



VarCom

Reference Manual

CDHD Servo Drive

DDHD Dual Drive

Revision: 8.6

Firmware Version 1.41.x

Revision History

| Document Revision | Date | Remarks |
|-------------------|-----------|--|
| 8.6 | Feb. 2017 | Firmware 1.41.10. Minor content update. |
| 8.5 | Jan. 2017 | Firmware 1.41.10 |
| 8.4 | Oct. 2016 | Firmware 1.41.4 |
| 8.3 | May 2016 | Firmware 1.41.2. Minor corrections. |
| 8.2 | May 2016 | Firmware 1.41.2. General release. |
| 8.1 | Feb. 2016 | Firmware 1.40.0. Limited release. |
| 8.0 | Nov. 2015 | Firmware 1.20.7. CDHD and DDHD drives. Internal release. |
| 7.1 | Mar. 2015 | Firmware version 1.15.24 |
| 7.0 | Jan. 2015 | Firmware version 1.15.xx |
| 6.2 | Mar. 2014 | Firmware version 1.4.6 |
| 6.1 | Jan. 2014 | Firmware version 1.4.5 |
| 6.0 | Oct. 2013 | Firmware version 1.4.4 |

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Contact Information

Servotronix Motion Control Ltd.
 21C Yagia Kapayim Street
 Petach Tikva 49130 Israel
 Tel: +972 (3) 927 3800
 Fax: +972 (3) 922 8075
 Website: www.servotronix.com

Technical Support

If you need assistance with the installation and configuration of the product, contact Servotronix technical support: tech.support@servotronix.com

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1 Introduction

VarCom Overview

When the host and drive are communicating over serial connection, a proprietary set of commands and variables, called **VarCom**, are used to configure, control and monitor the drive.

Commands and variables are identified by mnemonic (easily remembered code) names. For example, MPOLES is the VarCom code used to read and write the setting for the number of motor poles.

Some variables are read-only, while others have read and write access. Variables can be stored in the CDHD's non-volatile flash memory for use at each power-up.

Note: The terms *variable* and *parameter* are used interchangeably throughout the documentation.

Manual Format

This manual details the entire set of VarCom commands and variables, in alphabetic order.

Command and variable descriptions use different formats, as described below.

All commands and variables are presented as follows:

| | |
|---------------------|--|
| Definition | Short name, used in the graphical user interface software. |
| Type | Variable (R/W): A read/write variable. Variable (R): A read-only variable. Command |
| Description | Description of the command or variable. |
| Syntax | The command format, including any optional or required parameters. Commands are described using the following conventions: [] Indicates an optional parameter. { } Indicates a required parameter. A vertical bar separates two or more choices, either required arguments enclosed in braces { } or optional arguments enclosed in brackets []. Variable parameters are italicized within < >. |
| Firmware | The earliest version, or specific versions, in which the described functionality is available. |
| Drive status | Enabled Disabled Indicates the required state of the drive when the command or variable is issued or invoked. |

| | |
|----------------------|---|
| Range | <p>Discrete values and ranges of values.</p> <p>Parameter values can be written with up to 9 digits following the decimal point. When read, values will show only 3 digits following the decimal point.</p> <p>For example:</p> <pre>-->acc 0.123456789 -->acc 0.123 [rpm/s] --></pre> |
| Default value | The variable's default (factory-defined) value. |
| Unit | When variable or command values imply units of measure, these units are specified. |
| Non-volatile | <p>Yes No</p> <p>Indicates whether the value of the variable is stored in the non-volatile memory, and thereby available when the drive is rebooted.</p> <p>Not applicable for Command.</p> |
| Example | Examples of use. |
| See also | Links to related commands and variables. |
| CANopen | Where applicable, the equivalent EtherCAT COE and CANopen object code. |

2 VarCom Functions

Activation and Faults

Includes drive status, software enable, hardware enable, faults, fault history, fault recovery, clear faults, emergency stop.

| | | | |
|---------------|----------------|-----------|-----------|
| ACTIVE | K | RELAY | SWEN |
| CLEARFAULTS | MOTORPHASESCAN | RELAYMODE | SWENMODE |
| DISMODE | COMMERRMAXCNT | REMOTE | UVMODE |
| DISPLAYTEST | COMMERRTTHRESH | ST | UVRECOVER |
| EN | COMMERRVTHRESH | STALLTIME | UVTHRESH |
| FASTSTOENABLE | IGNOREBRKFLT | STALLVEL | UVTIME |
| FLT | OUTFLTLVL | STAT | WRN |
| FLTHIST | READY | STATUS | |

Hardware Power

Includes bus, PWM, drive rating, regeneration resistor, line-loss, under-voltage.

| | | | |
|-----------------|----------------|-------------|-------------|
| DICONT | LINELOSTTYPE | REGENMAXPOW | UVTHRESH |
| DIPEAK | OVTHRESH | REGENPOW | UVTIME |
| KCD | PWMFRQ | REGENRES | VBUS |
| LINELOSSMODE | REGENFLTMODE | UVMODE | VBUSREADOUT |
| LINELOSSRECOVER | REGENMAXONTIME | UVRECOVER | |

Communication

Includes drive address, serial communication, fieldbus, peek-poke, privilege.

| | | | |
|--------------|------------|------------|------------|
| ADDR | ECEMCYMODE | FBGMS | MTPMODE |
| BAUDRATE | ECHO | FBITIDX | OPMODE |
| CHECKSUM | FBGDS | FBITPRD | PASSWORD |
| COMMODE | FBGMS | FBPLIGNORE | SYNCSOURCE |
| DELAY | FBITIDX | FBSCALE | |
| DRIVSCRIPT | FBITPRD | GETMODE | |
| DRIVSCRIPTST | FBGDS | MSGPROMPT | |

Commutation

Includes phase find, phase advance, electrical angle, Hall sensors, sine commutation, six-step.

| | | | |
|----------------|---------------|----------------|---------------|
| CANBITRATE | HALLS | MPITCH | PHASEFINDI |
| COMMERRMAXCNT | HALLSINV | MPOLES | PHASEFINDMODE |
| COMMERRTTHRESH | HALLSTYPE | MTANGLC | PHASEFINDST |
| COMMERRVTHRESH | MENCRES | MTANGLP | PHASEFINDTIME |
| COMMFLTTHRESH | MENCTYPE | MVANGLF | WNSERR |
| COMMFLTTHRESH | MENCZPOS | MVANGLH | ZERO |
| CONFIG | MOTORCOMMTYPE | PHASEFIND | ZEROST |
| ELECTANGLE | MOTORSETUP | PHASEFINDANGLE | |
| FEEDBACKTYPE | MOTORSETUPST | PHASEFINDDELTA | |
| GETREC | MPHASE | PHASEFINDGAIN | |

Controller – Current

Includes controller, variables, DQ coordinates, and phase.

| | | | |
|-------------|----------|----------|----------------|
| ANIN1ISCALE | I | IV | ML |
| ANIN2ISCALE | ICMD | IVOFFSET | MLGAINC |
| CLVD | ID | KCBEMF | MLGAINP |
| CLVQ | IFFLPFHZ | KCD | MOTORPHASESCAN |
| CONFIG | IGRAV | KCFF | OPMODE |
| ESTOPI LIM | ILIM | KCI | OUTILVL1 |
| FRICINEG | IMAX | KCMODE | OUTILVL2 |
| FRICIPOS | IQ | KCP | STOP |
| FRICNVHYST | IU | MICONT | T |
| FRICPVHYST | IUOFFSET | MIPEAK | VBUS |

Controller – Position

Includes controller, variables, and gains.

| | | | |
|--------------|-----------|-------------|----------------|
| DIR | ICMD | MFBDIR | PEMAX |
| FRICINEG | INPOS | MODMODE | PFB |
| FRICIPOS | KNLVFF | MOVEABS | POSCONTROLMODE |
| FRICNVHYST | KPAFRC | MOVEINC | PROTARY |
| FRICPVHYST | KPAFRV | OPMODE | PTPTE |
| GEARIN | KPD | OUTPLVL1 | PTPVCMD |
| GEARMODE | KPE | OUTPLVL2 | STOP |
| GEAROUT | KPI | PCMD | STOPPED |
| HOLD | KPISATIN | PCMDFBRAW | UNITSLINPOS |
| HWPEXT | KPISATOUT | PE | UNITSROTPOS |
| HWPEXTCNTRLR | KPP | PEINPOS | VCMD |
| HWPEXTMACHN | KPVFR | PEINPOSTIME | |
| HWPOS | MECHANGLE | PELOOP | |

Controller – Velocity

Includes controller, variables, and gains.

| | | | |
|-------------|----------------|-------------|----------------|
| ANIN1VSCALE | J | OUTVLVL2 | VELCONTROLMODE |
| BW | KVFR | STEP | VELDESIGN |
| FILTHZ1 | KVI | STOP | VELFILTFRQ |
| FILTHZ2 | KVP | TF | VELFILTMODE |
| FILTMODE | LMJR | UNITSLINVEL | VF |
| FRICINEG | MJ | UNITSROTVEL | VFI |
| FRICIPOS | MKT | V | VH |
| FRICNVHYST | MSPEED | VCMD | VLIM |
| FRICPVHYST | NLVELLIMOPMODE | VD | VMAX |
| ICMD | OUTVLVL1 | VE | VR |

Direction

Includes elements and procedures related to direction of elements and motion, such as feedback device, motor leads, Halls.

| | | | |
|------------|------------|--------------|---|
| DIR | MECHANGLE | MOTORSETUPST | V |
| ELECTANGLE | MFBDIR | MPHASE | |
| HWPOS | MOTORSETUP | PFB | |

Emergency Stop

Includes active disable, dynamic braking, and faults, commutation error (runaway).

| | | | |
|-------------|-----------|----------------|----------------|
| DECDIST | DISMODE | HOLD | COMMERRVTHRESH |
| DECDIST2 | DISSPEED | ISTOP | STOP |
| DECSTOP | DISTIME | COMMERRMAXCNT | |
| DECSTOPTIME | ESTOPILIM | COMMERRTTHRESH | |

Feedback

Includes elements related to the position feedback device, such as sensAR, secondary feedback, incremental encoder, sine encoder, EnDat, resolver, Tamagawa, A quad B, index, Halls, Nikon, multi-turn.

| | | | |
|----------------|---------------|--------------|-------------|
| ABSOFFSET | HWPEXTCNTRLR | MFBDIR | SININITST |
| BISSCFIELDS | HWPEXTMACHN | MFBMODE | SINPARAM |
| BISSCINFO | HWPOS | MTTURNRESET | SFBVCINFO |
| DIR | INDEXDURATE | MOTORSETUP | TMTEMP |
| FEEDBACKTYPE | INDEXPFB | MOTORSETUPST | TMTURNRESET |
| HALLS | INDEXST | MRESPOLES | UNITSLINPOS |
| HALLSFILTAFF | IGNOREBATTFLT | MSININT | UNITSROTPOS |
| HALLSFILTT1 | IZERO | PFBBACKUP | XENCRES |
| HALLSFILTT2 | MECHANGLE | PFBOFFSET | ZERO |
| HALLSFILTVELFF | MENCAQBFILT | RESAMPLRANGE | ZEROST |
| HALLSINV | MENCRES | RESBW | |
| HALLSTYPE | MENCTYPE | SININIT | |
| HWPEXT | MENCZPOS | SININITMODE | |

Feedback – Secondary

Variables and commands for configuring and using secondary feedback, and for calibrating the voltage correction to ensure accuracy of secondary feedback.

| | | | |
|--------------|-------------|-------------|--------------|
| SFB | SFBPETHRESH | SFBVCILIM | SFBVCSPDFAST |
| SFB2MOTORDEN | SFBPETIME | SFBVCINFO | SFBVCSPDSLOW |
| SFB2MOTORNUM | SFBPFBPE | SFBVCINFO2 | SFBVCVLOW |
| SFBCMD | SFBTYPE | SFBVCMANUAL | SFBVCVUP |
| SFBMODE | SFBUNITSDEN | SFBVCMODE | SFBVEL |
| SFBOFFSET | SFBUNITSNUM | SFBVCSECT | |
| SFBPEMAX | SFBVCBLDIST | SFBVCSECT2 | |

Foldback

Variables and commands for configuring and using a foldback mechanism for thermal protection of the drive and motor.

| | | | |
|--------------|--------------|---------------|---------------|
| DICONT | IFOLDWTHRESH | MFOLDR | MIFOLDWTHRESH |
| DIPEAK | MFOLD | MFOLDT | MIPEAK |
| FOLD | MFOLDD | MICONT | |
| IFOLD | MFOLDDIS | MIFOLD | |
| IFOLDFTHRESH | MFOLDF | MIFOLDFTHRESH | |

Gearing

Includes: pulse following, scaling the pulse train, smoothing the profile.

| | | | |
|---------------|---------------|----------------|--------------|
| ENC FOLLOWER | GEARFILTMODE | GEARINMODE | HWPEXTCNTRLR |
| GEAR | GEARFILTT1 | GEARLIMITSMODE | HWPEXTMACHN |
| GEARACCTHRESH | GEARFILTT2 | GEARMODE | OPMODE |
| GEARDBVAL | GEARFILTVELFF | GEAROUT | PCMD |
| GEARFILTAFF | GEARIN | HWPEXT | XENCRES |

HD Control – Anti-Vibration

Variables and commands for configuring anti-vibration functionality.

| | | | |
|----------------|---------------|-----------------|-----------------|
| NLAFFLPFHZ | NLANTIVIBHZ | NLANTIVIBN | NLANTIVIBSHARP3 |
| NLANTIVIBGAIN | NLANTIVIBHZ2 | NLANTIVIBQ3 | |
| NLANTIVIBGAIN2 | NLANTIVIBHZ3 | NLANTIVIBSHARP | |
| NLANTIVIBGAIN3 | NLANTIVIBLMJR | NLANTIVIBSHARP2 | |

HD Control – Basic Tuning

Variables and commands for tuning the HD control loop.

VarCom mnemonics beginning with **KNL** usually indicate a gain.

VarCom mnemonics beginning with **NL** indicate other properties, such as frequency, damping, ratio, time constants, and so on.

| | | | |
|--------|---------------|----------------|--------------|
| KNLAFC | KNLUSERGAIN | NLNOTCH2CENTER | NLPEDFFRATIO |
| KNLD | NLFILTDAMPING | NLNOTCHBW | NLVELLIM |
| KNLI | NLFILTT1 | NLNOTCHCENTER | |
| KNLIV | NLMAXGAIN | NLPEAFF | |
| KNLP | NLNOTCH2BW | NLAFFLPFHZ | |

Homing

Variables and commands for configuring the drive's homing procedure.

| | | | |
|-----------|---------------|------------|----------|
| HOMEACC | HOMEIHARDSTOP | HOMESPEED1 | HOMETYPE |
| HOMECMD | HOMEOFFSET | HOMESPEED2 | |
| HOMECMDST | HOMEOFSTMOVE | HOMESTATE | |

I/Os – Analog

Includes scaling, offset, deadband, LP filter, current command, velocity command, dual gain, configurable analog output.

| | | | |
|----------------|-------------|-----------------|-------------|
| ANIN1 | ANIN1ISCALE | ANIN2LPFHZ | ANOUT |
| ANIN1DB | ANIN1LPFHZ | ANIN2MODE | ANOUTCMD |
| ANIN1FILTAFF | ANIN1OFFSET | ANIN2OFFSET | ANOUTISCALE |
| ANIN1FILTIN | ANIN1VSCALE | ANIN2USER | ANOUTLIM |
| ANIN1FILTMODE | ANIN1ZERO | ANIN2USERDEN | ANOUTMODE |
| ANIN1FILTT1 | ANIN2 | ANIN2USERNUM | ANOUTVSCALE |
| ANIN1FILTT2 | ANIN2DB | ANIN2USEROFFSET | OPMODE |
| ANIN1FILTVELFF | ANIN2ISCALE | ANIN2ZERO | |

I/Os – Digital

Includes touch probe, encoder simulation, limit switch, script, homing, clear fault, active state, brake, in position, stopped, invert polarity, drive script.

| | | | |
|------------|--------------|-------------|---------|
| ENCOUTMODE | GEARMODE | HWPEXTMACHN | ININ |
| ENCOUTRES | GEAROUT | IN | INMODE |
| ENCOUTZPOS | HWPEXT | IN32OPMODES | INPUTS |
| GEARIN | HWPEXTCNTRLR | IN32SWITCH | JOGSPD1 |

| | | | |
|--------------|----------|----------|------------|
| JOGSPD2 | OUTFTLVL | OUTPLVL1 | RELAY |
| OUT | OUTILVL1 | OUTPLVL2 | RELAYMODE |
| OUTBRAKE | OUTILVL2 | OUTPUTS | SYNCSOURCE |
| OUTBRAKEINV | OUTINV | OUTVLVL1 | XENCRES |
| OUTBRAKEMODE | OUTMODE | OUTVLVL2 | |

Limits

Includes current, velocity, position, soft limits, stall detection, foldback.

| | | | |
|---------------|--------------|------------|-----------|
| DICONT | ILIMACT | MIFOLD | STALLTIME |
| DIPEAK | IMAX | MIPEAK | STALLVEL |
| ESTOPILM | LIMSWITCHNEG | MSPEED | VLIM |
| FOLD | LIMSWITCHPOS | POSLIMHYST | VMAX |
| HOMEIHARDSTOP | MFOLD | POSLIMMODE | |
| IFOLD | MFOLDDIS | POSLIMNEG | |
| ILIM | MICONT | POSLIMPOS | |

Linear System

Includes support for linear motor units, pitch, mass, force.

| | | | |
|-------|-----------|-------------|-------------|
| MKF | MOTORTYPE | UNITSLINACC | UNITSLINVEL |
| MMASS | MPITCH | UNITSLINPOS | |

Memory – Non-volatile

Includes non-volatile memory elements, low level dump, non-SSV parameters that are saved, position backup process, firmware upgrade, production key, factory restore.

| | | | |
|--------|----------------|---------------|----------|
| DICONT | FACTORYRESTORE | PFBBACKUP | UVTHRESH |
| DIPEAK | LOAD | PFBBACKUPMODE | |
| DUMP | OVTRESH | SAVE | |

Motion

Includes command profile source, trapeze, S-curve, profile smoothing, serial motion commands, user selectable units, acceleration, deceleration.

| | | | |
|-------------|----------------|-----------------|---------------|
| ACC | MBST | MOVESMOOTHAVG | STOPPED |
| DEC | MODMODE | MOVESMOOTHLPFHZ | UNITSLINACC |
| DECSTOP | MOVEABS | MOVESMOOTHMODE | UNITSLINPOS |
| HOLD | MOVEINC | MOVESMOOTHSRC | UNITSLINVEL |
| HOLDMODE | MOVEINCCOUNTER | PDEN | UNITSROTACC |
| IN32OPMODES | MOVEINCDELAY | PEINPOSTIME | UNITSROTPOS |
| IN32SWITCH | MOVEINCDIST1 | PNUM | UNITSROTVEL |
| J | MOVEINCDIST2 | PROTARY | VELCMDMOVEAVG |
| JOGSPD1 | MOVEINCSPEED1 | PTPTE | VLIM |
| JOGSPD2 | MOVEINCSPEED2 | PTPVCMD | |
| MB | MOVESINE | STEP | |

Motor

Includes motor configuration parameters, type of motor, type of feedback, type of encoder, directions, thermal switch, phase advance, adaptive gain, foldback readout, temperature readout, motor setup procedure, motor parameter estimation.

| | | | |
|--------------|---------------|--------------|-----------------|
| DIR | MIFOLD | MOTORSETUP | MVANGLH |
| FEEDBACKTYPE | MIFOLDFTHRESH | MOTORSETUPST | OUTBRAKE |
| MENCRES | MIFOLDWTHRESH | MOTORTYPE | OUTBRAKEINV |
| MENCTYPE | MIPEAK | MPHASE | OUTBRAKEMODE |
| MENCZPOS | MJ | MPITCH | THERM |
| MFBDIR | MKF | MPOLES | THERMCLEARLEVEL |
| MFOLD | MKT | MR | THERMODE |
| MFOLDD | ML | MRESPOLES | THERMREADOUT |
| MFOLDDIS | MLGAINC | MSPEED | THERMTIME |
| MFOLDF | MLGAINP | MTANGLC | THERMTRIPLEVEL |
| MFOLDR | MMASS | MTANGLP | THERMTYPE |
| MFOLDT | MOTORCOMMTYPE | MTPMODE | |
| MICONT | MOTORNAME | MVANGLF | |

Recording

Includes captured signals for analysis, triggering, variables, timing, data retrieval.

| | | | |
|---------|----------|---------|-------------|
| GET | PRBPARAM | RECOFF | RECTRIGLIST |
| GETMODE | RECDONE | RECORD | |
| PRBFRQ | RECING | RECRDY | |
| PRBMODE | RECLIST | RECTRIG | |

Temperature

Includes thermal protection mechanisms, motor thermal switch, foldback limit, IPM temperature.

| | | |
|-----------------|--------------|----------------|
| DRIVETEMP | THERMODE | THERMTRIPLEVEL |
| THERM | THERMREADOUT | THERMTYPE |
| THERMCLEARLEVEL | THERMTIME | TMTEMP |

Touch Probe

Variables and commands for configuring and using a touch probe.

| | | |
|--------------|---------------|---------------|
| PROBECONFIG | PROBEDATAFALL | PROBELEVELPRD |
| PROBECOUNTER | PROBEDATARISE | PROBESTATUS |

Units

Configurable units for linear and rotary motor systems, with several acceleration, velocity and position unit options.

| | | | |
|-----------------|---------------|-----------|-------------|
| ABSOFFSET | HOMEACC | OUTVLVL1 | STEP |
| ACC | HOMEOFFSET | OUTVLVL2 | UNITSLINACC |
| ANIN1VSCALE | HOMESPEED1 | PCMD | UNITSLINPOS |
| ANIN2USER | HOMESPEED2 | PDEN | UNITSLINVEL |
| ANIN2USERDEN | INDEXPFB | PE | UNITSROTACC |
| ANIN2USERNUM | J | PEINPOS | UNITSROTPOS |
| ANIN2USEROFFSET | KVP | PELOOP | UNITSROTVEL |
| ANOUTVSCALE | MOVEABS | PEMAX | V |
| DEC | MOVEINC | PFB | VCMD |
| DECDIST | MOVEINCDIST1 | PFBOFFSET | VE |
| DECDIST2 | MOVEINCDIST2 | PNUM | VLIM |
| DECSTOP | MOVEINCSPEED1 | POSLIMNEG | VMAX |
| DISSPEED | MOVEINCSPEED2 | POSLIMPOS | |
| FRICNVHYST | MSPEED | PTPTE | |
| FRICPVHYST | OUTPLVL1 | PTPVCMD | |
| GEARACCTHRESH | OUTPLVL2 | STALLVEL | |

3 Variables and Commands

ABSOFFSET

| | |
|----------------------|---|
| Definition | Absolute Feedback Offset |
| Type | Variable (R/W) |
| Description | Gets/sets the offset value that is added to the initial absolute position detected by a HIPERFACE encoder after a power-cycle. |
| Syntax | Read: ABSOFFSET Write: ABSOFFSET <value> |
| Firmware | 1.2.12 |
| Drive status | Enabled Disabled |
| Range | If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev] If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch] |
| Default value | 0 |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | Yes |
| See also | HOMETYPE PFB PFBOFFSET |
| CANopen | 200Dh, sub-index 0 |

ACC

| | |
|----------------------|--|
| Definition | Acceleration |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the following values:</p> <ul style="list-style-type: none"> ■ Acceleration of internal profile velocity commands J (jog) and STEP. ■ Acceleration of internal profile position commands MOVEINC and MOVEABS. ■ Acceleration limit of P&D reference command (refer to GEARLIMITSMODE). ■ Acceleration limit of EtherCAT/CANopen reference commands. ■ Acceleration limit of the velocity command VCMD in Analog Velocity mode. |
| Syntax | <p>Read: ACC</p> <p>Write: ACC <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | <p>If MOTORTYPE 0 (Rotary):</p> <p>UNITSROTACC 0 = 0.004 to 16666.666</p> <p>UNITSROTACC 1 = 0.23 to 1000000</p> <p>UNITSROTACC 2 = 1.35 to 6000000</p> <p>If MOTORTYPE 2 (Linear):</p> <p>UNITSLINACC 1 = 0.12 to 533333.333</p> |
| Default value | <p>If MOTORTYPE 0 (Rotary):</p> <p>UNITSROTACC 0 = 10.000</p> <p>UNITSROTACC 1 = 40000.000</p> <p>UNITSROTACC 2 = 3600.000</p> <p>UNITSROTACC 3 = 50.000</p> <p>If MOTORTYPE 2 (Linear):</p> <p>UNITSLINACC 1 = 320.000</p> |
| Unit | <p>If MOTORTYPE 0 (Rotary):</p> <p>UNITSROTACC 0 = rps/s</p> <p>UNITSROTACC 1 = rpm/s</p> <p>UNITSROTACC 2 = deg/s²</p> <p>If MOTORTYPE 2 (Linear):</p> <p>UNITSLINACC 1 = mm/s²</p> |
| Non-volatile | Yes |
| See also | DEC DECSTOP J STEP UNITSROTACC |
| CANopen | 6083h , sub-index 0 |

ACTIVE

| | |
|----------------------|---|
| Definition | Drive Active Status (Drive Enabled) |
| Type | Variable (R) |
| Description | Indicates whether the drive is enabled and power is being applied to the motor. This variable is the drive's general operation status indicator. |
| Syntax | ACTIVE |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Drive is inactive 1 = Drive is enabled |
| Default value | Not applicable |
| Unit | Not applicable |
| Non-volatile | No |
| See also | EN FLT J READY REMOTE ST SWEN |

ADDR

| | |
|----------------------|--|
| Definition | Rotary Address Switch |
| Type | Variable (R) |
| Description | Indicates the rotary switch position that defines the drive's communication address. |
| Syntax | ADDR |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| CDHD Range | 00 to 99 |
| DDHD Range | 00 to 10 |
| Default value | Hardware defined |
| Unit | Not applicable |
| Non-volatile | No |
| Example | -->addr 03 --> |
| See also | ECHO MSGPROMPT |
| CANopen | 20E1h , sub-index 0 |

ANIN1

| | |
|----------------------|--|
| Definition | Analog Input 1 Value |
| Type | Variable (R) |
| Description | Indicates the value of analog input 1. |
| Syntax | ANIN1 |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | ± 12.5 |
| Default value | Not applicable |
| Unit | V |
| Non-volatile | No |
| See also | ANIN1DB ANIN1ISCALE ANIN1LPFHZ ANIN1OFFSET ANIN1VSCALE ANIN1ZERO ANIN2 |
| CANopen | 20F2h, sub-index 0 |

ANIN1DB

| | |
|----------------------|--|
| Definition | Analog Input 1 Deadband |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the deadband of analog input 1.</p> <p>If the absolute value of the analog input signal is less than this value, no analog command signal is generated.</p> <p>This function is useful for preventing the drive from responding to voltage noise near the zero point of the analog input.</p> <p>If ANIN1DB = 0.6, for example, the actual deadband range is -600 mV to +600 mV, and no motor movement occurs when the analog input voltage is within this range.</p> |
| Syntax | <p>Read: ANIN1DB</p> <p>Write: ANIN1DB <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 10 |
| Default value | 0.000 |
| Unit | V |
| Non-volatile | Yes |
| See also | ANIN1 ANIN2LPFHZ |
| CANopen | 20F3h , sub-index 0 |

ANIN1FILTAFF

| | |
|----------------------|---|
| Definition | Analog Input 1 MSQ Filter Second Derivative Feedforward |
| Type | Variable (R/W) |
| Description | Gets/sets an adjustable gain for the second derivative feedforward from the mean square filter applied to analog input 1. |
| Syntax | Read: ANIN1FILTAFF Write: ANIN1FILTAFF<value> |
| Firmware | 1.40.0 |
| Drive status | Disable |
| Range | -2 to 2 |
| Default value | 0.000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| Example | --> ANIN1FILTAFF 0 --> ANIN1FILTAFF 1 |
| See also | ANIN1 ANIN1FILTIN ANIN1FILTMODE ANIN1FILTT1 ANIN1FILTT2 ANIN1FILTVELFF |
| CANopen | |

ANIN1FILTIN

| | |
|----------------------|--|
| Definition | Analog Input 1 Value Before Mean Square Filter |
| Type | Variable (R) |
| Description | Value of the analog input 1 signal before the mean square filter is applied. |
| Syntax | ANIN1FILTIN |
| Firmware | 1.40.0 |
| Drive status | Enabled Disabled |
| Range | ± 12.5 |
| Default value | 0.000 |
| Unit | V |
| Non-volatile | Yes No |
| See also | ANIN1 ANIN1FILTAFF ANIN1FILTMODE ANIN1FILTT1 ANIN1FILTT2 ANIN1FILTVELFF |
| CANopen | |

ANIN1FILTMODE

| | |
|----------------------|--|
| Definition | Analog Input 1 Mean Square Filter |
| Type | Variable (R/W) |
| Description | Defines whether or not the mean square filter on the analog input 1 signal is activated. |
| Syntax | Read: ANIN1FILTMODE Write: ANIN1FILTMODE <value> |
| Firmware | 1.40.x |
| Drive status | Disabled |
| Range | 0 = Mean square filter not activated 1 = Mean square filter activated |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| Example | --> ANIN1FILTMODE 0 --> ANIN1FILTMODE 1 |
| See also | ANIN1 ANIN1FILTAFF ANIN1FILTIN ANIN1FILTT1 ANIN1FILTT2 ANIN1FILTVELFF |
| CANopen | |

ANIN1FILTT1

| | |
|----------------------|--|
| Definition | Analog Input 1 Filter Depth |
| Type | Variable (R/W) |
| Description | Gets/sets the filtering time of the mean square filter on the analog input 1 signal, in 125 μ s quanta. |
| Syntax | Read: ANIN1FILTT1 Write: ANIN1FILTT1 <value> |
| Firmware | 1.40.0 |
| Drive status | Disabled |
| Range | 0.375 to 32 |
| Default value | 2.000 |
| Unit | ms |
| Non-volatile | Yes |
| Example | --> ANIN1FILTT1 2.000 [ms] --> ANIN1FILTT1 3 |
| See also | ANIN1 ANIN1FILTAFF ANIN1FILTIN ANIN1FILTMODE ANIN1FILTT2 ANIN1FILTVELFF |
| CANopen | |

