

S-0-0022 - Attributes

Name in German:	IDN-Liste ungültige Betriebsdaten Phase 3		
Name in English:	IDN List of invalid op. data for comm. ph3		
ID number:	S-0-0022	Editability:	no
Function:	Parameter	Memory:	no
Data length:	2-byte variable	validity check:	no
Format:	IDN	Extreme value check:	no
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	--

S-0-0030, Manufacturer Version

Description:

You can read the drive product version as text from this parameter.

Example:

DKC01.1-ASE-02V07

S-0-0030 - Attributes

Name in German:	Hersteller-Version		
Name in English:	Manufacturer version		
ID number:	S-0-0030	Editability:	no
Function:	Parameter	Memory:	fixed
Data length:	1-byte variable	validity check:	no
Format:	ASCII	Extreme value check:	no
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	--

S-0-0032, Primary Mode of Operation

Description:

The mode of operation defined in this parameter will be activated in the drive if:

- the control and power sections are ready for operation
- the controller enable RF is set and
- the AH/Start signal has been given.

The operating mode can be selected by entering a bit list.

Bit list:	Meaning:
0000,0000,0011,0011	Position regulation, positioning interface, with following error
0000,0000,0011,1011	Position regulation, positioning interface, without following error

Fig. 2-1: Mode of operation

S-0-0032 - Attributes

Name in German:	Hauptbetriebsart		
Name in English:	Primary mode of operation		
ID number:	S-0-0032	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	BIN	Extreme value check:	no
Unit German/English:	--/--	combination check:	yes
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	111 011 b

S-0-0033 Secondary Operation Mode 1

Description:

The first secondary operation mode is reserved for jog mode with DKC.
The secondary operation mode is a fixed setting and cannot be changed.

S-0-0033 - Attributes

Name in German:	Nebenbetriebsart-1		
Name in English:	Secondary operation mode 1		
ID number:	S-0-0033	Editability:	no
Function:	Parameter	Memory:	Parallel E ² Prom
Data length:	2 bytes	validity check:	yes
Format:	Binary	Extreme value check:	no
Unit German/English:	-/-	combination check:	yes
Posit. after the dec.:	-	cyc. transmittable:	no
Input value min / max:	-/-		
Default value:	1100000000011011 b		

S-0-0036, Velocity Command Value

Description:

This parameter indicates the velocity command value. It is combined with **S-0037, Velocity command value** additively to determine the drive's effective velocity set point.

In the position control operating modes, this parameter displays the output error signal of the position controller.

S-0-0036 - Attributes

Name in German:	Geschwindigkeits-Sollwert		
Name in English:	Velocity command value		
ID number:	S-0-0036	Editability:	P234
Function:	Parameter	Memory:	no
Data length:	4 bytes	validity check:	no
Format:	DEC_MV	Extreme value check:	yes
Unit German/English:	S-0-0044/S-0-0044	combination check:	no
Posit. after the dec.:	S-0-0044	cyc. transmittable:	MDT
Input value min / max:	S-0-0044/S-0-0044	Default value:	--

S-0-0037, Additive Velocity Command Value

Description:

The additive velocity command value is added to **S-0-0036; Velocity command value** in the drive.

S-0-0037 - Attributes

Name in German:	Geschwindigkeits-Sollwert additiv		
Name in English:	Additive velocity command value		
ID number:	S-0-0037	Editability:	P234
Function:	Parameter	Memory:	no
Data length:	4 bytes	validity check:	no
Format:	DEC_MV	Extreme value check:	yes
Unit German/English:	S-0-0044/S-0-0044	combination check:	no
Posit. after the dec.:	S-0-0044	cyc. transmittable:	MDT
Input value min / max:	S-0-0044/S-0-0044	Default value:	--

S-0-0040, Velocity feedback value

Description:

The velocity feedback value is updated by the drive controller every 500ms (it can be transferred via the serial communication interface).

S-0-0040 - Attributes

Name in German:	Geschwindigkeits-Istwert		
Name in English:	Velocity feedback value		
ID number:	S-0-0040	Editability:	no
Function:	Parameter	Memory:	no
Data length:	4 bytes	validity check:	no
Format:	DEC_MV	Extreme value check:	no
Unit German/English:	S-0-0044/S-0-0044	combination check:	no
Posit. after the dec.:	S-0-0044	cyc. transmittable:	AT
Input value min / max:	S-0-0044/S-0-0044	Default value:	--

S-0-0041, Homing Velocity

Description:

Together with parameter **S-0-0108, Feedrate override**, this determines the velocity for command **S-0-0148, C600 Drive-controlled homing procedure**. In the case of a drive motor with an absolute encoder (K-type feedback option), if command S-0-0148, Drive-controlled homing is initiated, then the drive will proceed to the reference point (homing point) that was determined by command **P-0-0012, C300 Command Set absolute measurement** with this velocity.

S-0-0041 - Attributes

Name in German:	Referenzfahr-Geschwindigkeit		
Name in English:	Homing velocity		
ID number:	S-0-0041	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit German/English:	S-0-0044/S-0-0044	combination check:	no
Posit. after the dec.:	S-0-0044	cyc. transmittable:	no
Input value min / max:	>0/S-0-0044	Default value:	--

S-0-0042, Homing Acceleration

Description:

This parameter defines the acceleration value at which the drive performs command **S-0-0148, C600 Drive-controlled homing procedure**.

S-0-0042 - Attributes

Name in German:	Referenzfahr-Beschleunigung		
Name in English:	Homing acceleration		
ID number:	S-0-0042	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit German/English:	S-0-0160/S-0-0160	combination check:	no
Posit. after the dec.:	S-0-0160	cyc. transmittable:	no
Input value min / max:	0/S-0-0160	Default value:	1000; 0000

S-0-0043, Velocity Polarity Parameter

Description:

This parameter is used to switch the polarity of the velocity data in relation to the application.

The polarity is switched externally (at the command and feedback input and actual value output) and not within the control system velocity regulator.

The following applies to rotary motors:

Clockwise rotation when facing the motor shaft is the rule for a positive velocity command value and a positive velocity feedback value polarity.

Parameter structure:

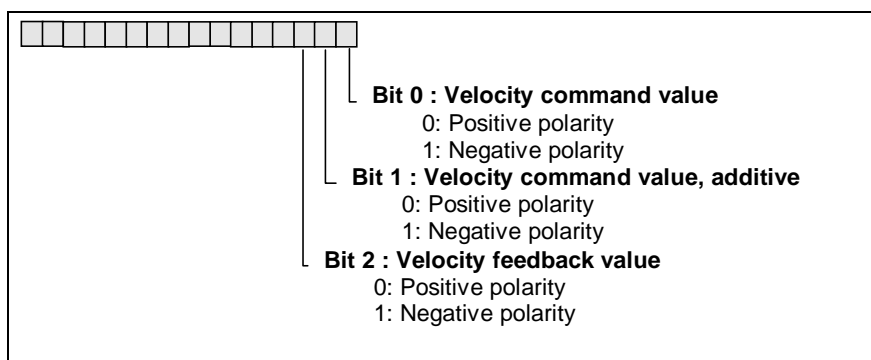


Fig. 2-2: S-0-0043, Velocity polarity parameter

S-0-0043 - Attributes

Name in German:	Geschwindigkeits-Polaritäten-Parameter		
Name in English:	Velocity polarity parameter		
ID number:	S-0-0043	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	BIN	Extreme value check:	no
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	0/--	Default value:	0

S-0-0044, Velocity Data Scaling Type

Description:

Various scaling types can be defined for the velocity data in the drive.

Examples: rpm -> rotary
 mm/min -> linear

Parameter structure:

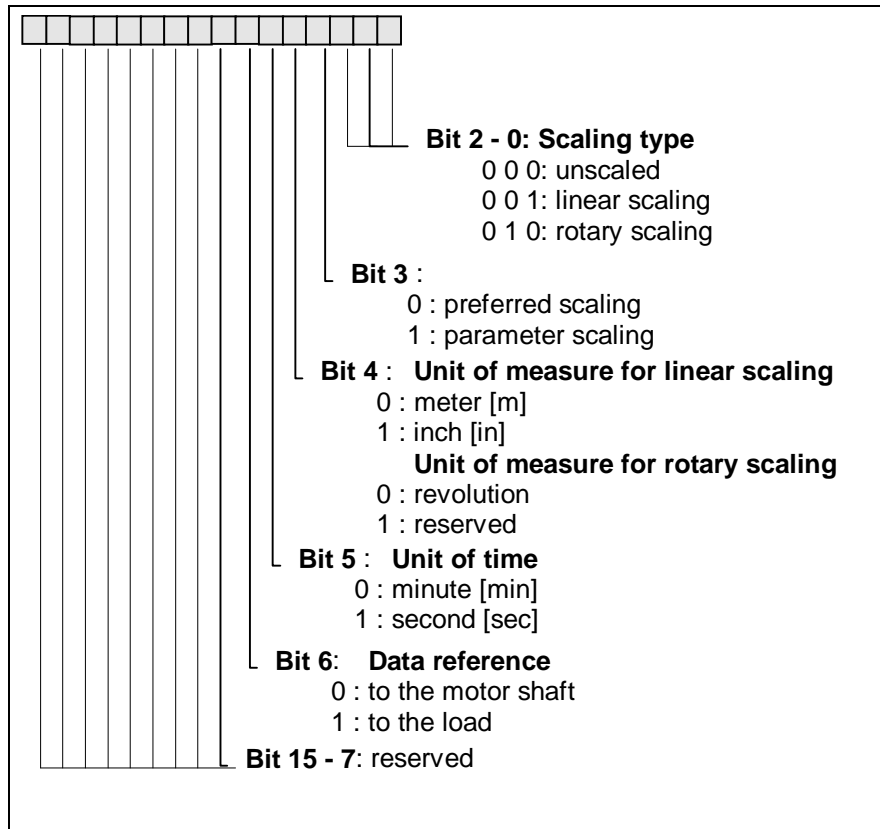


Fig. 2-3: S-0-0044, Velocity data scaling type

S-0-0044 - Attributes

Name in German:	Wichtungsart für Geschwindigkeitsdaten		
Name in English:	Velocity data scaling type		
ID number:	S-0-0044	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Check_P3
Format:	BIN	Extreme value check:	no
Unit German/English:	--/--	combination check:	yes
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	0 x 000A

S-0-0045, Velocity Data Scaling Factor

Description:

This parameter defines the scaling factor for all velocity data in the drive.
If preferred scaling is set with **S-0-0044, Velocity data scaling type**, this parameter will be set to 1.

S-0-0045 - Attributes

Name in German:	Wichtungs-Faktor für Geschwindigkeitsdaten		
Name in English:	Velocity data scaling factor		
ID number:	S-0-0045	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	1/65535	Default value:	1

S-0-0046, Velocity Data Scaling Exponent

Description:

This parameter defines the scaling exponent for all velocity data in the drive.

S-0-0046 - Attributes

Name in German:	Wichtungs-Exponent Geschwindigkeitsdaten		
Name in English:	Velocity data scaling exponent		
ID number:	S-0-0046	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	DEC_MV	Extreme value check:	yes
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	-32/+32	Default value:	-4

S-0-0047, Position Command Value

Description:

For positioning interface, the position command value is generated by the internal position command value interpolator. You can read the active position command value here.

S-0-0047 - Attributes

Name in German:	Lage-Sollwert		
Name in English:	Position Command Value		
ID number:	S-0-0047	Editability:	P234
Function:	Parameter	Memory:	no
Data length:	4 bytes	validity check:	no
Format:	DEC_MV	Extreme value check:	yes
Unit German/English:	S-0-0076/S-0-0076	combination check:	no
Posit. after the dec.:	S-0-0076	cyc. transmittable:	MDT
Input value min / max:	S-0-0076/S-0-0076	Default value:	--

S-0-0049, Positive Position Limit Value

Description:

The "positive position limit value" describes the maximum extent of travel in the positive direction.

The position limit is only active if all position data is referenced to the homing point, i.e., the drive is homed (bit 0 in parameter **S-0-0403, Position feedback value status** is set to 1). The position limit values can be switched off via bit 4 in **S-0-0055, Position polarity parameter**.

If a **target position** on the other side of the positive position limit is set in the drive, warning **E253, Target position out of range**, will be generated.

S-0-0049 - Attributes

Name in German:	Lage-Grenzwert positiv		
Name in English:	Positive position limit value		
ID number:	S-0-0049	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_MV	Extreme value check:	yes
Unit German/English:	S-0-0076/S-0-0076	combination check:	no
Posit. after the dec.:	S-0-0076	cyc. transmittable:	no
Input value min / max:	S-0-0076/S-0-0076	Default value:	10000.00

S-0-0050, Negative Position Limit Value

Description:

The "negative position limit value" describes the maximum extent of travel in the negative direction.

The position limit is only active if all position data is referenced to the homing point, i.e., the drive is homed (bit 0 in parameter **S-0-0403, Position feedback value status** is set to 1). The position limit values can be switched off via bit 5 in **S-0-0055, Position polarity parameter**.

If a target position on the other side of the negative position limit is set for the drive, warning **E253, Target position out of range**, will be generated.

S-0-0050 - Attributes

Name in German:	Lage-Grenzwert negativ		
Name in English:	Negative position limit value		
ID number:	S-0-0050	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_MV	Extreme value check:	yes
Unit German/English:	S-0-0076/S-0-0076	combination check:	no
Posit. after the dec.:	S-0-0076	cyc. transmittable:	no
Input value min / max:	S-0-0076/S-0-0076	Default value:	-10000.00

S-0-0051, Position Feedback Value 1 (Motor Feedback)

Description:

"Position feedback value 1" represents the current position of the rotational feedback. This value is updated every 500 ms (this can be read over the serial interface).

S-0-0051 - Attributes

Name in German:	Lage-Istwert-1		
Name in English:	Position feedback value 1 (Motor feedback)		
ID number:	S-0-0051	Editability:	no
Function:	Parameter	Memory:	no
Data length:	4 bytes	validity check:	no
Format:	DEC_MV	Extreme value check:	no
Unit German/English:	S-0-0076/S-0-0076	combination check:	no
Posit. after the dec.:	S-0-0076	cyc. transmittable:	AT
Input value min / max:	--/--	Default value:	--

S-0-0052, Reference Distance 1

Description:

This parameter displays the distance between the machine zero point and the homing point for the motor measurement system (Position feedback value 1).

After command **S-0-0148, C600 Drive-controlled homing procedure** has been executed, the drive will set the **Position command value, S-0-0047** and the **Position feedback value** "9.8, Drive-controlled homing procedure", **S-0-0051** to this value.

S-0-0052 - Attributes

Name in German:	Referenzmaß Lage-Istwert 1		
Name in English:	Reference distance 1		
ID number:	S-0-0052	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_MV	Extreme value check:	yes
Unit German/English:	S-0-0076/S-0-0076	combination check:	no
Posit. after the dec.:	S-0-0076	cyc. transmittable:	no
Input value min / max:	S-0-0076/S-0-0076	Default value:	0

S-0-0055, Position Polarity Parameter

Description:

This parameter can be used to invert the polarities of the given position data. These polarities are switched outside of the control system position regulator (i.e., at the command and feedback value input to and from the actual value output from the control system).

Since the position data from the rotational feedback are inverted, the result will be a different numeric value.

Note the following in reference to rotary motors:

"Motor-clockwise rotation" means the motor shaft turns in a clockwise direction (facing the motor shaft) if the position command value difference and the position feedback polarity are both positive.

Bit 4 is used to activate or deactivate product position limits.

Parameter structure:

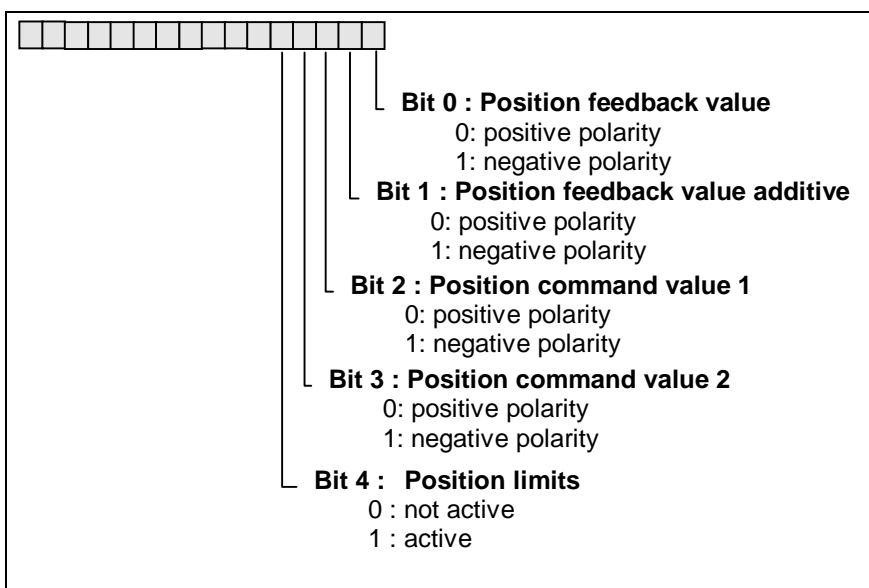


Fig. 2-4: S-0-0055, Position polarity parameter

Note: Only the bits named here are supported by the firmware.
If bit 0 is altered by the control system, the drive will also set the value for bits 1 - 3 to match the value of bit 0.

S-0-0055 - Attributes

Name in German:	Lage-Polaritäten-Parameter		
Name in English:	Position polarity parameter		
ID number:	S-0-0055	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	BIN	Extreme value check:	yes
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	0/31 = 11111 bin	Default value:	0

S-0-0057, Position Window

Description:

The drive sets the output "into position" when the amount of difference between the position feedback value and the position command value is less than the value of the position window and the position command value is the same as the target position.

During command **S-0-0148, C6 Drive-controlled homing**, this parameter is used to signal the end of the command through the INPOS output if the position feedback value enters into the homing point region \pm S-0-0057.

Also see Functional Description: "Into position INPOS"

S-0-0057 - Attributes

Name in German:	Positionierfenster		
Name in English:	Position window		
ID number:	S-0-0057	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_MV	Extreme value check:	yes
Unit German/English:	S-0-0076/S-0-0076	combination check:	no
Posit. after the dec.:	S-0-0076	cyc. transmittable:	no
Input value min / max:	0/S-0-0076	Default value:	10.00

S-0-0059, Position Switch Flag Parameter

Description:

The flag for the position switch point is dependent on the position feedback value.

If S-0-0051, Position feedback value 1, is less than S-0-0060, Position switch point, the corresponding flag is set to 0. If the position feedback value is greater than or equal to the position switch point, the corresponding flag will be set to 1. The status of the output "path switch point" at pinx2/19 corresponds to this flag.

S-0-0059 - Attributes

Name in German:	Positionsschaltpunkt - Parameter		
Name in English:	Position switch flag parameter		
ID number:	S-0-0059	Editability:	no
Function:	Parameter	Memory:	no
Data length:	2 bytes	validity check:	no
Format:	Binary	Extreme value check:	no
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	--	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	0

S-0-0060, Position Switch Point 1

The position switches are made up of a position switch point and a position switch point flag. If the position feedback value is less than the position switch point, the corresponding flag will be set to 0. If the position feedback value is greater than or equal to the position switch point, the corresponding flag will be set to 1.

S-0-0060 - Attributes

Name in German:	Positionsschaltpunkt 1		
Name in English:	Position switch point 1		
ID number:	S-0-0060	Editability:	P2/P3/P4
Function:	Parameter	Memory:	Param E2prom
Data length:	4 bytes	validity check:	yes
Format:	S-0-0076	Extreme value check:	yes
Unit German/English:	S-0-0076/S-0-0076	combination check:	no
Posit. after the dec.:	S-0-0076	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	--

S-0-0076, Position Data Scaling Type

Description:

Various scaling types for the position data in the drive can be set as described below.

Parameter structure:

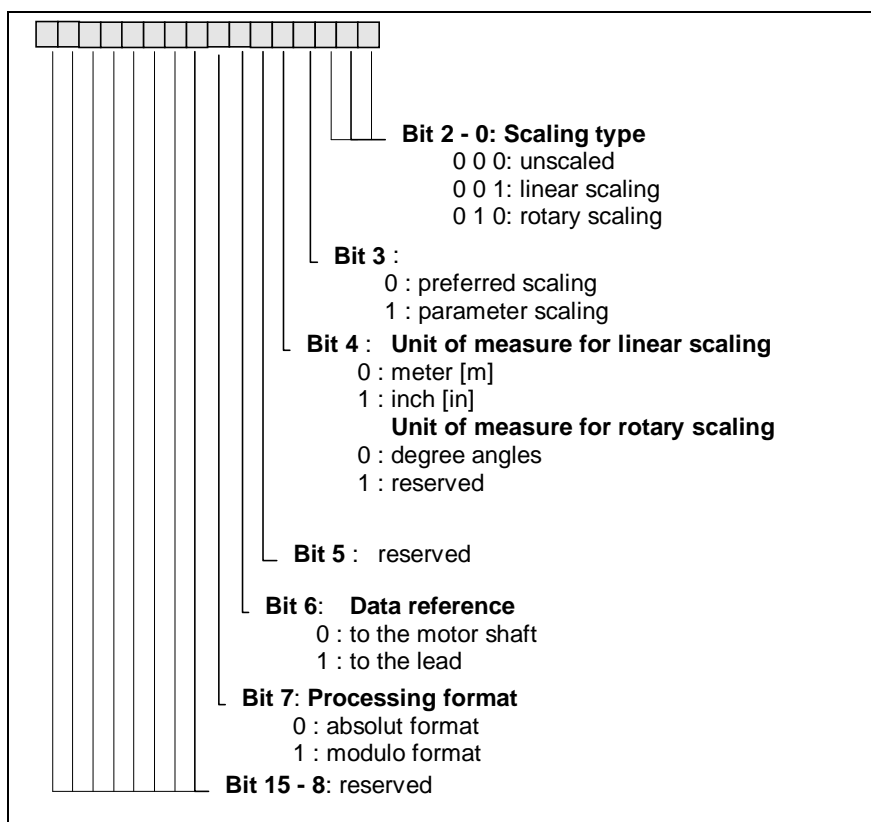


Fig. 2-5: S-0-0076, Position data scaling type

Note: Only the bits named here are supported by the firmware.

S-0-0076 - Attributes

Name in German:	Wichtungsart für Lagedaten		
Name in English:	Position data scaling type		
ID number:	S-0-0076	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	BIN	Extreme value check:	no
Unit German/English:	--/--	combination check:	yes
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	1010

S-0-0077, Linear Position Data Scaling Factor

Description:

This ID number contains the scaling factor that is to be used to scale all position data in the drive.

The parameter is set to 1 if linear preferred scaling has been set in **S-0-0076, Position data scaling type**.

S-0-0077 - Attributes

Name in German:	Wichtungs-Faktor transl. Lagedaten		
Name in English:	Linear position data scaling factor		
ID number:	S-0-0077	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	1/65535	Default value:	1

S-0-0078, Linear Position Data Scaling Exponent

Description:

This ID number contains the scaling exponent that is to be used to scale all position data in the drive if linear scaling has been selected.

If linear preferred scaling is selected, this parameter will be set by the drive.

S-0-0078 - Attributes

Name in German:	Wichtungs-Exponent transl. Lagedaten		
Name in English:	Linear Position Data Scaling Exponent		
ID number:	S-0-0078	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	DEC_MV	Extreme value check:	yes
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	32/32	Default value:	-6

S-0-0079, Rotational Position Resolution

Description:

If rotary position scaling is selected, the LSB valence for all position data will be set in this parameter.

The LSB bit can be specified in the following manner:

Example:

If you would like a resolution of 0.01 degrees for the LSB, you must set the parameter to a value of 36000.

If preferred scaling was set in parameter **S-0-0076, Position data scaling type**, the rotational position resolution will be set at 3,600,000. That means that the resolution for the LSB will be 0.0001 degrees.

S-0-0079 - Attributes

Name in German:	Rotations-Lageauflösung		
Name in English:	Rotational position resolution		
ID number:	S-0-0079	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	1/4294967295	Default value:	36000

S-0-0080, Torque/Force Command Value

Description:

This parameter shows the drive's current torque/force command value. During operation, this value is formed cyclically by the velocity controller.

The evaluation is dependent on the scaling of the torque and force data (only percentage scaling is currently supported).

100% = Motor continuous standstill torque, M_{dn}

Also see

S-0-0111, Motor current at standstill and **P-0-0051; Torque/force constant**

S-0-0080 - Attributes

Name in German:	Drehmoment/Kraft-Sollwert		
Name in English:	Torque/force command value		
ID number:	S-0-0080	Editability:	P234
Function:	Parameter	Memory:	no
Data length:	2 bytes	validity check:	no
Format:	DEC_MV	Extreme value check:	yes
Unit German/English:	S-0-0086/S-0-0086	combination check:	no
Posit. after the dec.:	S-0-0086	cyc. transmittable:	MDT
Input value min / max:	S-0-0086/S-0-0086	Default value:	0

S-0-0084, Torque/Force Feedback Value

Description:

This parameter represents the motor's current torque feedback value.

The evaluation is dependent on the scaling of the torque and force data (only percentage scaling is currently supported).

100% = Motor continuous standstill torque, Mdn

Also see

S-0-0111, Motor current at standstill and **P-0-0051; Torque/force constant**

S-0-0084 - Attributes

Name in German:	Drehmoment/Kraft-Istwert		
Name in English:	Torque/force feedback value		
ID number:	S-0-0084	Editability:	no
Function:	Parameter	Memory:	no
Data length:	2 bytes	validity check:	no
Format:	DEC_MV	Extreme value check:	no
Unit German/English:	S-0-0086/S-0-0086	combination check:	no
Posit. after the dec.:	S-0-0086	cyc. transmittable:	AT
Input value min / max:	S-0-0086/S-0-0086	Default value:	--

S-0-0085 Torque Polarity Parameter

Description:

The polarities for the given torque data as related to the application can be switched in this parameter.

The polarity is switched externally (at the command and feedback input and actual value output) and not within the control system velocity regulator.

The following applies to rotary motors:

Clockwise rotation when facing the motor shaft is the rule for a positive torque command value and a positive torque feedback value polarity.