ANIN1FILTT2

| | |
|----------------------|--|
| Definition | Analog Input 1 MSQ Filter Depth First and Second Derivative |
| Type | Variable (R/W) |
| Description | Gets/sets the filtering time of the mean square filter for the first and second derivative analog on the input 1 signal, in 125 μ s quanta. |
| Syntax | Read: ANIN1FILTT2 Write: ANIN1FILTT3 <value> |
| Firmware | 1.40.0 |
| Drive status | Disabled |
| Range | 0 to 32 |
| Default value | 4.000 |
| Unit | ms |
| Non-volatile | Yes |
| Example | --> ANIN1FILTT2 4.000 [ms] --> ANIN1FILTT2 3 |
| See also | ANIN1 ANIN1FILTAFF ANIN1FILTIN ANIN1FILTMODE ANIN1FILTT1 ANIN1FILTVELFF |
| CANopen | |

ANIN1FILTVELFF

| | |
|----------------------|---|
| Definition | Analog Input 1 MSQ Filter First Derivative Feedforward |
| Type | Variable (R/W) |
| Description | Gets/sets an adjustable gain for the first derivative feedforward from the mean square filter applied to analog input 1. |
| Syntax | Read: ANIN1FILTVELFF Write: ANIN1FILTVELFF <value> |
| Firmware | 1.40.0 |
| Drive status | Enabled Disabled |
| Range | -32 to 32 |
| Default value | 0.000 |
| Unit | ms |
| Non-volatile | Yes |
| Example | --> ANIN1FILTVELFF 0.000 [ms] --> ANIN1FILTVELFF 1 |
| See also | ANIN1 ANIN1FILTVELFF ANIN1FILTIN ANIN1FILTMODE ANIN1FILT1 ANIN1FILT2 |
| CANopen | |

ANIN1ISCALE

| | |
|----------------------|--|
| Definition | Analog Input 1 Current Scaling |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the scaling value of the analog current command from input 1.</p> <p>Current scaling affects how the motor current varies relative to any change in voltage at the analog input command.</p> <p>When the first analog input is used as the command for the current loop, it is important to set the scaling, that is, the ratio of the analog input voltage to the command that the drive interprets.</p> <p>For example, ANIN1ISCALE = 0.1 will produce a change of 0.1A to the motor for every 1V change.</p> |
| Syntax | Read: ANIN1ISCALE Write: ANIN1ISCALE <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | ±0.001 to DIPEAK |
| Default value | DIPEAK/100 |
| Unit | A/V |
| Non-volatile | Yes |
| See also | OPMODE |
| CANopen | 20F4h, sub-index 0 |

ANIN1LPFHZ

| | |
|----------------------|--|
| Definition | Analog Input 1 Filter |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the corner frequency of a first order (low pass) filter that is applied to analog input 1.</p> <p>This function is useful for filtering out high frequency noise from the analog input, or for limiting the rate of change of that signal.</p> <p>The ANIN1LPFHZ value represents the corner frequency of the filter. This filter is always present and is adjusted automatically as the analog input sampling rate changes for different operational modes.</p> <p>Note: If ANIN1LPFHZ is set to 10000, the filter will have no effect on the analog input value.</p> |
| Syntax | Read: ANIN1LPFHZ Write: ANIN1LPFHZ <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 10 to 10000 |
| Default value | 1000 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | ANIN1 ANIN1DB |
| CANopen | 20F5h, sub-index 0 |

ANIN1OFFSET

| | |
|----------------------|--|
| Definition | Analog Input 1 Offset |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the offset voltage for analog input 1. Used to compensate for the analog input signal offset or drift.</p> <p>The offset can also be set by a zeroing procedure, using the command ANIN1ZERO.</p> <p>The drive can receive an analog input signal in the range of $\pm 10V$. The drive uses the value stored in the ANIN1 variable to command the velocity of the motor or the current applied to the motor. The default correlation between the actual input signal and the value of ANIN1 is $\pm 10V = \pm 10000 \text{ mV}$. However, some applications provide, or require, a different analog input signal range.</p> <p>The drive analog offset function (ANIN1OFFSET) modifies the range correlation of the analog input signal and the velocity loop command (ANIN1). However, the value of ANIN1 remains $\pm 10V$; the upper value cannot be greater than 10V and the lower value cannot be less than -10V.</p> <p>For example, if ANIN1OFFSET = 5000, an analog input signal range of $\pm 10V$ equates to a command range of -5000 mV to +10000 mV. Motor movement is in response to a range of -5V to 10V on the input.</p> |
| Syntax | <p>Read: ANIN1OFFSET</p> <p>Write: ANIN1OFFSET <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | ± 10 |
| Default value | 0.000 |
| Unit | V |
| Non-volatile | Yes |
| See also | ANIN1 ANIN1ZERO |
| CANopen | 20F6h, sub-index 0 |

ANIN1VSCALE

| | |
|----------------------|---|
| Definition | Analog Input 1 Velocity Scaling |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the scaling of the analog velocity command from input 1.</p> <p>Velocity scaling affects how the motor speed will vary as a result of any change in voltage at the analog velocity command.</p> <p>When the first analog input is used as the command for the velocity loop, it is important to set the scaling, that is, the ratio of the analog input voltage to the command that the drive interprets.</p> <p>For example, if ANIN1VSCALE = 500 and UNITSROTVEL=1 (rpm), the result will be a variation of 500 rpm in the motor velocity for every 1V change.</p> |
| Syntax | <p>Read: ANIN1VSCALE</p> <p>Write: ANIN1VSCALE <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | <p>If MOTORTYPE 0 (Rotary):</p> <p>UNITSROTVEL 0 = $\pm(0.001 \text{ to } 3999.999)$</p> <p>UNITSROTVEL 1 = $\pm(0.06 \text{ to } 239999.94)$</p> <p>UNITSROTVEL 2 = $\pm(0.36 \text{ to } 1439999.64)$</p> <p>If MOTORTYPE 2 (Linear):</p> <p>UNITSLINVEL 1 = $\pm(0.032 \text{ to } 127999.96)$</p> |
| Default value | <p>If MOTORTYPE 0 (Rotary):</p> <p>UNITSROTVEL 0 = 0.001</p> <p>UNITSROTVEL 1 = 0.060</p> <p>UNITSROTVEL 2 = 0.360</p> <p>If MOTORTYPE 2 (Linear):</p> <p>UNITSLINVEL 1 = 0.032</p> |
| Unit | <p>If MOTORTYPE 0 (Rotary):</p> <p>UNITSROTVEL 0 = rps/V</p> <p>UNITSROTVEL 1 = rpm/V</p> <p>UNITSROTVEL 2 = (deg/s)/V</p> <p>If MOTORTYPE 2 (Linear):</p> <p>UNITSLINVEL 1 = (mm/s)/V</p> |
| Non-volatile | Yes |
| See also | OPMODE |
| CANopen | 20F7h, sub-index 0 |

ANIN1ZERO

| | |
|----------------------|--|
| Definition | Analog Input 1 Zeroing |
| Type | Command |
| Description | Causes the value of the analog input 1 signal to become 0 by modifying the analog offset value (ANIN1OFFSET). |
| | This command samples the analog input 64 times, calculates an average, and then adjusts IN1OFFSET to cancel out any input offset that may be present from such factors as drift and noise. |
| Syntax | ANIN1ZERO |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not applicable |
| Default value | Not applicable |
| Unit | Not applicable |
| Non-volatile | Not applicable |
| See also | ANIN1OFFSET |
| CANopen | 20F8h, sub-index 0 |

ANIN2

| | |
|----------------------|--|
| Definition | Analog Input 2 Value |
| Type | Variable (R) |
| Description | Indicates the value of analog input 2. |
| Syntax | ANIN2 |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | ± 12.5 |
| Default value | Not applicable |
| Unit | V |
| Non-volatile | No |
| See also | ANIN1 ANIN2MODE |
| CANopen | 20F9h, sub-index 0 |

ANIN2DB

| | |
|----------------------|---|
| Definition | Analog Input 2 Deadband |
| Type | Variable (R/W) |
| Description | Gets/sets the deadband of analog input 2. If the absolute value of the analog input signal is less than this value, no analog command signal is generated. |
| Syntax | Read: ANIN2DB Write: ANIN2DB <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 10 |
| Default value | 0.000 |
| Unit | V |
| Non-volatile | Yes |
| See also | ANIN1DB ANIN2 ANIN2LPFHZ |
| CANopen | 20FAh , sub-index 0 |

ANIN2ISCALE

| | |
|----------------------|---|
| Definition | Analog Input 2 Current (Torque) Scaling |
| Type | Variable (R/W) |
| Description | Gets/sets the scaling of the analog current command from input 2. When the second analog input is configured as the analog current limit, ANIN2SCALE sets the scaling of the current limit, in amperes per volt. The valid input voltage range for this functionality is 0-10 V, since current and current limits in the drive are positive values only. A negative analog input will be interpreted as zero. |
| Syntax | Read: ANIN2ISCALE Write: ANIN2ISCALE <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | ±0.001 to DIPEAK |
| Default value | DIPEAK/100 |
| Unit | A/V |
| Non-volatile | Yes |
| See also | ANIN1ISCALE ANIN2 ANIN2MODE |
| CANopen | 20FBh , sub-index 0 |

ANIN2LPFHZ

| | |
|----------------------|---|
| Definition | Analog Input 2 Filter |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the corner frequency of a first order filter that is applied to analog input 2.</p> <p>Note: If ANIN2LPFHZ is set to 10000, the filter will have no effect on the analog input value.</p> |
| Syntax | <p>Read: ANIN2LPFHZ</p> <p>Write: ANIN2LPFHZ <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 10 to 10000 |
| Default value | 1000 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | ANIN1LPFHZ ANIN2 ANIN2DB |
| CANopen | 20FCh , sub-index 0 |

ANIN2MODE

| | |
|---------------------------|--|
| Definition | Analog Input 2 Mode |
| Type | Variable (R/W) |
| Description | Gets/sets a value that defines the function of analog input 2. |
| Syntax | Read: ANIN2MODE Write: ANIN2MODE <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| CDHD Range | <p>-1 = Hardware defined dual gain. ANIN2 is inactive, ANIN1 has a 16 bit resolution, ANIN2MODE is read only.</p> <p>0 = Idle. ANIN2 input voltage is read only.</p> <p>1 = Dual gain - external jumper connection between the analog inputs is required.</p> <p>2 = Current limit mode - second analog input limits current command (uses ANIN2ISCALE)</p> <p>Note: Make sure hardware matches this configuration.</p> |
| CDHD Default value | <p>0 = When the drive is configured with Analog Input 2</p> <p>-1 = When the drive is not configured with Analog Input 2</p> |
| DDHD Range | <p>0 = Unavailable.</p> <p>Note: In DDHD, each axis has only one analog input:</p> <ul style="list-style-type: none"> ■ For axis 1, analog input is ANIN1 (interface C4 – pins 24 and 49). ■ For axis 2, analog input is ANIN1 (interface C4 – pins 25 and 50). |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | ANIN2 ANIN2ISCALE |
| CANopen | 2100h, sub-index 0 |

ANIN2OFFSET

| | |
|----------------------|--|
| Definition | Analog Input 2 Offset |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the offset voltage for analog input 2. Used to compensate for the analog input signal offset or drift.</p> <p>The offset can also be set by a zeroing procedure, using the command ANIN2ZERO.</p> |
| Syntax | <p>Read: ANIN2OFFSET</p> <p>Write: ANIN2OFFSET <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | ± 10 |
| Default value | 0.000 |
| Unit | V |
| Non-volatile | Yes |
| See also | ANIN1OFFSET ANIN2 ANIN2ZERO |
| CANopen | 20FDh, sub-index 0 |

ANIN2USER

| | |
|----------------------|---|
| Definition | Analog Input 2 Voltage Defined in User Units |
| Type | Variable (R) |
| Description | <p>Returns the value of the analog input 2 voltage converted into a user-defined unit.</p> <p>ANIN2USER is calculated as follows:</p> $ANIN2USER = ANIN2 \times \left(\frac{ANIN2USERNUM}{ANIN2USERDEN} \right) + ANIN2USEROFFSET$ <p>This equation defines the number of units (ANIN2USER) that are equivalent to a voltage value (ANIN2USERDEN).</p> |
| Syntax | ANIN2USER |
| Firmware | 1.20.6 |
| Drive status | Enable Disable |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | User defined |
| Non-volatile | No |
| Example | <pre>-->ANIN2USER -7654</pre> |
| See also | ANIN2USERDEN ANIN2USERNUM ANIN2USEROFFSET |
| CANopen | Not Applicable |

ANIN2USERDEN

| | |
|----------------------|---|
| Definition | Analog Input 2 Value Conversion to ANIN2USER - Denominator |
| Type | Variable (R/W) |
| Description | Gets/sets the denominator value in the ANIN2USER equation: $ANIN2USER = ANIN2 \times \left(\frac{ANIN2USERNUM}{ANIN2USERDEN} \right) + ANIN2USEROFFSET$ |
| Syntax | ANIN2USERDEN |
| Firmware | 1.20.6 |
| Drive status | Enable Disable |
| Range | 1 to 2147483647 |
| Default value | 1 |
| Unit | V |
| Non-volatile | Yes |
| Example | --> ANIN2USERDEN 1 --> ANIN2USERDEN 1234 --> |
| See also | ANIN2USER ANIN2USERNUM ANIN2USEROFFSET |
| CANopen | 216Eh, sub-index 0 |

ANIN2USERNUM

| | |
|----------------------|---|
| Definition | Analog Input 2 Value Conversion to ANIN2USER - Numerator |
| Type | Variable (R/W) |
| Description | Gets/sets the numerator value in the ANIN2USER equation: $ANIN2USER = ANIN2 \times \left(\frac{ANIN2USERNUM}{ANIN2USERDEN} \right) + ANIN2USEROFFSET$ |
| Syntax | ANIN2USERNUM |
| Firmware | 1.20.6 |
| Drive status | Enable Disable |
| Range | -2147483647 to 2147483647 |
| Default value | 100 |
| Unit | User defined |
| Non-volatile | Yes |
| Example | --> ANIN2USERNUM 100 --> ANIN2USERNUM 1234 --> |
| See also | ANIN2USER ANIN2USERDEN ANIN2USEROFFSET |
| CANopen | 216Fh, sub-index 0 |

ANIN2USEROFFSET

| | |
|----------------------|--|
| Definition | Analog Input 2 Value Conversion to ANIN2USER - Offset |
| Type | Variable (R/W) |
| Description | Gets/sets the offset value in the ANIN2USER equation: $ANIN2USER = ANIN2 \times \left(\frac{ANIN2USERNUM}{ANIN2USERDEN} \right) + ANIN2USEROFFSET$ |
| Syntax | Read: ANIN2USEROFFSET Write: ANIN2USEROFFSET <value> |
| Firmware | 1.20.6 |
| Drive status | Enable Disable |
| Range | -2147483647 to 2147483647 |
| Default value | 0 |
| Unit | User defined |
| Non-volatile | Yes |
| Example | --> ANIN2USEROFFSET 0 --> ANIN2USEROFFSET 1234 --> |
| See also | ANIN2USER ANIN2USERDEN ANIN2USERNUM |
| CANopen | 2170h , sub-index 0 |

ANIN2ZERO

| | |
|----------------------|---|
| Definition | Analog Input 2 Zero Command |
| Type | Command |
| Description | Causes the value of the analog input 2 signal to become 0 by modifying the analog offset value (ANIN2OFFSET). |
| Syntax | ANIN2ZERO |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not applicable |
| Default value | Not applicable |
| Unit | Not applicable |
| Non-volatile | Not applicable |
| See also | ANIN1ZERO ANIN2 ANIN2OFFSET |
| CANopen | 20FFh, sub-index 0 |

ANOUT

| | |
|----------------------|--|
| Definition | Analog Output Value |
| Type | Variable (R) |
| Description | Indicates the analog output value, in volts, as set by ANOUTMODE. The drive's analog output capability is $\pm 12V$. |
| Syntax | ANOUT |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | ± 12 |
| Default value | Not applicable |
| Unit | V |
| Non-volatile | No |
| See also | ANOUTMODE ANOUTCMD |
| CANopen | 2133h , sub-index 0 |

ANOUTCMD

| | |
|----------------------|--|
| Definition | Analog Output Command |
| Type | Command |
| Description | The analog output value set by user. Requires ANOUTMODE 0 |
| Syntax | ANOUTCMD { <i>value</i> } |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | ±ANOUTLIM |
| Default value | 0 |
| Unit | V |
| Non-volatile | No |
| See also | ANOUT ANOUTLIM ANOUTMODE |
| CANopen | 2134h , sub-index 0 |

ANOUTISCALE

| | |
|----------------------|--|
| Definition | Analog Output Current Scaling |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the scaling of the analog output voltage that represents the motor current (I) or the current command (ICMD).</p> <p>For example, if ANOUTMODE=4 (current command monitoring): $ANOUT [V] = ICMD [A] \div ANOUTISCALE [A/V]$</p> |
| Syntax | ANOUTISCALE |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 10 |
| Default value | $0.01 \times DIPEAK$ |
| Unit | A/V |
| Non-volatile | Yes |
| See also | ANOUT ANOUTLIM ANOUTMODE |
| CANopen | 2135h , sub-index 0 |

ANOUTLIM

| | |
|----------------------|--|
| Definition | Analog Output Voltage Limit |
| Type | Variable (R/W) |
| Description | Gets/sets the maximum voltage of the analog output command for all modes. |
| Syntax | ANOUTLIM |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 1 to 12 |
| Default value | 10.000 |
| Unit | V |
| Non-volatile | Yes |
| See also | ANOUT ANOUTCMD ANOUTMODE |
| CANopen | 2136h , sub-index 0 |

ANOUTMODE

| | |
|----------------------|---|
| Definition | Analog Output Mode |
| Type | Variable (R/W) |
| Description | Gets/sets a value that defines the function of the analog output. Known Limitation: For the first 3 seconds after power-up, DAC will output 12V. |
| Syntax | Read: ANOUTMODE Write: ANOUTMODE <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = User command. Uses value set by ANOUTCMD. 1 = Tachometer mode. For velocity feedback. 2 = Equivalent current monitoring. 3 = Velocity error monitoring. 4 = Current command monitoring. 5 = Triangle wave at low frequency (0.041 Hz). For testing. 6 = Current in-phase component (IQ) monitoring. 7 = Reserved (output 0). 8 = Reserved (output 0). 9 = Reserved. 10 = Reserved. 11 = Triangle wave (10 Hz). 12 = Rectangular wave (10 Hz). 13 = Velocity command (VCMD). 14 = Deactivated (ANOUT not supported; typically due to hardware limitation). |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | ANOUT ANOUTCMD ANOUTISCALE ANOUTLIM ANOUTVSCALE |
| Note | Velocity variables are scaled by ANOUTVSCALE, while current variables are scaled by ANOUTISCALE. |
| CANopen | 2137h , sub-index 0 |

ANOUTVSCALE

| | |
|----------------------|--|
| Definition | Analog Output Velocity Scaling |
| Type | Variable (R/W) |
| Description | Gets/sets the scaling of the analog output voltage that represents the actual velocity (V) or the velocity error (VE). |
| Syntax | Read: ANOUTVSCALE Write: ANOUTVSCALE <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | If MOTORTYPE 0 (Rotary) UNITSROTVEL 0 = -3999.999 to 3999.999 UNITSROTVEL 1 = -239999.940 to 239999.940 UNITSROTVEL 2 = -1439999.640 to 1439999.640 If MOTORTYPE 0 (Linear) UNITSROTVEL 1 = -127999.968 to 127999.968 |
| Default value | 0 |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTVEL 0 = rps/V UNITSROTVEL 1 = rpm/V UNITSROTVEL 2 = (deg/s)/V If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = (mm/s)/V |
| Non-volatile | Yes |
| See also | ANOUT ANOUTLIM ANOUTMODE |
| CANopen | 2138h, sub-index 0 |

AUTOHOME

| | |
|----------------------|--|
| Definition | Automatic Homing Mode |
| Type | Variable (R/W) |
| Description | <p>Gets/sets a value that defines whether or not automatic homing will be performed at power up.</p> <p>When automatic homing mode is active, homing will be attempted as soon as the drive is enabled for the first time after power up (even if faults needed to be cleared first). The drive should be in a position operation mode (OPMODE 4 or OPMODE 8).</p> |
| Syntax | <p>Read: AUTOHOME</p> <p>Write: AUTOHOME <value></p> |
| Firmware | 1.2.12 |
| Drive status | Enabled Disabled |
| Range | <p>0 = No Action. User must initiate homing manually.</p> <p>1 = Homing to be attempted after power up if conditions allow (that is, drive is enabled by means of a serial or hardware command, and no faults exist).</p> |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | HOMECMD HOMETYPE |
| CANopen | 200Eh, sub-index 0 |

BAUDRATE

| | |
|----------------------|--|
| Definition | Serial Baud Rate |
| Type | Variable (R/W) |
| Description | <p>Sets the communication bit rate between the drive and host computer. It is intended to enable more reliable communication in noisy environments.</p> <p>Changing the bit rate requires reestablishing communication with the PC software.</p> <p>At bootup, the 7-segment displays the message b r x x x x x (x = selected baud rate) if the baud rate is not the default value.</p> |
| Syntax | <p>READ: BAUDRATE</p> <p>WRITE: BAUDRATE <value></p> |
| Firmware | 1.3.2 |
| Drive status | Enabled Disabled |
| Range | <p>9600</p> <p>19200</p> <p>38400</p> <p>57600</p> <p>115200</p> |
| Default value | 115200 |
| Unit | bps |
| Non-volatile | Yes |
| See also | |

BISSCFIELDS

| | |
|----------------------|--|
| Definition | BiSS-C Encoder Data Fields Lengths and Bits |
| Type | Command |
| Description | <p>The drive firmware handles various BiSS-C devices according to the communication packet structure defined by the command BISSCFIELDS.</p> <p>This command sets the encoder multi-turn data length, multi-turn data resolution, single-turn data length, and single-turn data resolution values.</p> |
| Syntax | <p>BISSCFIELDS {<i>aa bb cc dd</i>}</p> <p>where:</p> <p><i>aa</i> = multi-turn data length value; <i>aa</i> must be equal to or greater than <i>bb</i></p> <p><i>bb</i> = multi-turn data resolution value [<i>aa+bb</i>] sum must not exceed 45</p> <p><i>cc</i> = single-turn data length value; <i>cc</i> must be equal to or greater than <i>dd</i></p> <p><i>dd</i> = single-turn data resolution value</p> |
| Firmware | 1.20.6 |
| Drive status | Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | BISSCINFO |
| CANopen | 2176h , sub-index 0 |

BISSCINFO

| | |
|----------------------|--|
| Definition | BiSS-C Encoder Info |
| Type | Command |
| Description | Returns information about the BiSS-C device. |
| Syntax | BISSCINFO |
| Firmware | 1.20.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | BISSCFIELDS |

BW

| | |
|----------------------|---|
| Definition | Velocity Loop Bandwidth for Pole Placement |
| Type | Variable (R/W) |
| Description | Gets/sets the velocity control loop bandwidth for the pole placement controller. (VELCONTROLMODE 2 or 4) |
| Syntax | Read: BW Write: BW <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 10 to 600 |
| Default value | 30 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | FILTMODE LMJR MJ MKT TF VELCONTROLMODE |
| CANopen | 2010h , sub-index 0 |

CANBITRATE

| | |
|----------------------|---|
| Definition | CAN Bus Bit Rate |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the CAN bus bit rate.</p> <p>When the drive is powered, it assumes the bit rate of any existing communication on the CAN bus. If no such communication is detected, the drive sets the communication rate to the CANBITRATE value.</p> <p>For the CANBITRATE setting to take effect, a SAVE command followed by a cycle power sequence must be executed.</p> |
| Syntax | CANBITRATE CANBITRATE <value> |
| Firmware | 1.3.2 |
| Drive status | Enabled Disabled |
| Range | 1 = 125 kbps 2 = 250 kbps 3 = 500 kbps 4 = 1000 kbps (required for CDHD with softMC 7) |
| Default value | 3 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | FBGDS FBITPRD |

CHECKSUM

| | |
|----------------------|---|
| Definition | Checksum |
| Type | Variable (R/W) |
| Description | <p>Enables/disables checksum protection on messages communicated between drive and host.</p> <p>The checksum is an 8-bit value, displayed within brackets <>. For example, 0x1F checksum is displayed as <1F> at the end of the message before the carriage return.</p> |
| Syntax | <p>Read: CHECKSUM</p> <p>Write: CHECKSUM <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | <p>0 = Message checksum disabled</p> <p>1 = Message checksum enabled</p> |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | <p>COMMODE</p> <p>ECHO</p> <p>MSGPROMPT</p> |

CLEARFAULTS

| | |
|----------------------|--|
| Definition | Clear Faults |
| Type | Command |
| Description | <p>Clears latched faults.</p> <p>Once all faults are cleared, the drive becomes ready for activation (READY).</p> <p>If clearing the faults causes the drive to re-enable, then software enable (SWEN) is disabled to prevent spontaneous re-enable.</p> |
| Note | When using a Tamagawa 17-bit multi-turn encoder, the command CLEARFAULT must be preceded by the command TMTURNRESET. |
| Syntax | CLEARFAULTS |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | DISMODE FLT FLTHIST |

CLVD

| | |
|----------------------|---|
| Definition | Voltage Command D Component |
| Type | Variable (R) |
| Description | Shows the D output of the current controller. |
| Syntax | CLVD |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Internal |
| Default value | Not Applicable |
| Unit | V |
| Non-volatile | No |
| See also | CLVQ |
| CANopen | 2013h, sub-index 0 |

CLVQ

| | |
|----------------------|---|
| Definition | Voltage Command Q Component |
| Type | Variable (R) |
| Description | Shows the Q output of the current controller. |
| Syntax | CLVQ |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Internal |
| Default value | Not Applicable |
| Unit | V |
| Non-volatile | No |
| See also | CLVD |
| CANopen | 2014h, sub-index 0 |

COMMERRMAXCNT

| | |
|----------------------|--|
| Definition | Commutation Error Counter |
| Type | Variable (R/W) |
| Description | Gets/clears the variable whose value indicates the commutation error count since COMMERRMAXCNT was last cleared. |
| Note | Replaces RAMAXERRCNT |
| Syntax | Read: COMMERRMAXCNT Write: COMMERRMAXCNT 0 |
| Firmware | 1.40.0 |
| Drive status | Enabled Disabled |
| Range | 0 (no other value allowed) |
| Default value | 0 |
| Unit | ms |
| Non-volatile | No |
| See also | COMMERRVTHRESH COMMFLTTRESH |

COMMERRTTHRESH

| | |
|----------------------|--|
| Definition | Commutation Error Threshold |
| Type | Variable (R/W) |
| Description | <p>Motor commutation errors are typically caused by incorrect wiring, incorrect parameters values, or encoder malfunction. The commutation error parameters allow users to define the settings for detecting an uncontrolled motion and declaring a fault.</p> <p>COMMERRTTHRESH gets/sets the error-counter threshold value for generating a commutation fault.</p> <p>When the commutation error is detected consecutively for COMMERRTTHRESH number of times, a commutation fault is generated.</p> |
| Note | Replaces RATTHRESH |
| Syntax | Read: COMMERRTTHRESH Write: COMMERRTTHRESH <value> |
| Firmware | 1.40.0 |
| Drive status | Enabled Disabled |
| Range | 0 to 3000 |
| Default value | 0 |
| Unit | ms |
| Non-volatile | Yes |
| See also | COMMERRVTHRESH COMMFLTTHRESH |

COMMERRVTHRESH

| | |
|----------------------|--|
| Definition | Commutation Error Velocity Deviation |
| Type | Variable (R/W) |
| Description | <p>Motor commutation errors are typically caused by incorrect wiring, incorrect parameters values, or encoder malfunction. The commutation error parameters allow users to define the settings for detecting an uncontrolled motion and declaring a fault.</p> <p>COMMERRVTHRESH gets/sets the threshold value of velocity deviation that will generate a commutation fault.</p> |
| Note | Replaces parameter RAVTHRESH |
| Syntax | Read: COMMERRVTHRESH Write: COMMERRVTHRESH <value> |
| Firmware | 1.40.0 |
| Drive status | Enable Disable |
| Range | 0 to VLIM |
| Default value | If MOTORTYPE 0 (Rotary): If UNITSROTVEL 0 = 1.000 If UNITSROTVEL 1 = 60.000 If UNITSROTVEL 2 = 359.999 If UNITSROTVEL 3 = $1 \times (\text{PNUM} / \text{PDEN})$ If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = $1 \times \text{MPITCH}$ UNITSLINVEL 2 = $1 \times (\text{PNUM} / \text{PDEN})$ |
| Unit | If MOTORTYPE 0 (Rotary): If UNITSROTVEL 0 = rps If UNITSROTVEL 1 = rpm If UNITSROTVEL 2 = deg/s If UNITSROTVEL 3 = user/s If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = mm/s UNITSLINVEL 2 = user/s |
| Non-volatile | Yes |
| See also | COMMFLTTRESH |

COMMFLTTRESH

| | |
|----------------------|---|
| Definition | Commutation Error Index Position Deviation |
| Type | Variable (R/W) |
| Description | <p>Motor commutation errors are typically caused by incorrect wiring, incorrect parameters values, or encoder malfunction. The commutation error parameters allow users to define the settings for detecting an uncontrolled motion and declaring a fault.</p> <p>COMMFLTTRESH gets/sets the value of commutation deviation from the index position that will generate a commutation fault.</p> <p>After commutation is initialized, the commutation angle at the index crossing position is monitored; if the angle deviates from the initial location by more than COMMFLTTRESH, a commutation fault is declared.</p> <p>The fault disables the drive according to the DISMODE setting for a (still) reliable feedback condition.</p> <p>The error message is "AqB Commutation fault", and the 7-segment LED display shows error code r39.</p> <p>Use COMMFLTTRESH 0 to disable this function.</p> |
| Notes | <p>Applicable for use only with encoders that have an index pulse.</p> <p>COMMFLTTRESH; not COMMFLTHRESH</p> |
| Syntax | <p>Read: COMMFLTTRESH</p> <p>Write: COMMFLTTRESH <value></p> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 0 to 20 |
| Default value | 2 |
| Unit | Electrical degree |
| Non-volatile | Yes |
| See also | COMMERRMAXCNT COMMERRTTHRESH COMMERRVTHRESH DISMODE ELECTANGLE FEEDBACKTYPE MENCTYPE MPHASE |