Structure of the parameter:

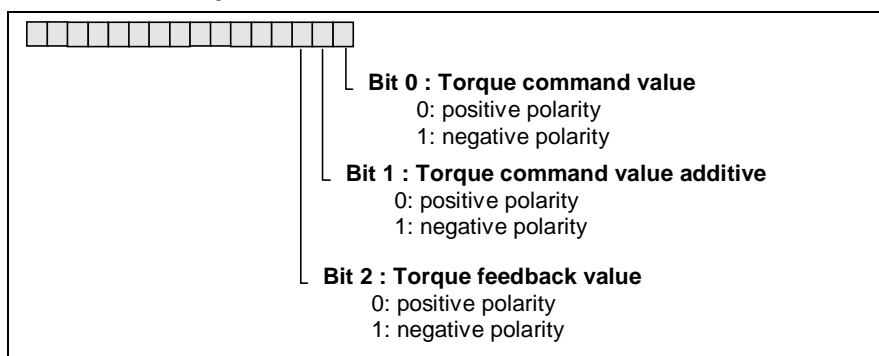


Fig. 2-6: S-0-0085, Torque/force polarity parameter

Note: If bit 0 is altered, the drive will also set the value of bits 1 - 2 to match the value of bit 0.

S-0-0085 - Attributes

Name in German:	Drehmoment-Polaritäten-Parameter		
Name in English:	Torque polarity parameter		
ID number:	S-0-0085	Editability:	P23
Function:	Parameter	Memory:	Param.E ² Prom
Data length:	2 bytes	validity check:	Phase 3
Format:	BIN	Extreme value check:	yes
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	--	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	0

S-0-0086, Torque/Force Data Scaling Type

Description:

Currently, only percentage scaling for torque force data is supported.

Note that

100 % = **S-0-0111, Motor current at standstill**

Also see

S-0-0111, Motor current at standstill and **P-0-0051; Torque/force constant**

S-0-0086 - Attributes

Name in German:	Wichtungsart für Drehmoment-Kraftdaten		
Name in English:	Torque/force data scaling type		
ID number:	S-0-0086	Editability:	23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	BIN	Extreme value check:	no
Unit German/English:	--/--	combination check:	yes
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	0

S-0-0091, Bipolar Velocity Limit Value

Description:

The "Bipolar velocity limit value" describes the maximum allowable velocity that is symmetrical in both directions. The maximum input value is restricted by **S-0-0113, maximum motor speed**.

S-0-0091 - Attributes

Name in German:	Geschwindigkeits-Grenzwert bipolar		
Name in English:	Bipolar velocity limit value		
ID number:	S-0-0091	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit German/English:	S-0-0044/S-0-0044	combination check:	no
Posit. after the dec.:	S-0-0044	cyc. transmittable:	MDT
Input value min / max:	>0/S-0-0113	Default value:	3000, 0000

S-0-0092, Bipolar Torque/Force Limit Value

Description:

This parameter describes the maximum allowable torque that is symmetrical in both directions (acceleration, deceleration).

The evaluation refers to the percentage of motor current at standstill.

100% = Motor current at standstill

Also see

S-0-0111, Motor current at standstill and **P-0-0051; Torque/force constant**

Note: The maximum torque is also affected by:

- **P-0-0006, Overload factor**
 - **P-0-0109, Torque/force peak limit**
 - **P-0-4011, Switching frequency**
-



WARNING

⇒ If this value is set at < 100%, the motor will not be able to produce its rated torque.

S-0-0092 - Attributes

Name in German:	Drehmoment/Kraft-Grenzwert bipolar		
Name in English:	Bipolar torque/force limit value		
ID number:	S-0-0092	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	DEC_MV	Extreme value check:	yes
Unit German/English:	S-0-0086/S-0-0086	combination check:	no
Posit. after the dec.:	S-0-0086	cyc. transmittable:	MDT
Input value min / max:	0/calculated peak moment		
Default value:	5000		

S-0-0093, Torque/Force Data Scaling Factor**Description:**

This parameter determines the scaling factor for all torque/force data in the drive.

Currently the parameter has no meaning, since only percentage scaling can be set for torque and force data.

S-0-0093 - Attributes

Name in German:	Wichtungs-Faktor für Drehmoment-Kraftdaten		
Name in English:	Torque/Force data scaling factor		
ID number:	S-0-0093	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	no
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	1/65535	Default value:	1

S-0-0094, Torque/Force Data Scaling Exponent**Description:**

This parameter determines the scaling exponent for all torque/force data in the drive.

Currently the parameter is not in use, since only percentage scaling can be set for torque and force data.

S-0-0094 - Attributes

Name in German:	Wichtungs-Exponent für Drehmoment-Kraftdaten		
Name in English:	Torque/force data scaling exponent		
ID number:	S-0-0094	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	DEC_MV	Extreme value check:	no
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	-1

S-0-0095, Diagnostic Message

Description:

This parameter allows you to read in the currently relevant operating status for the drive.

The appropriate diagnostic message number from **P-0-0001, Diagnostic message number** will appear in front of the operating status.

Example: "A010 Drive halt"

S-0-0095 - Attributes

Name in German:	Diagnose		
Name in English:	Diagnostic message		
ID number:	S-0-0095	Editability:	no
Function:	Parameter	Memory:	no
Data length:	1-byte variable, up to 40 characters		
validity check:	no		
Format:	ASCII	Extreme value check:	no
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	--

S-0-0097, Mask Class 2 Diagnostic

Description:

This parameter is not used in DKC03.1

S-0-0097 - Attributes

Name in German:	Maske Zustandsklasse 2		
Name in English:	Mask Class 2 diagnostic		
ID number:	S-0-0097	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	BIN	Extreme value check:	no
Unit German/English:	--/--	combination check:	yes
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--		
Default value:	1111 1111 1111 1111 b		

S-0-0098, Mask Class 3 Diagnostic

Description:

This parameter is not used in DKC03.1

S-0-0098 - Attributes

Name in German:	Maske Zustandsklasse 3		
Name in English:	Mask Class 3 diagnostic		
ID number:	S-0-0098	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	BIN	Extreme value check:	no
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--		
Default value:	1111 1111 1111 1111 b		

S-0-0099, Reset Class 1 Diagnostic**Description:**

This command can be activated with the S1 key on the Drive or through the serial interface. All errors in the drive will be cleared when this command is started through the serial interface. The drive will switch to the "Ready for operation" status if no other error is present.

If the command "Reset class 1 diagnostic" is activated with the S1 key, only one error will be deleted at a time. If the drive has stored several errors (up to 4 errors), a diagnostic message that corresponds to each error will appear sequentially each time the S1 key is pressed.

S-0-0099 - Attributes

Name in German:	Reset Zustandsklasse-1		
Name in English:	Reset class 1 diagnostic		
ID number:	S-0-0099	Editability:	P234
Function:	Command	Memory:	no
Data length:	2 bytes	validity check:	no
Format:	BIN	Extreme value check:	yes
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	0/11 b	Default value:	--

S-0-0100, Velocity Loop Proportional Gain**Description:**

This parameter contains the value for the velocity loop proportional gain.

The option is available to load motor-specific default values for the control loop parameters with the "Basic load" command.

S-0-00100 - Attributes

Name in German:	Geschwindigkeitsregler-Proportionalverstärkung		
Name in English:	Velocity loop proportional gain		
ID number:	S-0-0100	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit German/English:	As/rad/As/rad	combination check:	no
Posit. after the dec.:	1	cyc. transmittable:	no
Input value min / max:	0/312.9	Default value:	7

S-0-0101, Velocity Loop Integral Action Time

Description:

The velocity controller forms a current command value derived from the difference between the velocity command value and the velocity feedback value (= velocity regulation deviation).

This current command value consists of a proportional component and an integral component. The velocity loop integral action time corresponds to the time in which the integral component of the current command value is increasing with respect to the value of the proportional component.

Definition of the Integral action time

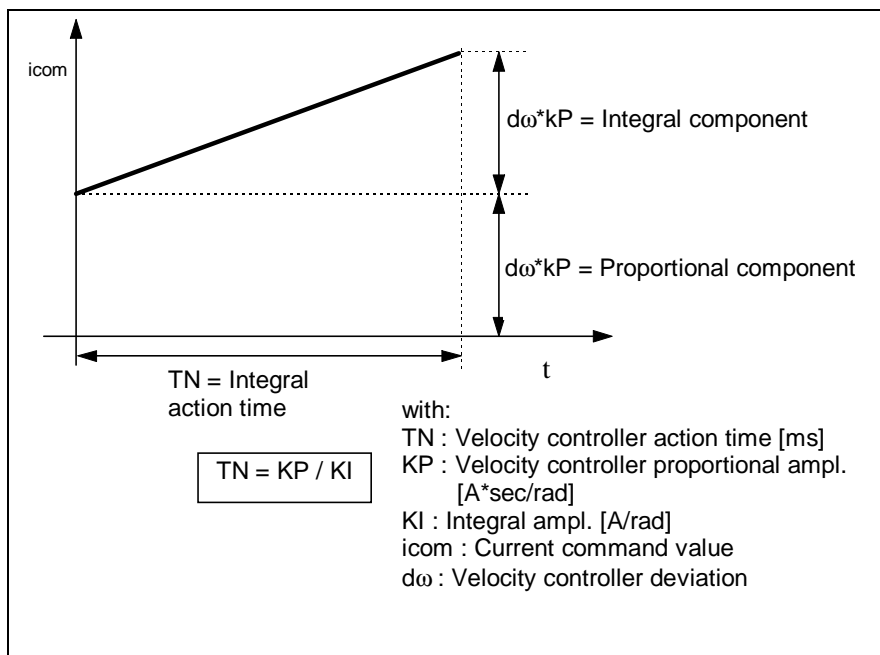


Fig. 2-7: Integral action time

The value of the time axis for which the integral component is equal to the proportional component is described as integral action time.

The integral component is turned off with the input value 0sec.

S-0-00101 - Attributes

Name in German:	Geschwindigkeitsregler-Nachstellzeit		
Name in English:	Velocity loop integral action time		
ID number:	S-0-0101	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit German/English:	ms/ms	combination check:	no
Posit. after the dec.:	1	cyc. transmittable:	no
Input value min / max:	2/3276.7	Default value:	15.0

S-0-0103, Modulo value**Description:**

When modulo format is set (parameter **S-0-0076, Position scaling** bit 7), the modulo value determines where position data will overflow at 0. If the position data are represented in modulo format, the input range of all position data must be between “-“ and “+“ **Modulo value**.

S-0-00103 - Attributes

Name in German:	Modulowert		
Name in English:	Modulo value		
ID number:	S-0-0103	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_MV	Extreme value check:	yes
Unit German/English:	S-0-0076/S-0-0076	combination check:	no
Posit. after the dec.:	S-0-0076	cyc. transmittable:	no
Input value min / max:	>0/S-0-0076	Default value:	360.00

S-0-0104, Position Loop KV-Factor**Description:**

This parameter contains the value for the proportional gain of the position controller.

There is an option which allows you to load a default value for the control loop parameters with the "Basic load" command.

S-0-00104 - Attributes

Name in German:	Lageregler KV-Faktor		
Name in English:	Position loop KV factor		
ID number:	S-0-0104	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit German/English:	1000/min/1000/min	combination check:	no
Posit. after the dec.:	2	cyc. transmittable:	no
Input value min / max:	0.02/239	Default value:	1.00

S-0-0106, Proportional Gain 1 Current Regulator

Description:

This parameter represents the proportional gain of the current Drive.

The current controller proportional gain is fixed for each of the motor-drive combinations. It depends on the type of motor and may not be changed. It can be determined with the "Basic load" command or from the motor data sheets.

S-0-00106 - Attributes

Name in German:	Stromregler-Proportionalverstärkung 1		
Name in English:	Proportional Gain 1 Current Regulator		
ID number:	S-0-0106	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit German/English:	V/A/V/A	combination check:	no
Posit. after the dec.:	2	cyc. transmittable:	no
Input value min / max:	0/500	Default value:	30.00

S-0-0107, Current Regulator 1 Integral Action Time

Description:

The value of this parameter depends on the motor and can be found in the motor data sheet.

2ms is loaded for the current controller integral action time 1 with the command "Basic load".

S-0-00107 - Attributes

Name in German:	Stromregler-Nachstellzeit-1		
Name in English:	Current Regulator 1 Integral Action Time		
ID number:	S-0-0107	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit German/English:	ms/ms	combination check:	no
Posit. after the dec.:	1	cyc. transmittable:	no
Input value min / max:	0/500.00	Default value:	1.0

S-0-0108, Feedrate Override

Description:

The feedrate override only works for "drive-controlled motion commands" such as:

- "Drive-controlled homing" command
- "Command-controlled operation" operating mode
- Jog mode

In such instances, the drive calculates the velocity command value itself. The feedrate override has a multiplying effect on the homing velocity, the block velocity and the jog velocity.

S-0-00108 - Attributes

Name in German:	Feedrate-Override		
Name in English:	Feedrate override		
ID number:	S-0-0108	Editability:	P4
Function:	Parameter	Memory:	no
Data length:	2 bytes	validity check:	no
Format:	DEC_OV	Extreme value check:	no
Unit German/English:	%/%	combination check:	no
Posit. after the dec.:	2	cyc. transmittable:	no
Input value min / max:	0/655.35	Default value:	100.00

S-0-0109, Motor Peak Current

Description:

Describes the maximum current that can flow in the motor without damaging it.

If the motor's peak current is less than the amplifier's peak current, the maximum current that is available will automatically be limited to the motor's peak current.

This value is stored in motor feedback for MDD and MKD motors and is uploaded into the controller RAM when the controller is turned on.

S-0-00109 - Attributes

Name in German:	Spitzenstrom Motor		
Name in English:	Motor peak current		
ID number:	S-0-0109	Editability:	no
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit German/English:	A/A	combination check:	no
Posit. after the dec.:	3	cyc. transmittable:	no
Input value min / max:	0/500	Default value:	--

S-0-0110, Amplifier Peak Current

Description:

The peak current available from the drive controller. The value is set by the drive itself. This current is available for short durations only.

S-0-00110 - Attributes

Name in German:	Spitzenstrom Verstärker		
Name in English:	Amplifier peak current		
ID number:	S-0-0110	Editability:	no
Function:	Parameter	Memory:	Amplf.-
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit German/English:	A/A	combination check:	no
Posit. after the dec.:	3	cyc. transmittable:	no
Input value min / max:	0.001/500	Default value:	--

S-0-0111, Motor Current at Standstill

Description:

The "motor current at standstill" is the continuous motor current capability at standstill according to the motor data sheet.

This value is stored in motor feedback for MDD and MKD motors and is uploaded into the controller RAM when the controller is turned on.

All torque/force data refer to motor current at standstill = 100%.

S-0-0111 - Attributes

Name in German:	Stillstandstrom Motor		
Name in English:	Motor current at standstill		
ID number:	S-0-0111	Editability:	no
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit German/English:	A/A	combination check:	no
Posit. after the dec.:	3	cyc. transmittable:	no
Input value min / max:	0/500	Default value:	--

S-0-0112, Amplifier Nominal Current

Description:

Allowable continuous current for the drive controller. The value is set by the drive itself.

S-0-0112 - Attributes

Name in German:	Nennstrom Verstärker		
Name in English:	Amplifier nominal current		
ID number:	S-0-0112	Editability:	no
Function:	Parameter	Memory:	Amplf.-
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	no
Unit German/English:	A/A	combination check:	no
Posit. after the dec.:	3	cyc. transmittable:	no
Input value min / max:	0.001/500	Default value:	--

S-0-0113, Maximum Motor Speed (nmax)

Description:

The maximum rotational speed of the motor cannot be exceeded. It also limits parameter **S-0-0091, Bipolar velocity limit value**.

This value is stored in motor feedback for MDD and MKD motors and is uploaded into the controller RAM when the controller is turned on.

In torque regulation, if the maximum motor speed is exceeded by more than 12.5%, the drive will be switched into a torque-free state and error message **F879, Velocity limit value exceeded**, will be generated.

S-0-0113 - Attributes

Name in German:	Maximalgeschwindigkeit des Motors		
Name in English:	Maximum motor speed (nmax)		
ID number:	S-0-0113	Editability:	no
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit German/English:	S-0-0044/S-0-0044	combination check:	no
Posit. after the dec.:	S-0-0044	cyc. transmittable:	no
Input value min / max:	0/S-0-0044	Default value:	--

S-0-0116, Resolution of Rotational Feedback 1

Description:

For motors with resolver feedback, the resolution of the rotational feedback is equal to the number of motor pole pairs. That means that a motor with 4 pole pairs has a resolver with 4 electrical cycles per motor mechanical revolution.

This value is stored in the motor feedback memory and cannot be changed.

S-0-0116 - Attributes

Name in German:	Rotationsgeber-1 Auflösung		
Name in English:	Resolution of rotational feedback 1		
ID number:	S-0-0116	Editability:	no
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	no
Unit German/English:	Zykl/Umdr bzw. /Cycl/Rev or inch (depending on P-0-4014		
combination check:	no		
Posit. after the dec.:	--	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	--

S-0-0121, Input Revolutions of Load Gear

Description:

A mechanical gear will often be employed between the motor and the load.

The gear ratio is defined by:

$\frac{\text{Output Revolutions of load Gear}}{\text{Input Revolutions of load Gear}}$
--

Fig. 2-8: Gear ratio

Example:

5 motor revolutions result in 2 gear output revolutions.

=> S-0-0121: 5
 S-0-0122: 2

S-0-0121 - Attributes

Name in German:	Lastgetriebe-Eingangsumdrehungen		
Name in English:	Input revolutions of load gear		
ID number:	S-0-0121	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	1/4294967295	Default value:	1

S-0-0122, Output Revolutions of Load Gear

Description:

A mechanical gear will often be employed between the motor and the load.

The gear ratio is defined by:

$\frac{\text{Input Revolutions of load Gear (S-0-0121)}}{\text{Output Revolutions of load Gear (S-0-0122)}}$
--

Fig. 2-9: Gear ratio

Example:

5 motor revolutions result in 2 gear output revolutions.

S-0-0121: 5

S-0-0122: 2

S-0-0122 - Attributes

Name in German:	Lastgetriebe-Ausgangsumdrehungen		
Name in English:	Output revolutions of load gear		
ID number:	S-0-0122	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	1/4294967295	Default value:	1

S-0-0123, Feed Constant

Description:

This parameter describes the conversion from rotary to linear motion. It is defined as the linear displacement of the load measured during one revolution of the gear drive shaft.

Ball screw spindle:	Rack and pinion:
Feed constant=pitch of screw (typical value 10.00 mm)	Feed constant= actual pitch diameter for the pinion * Pi

Fig. 2-2: Characteristic value for the feed constant

Also see Functional Description: "Scaling and Mechanical System Data"

S-0-0123 - Attributes

Name in German:	Vorschubkonstante		
Name in English:	Feed constant		
ID number:	S-0-0123	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	no
Unit German/English:	S-0-0076/S-0-0076	combination check:	no
Posit. after the dec.:	5	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	10,000.00

S-0-0124, Standstill Window

Description:

The motor's standstill is defined by the condition that the value of the **Velocity feedback value, S-0-0040** remains below the threshold for which parameters can be set (the "Standstill window").

In standstill, the output signal "In motion" is deleted.

S-0-0124 - Attributes

Name in German:	Stillstandsfenster		
Name in English:	Standstill window		
ID number:	S-0-0124	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_MV	Extreme value check:	yes
Unit German/English:	S-0-0044/S-0-0044	combination check:	no
Posit. after the dec.:	S-0-0044	cyc. transmittable:	no
Input value min / max:	0/S-0-0044	Default value:	10.0000

S-0-0127, C1 Communications phase 3 Transition Check

Description:

The commands "S-0-0127, C1 Communications phase 3 transition check" and "**S-0-0128, C2 Communications phase 4 transition check**" are used to switch from Set parameter mode to Operating mode.

When command "**S-0-0127, C1 Communications phase 3 transition check**" is used, the validity of all of the interface parameters will be checked. If any of the parameters are found to be invalid, the drive ends the command with an error message.

S-0-0127 - Attributes

Name in German:	C1 Umschaltvorbereitung auf Komm.-		
Name in English:	C1 Communications phase 3 transition check		
ID number:	S-0-0127	Editability:	P2
Function:	Command	Memory:	no
Data length:	2 bytes	validity check:	no
Format:	BIN	Extreme value check:	yes
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	0/11 b	Default value:	--

S-0-0128, C2 Communications Phase 4 Transition Check**Description:**

Commands "**S-0-0127, C1 Communications phase 3 transition check**" and "**S-0-0128, C2 Communications phase 4 transition check**" are used to switch from Set parameter mode to Operating mode.

When command "**S-0-0128, C2 Communications phase 4 transition check**" is executed, all parameters will be checked for validity and limit value encroachments. If any invalid parameters or any limit values have been encroached upon, the drive ends the command with an error message.

Also see **P-0-4023, C4 Communicationphase 2 transition check**

S-0-0128 - Attributes

Name in German:	C2 Umschaltvorbereitung auf Komm.-		
Name in English:	C2 Communications phase 4 transition check		
ID number:	S-0-0128	Editability:	P3
Function:	Command	Memory:	no
Data length:	2 bytes	validity check:	no
Format:	BIN	Extreme value check:	yes
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	0/11 b	Default value:	--

S-0-0135, Drive Status Word

Description:

This parameter makes it possible to read the drive status word via the serial interface.

It's structure is shown below:

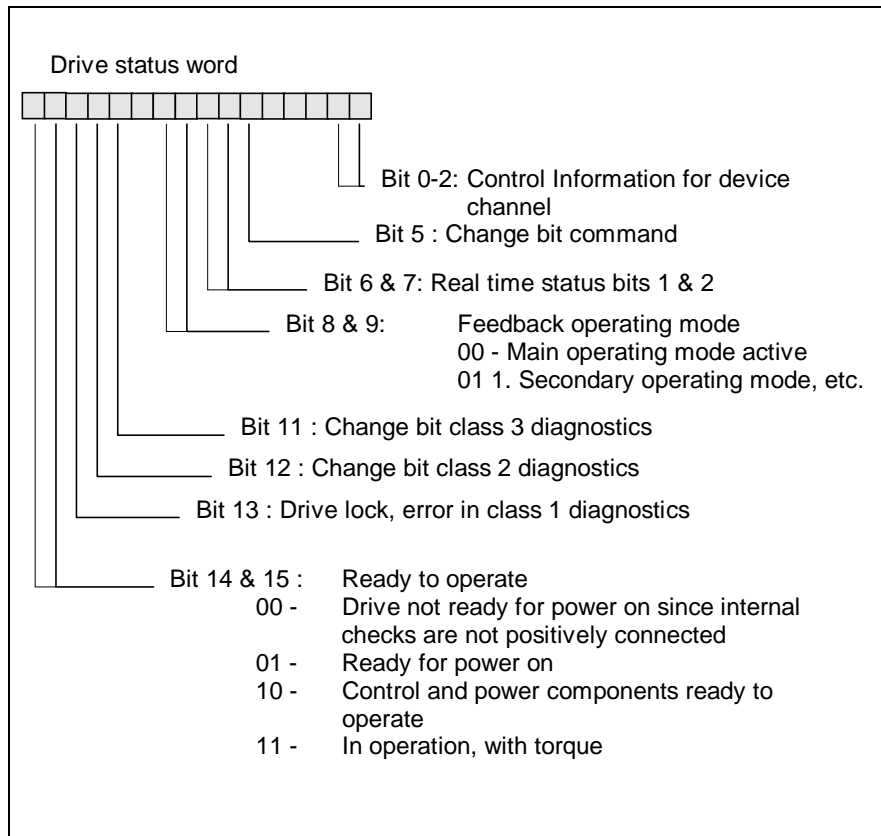


Fig. 2-10: Structure of the drive status word

Also see the functional description: "Drive status word"

S-0-0135 - Attributes

Name in German:	Antriebs - Status		
Name in English:	Drive status word		
ID number:	S-0-0135	Editability:	--
Function:	Parameter	Memory:	--
Data length:	2 bytes	validity check:	no
Format:	Binary	Extreme value check:	no
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	--	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	--

S-0-0138, Bipolar Acceleration Limit Value

Description:

"Bipolar acceleration" describes the maximum allowable acceleration that is symmetrical in both directions (acceleration and deceleration).

When "Drive halt" is used, the drive brakes at this deceleration until the velocity = 0.

During the jogging operation, the drive accelerates and brakes at this deceleration.

S-0-0138 - Attributes

Name in German:	Beschleunigung bipolar		
Name in English:	Bipolar acceleration limit value		
ID number:	S-0-0138	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_MV	Extreme value check:	yes
Unit German/English:	S-0-0160/S-0-0160	combination check:	no
Posit. after the dec.:	S-0-0160	cyc. transmittable:	MDT
Input value min / max:	0/S-0-0160	Default value:	1000.000

S-0-0140, Controller Type

Description:

The device type of the manufacturer can be found in text form in the operating data for the controller type.

Example:

DKC01.1-040-7

S-0-0140 - Attributes

Name in German:	Regelgerätetyp		
Name in English:	Controller type		
ID number:	S-0-0140	Editability:	no
Function:	Parameter	Memory:	Amplf.-
Data length:	1-byte variable	validity check:	Phase 3
Format:	ASCII	Extreme value check:	no
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	--

S-0-0141, Motor Type

Description:

The motor type of the connected motor can be seen as text in the operating data for the motor type.

This value is stored for MDD and MKD motors in the motor feedback and is loaded from there when the drive is started for the first time.

Example:

MDD 065A-N040-N2L-095GB0

S-0-0141 - Attributes

Name in German:	Motortyp		
Name in English:	Motor type		
ID number:	S-0-0141	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	1-byte variable	validity check:	Phase 3
Format:	ASCII	Extreme value check:	no
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	--

S-0-0142, Application Type

Description:

A descriptive name for the drive can be stored in this parameter (e.g., swivel axis). It has no functional significance.

S-0-0142 - Attributes

Name in German:	Anwendungsart		
Name in English:	Application type		
ID number:	S-0-0142	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	1-byte variable, max.		
validity check:	Phase 3		
Format:	ASCII	Extreme value check:	no
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	Default

S-0-0147, Homing Parameter

Description:

This parameter is used to set the processes for the **Drive-controlled homing procedure, S-0-0148** in relation to the machine layout, NC and drive installation.

Parameter structure:

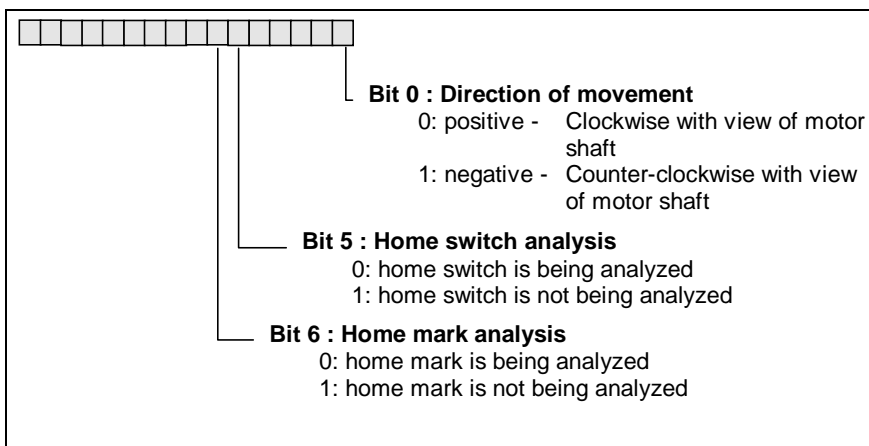


Fig. 2-11: S-0-0147, Homing Parameter

Note: Only the bits named here are supported by the firmware.

S-0-0147 - Attributes

Name in German:	Referenzfahr-Parameter		
Name in English:	Homing parameter		
ID number:	S-0-0147	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	BIN	Extreme value check:	no
Unit German/English:	--/--	combination check:	yes
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	100 b

S-0-0148, C600 Drive-Controlled Homing Procedure

Description:

When this command is set and enabled, the drive switches automatically into internal position control and accelerates using **S-0-0042, Homing acceleration** to **S-0-0041, Homing velocity** (as long as the drive is in "AF" operating status).. Bit 0 in **S-0-0403, Position feedback value status**, will be deleted as long as the drive is not yet in homing mode. If the command is still active, changes in the cyclic position command values will be ignored.

The process for the homing procedure can be determined with the **Homing parameter, S-0-0147**. After the command has been properly executed (drive is at standstill and position feedback value is related to the homing position), the drive sets bit 0 in parameter **S-0-0403, Position feedback value status**.

The position feedback value status parameter corresponds to the output "In reference".

If an absolute encoder is installed on the motor, this command will result in travel to the homing point.

S-0-0148 - Attributes

Name in German:	C6 Kommando Antriebsgeführtes Referencing		
Name in English:	C600 Drive-controlled homing procedure		
ID number:	S-0-0148	Editability:	P4
Function:	Command	Memory:	no
Data length:	2 bytes	validity check:	no
Format:	BIN	Extreme value check:	yes
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	0/11 b	Default value:	--

S-0-0150, Reference Offset 1

Description:

This parameter describes the distance between the position feedback reference mark 1 and **S-0-0052, Reference distance 1**.

At the end of the coming drive controlled homing procedure, the drive will position itself at the point equal to Reference distance 1 + Reference offset 1.

S-0-0150 - Attributes

Name in German:	Referenzmaß Offset 1		
Name in English:	Reference offset 1		
ID number:	S-0-0150	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_MV	Extreme value check:	yes
Unit German/English:	S-0-0076/S-0-0076	combination check:	no
Posit. after the dec.:	S-0-0076	cyc. transmittable:	no
Input value min / max:	S-0-0076/S-0-0076	Default value:	0

S-0-0159, Monitoring Window

Description:

The monitoring window makes it possible to set the maximum tolerable deviation between the measured position and the calculated position feedback value. If the position deviates and crosses into the monitoring window, the drive will set error **F228, Excessive deviation** in class 1 diagnostics.

The greatest deviation that occurs will always be stored in the parameter **P-0-0098, Maximum model deviation**.

S-0-0159 - Attributes

Name in German:	Überwachungsfenster	Editability:	P234
Name in English:	Monitoring window	Memory:	Param.E ² prom
ID number:	S-0-0159	validity check:	Phase 3
Function:	Parameter	Extreme value check:	yes
Data length:	4 bytes	combination check:	no
Format:	DEC_MV	cyc. transmittable:	no
Unit German/English:	S-0-0076/S-0-0076	Default value:	30.00
Posit. after the dec.:	S-0-0076		
Input value min / max:	0/S-0-0076		

S-0-0160, Acceleration Data Scaling Type

Description:

Various scaling types can be set as described below for the acceleration data in the drive.

Parameter structure:

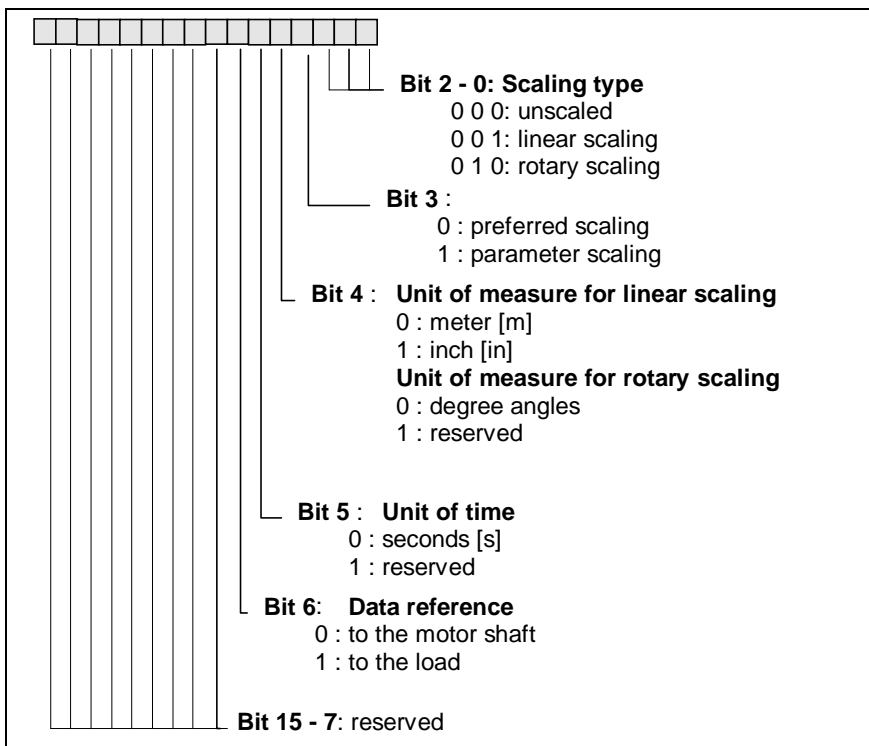


Fig. 2-12: S-0-0160, Acceleration data scaling type

Note: Only the bits named here are supported by the firmware.

S-0-0160 - Attributes

Name in German:	Wichtungsart für Beschleunigungsdaten		
Name in English:	Acceleration data scaling type		
ID number:	S-0-0160	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	BIN	Extreme value check:	no
Unit German/English:	--/--	combination check:	yes
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	0 x 000A

S-0-0161, Acceleration Data Scaling Factor

Description:

If parameter scaling is set in **S-0-0160, Acceleration data scaling type**, the scaling factor for all acceleration data in the drive will be determined in this parameter.

Parameter structure:

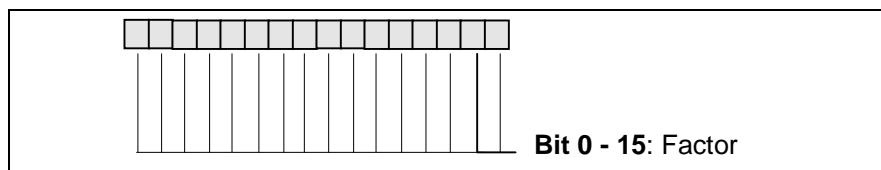


Fig. 2-13: S-0-0161, Scaling factor for acceleration

S-0-0161 - Attributes

Name in German:	Wichtungs-Faktor für Beschleunigungsdaten		
Name in English:	Acceleration data scaling factor		
ID number:	S-0-0161	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	1/65535	Default value:	1

S-0-0162, Acceleration Data Scaling Exponent

Description:

If parameter scaling is set in **S-0-0160, Acceleration data scaling type**, the scaling exponent for all acceleration data in the drive will be determined in this parameter.

Parameter structure:

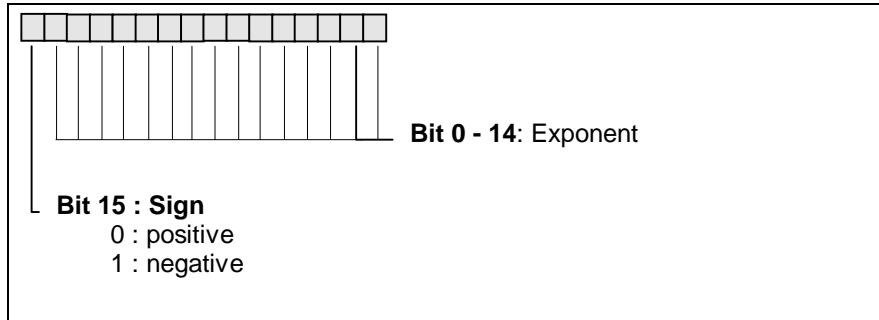


Fig. 2-14: Scaling exponent for acceleration data

S-0-0162 - Attributes

Name in German:	Wichtungs-Exponent für Beschleunigungsdaten		
Name in English:	Acceleration data scaling exponent		
ID number:	S-0-0162	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	DEC_MV	Extreme value check:	yes
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	32/32	Default value:	-3

S-0-0182, Manufacturer Class 3 Diagnostics

Description:

Various messages regarding operating status are stored here every 8ms. If the status of a message changes, this will not be signaled by a change bit.

Parameter structure:

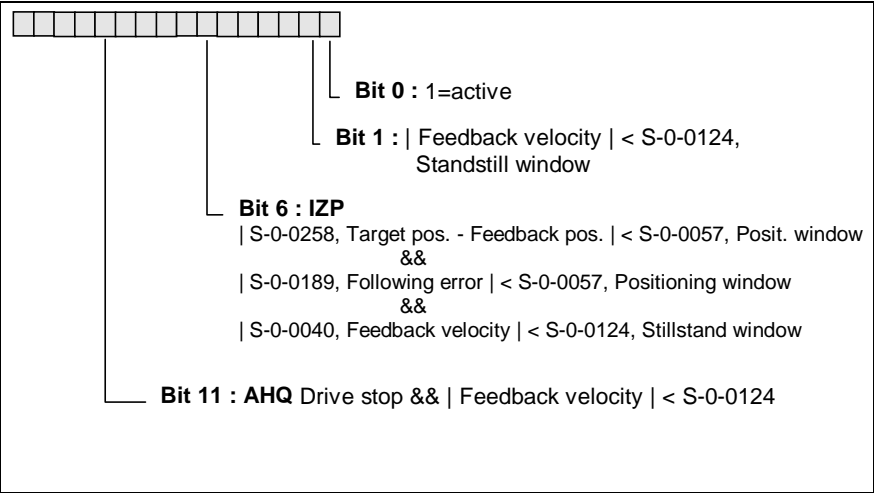


Fig. 2-15: S-0-0182, Manufacturer class 3 diagnostics

Note: Only the bits named here are supported by the firmware.

S-0-0182 - Attributes

Name in German:	Hersteller-Zustandsklasse-3		
Name in English:	Manufacturer class 3 diagnostics		
ID number:	S-0-0182	Editability:	no
Function:	Parameter	Memory:	no
Data length:	2 bytes	validity check:	no
Format:	BIN	Extreme value check:	no
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	AT
Input value min / max:	--/--	Default value:	--

S-0-0189, Following Error

Description:

In this operating data, the drive displays the current **Control deviation of the position controller**. This is the difference between the **S-0-0047, Position command value** and the **S-0-0051, Position feedback value** associated with it. The systematic following error for **Positioning with following error** is retained.

Following error = Position command value - Position feedback value 1

see also **P-0-0098, Maximum model deviation**

S-0-0186 - Attributes

Name in German:	Schleppabstand		
Name in English:	Following Error		
ID number:	S-0-0189	Editability:	--
Function:	Parameter	Memory:	no
Data length:	4 bytes	validity check:	no
Format:	Decimal with plus or minus sign		
Extreme value check:	no		
Unit German/English:	Scaling-based, S-0-0076/Scaling-based, S-0-0076		
combination check:	no		
Posit. after the dec.:	Scaling-based, S-0-0076		
cyc. transmittable:	AT		
Input value min / max:	--/--	Default value:	--

S-0-0192, IDN List of Backup Operation Data

Description:

The ID numbers for all operating data that must be loaded in the drive for proper operation are backed up in the IDN list. Normally these are the parameters that are buffered in parallel in parameter E²Prom.

The control system and DriveTop use this IDN list to create a backup copy of the drive parameters.

S-0-0192 - Attributes

Name in German:	IDN-Liste der zu sichernden Betriebsdaten		
Name in English:	IDN list of backup operation data		
ID number:	S-0-0192	Editability:	no
Function:	Parameter	Memory:	fixed
Data length:	2-byte variable	validity check:	no
Format:	IDN	Extreme value check:	no
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	--

S-0-0193, Positioning Jerk

Description:

The positioning jerk limits the acceleration change with respect to time in the operating mode with "Drive internal interpolation".

- Starting up positioning blocks
- Referencing
- Jogging

Note: At 0 value, the jerk filter is shut off.

S-0-0193 - Attributes

Name in German:	Positionier-Ruck		
Name in English:	Positioning jerk		
ID number:	S-0-0193	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit German/English:	S-0-0160/S-0-0160	combination check:	no
Posit. after the dec.:	S-0-0160	cyc. transmittable:	no
Input value min / max:	0/S-0-0160	Default value:	0

S-0-0258, Target Position

Description:

The target position is assigned to the drive as a command value by the controller in "Internal drive interpolation" operating mode. The drive travels toward the "target position" with due regard to **S-0-0259, Positioning velocity**, **S-0-0260, Positioning acceleration** and **S-0-0193, Positioning jerk**.

In the "Position control with positioning interface" operating mode, the target position of the current Positioning command is copied to parameter **S-0-0258, Positioning target position**.

S-0-0258 - Attributes

Name in German:	Zielposition		
Name in English:	Target Position		
ID number:	S-0-0258	Editability:	P234
Function:	Parameter	Memory:	no
Data length:	4 bytes	validity check:	no
Format:	DEC_MV	Extreme value check:	yes
Unit German/English:	S-0-0076/S-0-0076	combination check:	no
Posit. after the dec.:	S-0-0076	cyc. transmittable:	MDT
Input value min / max:	S-0-0076/S-0-0076	Default value:	--

S-0-0259, Positioning Velocity

Description:

In "Drive internal interpolation" operating mode, **S-0-0258, Target position** is approached at the positioning velocity. In "Block-controlled" operating mode, this value indicates the maximum positioning velocity for the case of positioning at limited velocity.

Also see Functional Description: Positioning at Limited Velocity

S-0-0259 - Attributes

Name in German:	Positionier-Geschwindigkeit		
Name in English:	Positioning velocity		
ID number:	S-0-0259	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit German/English:	S-0-0044/S-0-0044	combination check:	no
Posit. after the dec.:	S-0-0044	cyc. transmittable:	MDT
Input value min / max:	S-0-0044/S-0-0044	Default value:	1.0000

S-0-0260, Positioning Acceleration

Description:

"Positioning acceleration" is used in the "Drive internal interpolation" operating mode to accelerate up to the **S-0-0259, Positioning velocity** .

S-0-0260 - Attributes

Name in German:	Positionier-Beschleunigung		
Name in English:	Positioning acceleration		
ID number:	S-0-0260	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit German/English:	S-0-0160/S-0-0160	combination check:	no
Posit. after the dec.:	S-0-0160	cyc. transmittable:	MDT
Input value min / max:	S-0-0160/S-0-0160	Default value:	1000.000

S-0-0262, Command Basic Load

Description:

When this command is set and enabled, the default parameters in the motor for current, velocity and position control loop settings will be loaded and activated. The default parameters are **not** optimized for all applications. They establish a stable control loop status.

Also see **C700: Basic Load**



⇒ When this command is executed, parameters that have already been optimized may be overwritten.

S-0-0262 - Attributes

Name in German:	Kommando Urladen		
Name in English:	Basic load command		
ID number:	S-0-0262	Editability:	P234
Function:	Command	Memory:	no
Data length:	2 bytes	validity check:	no
Format:	BIN	Extreme value check:	yes
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	0/11 b	Default value:	--

S-0-0269, Parameter Buffer Mode

Description:

The "Parameter buffer mode" is used to determine whether the data transmitted through the serial interface will be stored temporarily (in RAM) or permanently (in EEPROM).

1: data will not be stored permanently.

0: data will be stored permanently.

After the control voltage supply has been switched on, the drive will initialize bit 0 to "0". To activate temporary storage mode, bit 0 must be forced to "1".

S-0-0269 - Attributes

Name in German:	Speicherungsmode		
Name in English:	Parameter buffer mode		
ID number:	S-0-0269	Editability:	P234
Function:	Parameter	Memory:	de
Data length:	2 bytes	validity check:	no
Format:	DEC_0V	Extreme value check:	yes
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	0/1	Default value:	0

S-0-0277, Position Feedback 1 Type Parameter**Description:**

This parameter is used to determine the significant properties of the motor feedback (Position feedback 1).

For DKC03.1, the parameter will be set automatically by the drive.

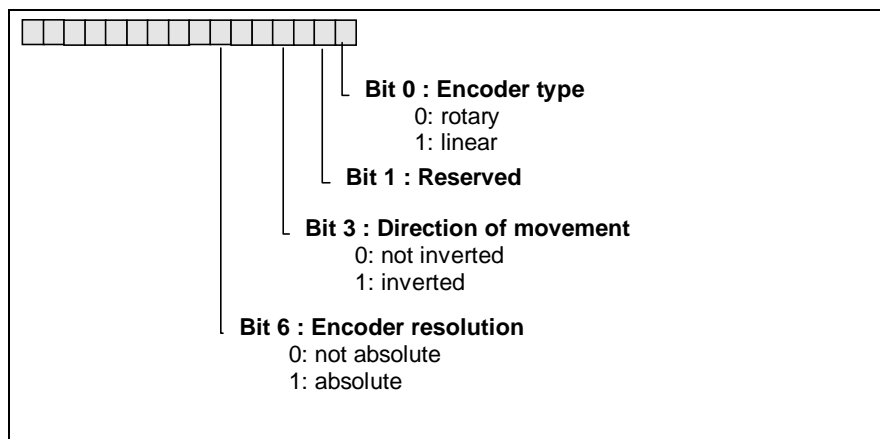
Parameter structure:

Fig. 2-16: S-0-0277, Position feedback parameter

Remark:

For absolute measurement systems with data memory, bit 6 will be set automatically.

When MDD and MKD motors are used, bits 0, 1, and 3 will be set and write-protected by the drive.

Note: Only the bits named here are supported by the firmware.

S-0-0277 - Attributes

Name in German:	Lagegeberart-Parameter 1		
Name in English:	Position feedback 1 type parameter		
ID number:	S-0-0277	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	validity check:	Phase 3
Format:	BIN	Extreme value check:	no
Unit German/English:	--/--	combination check:	yes
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	0

S-0-0299, Home Switch Offset

Description:

If several home references of the measurement system to be homed to are detectable in the travel region of the axis, then one of these marks must be selected as the relevant one by using a zero switch.

You should be careful not to select too small a distance between the zero switch edge and reference mark, because the edge may not be recognized at the correct time, and the next mark will be selected as a result.

For measurement systems with several home references having a constant, known distance between them, the distance from the edge to the mark will therefore be monitored.

The minimal permissible distance is $\frac{1}{4} \cdot d$, where d = the distance between the home references. The optimal distance is $\frac{1}{2} \cdot d$.

If the distance is less than $\frac{1}{4} \cdot d$, then **S-0-0148, C6 Drive-controlled homing procedure** will be interrupted with negative acknowledgement error **C602, Distance homing switch-reference mark erroneous**. The distance can then be changed mechanically or by using this parameter.

This parameter is not used for drives with an absolute encoder.

Also see **P-0-0020, Reference cam shifting**

S-0-0299 - Attributes

Name in German:	Referenzschalter-Offset		
Name in English:	Home switch offset		
ID number:	S-0-0299	Editability:	P234
Function:	Parameter	Memory:	Parameter-EEPROM
Data length:	4 bytes	validity check:	Phase 3
Format:	DEC_MV	Extreme value check:	yes
Unit German/English:	S-0-0076/S-0-0076	combination check:	no
Posit. after the dec.:	S-0-0076	cyc. transmittable:	no
Input value min / max:	S-0-0076/S-0-0076	Default value:	0

S-0-0331, Status Feedback = 0

Description:

This parameter sets an IDN for the "status feedback = 0" which can be used to allocate it to a real-time status bit (IDN 0-0305). The "status feedback = 0" is defined as a bit in class 3 diagnostics (IDN 0-0013) and is set when the velocity feedback value is found within the standstill window (IDN 00124).

Only bit 0 is defined in the operating data

The output "In motion" corresponds to this bit.

S-0-0331 - Attributes

Name in German:	Meldung	nist = 0	
Name in English:	Status "feedback = 0"		
ID number:	S-0-0331	Editability:	no
Function:	Parameter	Memory:	--
Data length:	2 bytes	validity check:	--
Format:	Binary	Extreme value check:	--
Unit German/English:	--/--	combination check:	--
Posit. after the dec.:	--	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	--

S-0-0390, Diagnostic Message Number**Description:**

The "Diagnostic message number" parameter contains a number which is also visible in the seven segment display. The control system can use this diagnostic message number to generate its own diagnostics (this can be used, for example, to generate messages in a language not available for diagnostics on the drive).

Example:

Diagnostic message: "F822 Motor encoder error: signals too small" in parameter S-0-0095

Seven-segment display: Alternates between "F8" <=> "22"

Diagnostic message number: "F822(hex)" in parameter P-0-0001

Also see **S-0-0095, Diagnostic message**

S-0-0390 - Attributes

Name in German:	Diagnose Nummer		
Name in English:	Diagnostic message number		
ID number:	S-0-0390	Editability:	no
Function:	Parameter	Memory:	no
Data length:	2-bytes	validity check:	no
Format:	Hex	Extreme value check:	no
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	--

S-0-0400, Home Switch**Description:**

This parameter is used to assign an IDN to the home switch status (external signal).

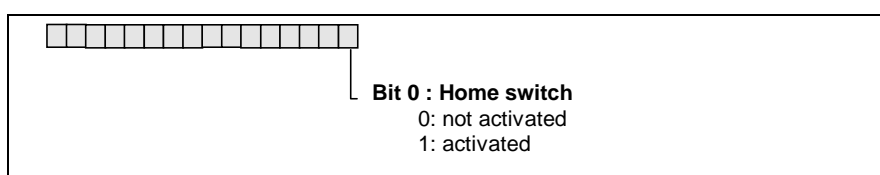
Parameter structure

Fig. 2-17: S-0-0400, Home switch

S-0-0400 - Attributes

Name in German:	Referenzpunktschalter		
Name in English:	Home switch		
ID number:	S-0-0400	Editability:	no
Function:	Parameter	Memory:	no
Data length:	2 bytes	validity check:	no
Format:	BIN	Extreme value check:	no
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	--

S-0-0403, Position Feedback Value Status

Description:

Bit 0 for this parameter is set by the drive if the position feedback value, whose origin was selected in bit 3 from **S-0-0147, Homing Parameter**, is fix-referenced to the machine zero point.

If the commands **S-0-0148, Drive controlled homing procedure**, or **P-0-0012, Set absolute distance** are performed, the bit will be reset when they are started and then set to 1 again once the command has been successfully completed.

The bit status position feedback value corresponds to the output "In reference".

Parameter structure:

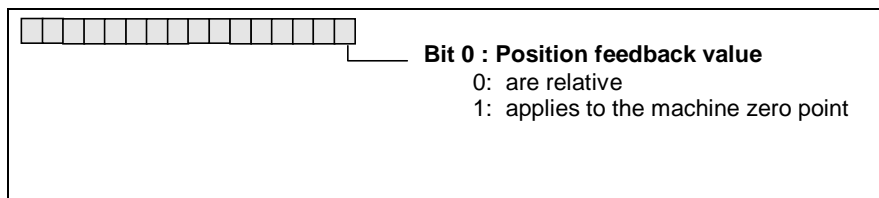


Fig. 2-18: S-0-0403, Position feedback value status

S-0-0403 - Attributes

Name in German:	Status Lageistwerte		
Name in English:	Position feedback value status		
ID number:	S-0-0403	Editability:	no
Function:	Parameter	Memory:	no
Data length:	2 bytes	validity check:	no
Format:	BIN	Extreme value check:	no
Unit German/English:	--/--	combination check:	no
Posit. after the dec.:	0	cyc. transmittable:	no
Input value min / max:	--/--	Default value:	--

3 Product Specific parameters

P 0 0001 Diagnostic Message Number

Description:

The diagnostic message number is stored in parameter "Diagnostic message number". It can also be viewed in the seven-segment display. This makes it possible for the control system to generate its own diagnostics using the diagnostic message number (for example in diagnostics in additional languages which are not stored in the drive). The machine control can use the diagnostic number to generate its own specific set of diagnostic messages.

Example:

Diagnostic Message: F822 Motor Feedback Error: "Signals are too small" in parameter P-0-0095
 Seven-segment Display: Alternates between "F8" <=> "22"
 Diagnostic message number: "F822(hex)" in parameter S-0-0001

Also see **S-0-0095, Diagnostic Message**

Note: This parameter displays the same thing as S-0-0390.

P-0-0001 - Attributes

Name in German:	Diagnose Nummer		
Name in English:	Diagnostic message number		
ID number:	P-0-0001	Editability:	no
Function:	Parameter	Memory:	no
Data length:	2 bytes	Validity check:	no
Format:	HEX	Extreme value check:	no
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	--/--	Default value:	--

P-0-0004, Smoothing Time Constant

Description:

The time constant that can be activated in this parameter affects the output of the velocity loop regulator. It can be used to suppress quantization effects and limit the bandwidth of the velocity loop.

P-0-0004 - Attributes

Name in German:	Glättungszeitkonstante		
Name in English:	Smoothing time constant		
ID number:	P-0-0004	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit in Ger./Eng.:	us/us	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	500/65535	Default value:	500

P-0-0005, Language Selection

Description:

All parameter names, units and diagnostic warning messages within the drive controller are stored in several languages. This parameter determines the output language for the text.