COMMODE

| | |
|----------------------|---|
| Definition | Communication Interface Mode |
| Type | Variable (R/W) |
| Description | Gets/sets the fieldbus communication interface mode. COMMODE 1 is applicable only for EtherCAT and CANopen drives. |
| Syntax | Read: COMMODE Write: COMMODE <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 = Serial RS232/USB communication enabled. EtherCAT/CANopen communication disabled. Drive can be software enabled at power-up (SWENMODE). Reference commands accepted via serial/pulse /analog interfaces only. 1 = For EtherCAT/CANopen drive only. EtherCAT/CANopen communication is enabled. Serial RS232/USB communication can be used as a utility for monitoring and changing parameters with limited functionality. Reference commands cannot be received via serial/pulse/analog interfaces. |
| Default value | 0 = For analog drive 1 = For CAN/EtherCAT drive |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | CHECKSUM MSGPROMPT SWENMODE |

CONFIG

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|--|-----------|--|-----|--------|-----------|------------|---------|--------|-----------|-------|--------|--------------|--------|----|--------|----|-----------|-----|-----|---------|------|-----|--------|-----|----|--------|-----|---------|------|---------|---------|------|----------|---------------|
| Definition | Configure Drive | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Type | Command | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Description | <p>Configures the current control and other internal drive mechanisms based on the configuration set. Since this configuration procedure depends on several variables, it is not executed automatically following parameter changes.</p> <p>The configuration process may take more than a few seconds to complete. Be sure the configuration has completed before attempting to enable the drive.</p> <p>When configuration is required, the 7-segment display shows -1.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <p>CONFIG is required after modifying the value of certain parameters, including, but not necessarily limited to, the following:</p> <table><tr><td>DIR</td><td>MFBDIR</td><td>MOTORTYPE</td></tr><tr><td>ENCOUTMODE</td><td>MFBMODE</td><td>MPITCH</td></tr><tr><td>ENCOUTRES</td><td>MICON</td><td>MPOLES</td></tr><tr><td>FEEDBACKTYPE</td><td>MIPEAK</td><td>MR</td></tr><tr><td>KCBEMF</td><td>MJ</td><td>MRESPOLES</td></tr><tr><td>KCD</td><td>MKF</td><td>MSININT</td></tr><tr><td>KCFF</td><td>MKT</td><td>MSPEED</td></tr><tr><td>KCI</td><td>ML</td><td>PWMFRQ</td></tr><tr><td>KCP</td><td>MLGAINC</td><td>VBUS</td></tr><tr><td>MENCRES</td><td>MLGAINP</td><td>VLIM</td></tr><tr><td>MENCTYPE</td><td>MOTORCOMMTYPE</td><td></td></tr></table> | | | DIR | MFBDIR | MOTORTYPE | ENCOUTMODE | MFBMODE | MPITCH | ENCOUTRES | MICON | MPOLES | FEEDBACKTYPE | MIPEAK | MR | KCBEMF | MJ | MRESPOLES | KCD | MKF | MSININT | KCFF | MKT | MSPEED | KCI | ML | PWMFRQ | KCP | MLGAINC | VBUS | MENCRES | MLGAINP | VLIM | MENCTYPE | MOTORCOMMTYPE |
| DIR | MFBDIR | MOTORTYPE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ENCOUTMODE | MFBMODE | MPITCH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ENCOUTRES | MICON | MPOLES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FEEDBACKTYPE | MIPEAK | MR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| KCBEMF | MJ | MRESPOLES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| KCD | MKF | MSININT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| KCFF | MKT | MSPEED | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| KCI | ML | PWMFRQ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| KCP | MLGAINC | VBUS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MENCRES | MLGAINP | VLIM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MENCTYPE | MOTORCOMMTYPE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Syntax | CONFIG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Firmware | 1.0.6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Drive status | Disabled | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Range | Not Applicable | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Default value | Not Applicable | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Unit | Not Applicable | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Non-volatile | Not Applicable | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| See also | MENCTYPE ML | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CANopen | 2002h , sub-index 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

CUSTOMERID

| | |
|----------------------|---|
| Definition | Customer ID |
| Type | Variable (R/W) |
| Description | Gets/sets a customer ID assigned to the drive unit. |
| Syntax | Read: CUSTOMERID Write: CUSTOMERID <value> |
| Firmware | 1.41.9 |
| Drive status | Enabled Disabled |
| Range | 0 to 4294967295 |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | |

DEC

| | |
|----------------------|--|
| Definition | Deceleration |
| Type | Variable (R/W) |
| Description | Gets/sets the deceleration value of the drive. |
| Syntax | Read: DEC Write: DEC <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | If MOTORTYPE 0 (Rotary): UNITSROTACC 0 = 0.004 to 16666.666 UNITSROTACC 1 = 0.23 to 1000000 UNITSROTACC 2 = 1.38 to 6000000 If MOTORTYPE 2 (Linear): UNITSLINACC 1 = 0.12 to 533333.333 |
| Default value | If MOTORTYPE 0 (Rotary): UNITSROTACC 0 = 10.000 UNITSROTACC 1 = 600.000 UNITSROTACC 2 = 3600.000 UNITSROTACC 3 = 50.000 If MOTORTYPE 2 (Linear): UNITSLINACC 1 = 320.000 |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTACC 0 = rps/s UNITSROTACC 1 = rpm/s UNITSROTACC 2 = deg/s ² If MOTORTYPE 2 (Linear): UNITSLINACC 1 = mm/s ² |
| Non-volatile | Yes |
| See also | ACC ANIN1 DECSTOP J STEP UNITSROTACC |
| CANopen | 6084h, sub-index 0 |

DECDIST

| | |
|----------------------|---|
| Definition | Deceleration Distance |
| Type | Variable (R/W) |
| Description | <p>The target position offset value, relative to the position captured at a stop triggered by a digital input set to INMODE 15.</p> <p>When the input triggers a stop, a position capture occurs, and a deceleration ramp is generated to stop the motion at DECDIST relative to the captured position.</p> <p>DECDIST is in user defined position units.</p> |
| Syntax | <p>Read: DECDIST</p> <p>Write: DECDIST <value></p> |
| Firmware | 1.2.12 |
| Drive status | Disabled |
| Range | <p>If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev]</p> <p>If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch]</p> |
| Default value | 0 |
| Unit | <p>If MOTORTYPE 0 (Rotary):</p> <ul style="list-style-type: none"> UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg <p>If MOTORTYPE 2 (Linear):</p> <ul style="list-style-type: none"> UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | Yes |
| See also | DECDIST2 DISMODE INMODE |
| CANopen | 2047h, sub-index 0 |

DECDIST2

| | |
|----------------------|---|
| Definition | Deceleration Distance 2 |
| Type | Variable (R/W) |
| Description | <p>The target position offset value, relative to the position captured at a stop triggered by a digital input set to INMODE 16.</p> <p>When the input triggers a stop, a position capture occurs, and a deceleration ramp is generated to stop the motion at DECDIST2 relative to the captured position.</p> <p>DECDIST2 is in user defined position units.</p> |
| Syntax | <p>Read: DECDIST2</p> <p>Write: DECDIST2<value></p> |
| Firmware | 1.2.12 |
| Drive status | Disabled |
| Range | <p>If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev]</p> <p>If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch]</p> |
| Default value | 0 |
| Unit | <p>If MOTORTYPE 0 (Rotary):</p> <p> UNITSROTPOS 0 = rev</p> <p> UNITSROTPOS 1 = count</p> <p> UNITSROTPOS 2 = deg</p> <p>If MOTORTYPE 2 (Linear):</p> <p> UNITSLINPOS 0 = pitch</p> <p> UNITSLINPOS 1 = count</p> <p> UNITSLINPOS 3 = mm</p> |
| Non-volatile | Yes |
| See also | DECDIST DISMODE INMODE |
| CANopen | 2048h, sub-index 0 |

DECSTOP

| | |
|----------------------|--|
| Definition | Active Disable Deceleration |
| Type | Variable (R/W) |
| Description | Gets/sets the deceleration value for an Active Disable or emergency stop. |
| Syntax | Read: DECSTOP Write: DECSTOP <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | If MOTORTYPE 0 (Rotary): UNITSROTACC 0 = 0.004 to 16666.666 UNITSROTACC 1 = 0.23 to 1000000 UNITSROTACC 2 = 1.38 to 6000000 If MOTORTYPE 2 (Linear): UNITSLINACC 1 = 0.12 to 533333.333 |
| Default value | If MOTORTYPE 0 (Rotary): UNITSROTACC 0 = 1666.667 UNITSROTACC 1 = 100000.000 UNITSROTACC 2 = 600000.000 If MOTORTYPE 2 (Linear): UNITSLINACC 1 = 53333.333 |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTACC 0 = rps/s UNITSROTACC 1 = rpm/s UNITSROTACC 2 = deg/s ² If MOTORTYPE 2 (Linear): UNITSLINACC 1 = mm/s ² |
| Non-volatile | Yes |
| See also | ACC DEC UNITSROTACC |
| CANopen | 6085h , sub-index 0 |

DECSTOPTIME

| | |
|----------------------|---|
| Definition | Active Disable Deceleration Time |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the deceleration time for an Active Disable or emergency stop.</p> <p>DECSTOP will override DECSTOPTIME if the resulting deceleration level exceeds DECSTOP.</p> |
| Syntax | <p>Read: DECSTOPTIME</p> <p>Write: DECSTOPTIME <value></p> |
| Firmware | 1.2.12 |
| Drive status | Disabled |
| Range | 0 to 6500 |
| Default value | 0 |
| Unit | ms |
| Non-volatile | Yes |
| See also | DECSTOP DISMODE |
| CANopen | 2049h, sub-index 0 |

DELAY

| | |
|----------------------|--|
| Definition | Script Delay |
| Type | Command |
| Description | Allows a pause during the execution of a drive script command. |
| Syntax | DELAY { <i>value</i> } |
| Firmware | 1.4.4 |
| Drive status | Enabled Disabled |
| Range | 0 to 65535 |
| Default value | Not Applicable |
| Unit | ms |
| Non-volatile | No |
| See also | DRIVESCRIPT DRIVESCRIPTST |

DICONT

| | |
|----------------------|--|
| Definition | Drive Continuous Current |
| Type | Variable (R) |
| Description | Indicates the continuous rated current for the drive (sinusoidal peak). This is a hardware-defined read-only variable that is detected automatically by the drive. |
| Syntax | DICONT |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | Not Applicable |
| Default value | Hardware defined |
| Unit | A |
| Non-volatile | Yes |
| See also | DIPEAK FOLD IFOLD MICONT |
| CANopen | 207Ch, sub-index 0 |

DIPEAK

| | |
|----------------------|---|
| Definition | Drive Peak Current |
| Type | Variable (R) |
| Description | Indicates the rated peak current of the drive (sinusoidal peak). This is a hardware-defined read-only variable. |
| Syntax | DIPEAK |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | Not Applicable |
| Default value | Hardware defined |
| Unit | A |
| Non-volatile | Yes |
| See also | DICONT IMAX MIPEAK |
| CANopen | 207Bh, sub-index 0 |

DIR

| | |
|----------------------|--|
| Definition | Feedback Direction |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the feedback positive direction.</p> <p>When DIR is set to 1, the variable V is inverted and the actual position determined by the motor feedback (PFB) is reversed. Other variables (MECHANGLE, ELECTANGLE, HWPOS) remain unchanged.</p> <p>Motor rotation does not change. To reverse the direction of rotation of motors that do not have an electronic motorplate (servo parameter bundle), 180 degrees must be added to MPHASE. In motors that have an electronic motorplate, the firmware will handle it internally.</p> <p>However, when DIR=1, issuing certain motion commands, such as Jog in Velocity Control mode or Move Absolute in Position Control mode, will produce motion in the direction and at the velocity indicated after the feedback inversion.</p> <p>When the value of DIR is changed, CONFIG is required.</p> |
| Syntax | <p>Read: DIR</p> <p>Write: DIR <value></p> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | <p>0 = Feedback direction not inverted</p> <p>1 = Feedback direction inverted</p> <p>-1 = Feedback direction inverted (same as DIR 1) without the negation of speed phase advance (MVANGLH/F)</p> |
| Default value | 0 |
| Note | If the drive system detects an electronic motor nameplate (such as used in the sensAR magnetic encoder), the value of parameter DIR is loaded directly from the encoder memory to the drive RAM at power-up. |
| Unit | Not applicable |
| Non-volatile | Yes |
| See also | <p>MFBDIR</p> <p>MOTORSETUP</p> <p>MPHASE</p> <p>PFB</p> <p>V</p> |
| CANopen | 2045h, sub-index 0 |

DISMODE

| | |
|----------------------|--|
| Definition | Disable Mode |
| Type | Variable (R/W) |
| Description | <p>The disabling of the drive may be the result of an explicit command from the motion controller or the drive's own response to a fault condition. When the drive becomes disabled, the Disable Mode function can be used in certain cases (see Note below) to bring the motor to a fast stop before power to the motor is shut off. This reduces the amount of motor coasting.</p> <p>DISMODE gets/sets a value that defines the Disable mode. The Disable mode consists of two mechanisms:</p> <ul style="list-style-type: none"> ■ Active Disabling brings the motor to a stop by means of a controlled deceleration to zero velocity, and then disables the drive. Active Disable cannot be applied when the drive is operating in a current control mode (OPMODE 2 or OPMODE 3). ■ Dynamic Braking holds the motor while the drive is disabled by applying only the motor's back-EMF to the stopping current; it can therefore be used even in the event of feedback loss. |
| Syntax | Read: DISMODE Write: DISMODE <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = No active disabling; no dynamic braking. 1 = No active disabling; dynamic braking on fault only. 2 = No active disabling; dynamic braking on any disable. 3 = Active disabling on fault*; no dynamic braking. 4 = Active disabling on fault*; dynamic braking on fault only. 5 = Active disabling on fault*; dynamic braking on any disable. |
| Note | <p>*When supported. Faults that require immediate disable (to prevent drive damage) and feedback faults that might cause a commutation error (runaway motor) cannot issue Active Disabling.</p> <p>In DISMODE 4 and 5 both Active Disable and Dynamic Braking are supported. In these modes, Active Disable brings the motor to a stop, and Dynamic Braking is activated after DISTIME.</p> |
| Note | Even when DISMODE=0 and DISTIME=0, a few milliseconds will elapse from the time of the disable request until the actual disable occurs. |
| Default value | 0 |
| Unit | Not Applicable |

| | |
|---------------------|--|
| Non-volatile | Yes |
| See also | DECSTOP DISSPEED DISTIME FLT ISTOP |
| CANopen | 2046h, sub-index 0 |

DISPLAYMODE

| | |
|----------------------|---|
| Definition | Display Mode |
| Type | Variable (R/W) |
| Description | Gets/sets the 7-segment digital display mode. |
| Syntax | Read: DISPLAYMODE Write: DISPLAYMODE <value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 0 = Serial communication operation modes are displayed 1 = Fieldbus operation modes are displayed 2 = Node IDs are displayed. |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | ACTIVE COMMODE FLT OPMODE ST |

DISPLAYTEST

| | |
|----------------------|---|
| Definition | Test 7-Segment Display |
| Type | Command |
| Description | Tests the 7-segment LED display on the front panel of the drive. |
| Syntax | <p>DISPLAYTEST All LED segments blink several times.</p> <p>DISPLAYTEST -1 The LED panel executes a test sequence.</p> <p>DISPLAYTEST {≥ 0} Returns to the terminal the binary equivalent of the LED segments that are currently lit.</p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | ADDR |
| CANopen | 20E2h, sub-index 0 |

DISSPEED

| | |
|----------------------|---|
| Definition | Active Disabling Speed Threshold |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the velocity threshold below which the motor is considered stopped and the Active Disabling timer starts the countdown to disable. The motor velocity must remain below this threshold for at least 50 ms for the motor to be considered stopped.</p> <p>The Active Disabling function ramps the motor to zero speed using DECSTOP.</p> <p>DISSPEED is compared to the actual motor speed; when the absolute speed drops below the threshold value for 50 ms, the active disabling timer (DISTIME) begins timing. Once the timer times out, the drive is disabled.</p> |
| Note | To use the Active Disabling function effectively, a position controller must be configured. |
| Syntax | Read: DISSPEED Write: DISSPEED <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to VMAX |
| Default value | If MOTORTYPE 0 (Rotary): UNITSROTACC 0 = 0.167 UNITSROTACC 1 = 10.000 UNITSROTACC 2 = 60.0 If MOTORTYPE 2 (Linear): UNITSLINACC 1 = 5333.304 |
| Unit | If MOTORTYPE 0 (Rotary): If UNITSROTVEL 0 = rps If UNITSROTVEL 1 = rpm If UNITSROTVEL 2 = deg/s If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = mm/s |
| Non-volatile | Yes |
| See also | DECSTOP DISMODE DISTIME FLT |
| CANopen | 204Ah, sub-index 0 |

DISTIME

| | |
|----------------------|--|
| Definition | Active Disabling Time |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the continuous time the motor must remain below DISSPEED before the drive is disabled by the Active Disabling function. This delay is typically set to accommodate brake engage time.</p> <p>The DISTIME counter begins only after motor velocity has been below DISSPEED for at least 50 ms.</p> |
| Note | To use the Active Disabling function effectively, a position controller must be configured. |
| Note | Even when DISMODE=0 and DISTIME=0, a few milliseconds will elapse from the time of the disable request until the actual disable occurs. |
| Syntax | Read: DISTIME Write: DISTIME <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 6500 |
| Default value | 10 |
| Unit | ms |
| Non-volatile | Yes |
| See also | DECSTOP DISMODE DISSPEED FLT |
| CANopen | 204Bh, sub-index 0 |

DRIVENAME

| | |
|----------------------|--|
| Definition | Drive Name |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the name assigned to the drive unit.</p> <p>The name may contain up to 20 alphanumeric characters.</p> <p>A quotation mark (") always precedes the name.</p> <p>Additional valid characters for use in the text string: () / - . :</p> |
| Syntax | <p>Read: DRIVENAME</p> <p>Write: DRIVENAME <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | " |
| Unit | Not Applicable |
| Non-volatile | No |
| Example | <pre>-->drivename "robot-axis1 -->drive name "ROBOT-AXIS1 --></pre> |
| See also | INFO MOTORNAME |

DRIVESCRIPT

| | |
|----------------------|---|
| Definition | Drive Script Command |
| Type | Command |
| Description | <p>Triggers a predefined sequence of terminal commands according to the combined status of defined digital inputs. The drive supports up to 32x2 scripts, each with a maximum of 128 characters.</p> <p>Up to 5 digital inputs can be defined to activate the scripts, with an additional digital input that serves as a trigger and defines whether activation occurs on rising or falling edge.</p> |
| Syntax | <p>DRIVESCRIPT <i>n</i> <i>I</i> "<i>command1~command2~command3</i> ;<i>remark</i></p> <p><i>n</i> = The identifier of the script based on the digital inputs defined as script bits 0 to 4</p> <p><i>i</i> = The script trigger input level for script activation: 0 = triggered on falling edge 1 = triggered on rising edge</p> <p>" = The start of the script string</p> <p>~ = Command separator</p> <p>; = Remark separator</p> |
| Firmware | 1.2.12 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| Example | -->drivescript 1 2 "k~opmode 0~en~j -10 ;Slowly Backward |
| See also | DRIVESCRIPTST |

DRIVESCRIPTST

| | | | | | | | | | | | | | |
|----------------------|--|------------|--------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|--------------|--------------|
| Definition | Drive Script Status | | | | | | | | | | | | |
| Type | Variable (R) | | | | | | | | | | | | |
| Description | <p>Indicates the script that is being executed.</p> <p>If no script is defined for the digital input combination, nothing will run.</p> <p>Digital input definition:</p> <table> <tr> <td>INMODE 5=9</td><td>Script</td></tr> <tr> <td>INMODE 6=10</td><td>Script bit 0</td></tr> <tr> <td>INMODE 7=11</td><td>Script bit 1</td></tr> <tr> <td>INMODE 8=12</td><td>Script bit 2</td></tr> <tr> <td>INMODE 9=13</td><td>Script bit 3</td></tr> <tr> <td>INMODE 10=14</td><td>Script bit 4</td></tr> </table> <p>Digital inputs 6-10 define which script to run.</p> <p>Digital input 5 triggers script execution.</p> | INMODE 5=9 | Script | INMODE 6=10 | Script bit 0 | INMODE 7=11 | Script bit 1 | INMODE 8=12 | Script bit 2 | INMODE 9=13 | Script bit 3 | INMODE 10=14 | Script bit 4 |
| INMODE 5=9 | Script | | | | | | | | | | | | |
| INMODE 6=10 | Script bit 0 | | | | | | | | | | | | |
| INMODE 7=11 | Script bit 1 | | | | | | | | | | | | |
| INMODE 8=12 | Script bit 2 | | | | | | | | | | | | |
| INMODE 9=13 | Script bit 3 | | | | | | | | | | | | |
| INMODE 10=14 | Script bit 4 | | | | | | | | | | | | |
| Syntax | DRIVESCRIPTST | | | | | | | | | | | | |
| Firmware | 1.2.12 | | | | | | | | | | | | |
| Drive status | Enabled Disabled | | | | | | | | | | | | |
| Range | Not Applicable | | | | | | | | | | | | |
| Default value | Not Applicable | | | | | | | | | | | | |
| Unit | Not Applicable | | | | | | | | | | | | |
| Non-volatile | No | | | | | | | | | | | | |
| Example | <pre>-->drivescriptst DriveScript [01][0] Start:J 100:DriveScript [01][0] Stop: --></pre> | | | | | | | | | | | | |
| See also | DRIVESCRIPT INMODE | | | | | | | | | | | | |

DRIVETEMP

| | |
|----------------------|---|
| Definition | Drive Temperature |
| Type | Variable (R) |
| Description | Indicates the temperature of the control and power boards in the drive, in Celsius degrees. |
| Syntax | DRIVETEMP |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | °C |
| Non-volatile | No |
| Example | -->drivetemp --> Control: 32[deg C] Power: 29[deg C] --> |
| See also | FOLD IFOLD THERM |
| CANopen | 2044h, sub-index 1 |

DUMP

| | |
|----------------------|---|
| Definition | Dump Drive Parameter Values |
| Type | Command |
| Description | Returns the set of configuration parameters that defines the complete functionality of the drive. The command can be used to backup the configuration. |
| Note | Some parameters, not intended for users, may appear in the list. Do not attempt to manipulate parameters that are not described in the product documentation or Help. |
| Syntax | DUMP |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | LOAD SAVE |

ECENCYMODE

| | |
|----------------------|--|
| Definition | EtherCAT Emergency Message Mode |
| Type | Variable (R/W) |
| Description | Defines whether or not EtherCAT emergency message is sent to the master. |
| Syntax | Read: ECENCYMODE Write: ECENCYMODE <value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 0 = EtherCAT emergency message is not sent to master 1 = EtherCAT emergency message is sent to master |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | |

ECHO

| | |
|----------------------|--|
| Definition | Serial Communication Character Echo |
| Type | Variable (R/W) |
| Description | <p>Enables/disables the serial port character echo. If echo is enabled, characters received via the serial port are echoed back to the serial port and displayed on the computer monitor.</p> <p>ECHO 1 is required for proper operation of the graphic interface software.</p> <p>ECHO 0 will cause the graphic interface software to lose certain functionalities. Use with caution.</p> |
| Syntax | <p>Read: ECHO</p> <p>Write: ECHO <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | <p>0 = Serial port echo disabled</p> <p>1 = Serial port echo enabled</p> |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | ADDR MSGPROMPT |

ELECTANGLE

| | |
|----------------------|---|
| Definition | Electrical Position |
| Type | Variable (R) |
| Description | Indicates the electrical angle position in 16-bit resolution. |
| Syntax | ELECTANGLE |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 65535 |
| Default value | Not Applicable |
| Unit | 65536/electrical cycle |
| Non-volatile | No |
| See also | MECHANGLE MENCRES MPHASE PHASEFIND |
| CANopen | 2016h, sub-index 0 |

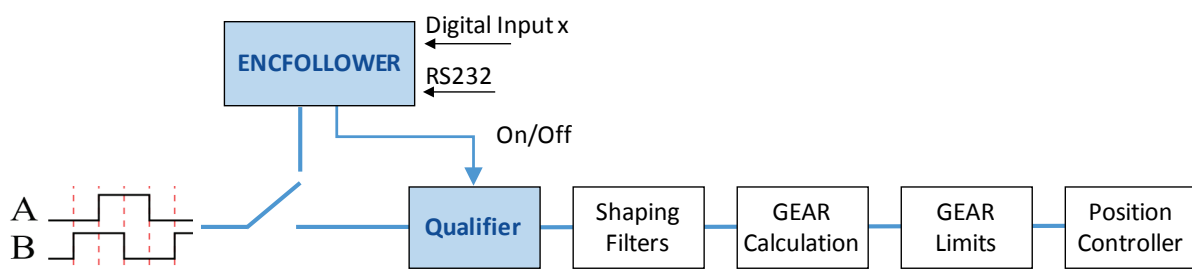
EN

| | |
|----------------------|--|
| Definition | Software Enable Command |
| Type | Command |
| Description | <p>Initiates a software enable of the drive. This command first attempts to reset any existing fault conditions, then sets SWEN to 1. If both READY and REMOTE have values of 1, the drive is in Active state.</p> <p>The value of ACTIVE indicates whether the EN command successfully enabled the drive.</p> |
| Syntax | EN |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | ACTIVE FLT K READY REMOTE ST SWEN |
| Note | <ul style="list-style-type: none">■ EN is the Software Enable command. It first attempts to clear any latched faults; if successful, the drive becomes Ready for enabling. When the drive is Ready and the Remote Enable (hardware) signal is on, the drive is enabled.■ READY (R) indicates whether a drive is ready to be enabled (waiting for Remote Enable ON signal).■ ACTIVE (R) indicates whether a drive is enabled. |

ENC FOLLOWER

| | |
|---------------------|--|
| Definition | Encoder Following Mode |
| Type | Variable (R/W) |
| Description | The encoder following function is activated by the digital input parameter INMODE <input#> 33 34 35 36 37, which sets both the required Position Gear mode (OPMODE 4) and a specific type of encoder following as defined ENCFOLLOWER. |
| Syntax | Read: ENCFOLLOWER Write: ENCFOLLOWER <value> |
| Firmware | 1.40.0 |
| Drive status | Enabled Disabled |
| Range | <p>0 = Encoder following is disabled. The drive ignores all input pulses from the master encoder. Input pulses are ignored and do not accumulate in the GEAR box.</p> <p>1 = Bi-Directional Encoder Following (Default). The master encoder following mode is enabled. The drive accepts all pulses from the master encoder "as is" as input to the GEAR box.</p> <p>2 = Uni-Directional Encoder Following – Positive. The master encoder following mode is enabled. The drive follows master encoder pulses in the positive direction only. If the master encoder moves in the opposite direction, the pulses from master encoder are discarded. After direction qualification and manipulation, the master encoder pulses to be used are input to the GEAR box.</p> <p>3 = Uni-directional Encoder Following – Negative The master encoder following mode is enabled. The drive follows master encoder pulses in the negative direction only. If the master encoder moves in the opposite direction, the pulses from master encoder are discarded. After direction qualification and manipulation, the master encoder pulses to be used are input to the GEAR box.</p> <p>4 = Absolute to Positive Direction Encoder Following. The master encoder following mode is enabled. The drive follows master encoder pulses in the positive direction regardless of the direction of the master encoder; for example, if the master encoder sends 1000 pulses, the drive follows 1000 pulses; if the master encoder sends -1000 pulses, the drive still follows 1000 pulses in the positive direction. After direction qualification and manipulation, the master encoder pulses to be used are input to the GEAR box.</p> |

| | |
|----------------------|---|
| | <p>5 = Absolute to Negative Direction Encoder Following. The master encoder following mode is enabled. The drive follows master encoder pulses in the negative direction regardless of the direction of the master encoder; for example, if the master encoder sends -1000 pulses, the drive follows -1000 pulses; if the master encoder sends 1000 pulses, the drive still follows -1000 pulses in the negative direction. After direction qualification and manipulation, the master encoder pulses to be used are input to the GEAR box.</p> |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | INMODE 33 34 35 36 37 |
| CANopen | |



ENCOUTMODE

| | |
|----------------------|--|
| Definition | Encoder Simulation Mode |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the value that indicates the state of encoder simulation.</p> <p>When the value of ENCOUTMODE is changed, CONFIG is required.</p> <p>Known Limitation: No index signal available for absolute Tamagawa encoder.</p> |
| Syntax | <p>Read: ENCOUTMODE</p> <p>Write: ENCOUTMODE <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | <p>0 = Encoder simulation not active</p> <p>1 = A/B encoder simulation. An index pulse is generated for each motor revolution (or pitch for linear motors). This mode is typically used with feedback devices that do not have a physical index. The drive outputs a simulated index.</p> <p>2 = A/B encoder simulation. The index pulse is routed directly from the motor feedback device (by the FPGA) to the drive, regardless of the value of ENCOUTRES. This mode is typically used for linear motors that have incremental AqB encoders, in which the index is used for homing and appear once per linear scale.</p> |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | ENCOUTRES ENCOUTZPOS MENCRES |
| CANopen | 20E3h, sub-index 0 |

ENCOUTRES

| | |
|----------------------|--|
| Definition | Encoder Simulation Line Resolution |
| Type | Variable (R/W) |
| Description | Gets/sets the resolution, in number of lines, of the encoder simulation output. Use plus for positive direction; minus for negative direction. When the value of ENCOUTRES is changed, CONFIG is required. |
| Notes | ENCOUTRES is applicable only when ENCOUTMODE=1. Changing the value of ENCOUTRES might cause the encoder simulation to generate extra pulses. |
| Syntax | Read: ENCOUTRES Write: ENCOUTRES <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | ± 10000000 |
| Default value | 2048 |
| Unit | If MOTORTYPE=0 (Rotary): lines per revolution (LPR) If MOTORTYPE=2 (Linear): lines per pitch (LPP) |
| Non-volatile | Yes |
| See also | ENCOUTMODE ENCOUTZPOS MENCRES |
| CANopen | 20E4h , sub-index 0 |