- 0: German
- 1: English

Additional languages are in preparation.

P-0-0005 - Attributes

Name in German:	Sprachumschaltung		
Name in English:	Language Selection		
ID number:	P-0-0005	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	0/1	Default value:	--

P-0-0006, Overload Factor

Description:

The "overload factor" parameter affects and determines the values for the torque-related drive parameters M_{\max} , M_{KB} and the short duration torque percent duty cycle, ED.

Increasing the overload factor corresponds to a reduction of the parameter values for:

- The percent duty cycle ED and
- the maximum peak torque M_{\max} , in some cases

$$\dot{U}F \approx \frac{M_{KB}}{M_{dN}} \cdot 100\%$$

OF	=	P-0-00061
MKB	=	Short period operational torque in Nm
MdN	=	Standstill torque in Nm

Formula 2-1: Overload factor

P-0-0006 Attributes

Name in German:	Überlastfaktor		
Name in English:	Overload factor		
ID number:	P-0-0006	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	Validity check:	Phase 3
Format:	DEC_0V	Extreme value check:	yes
Unit in Ger./Eng.:	% / %	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	1/500	Default value:	100

P-0-0008, Activation E-Stop-Function

Description:

Parameter P-0-0008, E-Stop function activation, causes activation of E-Stop input. The E-Stop input itself is always 0-active. The **polarity** of the E-Stop input cannot be selected; it can only be operative (with P-0-0008 = 1) or non-operative (with P-0-0008 = 0).

Activation of the E-Stop function initiates the same response in the drive as if a **non-fatal error** had been recognized. The response is **P-0-0119, Best possible deceleration**.

There are only 2 meaningful values in the ECODRIVE for activating E-Stop.

0: The E-Stop input is NOT evaluated.

1: The E-Stop input is operative.

Only the lowest-ordered bit of the binary parameter is evaluated.

Error **F234, Emergency-Stop** will be initiated if these two **conditions** are both satisfied at the same time:

1. P-0-0008 = 1
2. E-Stop input = 0 = without voltage

Note: If P-0-0008 = 1 (activated), a (24V) voltage must be present on the E-Stop input for the drive to operate.

P-0-0008 - Attributes

Name in German:	Aktivierung E-Stop-Funktion		
Name in English:	Activation E-Stop function		
ID number:	P-0-0008	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 Bytes	Validity check:	Phase 3
Format:	Binary	Extreme value check:	no
Unit in Ger./Eng.:	--/--	Combination check:	yes
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	0/11 b	Default value:	0

P-0-0009, Error Message Number

Description:

If an error occurs during cyclical operation, it will be diagnosed by the drive and shown on the seven-segment display.

At the same time a bit will be set in **S-0-0011, Class 1 diagnostic** and the change bit for this diagnostic class will be set in drive status word S-0-0135. The control system can now read the displayed error code as a decimal value (in the range 201 ... 899) and respond to the error in a specific, targeted manner.

If there is no error, the value of this parameter is 0.

Example:

Queuing error:	F822, "Motor feedback error: signal amplitude error"
P-0-0009:	822

Also see **S-0-0390, Diagnostic message number**

P-0-0009 - Attributes

Name in German:	Fehler Nummer		
Name in English:	Error message number		
ID number:	P-0-0009	Editability:	no
Function:	Parameter	Memory:	no
Data length:	2 bytes	Validity check:	no
Format:	DEC_0V	Extreme value check:	no
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	--/--	Default value:	--

P-0-0010, Excessive Position Command Value

Description:

The position command value monitor triggered error **F237, Excessive position command value difference**, and decelerated the drive according to the error handling defined in parameter **P-0-0119, Best possible deceleration**.

The excessive position command value which triggered the error is stored in parameter P-0-0010, and the last valid position command value is stored in parameter **P-0-0011, Last valid position command value**.

Only command values preset by the NC will be monitored.

P-0-0010 - Attributes

Name in German:	Exzessiver Lagesollwert		
Name in English:	Excessive Position Command		
ID number:	P-0-0010	Editability:	no
Function:	Parameter	Memory:	no
Data length:	4 bytes	Validity check:	no
Format:	DEC_MV	Extreme value check:	no
Unit in Ger./Eng.:	S-0-0076	Combination check:	no
Pos. after the dec.:	S-0-0076	Cyc. transmittable:	no
Input min/max:	S-0-0076	Default value:	--

P-0-0011, Last Valid Position Command Value

Description:

If error **F237, Excessive position command value difference** occurs, then the last valid position command value will be stored in this parameter.

P-0-0011 - Attributes

Name in German:	Letzter gültiger Lagesollwert		
Name in English:	Last valid position command value		
ID number:	P-0-0011	Editability:	no
Function:	Parameter	Memory:	no
Data length:	4 bytes	Validity check:	no
Format:	DEC_MV	Extreme value check:	no
Unit in Ger./Eng.:	S-0-0076	Combination check:	no
Pos. after the dec.:	S-0-0076	Cyc. transmittable:	no
Input min/max:	S-0-0076	Default value:	--

P-0-0012, C300 Set Absolute Measurement Command

Description:

When an absolute measuring system starts up, the drive will indicate a feedback value that is arbitrary and not referenced to the machine zero point. The value of the parameter **S-0-0403, Position feedback value status** will be 0.

The position feedback of this measuring system can be set to the desired value with the command "Set absolute measurement". After the "Set absolute measurement" command is executed, the position feedback value of the measurement-supplied encoder will contain a defined reference to the machine zero point.

Buffering all the required data of the absolute measuring system in the feedback data memory or parameter data memory ensures that all information is available after rebooting the system. The position feedback value permanently retains its reference to the machine zero point. All the required data for the absolute measuring system is permanently either in the feedback position data memory or in the drive parameter data memory, and is available after rebooting the drive system.

Parameter P-0-012 can be used for this function.

Also see **S-0-0128, C2 communications phase 4 transition check**

P-0-0012 - Attributes

Name in German:	Kommando Absolutmaß setzen		
Name in English:	C300 Command 'set absolute measurement'		
ID number:	P-0-0012	Editability:	P4
Function:	Command	Memory:	no
Data length:	2 bytes	Validity check:	no
Format:	BIN	Extreme value check:	yes
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	0/11 b	Default value:	--

P-0-0013, Command value mode for modulo format

Description:

Position command values such as **S-0-0047, Position command value** and **S-0-0258, Target position** with a modulo function active are interpreted according to the mode setting.

Parameter P-0-0013, command value mode in modulo format can be used to set the mode.

This parameter works only when **S-0-0076, Scaling type position data** had been activated for modulo format.

The parameter can take on the following values:

P-0-0013:	Meaning:
0	shortest path
1	positive direction
2	negative direction

Fig. 2-3: Parameter P-0-0013

**Warning**

⇒ With the step motor interface, only
0 = "shortest path" can be set.

P-0-0013 - Attributes

Name in German:	Sollwertmodus im Moduloformat		
Name in English:	Command value mode for modulo format		
ID number:	P-0-0013	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	MDT
Input min/max:	0/2	Default value:	0

P-0-0018, Number of Pole Pairs/Pole Pair Distance**Description:**

This indicates the number of pole pairs per motor revolution for rotating motors.

This value does not need to be indicated here for motors with motor feedback data memory.

P-0-0018 - Attributes

Name in German:	Polpaarzahl/Polpaarweite		
Name in English:	Number of pole pairs/pole pair distance		
ID number:	P-0-0018	Editability:	no
Function:	Parameter	Memory:	Feedback
Data length:	2 bytes	Validity check:	Phase 3
Format:	DEC-OV	Extreme value check:	yes
		Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	1/4	Default value:	--
Unit in Ger./Eng.:	Polpaare / Pairs of poles; or mm (depends on P-0-4014, Motor type)		

P-0-0019, Position Start Value

Description:

The position start value is used in non-absolute measurement systems to set parameters for a defined initialization value with Position feedback value of 1.

During initialization of the Position feedback value, the drive tests whether the Position start value was written in communications phase 2 or 3. Only then will the position feedback value 1 be set on this value. The initial position value works only with a single-turn feedback.

P-0-0019 - Attributes

Name in German:	Lageanfangswert		
Name in English:	Position start value		
ID number:	P-0-0019	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	Validity check:	no
Format:	DEC_MV	Extreme value check:	no
Unit in Ger./Eng.:	S-0-0076	Combination check:	no
Pos. after the dec.:	S-0-0076	Cyc. transmittable:	no
Input min/max:	S-0-0076	Default value:	0

P-0-0020, Reference Cam Shifting

Description:

During drive-controlled homing, the home switch can be evaluated by the drive. There is an optimal location from the relative position of the home switch flag to zero mark of the motor encoder. To help the installer during initial installation, the distance from the homing cam to the ideal point is given in this parameter.

The value displayed is dependent on the selected position data scaling type (**S-0-0076, Position data scaling type**). It can be displayed in [mm], [degrees] or [inch].

Also see **S-0-0299, Home switch offset**

P-0-0020 - Attributes

Name in German:	Verschiebung des Referenznockens um..		
Name in English:	Reference cam shifting		
ID number:	P-0-0020	Editability:	no
Function:	Parameter	Memory:	no
Data length:	4 bytes	Validity check:	no
Format:	DEC_MV	Extreme value check:	no
Unit in Ger./Eng.:	S-0-0076	Combination check:	no
Pos. after the dec.:	S-0-0076	Cyc. transmittable:	no
Input min/max:	S-0-0076	Default value:	--

P-0-0038, Signal Selection for Analog Output Channel 1

Description:

Two outputs make it possible to read internal drive operational signals and output variables as analog voltage signals. These can be examined by connecting an oscilloscope to the analog outputs. The maximum output voltage is +/- 10V with a resolution of 8 bits. Pre-defined channel-selection numbers are available to select specific signals. For analog channel 1, the selection can be indicated by entering the channel selection number in parameter P-0-0038.

The following predefined signals are available:

Number:	Signal selection:	Scaling:
0x0	Zero point	0V
0x1	Torque-producing command current	P-0-0136
0x2	Velocity feedback actual value (after mixing and filtering)	P-0-0040
0x3	S-0-0036, Velocity command value	P-0-0040
0x4	Position command value difference	P-0-0040
0x5	S-0-0051, Position feedback value 1	P-0-0042
0x6	S-0-0053, Position feedback value 2	P-0-0042
0x7	S-0-0189, Following error	P-0-0042
0x8	Sine signal of motor feedback	1: 1
0x9	Cosine signal of motor feedback	1: 1
0xa	P-0-0139	1:1
0xb	P-0-0140	1:1
0xd	Velocity command value	P-0-0040
0x10	Sine signal external feedback	1: 1
0x11	Cosine signal external feedback	1: 1
0x12	Torque-producing current actual value	P-0-0136
0x13	Magnetization current actual value	P-0-0136
0x14	Velocity feedback value of the motor feedback	P-0-0040
0X16	Bleeder load	10V = 100%

Fig. 3-4: Signal selection for analog output

The following parameters should be considered for scaling:

- **P-0-0040 Scaling for velocity data on analog channel 1**
- **P-0-0042 Scaling for position data on analog channel 1**

P-0-0038 - Attributes

Name in German:	Signal-Auswahl Analogkanal 1		
Name in English:	Signal Select Analog Output Channel 1		
ID number:	P-0-0038	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	Validity check:	Phase 3
Format:	HEX	Extreme value check:	no
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	--/--	Default value:	0

P-0-0039, Signal Selection for Analog Output Channel 2

Description:

Two output channels make it possible to read internal drive operational signals and output variables as analog voltage signals. These can be examined by connecting an oscilloscope to the analog outputs. The maximum output voltage is +/- 10 volts, with a resolution of 8 bits. Predefined channel selection numbers are available to select specific signals. For analog channel 2, the selection can be indicated by entering the channel selection number in parameter P-0-0039.

The following predefined signals are available:

Number:	Signal selection:	Scaling:
0x0	Zero point	0V
0x1	Torque-producing command current	P-0-0137
0x2	Velocity feedback actual value (after mixing and filtering)	P-0-0041
0x3	S-0-0036, Velocity command value	P-0-0041
0x4	Position command value difference	P-0-0041
0x5	S-0-0051, Position feedback value 1	P-0-0043
0x6	S-0-0053, Position feedback value 2	P-0-0043
0x7	S-0-0189, Following error	P-0-0043
0x8	Sine signal of motor feedback	1: 1
0x9	Cosine signal of motor feedback	1: 1
0xa	P-0-0139	1:1
0xb	P-0-0140	1:1
0xd	Velocity command value	P-0-0040
0x10	Sine signal external feedback	1: 1
0x11	Cosine signal external feedback	1: 1
0x12	Torque-producing current actual value	P-0-0137
0x13	Magnetization current actual value	P-0-0137
0x14	Velocity feedback value of the motor feedback	P-0-0041
0x16	Bleeder load	10V = 100%

Fig. 3-5: Signal selection for analog output

The following parameters should be considered for scaling:

- **P-0-0041** Scaling the speed of analog channel 1
- **P-0-0043** Scaling the position data of analog channel 1

P-0-0039 - Attributes

Name in German:	Signal-Auswahl Analogkanal 2		
Name in English:	Signal select analog output channel 2		
ID number:	P-0-0039	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	Validity check:	no
Format:	HEX	Extreme value check:	no
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	--/--	Default value:	0

P-0-0040, Scaling of Velocity Data on Analog Output Channel 1

Description:

If velocity data have been selected with parameter **P-0-038, Signal selection for analog output channel 1**, scaling for this data can be defined with parameter P-0-0040.

The unit of rpm/10V will always be in reference to the motor. If a gear ratio is present, it will not be considered.

P-0-0040 - Attributes

Name in German:	Wichtg. von Geschwindigk. Analogausgabe-Kanal 1		
Name in English:	Scaling of velocity data on output channel 1		
ID number:	P-0-0040	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	Validity check:	Phase 3
Format:	DEC-OV	Extreme value check:	yes
		Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	1/65535	Default value:	2000
Unit in Ger./Eng.:	Upm/10V / rpm/10V		

P-0-0041, Scaling of Velocity Data on Analog Output Channel 2

Description:

If velocity data have been selected with parameter **P-0-039, Signal selection for analog channel 2**, scaling for this data can be defined with parameter P-0-0041.

The unit of rpm/10V will always be in reference to the motor. If a gear ratio is present, it will not be considered.

P-0-0041 - Attributes

Name in German:	Wichtg. von Geschwindigk. Analogausgabe-Kanal 2		
Name in English:	Scaling of velocity data on analog output channel 2		
ID number:	P-0-0041	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
		Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	1/65535	Default value:	2000
Unit in Ger./Eng.:	Upm/10V / rpm/10V		

P-0-0042, Scaling for Position Data on Analog Output Channel 1

Description:

If position data has been selected with parameter **P-0-0038, Signal selection for analog output channel 1**, then scaling of this data can be defined with parameter P-0-0042.

The unit "degrees" always refers to the motor.

P-0-0042 - Attributes

Name in German:	Wichtg. von Lagedaten Analogausgabe-Kanal 1		
Name in English:	Scaling for position data on analog output channel 1		
ID number:	P-0-0042	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	no
		Combination check:	no
Pos. after the dec.:	1	Cyc. transmittable:	no
Input min/max:	0.1/6553.5	Default value:	360.0
Unit in Ger./Eng.:	Grad/10V / Deg/10V		

P-0-0043, Scaling for Position Data on Analog Output Channel 2

Description:

If position data have been selected with parameter **P-0-0039, Signal selection for analog output channel 2**, then parameter P-0-0043 can be used to determine the scaling of this data.

The unit "degree" always refers to the motor.

P-0-0043 - Attributes

Name in German:	Wichtg. von Lagedaten Analogausgabe-Kanal 2		
Name in English:	Scaling for position data on analog output channel 2		
ID number:	P-0-0043	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	no
		Combination check:	no
Pos. after the dec.:	1	Cyc. transmittable:	no
Input min/max:	0.1/6553.5	Default value:	360.0
Unit in Ger./Eng.:	Grad/10V / Deg/10V		

P-0-0050 Acceleration Feedforward, Proportional Gain

Description:

Acceleration feedforward reduces the following error during acceleration in an operating mode with no following error. The current acceleration command value is multiplied by the "Proportional gain acceleration feedforward"

(→ Ccomm) and the result is added to the current command value from the velocity controller.

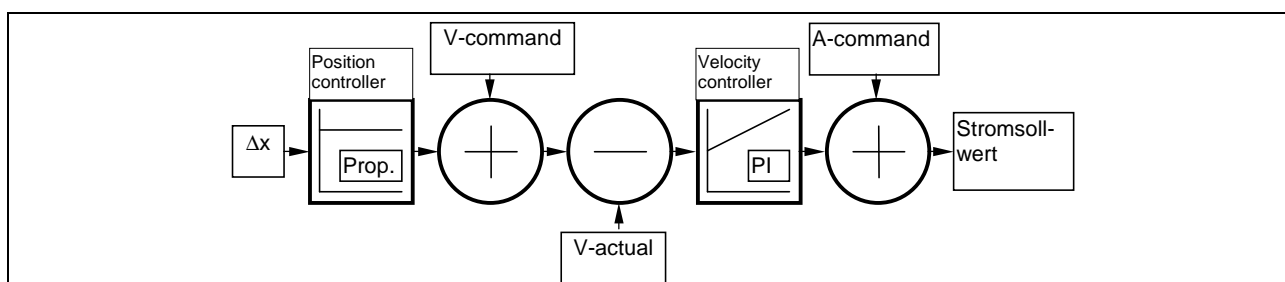


Fig. 2-1: Velocity and acceleration feedforward

Activation

Acceleration feedforward is activated by writing a value greater than 0 to the parameter.

Note: Note that the controller also works without feedforward! (default value = 0). Acceleration feedforward is only possible in operating mode without following error.

Comparison between Feedforwards

Velocity feedforward is activated by selecting an operating mode without following error. From the point of view of the position controller, it results in **Feedforward 1st level** (velocity) and makes the position deviation 0 at a constant velocity. During acceleration and braking, however, there will still be a following error.

Acceleration feedforward is activated by entering a value greater than 0 for this parameter. From the point of view of the position controller, it results in **Feedforward 2nd level** (prop. to the acceleration) and reduces the position deviation to 1 if the correct value was selected and acceleration is constant.

P-0-0050 - Attributes

Name in German:	Beschleunigungsvorsteuerung Prop.verst.		
Name in English:	Proportional gain acceleration feedforward		
ID number:	P-0-0050	Editability:	P234
Function:	Parameter	Memory:	Param.EEPROM
Data length:	2 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
		Combination check:	no
Pos. after the dec.:	1	Cyc. transmittable:	no
Input min/max:	0/5006.5	Default value:	0
Unit in Ger./Eng.:	mA/(rad/s²) / mA/(rad/s²)		

P-0-0051, Torque/Force Constant

Description:

The torque/force constant determines what driving torque of the motor is given by a specified motor current. In synchronous motors, this value depends entirely on the design of the motor.

This value is stored in the motor feedback memory and cannot be changed.

$$MA[Nm;N] = (P-0-0051) \cdot (P-0-0080) \cdot (S-0-0111)$$

MA:	Drive torque
P-0-0051	Torque/force constant [NmTorque]
S-0-0080	Torque/force command value [%]
S-0-0111	Continuous motor current at standstill

Formula 2-2: Drive torque

P-0-0051 - Attributes

Name in German:	Drehmoment/Kraft-Konstante		
Name in English:	Torque constant		
ID number:	P-0-0051	Editability:	no
Function:	Parameter	Memory:	Feedback
Data length:	2 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit in Ger./Eng.:	Nm/A/Nm/A	Combination check:	no
Pos. after the dec.:	2	Cyc. transmittable:	no
Input min/max:	0/1000	Default value:	--

P-0-0090, Travel Limit Parameter

Description:

Parameter P-0-0090 activates the travel limit switch. In addition to this, the inputs can be inverted in this parameter.

Parameter structure:

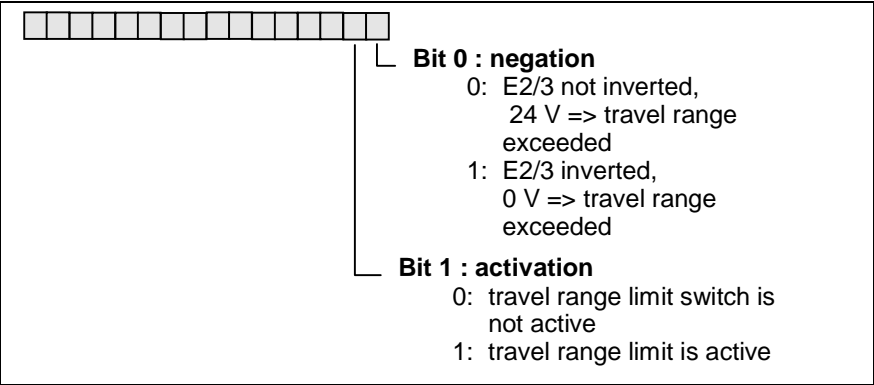


Fig. 2-19: P-0-0090, Travel limit parameter

P-0-0090 - Attributes

Name in German:	Fahrbereichsgrenzscharter-Parameter		
Name in English:	Travel limit parameter		
ID number:	P-0-0090	Editability:	P23
Function:	Parameter	Memory:	Param.E²prom
Data length:	2 bytes	Validity check:	Phase 3
Format:	BIN	Extreme value check:	yes
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	0/111 bin	Default value:	0

P-0-0097, Absolute Encoder Control Window

Description:

An absolute encoder can be used to compare the drive memory data and the actual feedback position value on the axis during command execution of window 3 -> 4.

If the difference is greater than what was set as allowable in parameter P-0-0097, error message **C276, Absolute encoder error** will be generated. **This error indicates that the absolute position of the axis has changed since the last time it was taken out of operating mode.**

Typically, 30 degrees in reference to the motor shaft can be used as a default value if the shaft contains a holding brake (i.e. it is self-locking).

P-0-0097 - Attributes

Name in German:	Absolutgeber-Überwachungsfenster		
Name in English:	Absolute encoder control window		
ID number:	P-0-0097	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	Validity check:	Phase 3
Format:	DEC_MV	Extreme value check:	yes
Unit in Ger./Eng.:	S-0-0076	Combination check:	no
Pos. after the dec.:	S-0-0076	Cyc. transmittable:	no
Input min/max:	0/S-0-0076	Default value:	250.00

P-0-0098, Maximum Model Deviation

Description:

Maximum model deviation refers to the maximum deviation between the actual position feedback and the model position feedback value calculated by the drive.

The parameter can be used to assist in setting parameters for **S-0-0159, Monitoring window**.

Two cases must be distinguished for understanding and using the model position feedback.

- **position control allowing following error**

In this operating mode, the controlled trajectory is simulated by means of a model.

The maximum deviation between the calculated position feedback module value and the real position feedback value will be stored in parameter P-0-0098.

The control system model represents a delayed component of the first order, which is dependent only on the Kv factor of the position controller.

- **position control without following error**

In this operating mode, the position command value is compared to the position feedback value. The maximum deviation encountered will be stored in P-0-0098.

A model for the controlled system is not necessary in this case.

Note: The parameter can be written to, so that it can be set back to 0, for example.

P-0-0098 - Attributes

Name in German:	max. Modellabweichung		
Name in English:	Maximum model deviation		
ID number:	P-0-0098	Editability:	P234
Function:	Parameter	Memory:	no
Data length:	4 bytes	Validity check:	no
Format:	DEC_MV	Extreme value check:	yes
Unit in Ger./Eng.:	S-0-0076	Combination check:	no
Pos. after the dec.:	S-0-0076	Cyc. transmittable:	no
Input min/max:	0/S-0-0076	Default value:	--

P-0-0109 Torque/Force Peak Limit

Description:

This parameter restricts the maximum allowable torque. **100%** corresponds to **Motor torque at standstill**. This limitation works together with **S-0-0092, Bipolar torque limit**. The latter value (S-0-0092) should be smaller.

Also see

S-0-0111, Motor current at standstill and **P-0-0051; Torque/force constant**

P-0-0109 - Attributes

Name in German:	Spitzendrehmoment/Kraft-Begrenzung		
Name in English:	Torque/force peak limit		
ID number:	P-0-0109	Editability:	P234
Function:	Parameter	Memory:	Param.EEPROM
Data length:	2 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Combination check:	no	Cyc. transmittable:	no
Input min/max:	0/= peak torque encountered		
Unit in Ger./Eng.:	Scaling-based, S-0-0086		
Pos. after the dec.:	Scaling-based, S-0-0086		
Default value:	500.0 %		

P-0-0119, Deceleration as best as possible

Description:

This parameter specifies the type of braking to a standstill for the drive in the event of:

- non-fatal errors
- interface errors
- switching off the controller enable signal

P-0-0119:	Response type:
0	Velocity command value zero switch, i.e., the motor will be braked with consideration of the bipolar torque limit value. The maximum allowable braking time is 500ms. The holding brake will be activated 100 milliseconds before the operation of the brake time. Should the velocity already have fallen below the value of "S-0-0124 Standstill window", the holding break will be activated immediately. After 500ms, the motor is torque-free.
1	Switch to torque-free state

Fig. 2-6: Type of response

At the earliest, the controller enable can be turned on again after the error response has expired.

P-0-0119 - Attributes

Name in German:	Bestmögliche Stillsetzung		
Name in English:	Deceleration as best as possible		
ID number:	P-0-0119	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	0/1	Default value:	0

P-0-0123, Absolute Encoder Buffer

Description:

All the data that the absolute encoder needs for position initialization is stored in this parameter.

It does not appear in the DriveTop, nor in the list of all parameters.

P-0-0123 - Attributes

Name in German:	Absolutgeber-Puffer		
Name in English:	Absolute encoder buffer		
ID number:	P-0-0123	Editability:	no
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2-byte variable	Validity check:	no
Format:	HEX	Extreme value check:	no
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	--/--	Default value:	--

P-0-0136, Scaling Torque/Force Channel 1

Description:

If torque data were selected with parameter **P-0-0038, Signal selection for analog channel 1**, parameter **P-0-0136** can be used to determine scaling for this data.

The unit for P-0-0136 is A/10V = current/full amplitude.

For example, if 40.0 A/10V is given, then the analog signal will have a scaling of 4 A/V.

S-0-0136 - Attributes

Name in German:	Wichtung Drehmoment/Kraft Analogausgabe Kanal 1		
Name in English:	Scaling torque/force channel 1		
ID number:	P-0-0136	Editability:	234
Function:	Parameter	Memory:	Prog.Module
Data length:	2 bytes	Validity check:	no
Format:	DEC_0V	Extreme value check:	yes
Unit in Ger./Eng.:	A/10V / A/10V	Combination check:	no
Pos. after the dec.:	1	Cyc. transmittable:	no
Input min/max:	0.1/6553.5	Default value:	ITYP

P-0-0137, Scaling Torque/Force Channel 2

Description:

If torque data were selected with parameter **P-0-0039, Signal selection for analog channel 2**, parameter **P-0-0137** can be used to determine scaling for this data.

The unit for P-0-0137 is A/10V = current/full amplitude.

For example, if 40.0 A/10V is given, then the analog signal will have a scaling of 4 A/V.

S-0-0137 - Attributes

Name in German:	Wichtung Drehmoment/Kraft Analogausgabe Kanal 2		
Name in English:	Scaling torque/force channel 2		
ID number:	P-0-0137	Editability:	P234
Function:	Parameter	Memory:	Prog.Module
Data length:	2 bytes	Validity check:	no
Format:	DEC_0V	Extreme value check:	yes
Unit in Ger./Eng.:	A/10V / A/10V	Combination check:	no
Pos. after the dec.:	1	Cyc. transmittable:	no
Input min/max:	0.1/6553.5	Default value:	ITYP

P-0-0139, Analog Output 1

Description:

If analog output 1 (P-0-0139) has been selected with parameter **P-0-0038 Signal selection for analog output channel 1** or **P-0-0039 Signal selection for analog output channel 2**, the content of parameter P-0-0139 will be sent to analog output channel 1 or 2.

Only values between -128 and +127 are possible. They will be converted to +/-10V at a ratio of 1:1.

S-0-0139 - Attributes

Name in German:	Analogausgang 1		
Name in English:	Analog output 1		
ID number:	P-0-0139	Editability:	P234
Function:	Parameter	Memory:	no
Data length:	2 bytes	Validity check:	no
Format:	DEC_0V	Extreme value check:	yes
Unit in Ger./Eng.:	0.078V/0.078V	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	-128/127	Default value:	--

P-0-0140, Analog Output 2

Description:

If analog output 1 (P-0-0140) has been selected with parameter **P-0-0038 Signal selection for analog output channel 1** or **P-0-0039 Signal selection for analog output channel 2**, the content of parameter P-0-0140 will be sent to analog output channel 1 or 2.

Only values between -128 and +127 are possible. They will be converted to +/-10V at a ratio of 1:1.

S-0-0140 - Attributes

Name in German:	Analogausgang 2		
Name in English:	Analog output 2		
ID number:	P-0-0140	Editability:	P234
Function:	Parameter	Memory:	no
Data length:	2 bytes	Validity check:	no
Format:	DEC_0V	Extreme value check:	yes
Unit in Ger./Eng.:	0.078V/0.078V	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	-128/127	Default value:	--

P-0-0168, Maximum Acceleration

Description:

The maximum possible acceleration for the drive in use is displayed in this parameter's data field.

The value is closely approximate to being indirectly proportional to the drive's total moment of inertia (motor plus load) and directly proportional to the peak torque of the drive.

This maximum value is determined when controller values are automatically set, **P-0-0162** and is used as a **default value** for determining the **positioning commands**.

Thus the parameter will contain a meaningful value only if command "C9 Automatic controller settings" has been started previously.

The numeric value 0 is entered as a **default value** to make it obvious that the parameter has not yet been set to a valid value.

P-0-0168 - Attributes

Name in German:	max. parametrierbare Beschleunigung		
Name in English:	Maximum acceleration		
ID number:	P-0-0168	Editability:	P2,P3,P4
Function:	Parameter	Memory:	no
Data length:	4 bytes	Validity check:	no
Format:	DEC_OV	Extreme value check:	yes
Unit in Ger./Eng.:	S-0-0160	Combination check:	no
Pos. after the dec.:	S-0-0160	Cyc. transmittable:	no
Input min/max:	0/S-0-0160	Default value:	0

P-0-0508, Commutator Offset

Description:

For synchronous motors, this parameter indicates the offset between the raw value of the rotational feedback and the resulting absolute electrical angle between the stator current vector and the rotor flux vector.

For motors with motor feedback data memory, the commutator offset is stored in the memory and therefore does not need to be entered.

P-0-0508 - Attributes

Name in German:	Kommutierungs-Offset		
Name in English:	Commutator offset		
ID number:	P-0-0508	Editability:	no
Function:	Parameter	Memory:	Feedback
Data length:	2 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	0/10000	Default value:	--

P-0-0509, Slot-Angle

Description:

This parameter is not currently available for use.

P-0-0509 - Attributes

Name in German:	Paßfedernutwinkel		
Name in English:	Slot-angle		
ID number:	P-0-0509	Editability:	no
Function:	Parameter	Memory:	Feedback
Data length:	4 bytes	Validity check:	Phase 3
Format:	DEC_MV	Extreme value check:	yes
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	0/3599	Default value:	--

P-0-0510, Moment of Inertia of the Rotor

Description:

This parameter gives the moment of inertia of the rotor without a load. For motors with feedback memory, it is stored there.

P-0-0510 - Attributes

Name in German:	Rotorträgheitsmoment		
Name in English:	Moment of inertia of the rotor		
ID number:	P-0-0510	Editability:	no
Function:	Parameter	Memory:	Feedback
Data length:	4 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit in Ger./Eng.:	kgm ² /kgm ²	Combination check:	no
Pos. after the dec.:	5	Cyc. transmittable:	no
Input min/max:	0/1.00000	Default value:	--

P-0-0511, Brake Current

Description:

This parameter does not work with DKC01.

P-0-0511 - Attributes

Name in German:	Haltebremsenstrom		
Name in English:	Brake current		
ID number:	P-0-0511	Editability:	no
Function:	Parameter	Memory:	Feedback
Data length:	4 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit in Ger./Eng.:	A/A	Combination check:	no
Pos. after the dec.:	3	Cyc. transmittable:	no
Input min/max:	0/500.000	Default value:	--

P-0-0512, Default Position Loop Kv factor

Description:

Default value for the position loop proportional gain. This parameter is set during the manufacturing stage and cannot be changed. The "Load default parameters" command copies the value of this parameter into parameter **S-0-0104, Position loop Kv factor**.

Also see **S-0-0104, Position Loop KV-Factor**

P-0-0512 - Attributes

Name in German:	Defaultwert für Lageregler Kv-Faktor		
Name in English:	Default position loop Kv factor		
ID number:	P-0-0512	Editability:	no
Function:	Parameter	Memory:	Feedback
Data length:	2 bytes	Validity check:	P3
Format:	decimal	Extreme value check:	yes
Unit in Ger./Eng.:	1000/min/1000/min	Combination check:	no
Pos. after the dec.:	2	Cyc. transmittable:	no
Input min/max:	0.01/327.67	Default value:	--

P-0-0513, Feedback Type

Description:

This value is available for all measuring systems with feedback data memory and diagrams important properties of the measuring system, in addition to control analysis. The coding of the parameter is set by the manufacturer of the drive or encoder.

The parameter cannot be written (read only) and serves merely to provide information about the connected feedback.

For motors with single-turn resolver, the value is = 0.

For motors with multi-turn resolver, the value is = 16.

P-0-0513 - Attributes

Name in German:	Feedbacktyp		
Name in English:	Feedback type		
ID number:	P-0-0513	Editability:	no
Function:	Parameter	Memory:	Feed.-E ² prom
Data length:	2 bytes	Validity check:	P3
Format:	DEC_OV	Extreme value check:	yes
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	0/100	Default value:	--

P-0-0514, Absolute Encoder Offset

Description:

The parameter function for the initializing position of the absolute encoder.

P-0-0514 read only (cannot be written to).

P-0-0514 - Attributes

Name in German:	Absolutgeber-Offset		
Name in English:	Absolute encoder offset		
ID number:	P-0-0514	Editability:	no
Function:	Parameter	Memory:	Feedb.-E ² prom
Data length:	4 bytes	Validity check:	no
Format:	HEX	Extreme value check:	no
Unit in Ger./Eng.:	Inkr./Incr.	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	--/--	Default value:	--

P-0-0516, Feedback Interface

Description:

This parameter is not used with DKC03.1

P-0-0516 - Attributes

Name in German:	Feedback-Schnittstelle		
Name in English:	Feedback interface		
ID number:	P-0-0516	Editability:	no
Function:	Parameter	Memory:	Amplf.-EEProm
Data length:	2 bytes	Validity check:	P3
Format:	DEC	Extreme value check:	yes
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	--	Cyc. transmittable:	no
Input min/max:	0/100	Default value:	--

P-0-0518 Amplifier Nominal Current 2

Description:

This parameter specifies the maximum nominal current of the amplifier at reduced peak current.

Based on parameters **S-0-0110, Amplifier peak current**, **S-0-0112, Amplifier nominal current** and **P-0-0519, Amplifier peak current-2**, it specifies the length of the peak current characteristics for the peak current limit of the amplifier.

No value can be entered since it is permanently programmed within the amplifier.

P-0-0518 - Attributes

Name in German:	Verstärker Dauerstrom 2		
Name in English:	Amplifier nominal current 2		
ID number:	P-0-0518	Editability:	no
Function:	Parameter	Memory:	Amplf.
Data length:	4 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit in Ger./Eng.:	A/A	Combination check:	no
Pos. after the dec.:	3	Cyc. transmittable:	no
Input min/max:	0.001/500	Default value:	--

P-0-0519, Amplifier Peak Current 2

Description:

The drive allows you to define a changed continuous peak current characteristic line with reduced amplifier peak current, thus with an increased amplifier continuous current.

For this case, parameter P-0-0519 specifies an amplifier peak current.

It determines the functioning points on the peak current characteristic line.

No value for this parameter can be entered, since it is permanently programmed in the amplifier.

P-0-0519 - Attributes

Name in German:	Verstärker Spitzenstrom-2		
Name in English:	Amplifier Peak Current-2		
ID number:	P-0-0519	Editability:	no
Function:	Parameter	Memory:	Amplf.
Data length:	4 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit in Ger./Eng.:	A/A	Combination check:	no
Pos. after the dec.:	3	Cyc. transmittable:	no
Input min/max:	0.001/500	Default value:	--

P-0-0520, Hardware Code

Description:

Parameter for identification of the hardware.

The parameter is set during the manufacturing stage and cannot be changed.

P-0-0520 - Attributes

Name in German:	Hardware-Kennung		
Name in English:	Hardware Code		
ID number:	P-0-0520	Editability:	not editable
Function:	Parameter	Memory:	Amplf. EEPROM
Data length:	2 bytes	Validity check:	no
Format:	decimal	Extreme value check:	no
Unit in Ger./Eng.:	keine/none	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	--/--	Default value:	--

P-0-1003, Velocity Feedback Value Filter Time Base

Description:

The velocity feedback value filter is used as a VZ1 low-pass filter. This filter time constant is adjusted within this parameter.

The filter does not work at an input of 500 usec.

P-0-1003 - Attributes

Name in German:	Geschwindigkeitswert Filterzeitkonstante		
Name in English:	Velocity feedback value filter time base		
ID number:	P-0-1003	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit in Ger./Eng.:	us/us	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	500/65535	Default value:	500

P-0-1222, Command Value Smoothing Time Constant

Description:

Parameter **P-0-1222, Velocity command filter** works in "Velocity regulation" operating mode and in response to the error "Velocity command value zero switch with ramp and filter".

With the time base entered here, **S-0-0036, Velocity command value** is performed in Velocity regulation operating mode along with it, using a low-pass filter. This serves to diminish surges in acceleration over the course of command values.

The resulting velocity command value results from the sum of the ramped and filtered value in **S-0-0036, Velocity command value** and the direct value in **S-0-0037, Additive velocity command value**.

P-0-1222 - Attributes

Name in German:	Geschwindigkeits-Sollwert-Filterzeitkonstante		
Name in English:	Command Value Smoothing Time Constant		
ID number:	P-0-1222	Editability:	P234
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	Validity check:	P3
Format:	DEC_OV	Extreme value check:	yes
Unit in Ger./Eng.:	us / us	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	500 / 65535	Default value:	500

P-0-4000, Current Zero Trim Phase U

Description:

This parameter serves to display the determined result of the zero trim procedure for the current feedback sensor of the U phase.

P-0-4000 - Attributes

Name in German:	Strommeß-Nullabgleich Phase U		
Name in English:	Current zero trim phase U		
ID number:	P-0-4000	Editability:	no
Function:	Parameter	Memory:	Amplf.-E ² prom
Data length:	2 bytes	Validity check:	P3
Format:	DEC_MV	Extreme value check:	yes
Unit in Ger./Eng.:	% / %	Combination check:	no
Pos. after the dec.:	2	Cyc. transmittable:	no
Input min/max:	-100.00/100.00	Default value:	--

P-0-4001, Current Zero Trim Phase V

Description:

This parameter serves to display the determined result of the zero trim procedure for the current feedback sensor of the V phase.

P-0-4001 - Attributes

Name in German:	Strommeß-Nullabgleich Phase V		
Name in English:	Current zero trim phase V		
ID number:	P-0-4001	Editability:	no
Function:	Parameter	Memory:	Amplf.-E ² prom
Data length:	2 bytes	Validity check:	P3
Format:	DEC_MV	Extreme value check:	yes
Unit in Ger./Eng.:	% / %	Combination check:	no
Pos. after the dec.:	2	Cyc. transmittable:	no
Input min/max:	-100.00/100.00	Default value:	--

P-0-4002, Current Amplify Trim Phase U

Description:

The test field of this parameter is used to trim the current sensor in reference to its amplifier error with a DKC devices.

P-0-4002 - Attributes

Name in German:	Strommeßverstärkungsabgleich Phase U		
Name in English:	Current amplify trim phase U		
ID number:	P-0-4002	Editability:	no
Function:	Parameter	Memory:	Amplf.-E ² prom
Data length:	2 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	4	Cyc. transmittable:	no
Input min/max:	0.0001/2.0000	Default value:	--

P-0-4003, Current Amplify Trim Phase V

Description:

The test field of this parameter is used to trim the current sensor in reference to its amplifier error with a DKC devices.

P-0-4003 - Attributes

Name in German:	Strommeßverstärkungsabgleich Phase V		
Name in English:	Current amplify trim phase V		
ID number:	P-0-4003	Editability:	no
Function:	Parameter	Memory:	Amplf.-E ² prom
Data length:	2 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	4	Cyc. transmittable:	no
Input min/max:	0.0001/2.0000	Default value:	--

P-0-4004, Magnetization Current

Description:

This parameter is not in use. It does not appear in DriveTop.

P-0-4004 - Attributes

Name in German:	Magnetisierungsstrom		
Name in English:	Magnetization current		
ID number:	P-0-4004	Editability:	P23
Function:	Parameter	Memory:	fixed
Data length:	4 bytes	Validity check:	no
Format:	DEC_OV	Extreme value check:	no
Unit in Ger./Eng.:	A/A	Combination check:	no
Pos. after the dec.:	3	Cyc. transmittable:	no
Input min/max:	0.001/500.000	Default value:	0

P-0-4005 Back EMF Constant

Description:

This parameter is not in use.

P-0-4005 - Attributes

Name in German:	EMK-Konstante		
Name in English:	Back EMF constant		
ID number:	P-0-4005	Editability:	--
Function:	Parameter	Memory:	fixed
Data length:	4 bytes	Validity check:	no
Format:	decimal	Extreme value check:	no
Unit in Ger./Eng.:	Vs/rad/Vs/rad	Combination check:	no
Pos. after the dec.:	4	Cyc. transmittable:	no
		Default value:	--
Input min/max:	0.0001/429496.7295		

P-0-4006, Process block Target Position

Description:

List of the target positions for block-controlled operating mode (positioning interface). Up to 64 position values can be entered, where the first element specifies the target position of process command 0 and the second element specifies the target position of process command 1, etc.

The number of the target positions must always be greater than or equal to the number of the process commands to be handled. If process commands are selected for which there are no target positions, then the warning "non-programmed process command" will be generated.

P-0-4006 - Attributes

Name in German:	Verfahrsatz Zielposition		
Name in English:	Process block target position		
ID number:	P-0-4006	Editability:	P2/P3/P4
Function:	Parameter	Memory:	parallel EEPROM
		Validity check:	yes
Format:	S-0-0076	Extreme value check:	yes
Unit in Ger./Eng.:	S-0-0076	Combination check:	no
Pos. after the dec.:	S-0-0076	Cyc. transmittable:	no
Input min/max:	S-0-0076	Default value:	--
Data length:	A list with 64 elements per 4 bytes, total 256 bytes		

P-0-4007, Process block Velocity

Description:

List of the process command velocity for block-controlled operating mode (positioning interface). Up to 64 velocities values can be entered, where the first element specifies the maximum velocity of process command 0 and the second element specifies the velocity of process command 1, etc.

The number of the process command velocities must always be greater than or equal to the number of process commands to be handled. If process commands are selected for which there are no process command velocities, then the warning **"non-programmed process command"** will be generated.

P-0-4007 - Attributes

Name in German:	Verfahrensatz Geschwindigkeit		
Name in English:	Process block velocity		
ID number:	P-0-4007	Editability:	P2/P3/P4
Function:	Parameter	Memory:	parallel EEPROM
		Validity check:	yes
Format:	S-0-0044	Extreme value check:	yes
Unit in Ger./Eng.:	S-0-0044	Combination check:	no
Pos. after the dec.:	S-0-0044	Cyc. transmittable:	no
Input min/max:	0/S-0-0044	Default value:	10.0000
Data length:	A list with 64 elements per 4 bytes, total 256 bytes		

P-0-4008, Process block Acceleration

Description:

A list of the acceleration for the block-controlled operating mode (positioning interface). Up to 64 acceleration values can be entered, where the first element specifies the maximum acceleration of process command 0 and the second element specifies the acceleration of process command 1, etc.

The number of accelerations must always be greater than or equal to the number of operation process commands. If process commands are selected for which there is no acceleration, then the warning "non-programmed method operation" will be generated.

P-0-4008 - Attributes

Name in German:	Verfahrensatz Beschleunigung		
Name in English:	Process block acceleration		
ID number:	P-0-4008	Editability:	P2/P3/P4
Function:	Parameter	Memory:	parallel EEPROM
		Validity check:	yes
Format:	decimal	Extreme value check:	yes
Unit in Ger./Eng.:	S-0-0160	Combination check:	no
Pos. after the dec.:	S-0-0160	Cyc. transmittable:	no
Input min/max:	>0/S-0-0160	Default value:	100.000
Data length:	A list with 64 elements per 4 bytes, total 256 bytes		

P-0-4009, Process block Jerk

Description:

List of the jerk limit value for block-controlled operating mode (positioning interface). Up to 64 jerk limit values can be entered, where the first element specifies the maximum jerk limit value of process command 0 and the second element specifies the maximum jerk limit value of process command 1, etc.

The number of the jerk limit values must be greater than or equal to the number of operation process commands. If process commands are selected for which there is no jerk limit value, then the warning "non-programmed process command" will be generated.

The jerk limit can be turned off by entering 0.

P-0-4009 - Attributes

Name in German:	Verfahrsatz Ruck		
Name in English:	Process block jerk		
ID number:	P-0-4009	Editability:	P2/P3/P4
Function:	Parameter	Memory:	yes
		Validity check:	yes
Format:	Parameter	Extreme value check:	no
Unit in Ger./Eng.:	S-0-0160	Combination check:	no
Pos. after the dec.:	S-0-0160	Cyc. transmittable:	no
Input min/max:	0/S-0-0160	Default value:	0
Data length:	A list with 64 elements per 4 bytes, total 256 bytes		

P-0-4010, Load Inertia

Description:

The parameter contains the calculated load inertia independent of **P-0-0510, Moment of inertia of the rotor**. The load inertia is useful in optimizing the rotation velocity control, but is **not used** in the current version. The load refers to the motor, in a rotational sense.

Also see **P-0-0510, Moment of inertia of the rotor**

P-0-4010 - Attributes

Name in German:	Lastträgheitsmoment		
Name in English:	Load inertia		
ID number:	P-0-4010	Editability:	P234 (always)
Function:	Parameter	Memory:	Param.E ² prom
Data length:	4 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit in Ger./Eng.:	kg m ² /kg m ²	Combination check:	no
Pos. after the dec.:	6	Cyc. transmittable:	no
Input min/max:	0/2147.483647	Default value:	0

P-0-4011, Switching Frequency

Description:

This parameter can be used to set the switch frequency of the pulse switching controller to 4 and 8 kHz.

P-0-4011 - Attributes

Name in German:	Schaltfrequenz		
Name in English:	Switching frequency		
ID number:	P-0-4011	Editability:	P23
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit in Ger./Eng.:	kHz/kHz	Combination check:	yes
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	4/8	Default value:	4

P-0-4012, Slip Factor

Description:

This parameter is not in use. It does not appear in DriveTop.

P-0-4012 - Attributes

Name in German:	Schlupffaktor		
Name in English:	Slip factor		
ID number:	P-0-4012	Editability:	-
Function:	Parameter	Memory:	fixed
Data length:	2 bytes	Validity check:	-
Format:	DEC_OV	Extreme value check:	no
Unit in Ger./Eng.:	Hz/100A/Hz/100A	Combination check:	no
Pos. after the dec.:	2	Cyc. transmittable:	no
Input min/max:	-/-	Default value:	--

P-0-4013 Maximum Rotor Frequency

Description:

This parameter is not in use. It does not appear in DriveTop.

P-0-4013 - Attributes

Name in German:	Maximale Rotorfrequenz		
Name in English:	Maximum rotor frequency		
ID number:	P-0-4013	Editability:	-
Function:	Parameter	Memory:	fixed
Data length:	2 bytes	Validity check:	-
Format:	DEC_OV	Extreme value check:	no
Unit in Ger./Eng.:	Hz/Hz	Combination check:	no
Pos. after the dec.:	2	Cyc. transmittable:	no
Input min/max:	-/-	Default value:	--

P-0-4014, Motor Type

Description:

The motor type can be selected with this parameter. The parameter cannot be changed, since only synchronous motors can be operated.

- 1: Synchronous motor

P-0-4014 - Attributes

Name in German:	Motorart		
Name in English:	Motor type		
ID number:	P-0-4014	Editability:	no
Function:	Parameter	Memory:	Param.E ² prom
Data length:	2 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	1/5	Default value:	--

P-0-4015, Intermediate Voltage

Description:

The DC bus voltage is stored in the amplifier as a parameter.

The parameter is not editable and serves only for display, as well as for internal calculations (PWM).

P-0-4015 - Attributes

Name in German:	Zwischenkreisspannung		
Name in English:	Intermediate Voltage		
ID number:	P-0-4015	Editability:	no
Function:	Parameter	Memory:	Amplf.
Data length:	2 bytes	Validity check:	Phase 3
Format:	DEC_OV	Extreme value check:	yes
Unit in Ger./Eng.:	V/V	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	1/1000	Default value:	--

P-0-4016, Dynamic Compensation

Description:

This parameter is not in use.

P-0-4016 - Attributes

Name in German:	Dynamischer Kommutierungsoffset		
Name in English:	Dynamic compensation		
ID number:	P-0-4016	Editability:	-
Function:	Parameter	Memory:	Amplf.-E ² prom
Data length:	2 bytes	Validity check:	yes
Format:	DEC_OV	Extreme value check:	yes
		Combination check:	no
Pos. after the dec.:	2	Cyc. transmittable:	no
Input min/max:	0.00/3.80	Default value:	--
Unit in Ger./Eng.:	Grad/1000Upm/Degrees/1000rpm		

P-0-4019, Process block Mode

Description:

Setup for process command mode for each individual process command ("relative process command", "absolute process command", travel in positive direction" or "travel in negative direction"). The first element of the list specifies the mode for the process command 0, the second specifies the mode for the process command 1, etc.

Process mode	Value to be set up
Absolute process command	1 h
Relative process command	2 h
Travel in pos. direction	4 h
Travel in neg. direction	8 h

Fig. 2-7: Possible adjustable process command modes

Also see Functional Description: "Positioning Operation"

The higher-ordered bits designate the mode in **Following block operating mode**.

The number of process command modes must always be greater than or equal to the number of process commands to be handled. If process commands are selected for which there are no process modes, the warning "non-programmed process command" will be generated.

P-0-4019 - Attributes

Name in German:	Verfahrensat Modus	Editability:	P2/P3/P4
Name in English:	Process block Mode	Memory:	parallel EEPROM
ID number:	P-0-4019	Validity check:	yes
Function:	Parameter	Extreme value check:	no
Format:	HEX	Combination check:	yes
Unit in Ger./Eng.:	--/--	Cyc. transmittable:	no
Pos. after the dec.:	--	Default value:	1
Input min/max:	--/--		
Data length:	A list with 64 elements per 2 bytes, total 128 bytes		

P-0-4021, Baud Rate (RS232/485)

Description:

Various baud rates can be set for communication via serial interface.

Baud rate [Baud]	Setting in parameter P-0-4021
9600	0
19200	1

Fig. 2-8: Possible baud rates

Note: Do not turn off baud rates in the list of all parameters in DriveTop. Doing this will block out further communication.

P-0-4021 - Attributes

Name in German:	Baud - Rate (RS232/485)		
Name in English:	Baud rate (RS232/485)		
ID number:	P-0-4021	Editability:	P2/P3/P4
Function:	Parameter	Memory:	parallel EEPROM
Data length:	2 bytes	Validity check:	yes
Format:	decimal	Extreme value check:	yes
Unit in Ger./Eng.:	-/-	Combination check:	no
Pos. after the dec.:	-	Cyc. transmittable:	no
Input min/max:	0/3	Default value:	0

P-0-4022, Drive Address

Description:

The address for the drive can be set here, providing the address deviates from the coding switches selected. For communication via RS485-interface with more than one drive, each drive must contain a different address, so that at any one time only the drive actually accessed will respond.

The address can range from 0 to 99.

A terminal program is used to select the drive with the desired address, with drive address BCD.

Also see Functional Description: Setting the Drive Address

P-0-4022 - Attributes

Name in German:	Antriebsadresse		
Name in English:	Drive address		
ID number:	P-0 4022	Editability:	P2
Function:	Parameter	Memory:	parallel EEPROM
Data length:	2 bytes	Validity check:	yes
Format:	decimal	Extreme value check:	yes
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	--	Cyc. transmittable:	no
Input min/max:	0/65535	Default value:	256

P-0-4023, C4 Communicationphase 2 transition check

Description:

Switching command from drive mode (phase 3, P3) into parameter mode (phase 2, P2).