ENCOUTZPOS

| | |
|----------------------|--|
| Definition | Encoder Simulation Index Position |
| Type | Variable (R/W) |
| Description | Gets/sets the index offset value of the encoder simulation output (ENCOUTRES). |
| Note | ENCOUTRES is applicable only when ENCOUTMODE=1. |
| Syntax | Read: ENCOUTZPOS Write: ENCOUTZPOS <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 40000000 |
| Default value | 0 |
| Unit | Count |
| Non-volatile | Yes |
| See also | ENCOUTMODE ENCOUTRES MENCRES |
| CANopen | 20E5h , sub-index 0 |

ESTOPILIM

| | |
|----------------------|---|
| Definition | Emergency or Controlled Stop Current Limit |
| Type | Variable (R/W) |
| Description | Gets/sets the current limit during an emergency or controlled stop (expressed as factor of ILIM). |
| Syntax | Read: ESTOPILIM Write: ESTOPILIM <value> |
| Firmware | 1.2.12 |
| Drive status | Enabled Disabled |
| Range | 0.001 to 1 |
| Default value | 1.000 (factor of ILIM) |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | DISMODE ILIM |
| CANopen | 208Dh, sub-index 0 |

EXTADDITIVEICMD

| | |
|----------------------|--|
| Definition | External Additive ICMD Value |
| Type | Variable (R/W) |
| Description | <p>EXTADDITIVEICMD is a feedforward current offset, which is added to the current command issued by the drive's position/velocity controller.</p> <p>The command is intended to be used by EtherCAT/CANopen devices operating in Cyclic Position mode.</p> |
| Syntax | <p>Read: EXTADDITIVEICMD</p> <p>Write: EXTADDITIVEICMD <value></p> |
| Firmware | 1.4.6 |
| Drive status | Enabled Disabled |
| Range | \pm ILIM |
| Default value | 0.000 |
| Unit | A |
| Non-volatile | No |
| See also | EXTADDITIVEVCMD |
| CANopen | 60B2h, sub-index 0 |

EXTADDITIVEVCMD

| | |
|----------------------|---|
| Definition | External Additive VCMD Value |
| Type | Variable (R/W) |
| Description | <p>EXTADDITIVEVCMD is a feedforward current offset, which is added to the current command issued by the drive's position/velocity controller.</p> <p>EXTADDITIVEVCMD is applicable only to the linear position controller (POSCONTROLMODE 0).</p> |
| Syntax | <p>Read: EXTADDITIVEVCMD</p> <p>Write: EXTADDITIVEVCMD <value></p> |
| Firmware | 1.4.6 |
| Drive status | Enabled Disabled |
| Range | \pm VLIM |
| Default value | 0.000 |
| Unit | <p>If MOTORTYPE 0 (Rotary):</p> <ul style="list-style-type: none">If UNITSROTVEL 0 = rpsIf UNITSROTVEL 1 = rpmIf UNITSROTVEL 2 = deg/s <p>If MOTORTYPE 2 (Linear):</p> <ul style="list-style-type: none">UNITSLINVEL 1 = mm/s |
| Non-volatile | No |
| See also | EXTADDITIVEICMD |
| CANopen | 60B1h , sub-index 0 |

FACTORYRESTORE

| | |
|----------------------|--|
| Definition | Restore Factory Settings |
| Type | Command |
| Description | <p>Restores all configuration variables to their factory default settings.</p> <p>If the drive system includes an encoder with an electronic motor plate (MTP), the drive will restore all configuration variables from the MTP.</p> <p>FACTORYRESTORE does not clear the fault log.</p> |
| Syntax | FACTORYRESTORE |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | DUMP LOAD SAVE |
| CANopen | 204Ch, sub-index 0 |

FASTSTOENABLE

| | |
|----------------------|---|
| Definition | Fast STO-Enable Function |
| Type | Variable (R/W) |
| Description | <p>Defines whether the Fast STO Enable function is activated.</p> <p>Applicable only for DDHD and STO-certified CDHD drives (-ST models) – drives capable of AC-loss detection. When Fast STO Enable is active, the drive can be reenabled within 150 ms, rather than 800 ms, once the STO condition is cleared.</p> |
| Syntax | <p>Read: FASTOENABLE</p> <p>Write: FASTOENABLE <value></p> |
| Firmware | 1.20.6 |
| Drive status | Enabled Disabled |
| Range | <p>0 = Not activated</p> <p>1 = Activated</p> |
| Default value | 0, if applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | |

FBGDS

| | |
|----------------------|---|
| Definition | Fieldbus CANopen Gear Driving Shaft Scaling |
| Type | Variable (R/W) |
| Description | Fieldbus CANopen gear ratio driving shaft revolution scaling factor (object 6091h sub-index 2). |
| Syntax | Read: FBGDS Write: FBGDS <value> |
| Firmware | 1.2.12 |
| Drive status | Enabled Disabled |
| Range | 1 to 4294967295 |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | FBGMS FBITIDX FBSCALE |
| CANopen | 6091h, sub-index 2 |

FBGMS

| | |
|----------------------|--|
| Definition | Fieldbus CANopen Gear Motor Shaft Scaling |
| Type | Variable (R/W) |
| Description | Fieldbus CANopen gear ratio motor shaft revolution scaling factor (object 6091h sub-index 1) |
| Syntax | Read: FBGMS Write: FBGMS <value> |
| Firmware | 1.2.12 |
| Drive status | Enabled Disabled |
| Range | 1 to 4294967295 |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | FBGDS FBITIDX FBSCALE |
| CANopen | 6091h, sub-index 1 |

FBITIDX

| | |
|----------------------|---|
| Definition | Fieldbus EtherCAT/CANopen Interpolation Time Index |
| Type | Variable (R/W) |
| Description | Fieldbus CANopen interpolation time index for the fieldbus cycle time calculations. |
| Note | The cycle time in the controller and the cycle time in the drive (FBITIDX, FBITPRD) must be identical. |
| Syntax | Read: FBITIDX Write: FBITIDX <value> |
| Firmware | 1.2.12 |
| Drive status | Disabled |
| Range | -128 to 63 |
| Default value | -3 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | FBGDS FBGMS FBITIDX FBITPRD FBSCALE |
| CANopen | 60C2h, sub-index 2 |

FBITPRD

| | |
|----------------------|---|
| Definition | Fieldbus EtherCAT/CANopen Interpolation Time |
| Type | Variable (R/W) |
| Description | Fieldbus CANopen interpolation time period for the fieldbus cycle time calculations. |
| Note | The cycle time in the controller and the cycle time in the drive (FBITIDX, FBITPRD) must be identical. |
| Syntax | Read: FBITPRD Write: FBITPRD <value> |
| Firmware | 1.2.12 |
| Drive status | Disabled |
| Range | 1 to 255 |
| Default value | 2 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | CANBITRATE FBGDS FBITIDX FBITPRD |
| CANopen | 60C2h, sub-index 1 |

FBPLIGNORE

| | |
|----------------------|--|
| Definition | Fieldbus Ignore Packet Loss Fault |
| Type | Variable (R/W) |
| Description | Defines whether the drive ignores or responds to the fieldbus packet loss fault. |
| Syntax | Read: FBPLIGNORE Write: FBPLIGNORE <value> |
| Firmware | 1.4.4 |
| Drive status | Disabled |
| Range | 0 = Drive responds to fault 1 = Drive ignores fault |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | FBSCALE |

FBSCALE

| | |
|----------------------|--|
| Definition | Fieldbus Unit Scaling |
| Type | Variable (R/W) |
| Description | Fieldbus unit scaling for internal counts. Defines the number of bits of a 32-bit position that are equivalent to a number of revolutions. |
| Syntax | Read: FBSCALE Write: FBSCALE <value> |
| Firmware | 1.2.12 |
| Drive status | Enabled Disabled |
| Range | 0 to 20 |
| Default value | 12 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | FBPLIGNORE MENCRES |
| CANopen | 200Fh , sub-index 0 |

FEEDBACKBR

| | | | |
|---------------|---|-----------------------------|---------|
| Definition | Communication Feedback Baud Rate | | |
| Type | Variable (R/W) | | |
| Description | <p>Gets/sets the baud rate of certain feedback devices.</p> <p>FEEDBACKBR values other than the default may be set only if the configured encoder requires the change (such as Nikon with 4 MBaud communication rate), or if the configured encoder communication rate is determined by the drive (clocked encoders such as EnDat and BiSS-C).</p> <p>When using a FEEDBACKBR value other than the default with clocked encoders, verify that the selected baud rate matches the encoder query rate</p> | | |
| | By default, FEEDBACKBR = 0, meaning feedback devices are automatically set to the following baud rates: | | |
| | Nikon 17-bit and 20-bit Absolute Encoder; single/multi-turn | FEEDBACKTYPE 4 | 2.5 MBd |
| | Tamagawa 17-bit and 23-bit Absolute Encoder; multi- turn | FEEDBACKTYPE 6 | 2.5 MBd |
| | Tamagawa 17-bit and 23-bit Absolute Encoder; single turn | FEEDBACKTYPE 7 | 2.5 MBd |
| | EnDat 2.x Communication Only | FEEDBACKTYPE 11 | 2 MBd |
| | sensAR | FEEDBACKTYPE 12 | 2.5 MBd |
| | Sankyo Absolute Rotary Encoder | FEEDBACKTYPE 14 | 2.5 MBd |
| Syntax | Read: FEEDBACKBR Write: FEEDBACKBR <value> | | |
| Firmware | 1.15.xx | | |
| Drive status | Disabled | | |
| Range | 0 to 5000 | | |
| Default value | 0 | | |
| Unit | kBd | | |
| Non-volatile | Yes | | |
| Example | --> FEEDBACKBR 4000 | Sets the baud rate to 4 MBd | |
| See also | FEEDBACKTYPE | | |

FEEDBACKTYPE

| | | | |
|---------------------|---|---------------------|--------------------|
| Definition | Feedback Type | | |
| Type | Variable (R/W) | | |
| Description | <p>Gets/set the motor feedback type.</p> <p>If FEEDBACKTYPE = 0, the motor feedback is detected automatically by the drive.</p> <p>When the value of FEEDBACKTYPE is changed, CONFIG is required.</p> | | |
| Syntax | <p>Read: FEEDBACKTYPE</p> <p>Write: FEEDBACKTYPE <value></p> | | |
| Firmware | 1.0.6 | | |
| Drive status | Disabled | | |
| Range | | FEEDBACKTYPE | MENCTYPE |
| | Resolver | 1 | Not Applicable (0) |
| | Incremental Encoder; A, B and index channels, and Halls (A/B/Z/H) | 2 | 0 |
| | Incremental Encoder; A/B/Z commutation initialization by PHASEFIND command | 2 | 1 |
| | Incremental Encoder; A/B/Z commutation initialization by ENABLE or PHASEFIND command | 2 | 2 |
| | Incremental Encoder; A/B commutation initialization by PHASEFIND command | 2 | 3 |
| | Incremental Encoder; A/B commutation initialization by ENABLE or PHASEFIND command | 2 | 4 |
| | Halls only | 2 | 5 |
| | Incremental Encoder; A/B/H | 2 | 6 |
| | Tamagawa Incremental Encoder (8 wires) | 2 | 11 |
| | Sine Encoder; A/B/Z/H | 3 | 0 |
| | Sine Encoder; A/B/Z commutation initialization by PHASEFIND command | 3 | 1 |
| | Sine Encoder; A/B/Z commutation initialization by ENABLE and PHASEFIND command | 3 | 2 |
| | Sine Encoder; A/B commutation initialization by PHASEFIND command | 3 | 3 |
| | Sine Encoder; A/B ; commutation initialization by ENABLE or PHASEFIND command | 3 | 4 |
| | Sine Encoder; A/B/H | 3 | 6 |
| | EnDat 2.X with Sine Signals | 3 | 9 |
| | HIPERFACE with Sine Signals | 3 | 10 |

| | | | |
|----------------------|---|----|--------------------|
| | Nikon 17-bit and 20-bit Absolute Encoder; single/multi-turn | 4 | Not Applicable (0) |
| | Tamagawa 17-bit and 23-bit Absolute Encoder; multi-turn | 6 | Not Applicable (0) |
| | Tamagawa 17-bit and 23-bit Absolute Encoder; single turn | 7 | Not Applicable (0) |
| | EnDat 2.x Communication Only | 11 | 0 |
| | sensAR Single turn | 12 | Not Applicable (0) |
| | Sankyo Absolute Rotary Encoder; 17-bit per revolution; 24-bit multi-turn counter. Requires MENCRES=32768 | 14 | Not Applicable (0) |
| | Biss-C feedback device | 16 | Not Applicable (0) |
| | sensAR Multi-turn | 19 | Not Applicable (0) |
| Default value | 0 | | |
| Note | If the drive system detects an electronic motor nameplate (such as used in the sensAR magnetic encoder), the value of parameter FEEDBACKTYPE is loaded directly from the encoder memory to the drive RAM at power-up. | | |
| Unit | Not Applicable | | |
| Non-volatile | Yes | | |
| See also | MENCRES MENCTYPE MOTORTYPE MRESPOLES | | |
| CANopen | 204Dh , sub-index 0 | | |

FILTHZ1

| | |
|----------------------|--|
| Definition | Velocity Loop Output Filter Parameter 1 |
| Type | Variable (R/W) |
| Description | Velocity loop output filter first parameter. A multi-function parameter for setting the output filter of the velocity controller. FILTMODE defines its functionality. |
| Syntax | Read: FILTHZ1 Write: FILTHZ1 <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 1 to 10000 |
| Default value | 1000 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | FILTHZ2 FILTMODE |
| CANopen | 204Eh, sub-index 0 |

FILTHZ2

| | |
|----------------------|---|
| Definition | Velocity Loop Output Filter Parameter 2 |
| Type | Variable (R/W) |
| Description | Velocity loop output filter second parameter. A multi-function parameter for setting the output filter of the velocity controller. FILTMODE defines its functionality. |
| Syntax | Read: FILTHZ2 Write: FILTHZ2 <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 1 to 10000 |
| Default value | 2000 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | FILTHZ1 FILTMODE |
| CANopen | 204Fh, sub-index 0 |

FILTMODE

| | |
|----------------------|--|
| Definition | Velocity Loop Output Filter Mode |
| Type | Variable (R/W) |
| Description | Gets/sets the value that defines the velocity loop output filter. |
| Syntax | Read: FILTMODE Write: FILTMODE <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Transparent feed through; no filtering. 1 = First order low pass filter; sets FILTHZ1 as corner frequency. 2 = Double first order low pass filter; sets FILTHZ1 and FILTHZ2 as corner frequencies. 3 = Notch filter; sets FILTHZ2 as notch center frequency and FILTHZ1 as notch frequency width. 4 = High pass filter; sets FILTHZ1 as corner frequency. 5 = Band pass; sets FILTHZ2 as bandpass center frequency and FILTHZ1 as bandpass frequency width. 6 = User defined polynomial filter; sets VF. |
| Default value | 2 |
| Unit | Not applicable |
| Non-volatile | Yes |
| See also | FILTHZ1 FILTHZ2 VELCONTROLMODE VF |
| CANopen | 2050h , sub-index 0 |

FLT

| | |
|----------------------|--|
| Definition | Print Faults |
| Type | Variable (R) |
| Description | Returns a list of faults latched by the drive. Faults remain latched until cleared by CLEARFAULTS or EN, provided that the fault condition has been removed. |
| Syntax | FLT |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | DISMODE FLTHIST WRN |
| CANopen | 603Fh, sub-index 0 |

FLTHIST

| | |
|----------------------|--|
| Definition | Fault History |
| Type | Command |
| Description | <p>Returns the contents of the fault buffer.</p> <p>The drive transmits the fault history to the serial port. The most recent fault is sent first. A time stamp in the format of hours:minutes:seconds is displayed along with each fault, indicating the time at which the fault occurred.</p> <p>The fault buffer can contain up to 40 faults. Once the buffer is full, the oldest fault is automatically removed whenever a new fault is added.</p> |
| Syntax | FLTHIST |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| Example | <pre>--> flthist 2:28:55 A/B Line Break 2:28:55 Illegal Halls 2:28:49 Illegal Halls --></pre> |
| See also | FLT WRN |

FOLD

| | |
|----------------------|---|
| Definition | Drive Foldback Status |
| Type | Variable (R) |
| Description | Indicates whether the drive foldback limit (IFOLD) has dropped below the application's current limits (ILIM). |
| Syntax | FOLD |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Foldback limit above ILIM 1 = Foldback limit below ILIM |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | DICONT IFOLD IFOLDFTHRESH IFOLDWTHRESH ILIM |
| CANopen | 2051h , sub-index 0 |

FRICINEG

| | |
|----------------------|---|
| Definition | Friction Compensation Negative Current |
| Type | Variable (R/W) |
| Description | Gets/sets the level of current to add to the current command when commanded velocity is negative. Subject to hysteresis of the friction compensation mechanism. |
| Syntax | Read: FRICINEG Write: FRICINEG <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | ±DIPEAK |
| Default value | 0.000 |
| Unit | A |
| Non-volatile | Yes |
| See also | FRICIPOS FRICNVHYST FRICPVHYST |
| CANopen | 2052h , sub-index 0 |

FRICIPOS

| | |
|----------------------|---|
| Definition | Friction Compensation Positive Current |
| Type | Variable (R/W) |
| Description | Gets/sets the level of current to add to the current command when commanded velocity is positive. Subject to hysteresis of the friction compensation mechanism. |
| Syntax | Read: FRICIPOS Write: FRICIPOS <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | ±DIPEAK |
| Default value | 0.000 |
| Unit | A |
| Non-volatile | Yes |
| See also | FRICINEG FRICNVHYST FRICPVHYST |
| CANopen | 2053h , sub-index 0 |

FRICNVHYST

| | |
|----------------------|--|
| Definition | Friction Compensation Negative Velocity Hysteresis |
| Type | Variable (R/W) |
| Description | Gets/sets the velocity hysteresis in the negative direction for the friction compensation mechanism. |
| Syntax | Read: FRICNVHYST Write: FRICNVHYST <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | ±1000 rpm |
| Default value | 0.000 |
| Unit | If MOTORTYPE 0 (Rotary): If UNITSROTVEL 0 = rps If UNITSROTVEL 1 = rpm If UNITSROTVEL 2 = deg/s If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = mm/s |
| Non-volatile | Yes |
| See also | FRICINEG FRICIPOS FRICPVHYST |
| CANopen | 2054h , sub-index 0 |

FRICPVHYST

| | |
|----------------------|--|
| Definition | Friction Compensation Positive Velocity Hysteresis |
| Type | Variable (R/W) |
| Description | Gets/sets the velocity hysteresis in the positive direction for the friction compensation mechanism. |
| Syntax | Read: FRICPVHYST Write: FRICPVHYST <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | ±1000 [rpm] |
| Default value | 0.000 |
| Unit | If MOTORTYPE 0 (Rotary): If UNITSROTVEL 0 = rps If UNITSROTVEL 1 = rpm If UNITSROTVEL 2 = deg/s If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = mm/s |
| Non-volatile | Yes |
| See also | FRICINEG FRICIPOS FRICNVHYST |
| CANopen | 2055h, sub-index 0 |

GEAR

| | |
|----------------------|---|
| Definition | Gear |
| Type | Variable (R/W) |
| Description | Engages/disengages the gearing. |
| Syntax | Read: GEAR Write: GEAR <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Gearing disengaged 1 = Gearing engaged |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | GEARMODE |
| CANopen | 211Eh, sub-index 0 |

GEARACCTHRESH

| | |
|----------------------|---|
| Definition | Gear Acceleration Threshold |
| Type | Variable (R/W) |
| Description | <p>Maximum acceleration for gearing.</p> <p>Used for the combination of HD position controller (POSCTRLMODE 2 or 1) and gearing input (OPMODE 4).</p> <p>This threshold defines the value below which the acceleration derived from the gear filter as input to the position controller is 0.</p> |
| Syntax | <p>Read: GEARACCTHRESH</p> <p>Write: GEARACCTHRESH <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | <p>If MOTORTYPE 0 (Rotary):</p> <p>UNITSROTACC 0 = 0 to 16666.666</p> <p>UNITSROTACC 1 = 0 to 1000000</p> <p>UNITSROTACC 2 = 0 to 6000000</p> <p>If MOTORTYPE 2 (Linear):</p> <p>UNITSLINACC 1 = 0 to 533333.333</p> |
| Default value | <p>If MOTORTYPE 0 (Rotary):</p> <p>UNITSROTACC 0 = 16666.667</p> <p>UNITSROTACC 1 = 1000000.000</p> <p>UNITSROTACC 2 = 6000000.000</p> <p>If MOTORTYPE 2 (Linear):</p> <p>UNITSLINACC 1 = 533333.333</p> |
| Unit | <p>If MOTORTYPE 0 (Rotary):</p> <p>UNITSROTACC 0 = rps/s</p> <p>UNITSROTACC 1 = rpm/s</p> <p>UNITSROTACC 2 = deg/s²</p> <p>If MOTORTYPE 2 (Linear):</p> <p>UNITSLINACC 1 = mm/s²</p> |
| Non-volatile | Yes |
| See also | GEARMODE OPMODE POSCTRLMODE |
| CANopen | 2120h, sub-index 0 |

GEARDBVAL

| | |
|----------------------|--|
| Definition | Gearing Deadband Value |
| Type | Variable (R/W) |
| Description | Gets/sets a deadband value for a master encoder input. Applicable only when an encoder following mode (ENCFOLLOWER) is active. |
| Syntax | Read: GEARDBVAL Write: GEARDBVAL <value> |
| Firmware | 1.40.0 |
| Drive status | Enabled Disabled |
| Range | 0 to 32767 |
| Default value | 2 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | ENCFOLLOWER |
| CANopen | |

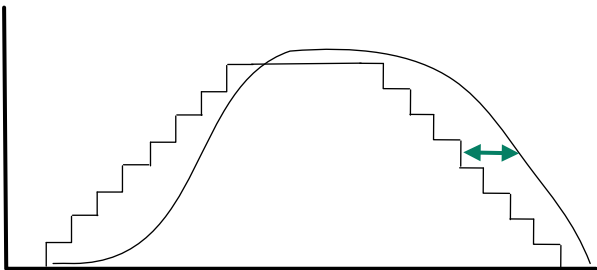
GEARFILTAFF

| | |
|----------------------|--|
| Definition | Gear Filter Acceleration Feedforward |
| Type | Variable (R/W) |
| Description | Gets/sets the value of the gear filter acceleration feedforward. |
| Syntax | Read: GEARFILTAFF Write: GEARFILTAFF <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | ± 2 |
| Default value | 0.000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | GEARMODE |
| CANopen | 2121h, sub-index 0 |

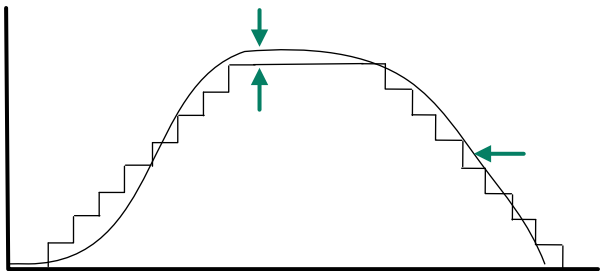
GEARFILTMODE

| | |
|----------------------|--|
| Definition | Gear Filter Mode |
| Type | Variable (R/W) |
| Description | Defines whether or not the gear filter is activated. |
| Syntax | Read: GEARFILTMODE Write: GEARFILTMODE <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 = Gear filter not activated 1 = Gear filter activated |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | GEARFILTT1 GEARFILTT2 GEARMODE |
| CANopen | 2122h , sub-index 0 |

GEARFILTT1

| | |
|----------------------|---|
| Definition | Gear Filter Depth |
| Type | Variable (R/W) |
| Description | <p>Gear filter depth, in 0.25 ms quanta.</p> <p>Increasing GEARFILTT1 smooths the input command PTPVCMD, but adds a delay.</p> <p>$\text{GEARFILTT1} = \sim 2 \times \text{input step width}$</p>  |
| Syntax | <p>Read: GEARFILTT1</p> <p>Write: GEARFILTT1 <value></p> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0.75 to 32 |
| Default value | 2.000 |
| Unit | ms |
| Non-volatile | Yes |
| See also | GEARFILTT2 GEARMODE |
| CANopen | 2123h, sub-index 0 |

GEARFILTT2

| | |
|----------------------|---|
| Definition | Gear Filter Velocity and Acceleration Depth |
| Type | Variable (R/W) |
| Description | <p>Gear filter velocity and acceleration depth.</p> <p>Increasing GEARFILTT2 and VELFF compensates for the delay, but adds overshoots.</p> <p>If VELFF= GEARFILTT2: no delay</p>  |
| Syntax | <p>Read: GEARFILTT2</p> <p>Write: GEARFILTT2 <value></p> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 to 60 |
| Default value | 4.000 |
| Unit | ms |
| Non-volatile | Yes |
| See also | GEARFILTT1 GEARMODE |
| CANopen | 2124h, sub-index 0 |

GEARFILTVELFF

| | |
|----------------------|---|
| Definition | Gear Filter Velocity Feedforward |
| Type | Variable (R/W) |
| Description | Gets/sets the gear filter velocity feedforward. Note: Was GEARFILTVEFF in previous firmware versions. |
| Syntax | Read: GEARFILTVELFF Write: GEARFILTVELFF <value> |
| Firmware | 1.3.2 |
| Drive status | Disabled |
| Range | ±200 |
| Default value | 0.000 |
| Unit | ms |
| Non-volatile | Yes |
| See also | GEARFILTAFF GEARFILTMODE GEARFILTT1 GEARFILTT2 GEARMODE |
| CANopen | 2125h, sub-index 0 |

GEARIN

| | |
|----------------------|--|
| Definition | Gear Ratio Numerator |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the numerator of the gearbox equation.</p> <p>The gearing relationship is as follows: $(\text{GEARIN}/\text{GEAROUT}) \times (1/\text{XENCRES})$</p> <p>Gearing sets up a relationship between the number of input pulses (HWPEXT counts) and the position increments of the motor shaft (or actual motor position, PFB).</p> <p>The rate at which position increments of the motor shaft (motor speed) occur is determined by the gearing relationship and the line frequency of the pulse train.</p> <p>The direction of rotation is determined by the sign of the variable GEARIN.</p> |
| Note | <p>The HWPEXT/PCMD ratio is not maintained under the following condition:</p> <p>GEAROUT=1 GEARIN>5000</p> <p>No warning is issued.</p> |
| Syntax | <p>Read: GEARIN</p> <p>Write: GEARIN <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | ±2147483647 |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | GEARMODE GEAROUT |
| CANopen | 2126h, sub-index 0 |

GEARINMODE

| | |
|----------------------|---|
| Definition | Gearing Input Interpolation |
| Type | Variable (R/W) |
| Description | Used for gearing that is fed through the Controller I/F connector only. Enables interpolation of the gearing signal and increase of resolution by a factor of 16. |
| Syntax | Read: GEARINMODE Write: GEARINMODE <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 = Gearing input interpolation not activated 1 = Gearing input interpolation activated |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | GEARMODE HWPEXT |
| CANopen | 2127h, sub-index 0 |

GEARLIMITSMODE

| | |
|--------------------|--|
| Definition | Electronic Gearing Mode |
| Type | Variable (R/W) |
| Description | <p>Defines how the drive performs electronic gearing when operating in Gear Position mode (OPMODE 4).</p> <p>This is a bit-wise parameter, hence the range 0 to 31. The bits have the following meanings.</p> <p>Bit 0:</p> <p>0 = If the drive is disabled or if HOLD 0 is in effect, incoming master pulses are discarded.</p> <p>1 = Even if the drive is disabled, incoming master pulses are evaluated.</p> <p>Bit 1:</p> <p>0 = If a limit switch has been activated, incoming master pulses that command motion in the direction of the activated switch are discarded.</p> <p>1 = If a limit switch has been activated, and even if the motor has stopped, incoming master pulses that command motion in the direction of the activated switch are evaluated.</p> <p>Bit 2:</p> <p>0 = Trajectory of the master is not limited by the ACC, DEC and VLIM settings of the drive.</p> <p>1 = Trajectory of the master is limited by the ACC, DEC and VLIM settings of the drive.</p> <p>Bit 3:</p> <p>0 = Follows the master position with compensation for the position lag between the master and the slave, which may be caused by the ACC, DEC or VLIM settings.</p> <p>1 = Does not compensate for the position lag between the master and the slave.</p> <p>Bit 4:</p> <p>0 = Does not allow overshoot of the master position. The trajectory generator of the slave always attempts to decelerate into the target position of the master.</p> <p>1 = Allows the slave to run synchronously with the master, which may result in the slave overshooting the target position of the master (particularly if acceleration and deceleration limits cause an abrupt stop of the master).</p> |
| Note | If bit 0 is set, bit 2 must also be set. Since the position difference between the master and the slave may increase while drive is in disabled state, it is necessary to apply ACC, DEC, VLIM settings after the drive is reenabled. |
| Syntax | <p>Read: GEARLIMITSMODE</p> <p>Write: GEARLIMITSMODE <value></p> |
| Firmware | 1.0.6 |

| | |
|----------------------|--|
| Drive status | Enabled Disabled |
| Range | 0 to 31 (If all bits are true, the bit-combination in binary format is 0b11111, which has a decimal value of 31.) |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | GEARFILTMODE GEARMODE |
| CANopen | 2128h, sub-index 0 |

GEARMODE

| | |
|----------------------|---|
| Definition | Gearing Operation Mode |
| Type | Variable (R/W) |
| Description | Gets/sets the gearing source and method. |
| Syntax | Read: GEARMODE Write: GEARMODE <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | <p>0* = Encoder (quadrature) following (controller interface). Signals are received on the Controller interface (C2) at pins 28 and 11 (Quadrature A), and pins 9 and 27 (Quadrature B).</p> <p>1* = Pulse and direction (controller interface). Signals are received on the Controller interface (C2) at pins 28 and 11 (Pulse), and 9 and 27 (Direction).</p> <p>2* = Up/down counting (controller interface). Signals are received on the Controller interface (C2) at pins 28 and 11 (Up) and pins 9 and 27 (Down).</p> <p>3 = Encoder (quadrature) follower (secondary encoder). Signals are received on the Machine interface (C3) at pins 1 and 11 (Quadrature A) and pins 2 and 12 (Quadrature B).</p> <p>4 = Pulse and direction (secondary encoder). Signals are received on the Machine interface (C3) at pins 1 and 11 (Pulse), and 2 and 12 (Direction).</p> |
| *Note | <p>GEARMODE 0, 1, 2: If inputs 5 and 6 are set, respectively, to INMODE 17 and 18, signals are received instead from fast inputs 5 and 6 on the Controller interface (C2) at pins 32 and 15.</p> |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | GEARIN GEAROUT INMODE OPMODE PCMD |
| CANopen | 20B3h, sub-index 0 |