The command can only be processed if the controller enable is turned off.

Also see Functional Description: DriveTop Menu Structure

P-0-4023 - Attributes

Name in German:	C4 Umschalten auf Phase 2		
Name in English:	C4 Communicationphase 2 transition check		
ID number:	P-0-4023	Editability:	P2/P3/P4
Function:	Command	Memory:	no
Data length:	2 bytes	Validity check:	no
Format:	Binary	Extreme value check:	yes
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	--	Cyc. transmittable:	no
Input min/max:	0/11 b	Default value:	--

P-0-4024, Test Status

Description:

Provides information about the progress on product in development.

P-0-4024 - Attributes

Name in German:	Prüfstatus		
Name in English:	Test status		
ID number:	P-0-4024	Editability:	--
Function:	Parameter	Memory:	Amplf.-E ² prom
Data length:	2 bytes	Validity check:	P3
Format:	HEX	Extreme value check:	no
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	--	Cyc. transmittable:	no
Input min/max:	--/--	Default value:	no

P-0-4025, Password

Description:

A password can be entered to prevent any unauthorized users from writing values to any of the parameters. The password "007" is set when the product is delivered. Parameters can be written to by using the password "007".

Also see Functional Description: "Password protection"

P-0-4025 - Attributes

Name in German:	Passwort	Editability:	P2/P3/P4
Name in English:	Password	Memory:	parallel EEPROM
ID number:	P-0-4025	Validity check:	no
Function:	Parameter	Extreme value check:	no
Data length:	max.	Combination check:	no
Format:	ASCII	Cyc. transmittable:	no
Unit in Ger./Eng.:	--/--	Default value:	--
Pos. after the dec.:	--		
Input min/max:	--/--		

P-0-4026, Process block Selection

Description:

You can use this parameter to read the process command selected by input signals P0 to P5 when "Drive halt" has occurred. If the device is in "drive enable" (AF), then the number of the positioning command which currently being processed can be read here.

P-0-4026 - Attributes

Name in German:	Verfahrensauswahl	Editability:	yes
Name in English:	Process block selection	Memory:	no
ID number:	P-0-4026	Validity check:	no
Function:	Parameter	Extreme value check:	yes
Data length:	2 bytes	Combination check:	no
Format:	decimal	Cyc. transmittable:	no
Unit in Ger./Eng.:	--/--	Default value:	--
Pos. after the dec.:	--		
Input min/max:	0/61		

P-0-4027, Function Parameter

Description:
A bit bar with which you can turn various functions in the firmware on and off.

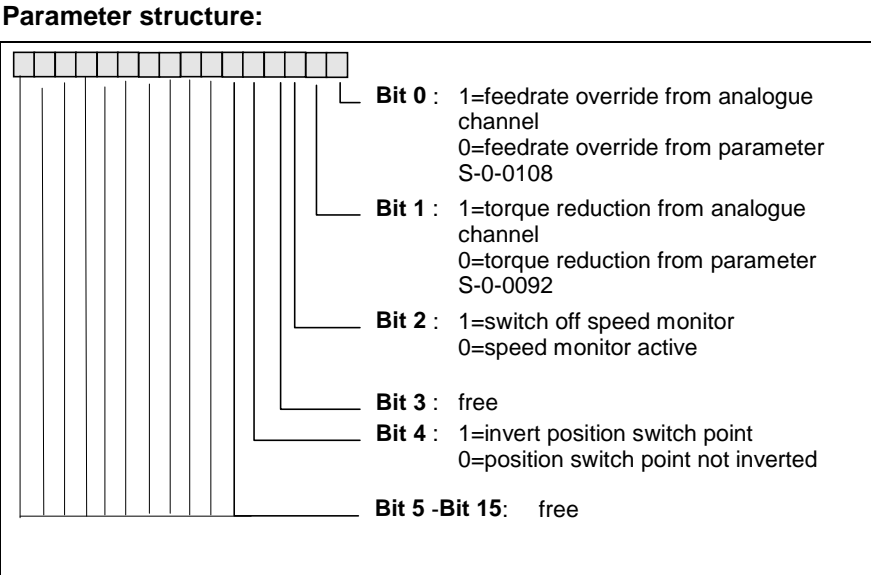


Fig. 2-20: P-0-4027, Function parameter

P-0-4027 - Attributes

Name in German:	Funktionsparameter		
Name in English:	Function parameter		
ID number:	P-0-4027	Editability:	P2
Function:	Parameter	Memory:	parallel EEPROM
Data length:	2 bytes	Validity check:	P3
Format:	HEX	Extreme value check:	no
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	--	Cyc. transmittable:	no
Input min/max:	--/--	Default value:	0 x 0040

P-0-4028, Impulse Wire Feedback Offset

Description:

This parameter is used to store the offset of the impulse wires for resolver feedback.

It is set before the product is delivered to you and stored in feedback memory.

P-0-4028 - Attributes

Name in German:	Impulsdrahtgeber-Offset		
Name in English:	Impulse wire feedback offset		
ID number:	P-0-4028	Editability:	no
Function:	Parameter	Memory:	Feedb.-E ² prom
Data length:	4 bytes	Validity check:	no
Format:	DEC	Extreme value check:	no
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	--/--	Default value:	10.0000

P-0-4029, Impulse Wire Feedback PIC Counter Value

Description:

This parameter contains the information for the absolute position of the encoder.

The value is updated at each position initialization. The value is read only (cannot be edited).

P-0-4029 - Attributes

Name in German:	Impulsdrahtgeber-Zählerstand		
Name in English:	Impulse wire feedback PIC counter value		
ID number:	P-0-4029	Editability:	no
Function:	Parameter	Memory:	Feedb.-
Data length:	4 bytes	Validity check:	no
Format:	HEX	Extreme value check:	no
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	--/--	Default value:	10.0000

P-0-4030, Jog Velocity

Description:

The limit value for the travel velocity during travel via jog input. The value must be less than the contents of parameter S-0-0091 "Bipolar velocity limit value".

Travel velocity is also affected by "**S-0-0108, Feedrate override**".

P-0-4030 - Attributes

Name in German:	Tipp-Geschwindigkeit	Editability:	P2/P3/P4
Name in English:	Jog velocity	Memory:	parallel EEPROM
ID number:	P-0-4030	Validity check:	yes
Function:	Parameter	Extreme value check:	yes
Data length:	4 bytes	Combination check:	no
Format:	decimal	Cyc. transmittable:	no
Unit in Ger./Eng.:	S -0-0044	Default value:	10.0000
Pos. after the dec.:	S -0-0044		
Input min/max:	>0/S -0-0044		

P-0-4035, Trim-Current

Description:

This parameter contains the current value with which the scaling of the **current measurement** of the drive control is precisely compared in the factory. This serves to eliminate system errors in the current measurement. The value is of no direct use to the user, and it **cannot be changed**.

Also see

P-0-4002, Current Amplify Trim Phase U and **P-0-04003, Current Amplify Trim Phase V**

P-0-4035 - Attributes

Name in German:	Abgleichstrom	Editability:	no
Name in English:	Trim-Current	Memory:	Verst.-EEPROM
ID number:	P-0-4035	Validity check:	Phase 3
Function:	Parameter	Extreme value check:	yes
Data length:	4 bytes	Combination check:	no
Format:	DEC_OV	Cyc. transmittable:	no
Unit in Ger./Eng.:	A/A	Default value:	--
Pos. after the dec.:	3		
Input min/max:	0.001/500.000		

P-0-4036, Connected Motor Type

Description:

The drive control uses this parameter to keep track of the type of motor attached to it. The information is in text format.

If the type stored in this parameter differs from the type returned by feedback, **S-0-0141, Motor type**, when operating mode is turned on, this means that a new motor has been attached. The display will then request that the user run "UL" (basic load) to initialize the motor dependent parameters. In this regard, see command **S-0-0262, Command Basic load**. A number of things take place in Basic load, including overwriting this parameter, "Connected motor type".

Also see **S-0-0141, Motor type**

P-0-4036 - Attributes

Name in German:	Angeschlossener Motortyp		
Name in English:	Connected motor type		
ID number:	P-0-4036	Editability:	P234
Function:	Parameter	Memory:	Param.EEPROM
Data length:	up to 40 symbols	Validity check:	Phase 3
Format:	ASCII	Extreme value check:	no
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	--	Cyc. transmittable:	no
Input min/max:	--/--	Default value:	empty

P-0-4037, Default Velocity Loop Proportional Gain

Description:

The default value for the velocity loop proportional gain. This parameter is set during the manufacturing stage and cannot be changed. During "Load default parameters", the value of the parameter is copied into parameter **S-0-0100, Velocity loop proportional gain**.

The scaling and the unit are different from **S-0-0100, Velocity loop proportional gain**.

The motor can be run with the default values; for optimal adaptation to the mechanical environment, parameter S-0-0100 must still be optimized.

P-0-4037 - Attributes

Name in German:	Default Drehzahlregler-Proportionalverstärkung		
Name in English:	Default velocity loop proportional gain Kp		
ID number:	P-0-4037	Editability:	no
Function:	Parameter	Memory:	Feedback
Data length:	2 bytes	Validity check:	P3
Format:	decimal	Extreme value check:	no
Unit in Ger./Eng.:	mAs/rad/mAs/rad	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	0/32767	Default value:	--

P-0-4038, Default Velocity Loop Integral Action Time

Description:

The default value for the velocity loop integral action time. This parameter is set during the manufacturing stage and cannot be changed. During "Load default parameters", the value of the parameter is copied into parameter **S-0-0101, Velocity loop integral action time**.

The motor can be operated with the default values. For optimal adaptation on the mechanical environment, parameter **S-0-0101** must still be optimized.

P-0-4038 - Attributes

Name in German:	Defaultwert Drehzahlregler-Nachstellzeit		
Name in English:	Default velocity loop integral action time		
ID number:	P-0-4038	Editability:	no
Function:	Parameter	Memory:	Feedback
Data length:	2 bytes	Validity check:	yes
Format:	decimal	Extreme value check:	yes
Unit in Ger./Eng.:	ms/ms	Combination check:	no
Pos. after the dec.:	1	Cyc. transmittable:	no
Input min/max:	0.1/6553.5	Default value:	--

P-0-4039, Default Current Loop Proportional Gain

Description:

The default value for the current loop proportional gain. This parameter is set during the manufacturing stage and cannot be changed. During "Load default parameters", the value of the parameter is copied into parameter **S-0-0106, Proportional gain 1 current regulator**.

The current loop gain is already optimized and should not be changed.

P-0-4039 - Attributes

Name in German:	Default Stromregler-Proportionalverstärkung		
Name in English:	Default current loop proportional gain		
ID number:	P-0-4039	Editability:	no
Function:	Parameter	Memory:	Feedback
Data length:	2 bytes	Validity check:	yes
Format:	decimal	Extreme value check:	yes
Unit in Ger./Eng.:	V/A/V/A	Combination check:	no
Pos. after the dec.:	2	Cyc. transmittable:	no
Input min/max:	0/500	Default value:	--

P-0-4040, Digital Inputs

Description:

Bit bar for reading DKC digital input signals. At the limit switches and the zero switch, 1 means: there is a voltage of approximately 24V at the input. The other signals come from the Profibus interface.

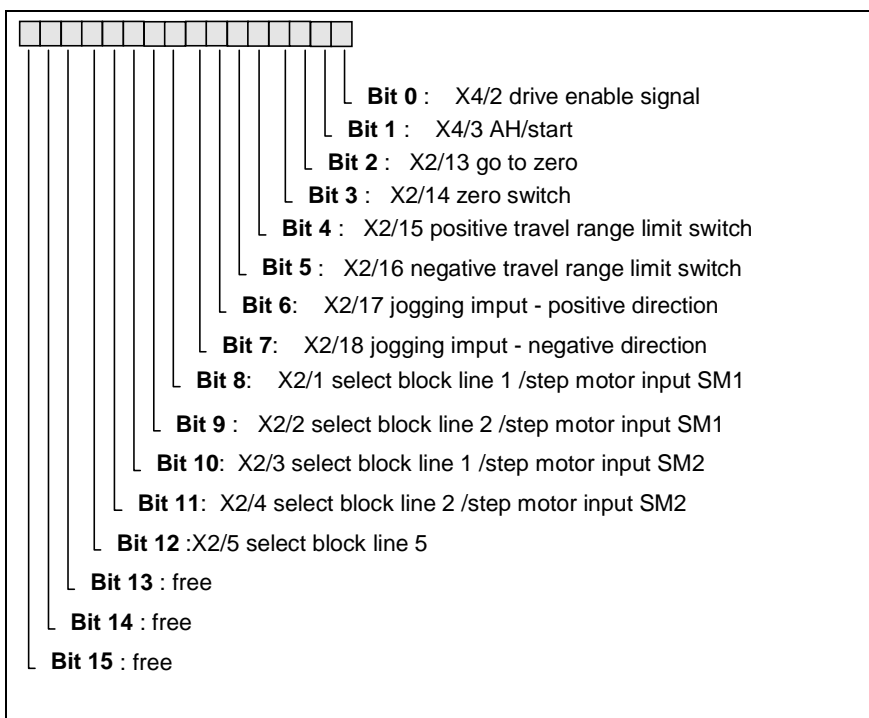


Fig. 2-21: P-0-4040 digital inputs

Also see Functional Description "Drive control word"

P-0-4040 - Attributes

Name in German:	Digitale Eingänge	Editability:	no
Name in English:	Digital Inputs	Memory:	no
ID number:	P-0-4040	Validity check:	no
Function:	Parameter	Extreme value check:	no
Data length:	2 bytes	Combination check:	no
Format:	binary	Cyc. transmittable:	no
Unit in Ger./Eng.:	--/--	Default value:	--
Pos. after the dec.:	--		
Input min/max:	--/--		

P-0-4041, Digital Outputs

Description:

A bit bar with DKC digital output signals.

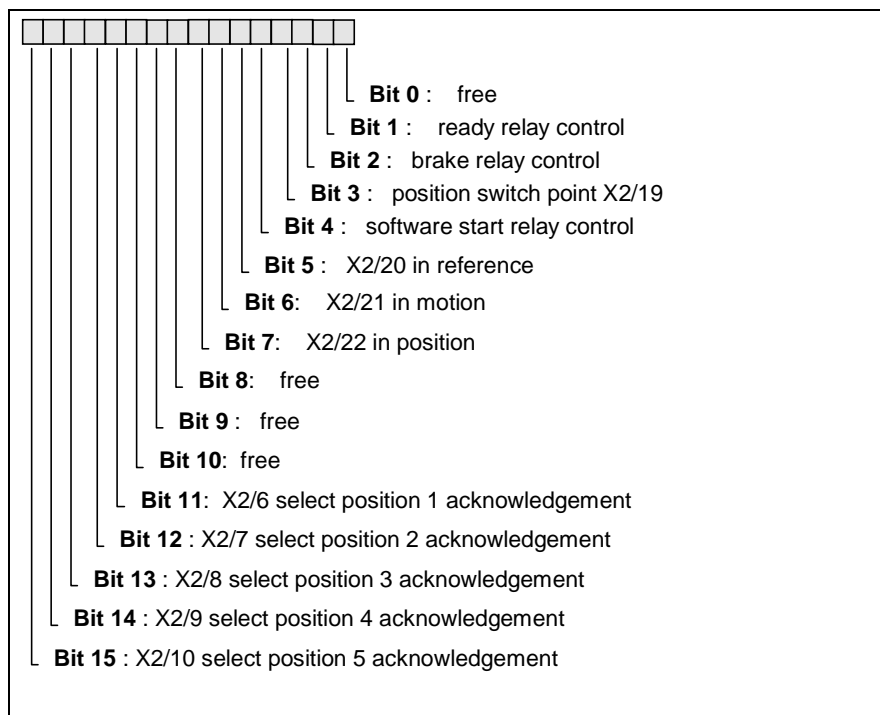


Fig. 2-22: P-0-4041 digital outputs

Note: The highest-ordered bit of the process command acknowledgement will be truncated.

Also see Functional Description Drive control word"

P-0-4041 - Attributes

Name in German:	Digitale Ausgänge		
Name in English:	Digital outputs		
ID number:	P-0-4041	Editability:	no
Function:	Parameter	Memory:	no
Data length:	2 bytes	Validity check:	no
Format:	Binary	Extreme value check:	no
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	--	Cyc. transmittable:	no
Input min/max:	--/--	Default value:	--

P-0-4042, Default Velocity Loop Delay Time**Description:**

The default value for the velocity loop smoothing base. This parameter is set during the manufacturing stage and cannot be changed. During "Load default parameters", the value of the parameter is copied into parameter **P-0-0004, Smoothing Time Constant**.

P-0-4042 - Attributes

Name in German:	Defaultwert Drehzahlregler-Glättungszeitkonstante		
Name in English:	Default velocity loop delay time		
ID number:	P-0-4042	Editability:	no
Function:	Parameter	Memory:	Feedback
Data length:	2 bytes	Validity check:	P3
Format:	decimal	Extreme value check:	yes
Unit in Ger./Eng.:	us/us	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	500/65535	Default value:	--

P-0-4043, Bleeder Overload Factor

Description:

The parameter describes the transient overloadability of the installed braking resistance. If the bleeder overload factor = 60, then the peak capacity of the braking resistance is 60 times the continuous capacity. This parameter is set during the manufacturing stage and cannot be changed.

P-0-4043 - Attributes

Name in German:	Bleederüberlastfaktor		
Name in English:	Bleeder overload factor		
ID number:	P-0-4043	Editability:	no
Function:	Parameter	Memory:	Amplf.-EEProm
Data length:	2 bytes	Validity check:	P3
Format:	decimal	Extreme value check:	yes
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	1/100	Default value:	--

P-0-4044, Bleeder load

Description:

This parameter specifies the average capacity of the braking resistance. 100% here means that the braking resistance will be applied continuously. For a safe operation, the load should be < 80% The value is very highly smoothed.

In order to determine whether a processing cycle is placing excessive load on the braking resistance, the analog signal "Bleeder load" should be considered.

P-0-4044 Attributes

Name in German:	Bleederauslastung		
Name in English:	Bleeder Load		
ID number:	P-0-4044	Editability:	no
Function:	Parameter	Memory:	no
Data length:	2 bytes	Validity check:	no
Format:	decimal	Extreme value check:	no
Unit in Ger./Eng.:	% / %	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	--/--	Default value:	--

P-0-4045, Active permanent Current

Description:

This parameter indicates how much current the drive can supply in the current combination in continuous operation. This value, when multiplied by the **P-0-0051, Torque constant** of the motor, yields the continuous available torque.

This parameter is calculated by the drive controller when operating mode is turned on, and cannot be changed. The following **current and torque/force limits** and settings are used to determine this limit value:

ID Number	Name	Unit
S-0-0111	Motor current at standstill 1)	A
S-0-0112	Amplifier continuous current 1	A
P-0-0518	Amplifier nominal current 2	A
S-0-0092	Bipolar torque limit 2)	%
P-0-0006	Overload factor 3)	%

Fig. 2-9: Factors for determining active continuous current

1) The motor current at standstill is that value to which the percentage specifications are related; it corresponds to 100%.

2) included if < 100%

The overload factor is not linearly dependent. It should be considered in connection with continuous current 1 and nominal current 2.

P-0-4045 - Attributes

Name in German:	Wirksamer Dauerstrom		
Name in English:	Active permanent current		
ID number:	P-0-4045	Editability:	no
Function:	Parameter	Memory:	no
Data length:	4 bytes	Validity check:	no
Format:	DEC_OV	Extreme value check:	no
Unit in Ger./Eng.:	A/A	Combination check:	no
Pos. after the dec.:	3	Cyc. transmittable:	no
Input min/max:	--/--	Default value:	--

P-0-4046, Active Peak Current

Description:

This parameter shows how much current the drive can supply in the current combination **momentarily** (0.4s). When multiplied by the **P-0-0051, Torque constant** of the motor, it yields the available transient torque (e.g. for acceleration procedures).

This parameter is calculated by the drive controller when operating mode is turned on, and cannot be changed. The following **current and torque/force limits** and settings are used to determine this limit value:

ID Number	Name	Unit
S-0-0109	Motor peak current	A
S-0-0110	Amplifier peak current 1	A
P-0-0519	Amplifier peak current 2	A
S-0-0092	Bipolar torque limit	%
P-0-0006	Overload factor 3)	%

Fig. 2-10: Factors in determining the active peak current

3) The overload factor is not linearly dependent. It should be considered in connection with peak current 1 and peak current 2.

P-0-4046 - Attributes

Name in German:	Wirksamer Spitzenstrom		
Name in English:	Active peak current		
ID number:	P-0-4046	Editability:	no
Function:	Parameter	Memory:	no
Data length:	4 bytes	Validity check:	no
Format:	DEC_OV	Extreme value check:	no
Unit in Ger./Eng.:	A/A	Combination check:	no
Pos. after the dec.:	3	Cyc. transmittable:	no
Input min/max:	--/--	Default value:	--

P-0-4047, Motor Inductance

Description:

The inductance of the motor as measured between two supply terminals.
This parameter is set during the manufacturing stage and cannot be changed.

P-0-4047 - Attributes

Name in German:	Motorinduktivität		
Name in English:	Motor inductance		
ID number:	P-0-4047	Editability:	no
Function:	Parameter	Memory:	Feedback
Data length:	2 bytes	Validity check:	no
Format:	decimal	Extreme value check:	no
Unit in Ger./Eng.:	mH/mH	Combination check:	no
Pos. after the dec.:	2	Cyc. transmittable:	no
Input min/max:	0/655.35	Default value:	--

P-0-4048, Stator Resistance

Description:

The stator resistance of the motor as measured between two supply terminals.
This parameter is set during the manufacturing stage and cannot be changed.

P-0-4048 - Attributes

Name in German:	Wicklungswiderstand		
Name in English:	Stator resistance		
ID number:	P-0-4048	Editability:	no
Function:	Parameter	Memory:	Feedback
Data length:	2 bytes	Validity check:	no
Format:	decimal	Extreme value check:	no
Unit in Ger./Eng.:	Ohm/Ohm	Combination check:	no
Pos. after the dec.:	3	Cyc. transmittable:	no
Input min/max:	0/65.535	Default value:	--

P-0-4049, Default Current Loop Integral Action Time

Description:

The default value for the current loop integral action time. This parameter is set during the manufacturing stage and cannot be changed. During "Load default parameters", the value of the parameter are copied into parameter **S-0-0107, Current Regulator 1 Integral Action Time**.

The current loop integral action time is already optimized and cannot be changed.

P-0-4049 - Attributes

Name in German:	Defaultwert Stromregler-Nachstellzeit		
Name in English:	Default current loop integral action time		
ID number:	P-0-4049	Editability:	no
Function:	Parameter	Memory:	Feedback
Data length:	2 bytes	Validity check:	no
Format:	decimal	Extreme value check:	yes
Unit in Ger./Eng.:	ms/ms	Combination check:	no
Pos. after the dec.:	1	Cyc. transmittable:	no
Input min/max:	0/6553.5	Default value:	--

P-0-4050, Delay Answer RS232/485

Description:

Defines the minimal time that must pass after the last character of a telegram has been received over the serial interface before the first symbol of the response can be sent. This time span is required for RS485 operation for switching from send to receive operating mode or vice-versa. This parameter is not actually required for RS232 mode, but should nevertheless be set to 1ms.

Also see Functional Description: General Information for Serial Communication

P-0-4050 - Attributes

Name in German:	Antwortverzögerung RS232/485		
Name in English:	Delay answer RS232/485		
ID number:	P-0-4050	Editability:	P2/P3/P4
Function:	Parameter	Memory:	Param.EEPROM
Data length:	2 bytes	Validity check:	P3
Format:	decimal	Extreme value check:	yes
Unit in Ger./Eng.:	ms/ms	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	0/200	Default value:	0

P-0-4051 Process block Acquittance

Description:

This parameter reflects the positioning command selection acquittance. It is also accessible in the profibus outputs provided for this purpose.

At **Drive_Start = 0** (Drive Halt) the acquittance displays the preselected positioning command, **inverted** (complement), if controller enable = 1.

At **Drive_Start = 1** acquittance displays the current positioning command, and is **not inverted**, if it was accepted.

Also see Functional Description: "Acquittance of positioning block selection with controller enable active"

P-0-4051 - Attributes

Name in German:	Positioniersatzquittung		
Name in English:	Process block acquittance		
ID number:	P-0-4051	Editability:	no
Function:	Parameter	Memory:	no
Data length:	2 bytes	Validity check:	no
Format:	DEC_OV	Extreme value check:	no
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	--/--	Default value:	--

P-0-4052 Last Process block

Description:

This parameter contains the number of the last accepted positioning command. This last process command number is also available after switching off and back on as the positioning block selection acquittance, as long as controller enable has not been given.

P-0-4052 - Attributes

Name in German:	Letzter angenommener Positioniersatz		
Name in English:	Last process block		
ID number:	P-0-4052	Editability:	P2
Function:	Parameter	Memory:	Param.EEPROM
Data length:	2 bytes	Validity check:	P3
Format:	DEC_OV	Extreme value check:	no
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	0	Cyc. transmittable:	no
Input min/max:	--/--	Default value:	--

P-0-4094 C8 Command Base-Parameter load

Description:

When this command is executed, all parameters in the parallel EEPROM will be set to the default values in the EProm. Invalid parameters will be corrected.

After the firmware version is changed, all parameters will be set to invalid values. The drive then reports "PL" on the seven-segment display (the serial interface is not yet active). You can also start this command by pressing the S1 key, so that all parameters will revert to the default value.

Also see **C800, Command load basic parameter**

P-0-4094 - Attributes

Name in German:	Kommando Parameter-Default-Einstellung		
Name in English:	C8 Command Base-Parameter load		
ID number:	P-0-4094	Editability:	P2
Function:	Command	Memory:	no
Data length:	2 bytes	Validity check:	no
Format:	Binary	Extreme value check:	yes
Unit in Ger./Eng.:	--/--	Combination check:	no
Pos. after the dec.:	--	Cyc. transmittable:	no
Input min/max:	0/11 b	Default value:	--

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ECODRIVE
DKC03.1 Drive controller

Supplement B
Diagnostic Message Description
PDP 03VRS

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2-1

1 DIAGNOSTIC MESSAGE DESCRIPTION

1.1 Trouble Shooting Guide

The following diagnostic descriptions explain the meaning of the H1 status display on the DKC. The meaning, possible causes for the error, and the possible remedies are described in this section.