GEAROUT

| | |
|----------------------|---|
| Definition | Gear Ratio Denominator |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the denominator of the gearbox equation.</p> <p>The gearing relationship is as follows: $(\text{GEARIN}/\text{GEAROUT}) \times (1/\text{XENCRES})$</p> <p>Gearing sets up a relationship between the number of input pulses (HWPEXT counts) and the position increments of the motor shaft (or actual motor position, PFB).</p> <p>The rate at which position increments of the motor shaft (motor speed) occur is determined by the gearing relationship and the line frequency of the pulse train.</p> |
| Note | <p>The HWPEXT/PCMD ratio is not maintained under the following condition:</p> <p style="padding-left: 40px;">GEAROUT=1 GEARIN>5000</p> <p>No warning is issued.</p> |
| Syntax | <p>Read: GEAROUT</p> <p>Write: GEAROUT <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | ±2147483647 |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | GEARIN GEARMODE |
| CANopen | 2129h , sub-index 0 |

GET

| | |
|----------------------|--|
| Definition | Get Recorded Data |
| Type | Command |
| Description | Gets the recorded data that was captured using the recording mechanism. The data is retrieved in ASCII or binary format according to the value of GETMODE. |
| Syntax | GET |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | GETMODE RECORD |
| Example | <pre>-->get Binary Units Frame: HD Recording (Binary Format(1000,32 "PE", "VCMD", "V" 0.000,0.000,0.000 0.000,0.000,0.000 0.000,0.000,0.000 0.000,20.176,0.000 0.000,74.176,0.000 0.000,128.176,0.000 0.000,182.176,14.736 0.000,236.176,31.747 ... 0.000,1999.978,1999.471 0.000,1999.978,1998.976 0.000,1999.978,1998.779 0.000,1999.978,2000.559 0.000,1999.978,1999.471 0.000,1999.978,1998.383 0.000,1999.978,1998.581 0.000,1999.978,2001.943 ... 0.000,0.000,0.000 0.000,0.000,0.000 --></pre> |
| CANopen | 20E7, sub-index 1 |

GETMODE

| | |
|----------------------|---|
| Definition | Recorded Data Transfer Format |
| Type | Variable (R/W) |
| Description | Gets/sets the data transfer format used by the GET command. |
| Syntax | Read: GETMODE Write: GETMODE <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = ASCII data transfer format 3 = Binary data transfer format 4 = Binary data transfer format, including header data |
| Default value | 3 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | GET RECORD |

GETREC

| | |
|----------------------|--|
| Definition | Get Line of Recorded Data |
| Type | Command |
| Description | <p>Gets a specific line from the last buffer of recorded data that was captured using RECORD. For example, GETREC 5 returns the fifth line of the last recorded buffer.</p> <p>To retrieve data using this command, GETMODE≠3.</p> |
| Syntax | GETREC { <i>value</i> } |
| Firmware | 1.3.2 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | RECORD |

HALLS

| | |
|----------------------|---|
| Definition | Hall Signals |
| Type | Variable (R) |
| Description | Indicates the current state of the Hall commutation sensors. |
| Syntax | HALLS |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Hall sensor in low position 1 = Hall sensor in high position |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| Example | <pre>-->halls Hu Hv Hw 1 1 1 --></pre> |
| See also | ELECTANGLE FEEDBACKTYPE MECHANGLE MENCTYPE |
| CANopen | 2056h, sub-index 1 |

HALLSCOMMTHRESH

| | |
|----------------------|--|
| Definition | Halls-Only Commutation Source Threshold |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the threshold value for Halls-only (MENCTYPE 5) commutation, in Hall signals per seconds.</p> <p>When the Hall sensor signaling rate goes above the threshold, commutation changes to sine commutation.</p> <p>When the Hall sensor signaling rate falls below 75% of threshold value, commutation changes to six-step commutation.</p> |
| Syntax | <p>Read: HALLSCOMMTHRESH</p> <p>Write: HALLSCOMMTHRESH <value></p> |
| Firmware | 1.40.0 |
| Drive status | Enabled Disabled |
| Range | 10 to 10,000 |
| Default value | 40 |
| Unit | Hall signals per second |
| Non-volatile | Yes |
| See also | HALLSONLYCOMM MENCTYPE 5 |
| CANopen | |

HALLSFILTAFF

| | |
|----------------------|---|
| Definition | Halls-Only Mean Square Filter Acceleration Feedforward |
| Type | Variable (R/W) |
| Description | Provides adjustable gain for the acceleration feedforward from the MSQ filter for Halls-only feedback. |
| Syntax | Read: HALLSFILTAFF Write: HALLSFILTAFF <value> |
| Firmware | 1.4.4 |
| Drive status | Disabled |
| Range | -2 to 2 |
| Default value | 0.000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | FEEDBACKTYPE HALLS HALLSFILTT1 HALLSFILTT2 MENCTYPE |

HALLSFILTT1

| | |
|----------------------|---|
| Definition | Halls-Only Mean Square Filter Depth |
| Type | Variable (R/W) |
| Description | Filtering time constant for Halls-only position feedback, in 125 μ s quanta. |
| Syntax | Read: HALLSFILTT1 Write: HALLSFILTT1 <value> |
| Firmware | 1.4.4 |
| Drive status | Disabled |
| Range | 0.375 to 32 |
| Default value | 2.000 |
| Unit | ms |
| Non-volatile | Yes |
| See also | HALLSFILTAFF HALLSFILTT2 HALLSFILTVELFF MENCTYPE |

HALLSFILTT2

| | |
|----------------------|---|
| Definition | Halls-Only Mean Square Filter Velocity and Acceleration Filter Depth |
| Type | Variable (R/W) |
| Description | Filtering time constant for Halls-only velocity and acceleration indications, in 125 μ s quanta. |
| Syntax | Read: HALLSFILTT2 Write: HALLSFILTT2<value> |
| Firmware | 1.4.4 |
| Drive status | Disabled |
| Range | 0 to 32 |
| Default value | 4.000 |
| Unit | ms |
| Non-volatile | Yes |
| See also | HALLSFILTAFF HALLSFILTT1 HALLSFILTVELFF MENCTYPE |

HALLSFILTVELFF

| | |
|----------------------|--|
| Definition | Halls-Only Mean Square Filter Velocity Feedforward |
| Type | Variable (R/W) |
| Description | Halls-only filter velocity feedforward output gain. |
| Syntax | Read: HALLSFILTVELFF Write: HALLSFILTVELFF <value> |
| Firmware | 1.4.4 |
| Drive status | Disabled |
| Range | -32 to 32 |
| Default value | 0.000 |
| Unit | ms |
| Non-volatile | Yes |
| See also | HALLSFILTAFF HALLSFILTT1 HALLSFILTT2 MENCTYPE |

HALLSINV

| | |
|----------------------|--|
| Definition | Hall Signals Inversion |
| Type | Variable (R/W) |
| Description | Inverts the polarity of individual Hall signals associated with motor phases UVW, thereby providing correction for crossed wiring. This variable is set during the MOTORSETUP procedure. |
| Syntax | Read: HALLSINV Write: HALLSINV <0 1> <0 1> <0 1> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Hall signal not inverted 1 = Hall signal inverted |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| Example | <pre>-->hallsinv 1 1 0 -->halls Hu Hv Hw 0 0 1 -->hallsinv 1 0 0 -->halls Hu Hv Hw 0 1 1 --></pre> |
| See also | FEEDBACKTYPE HALLS HALLSTYPE MOTORSETUP MENCTYPE |
| CANopen | 2057h , sub-index 1 |

HALLSONLYCOMM

| | |
|----------------------|---|
| Definition | Halls-Only Commutation Source |
| Type | Variable (R/W) |
| Description | Defines whether the Halls-only commutation (MENCTYPE 5) is performed according to six-step phase currents, or whether it is based on an extrapolated position. |
| Syntax | Read: HALLSONLYCOMM Write: HALLSONLYCOMM <value> |
| Firmware | 1.40.0 |
| Drive status | Enabled Disabled |
| Range | 0 = Six-step commutation with MPHASE correction (backward compatible) 1 = Commutation is based on an extrapolated position while velocity exceeds the threshold of Hall signals per second set by HALLSCOMMTHRESH, and changes to six-step when velocity falls below 75% of the Hall signals per second threshold. |
| | 1 - Halls-Only will switch to Commutation based on Extrapolated Position when Velocity exceeds 40 Halls-Switches per Second, and will revert to Six-Step when Velocity falls below 30 Halls-Switches per Second. |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | HALLSCOMMTHRESH MENCTYPE 5 |
| CANopen | 2179h, sub-index 1 |

HALLSTYPE

| | |
|----------------------|--|
| Definition | Hall Signals Type |
| Type | Variable (R/W) |
| Description | Gets/sets the source and method used for Hall sensors. |
| Syntax | Read: HALLSTYPE Write: HALLSTYPE <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| CDHD Range | 0 = Single-ended connection through the main Feedback connector 1 = Differential connection through the main Feedback connector. Refer to pinout documentation in product user manual. |
| DDHD Range | 2 = Differential connection through the Machine I/F connector. Refer to pinout documentation in product user manual. |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | FEEDBACKTYPE HALLS HALLSINV MOTORSETUP MENCTYPE |
| CANopen | 2058h , sub-index 0 |

HOLD

| | |
|----------------------|---|
| Definition | Hold Position Command |
| Type | Command |
| Description | Instructs motor whether to maintain its position. |
| Syntax | HOLD Queries the Hold state HOLD {0 1} Defines the Hold state |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Do not hold position 1 = Hold position |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | J OPMODE MOVEINC STOPPED |
| CANopen | 2063h , sub-index 0 |

HOLDMODE

| | |
|--------------------|--|
| Definition | Resume Motion or Homing After Hold Interrupt |
| Type | Variable (R/W) |
| Description | <p>Defines whether or not an interrupted motion or homing will resume once the input that triggered the hold is released.</p> <p>Hold in OPMODE 0 (Velocity control) or Hold in OPMODE 8 (Position control):</p> <p>When the digital input configured for the Hold function (INMODE <i#> 30) is activated, the drive stops (according to DECSTOP) and command execution is paused.</p> <p>While in the Hold state, a warning is indicated both on the drive's 7-segment display (blinking operation mode) and in response to ST ("HOLD mode active" message).</p> <p>In addition, while in the Hold state, STOPPED= -1, indicating that movement has been interrupted.</p> <p>If HOLDMODE=1 (and OPMODE=0 or 8):</p> <p style="padding-left: 40px;">When the Hold input is released, the drive resumes the interrupted motion, and continues to the original target (Position mode) or executes a jog according to the original JOG command (Velocity mode).</p> <p style="padding-left: 40px;">Once the original motion has resumed, STOPPED=0.</p> <p style="padding-left: 40px;">When the original command is completed, STOPPED=2, indicating the motion profile has been completed.</p> <p>If HOLDMODE=0 (and OPMODE=0 or 8):</p> <p style="padding-left: 40px;">When the Hold input is released, the drive does not resume the interrupted motion. A new command can be generated by applying a new MOVEINC or MOVEABS command.</p> <p>Hold during Homing:</p> <p>When the digital input configured for the Hold function (INMODE <i#> 30) is activated, the drive halts the homing process and the motor stops.</p> <p>While in the Hold state, a warning is indicated both on the drive's 7-segment display (blinking operation mode) and in response to ST (Hold Mode Active message).</p> <p>If HOLDMODE=1:</p> <p style="padding-left: 40px;">When the Hold input is released, the homing process automatically restarts.</p> <p>If HOLDMODE=0:</p> <p style="padding-left: 40px;">When the Hold input is released, the drive does not resume the interrupted homing sequence (HOMESTATE=20, indicating homing failed). A new homing command can be generated by issuing a new HOMECMD command.</p> |
| Syntax | <p>Read: HOLDMODE</p> <p>Write: HOLDMODE <value></p> |
| Firmware | 1.20.6 |

| | |
|----------------------|--|
| Drive status | Enabled Disabled |
| Range | 0 = When the Hold input is released, the interrupted movement/homing does not resume. 1 = When the Hold input is released, the interrupted movement/homing resumes. |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | INMODE 30 |

HOMEACC

| | |
|----------------------|---|
| Definition | Homing Acceleration |
| Type | Variable (R/W) |
| Description | <p>Acceleration (and deceleration) for the homing process. HOMEACC is defined according to the units currently in effect. It is used in acceleration and deceleration of all trajectories (moves) during homing.</p> <p>If and when a limit switch is engaged, DECSTOP will override HOMEACC.</p> |
| Syntax | <p>Read: HOMEACC</p> <p>Write: HOMEACC <value></p> |
| Firmware | 1.2.12 |
| Drive status | Enabled Disabled |
| Range | <p>If MOTORTYPE 0 (Rotary):</p> <p>UNITSROTACC 0 = 0.004 to 16666.666</p> <p>UNITSROTACC 1 = 0.224 to 1000000</p> <p>UNITSROTACC 2 = 1.342 to 6000000</p> <p>If MOTORTYPE 2 (Linear):</p> <p>UNITSLINACC 1 = 0.12 to 533333.333</p> |
| Default value | 4000 [rpm/s] |
| Unit | <p>If MOTORTYPE 0 (Rotary):</p> <p>UNITSROTACC 0 = rps/s</p> <p>UNITSROTACC 1 = rpm/s</p> <p>UNITSROTACC 2 = deg/s²</p> <p>If MOTORTYPE 2 (Linear):</p> <p>UNITSLINACC 1 = mm/s²</p> |
| Non-volatile | Yes |
| See also | HOMETYPE |
| CANopen | 609Ah, sub-index 0 |

HOMECMD

| | |
|----------------------|--|
| Definition | Homing Command |
| Type | Command |
| Description | <p>HOMECMD starts the homing process.</p> <p>Before HOMECMD can be issued, the drive must be in Position Control or Position Gear operation mode (OPMODE 8 or OPMODE 4, respectively), and enabled; this means that no faults are in effect.</p> <p>If homing is in progress and needs to be aborted, use the command HOMECMD 0. This will stop all motion. It will also reset the homing state machine, resulting in HOMESTATE 0.</p> <p>Do not use the STOP command to terminate the homing procedure.</p> |
| Syntax | <p>HOMECMD Starts the homing process.</p> <p>HOMECMD 0 Aborts homing and stops all motion.</p> |
| Firmware | 1.2.12 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | HOMETYPE |
| CANopen | 2103h, sub-index 0 |

HOMECDST

| | |
|----------------------|---|
| Definition | Homing Process Status |
| Type | Variable (R) |
| Description | <p>Gets and displays the status of the homing process.</p> <p>Possible responses:</p> <p>Homing Not Issued Homing has not been initiated since the last power cycle (corresponds to HOMESTATE 0).</p> <p>Homing Succeeded Homing completed successfully (corresponds to HOMESTATE 19).</p> <p>Homing Process Active Currently at State: nn, using State-Machine xx Homing is in progress; 'nn' is the state of the homing state-machine (corresponds to HOMESTATE response), 'xx' is the state-machine in use (for factory troubleshooting only).</p> <p>State-Machine used: 'xx' Failure at Homing State: 'nn' Failure Cause: [Neg. Limit-Switch Pos. Limit-Switch Home-Switch not Engaged Drive Disabled Incorrect Stopping Indication Home-Switch not Disengaged] Homing has failed (corresponds to HOMESTATE 20), with a list of possible causes for the failure.</p> |
| Syntax | HOMECDST |
| Firmware | 1.20.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | HOMESTATE LIMSWITCHNEG LIMSWITCHPOS |

HOMEIHARDSTOP

| | |
|----------------------|--|
| Definition | Current Level for Homing on Hard Stop |
| Type | Variable (R/W) |
| Description | Gets/sets the current level at which a hard stop is detected. Used when the homing process uses a hard stop for direction-reversal (and not a limit switch). |
| Syntax | Read: HOMEIHARDSTOP Write: HOMEIHARDSTOP <value> |
| Firmware | 1.3.2 |
| Drive status | Enabled Disabled |
| Range | 0 to 150 |
| Default value | 0.000 |
| Unit | A |
| Non-volatile | Yes |
| See also | HOMETYPE |
| CANopen | 2104h, sub-index 0 |

HOMEOFFSET

| | |
|----------------------|---|
| Definition | Home Offset |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the value that defines an offset from the homing trigger position. The trigger may be an index mark, a transition of a limit switch or the home switch, or another source (as defined by HOMETYPE).</p> <p>HOMEOFFSET is used when the position at which the homing trigger is detected is not considered the home position (PFB 0).</p> <p>Once the trigger source is detected, the drive sets the feedback position (PFB) to the value of HOMEOFFSET, and instructs the motor to move to position 0.</p> |
| Note | HOMEOFFSET value is not applied when HOMETYPE=35 (declares present position as home). |
| Syntax | Read: HOMEOFFSET Write: HOMEOFFSET <value> |
| Firmware | 1.2.12 |
| Drive status | Enabled Disabled |
| Range | If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev] If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch] |
| Default value | 0 |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | Yes |
| See also | HOMETYPE |
| CANopen | 607Ch, sub-index 0 |

HOME OFSTMOVE

| | |
|----------------------|--|
| Definition | Home Offset Move |
| Type | Variable (R/W) |
| Description | <p>Defines whether or not the axis is moved according to HOME OFFSET during the homing process.</p> <p>The HOME OFFSET movement is used to ensure that the value of PFB is 0 at the end of the homing process.</p> <p>HOME OFSTMOVE is ignored if HOMETYPE=35.</p> |
| Syntax | <p>Read: HOME OFSTMOVE</p> <p>Write: HOME OFSTMOVE <value></p> |
| Firmware | 1.4.4 |
| Drive status | Enabled Disabled |
| Range | <p>0 = Once the homing trigger is detected, the axis will move to the location of the trigger; at the end of the homing process the value of PFB will be HOME OFFSET.</p> <p>1 = Once the homing trigger is detected, the axis will move according to the value of HOME OFFSET; at the end of the homing process the value of PFB will be 0.</p> |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | HOME OFFSET HOMETYPE |

HOMESPEED1

| | |
|----------------------|--|
| Definition | Homing Speed 1 - Switch Search |
| Type | Variable (R/W) |
| Description | The initial velocity used in the homing process during the search for limit switches, home switches, and hard stops. HOMESPEED1 is defined according to the units currently in effect. |
| Syntax | Read: HOMESPEED1 Write: HOMESPEED1<value> |
| Firmware | 1.2.12 |
| Drive status | Disabled |
| Range | 1 [rpm] to VMAX |
| Default value | If MOTORTYPE 0 (Rotary): If UNITSROTVEL 0 = 1.166 If UNITSROTVEL 1 = 100 If UNITSROTVEL 2 = 600 If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = 53.333 |
| Unit | If MOTORTYPE 0 (Rotary): If UNITSROTVEL 0 = rps If UNITSROTVEL 1 = rpm If UNITSROTVEL 2 = deg/s If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = mm/s |
| Non-volatile | Yes |
| See also | HOMETYPE |
| CANopen | 6099h, sub-index 1 |

HOMESPEED2

| | |
|----------------------|---|
| Definition | Homing Speed 2 - Index Search |
| Type | Variable (R/W) |
| Description | <p>The velocity used in the homing process during the search for the homing trigger, which may be an index mark, a limit switch transition, a home switch transition, or another source (as defined by HOMETYPE).</p> <p>HOMESPEED2 is defined according to the units currently in effect.</p> <p>The value of HOMESPEED2 should be set much lower than HOMESPEED1 to increase the accuracy of the trigger capture.</p> |
| Syntax | Read: HOMESPEED2 Write: HOMESPEED2<value> |
| Firmware | 1.2.12 |
| Drive status | Disabled |
| Range | 1 [rpm] to VMAX |
| Default value | If MOTORTYPE 0 (Rotary): If UNITSROTVEL 0 =0.333 If UNITSROTVEL 1 =20 If UNITSROTVEL 2 =120 If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = 10.667 |
| Unit | If MOTORTYPE 0 (Rotary): If UNITSROTVEL 0 =rps If UNITSROTVEL 1 =rpm If UNITSROTVEL 2 =deg/s If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = mm/s |
| Non-volatile | Yes |
| See also | HOMETYPE |
| CANopen | 6099h, sub-index 2 |

HOMESTATE

| | |
|----------------------|---|
| Definition | Homing Status |
| Type | Variable (R) |
| Description | <p>Indicates the state of the homing process.</p> <p>HOMESTATE 0 indicates homing is idle. Use HOMECMD 0 (abort homing) to reset.</p> <p>Any HOMESTATE value other than 0, 19 or 20 indicates homing is in progress or stuck; reset if necessary.</p> |
| Syntax | HOMESTATE |
| Firmware | 1.2.12 |
| Drive status | Enabled Disabled |
| Range | <p>0 = Homing idle</p> <p>19 = Homing completed</p> <p>20 = Homing failed</p> <p><i>any other value</i> = Homing in progress, or stalled</p> |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | HOMETYPE |
| CANopen | 2090h, sub-index 0 |

HOMETYPE

| | |
|---------------------|--|
| Definition | Homing Type |
| Type | Variable (R/W) |
| Description | <p>Gets/sets a value that defines the type of homing process that will be performed.</p> <p>HOMETYPE defines when direction of motion is reversed during homing, the homing trigger (e.g., switch, index), and other conditions.</p> <p>Homing types 1 through 14, 17 through 30 and 33 through 35 are according to CiA 402. Additional homing types have been defined per customer requests.</p> <p>Homing on index mark can be used with resolver motor feedback (HOMETYPE 1-14, 33, 34, -8, -12, -33, -34, -40, -44, -65, -66, -97, -98). The location of the resolver index mark is where the motor mechanical angle (MECHANGLE) is 0.</p> <p>To achieve greater accuracy of the homing procedure (i.e., minimum PFB counts from MECHANGLE 0), reduce the value of HOMESPEED2.</p> |
| Syntax | <p>Read: HOMETYPE</p> <p>Write: HOMETYPE <value></p> |
| Firmware | 1.2.12 |
| Drive status | Enabled Disabled |
| Range | <p>1 = Homing on first index mark after disengaging from negative limit.</p> <p>2 = Homing on first index mark after disengaging from positive limit.</p> <p>3 = Homing on first index mark after disengaging from home switch (home switch at positive travel).</p> <p>4 = Homing on first index mark after engaging home switch (home switch at positive travel).</p> <p>5 = Homing on first index mark after disengaging from home switch (home switch at negative travel).</p> <p>6 = Homing on first index mark after engaging home switch (home switch at negative travel).</p> <p>7 = Homing on first index mark after disengaging from negative side of home switch; initial move positive.</p> <p>8 = Homing on first index mark after engaging negative side of home switch; initial move positive.</p> <p>9 = Homing on first index mark after engaging positive side of home switch; initial move positive.</p> <p>10 = Homing on first index mark after disengaging from positive side of home switch; initial move positive.</p> <p>11 = Homing on first index mark after disengaging from positive side of home switch; initial move negative.</p> <p>12 = Homing on first index mark after engaging positive side of home switch; initial move negative.</p> |

| | |
|--|--|
| | <p>13 = Homing on first index mark after engaging negative side of home switch; initial move negative.</p> <p>14 = Homing on first index mark after disengaging from negative side of home switch; initial move negative.</p> <p>15 = Reserved</p> <p>16 = Reserved</p> <p>17 = Homing on falling edge of negative limit.</p> <p>18 = Homing on falling edge of positive limit.</p> <p>19 = Homing on falling edge of home switch (home switch at positive travel).</p> <p>20 = Homing on rising edge of home switch (home switch at positive travel).</p> <p>21 = Homing on falling edge of home switch (home switch at negative travel).</p> <p>22 = Homing on rising edge of home switch (home switch at negative travel).</p> <p>23 = Homing on negative side falling edge of home switch; initial move positive.</p> <p>24 = Homing on negative side rising edge of home switch; initial move positive.</p> <p>25 = Homing on positive side rising edge of home switch; initial move positive.</p> <p>26 = Homing on positive side falling edge of home switch; initial move positive.</p> <p>27 = Homing on positive side falling edge of home switch; initial move negative.</p> <p>28 = Homing on positive side rising edge of home switch; initial move negative.</p> <p>29 = Homing on negative side rising edge of home switch; initial move negative.</p> <p>30 = Homing on negative side falling edge of home switch; initial move negative.</p> <p>31 = Reserved</p> <p>32 = Reserved</p> <p>33 = Homing on index mark, moving negative. 34 = Homing on index mark, moving positive.</p> <p>35 = Declare present position as home. (PFB reading after homing will always be HOMEOFFSET regardless of HOME OFSTMOVE setting).</p> |
| | <p>-8 = Homing on first index mark after engaging negative side of home switch; initial move positive, retract upon first contact with home switch edge.</p> <p>-9 = Homing on first index mark after engaging positive side of home switch; initial move positive; if engaging positive limit switch then stop and issue failure indication.</p> <p>-10 = Homing on first index mark after disengaging from positive side of home switch; initial move positive; if engaging positive limit switch then stop and issue failure indication.</p> |

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- 12 = Homing on first index mark after engaging positive side of home switch; initial move negative, retract upon first contact with home switch edge.
 - 13 = Homing on first index mark after engaging negative side of home switch; initial move negative; if engaging negative limit switch then stop and issue failure indication.
 - 14 = Homing on first index mark after disengaging from negative side of home switch; initial move negative; if engaging negative limit switch then stop and issue failure indication.
 - 24 = Homing on negative side rising edge of home switch; initial move positive, retract upon first contact with home switch edge.
 - 26 = Homing on positive side falling edge of home switch; initial move positive; if engaging positive limit switch then stop and issue failure indication.
 - 28 = Homing on positive side rising edge of home switch; initial move negative, retract upon first contact with home switch edge.
 - 30 = Homing on negative side falling edge of home switch; initial move negative; if engaging negative limit switch then stop and issue failure indication.
 - 33 = Homing on index mark after direction reversal on hard stop; initial move negative.
 - 34 = Homing on index mark after direction reversal on hard stop; initial move positive.
 - 40 = Homing on first index mark after engaging negative side of home switch; initial move positive; reverse direction on hard stop.
 - 44 = Homing on first index mark after engaging positive side of home switch; initial move negative; reverse direction on hard stop.
 - 56 = Homing on negative side rising edge of home switch; initial move positive; reverse direction on hard stop; retract upon first contact with home-switch edge.
 - 60 = Homing on positive side rising edge of home switch; initial move negative; reverse direction on hard stop, retract upon first contact with home switch edge.
 - 65 = Homing on index mark; initial move negative; if index mark not found reverse direction on hard stop.
 - 66 = Homing on index mark; initial move positive; if index mark not found reverse direction on hard-stop.
 - 97 = Homing on index mark; initial move negative; if index mark not found reverse direction on negative limit switch.
 - 98 = Homing on index mark; initial move positive; if index mark not found reverse direction on positive limit switch.
 - 125 = Homing on hard stop at negative end of travel.
 - 126 = Homing on hard stop at positive end of travel.
-

| | |
|----------------------|---|
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | HOMEACC HOMECMD HOMEOFFSET HOMEOFSTMOVE HOMESPEED1 HOMESPEED2 HOMESTATE |
| CANopen | 6098h, sub-index 0 |

HSAVE

| | |
|----------------------|--|
| Definition | Save Parameters to Encoder EEPROM |
| Type | Command |
| Description | <p>Writes the current values of MPHASE and PFBOFFSET to the EnDat/HIPERFACE encoder memory. These parameters will be loaded after the next power up or feedback initialization.</p> <p>The command HSAVE 1 performs the same function as HSAVE, but prevents the (possibly incorrect) parameter values from being loaded from the encoder memory at the next power up or feedback initialization; instead, the encoder will be initialized with parameters values from drive memory.</p> |
| Syntax | HSAVE |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | FEEDBACKTYPE MPHASE PFBOFFSET |

HWPEXT

| | |
|----------------------|--|
| Definition | Hardware Position External |
| Type | Variable (R) |
| Description | <p>Indicates the position as measured by an external feedback device.</p> <p>HWPEXT displays a valid value ONLY when the secondary encoder input is in use while a Gearing operation mode (GEARMODE) is enabled.</p> |
| Note | <p>The HWPEXT/PCMD ratio is not maintained under the following condition:</p> <p>GEAROUT=1 GEARIN>5000</p> <p>No warning is issued.</p> |
| Note | <p>HWPEXT 0</p> <p>When operating in Gearing mode (OPMODE 4), it may be useful to zero the indicated position of the master axis, by means of the command HWPEXT 0.</p> <p>HWPEXT 0 stores the indicated master position into an offset variable, and subtracts the offset value from the indicated position from that point on.</p> |
| Syntax | HWPEXT |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 65535 |
| Default value | Not Applicable |
| Unit | counts |
| Non-volatile | No |
| See also | GEARMODE PCMD XENCRES |
| CANopen | 2064h, sub-index 0 |

HWPEXTCNTRLR

| | |
|----------------------|--|
| Definition | Hardware Position External (FPGA) |
| Type | Variable (R) |
| Description | Indicates the position as measured by an external feedback device (FPGA); 32-bit counter of the pulse and direction input from the controller interface connector. |
| Syntax | HWPEXTCNTRLR |
| Firmware | 1.3.2 |
| Drive status | Enabled Disabled |
| Range | Not applicable |
| Default value | Not applicable |
| Unit | Count |
| Non-volatile | No |
| Example | -->hwpextcntrlr 4294943248 [Counts] |
| See also | GEARINMODE GEARMODE HWPEXT HWPEXTMACHN |
| CANopen | 217Eh , sub-index 0 |

HWPEXTMACHN

| | |
|----------------------|--|
| Definition | Hardware Position External (DSP) |
| Type | Variable (R) |
| Description | Indicates the position as measured by an external feedback device (DSP); 32-bit counter of the pulse and direction input from the machine interface connector. |
| Syntax | HWPEXTMACHN |
| Firmware | 1.3.2 |
| Drive status | Enabled Disabled |
| Range | Not applicable |
| Default value | Not applicable |
| Unit | Count |
| Non-volatile | No |
| Example | -->hwpextmachn 4294943248 [Counts] |
| See also | GEARMODE HWPEXT HWPEXTCNTRLR |
| CANopen | 20B6h, sub-index 0 |

HWPOS

| | |
|----------------------|---|
| Definition | Hardware Position |
| Type | Variable (R) |
| Description | Indicates the position, as measured by the feedback device. |
| Syntax | HWPOS |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable. Depends upon the feedback device. |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | ELECTANGLE FEEDBACKTYPE MECHANGLE MENCRES MENCTYPE MRESPOLES |
| CANopen | 2065h , sub-index 0 |

I

| | |
|----------------------|---|
| Definition | Motor Current |
| Type | Variable (R) |
| Description | Indicates the equivalent motor current (equivalent sinusoidal peak). |
| Syntax | I |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | A |
| Non-volatile | No |
| See also | ICMD ID IFOLD ILIM IMAX IU |
| CANopen | 6078h, sub-index 0 |

ICMD

| | |
|----------------------|--|
| Definition | Current Command |
| Type | Variable (R) |
| Description | Indicates the current command, which is generated either directly (EtherCAT/CANopen, serial or analog reference command), or as output of the position or velocity controller. |
| Syntax | ICMD |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | A |
| Non-volatile | No |
| See also | I ID IFOLD ILIM IMAX IU |
| CANopen | 6074h, sub-index 0 |

ID

| | |
|----------------------|---|
| Definition | Current D Axis |
| Type | Variable (R) |
| Description | In vector control, indicates the value perpendicular to IQ. |
| Syntax | ID |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | A |
| Non-volatile | No |
| See also | I ILIM IMAX IQ IU |
| CANopen | 2066h, sub-index 0 |

IFFLPPHZ

| | |
|----------------------|--|
| Definition | Current Feedforward Low Pass Filter |
| Type | Variable (R/W) |
| Description | Gets/sets the corner frequency of a first-order filter of the feedforward low pass filter. |
| Syntax | Read: IFFLPPHZ Write: IFFLPPHZ <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 10 to 1000 |
| Default value | 80 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | KCBEMF MKT |
| CANopen | 2068h , sub-index 0 |

IFOLD

| | |
|----------------------|--|
| Definition | Drive Foldback Current Limit |
| Type | Variable (R) |
| Description | <p>Indicates the current limit derived from the foldback mechanism. A foldback condition occurs when IFOLD drops below ILIM.</p> <p>This variable is useful for checking how close the current is to the foldback limit.</p> |
| Syntax | IFOLD |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 300 |
| Default value | Not applicable |
| Unit | A |
| Non-volatile | No |
| See also | DICONT FOLD IFOLDFTHRESH IFOLDWTHRESH ILIM |
| CANopen | 2069h , sub-index 0 |

IFOLDFTHRESH

| | |
|----------------------|--|
| Definition | Drive Foldback Fault Threshold |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the current threshold level for declaring a fault due to foldback.</p> <p>The drive foldback threshold fault is declared when IFOLD drops below IFOLDFTHRESH.</p> |
| Syntax | <p>Read: IFOLDFTHRESH</p> <p>Write: IFOLDFTHRESH <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 300 |
| Default value | Not Applicable |
| Unit | A |
| Non-volatile | Yes |
| See also | DICONT FOLD IFOLD IFOLDWTHRESH ILIM |
| CANopen | 206Ah , sub-index 0 |

IFOLDWTHRESH

| | |
|----------------------|--|
| Definition | Drive Foldback Warning Threshold |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the current threshold level for declaring a warning due to foldback.</p> <p>The drive foldback threshold warning is declared when IFOLD drops below IFOLDWTHRESH.</p> |
| Syntax | <p>Read: IFOLDWTHRESH</p> <p>Write: IFOLDWTHRESH <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 300 |
| Default value | Not Applicable |
| Unit | A |
| Non-volatile | Yes |
| See also | DICONT FOLD IFOLD IFOLDFTHRESH ILIM |
| CANopen | 206Bh, sub-index 0 |

IGNOREBATTFLT

| | |
|----------------------|--|
| Definition | Ignore Encoder Battery Fault |
| Type | Variable (R/W) |
| Description | Indicates whether the drive will respond to an encoder battery voltage warning or fault. Allows a multi-turn absolute encoder to be used without a backup battery, as a single-turn absolute encoder. |
| Syntax | Read: IGNOREBATTFLT Write: IGNOREBATTFLT <value> |
| Firmware | 1.41.x |
| Drive status | Enabled Disabled |
| Range | 0 = Drive detects and responds to encoder battery fault. 1 = Drive ignores encoder battery fault (absolute multi-turn position will not be retained after a power cycle). |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | MTTURNRESET |

IGNOREBRKFLT

| | |
|----------------------|--|
| Definition | Ignore Power Brake Fault |
| Type | Variable (R/W) |
| Description | Note: Applicable only to CDHD 400/480 VAC drives, 3A, 6A, 12A, 30A |
| Note | Previously: IGNOREPWRBRK |
| Syntax | Read: IGNOREBRKFLT Write: IGNOREBRKFLT <value> |
| Firmware | 1.20.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Drive ignores brake fault indication 1 = Drive ignores STO fault indication |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | ST |

IGNOREPDLB

| | |
|----------------------|--|
| Definition | Ignore Pulse and Direction Line Break |
| Type | Variable (R/W) |
| Description | Defines whether the Pulse and Direction line break is ignored while the drive is disabled. |
| Syntax | Read: IGNOREPDLB Write: IGNOREPDLB <value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 0 = Drive disregards P&D line break when disabled 1 = Drive responds to P&D line break even when disabled |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | GEARMODE |

IGRAV

| | |
|----------------------|--|
| Definition | Gravity Compensation |
| Type | Variable (R/W) |
| Description | Gets/sets the value of the gravity compensation constant. IGRAV is added to the current loop command to compensate for gravity or similar constant interference. |
| Syntax | Read: IGRAV Write: IGRAV <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | ±DIPEAK |
| Default value | 0.000 |
| Unit | A |
| Non-volatile | Yes |
| See also | I FRICINEG FRICIPOS ILIM DIPEAK |
| CANopen | 206Ch, sub-index 0 |

ILIM

| | |
|----------------------|--|
| Definition | User Current Limit |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the application current limit, allowing the user to limit the drive's peak current.</p> <p>This variable limits the current command that will be accepted from the user (using the T command in OPMODE 2) or issued by the control loops (in OPMODE 0, 1, 3, and 4). ILIM is an independent variable that is not calculated from hardware parameters and is not dependent on any other variables. ILIM is similar to VLIM (which is used in OPMODE 0 and 1) and can be used to protect delicate load equipment.</p> |
| Syntax | Read: ILIM Write: ILIM <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to IMAX |
| Default value | Not Applicable |
| Unit | A |
| Non-volatile | Yes |
| See also | I IMAX |
| CANopen | 6073h , sub-index 0 |

ILIMACT

| | |
|----------------------|--|
| Definition | Drive Actual Current Limit |
| Type | Variable (R) |
| Description | Reports the actual current limit. Useful when the limit is dynamic due to analog control over current limit. ILIMACT is the minimum between ILIM and the analog current limit (only for ANIN2MODE 2). |
| Syntax | ILIMACT |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | A |
| Non-volatile | No |
| See also | ANIN2MODE ILIM IMAX |

IMAX

| | |
|----------------------|---|
| Definition | Drive Current Limit |
| Type | Variable (R) |
| Description | Displays the maximum current limit for a drive and motor combination. |
| Syntax | IMAX |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | A |
| Non-volatile | No |
| See also | DIPEAK I ILIM MIPEAK |
| CANopen | 20F0h, sub-index 0 |

IN

| | |
|----------------------|---|
| Definition | Input Status |
| Type | Variable (R) |
| Description | Gets the state of a digital input. |
| Syntax | IN <input#> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | <i>input#</i> = 1 to 11 0 = Input off 1 = Input on |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| Example | -->IN 1 0 |
| See also | ININV INMODE INPUTS |
| CANopen | 60FDh , sub-index 0 |

IN32OPMODES

| | |
|----------------------|--|
| Definition | Operation Mode Change Input Level |
| Type | Variable (R/W) |
| Description | <p>Enables the operation mode to be changed on-the-fly, even while drive is enabled.</p> <p>IN32OPMODES holds a 16-bit value.</p> <p>The high byte defines the operation mode to be activated upon a high level of the digital input defined in INMODE <i#> 32.</p> <p>The low byte defines the operation to be activated upon a low level of the digital input defined in INMODE <i#> 32.</p> <p>For example:</p> <pre>-->INMODE 8 32 -->IN32OPMODES h0403</pre> <p>A high level of digital input 8 sets OPMODE 4.</p> <p>A low level of digital input 8 sets OPMODE 3.</p> |
| Syntax | <p>Read: IN32OPMODES</p> <p>Write: IN32OPMODES <value></p> |
| Firmware | 1.40.0 |
| Drive status | Enabled Disabled |
| Range | 0 to 2056 (0 ... 0x808) |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | IN32SWITCH INMODE OPMODE OPMODESWITCH |
| CANopen | |

IN32SWITCH

| | |
|----------------------|--|
| Definition | Operation Mode Change Resume Motion |
| Type | Variable (R/W) |
| Description | Defines if and how motion resumes after switching back to an OPMODE that corresponds to a specific input level. |
| Note | When switching back to OPMODE 4: The gearing position will be restored only if bit 2 in the GEARLIMITSMODE parameter is set to 1; otherwise the drive will be unable to perform any profile according to ACC, DEC or VLIM. |
| Syntax | Read: IN32SWITCH Write: IN32SWITCH <value> |
| Firmware | 1.40.0 |
| Drive status | Enabled Disabled |
| Range | 0 to 3 |
| Range | <p>0 = No further action will occur after switching the operation mode via INMODE <i#> 32.</p> <p>1 = The previous command value will be restored if the digital input switches back to the OPMODE defined in the low byte of IN32OPMODES.</p> <p>2 = The previous command value will be restored if the digital input switches back to the OPMODE defined in the high byte of IN32OPMODES.</p> <p>3 = The previous command value will be restored if the digital input switches back to the OPMODE defined by either the low or high byte in IN32OPMODES.</p> |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | IN32SWITCH INMODE OPMODE OPMODESWITCH |
| CANopen | |

INDEXDURATE

| | |
|----------------------|---|
| Definition | Simulated Encoder Index Pulse Duration |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the duration of the simulated index pulse in the encoder simulation feature. This function allows users to observe index pulses of very short durations.</p> <p>To be used effectively, the duration of the simulated index pulse must be shorter than the time length of one revolution; otherwise a constant signal will be generated.</p> <p>INDEXDURATE 0 = The drive will issue the simulated index pulse according to the hardware mechanism's defaults.</p> |
| Syntax | Read: INDEXDURATE Write: INDEXDURATE <value> |
| Firmware | 1.4.4 |
| Drive status | Enabled Disabled |
| Range | 0 to 100 |
| Default value | 0 |
| Unit | ms |
| Non-volatile | Yes |
| See also | ENCOUTMODE ENCOUTRES ENCOUTZPOS INDEXST MENCRES |

INDEXPFB

| | |
|----------------------|---|
| Definition | Encoder Index Position Feedback |
| Type | Variable (R) |
| Description | Indicates the position feedback (PFB) captured at the first index detection after power on. |
| Syntax | INDEXPFB |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev] If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch] |
| Default value | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = 0.309 UNITSROTPOS 1 = 2529.69 UNITSROTPOS 2 = 111.168 If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = 0.309 UNITSLINPOS 1 = 2529.69 |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | No |
| See also | FEEDBACKTYPE HWPOS MENCTYPE MENCZPOS PFB UNITSROTPOS |
| CANopen | 206Fh, sub-index 0 |

INDEXST

| | |
|----------------------|---|
| Definition | Encoder Index Signal Status |
| Type | Variable (R) |
| Description | Indicates the state of the encoder index signal. |
| Syntax | Read: INDEXST Write: INDEXST <value> |
| Firmware | 1.4.4 |
| Drive status | Enabled Disabled |
| Range | 0 = Encoder index signal inactive; position not within index 1 = Encoder index signal active; position within index |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | ENCOUTMODE ENCOUTRES ENCOUTZPOS INDEXDURATE MENCRES |

INFO

| | |
|----------------------|--|
| Definition | Drive Info |
| Type | Command |
| Description | Returns information about the drive. |
| Syntax | INFO |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| Example | <pre>-->info Digital Servo Drive ----- Drive model number: CDHD-0062AAF1-00 Peak current : 25.455 A / 18.000 Arms Continuous current: 8.485 A / 6.000 Arms Feedback type : sensAR Magnetic Encoder Single Turn Interface : Analog Voltage, Pulse Train Ref, CANopen(R), USB, RS232 Voltage : 200 V Product S/N : 214M-2015139, December 2014 Control board P/N : PRDr90CSCF7z-00 S/N : F4114-000038 HW revision : B0 Eeprom revision : 4 Flash Device ID : SST 39VF1601C Power board P/N : PRDr90PACSMz-06 S/N : F4214-000521 HW revision : C0 Eeprom revision : 9 Firmware Version : 1.41.9 FPGA Version : 1.87 May 26 2016 Resident Version : 1.3.1 Runtime : 186:15:04</pre> |
| See also | DRIVENAME TRUN VER |

ININV

| | |
|----------------------|--|
| Definition | Input Polarity |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the input polarity of the digital inputs.</p> <p>ININV <i>i#</i> 0: no inversion is in effect, and the input is considered inactive when it is pulled low through a connection to digital ground.</p> <p>ININV <i>i#</i> 1: inversion is in effect, and the switch is considered inactive when it is open-circuit or pulled high.</p> <p>Warning: Make sure ININV=0 for the input that triggers Hold and Resume Motion (INMODE <i>i#</i> 30). Thus, if the input value is 0 and a wire break occurs, no unintentional movement will result. Reversing the input logic on this input is not recommended, and is fully the responsibility of the user.</p> |
| Syntax | <p>Read: ININV <<i>input#</i>></p> <p>Write: ININV <<i>input#</i>> <<i>invert</i>></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | <p><i>input#</i> = 1 to 11</p> <p><i>invert</i>:</p> <p>0 = Input not inverted</p> <p>1 = Input inverted</p> |
| Default value | 0 |
| Unit | Not applicable |
| Non-volatile | Yes |
| Example | <pre>-->ininv 1 0 -->ininv 1 1 -->ininv 1 1 --></pre> |
| See also | IN INMODE INPUTS |
| CANopen | 2070h, sub-index 1 |

INMODE

| | |
|---------------------|--|
| Definition | Input Mode |
| Type | Variable (R/W) |
| Description | Gets/sets a value that defines a functionality for each of the available digital inputs. |
| Syntax | Read: INMODE <input#> Write: INMODE <input#> <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| CDHD Range | <p><i>input#</i> = 1 to 11</p> <p><i>value</i>:</p> <ul style="list-style-type: none"> 0 = Idle 1 = Remote enable 2 = Clear faults* 3 = Phase lock loop (PLL) synchronization 4 = Emergency stop, activates Active Disable 5 = Limit switch positive 6 = Limit switch negative 7 = Reserved 8 = Home switch 9 = Script trigger 10 = Script bit 0 11 = Script bit 1 12 = Script bit 2 13 = Script bit 3 14 = Script bit 4 15 = Stop on input (with DECDIST as offset) 16 = Stop on input (with DECDIST2 as offset) 17 = Gearing pulse signal – on digital input 5 only 18 = Gearing direction signal - on digital input 6 only 19 to 25 = Reserved 26 = Homing command 27 = Touch probe 1 28 = Reserved 29 = Reserved 30 = Hold and resume motion** 31 = Reserved 32 = Operation mode change while drive enabled 33 = Explicitly sets OPMODE 4 and ENCFOLLOWER 1[†] 34 = Explicitly sets OPMODE 4 and ENCFOLLOWER 2[†] 35 = Explicitly sets OPMODE 4 and ENCFOLLOWER 3[†] 36 = Explicitly sets OPMODE 4 and ENCFOLLOWER 4[†] 37 = Explicitly sets OPMODE 4 and ENCFOLLOWER 5[†] 38 = JOG motor to positive direction at speed JOGSPD1[‡] 39 = JOG motor to negative direction at speed -JOGSPD1[‡] 40 = JOG motor to positive direction at speed JOGSPD2[‡] 41 = JOG motor to negative direction at speed -JOGSPD2[‡] |

| | |
|-------------------|---|
| DDHD Range | <p>DDHD: <i>input#</i> = 1 to 8</p> <p><i>value:</i></p> <ul style="list-style-type: none"> 0 = Idle 1 = Remote enable 2 = Clear faults* 3 = Phase lock loop (PLL) synchronization 4 = Emergency stop, activates Active Disable 5 = Limit switch positive 6 = Limit switch negative 7 = Reserved 8 = Home switch 9 = Script trigger 10 = Script bit 0 11 = Script bit 1 12 = Script bit 2 13 = Script bit 3 14 = Script bit 4 15 = Stop on input (with DECDIST as offset) 16 = Stop on input (with DECDIST2 as offset) 17 = Gearing pulse signal – on digital input 5 only 18 = Gearing direction signal - on digital input 6 only 19 to 25 = Reserved 26 = Homing command 27 = Touch probe 1 28 = Touch probe 2 29 = Reserved 30 = Hold and resume motion ** 31 = Reserved . . . |
| *Note | <p>INMODE <i#> 2 will not clear a fault if the condition causing the fault has not been removed.</p> <p>To clear a fault using I/Os, REMOTE must be disabled.</p> <p>Therefore, when a fault occurs, enter the following sequence of commands to prevent the drive from being reenabled unintentionally before the fault is cleared:</p> <pre>REMOTE 0 INMODE <i#> 2 REMOTE 1</pre> <p>If CLEARFAULTS is used, it will also issue a software disable command (K) automatically; thus, if all other conditions for activation are present, the software enable command (EN) will immediately enable the drive.</p> |

| | |
|-------------------------------|---|
| **Note | <p>INMODE <i#> 30:</p> <p>Defines an input as a Hold and Resume Motion trigger. When the digital input configured for the Hold/Resume function is activated, the drive stops a jog movement (in OPMODE 0), or a motion task (in OPMODE 8), or a running homing procedure (in OPMODE 8). When the input is released, the drive allows the interrupted motion to resume. While in the Hold state, a warning is indicated both on the drive's 7-segment display (blinking operation mode) and in response to ST (Hold Mode Active message). Requires HOLDMODE=1. If HOLDMODE=0, the interrupted motion will not resume.</p> <p>Warning: Make sure ININV=0 for the input that triggers Hold and Resume Motion. Thus, if the input value is 0 and a wire break occurs, no unintentional movement will result. Reversing the input logic (ININV=1) is not recommended, and is fully the responsibility of the user.</p> |
| †Note | <p>INMODE <i#> 33 34 35 36 37</p> <p>Only one digital input should be defined for the encoder following functionality.</p> <p>If two or more digital inputs are defined for encoder following and activated at the same time, the drive will set ENCFOLLOWER=0, and issue a warning.</p> <p>If multiple digital inputs defined for encoder following are all inactive at the same time, the drive will set ENCFOLLOWER=0.</p> <p>If no digital input is defined for encoder following, the drive will use the ENCFOLLOWER value from non-volatile memory or from RAM.</p> |
| #Note | <p>Only one of the digital inputs defined for the jog function should be activated at a time.</p> <p>If two or more digital inputs are defined for the jog function and activated at the same time, the drive will not jog the motor.</p> |
| CDHD Default value | <p>INMODE <input1> = 1 INMODE <input2-11> = 0</p> |
| DDHD Default value | <p>INMODE <input1> = 1 INMODE <input2-8> = 0</p> |
| Unit | Not Applicable |
| Non-volatile | Yes |
| Example | <pre>-->INMODE 1 0 -->INMODE 1 0 --></pre> |

| | |
|-----------------|---|
| See also | GEARMODE HOLDMODE IN ININV INPUTS SYNCSOURCE |
| CANopen | 20E0h, sub-index 1 |

INPOS

| | |
|----------------------|--|
| Definition | In Position Indication |
| Type | Variable (R) |
| Description | Indicates that the position error PE has entered the allowed tolerance PEINPOS. INPOS can be used only when the motion command has been generated by the drive. |
| Syntax | INPOS |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Not in position 1 = In position |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | PEINPOS PEINPOSTIME PEMAX STOPPED |
| CANopen | 20B5h, sub-index 0 |

INPUTS

| | |
|----------------------|--|
| Definition | Inputs Status |
| Type | Variable (R) |
| Description | Gets the state of all digital inputs. A header lines identifies each of the inputs. |
| Syntax | INPUTS |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Input off 1 = Input on |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| Example | -->INPUTS 1 2 3 4 5 6 7 8 9 10 11 1 0 0 0 0 0 0 0 0 0 0 --> |
| See also | IN ININV INMODE |

IQ

| | |
|----------------------|---|
| Definition | Current Q Axis |
| Type | Variable (R) |
| Description | In vector control, indicates the current for the torque. This value is perpendicular to ID . |
| Syntax | IQ |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | A |
| Non-volatile | No |
| See also | I ID ILIM IMAX IU |
| CANopen | 2067h, sub-index 0 |

ISTOP

| | |
|----------------------|---|
| Definition | Dynamic Braking Current |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the maximum current allowed during the dynamic braking process.</p> <p>Dynamic braking is a mechanism by which the drive holds the motor during Disabling mode, with only the motor's back EMF used to apply the stopping current.</p> |
| Syntax | <p>Read: ISTOP</p> <p>Write: ISTOP <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to DIPEAK |
| Default value | DIPEAK |
| Unit | A |
| Non-volatile | Yes |
| See also | DISMODE DISSPEED FLT |
| CANopen | 2071h, sub-index 0 |

IU

| | |
|----------------------|---|
| Definition | Phase U Actual Current |
| Type | Variable (R) |
| Description | Indicates the actual current in Phase U (of UVW). |
| Syntax | IU |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | A |
| Non-volatile | No |
| See also | I ID ICMD ILIM IUOFFSET IV |
| CANopen | 2072h, sub-index 0 |

IUOFFSET

| | |
|----------------------|--|
| Definition | Phase U Current Offset |
| Type | Variable (R) |
| Description | Indicates the current offset of phase U (of UVW).. |
| Syntax | IUOFFSET |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | A |
| Non-volatile | No |
| See also | IU |
| CANopen | 2073h, sub-index 0 |

IV

| | |
|----------------------|---|
| Definition | Phase V Actual Current |
| Type | Variable (R) |
| Description | Indicates the actual current in phase V (of UVW). |
| Syntax | IV |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | A |
| Non-volatile | No |
| See also | I ID ICMD ILIM IU IUOFFSET |
| CANopen | 2074h, sub-index 0 |

IVOFFSET

| | |
|----------------------|---|
| Definition | Phase V Current Offset |
| Type | Variable (R) |
| Description | Indicates the current offset of phase V (of UVW). |
| Syntax | IVOFFSET |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | A |
| Non-volatile | Yes |
| See also | IV |
| CANopen | 2075h, sub-index 0 |

IZERO

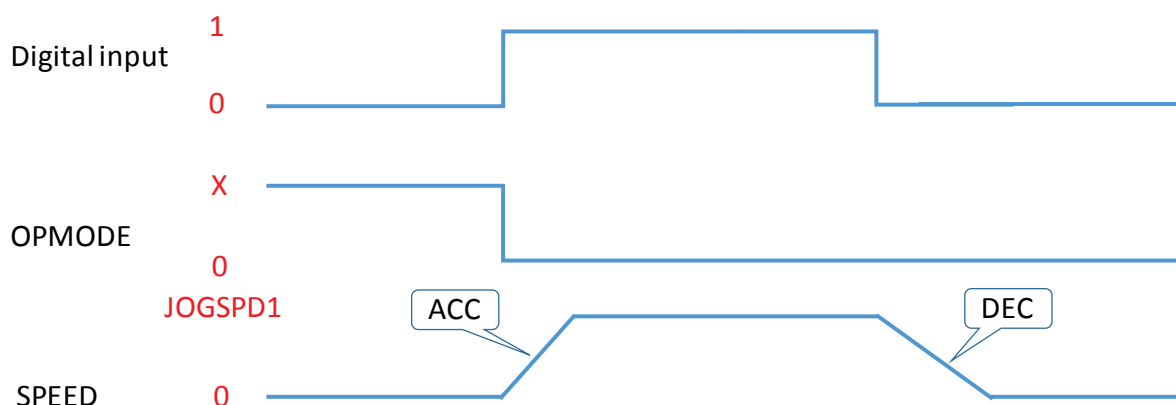
| | |
|----------------------|--|
| Definition | Zero Procedure Current |
| Type | Variable (R/W) |
| Description | Gets/sets the current for the ZERO procedure. |
| Syntax | IZERO |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to DIPEAK |
| Default value | 0.100 |
| Unit | A |
| Non-volatile | Yes |
| See also | ILIM MIPEAK ZERO |
| CANopen | 2076h, sub-index 0 |

J

| | |
|----------------------|--|
| Definition | Jog Command |
| Type | Command |
| Description | Issues a velocity jog. If the drive has been disabled, the jog command is reset to zero. |
| Syntax | <p>J Queries the command</p> <p>J <i>speed</i> Starts jog at a constant speed.</p> <p>J <i>speed duration</i> Starts jog at a constant speed for specified duration, after which a zero velocity command is issued.</p> |
| Firmware | 1.0.6 |
| Drive status | Enabled |
| Range | <i>speed</i> : \pm VLIM <i>duration</i> : +[unlimited] |
| Default value | Not Applicable |
| Unit | <i>speed</i> : If MOTORTYPE 0 (Rotary): UNITSROTVEL 0 = rps UNITSROTVEL 1 = rpm UNITSROTVEL 2 = deg/s If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = mm/s <i>duration</i> : ms |
| Non-volatile | Not Applicable |
| See also | ACC OPMODE STEP STOP |

JOGSPD1

| | |
|----------------------|---|
| Definition | Jog Speed 1 Triggered by Input |
| Type | Variable (R/W) |
| Description | <p>Defines a speed for a JOG command triggered by a digital input.</p> <p>The configured digital input functionality defines whether the motor moves in a positive (INMODE 38) or negative (INMODE 39) direction.</p> <p>ACC and DEC define the acceleration and deceleration values.</p> |
| Note | <p>Only one of the digital inputs defined for the jog function should be activated at a time.</p> <p>If two or more digital inputs are defined for the jog function and activated at the same time, the drive will not jog the motor.</p> |
| Syntax | <p>Read: JOGSPD1</p> <p>Write: JOGSPD1 <value></p> |
| Firmware | 1.40.0 |
| Drive status | Enabled Disabled |
| Range | 0 to VLIM |
| Default value | 100.000 |
| Unit | According to UNITSROTVEL |
| Non-volatile | Yes |
| See also | JOGSPD2 |
| CANopen | |



JOGSPD2

| | |
|----------------------|---|
| Definition | Jog Speed 2 Triggered by Input |
| Type | Variable (R/W) |
| Description | <p>Defines a speed for a JOG command triggered by a digital input.</p> <p>The configured digital input functionality defines whether the motor moves in a positive (INMODE 40) or negative (INMODE 41) direction.</p> <p>ACC and DEC define the acceleration and deceleration values.</p> |
| Note | <p>Only one of the digital inputs defined for the jog function should be activated at a time.</p> <p>If two or more digital inputs are defined for the jog function and activated at the same time, the drive will not jog the motor.</p> |
| Syntax | <p>Read: JOGSPD2</p> <p>Write: JOGSPD2 <value></p> |
| Firmware | 1.40.0 |
| Drive status | Enabled Disabled |
| Range | 0 to VLIM |
| Default value | 500.000 |
| Unit | According to UNITSROTVEL |
| Non-volatile | Yes |
| See also | JOGSPD1 |
| CANopen | |

K

| | |
|----------------------|---|
| Definition | Disable Command |
| Type | Command |
| Description | <p>Disables the drive. The behavior of the drive upon disable command is defined by DISMODE.</p> <p>K removes the software enable condition (SWEN) from the activation chain.</p> |
| Note | <p>Applicable in COMMODE 0 only.</p> <p>When the drive is operating in COMMODE 1, it must be disabled through the EtherCAT/CANopen interface.</p> |
| Syntax | K |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | ACTIVE EN FLT READY REMOTE ST SWEN |

KCBEMF

| | |
|----------------------|---|
| Definition | Current BEMF Compensation Gain |
| Type | Variable (R/W) |
| Description | Gets/sets the feedforward BEMF compensation ratio for the current control. When the value of KCBEMF is changed, CONFIG is required. |
| Note | As of version 1.40.0, the drive firmware includes a table that has bundled parameter data for certain drive and motor pairings. When a system drive and motor “parameter bundle” is found in the table, the values of current loop parameters KCBEMF, KCD, KCFF, KCI, and KCP are set automatically and cannot be manipulated by users. |
| Syntax | Read: KCBEMF Write: KCBEMF <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 to 2 |
| Default value | 1.000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | IFFLPFHZ MKT |
| CANopen | 2003h, sub-index 0 |

KCD

| | |
|----------------------|---|
| Definition | Dead Time Compensation Minimal Level |
| Type | Variable (R/W) |
| Description | Minimum current level to start compensation for dead-time effect. When the value of KCD is changed, CONFIG is required. |
| Note | As of version 1.40.0, the drive firmware includes a table that has bundled parameter data for certain drive and motor pairings. When a system drive and motor “parameter bundle” is found in the table, the values of current loop parameters KCBEMF, KCD, KCFF, KCI, and KCP are set automatically and cannot be manipulated by users. |
| Syntax | Read: KCD Write: KCD <value> |
| Firmware | 1.3.2 |
| Drive status | Disabled |
| Range | 0 to 10 |
| Default value | 2.00 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | PWMFRQ |
| CANopen | 20EFh, sub-index 0 |

KCFF

| | |
|----------------------|---|
| Definition | Current KFF Gain |
| Type | Variable (R/W) |
| Description | Gets/sets the current controller feedforward (KFF) gain. When the value of KCFF is changed, CONFIG is required. |
| Note | As of version 1.40.0, the drive firmware includes a table that has bundled parameter data for certain drive and motor pairings. When a system drive and motor “parameter bundle” is found in the table, the values of current loop parameters KCBEMF, KCD, KCFF, KCI, and KCP are set automatically and cannot be manipulated by users. |
| Syntax | Read: KCFF Write: KCFF <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0.001 to 100 |
| Default value | 1.000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | KCBEMF KCI KCP |
| CANopen | 2082h, sub-index 0 |