You should proceed in this order for every incident:

- Read the diagnostic display on the device or DriveTop.
- Take note of the diagnostic description.
- Eliminate the cause of the error.
- Clear the error.

There are three ways to clear an error:

- The S1 reset button on the drive.
- DriveTop
- Profibus Freset

If a malfunction cannot be eliminated with the help of the diagnostic descriptions, please contact **INDRAMAT** customer service.

Reset Button S1

After the error has been eliminated, the error message must be cleared by pressing the Clear error button S1. The drive controller has an error memory which works on the "first-in, first-out" principle. If several errors occur in a row, the first 4 will be saved. The error which occurred first is displayed on H1. Each time the S1 key is pressed, the error which is displayed will be cleared and the next error will appear in the display until all of the saved errors have been cleared.

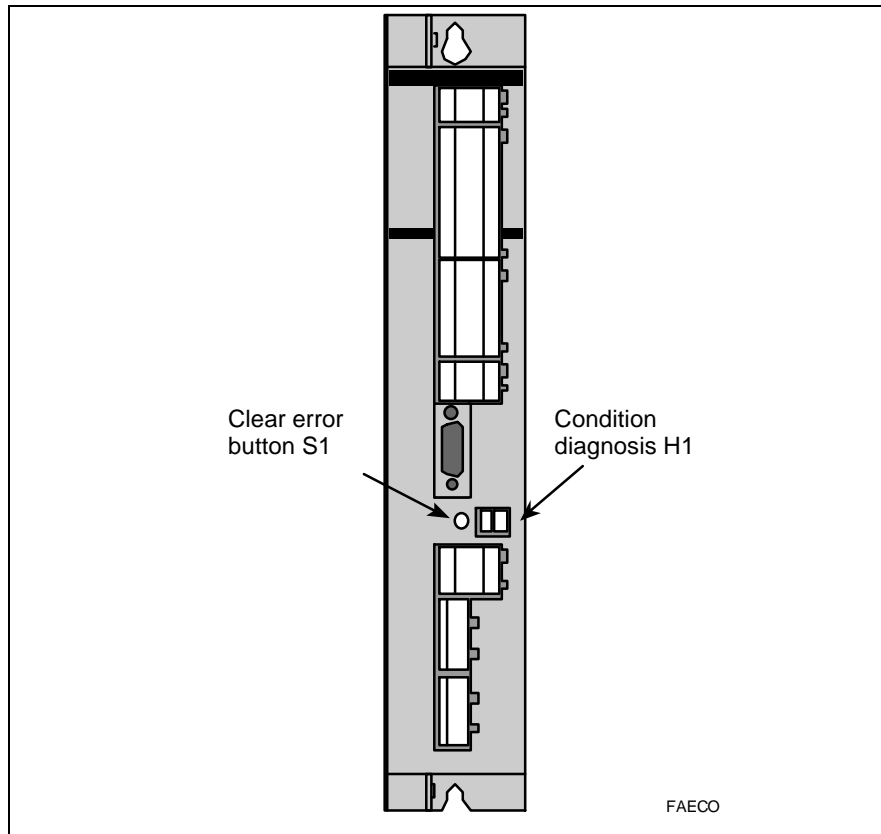


Fig. 1-1: Condition diagnosis H1 and clear error button S1 on the DKC03

Condition Display H1

The H1 condition display on the front side of the DKC gives information about:

- Operating condition of the drive controller
- Drive controller or cable malfunctions
- Motor malfunctions
- Malfunctions caused by invalid parameter input
- Application errors

1.2 Error Diagnostic Messages

UL Motor Type Not Reported

Description:

The settings for current regulation, velocity command, and position loop are stored in the feedback of the motor. When the controller is connected to a motor for the first time, the controller displays that the controller settings are not the right ones for that motor. If the Basic load command is started, the default controller settings are loaded into the drive controller from feedback memory.

By pressing the S1 button on the drive controller, you cause the drive to overwrite its stored parameters with the control loop parameters from the motor feedback.

Cause:

Motor was exchanged.

The parameter file was loaded in which parameter "**P-0-4036, Connected motor type**" distinguishes motor types.

Remedy:

Activate command "C700 Basic load" or press the S1 button.

F208 Attributes

SS Display:	UL
Diagnostic message:	F208 Motortyp nicht angemeldet F208 Motor type not reported
Diagnostic message number:	F208
Error class:	Non-fatal
Error number:	208

PL Load Default Parameter Values

Description:

After changing firmware (EPROMs), if the parameters have been changed in regards to the old product, the drive will display "**PL**". By pressing the S1 button on the controller, or by activating the "Load basic parameter command", you will cause all parameters to be deleted and the default values will be restored.

Cause:

The firmware was changed, and the number of parameters of the new firmware was different than that of the older one.

Remedy:

Press S1 button on the drive controller. This will erase all the parameters and restore the default values.

**WARNING**

⇒ This procedure will overwrite all parameters and process commands.

F209 Attributes

SS Display:	PL
Diagnostic message:	PL Defaultwerte der Parameter laden PL Load default parameter values
Diagnostic message number:	PL
Error class:	Non-fatal

F207 Switching to an Uninitialized Operating Mode**Description:**

A valid operating mode has not been defined.

Generally this error cannot occur with DKC03, since operating mode input is checked as part of the input.

Remedy:

Input the correct operating mode.

F207 Attributes

SS Display:	F2/07
Diagnostic message:	F207 Umsch. auf nicht initial. Betriebsart F207 Switching to an uninitialized operation mode
Error number:	207
Diagnostic message number:	F207
Error class:	Non-fatal

F218 Heatsink Overtemperature Shutdown**Description:**

The temperature of the DKC's heatsink is monitored. If the temperature of the heatsink gets too high, the drive will power down in order to protect it from damage.

Cause:

1. Ambient temperature is too high. The specified operational data is valid up to an ambient temperature of 45°C/113°F.
2. The DKC's heatsink is dirty.
3. Air flow is prevented by other assembly parts or a control panel assembly.
4. Heatsink blower may be defective.

Remedy:

- For 1. Reduce the ambient temperature. For example, you could cool the control cabinet.
- For 2. Remove any obstruction or dirt from the heatsink.
- For 3. Install the device vertically and clear a large enough area for proper heatsink ventilation.
- For 4. Replace the drive.

F218 Attributes

SS Display:	F2/18
Diagnostic message:	F218 Verstärkerübertemp.-Abschaltung F218 Heatsink overtemperature shutdown
Error number:	218
Diagnostic message number:	F218
Error class:	Non-fatal

F219 Motor Overtemperature Shutdown

Description:

The motor is too hot. In response, the drive controller has issued the warning: "**E251 Motor overtemperature warning**" for approx. 30 seconds. The drive controller then shuts down immediately.

Cause:

1. The motor became overloaded. The effective torque demand on the motor was above its allowable continuous torque level for too long.
2. Short or ground in the connection to the motor temperature monitor.
3. Instability in the velocity loop.

Remedy:

- For 1. Check the layout of the motor. If the system has been in operation for a long time, check to see if the operating conditions have changed (in regard to pollution, friction, moved components, etc.).
- For 2. Check wires and cables to the motor temperature monitor for wire breaks and short circuits.
- For 3. Check velocity loop parameters.

F219 Attributes

SS Display:	F2/19
Diagnostic message:	F219 Motorübertemp.-Abschaltung F219 Motor overtemperature shutdown
Error number:	219
Diagnostic message number:	F219
Error class:	Non-fatal

F220 Bleeder Overtemperature Shutdown**Description:**

Overload of the bleeder resistor. When the maximum braking energy has been exceeded, the drive controller is turned off after it is stopped, thereby protecting the bleeder from temperature damage.

Cause:

1. The energy feed back from the machine's mechanism via the motor is too great.

Remedy:

- For 1. For too much power ---> reduce the acceleration value.
For too much energy ---> reduce the velocity.
Check the drive controller layout.
If necessary, install an additional bleeder module.

F220 Attributes

SS Display:	F2/20
Diagnostic message:	F220 Abschaltung wegen Bleederüberlast F220 Bleeder overtemperature shutdown
Error number:	220
Diagnostic message number:	F220
Error class:	Non-fatal

F226 Under Voltage Error**Description:**

The level of the DC bus voltage is monitored by the drive controller. If the DC bus voltage falls below a minimal threshold, the drive independently shuts down according to the error response that was set.

Cause:

1. The power source has been interrupted without switching off the drive with the drive enable signal (RF).
2. Interruption in the power supply

Remedy:

- For 1 Check the logic for activating the drive controller within the connected control system.
- For 2 Check the power supply.

The error can be cleared by removing the controller enable signal.

F226 Attributes

SS Display:	F2/26
Diagnostic message:	F226 Unterspannungsfehler F226 Under voltage error
Error number:	226
Diagnostic message number:	F226
Error class:	Non-fatal

F228 Excessive Deviation

Description:

The drive could not process the given command value and responded according to the set error response.

Cause:

1. The acceleration capacity of the drive was exceeded.
2. The motor shaft was blocked.
3. Set parameter error in the drive parameters.
4. Parameters set incorrectly for **"S-0-0159, Monitoring window"**.

Remedy:

- For 1. Check parameter **S-0-0092, Bipolar torque limit** and set it equal to the maximum allowable value for the application.
- For 2. Check the mechanical system and eliminate any jamming of the motor shaft.
- For 3. Check the drive controller parameters.
- For 4. **Set parameters for "S-0-0159, Monitoring window"**.

F228 Attributes

SS Display:	F2/28
Diagnostic message:	F228 Exzessive Regelabweichung F228 Excessive deviation
Error number:	228
Diagnostic message number:	F228
Error class:	Non-fatal

F229 Motor Encoder Error: Quadrant Error

Description:

An encoder signal error was found during the encoder evaluation.

Cause:

1. Defective encoder cable
2. Insulation disturbance on the encoder or the encoder cable
3. Defective drive controller

Remedy:

- For 1. Check the encoder cable and exchange, if necessary.
- For 2. Use only insulated motor and power cables.
Separate encoder cable from power cables.
- For 3. Exchange drive controller.

F229 Attributes

SS Display:	F2/29
Diagnostic message:	F229 Motorgeberfehler: Quadrantenfehler F229 Motor encoder failure: quadrant error
Error number:	229
Diagnostic message number:	F229
Error class:	Non-fatal

F234 Emergency-Stop

Cause:

The E-Stop feature (Emergency Stop) was initiated by switching off the +24V on the **Input X4-3 / E-Stop**. The drive was brought to a standstill by the error response which had previously been set.

The feature had previously been activated by parameter **P-0-0008, Activation of E-Stop feature** (Standard).

Remedy:

1. Eliminate the cause which led to switching off the +24V on the input /E-Stop.
2. Activate command **Reset class 1 diagnostics** using control system (see Control System Manual).

F234 Attributes

SS Display:	F2/34
Diagnostic message:	F234 E-Stop aktiviert F234 Emergency Stop
Error number:	234
Diagnostic message number:	F234
Error class:	Non-fatal

F248 Low Battery Voltage

Cause:

The connected motor has an absolute encoder, and the absolute position information is stored in the motor feedback. This memory has a battery-powered backup for the electronic circuit, and the battery is designed for an operating life of 10 years. If the battery voltage falls below 2.8 V, this message appears. The absolute encoder function will still be preserved for about 2 weeks.

Instructions for Exchanging Batteries

Have the following tools and accessories ready:

- Torx screwdriver size 10
- Needle-nose pliers, torque wrench
- New packaged battery (Part No.: 257101)

If the control voltage is turned off while the battery is taken out, the absolute position will be lost.

The measurement position must be reestablished by executing the **Set absolute measurement** command.

F248 Attributes

SS Display:	F2/48
Diagnostic message:	F248 Batterie-Unterspannung F248 Low battery voltage
Error number:	248
Diagnostic message number:	F248
Error class:	Non-fatal

F276 Absolute Encoder Error, Position Deviation > P-0-0097

Description:

When a drive controller with an absolute encoder motor (multiturn) is turned off, the current actual position is saved. When it is turned back on, the absolute position given by the encoder is compared with this stored position. If the deviation is greater than the "**Absolute encoder monitoring window**" parameter value, then error "**F276, Absolute encoder error**" will be generated and passed on to the control system.

Cause:

1. Turning on for the first time (invalid stored position).
2. The motor was moved further than allowed by the parameter in the absolute encoder monitoring window, P-0-0097, while it was turned off.
3. Incorrect position initialization.

Remedy:

- For 1. Clear error (set absolute position).
- For 2. The motor was moved while turned off and is located outside of its permissible position. Check to see if the displayed position is correct in relation to the machine zero point. Then clear errors.
- For 3. **Accidental axis motion may cause an accident.**
Check absolute position information. A feedback defect is present if the absolute position information is false. The motor should be exchanged and sent to INDRAMAT Customer Service for testing.

F276 Attributes

SS Display:	F2/76
Diagnostic message:	F276 Absolutgeber außerhalb des Überwachungsfenster F276 Absolute encoder error
Error number:	276
Diagnostic message number:	F276
Error class:	Non-fatal

F277 Current Measurement Trim Error

This error should only occur in the factory during fine tuning of the current measurement.

F277 Attributes

SS Display:	F2/77
Diagnostic message:	F277 Strommeßabgleich fehlerhaft F277 Offset of current wrong
Error number:	277
Diagnostic message number:	F277
Error class:	Non-fatal

F402 Double MDT Error Shutdown**What has happened?**

Failure of bus connection to control system. Several master data telegrams (MDT) have been excluded during cyclical communication.

For Sercos device DKC02

The master data telegram (MDT) was not received in the drive in two successive SERCOS cycles.

Cause:

1. Disruption in the LWL transmission line.
2. Too much attenuation in the light signal.
3. Malfunction in the SERCOS interface (general).

Remedy:

- For 1. Check all LWL connections in the SERCOS ring.
- For 2. Measure the attenuation in the LWL cable. The maximum attenuation between TX and RX must not exceed 12.5 dB.
- For 3. Exchange the SERCOS interface module or the drive.

For Profibus device DKC03

After the bus has already been powered up (green LED is on), no for more data telegrams have come from the bus master (control system), for a longer period of time than the one set by the master **Watchdog** time, typically 20ms..50ms. Several master data telegrams (MDT) are thus missing. The green LED goes off again.

Note: The profibus doesn't need to run from the beginning on, but there is no way to enable the DKC03 and proceed without it. No error will be generated until the Profibus DP has already been running with cyclical communication and has then stopped.

Cause:

1. Incorrect configuration.
2. Waiting for another (missing) DP slave has gone on too long. If the green LED flickers, this is probably the problem.
3. After the ECODRIVE has been initialized, other slaves are initialized, and the wait for them is too long.
4. Defective contact in the bus cable or plug.

Remedy:

- For 1. Please consult the control system **Configurator** program (bus master).
- For 2. Remove DP slaves which are not physically present from the configuration for cyclical communication (in the control system).
- For 3. **After initialization**, the ECODRIVE expects **regular telegrams** within the selected Watchdog time. If necessary, change the order in which the slaves are initialized. Put the ones that take longest first.
- For 4. Test the bus connection with a **multimeter**. The signals are differential between **pins 8 and 3** on the Profibus plugs (9p. D-Sub).

F402 Attributes

SS Display:	F4/02
Diagnostic message:	F401 Abschaltung zweifacher MDT-Ausfall F402 Double MDT error shutdown
Error number:	402
Diagnostic message number:	F402
Error class:	interface

F630 Position Limit Value Exceeded

Description:

The drive controller has been given a position command value which falls outside of the travel region parameter. The drive controller has been instructed to give an error when the travel range has been exceeded.

Travel Area Exceeded as Error:

The drive controller brakes with maximum torque. After it has stopped, the drive controller switches to torque-free operation. After the error has been cleared, the drive controller can be activated again and moved into the allowable travel area.

Cause:

Actual position value is outside of the travel region.

Remedy:

1. Enter a command value in the direction of the travel area.
2. Shift the position limits if necessary.
3. Turn off the position limit monitor
(when displaying the position data in modulo format).

F630 Attributes

SS Display:	F6/30
Diagnostic message:	F630 Lagegrenzwert ist überschritten F630 Position limit value exceeded
Error number:	630
Diagnostic message number:	F630
Error class:	Travel range

F644 Travel Limit Switch Activated

Description:

The motor was moved, and tripped one of the two travel limit switches. The drive controller has been instructed to give an error when the travel range has been exceeded.

Travel Area Exceeded as Error:

The drive controller brakes with maximum torque. After it has stopped, the drive controller switches to torque-free operation. After the error has been cleared, the drive controller can be activated again and moved into the allowable travel area by entering an appropriate command value.

Cause:

One of the travel limit switches was tripped.

Remedy:

1. Enter a command value in the direction of the travel area.
2. Move the travel limit switches, if necessary.
3. Invert the analysis for the travel limit switches, if necessary, or turn them off (when displaying the position data in modulo format).

F644 Attributes

SS Display:	F6/44
Diagnostic message:	F644 Fahrbereichsendschalter betätigt F644 Travel limit switch detected
Error number:	644
Diagnostic message number:	F644
Error class:	Travel range

F822 Motor Encoder Error: Signals too Small

Description:

The motor encoder signals are monitored. If the signal amplitudes as measured via AK1 and AK2 fall outside of the allowable range between $U_{ss} = 12.0V$ and $U_{ss} = 18.0 V$, this error message appears. The drive becomes torque-free and an optional brake is immediately activated.

Cause:

1. Defective feedback cable
2. Defective feedback

Remedy:

For 1. Check the feedback cable.

Lay the feedback cable well away from the motor power cable.

The shielding must be placed on the drive control (see project reference of the drive control).

For 2. Exchange motor.

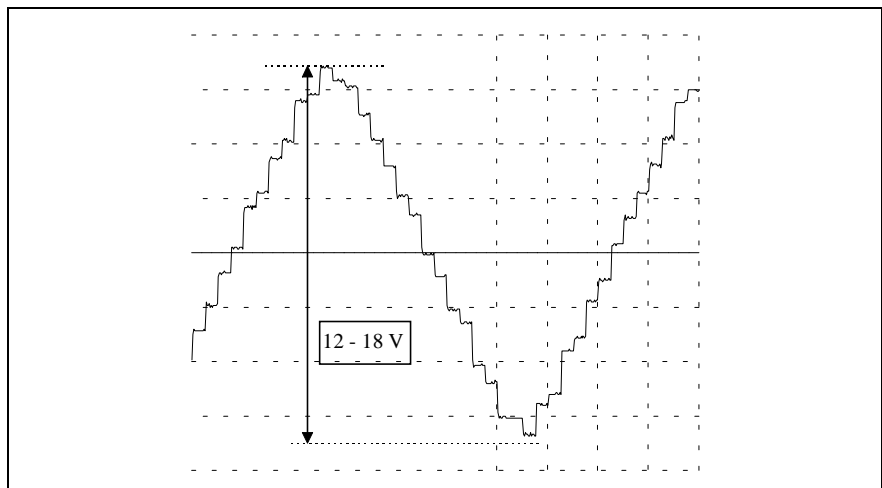


Fig. 1-2: Regular signal amplitude measured via AK X31/1-2

F822 Attributes

SS Display:	F8/22
Diagnostic message:	F822 Motorgeberfehler: Signale zu klein F822 Motor encoder failure: signals too small
Error number:	822
Diagnostic message number:	F822
Error class:	Fatal

F860 Overcurrent: Short in Powerstage

Description:

The current in the power transistor bridge has exceeded the value of the peak current of the drive by a factor of two. As a result, the drive will be switched to torque-free operation. An optional brake is activated immediately.

Cause:

1. Short circuit in the motor cable.
2. Defective power section in the drive controller.
3. Incorrect parameters for the current regulator.

Remedy:

- For 1. Check the motor cable for a short.
- For 2. Exchange drive controller.
- For 3. The current regulator parameters should not deviate from the installation values from the feedback.

F860 Attributes

SS Display:	F8/60
Diagnostic message:	F860 Brückensicherung F860 Overcurrent: short in powerstage
Error number:	860
Diagnostic message number:	F860
Error class:	Fatal

F870 +24 V Error

Description:

The DKC requires a 24V control voltage. If the maximum allowable tolerance of +/- 20% is exceeded, then the drive controller is immediately switched to torque-free operation. An optional brake is activated.

Cause:

1. Disturbance or overload of the 24 V supply voltage.
Measure control voltages.

Remedy:

For 1. Check the wiring and/or replace the power supply module.

F870 Attributes

SS Display:	F8/70
Diagnostic message:	F870 + 24 Volt Fehler F870 + 24 volt error
Error number:	870
Diagnostic message number:	F870
Error class:	Fatal

F873 Power Supply Driver Stage Fault

Description:

The voltage supply of the driver stage is monitored. If the voltage is too low, the drive is turned off.

Cause:

1. Voltage supply of the driver stage is too low.

Remedy:

For 1. Exchange drive controller.

F873 Attributes

SS Display:	F8/73
Diagnostic message:	F873 Spannung der Treiberstufen gestört F873 Power supply driver stage fault
Error number:	873
Diagnostic message number:	F873
Error class:	Fatal

F878 Velocity Loop Error

Description:

The velocity loop monitor will appear when the following conditions occur simultaneously:

- The current command value is at the peak current limit.
- The difference between the actual velocity and the command velocity is greater than 10% of the maximum motor velocity.
- The velocity control deviation does not diminish over a time frame of 20ms.

Cause:

1. Motor cable is connected incorrectly
2. Defective controller section of the drive
3. Defective feedback
4. Parameters set incorrectly for velocity

Remedy:

For 1. Check motor cable connection.

For 2. Exchange drive controller.

For 3. Exchange motor.

For 4. Check velocity controller to see if it is within operational parameters.

F870 Attributes

SS Display:	F8/70
Diagnostic message:	F870 + 24 Volt-Fehler F870 + 24 volt error
Error number:	870
Diagnostic message number:	F870
Error class:	Fatal

F879 Velocity Limit Value Exceeded (S-0-0092)

Description:

The feedback velocity is monitored in torque regulation mode. This error is generated if the programmed velocity in parameter "**S-0-0091, Bipolar velocity limit value**" is exceeded by 1.25 times, or a maximum of 100 rpm.

Cause:

The load torque was greater or less than the torque command value for too long a time. This leads to an increase in the feedback velocity up to the maximum possible motor velocity.

Remedy:

Check the primary control loop.

F879 Attributes

SS Display:	F8/79
Diagnostic message:	F879 S-0-0091, Geschwindigkeitsgrenzwert überschritten F879 (S-0-0091) Velocity limit value exceeded
Error number:	879
Diagnostic message number:	F879
Error class:	Fatal

F895 4 kHz Signal Error

Description:

The 4kHz signal for creating the resolver signal is synchronized with the software processing. This error message is generated when synchronization occurs improperly.

Cause:

1. The resolver control voltage is not properly synchronized in regards to the software.
2. The error can be produced by an electrical discharge.

Remedy:

- For 1. Exchange drive controller and return it for testing.
- For 2. Power down and then on. If this does not solve the problem, exchange the drive controller and return it for testing.

F895 Attributes

SS Display:	F8/95
Diagnostic message:	F895 4kHz Signal fehlerhaft F895 4kHz fault
Error number:	895
Diagnostic message number:	F895
Error class:	Fatal

1.3 Warning Diagnostic Messages

E250 Heatsink Overtemperature Warning

Description:

The temperature of the heatsink in the drive controller has reached the maximum allowable temperature. The drive controller follows the command value input for a period of 30 seconds. This makes it possible to bring the shaft to a standstill while remaining true to the process (for example, close the operation, leave the collision area, etc.). After 30 seconds, the response set in the "**Best possible deceleration, P-0-0119**" parameter will be initiated by the drive controller.

Cause:

1. Failure of the drive's internal blower.
2. Failure of the control cabinet's climate control.
3. Incorrect control cabinet dimensioning in regards to heat dissipation.

Remedy:

- For 1. If the blower fails, exchange the drive controller.
 For 2. Install climatization feature in the cabinet.
 For 3. Check the dimensions of the control cabinet.

E250 Attributes

SS Display:	E2/50
Diagnostic message:	E250 Verstärker Übertemp.-Warnung E250 Drive overtemperature warning
Diagnostic message number:	E250
Warning class:	Non-fatal

E251 Motor Overtemperature Warning

Description:

The motor is too hot. The drive controller follows the command value input for a period of 30 seconds. This makes it possible to bring the shaft to a standstill while remaining true to the process (for example, close the operation, leave the collision area, etc.). After 30 seconds the reaction set in the "**Best possible deceleration, P-0-0119**" parameter will be initiated by the drive controller.

Cause:

The motor became overloaded. The effective torque required of the motor was above the allowable standstill continuous torque for too long.

Remedy:

Check the layout of the motor. For systems which have been in use for a long time, check to see if the drive controller conditions have changed (in regards to pollution, friction, components which have been moved, etc.).

E251 Attributes

SS Display:	E2/51
Diagnostic message:	E251 Motor Übertemp.-Warnung E251 Motor overtemperature warning
Diagnostic message number:	E251
Warning class:	Non-fatal

E252 Bleeder Overtemperature Warning

Description:

(See cause)

Cause:

About 90% of the DKC's braking resistance is equalized by the energy reflected back by the motor. The bleeder overtemperature warning shows that bleeder overload should be expected if the reflected energy continues to rise.

Remedy:

Reduce acceleration or velocity values and, if necessary, check the drive controller layout.

E252 Attributes

SS Display:	E2/52
Diagnostic message:	E252 Bleedervorwarnung E252 Bleeder overtemperature warning
Diagnostic message number:	E252
Warning class:	Non-fatal

E253 Target Position Out of Range

Description:

A position which would exceed the position limits will not be accepted. The drive will not move in "command-controlled operation".

Cause:

1. Position limit value monitor was activated.
2. In the "Drive-internal interpolation" operating mode, **"S-0-0258, Target position"** will be checked to determine if it is in the possible travel range of the drive.
3. In the "Command-controlled operation" operating mode, the target position of the selected process command will be checked to see if it falls within the travel range.

The possible travel range is defined by the two parameters **"S-0-0049 Position limit positive,"** and **"S-0-0050, Position limit negative"**.

The E253 message will be generated if the target position lies outside of the travel range.