KCI

| | |
|----------------------|---|
| Definition | Current KI Gain |
| Type | Variable (R/W) |
| Description | Gets/sets the current controller integrator (KI) gain. When the value of KCI is changed, CONFIG is required. |
| Note | As of version 1.40.0, the drive firmware includes a table that has parameter bundled data for certain drive and motor pairings. When a system drive and motor “parameter bundle” is found in the table, the values of current loop parameters KCBEMF, KCD, KCFF, KCI, and KCP are set automatically and cannot be manipulated by users. |
| Syntax | Read: KCI Write: KCI <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0.001 to 100 |
| Default value | 1.000 |
| Unit | Not applicable |
| Non-volatile | Yes |
| See also | KCBEMF KCFF KCP |
| CANopen | 2006h, sub-index 0 |

KCMODE

| | |
|----------------------|--|
| Definition | Current Loop Compatibility Mode |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the type of current control loop.</p> <p>Enables use of the new firmware version while maintaining the existing current control settings. Useful for applications in which the upgrade to the latest current control structure is not desired.</p> |
| Syntax | <p>Read: KCMODE</p> <p>Write: KCMODE <value></p> |
| Firmware | 1.3.2 |
| Drive status | Disabled |
| Range | <p>0 = Current control loop for firmware version 1.3.2 and higher.</p> <p>1 = Keeps the current control loop from a previous firmware version (SSV file). After changing KCMODE from 0 to 1, you must issue the command SAVE, and recycle the drive's AC power.</p> <p>2 = Uses the latest version of the current controller; recommended except in specific cases of backward compatibility issues.</p> <p>3 = Reserved.</p> <p>4 = Reserved.</p> <p>5 = Reserved.</p> <p>6 = Enhanced current control loop. Provides better current symmetry and better bandwidth.</p> |
| Note | <p>KCMODE 6 is the default value.</p> <p>Users of previous firmware versions may want to change or keep KCMODE at its previous setting to maintain backward compatible and avoid fine tuning. However, for new applications the Enhanced Current Loop setting is highly recommended to achieve better performance and bandwidth.</p> |
| Default value | 6 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | CONFIG ML |
| CANopen | 2106h, sub-index 0 |

KCP

| | |
|----------------------|---|
| Definition | Current KP Gain |
| Type | Variable (R/W) |
| Description | Gets/sets the current controller proportional (KP) gain. When the value of KCP is changed, CONFIG is required. |
| Note | As of version 1.40.0, the drive firmware includes a table that has bundled parameter data for certain drive and motor pairings. When a system drive and motor “parameter bundle” is found in the table, the values of current loop parameters KCBEMF, KCD, KCFF, KCI, and KCP are set automatically and cannot be manipulated by users. |
| Syntax | Read: KCP Write: KCP <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 to 100 |
| Default value | 1.000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | KCBEMF KCFF KCI |
| CANopen | 2007h, sub-index 0 |

KCUSERGAIN

| | |
|----------------------|---|
| Definition | Current User Gain |
| Type | Variable (R/W) |
| Description | Gets/sets the current user gain. |
| Syntax | Read: KCUSERGAIN Write: KCUSERGAIN <value> |
| Firmware | 1.41.x |
| Drive status | Enable Disabled |
| Range | 0.1 to 10 |
| Default value | 1.000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | |
| CANopen | |

KNLAFRC

| | |
|----------------------|---|
| Definition | HD Acceleration Feedforward |
| Type | Variable (R/W) |
| Description | ICMD acceleration feedforward. |
| Syntax | Read: KNLAFRC Write: KNLAFRC <value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 0 to 200 |
| Default value | 0 |
| Unit | % of nominal |
| Non-volatile | Yes |
| See also | KNLD KNLI KNLIV KNLP |

KNLD

| | |
|----------------------|---|
| Definition | HD Derivative Gain |
| Type | Variable (R/W) |
| Description | <p>KNLD is the HD control equivalent of PID D. It is used in the HD control loop to reduce velocity error.</p> <p>The feedback gain parameters are tuned in the following general order: KNLD → KNLIV → KNLP → KNLI</p> |
| Syntax | <p>Read: KNLD</p> <p>Write: KNLD <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 2000 |
| Default value | 80.000 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | KNLI KNLP KNLIV POSCONTROLMODE |
| CANopen | 2017h, sub-index 0 |

KNLI

| | |
|----------------------|---|
| Definition | HD Integral Gain |
| Type | Variable (R/W) |
| Description | KNLIV is the HD control equivalent of PID I. It is used in the HD control loop to reduce standstill error. The feedback gain parameters are tuned in the following general order: KNLD → KNLIV → KNLP → KNLII |
| Syntax | Read: KNLII Write: KNLII <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 200 |
| Default value | 10.000 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | KNLD KNLP KNLIV POSCONTROLMODE |
| CANopen | 2018h, sub-index 0 |

KNLIV

| | |
|----------------------|---|
| Definition | HD Derivative-Integral Gain |
| Type | Variable (R/W) |
| Description | <p>KNLIV is the HD control equivalent of PID D and I.</p> <p>It is used in the HD control loop to reduce both error and steady state error and to increases control stiffness.</p> <p>The feedback gain parameters are tuned in the following general order: KNLD → KNLIV → KNLP → KNLI</p> |
| Syntax | <p>Read: KNLIV</p> <p>Write: KNIV <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 400 |
| Default value | 40.000 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | KNLD KNLI KNLP POSCONTROLMODE |
| CANopen | 2019h, sub-index 0 |

KNLP

| | |
|----------------------|---|
| Definition | HD Proportional Gain |
| Type | Variable (R/W) |
| Description | KNLP is the HD control equivalent of PID P. It is used in the HD control loop to reduce position error. The feedback gain parameters are tuned in the following general order: KNLD → KNLIV → KNLP → KNLI |
| Syntax | Read: KNLP Write: KNLP <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 400 |
| Default value | 30.000 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | KNLD KNLI KNLIV POSCONTROLMODE |
| CANopen | 201Ah, sub-index 0 |

KNLUSERGAIN

| | |
|----------------------|--|
| Definition | HD Global Gain |
| Type | Variable (R/W) |
| Description | HD adaptive gain scaling factor |
| Syntax | Read: KNLUSERGAIN Write: KNLUSERGAIN <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0.1 to 3.0 |
| Default value | 0.500 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | KNLI KNLP POSCONTROLMODE |
| CANopen | 201Bh, sub-index 0 |

KNLVFF

| | |
|----------------------|---|
| Definition | HD Velocity Feedforward |
| Type | Variable (R/W) |
| | HD velocity feedforward |
| Description | <p>HD velocity feedforward. The default value of 1 represents 100% feedforward value, which ensures the highest HD loop responsiveness.</p> <p>In applications that require a “softer” response, KNLVFF should be rapidly reduced until the desired response is achieved.</p> |
| Syntax | <p>Read: KNLVFF</p> <p>Write: KNLVFF <value></p> |
| Firmware | 1.20.6 |
| Drive status | Enabled Disabled |
| Range | 0.000 to 1.000 |
| Default value | 1.000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | |

KPAFRC

| | |
|----------------------|--|
| Definition | Position Acceleration Feedforward to Current |
| Type | Variable (R/W) |
| Description | Gets/sets the position acceleration feedforward to current loop. |
| Syntax | Read: KPAFRC Write: KPAFRC <value> |
| Firmware | 1.2.12 |
| Drive status | Enabled Disabled |
| Range | ± 1000 |
| Default value | 0.000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | KPP KPVFR POSCONTROLMODE |
| CANopen | 201Ch , sub-index 0 |

KPAFRV

| | |
|----------------------|---|
| Definition | Position Acceleration Feedforward |
| Type | Variable (R/W) |
| Description | Gets/sets the position acceleration feedforward. |
| Syntax | Read: KPAFR Write: KPAFR <value> |
| Firmware | 1.2.12 |
| Drive status | Enabled Disabled |
| Range | ±1000 |
| Default value | 0.000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | KPP KPAFRC POSCONTROLMODE |
| CANopen | 201Dh, sub-index 0 |

KPD

| | |
|----------------------|--|
| Definition | Position Derivative Gain |
| Type | Variable (R/W) |
| Description | Gets/sets the position controller derivative (KD) gain. |
| Syntax | Read: KPD Write: KPD <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 1000 |
| Default value | 0.000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | KPE KPI POSCONTROLMODE |
| CANopen | 201Eh , sub-index 0 |

KPE

| | |
|----------------------|--|
| Definition | Position Proportional Adaptive Gain |
| Type | Variable (R/W) |
| Description | The position proportional adaptive gain. |
| Syntax | Read: KPE Write: KPE <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 4 |
| Default value | 0.000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | KPD KPI POSCONTROLMODE |
| CANopen | 201Fh, sub-index 0 |

KPI

| | |
|----------------------|--|
| Definition | Position Integral Gain |
| Type | Variable (R/W) |
| Description | Gets/sets the position controller integral (KI) gain. |
| Syntax | Read: KPI Write: KPI <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 1000 |
| Default value | 0.000 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | KPE KPD POSCONTROLMODE |
| CANopen | 2020h , sub-index 0 |

KPISATIN

| | |
|----------------------|--|
| Definition | Position Integral Input Saturation |
| Type | Variable (R/W) |
| Description | The position integral input saturation. |
| Syntax | Read: KPISATIN Write: KPISATIN <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 10000 |
| Default value | 0.000 |
| Unit | If MOTORTYPE 0 (Rotary): rev If MOTORTYPE 2 (Linear): mm |
| Non-volatile | Yes |
| See also | KPI KPISATOUT POSCONTROLMODE |
| CANopen | 2077h , sub-index 0 |

KPISATOUT

| | |
|----------------------|---|
| Definition | Position Integral Output Saturation |
| Type | Variable (R/W) |
| Description | The position integral output saturation. |
| Syntax | Read: KPISATOUT Write: KPISATOUT <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 10000 |
| Default value | 0.000 |
| Unit | rps |
| Non-volatile | Yes |
| See also | KPI KPISATIN POSCONTROLMODE |
| CANopen | 2021h , sub-index 0 |

KPP

| | |
|----------------------|--|
| Definition | Position Proportional Gain |
| Type | Variable (R/W) |
| Description | Gets/sets the proportional gain for the linear position controller (POSCONTROLMODE 0) |
| Syntax | Read: KPP Write: KPP <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 1200 |
| Default value | 1.000 |
| Unit | Rotary: rps/rev Linear: (mm/sec)/mm |
| Non-volatile | Yes |
| See also | KPD KPE KPI KPVFR POSCONTROLMODE |
| CANopen | 2022h , sub-index 0 |

KPVFR

| | |
|----------------------|--|
| Definition | Position Velocity Feedforward |
| Type | Variable (R/W) |
| Description | The position control velocity feedforward. |
| Syntax | Read: KPVFR Write: KPVFR <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | -2 to 2 |
| Default value | 0.00 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | KPD KPE KPI KPP POSCONTROLMODE |
| CANopen | 2023h , sub-index 0 |

KVFR

| | |
|----------------------|--|
| Definition | Velocity Feedforward Ratio |
| Type | Variable (R/W) |
| Description | Gets/sets the velocity feedforward ratio. |
| Syntax | Read: KVFR Write: KVFR <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0.000 to 1.000 |
| Default value | 0.000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | FILTMODE KVP KVI VELCONTROLMODE |
| CANopen | 2025h , sub-index 0 |

KVI

| | |
|----------------------|---|
| Definition | Velocity Integral Gain |
| Type | Variable (R/W) |
| Description | Gets/sets the velocity integral gain |
| Syntax | Read: KVI Write: KVI <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 200000 |
| Default value | 0.000 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | FILTMODE KVFR KVP VELCONTROLMODE |
| CANopen | 2026h , sub-index 0 |

KVP

| | |
|----------------------|---|
| Definition | Velocity Proportional Gain |
| Type | Variable (R/W) |
| Description | Gets/sets the velocity proportional gain. |
| Syntax | Read: KVP Write: KVP <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 1000000 |
| Default value | 0.010 |
| Unit | If MOTORTYPE 0 (Rotary): A/rps If MOTORTYPE 2 (Linear): A/(mm/s) |
| Non-volatile | Yes |
| See also | FILTMODE KVFR KVI VELCONTROLMODE |
| CANopen | 2027h , sub-index 0 |

LIMSWITCHNEG

| | |
|----------------------|---|
| Definition | Limit Switch Negative Status |
| Type | Variable (R) |
| Description | <p>LIMSWITCHNEG indicates the status of all negative limit events. Its individual bits are set or cleared independently of each other, in response to the events described below.</p> <p>Bit 0 is set when the actual position (PFB) is less than the minimum position for software limit (POSLIMNEG). The bit is cleared otherwise.</p> <p>Bit 1 is set when the input assigned negative limit switch functionality by "INMODE <i>n</i> 6" is activated. The bit is cleared otherwise.</p> <p>Bits 2 and 3 are always set or cleared together. When bit 1 is set (negative limit switch is activated), bit 2 and bit 3 are also set; in addition, the actual position (PFB) is captured internally. Bits 2 and 3 are cleared whenever bit 1 is cleared AND the actual position is greater than the captured position.</p> <p>Bits 2 and 3 will not be set if bits 2 and 3 of LIMSWITCHPOS are already set.</p> <p>Possible values are combinations of bit 0, bit 1, and bits 2 and 3. It is sufficient, however, to monitor bit 2 only, or bit 3 only to obtain the limit switch status.</p> |
| Syntax | LIMSWITCHNEG |
| Firmware | 1.2.12 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | HOMETYPE INMODE LIMSWITCHPOS POSLIMMODE |
| CANopen | 2078h, sub-index 0 |

LIMSWITCHPOS

| | |
|----------------------|---|
| Definition | Limit Switch Positive Status |
| Type | Variable (R) |
| Description | <p>LIMSWITCHPOS indicates the status of all positive limit events. Its individual bits are set or cleared independently of each other, in response to the events described below.</p> <p>Bit 0 is set when the actual position (PFB) is greater than the maximum position for software limit (POSLIMPOS). The bit is cleared otherwise.</p> <p>Bit 1 is set when the input assigned positive limit switch functionality by "INMODE <i>n</i> 5" is activated. The bit is cleared otherwise.</p> <p>Bits 2 and 3 are always set or cleared together. When bit 1 is set (positive limit switch is activated), bit 2 and bit 3 are also set; in addition, the actual position (PFB) is captured internally. Bits 2 and 3 are cleared whenever bit 1 is cleared AND the actual position is less than the captured position.</p> <p>Bits 2 and 3 will not be set if bits 2 and 3 of LIMSWITCHNEG are already set.</p> <p>Possible values are combinations of bit 0, bit 1, and bits 2 and 3. It is sufficient, however, to monitor bit 2 only, or bit 3 only to obtain the limit switch status.</p> |
| Syntax | LIMSWITCHPOS |
| Firmware | 1.2.12 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | HOMETYPE INMODE LIMSWITCHNEG POSLIMMODE |
| CANopen | 2079h, sub-index 0 |

LINELOSSMODE

| | |
|----------------------|--|
| Definition | Bus AC Supply Line Disconnect Mode |
| Type | Variable (R/W) |
| Description | <p>Applicable only for DDHD and STO-certified CDHD drives (-ST models).</p> <p>A feature that monitors the bus supply, and defines how the drive will respond if phase loss is detected.</p> <p>Warning display: o</p> <p>Warning message: Bus AC supply line disconnect</p> <p>Fault display: o7</p> <p>Fault message: Bus AC supply line disconnect</p> |
| Syntax | <p>Read: LINELOSSMODE</p> <p>Write: LINELOSSMODE <value></p> |
| Firmware | 1.15.xx |
| Drive status | Enable Disable |
| Range | <p>0 = Fault when drive enabled or disabled</p> <p>1 = Fault when drive enabled, warning when disabled</p> <p>2 = Warning when drive enabled or disabled</p> |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | LINELOSSRECOVER LINELOSSTYPE |

LINELOSSRECOVER

| | |
|----------------------|---|
| Definition | Bus AC Supply Line Disconnect Recovery Mode |
| Type | Variable (R/W) |
| Description | Applicable only for DDHD and STO-certified CDHD drives (-ST models). Defines how the drive will recover from a bus AC supply line disconnect fault. |
| Syntax | Read: LINELOSSRECOVER Write: LINELOSSRECOVER <value> |
| Firmware | 1.15.xx |
| Drive status | Enable Disable |
| Range | 0 = No auto recovery 1 = Auto recovery (CLEARFAULTS is not needed) |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | LINELOSSMODE LINELOSSTYPE |

LINELOSSTYPE

| | |
|----------------------|---|
| Definition | Bus AC Supply Line Disconnect Type |
| Type | Variable (R/W) |
| Description | Applicable only for DDHD and STO-certified CDHD drives (-ST models). Defines the types of bus AC supply line disconnect fault. Programmable only if supported by hardware. |
| Syntax | Read: LINELOSSTYPE Write: LINELOSSTYPE <value> |
| Firmware | 1.15.xx |
| Drive status | Enable Disable |
| Range | 0 – No detection 1 – Detection for one phase connection 2 – Detection for three phase connection |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | LINELOSSMODE LINELOSSRECOVER |

LIST

| | |
|----------------------|---|
| Definition | List All Variables and Commands |
| Type | Command |
| Description | Returns a list of valid variables and commands. Only the variables names, and not their values, are transmitted. |
| Note | Some factory variables and commands, not intended for users, may appear in the list. Do not attempt to manipulate parameters that are not described in the product documentation or Help. |
| Syntax | LIST |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | INFO RECLIST RECTRIGLIST |

LMJR

| | |
|----------------------|---|
| Definition | Load to Motor Inertia Ratio |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the ratio of the load inertia to the motor inertia. If LMJR=2, for example, the total inertia is 3 times the inertia of the motor:</p> $J_{\text{total}} = MJ \times (1 + \text{LMJR})$ <p>The motor rotor inertia (MJ) and the load moment of inertia ratio (LMJR) define the total system moment of inertia. LMJR can be set by the user or determined by an autotuning procedure.</p> |
| Syntax | Read: LMJR Write: LMJR <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 2000 |
| Default value | 1.000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | BW MJ TF VELCONTROLMODE |
| CANopen | 207Ah, sub-index 0 |

LOAD

| | |
|----------------------|--|
| Definition | Load Commands to RAM |
| Type | Command |
| Description | Loads configuration variables from non-volatile memory to RAM. Any changes in configuration parameters which have been made since the last SAVE will be overwritten by the values loaded from the non-volatile memory. |
| Syntax | LOAD |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | DUMP FACTORYRESTORE SAVE |
| CANopen | 1011h, sub-index 1 |

MB

| | |
|----------------------|---|
| Definition | Motion Buffer Command |
| Type | Command |
| Description | <p>Activates the motion buffer sequence, as defined by: MOVEINCCOUNTER, MOVEINCDIST1, MOVEINCDIST2, MOVEINCSPEED1 and MOVEINCSPEED2.</p> <p>PEINPOS and PEINPOSTIME must also be defined.</p> <p>A set of two incremental position moves are repeated a number of times, as defined by the counter. The next move is performed when the PEINPOS condition is met.</p> |
| Syntax | MB |
| Firmware | 1.0.6 |
| Drive status | Enabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | MBST MOVEINCCOUNTER MOVEINCDELAY MOVEINCDIST1 MOVEINCDIST2 MOVEINCSPEED1 MOVEINCSPEED2 |

MBST

| | |
|----------------------|--|
| Definition | Motion Buffer Execution Status |
| Type | Variable (R) |
| Description | Returns the motion buffer repetition count during operation, and returns the total duration as soon as the motion sequence is completed. |
| Syntax | MBST |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable; see Example below |
| Default value | Not Applicable; see Example below |
| Unit | Not Applicable; see Example below |
| Non-volatile | No |
| Example | <p>Running the following command sequence produces the following MBST response.</p> <pre>-->MOVEINCCOUNTER=5 -->MOVEINCDIST1=2 -->MOVEINCDIST2=-2 -->MOVEINCSPEED1=200 -->MOVEINCSPEED2=300 -->MB -->MBST Running. Iteration: 1/5 Execution Time: 8ms -->MBST Running. Iteration: 1/5 Execution Time: 1020ms -->MBST Running. Iteration: 2/5 Execution Time: 2033ms -->MBST Running. Iteration: 3/5 Execution Time: 3044ms -->MBST Running. Iteration: 4/5 Execution Time: 4056ms -->MBST Running. Iteration: 5/5 Execution Time: 5068ms -->MBST Done. Execution Time: 5501ms</pre> |
| See also | MB MOVEINCCOUNTER MOVEINCDIST1 MOVEINCDIST2 MOVEINCSPEED1 MOVEINCSPEED2 |

MECHANGLE

| | |
|----------------------|---|
| Definition | Motor Mechanical Angle |
| Type | Variable (R) |
| Description | The actual position of the motor within one revolution. |
| Syntax | MECHANGLE |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 to 65535 |
| Default value | Not applicable |
| Unit | If MOTORTYPE 0 (Rotary): 65536/rev If MOTORTYPE 2 (Linear): 65536/pitch |
| Non-volatile | No |
| See also | ELECTANGLE FEEDBACKTYPE MENCRES MPHASE |
| CANopen | 2028h , sub-index 0 |

MENCAQBFILT

| | |
|----------------------|---|
| Definition | Motor Encoder A/B Quadrature Filter |
| Type | Variable (R/W) |
| Description | Enables/disables the FPGA filter on A and B signals from incremental encoders. Disabling the filter prevents the drive from losing commutation without sensing a fault. |
| Syntax | Read: MENCAQBFILT Write: MENCAQBFILT <value> |
| Firmware | 1.4.4 |
| Drive status | Disable |
| Range | 0 = Disables filter on incremental encoder A and B signals. Recommended for use with high resolution incremental encoders, or incremental encoders whose A and B phase difference is not 90°. 1 = Enables filter on incremental encoder A and B signals. |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | FEEDBACKTYPE |

MENCRES

| | |
|----------------------|---|
| Definition | Motor Encoder Resolution |
| Type | Variable (R/W) |
| Description | <p>For encoder feedback systems, gets/sets the resolution of the motor encoder, in number of lines per revolution, or lines per pitch, of the motor.</p> <p>When the value of MENCRES is changed, CONFIG is required.</p> |
| Syntax | <p>Read: MENCRES</p> <p>Write: MENCRES <value></p> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | <p>Drive supporting rotary motor: 1 to 10,000 (LPR)</p> <p>Drive supporting linear and rotary motors: 1 to 256,000,000 (LPR/LPP)</p> |
| Default value | 1048576 [LPR] |
| Note | If the drive system detects an electronic motor nameplate (such as used in the sensAR magnetic encoder), the value of parameter MENCRES is loaded directly from the encoder memory to the drive RAM at power-up. |
| Unit | <p>MOTORTYPE=0 (Rotary): lines per revolution (LPR)</p> <p>MOTORTYPE=2 (Linear): lines per pitch (LPP)</p> |
| Non-volatile | Yes |
| See also | FEEDBACKTYPE MENCTYPE |
| CANopen | 608F, sub-index 1 |

MENCTYPE

| | | | |
|---------------------|--|-----------------|---------------------|
| Definition | Motor Encoder Type | | |
| Type | Variable (R/W) | | |
| Description | <p>Gets/sets the motor encoder type.</p> <p>When the value of MENCTYPE is changed, CONFIG is required.</p> <p>Rotary motors: When setting MENCTYPE=0 (A/B/Z/Halls) for the first time, it must be followed by the MOTORSETUP command. MOTORSETUP will always detect and set the correct commutation index position (MENCZPOS) for rotary motors. Failure to initialize the index may result in a commutation fault.</p> <p>Linear motors: The index position typically occurs once per linear scale, and not at every electrical revolution (MPITCH). Since the index may vary from motor to motor, always use MENCTYPE=6 (A/B+Halls) for linear motors. Homing on index and other functions dependent upon the index can still be executed.</p> | | |
| Syntax | Read: MENCTYPE Write: MENCTYPE <value> | | |
| Firmware | 1.0.6 | | |
| Drive status | Disabled | | |
| Range | | MENCTYPE | FEEDBACKTYPE |
| | Incremental Encoder; A, B and index channels, and Halls (A/B/Z/H) | 0 | 2 |
| | Sine Encoder; A/B/Z/H | 0 | 3 |
| | Incremental Encoder; A/B/Z commutation initialization by PHASEFIND command | 1 | 2 |
| | Sine Encoder; A/B/Z commutation initialization by PHASEFIND command | 1 | 3 |
| | Incremental Encoder; A/B/Z commutation initialization by ENABLE or PHASEFIND command | 2 | 2 |
| | Sine Encoder; A/B/Z commutation initialization by ENABLE and PHASEFIND command | 2 | 3 |
| | Incremental Encoder; A/B commutation initialization by PHASEFIND command | 3 | 2 |
| | Sine Encoder; A/B commutation initialization by PHASEFIND command | 3 | 3 |
| | Incremental Encoder; A/B commutation initialization by ENABLE or PHASEFIND command | 4 | 2 |
| | Sine Encoder; A/B ; commutation initialization by ENABLE or PHASEFIND command | 4 | 3 |
| | Halls only | 5 | 2 |
| | Incremental Encoder; A/B/H | 6 | 2 |

| | | | |
|----------------------|---|----|----|
| | Sine Encoder; A/B/H | 6 | 3 |
| | EnDat 2.1 with Sine Signals | 9 | 3 |
| | HIPERFACE with Sine Signals | 10 | 3 |
| | Tamagawa Incremental Encoder (8 wires) | 11 | 2 |
| | Reserved | 12 | -- |
| Default value | 6 | | |
| Note | If the drive system detects an electronic motor nameplate (such as used in the sensAR magnetic encoder), the value of parameter MENCTYPE is loaded directly from the encoder memory to the drive RAM at power-up. | | |
| Unit | Not Applicable | | |
| Non-volatile | Yes | | |
| See also | FEEDBACKTYPE HALLS PHASEFIND | | |
| CANopen | 2029h, sub-index 0 | | |

MENCZPOS

| | |
|----------------------|--|
| Definition | Motor Encoder Index Position |
| Type | Variable (R/W) |
| Description | For encoder feedback systems only, gets/sets the encoder index position. |
| Syntax | Read: MENCZPOS Write: MENCZPOS <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 to 359 |
| Default value | 0 |
| Unit | Electrical degree |
| Non-volatile | Yes |
| See also | PHASEFIND MENCTYPE |
| CANopen | 202Ah , sub-index 0 |

MFBDIR

| Definition | Motor and Feedback Direction | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------|---|----------|---------------------|--------------|----------------|--------|--|----------|---------------------|--------------|----------------|---|---|----|----|----|----|---|---|-----|----|----|----|---|---|----|-----|----|----|---|---|-----|-----|----|----|---|---|----|----|-----|----|---|---|-----|----|-----|----|---|---|----|-----|-----|----|---|---|-----|-----|-----|----|---|---|----|----|----|-----|---|---|-----|----|----|-----|----|---|----|-----|----|-----|----|---|-----|-----|----|-----|----|---|----|----|-----|-----|----|---|-----|----|-----|-----|----|---|----|-----|-----|-----|----|---|-----|-----|-----|-----|
| Type | Variable (R/W) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Description | <p>Gets/sets several direction and polarity options. MFBDIR is set by the MOTORSETUP procedure.</p> <p>When the value of MFBDIR is changed, CONFIG is required.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Syntax | <p>Read: MFBDIR</p> <p>Write: MFBDIR <value></p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Firmware | 1.0.6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Drive status | Disabled | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Range | <table> <tr> <th>MFBDIR</th><th></th><th>Swap U-V</th><th>Swap Halls Decoding</th><th>Invert Index</th><th>Invert Sin-Cos</th></tr> <tr><td>0</td><td>=</td><td>No</td><td>No</td><td>No</td><td>No</td></tr> <tr><td>1</td><td>=</td><td>Yes</td><td>No</td><td>No</td><td>No</td></tr> <tr><td>2</td><td>=</td><td>No</td><td>Yes</td><td>No</td><td>No</td></tr> <tr><td>3</td><td>=</td><td>Yes</td><td>Yes</td><td>No</td><td>No</td></tr> <tr><td>4</td><td>=</td><td>No</td><td>No</td><td>Yes</td><td>No</td></tr> <tr><td>5</td><td>=</td><td>Yes</td><td>No</td><td>Yes</td><td>No</td></tr> <tr><td>6</td><td>=</td><td>No</td><td>Yes</td><td>Yes</td><td>No</td></tr> <tr><td>7</td><td>=</td><td>Yes</td><td>Yes</td><td>Yes</td><td>No</td></tr> <tr><td>8</td><td>=</td><td>No</td><td>No</td><td>No</td><td>Yes</td></tr> <tr><td>9</td><td>=</td><td>Yes</td><td>No</td><td>No</td><td>Yes</td></tr> <tr><td>10</td><td>=</td><td>No</td><td>Yes</td><td>No</td><td>Yes</td></tr> <tr><td>11</td><td>=</td><td>Yes</td><td>Yes</td><td>No</td><td>Yes</td></tr> <tr><td>12</td><td>=</td><td>No</td><td>No</td><td>Yes</td><td>Yes</td></tr> <tr><td>13</td><td>=</td><td>Yes</td><td>No</td><td>Yes</td><td>Yes</td></tr> <tr><td>14</td><td>=</td><td>No</td><td>Yes</td><td>Yes</td><td>Yes</td></tr> <tr><td>15</td><td>=</td><td>Yes</td><td>Yes</td><td>Yes</td><td>Yes</td></tr> </table> <p>Alternately, MFBDIR can be interpreted by its binary representation:</p> <p>Bit 1: Swap U-V</p> <p>Bit 2: Swap Halls Decoding</p> <p>Bit 3: Invert Index</p> <p>Bit 4: Invert Sine-Cosine (reverse direction)</p> | | | | | MFBDIR | | Swap U-V | Swap Halls Decoding | Invert Index | Invert Sin-Cos | 0 | = | No | No | No | No | 1 | = | Yes | No | No | No | 2 | = | No | Yes | No | No | 3 | = | Yes | Yes | No | No | 4 | = | No | No | Yes | No | 5 | = | Yes | No | Yes | No | 6 | = | No | Yes | Yes | No | 7 | = | Yes | Yes | Yes | No | 8 | = | No | No | No | Yes | 9 | = | Yes | No | No | Yes | 10 | = | No | Yes | No | Yes | 11 | = | Yes | Yes | No | Yes | 12 | = | No | No | Yes | Yes | 13 | = | Yes | No | Yes | Yes | 14 | = | No | Yes | Yes | Yes | 15 | = | Yes | Yes | Yes | Yes |
| MFBDIR | | Swap U-V | Swap Halls Decoding | Invert Index | Invert Sin-Cos | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | = | No | No | No | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | = | Yes | No | No | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | = | No | Yes | No | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | = | Yes | Yes | No | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | = | No | No | Yes | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | = | Yes | No | Yes | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | = | No | Yes | Yes | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | = | Yes | Yes | Yes | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | = | No | No | No | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | = | Yes | No | No | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | = | No | Yes | No | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | = | Yes | Yes | No | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | = | No | No | Yes | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | = | Yes | No | Yes | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | = | No | Yes | Yes | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | = | Yes | Yes | Yes | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Default value | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | |
|---------------------|---|
| Note | If the drive system detects an electronic motor nameplate (such as used in the sensAR magnetic encoder), the value of parameter MFBDIR is loaded directly from the encoder memory to the drive RAM at power-up. |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | DIR MOTORSETUP MPHASE PFB V |
| CANopen | 202Bh, sub-index 0 |