Remedy:

- For 1. Deactivate the position limit monitor.
- For 2. Check **S-0-0258, Target position** which has been entered and correct it if necessary.
- For 3. Check the target position of the process command. Relative paths of travel can be added together to determine the current position.
- Also, check the position limits.

E253 Attributes

SS Display:	E2/53
Diagnostic message:	E253 Zielposition außerhalb des Verfahrbereiches E253 Target position out of range
Diagnostic message number:	E253
Warning class:	Non-fatal

E254 Drive not Referenced

Description:

If "Absolute positioning commands" are selected while in "Command-controlled operation" the drive must be homed. If this is not the case, an absolute position cannot be reached. The drive rejects this positioning command and stops. This warning will be generated.

Cause:

Absolute positioning command was selected without the drive having been referenced.

Remedy:

1. Reference the drive
2. Select "Relative positioning command".

E254 Attributes

SS Display:	E2/54
Diagnostic message:	E254 Referenz fehlt E254 Drive not referenced
Diagnostic message number:	E254
Warning class:	Non-fatal

E255 Feedrate Override (S-0-0108) = 0**Description:**

The transversing velocity can be changed while jogging, homing and while in positioning operation with the "**S-0-0108, Feedrate override**" parameter. The warning will be given if the value of this parameter is 0, since the drive controller cannot follow command values which do not move.

Cause:

1. Feedrate override is set to zero.
2. The "Feedrate override via analog output" field is activated and the voltage there is 0V.

Remedy:

- For 1. Set the **S-0-0108** parameter to the correct value for the application.
- For 2. Deactivate the field or set a voltage greater than 0V.

E255 Attributes

SS Display:	E2/55
Diagnostic message:	E255 Feedrate Override(S-0-0108) = 0 E255 Feedrate override(S-0-0108) = 0
Diagnostic message number:	E255
Warning class:	Non-fatal

E256 Torque Limit Value = 0

Cause:

1. For protection against mechanical overload, the maximum torque can be limited by parameter "**S-0-0092, Bipolar torque limit**". If the current value of this parameter is equal to 0, the motor does not develop torque and does not follow the command value which has been entered.
2. Torque reduction is set via an analog channel and the current generated will be 10 V.

Remedy:

For 1. Set the torque limit to a value greater than 0.

For 2. Make the analog voltage less than 10 V.

E256 Attributes

SS Display:	E2/56
Diagnostic message:	E256 Momentgrenzwert E256 Torque limit value = 0
Diagnostic message number:	E256
Warning class:	Non-fatal

E257 Continuous Current Limiting Active

Description:

The drive controller makes the peak current available for 400ms. Thereafter, the continuous current limit becomes active and dynamically limits the peak current to the continuous current.

Cause:

More continuous torque was required than was available.

Remedy:

1. Check the drive controller layout.
2. With systems which have been used for longer periods of time, check to see if the drive controller conditions have changed in regards to:
 - friction
 - components which have been moved

E257 Attributes

SS Display:	E2/57
Diagnostic message:	E257 Dauerstrombegrenzung aktiv E257 Continuous current limiting active
Diagnostic message number:	E257
Warning class:	Non-fatal

E258 Selected Process Block Is Not Programmed

Cause:

A positioning block was selected for which there is no set target position, positioning velocity, etc.

Remedy:

Select another positioning block or enter the required data.

E258 Attributes

SS Display:	E2/58
Diagnostic message:	Nicht programmierter Verfahrenssatz angewählt E258 Selected process block is not programmed
Diagnostic message number:	E258
Warning class:	Non-fatal

E259 Command Velocity Limit Active

Description:

The velocity command value is limited to the value set in parameter "**S-0-0091, Bipolar velocity limit**" when in the position and velocity control operating modes. This warning is given if the value in parameter "**S-0-0036, Velocity command value**" reaches this limit.

Cause:

1. Parameter "**S-0-0091, Bipolar velocity limit**" was set too low.

Remedy:

- For 1. In normal operation, set parameter "**S-0-0091, Bipolar velocity limit**" to a value 10% higher than the NC operating velocity.

E259 Attributes

SS Display:	E2/59
Diagnostic message:	E259 Drehzahlbegrenzung aktiv E259 Command velocity limit active
Diagnostic message number:	E259
Warning class:	Non-fatal

E264 Target Position Not Representable**Cause:**

When using the "Command controlled operation" operating mode, the target position of the selected additive process command is checked to determine whether it falls within the represented range.

Remedy:

1. Check the target position and correct if necessary.
2. Select the position data display channel in modulo format.

E264 Attributes

SS Display:	E2/64
Diagnostic message:	E264 Zielposition nicht darstellbar E264 Target position not representable
Diagnostic message number:	E264
Warning class:	Non-fatal

E825 Overvoltage in the Power Stage**Cause:**

1. The energy feed back from the machine's mechanism via the motor was so great momentarily that it could not be completely converted to heat by the bleeder. As a result, the DC bus voltage rose above the maximum allowable value. The motor was then switched to torque-free operation. If the DC bus voltage falls below the maximum allowable value, the controller will be turned on again.
2. DC bus voltage is too high.

Remedy:

- For 1. Reduce the acceleration values and check the drive controller layout if necessary. Install an auxiliary bleeder, if necessary.
- For 2. Check the supply voltage if necessary.

E825 Attributes

SS Display:	E8/25
Diagnostic message:	E825 Überspannung in Leistungsteil E825 Overvoltage in the power stage
Error number:	825
Diagnostic message number:	E825
Error class:	Non-fatal

E830 Position Limit Value Exceeded

Description:

A position command was given to the drive which falls outside of the allowable travel area. The drive controller's response to exceeding the travel region has been selected as a warning.

Exceeding the Travel Range as a Warning:

The drive brakes with maximum torque until it reaches a standstill and stays in an activated condition at this position. If command values are entered which lead into the permitted travel region, the drive will once again follow these commands and the warning will disappear.

E830 Attributes

SS Display:	E8/30
Diagnostic message:	E830 Lagegrenzwert überschritten E830 Position limit value exceeded
Diagnostic message number:	E830
Warning class:	Fatal

E831 Position Limit Reached During Jogging

Description:

If the position limit value monitor is activated and the drive is "HOMED", then it will position on the trip limit while in travel. If the drive is at or past the position limit, it will not move and will give the message "Position limit reached during jogging."

Remedy:

1. Move the motor back to the allowable travel region with the jog function.
2. Turn off the position limit monitor.

E831 Attributes

SS Display:	E8/31
Diagnostic message:	E831 Beim Tippen Lagegrenzwert erreicht E831 Jog position limit value exceeded
Diagnostic message number:	831
Warning class:	Fatal

E844 Travel Limit Switch Activated**Description:**

The motor was moved, and tripped one of the two travel limit switches. The drive controller's response to exceeding the travel region has been selected as a warning.

Exceeding the Travel Range as a Warning:

The drive brakes with maximum torque until it reaches a standstill and stays in an activated condition at this position. If command values are entered which lead into the permitted travel region, the drive will once again follow these commands and the warning will disappear.

E844 Attributes

SS Display:	E8/44
Diagnostic message:	E844 Fahrbereichsendschalter betätigt E844 Travel limit switch activated
Diagnostic message number:	E844
Warning class:	Fatal

1.4 Command Diagnostic Messages

C100 Communications Phase 3 Transition Check

Description:

Command "**S-0-0127, C1 Communications phase 3 transition check**" is activated. The drive switches from set parameter mode to operating mode.

C100 Attributes

SS Display:	C1/00
Diagnostic message:	C100 Umschaltvorbereitung Phase 2 nach 3 C100 Communications phase 3 transition check
Diagnostic message number:	C100

C101 Invalid Communication Parameters (S-0-0021)

Cause:

Invalid parameters were found during the switch from set parameter mode to operating mode.

Remedy:

Connect the drive controller to a PC and activate DriveTop. Select menu item "Parameter | List of invalid parameters" and set valid parameters.

C101 Attributes

SS Display:	C1/01
Diagnostic message:	C101 Kommunikations-Parameter unvollständig (S-0-0021) C101 Invalid communication parameter (S-0-0021)
Diagnostic message number:	C101

C102 Limit Error Communication Parameter (S-0-0021)

Cause:

Parameters which exceed their limits were found during the switch from the set parameter mode to operating mode.

Remedy:

Connect the drive controller to a PC and activate DriveTop. Select menu item "Parameter | List of invalid parameters" and set valid parameters.

C102 Attributes

SS Display:	C1/02
Diagnostic message:	C102 Kommunikations-Parameter Grenzwertfehler (S-0-0021) C102 Limit error communication parameter (S-0-0021)
Diagnostic message number:	C102

C200 Communications Phase 4 Transition Check

Description:

The C2 command carries out the last steps of the switch from set parameter mode to operating mode. This includes conducting numerous parameter checks.

C200 Attributes

SS Display:	C2
Diagnostic message:	C200 Umschaltvorbereitung Phase 3 nach 4 C200 Communications phase 4 transition check
Diagnostic message number:	C200

C201 Invalid Parameter Block (-> S-0-0022)

Cause:

Parameters which are necessary for the operation of the drive in operating mode are invalid.

Remedy:

Connect the drive controller to a PC and activate DriveTop. Select menu item "Parameter | List of invalid parameters" and set valid parameters.

C201 Attributes

SS Display:	C2/01
Diagnostic message:	C201 Parametersatz unvollständig (-> S-0-0022) C201 Invalid parameter (-> S-0-0022)
Diagnostic message number:	C201

C202 Limit Error Parameter (-> S-0-0022)

Cause:

Parameters which are necessary for running the drive in operating mode are outside of their minimum or maximum input values.

Remedy:

Connect the drive controller to a PC and activate DriveTop. Select menu item "Parameter | List of invalid parameters" and set valid parameters.

C202 Attributes

SS Display: C2/02
Diagnostic message: C202 Parameter Grenzwertfehler (-> S-0-0022)
C202 Limit error parameter (-> S-0-0022)
Diagnostic message number: C202

C203 Parameter Calculation Error (-> S-0-0022)**Cause:**

Calculation errors were found in the parameters which are necessary to run the drive controller in the operating mode. The errors make normal operation impossible.

Remedy:

Connect the drive controller to a PC and activate DriveTop. Select menu item "Parameter | List of invalid parameters" and set valid parameters.

C203 Attributes

SS Display: C2/03
Diagnostic message: C203 Parameter Umrechnungsfehler (-> S-0-0022)
C203 Parameter calculation error (-> S-0-0022)
Diagnostic message number: C203

C207 Loading Error LCA**Cause:**

Defective drive

Remedy:

1. Power down and then on again. If this does not solve the problem,
2. Exchange the drive.

C207 Attributes

SS Display: C2/07
Diagnostic message: C207 Ladefehler LCA
C207 Load error LCA
Diagnostic message number: C207

C208 Invalid SSI Parameter (-> S-0-0022)

Description:

When the motors are first delivered, the parameter for absolute control emulation is purposely invalid to ensure that the "Set absolute measurement emulator command" will be executed after a motor is exchanged.

Cause:

The SSI emulation was selected. The parameters required for emulation are invalid.

Remedy:

Connect the drive controller to a PC and activate DriveTop.

Select the menu item "Actual position output" for controller emulation type "Absolute controller emulation (SSI)":

- Write a value to "Homing position/offset".
- Select "Absolute control directional counter".

C208 Attributes

SS Display:	C2/08
Diagnostic message:	C208 SSI Parameter unvollständig (S-0-0022) C208 Invalid SSI parameter (S-0-0022)
Diagnostic message number:	C208

C211 Invalid Feedback Data (-> S-0-0022)

Description:

Invalid data was found while processing the parameters stored in the motor feedback.

Causes:

1. Defective motor feedback cable
2. Defective motor feedback

Remedy:

For 1. Check the motor feedback cable.

For 2. Exchange the motor.

C211 Attributes

SS Display:	C2/11
Diagnostic message:	C211 Ungültige Feedbackdaten (-> S-0-0022) C211 Invalid feedback data (-> S-0-0022)
Diagnostic message number:	C211

C212 Invalid Amplifier Data (-> S-0-0022)

Description:

Data for device identification is read from the drive controller while the drive is being initialized. If invalid data is detected, this error message will be displayed.

Cause:

Defective hardware in the drive controller

Remedy:

Exchange drive controller.

C212 Attributes

SS Display:	C2/12
Diagnostic message:	C212 Ungültige Verstärkerdaten (-> S-0-0022) C212 Invalid amplifier data (-> S-0-0022)
Diagnostic message number:	C212

C213 Position Data Scaling Error

Cause:

The display format of the position data can be set with the position data scaling parameter. The internal drive controller format of the position data is dependent on the motor encoder being used and the resolution of the controller. The factor for converting the position data from the internal drive format into display format or vice-versa is outside of the workable area because either:

- Rotary motor and linear positional scaling (in reference to motor) cannot be represented or
- the calculated factor for converting the position data from display format to internal format (or vice-versa) cannot be represented.

Remedy:

Connect the drive with a PC and start DriveTop. Select a scaling setting in the "Scaling/mechanical system" dialog box.

If you want a scaling setting other than one used in DriveTop, check the following parameters.

- **S-0-0076, Position Data Scaling Type**
- **S-0-0077, Position Data Scaling Factor**
- **S-0-0078, Position Data Scaling Exponent**
- **S-0-0121, Input Revolutions of Load Gear**
- **S-0-0122, Output Revolutions of Load Gear**
- **S-0-0123, Feed Constant**

C213 Attributes

SS Display:	C2/13
Diagnostic message:	C213 Wichtung der Lagedaten fehlerhaft C213 Position data scaling error
Diagnostic message number:	C213

C214 Velocity Data Scaling Error

Cause:

The display format of the velocity data can be set using the scaling parameter. The internal drive format of the velocity data is dependent on the rotational feedback in use and the resolution of the controller. The factor for converting the velocity data from internal drive format to display format (or vice-versa) is outside the workable area.

Remedy:

Connect the drive with a PC and start DriveTop. Select a scaling setting in the "Scaling/mechanical system" dialog box.

If you want a scaling setting other than one used in DriveTop, check the following parameters.

- S-0-0044, Velocity Data Scaling Type
- S-0-0045, Velocity Data Scaling Factor
- S-0-0046, Velocity Data Scaling Exponent
- S-0-0121, Input Revolutions of Load Gear
- S-0-0122, Output Revolutions of Load Gear
- S-0-0123, Feed Constant

C214 Attributes

SS Display:	C2/14
Diagnostic message:	C214 Wichtung der Geschwindigkeitsdaten fehlerhaft C214 Velocity data scaling error
Diagnostic message number:	C214

C215 Acceleration Data Scaling Error

Cause:

The display format of the acceleration data can be set for the acceleration data using scaling parameters. The internal drive format of the acceleration data is dependent on the rotational feedback in use and the resolution of the feedback. The factor for converting acceleration data from internal drive format to display format (or vice-versa) is outside the workable area.

Remedy:

Connect the drive with a PC and start DriveTop. Select a scaling setting in the "Scaling/mechanical system" dialog box.

If you want a scaling setting other than one used in DriveTop, check the following parameters.

- **S-0-0160, Acceleration Data Scaling Type**
- **S-0-0161, Acceleration Data Scaling Factor**
- **S-0-0162, Acceleration Data Scaling Exponent**
- **S-0-0121, Input Revolutions of Load Gear**
- **S-0-0122, Output Revolutions of Load Gear**
- **S-0-0123, Feed Constant**

C215 Attributes

SS Display: C2/15
Diagnostic message: C215 Wichtung der Beschleunigungsdaten fehlerhaft
 C215 Acceleration data scaling error
Diagnostic message number: C215

C216 Torque/Force Data Scaling Error

Cause:

The display format of the torque data can be set for the torque data using scaling parameters. The factor for converting torque data from internal drive format to display format (or vice-versa) is outside the workable area.

Remedy:

Connect the drive with a PC and start DriveTop. Select a scaling setting in the "Scaling/mechanical system" dialog box.

If you want a scaling setting other than one used in DriveTop, check the following parameters.

- **S-0-0086, Torque/Force Data Scaling Type**
- **S-0-0093, Torque/Force Data Scaling Factor**
- **S-0-0094, Torque/Force Data Scaling Exponent**

C216 Attributes

SS Display: C2/16
Diagnostic message: C216 Wichtung der Drehmoment/Kraftdaten fehlerhaft
 C216 Torque/force data scaling error
Diagnostic message number: C216

C217 Motor Feedback Data Reading Error

Cause:

All MKD and MDD motors contain feedback data memory from which settings for the controller can be read. An error was discovered while reading these values.

Remedy:

Check the feedback cable.

Exchange the motor.

C217 Attributes

SS Display:	C2/17
Diagnostic message:	C217 Fehler beim Lesen der Motorgeberdaten C217 Motor feedback data reading error
Diagnostic message number:	C217

C220 Motor Feedback Initializing Error

Description:

A number of tests are performed when the motor feedback is initialized. An error was detected while doing this. This error may be:

1. Interruption of communication with the feedback
2. Invalid offset between the high and low resolution track
3. Error in the measuring system micro-controller

Cause:

1. Defective motor feedback cable
2. Defective motor feedback
3. Defective measurement system interface

Remedy:

For 1. Check the motor feedback cable.

For 2. Exchange the motor.

For 3. Exchange the measuring system interface (module).

C220 Attributes

SS Display:	C2/20
Diagnostic message:	C220 Fehler bei Mot.Geber-Initialisierung C220 Motor feedback initializing error
Diagnostic message number:	C220

C227 Modulo Range Error

Cause:

The modulo value entered is greater than half of the drive controller's position representation range. (Half of the position representation range for the DKC03 is 2048 rotations.)

Remedy:

Select a smaller modulo value.

C227 Attributes

SS Display:	C2/27
Diagnostic message:	C227 Modulo-Bereichs-Fehler C227 Modulo range error
Diagnostic message number:	C227

C300 Command: Set Emulation Absolute Value

Description:

The actual position of the motor can be generated by means of an SSI emulation. The zero point of the generated position can be set with command "C300 Command: Set emulation absolute value".

C300 Attributes

SS Display:	C3
Diagnostic message:	C300 Kommando Absolutmaß-Emulator setzen C300 Command set emulation absolute value
Diagnostic message number:	C300

C300 Set Absolute Measurement

Description:

The command "**P-0-0012, Set absolute measurement**" was activated by the control system in use.

C300 Attributes

SS Display:	C3
Diagnostic message:	C300 Absolutmaß setzen C300 Set absolute measurement
Diagnostic message number:	C300

C301 Setting Absolute Measurement Not Allowed, Drive Enabled

Cause:

The command "C300 Command: Set absolute measurement emulator" was started by the given control enabler.

Remedy:

End the command and deactivate the drive enable.

C301 Attributes

SS Display:	C3/01
Diagnostic message:	C301 Absolutmaß setzen bei Antriebsfreigabe nicht möglich C301 Setting absolute measurement not allowed, drive enabled
Diagnostic message number:	C301

C302 Absolute Measurement System Not Installed

Description:

Command "**P-0-0012, Command: set absolute measurement**" was given when no absolute measuring system was installed.

The command cannot be processed because no absolute measurement system is available.

Cause:

1. The command should not have been activated.
2. The connected motor does not contain an absolute encoder. (Option)

Remedy:

For 1. Stop the command process.

For 2. Equip the motor or external measurement system with an absolute encoder function .

C302 Attributes

SS Display:	C3/02
Diagnostic message:	C302 Kein absolutes Meßsystem vorhanden C302 Absolute measurement system not installed
Diagnostic message number:	C302

C400 Switch to Set Parameter Mode

Description:

The command for transition to set parameter mode. This command must be given to edit parameters which can only be edited in set parameter mode.

C400 Attributes

SS Display:	C4
Diagnostic message:	C400 Umschalten auf Phase 2 C400 Command: switch to set parameter mode
Diagnostic message number:	C400

C401 Active Drive, Switch Not Allowed

Cause:

The command "C400 Switch from operating to set parameter mode" was started even though the drive enabler was activated.

Remedy:

End the command and turn off the drive enable; the command can then be started again.

C401 Attributes

SS Display:	C4/01
Diagnostic message:	C401 Antrieb aktiv, Umschalten nicht zulässig C401 Drive active, switch not allowed
Diagnostic message number:	C401

C500 Reset Class 1 Diagnostic

Description:

The command for clearing errors, "**S-0-0099, Reset class 1 diagnostics**" was activated via the control system in use. All internal drive errors are deleted. Previously, however, the errors should have been corrected.

C500 Attributes

SS Display:	C5
Diagnostic message:	C500 Reset Zustandsklasse-1 C500 Reset class 1 diagnostic (error reset)
Diagnostic message number:	C500

C600 Command: Drive-Controlled Homing Procedure

Description:

The command "**S-0-0148, Drive-controlled homing procedure**" was activated via the control system in use. The drive controller automatically performs the internal drive homing procedure. To do this, give the drive a start command. Prior to this the drive must be enabled and under torque.

C600 Attributes

SS Display:	C6
Diagnostic message:	C600 Kommando Antriebsgeführtes Referenzieren C600 Drive-controlled homing procedure command
Diagnostic message number:	C600

C601 Homing Procedure Not Permitted Without Driver Enable

Cause:

The command was given without the drive enable being turned on.

Remedy:

1. Turn the drive enable on.
2. Give the command again.

C601 Attributes

SS Display:	C6/01
Diagnostic message:	C601 Referenzieren ohne Antriebsfreigabe nicht möglich C601 Homing procedure not permissable without driver enable
Diagnostic message number:	C601

C602 Distance homing switch-reference mark erroneous

Cause:

During the drive-controlled homing procedure, an ambiguous position for the home reference of the rotational feedback and the switch flank of the home switch was determined

.

Remedy:

The cam of the home switch must be shifted such that an accurate homing procedure is possible.

- Read the contents of parameter "**P-0-0020, Shifting the homing cam**".
- Mechanically shift the homing cam by the amount in the parameter.
- Perform the drive-controlled homing procedure again.

C602 Attributes

SS Display:	C6/02
Diagnostic message:	C602 Abstand Nullschalter-Referenzmarke fehlerhaft C602 Distance homing switch-reference mark erroneous
Diagnostic message number:	C602

C603 Homing Procedure Not Permitted in This Operating Mode

Cause:

The homing command cannot be processed during operation of the drive in torque control or velocity control.

Remedy:

Clear the homing command.
Set another operating mode.

C603 Attributes

SS Display:	C6/03
Diagnostic message:	C603 Referenzieren in dieser Betriebsart nicht möglich C603 Homing procedure not permitted in this operating mode
Diagnostic message number:	C603

C604 Homing Procedure Not Permitted With Absolute Measurement Control

Cause:

If the homing command is called up by with an absolute value controller without the command "**P-0-0012, Set absolute measurement**" having been previously processed, the homing command will be discontinued with this error.

If the encoder was homed with "**Set absolute measurement**", the homing command will activate positioning to the home point.

Remedy:

Home the absolute encoder with the command "**Set absolute measurement**".

C604 Attributes

SS Display:	C6/04
Diagnostic message:	C604 Referenzieren mit Absolutmaßgeber nicht möglich C604 Homing procedure not possible with absolute measurement control
Diagnostic message number:	C604

C700 Basic Load

Description:

The technical control adaptation of the mechanical system to the digital drive is carried out on MDD and MKD motors by activating the velocity control parameter stored in the motor feedback. The drive controller signals with message C7 that the C7 basic load command was activated by the "**S-0-0262, Basic load**" command.

C700 Attributes

SS Display:	C7/00
Diagnostic message:	C700 Urladen C700 Basic load
Diagnostic message number:	C700

C800 Load Basic Parameters

Description:

By pressing the S1 button on the controller with display PL or by starting the "Load basic parameters command," all parameters will be erased and reset to the default values.

The process commands are lost also.

C800 Attributes

SS Display:	C8/00
Diagnostic message:	C800 Kommando Basisparameter laden C800 Command load basic parameters
Diagnostic message number:	C800

1.5 Status Diagnostic Message

A002 Communications Phase 2

Set Parameter Mode

A002 Attributes

Diagnostic message:	A002 Kommunikationsphase 2 A002 Communications phase 2
Diagnostic message number:	A002

A003 Communications Phase 3

Set Parameter Mode

A003 Attributes

Diagnostic message:	A003 Kommunikationsphase 3 A003 Communications phase 3
Diagnostic message number:	A003

A010 Drive Halt

Description:

The drive halt function was activated by the control system in use. The drive halt function serves to stop the motor at a defined deceleration and a defined jerk.

The deceleration or jerk limit of the previous position block functions during "linked block operation".

The acceleration limit and bipolar jerk value function during jogging operation and step motor interface.

The drive is brought to a standstill by switching the velocity command value to zero during velocity and torque control.

A010 Attributes

SS Display:	AH
Diagnostic message:	A010 Antrieb Halt A010 Drive Halt
Diagnostic message number:	A010

A012 Control and Power Sections Ready for Operation

Description:

The drive is supplied with control voltage and the power is switched on. The drive is ready for power delivery.

A012 Attributes

SS Display:	Ab
Diagnostic message:	A012 Steuer- und Leistungsteil betriebsbereit A012 Control and power sections ready for operation
Diagnostic message number:	A012

A013 Ready for Power ON

Description:

The drive is supplied with a control voltage; there are no errors in the drive controller. The drive is ready to be turned on.

A013 Attributes

SS Display:	bb
Diagnostic message:	A013 Bereit zur Leistungszuschaltung A013 Ready for power ON
Diagnostic message number:	A013

A206 Position Mode/POSITION Encoder 1

Description:

The drive controller is in position control mode allowing following error. The drive is positioned on the selected target position with the given acceleration, velocity and jerk.

A206 Attributes

SS Display: AF
Diagnostic message: A206 Lageregelung/POSITIONIER-Antrieb
A206 Position mode/POSITION encoder 1
Diagnostic message number: A206

A207 Position Mode/POSITION Without Following Error

Description:

The drive controller is in position control mode with no following error. The drive is positioned on the selected target position with the given acceleration, velocity and jerk.

A207 Attributes

SS Display: AF
Diagnostic message: A207 Lageregelung/POSITIONIER-Antrieb
schleppfehlerfrei
A207 Position Mode/POSITION Without Following
Error
Diagnostic message number: A207

AF Drive Enable

The drive will follow the velocity command.

JF Jogging in the Positive Direction

The drive moves with a jogging velocity in the positive direction.

Jb Jogging in the negative direction

The drive moves with a jogging velocity in the negative direction.

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