MFBMODE

| | |
|----------------------|--|
| Definition | Motor Feedback Mode |
| Type | Variable (R/W) |
| Description | <p>Enables the resolution enhancement mechanism.</p> <p>MFBMODE is applicable only for incremental encoders (FEEDBACKTYPE 2, MENCTYPE 0, 1, 2, 3, 4, 6).</p> <p>When MFBMODE is enabled PFB is displayed with a decimal fraction.</p> <p>When the value of MFBMODE is changed, CONFIG is required.</p> |
| Syntax | <p>Read: MFBMODE</p> <p>Write: MFBMODE <value></p> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | <p>0 = Resolution enhancement disabled</p> <p>1 = Resolution enhancement enabled</p> <p>2 = Encoder interpolation is not performed, and there is no compensation for deviations from the 90-degree phase shift</p> |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | FEEDBACKTYPE MENCTYPE |
| CANopen | 202Dh, sub-index 0 |

MFOLD

| | |
|----------------------|--|
| Definition | Motor Foldback Status |
| Type | Variable (R) |
| Description | Indicates whether the motor foldback limit (MIFOLD) has dropped below the application current limits (ILIM). |
| Syntax | MFOLD |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Foldback limit above ILIM 1 = Foldback limit below ILIM |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | ILIM MIFOLD MIFOLDFTHRESH MIFOLDWTHRESH |
| CANopen | 202Eh, sub-index 0 |

MFOLDD

| | |
|----------------------|--|
| Definition | Motor Foldback Delay Time |
| Type | Variable (R/W) |
| Description | Gets/sets the time delay for motor foldback. This is the amount of time that the system current can exceed MICON _T before the drive enters the motor foldback state (MFOLD 1). The timing units assume a worst-case scenario, in which the drive is applying MIPEAK current. A current level that is less than MIPEAK can be allowed for longer time. |
| Syntax | Read: MFOLDD Write: MFOLDD <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 1 to 2400 |
| Default value | 5.000 |
| Note | If the drive system detects an electronic motor nameplate (such as used in the sensAR magnetic encoder), the value of parameter MFOLDD is loaded directly from the encoder memory to the drive RAM at power-up. |
| Unit | second |
| Non-volatile | Yes |
| See also | MFOLDDIS MFOLDR MFOLDT MICON_T MIPEAK |
| CANopen | 202Fh, sub-index 0 |

MFOLDDIS

| | |
|----------------------|--|
| Definition | Motor Foldback Disable |
| Type | Variable (R/W) |
| Description | Gets/sets a value that defines whether motor foldback protection is activated. |
| Syntax | Read: MFOLDDIS Write: MFOLDDIS <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 = Motor foldback protection activated. 1 = Motor foldback protection not activated. |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | MFOLD MFOLDD MFOLDR MFOLDT MICON MIFOLD MIPEAK |
| CANopen | 2030h, sub-index 0 |

MFOLDF

| | |
|----------------------|---|
| Definition | Motor Foldback Factor |
| Type | Variable (R/W) |
| Description | <p>MFOLDF is used to increase the effective continuous current setting of the motor (MICON_T) for the motor foldback protection mechanism.</p> <p>When MFOLDF>1, the effective MICON_T=MFOLDF × MICON_T.</p> |
| Syntax | <p>Read: MFOLDF</p> <p>Write: MFOLDF <value></p> |
| Firmware | 1.4.4 |
| Drive status | Disabled |
| Range | 1 to 1.5 |
| Default value | 1 |
| Note | If the drive system detects an electronic motor nameplate (such as used in the sensAR magnetic encoder), the value of parameter MFOLDF is loaded directly from the encoder memory to the drive RAM at power-up. |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | MFOLDDIS MFOLDT MICON_T |

MFOLDER

| | |
|----------------------|--|
| Definition | Motor Foldback Recovery Time |
| Type | Variable (R) |
| Description | Gets/sets the recovery time for motor foldback. After the drive enters the motor foldback state (MFOLD=1), and the current folds back to MICON, this is the minimum amount of time that the current must be held at 0 before it can be MIPEAK for the full MFOLDD time. |
| Note | MFOLDER is a read only parameter, calculated from MIPEAK, MICON, MFOLDD, and MFOLDT. Since MIPEAK and MICON have a default value of 0, the initial value of MFOLDER is 0.001. Once proper values are set for MIPEAK and MICON, MFOLDER gets a valid value. |
| Syntax | MFOLDER |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | second |
| Non-volatile | No |
| See also | MFOLDD MFOLDDIS MFOLDT MICON MIPEAK |
| CANopen | 2031h , sub-index 0 |

MFOLDT

| | |
|----------------------|---|
| Definition | Motor Foldback Time Constant |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the time constant for motor foldback.</p> <p>After the drive enters the motor foldback state (MFOLD 1), this variable defines how long it will take the drive to reduce the system current level to MICON.</p> |
| Syntax | <p>Read: MFOLDT</p> <p>Write: MFOLDT <value></p> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 1 to 1200 |
| Default value | 5.000 |
| Note | If the drive system detects an electronic motor nameplate (such as used in the sensAR magnetic encoder), the value of parameter MFOLDT is loaded directly from the encoder memory to the drive RAM at power-up. |
| Unit | second |
| Non-volatile | Yes |
| See also | MFOLDD MFOLDDIS MFOLDR MICON MIPEAK |
| CANopen | 2032h , sub-index 0 |

MICONT

| | |
|----------------------|---|
| Definition | Motor Continuous Current |
| Type | Variable (R/W) |
| Description | Gets/sets the motor's continuous rated current. When the value of MICONT is changed, CONFIG is required. |
| Note | MICONT and MIPEAK have a factory default setting of 0. Once the values of MICONT and MIPEAK are set, the value of MIFOLD is set accordingly. |
| Syntax | Read: MICONT Write: MICONT <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0.1 to 150 |
| Default value | 0.000 |
| Note | If the drive system detects an electronic motor nameplate (such as used in the sensAR magnetic encoder), the value of parameter MICONT is loaded directly from the encoder memory to the drive RAM at power-up. |
| Unit | A (peak) |
| Non-volatile | Yes |
| See also | DICONT ILIM MFOLD MIFOLD MIPEAK |
| CANopen | 6075h , sub-index 0 |

MIFOLD

| | |
|----------------------|--|
| Definition | Motor Foldback Current |
| Type | Variable (R) |
| Description | <p>Indicates the current limit derived from the motor foldback mechanism. A foldback condition occurs when MIFOLD goes below ILIM.</p> <p>This variable is useful for checking how close the current is to the foldback limit.</p> <p>The value of MIFOLD is calculated according to the values of MIPEAK and MICONT</p> |
| Syntax | MIFOLD |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 300 |
| Default value | 0.000 |
| Unit | A |
| Non-volatile | No |
| See also | ILIM MFOLD MIFOLD MIPEAK MIFOLDFTHRESH MIFOLDWTHRESH |
| CANopen | 2033h, sub-index 0 |

MIFOLDFTHRESH

| | |
|----------------------|---|
| Definition | Motor Foldback Fault Threshold |
| Type | Variable (R/W) |
| Description | Gets/sets the motor foldback fault threshold. |
| Note | When the drive is paired with a PRO2 motor, and obtains data from the electronic motor nameplate, the default value of MIFOLDFTHRESH is the same as MICONT. |
| Syntax | Read: MIFOLDFTHRESH Write: MIFOLDFTHRESH <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 300 |
| Default value | 0.000 |
| Unit | A |
| Non-volatile | Yes |
| See also | ILIM MFOLD MICONT MIFOLD MIFOLDWTHRESH |
| CANopen | 2034h , sub-index 0 |

MIFOLDWTHRESH

| | |
|----------------------|---|
| Definition | Motor Foldback Warning Threshold |
| Type | Variable (R/W) |
| Description | Gets/sets the motor foldback fault warning threshold. |
| Note | When the drive is paired with a PRO2 motor, and obtains data from the electronic motor nameplate, the default value of MIFOLDWTHRESH is the same as MIPEAK. |
| Syntax | Read: MIFOLDWTHRESH Write: MIFOLDWTHRESH <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 300 |
| Default value | 0.000 |
| Unit | A |
| Non-volatile | Yes |
| See also | ILIM MFOLD MIFOLD MIFOLDFTHRESH MIPEAK |
| CANopen | 2035h , sub-index 0 |

MIPEAK

| | |
|----------------------|---|
| Definition | Motor Peak Current |
| Type | Variable (R/W) |
| Description | Gets/sets the motor's peak rated current. When the value of MIPEAK is changed, CONFIG is required. |
| Note | MIPEAK and MICONT have a factory default setting of 0. Once the values of MIPEAK and MICONT are set, the value of MIFOLD is set accordingly. |
| Syntax | Read: MIPEAK Write: MIPEAK <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0.1 to 150 |
| Default value | 0.000 |
| Note | If the drive system detects an electronic motor nameplate (such as used in the sensAR magnetic encoder), the value of parameter MIPEAK is loaded directly from the encoder memory to the drive RAM at power-up. |
| Unit | A |
| Non-volatile | Yes |
| See also | DIPEAK ILIM IMAX MICONT MIFOLD |
| CANopen | 2036h , sub-index 0 |

MJ

| | |
|----------------------|---|
| Definition | Rotor Inertia |
| Type | Variable (R/W) |
| Description | Gets/sets the motor's rotor inertia (rotary motors). The motor rotor inertia (MJ) and the load moment of inertia ratio (LMJR) define the total system moment of inertia. When the value of MJ is changed, CONFIG is required. |
| Syntax | Read: MJ Write: MJ <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0.00 to 2000000.00 |
| Default value | 0.020 |
| Note | If the drive system detects an electronic motor nameplate (such as used in the sensAR magnetic encoder), the value of parameter MJ is loaded directly from the encoder memory to the drive RAM at power-up. |
| Unit | $\text{kg}\cdot\text{m}^2\times 10^{-3}$ |
| Non-volatile | Yes |
| See also | LMJR MKT VELCONTROLMODE |
| CANopen | 2037h , sub-index 0 |

MKF

| | |
|----------------------|---|
| Definition | Torque Constant for Linear Motor |
| Type | Variable (R/W) |
| Description | Linear motor torque constant. When the value of MKF is changed, CONFIG is required. |
| Note | Applicable only for drives that support linear servo motors. |
| Syntax | Read: MKF Write: MKF <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0.001 to 1000 |
| Default value | 0.016 |
| Unit | Nm/A |
| Non-volatile | Yes |
| See also | MKT MMASS MOTORTYPE MPITCH |
| CANopen | 2038h , sub-index 0 |

MKT

| | |
|----------------------|---|
| Definition | Torque Constant |
| Type | Variable (R/W) |
| Description | Gets/sets the motor's torque constant (Kt) in metric units. This value is used for current loop controller design, KCBEMF, compensation algorithm, and standard pole-placement velocity controller design (VELCONTROLMODE 2 or 4). When the value of MKT is changed, CONFIG is required. |
| Syntax | Read: MKT Write: MKT <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | Drive supporting rotary motor: 0.001 to 3 Drive supporting linear and rotary motors: 0.001 to 65 |
| Default value | 0.016 |
| Note | If the drive system detects an electronic motor nameplate (such as used in the sensAR magnetic encoder), the value of parameter MKT is loaded directly from the encoder memory to the drive RAM at power-up. |
| Unit | Nm/A |
| Non-volatile | Yes |
| See also | KCBEMF LMJR MJ VELCONTROLMODE |
| CANopen | 2039h, sub-index 0 |

ML

| | |
|----------------------|---|
| Definition | Motor Inductance |
| Type | Variable (R/W) |
| Description | Gets/sets the motor's minimum line-to-line inductance. This variable is used for current loop controller design and as an input to the vector control algorithms. When the value of ML is changed, CONFIG is required. |
| Syntax | Read: ML Write: ML <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0.001 to 1000 |
| Default value | 0.000 |
| Note | If the drive system detects an electronic motor nameplate (such as used in the sensAR magnetic encoder), the value of parameter ML is loaded directly from the encoder memory to the drive RAM at power-up. |
| Unit | mH |
| Non-volatile | Yes |
| See also | KCP VBUS |
| CANopen | 203Ah, sub-index 0 |

MLGAINC

| | |
|----------------------|--|
| Definition | Adaptive Gain at Continuous Motor Current |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the current loop adaptive gain value at continuous motor current (MICON). MLGAINC and MLGAINP define the adaptive gain algorithm that is based on motor current.</p> <p>When the value of MLGAINP is changed, CONFIG is required.</p> |
| Syntax | <p>Read: MLGAINC</p> <p>Write: MLGAINC <value></p> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0.1 to 1 |
| Default value | 1.000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | ML MLGAINP |
| CANopen | 203Bh, sub-index 0 |

MLGAINP

| | |
|----------------------|--|
| Definition | Adaptive Gain at Peak Motor Current |
| Type | Variable (R/W) |
| Description | Get/sets the current loop adaptive gain value at peak motor current (MIPEAK). MLGAINC and MLGAINP define the adaptive gain algorithm that is based on motor current. When the value of MLGAINP is changed, CONFIG is required. |
| Syntax | Read: MLGAINP Write: MLGAINP <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0.1 to 1.0 |
| Default value | 1.000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | ML MLGAINC |
| CANopen | 203Ch, sub-index 0 |

MMASS

| | |
|----------------------|--|
| Definition | Mass of Linear Motor Without Load |
| Type | Variable (R/W) |
| Description | Gets/sets the mass of the linear motor carriage without any additional payload. It is used as the base for estimating the total moving mass. |
| Note | Applicable only for drives that support linear servo motors. |
| Syntax | Read: MMASS Write: MMASS <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 100 |
| Default value | 0.000 |
| Unit | kg |
| Non-volatile | Yes |
| See also | MJ MKF MOTORTYPE MPITCH |
| CANopen | 203Dh, sub-index 0 |

MODMODE

| | |
|----------------------|--|
| Definition | Position Modulo Mode |
| Type | Variable (R/W) |
| Description | Enables/disables the position modulo. When MODMODE is enabled, PFB and PCMD roll over the limits set by PROTARY. MODMODE has no effect when used with linear motors. |
| Syntax | Read: MODMODE Write: MODMODE <value> |
| Firmware | 1.15.xx. Updated 1.41.9. |
| Drive status | Disabled |
| Range | 0 = Position modulo mode disabled. 1 = Position modulo mode enabled;MOVEABS by shortest path. 3 = Position modulo mode enabled;MOVEABS in positive direction only. 5 = Position modulo mode enabled;MOVEABS in negative direction only. |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | MOVEABS PROTARY |
| CANopen | 214Eh, sub-index 0 |

MOTORCOMMTYPE

| | |
|----------------------|--|
| Definition | Motor Commutation Type |
| Type | Variable (R/W) |
| Description | <p>Gets/sets a variable that defines the type of motor commutation</p> <p>When the value of MOTOCOMMTYPE is changed, CONFIG is required.</p> |
| Syntax | <p>Read: MOTORCOMMTYPE</p> <p>Write: MOTORCOMMTYPE <value></p> |
| Firmware | 1.2.12 |
| Drive status | Disabled |
| Range | <p>0 = Brushless motor</p> <p>1 = Brush motor</p> <p>2 = DC and voice coil motors</p> |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | <p>ELECTANGLE</p> <p>FEEDBACKTYPE</p> <p>MENCTYPE</p> <p>MOTORTYPE</p> |
| CANopen | 203Eh, sub-index 0 |

MOTORNAME

| | |
|----------------------|---|
| Definition | Motor Name |
| Type | Variable (R/W) |
| Description | Gets/sets the name assigned to the motor. The name may contain up to 20 alphanumeric characters. A quotation mark (") always precedes the name. Additional valid characters for use in the text string: () / - . : |
| Syntax | Read: MOTORNAME Write: MOTORNAME <text> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | " |
| Note | If the drive system detects an electronic motor nameplate (such as used in the sensAR magnetic encoder), the value of parameter MOTORNAME is loaded directly from the encoder memory to the drive RAM at power-up. |
| Unit | Not applicable |
| Non-volatile | Yes |
| See also | DRIVENAME FACTORYRESTORE MOTORTYPE |
| CANopen | 203Fh, sub-index 0 |

MOTORPHASESCAN

| | |
|----------------------|---|
| Definition | Motor phase Disconnect Scan |
| Type | Variable (R/W) |
| Description | Enables/disables detection of wire breaks in motor phases. When enabled, if a wire break is detected in one or more of the motor phases, this mechanism issues a fault: "phase – disconnected" and the 7-segment display shows r27 . Detection can occur only when drive is enabled and a current command is issued by the user, or by velocity or position controllers. |
| Syntax | Read: MOTORPHASESCAN Write: MOTORPHASESCAN <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Motor phases wire break detection disabled 1 = Motor phases wire break detection enabled 2 = Reserved |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | FLT ST |
| CANopen | 2040h, sub-index 0 |

MOTORSETUP

| | |
|----------------------|---|
| Definition | Motor Setup Command |
| Type | Command |
| Description | <p>Runs an automatic procedure for setting commutation related variables. The procedure involves finding the electrical phase and detecting the direction of motor movement, Hall switches and index crossing.</p> <p>MOTORSETUP sets MFBDIR, MENCRES, MPOLES, MPHASE, MENCZPOS. The procedure takes approximately 30 seconds and a motor rotation of about one revolution is expected.</p> <p>While the Motor Setup procedure is in progress (even when the drive is disabled), the drive's 7-segment display shows a flashing "A".</p> <p>When the procedure finishes successfully, the display returns to its normal state.</p> <p>If the procedure fails, the display shows "-5".</p> <p>The motor setup routine can be used for the following configurations:</p> <ul style="list-style-type: none"> ■ Encoders with square-wave quadrature signals: FEEDBACKTYPE 2 with: MENCTYPE 0, 1, 2, 3, 4, 6, 11 ■ Encoders with sine signals: FEEDBACKTYPE 3 with: MENCTYPE 0, 1, 2, 3, 4, 6, 9 MENCTYPE 10 MENCTYPE 11 ■ Communication-only encoders: FEEDBACKTYPE 6 FEEDBACKTYPE 7 FEEDBACKTYPE 11 FEEDBACKTYPE 12 FEEDBACKTYPE 14 FEEDBACKTYPE 16 ■ Resolver: FEEDBACKTYPE 1 |
| Syntax | MOTORSETUP |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | Not applicable |
| Default value | Not applicable |
| Unit | Not applicable |
| Non-volatile | Not applicable |

| | |
|-----------------|---|
| See also | FEEDBACKTYPE MENCRES MENCTYPE MENCZPOS MFBDIR MOTORSETUPST MPHASE MPOLES |
| CANopen | 2041, sub-index 0 |

MOTORSETUPST

| | |
|----------------------|--|
| Definition | Motor Setup Status |
| Type | Command |
| Description | Reports the internal stages of the MOTORSETUP procedure together with the message that includes the running state, actions taken or failure cause. |
| Syntax | MOTORSETUPST |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | Not Applicable; see Example below |
| Default value | Not Applicable; see Example below |
| Unit | Not Applicable; see Example below |
| Non-volatile | Not Applicable |
| Example | <pre>-->motorsetupst Motor Setup Not Issued Stage: 0/27 --></pre> |
| Example | <pre>1->motorsetupst Motor Setup Active Stage: 20/36 1->motorsetupst Motor Setup Active Stage: 23/36 1->motorsetupst Motor Setup Active Stage: 24/36 1->motorsetupst Motor Setup Succeeded Current Pulse: 125 mA 195 ms Stage: 0/36 1-></pre> |
| See also | MOTORSETUP PHASEFINDST |
| CANopen | 2042h, sub-index 0 |

MOTORTYPE

| | |
|----------------------|--|
| Definition | Motor Type |
| Type | Variable (R/W) |
| Description | Gets/sets a value that defines the motor type. When the value of MOTORTYPE is changed, CONFIG is required. |
| Syntax | Read: MOTORTYPE Write: MOTORTYPE <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 = Rotary motor 2 = Linear motor Note: Applicable for drive models that support linear and rotary servo motors. |
| Default value | 0 |
| Note | If the drive system detects an electronic motor nameplate (such as used in the sensAR magnetic encoder), the value of parameter MOTORTYPE is loaded directly from the encoder memory to the drive RAM at power-up. |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | FEEDBACKTYPE |
| CANopen | 2024h, sub-index 0 |

MOVEABS

| | |
|----------------------|---|
| Definition | Move Absolute Command |
| Type | Command |
| Description | Executes an absolute position movement according to the acceleration settings that are in effect. STOPPED and PEINPOS indicate completion of motion. |
| Syntax | MOVEABS { <i>distance</i> } { <i>velocity</i> } |
| Firmware | 1.0.6 |
| Drive status | Enabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | MB MOVEINC OPMODE PFB |

MOVEINC

| | |
|----------------------|--|
| Definition | Move Incremental Command |
| Type | Command |
| Description | <p>Executes an incremental position movement according to the acceleration settings that are in effect.</p> <p>If <i>blending_mode</i> = 1 and MOVEINC is issued while a movement is in progress, the current movement is discontinued, and the new movement starts immediately.</p> <p>If <i>blending_mode</i> = 2 or 3 and MOVEINC is issued while a movement is in progress, the incremental move will be added to the position target of the current move.</p> <p>In all blending modes the final position is the summation of the target positions of both the currently executed command and the newly issued MOVEINC command.</p> <p>STOPPED and PEINPOS indicate completion of motion.</p> |
| Syntax | MOVEINC { <i>distance</i> } { <i>velocity</i> } [<i>blending_mode</i>] |
| Note | <i>blending_mode</i> is optional; if not specified, blending mode 2 is used. |
| Firmware | 1.0.6 |
| Drive status | Enabled |
| Range | <p><i>distance</i> = Not Applicable</p> <p><i>velocity</i> = Not Applicable</p> <p><i>blending_mode</i>:</p> <p>1 = MOVEINC is executed immediately.</p> <p>2 = MOVEINC is executed at the end of the currently executed movement (default value).</p> <p>3 = MOVEINC is executed at the end of the currently executed movement without stopping.</p> |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | MB MOVEABS OPMODE PFB |

MOVEINCCOUNTER

| | |
|----------------------|---|
| Definition | Move Incremental Iterations |
| Type | Variable (R/W) |
| Description | Gets/sets the number of repetitions of an incremental movement to be executed. |
| Syntax | Read: MOVEINCCOUNTER Write: MOVEINCCOUNTER <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 65535 |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | MB MBST MOVEINCDIST1 MOVEINCSPEED1 |

MOVEINCDELAY

| | |
|----------------------|--|
| Definition | Move Incremental Delay |
| Type | Variable (R/W) |
| Description | The delay between the preset incremental moves. |
| Syntax | Read: MOVEINCDELAY Write: MOVEINCDELAY <value> |
| Firmware | 1.3.2 |
| Drive status | Enabled Disabled |
| Range | 0 to 100000 |
| Default value | 0 |
| Unit | ms |
| Non-volatile | Yes |
| See also | MB MBST MOVEINCCOUNTER |

MOVEINCDIST1

| | |
|----------------------|---|
| Definition | Move Incremental Distance 1 |
| Type | Variable (R/W) |
| Description | Gets/sets the first incremental move distance for the motion buffer cycle. |
| Syntax | Read: MOVEINCDIST1 Write: MOVEINCDIST1 <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev] If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch] |
| Default value | 0 |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | Yes |
| See also | MB MBST MOVEINCCOUNTER MOVEINCSPEED1 |

MOVEINCDIST2

| | |
|----------------------|---|
| Definition | Move Incremental Distance 2 |
| Type | Variable (R/W) |
| Description | Gets/sets the second incremental move distance for the motion buffer cycle. |
| Syntax | Read: MOVEINCDIST2 Write: MOVEINCDIST2 <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev] If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch] |
| Default value | 0 |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | Yes |
| See also | MB MBST MOVEINCCOUNTER MOVEINCSPEED2 |

MOVEINCSPEED1

| | |
|----------------------|--|
| Definition | Move Incremental Speed 1 |
| Type | Variable (R/W) |
| Description | Gets/sets the first incremental move velocity for the motion buffer cycle. The actual move speed value will not exceed VLIM. |
| Syntax | Read: MOVEINCSPEED1 Write: MOVEINCSPEED1 <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to VLIM |
| Default value | If MOTORTYPE 0 (Rotary): UNITSROTVEL 0 = 0.167 UNITSROTVEL 1 = 10.000 UNITSROTVEL 2 = 60.000 If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = 5.333 |
| Unit | If MOTORTYPE 0 (Rotary): If UNITSROTVEL 0 = rps If UNITSROTVEL 1 = rpm If UNITSROTVEL 2 = deg/s If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = mm/s |
| Non-volatile | Yes |
| See also | MB MBST MOVEINCCOUNTER MOVEINCDIST1 |


MOVEINCSPEED2

| | |
|----------------------|--|
| Definition | Move Incremental Speed 2 |
| Type | Variable (R/W) |
| Description | Gets/sets the second incremental move velocity for the motion buffer cycle. The actual move speed value will not exceed VLIM. |
| Syntax | Read: MOVEINCSPEED2 Write: MOVEINCSPEED2 <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to VLIM |
| Default value | If MOTORTYPE 0 (Rotary): UNITSROTVEL 0 = 0.167 UNITSROTVEL 1 = 10.000 UNITSROTVEL 2 = 60.000 If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = 5.333 |
| Unit | If MOTORTYPE 0 (Rotary): If UNITSROTVEL 0 = rps If UNITSROTVEL 1 = rpm If UNITSROTVEL 2 = deg/s If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = mm/s |
| Non-volatile | Yes |
| See also | MB MBST MOVEINCCOUNTER MOVEINCDIST2 |

MOVESINE

| | |
|----------------------|---|
| Definition | Move Sine Command |
| Type | Command |
| Description | <p>Executes a sine position profile according to the specified amplitude and frequency settings.</p> <p>Available only in OPMODE 8.</p> <p>If the number of iterations is not specified, the movement is repeated endlessly.</p> <p>The command STOP can be used to terminate the movement.</p> |
| Syntax | MOVESINE <i>{amplitude}</i> <i>{frequency}</i> [<i>repetitions</i>] |
| Firmware | 1.40.0 |
| Drive status | Enabled |
| Range | <i>amplitude</i> : 1 – 2 ³² <i>frequency</i> : 1 – 400 <i>repetitions</i> : 1 – 2 ³² |
| Default value | <i>amplitude</i> : 1000 <i>frequency</i> : 10 <i>repetitions</i> : 1 |
| Unit | <i>amplitude</i> : user position units (rev, deg, count) <i>frequency</i> : Hz <i>repetitions</i> : Not Applicable |
| Non-volatile | No |
| Example | MOVESINE 10000 10 5 |
| See also | |
| CANopen | 202Ch, sub-index 0 |

MOVESMOOTHAVG

| | |
|----------------------|--|
| Definition | Position Command Moving Average Filter |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the moving average filter.</p> <p>The moving average filter can be applied to a position or velocity reference command in order to smooth the command and shape it into an S-curve profile.</p>  |
| Syntax | Read: MOVESMOOTHAVG Write: MOVESMOOTHAVG <value> |
| Firmware | 1.4.4 |
| Drive status | Enabled (motor must be at standstill) Disabled |
| Range | 0.25 to 256 |
| Default value | 4 |
| Unit | ms |
| Non-volatile | Yes |
| See also | MOVESMOOTHMODE |
| CANopen | 2108h , sub-index 0 |

MOVESMOOTHLPFHZ

| | |
|----------------------|--|
| Definition | Position Command Move Low Pass Filter |
| Type | Variable (R/W) |
| Description | Gets/sets the low pass filter for position command move. |
| Syntax | Read: MOVESMOOTHLPFHZ Write: MOVESMOOTHLPFHZ <value> |
| Firmware | 1.2.12 |
| Drive status | Enabled (motor must be at standstill) Disabled |
| Range | 1 to 5000 |
| Default value | 5000 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | ACC DEC MOVEABS MOVEINC |
| CANopen | 202Ch, sub-index 0 |

MOVESMOOTHMODE

| | |
|---------------------|--|
| Definition | Position Command Smoothing Mode |
| Type | Variable (R/W) |
| Description | Defines the method of smoothing for the position command. |
| Note | To apply a smoothing filter to an external reference command, such as P&D or EtherCAT/CANopen, certain bits in MOVESMOOTHSRC must first be set. |
| Syntax | Read: MOVESMOOTHMODE Write: MOVESMOOTHMODE <value> |
| Firmware | 1.3.2 |
| Drive status | Disabled |
| Range | 0 = No smoothing of profile 1 = Low pass filter (LPF) smoothing of profile based on MOVESMOOTHLPFHZ 2 = S-curve smoothing according to MOVESMOOTHAVG |
| Default | 2 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | MOVEABS MOVEINC MOVESMOOTHAVG MOVESMOOTHLPFHZ MOVESMOOTHSRC |
| CANopen | 2109h , sub-index 0 |

MOVESMOOTHSRC

| | |
|----------------------|--|
| Definition | Position Command Smoothing Source |
| Type | Variable (R/W) |
| Description | <p>Defines the position command smoothing source.</p> <p>This is a bit-wise parameter, hence the range 0 to 15.</p> <p>bit 0: smooth on PTP (1=yes, 0=no)</p> <p>bit 1: smooth on gearing</p> <p>bit 2: smooth on fieldbus</p> <p>bit 3: smooth during halt (limit switch, for example) if the halted move is also smoothed.</p> |
| Syntax | <p>Read: MOVESMOOTHSRC</p> <p>Write: MOVESMOOTHSRC <value></p> |
| Firmware | 1.15.xx |
| Drive status | Disabled |
| Range | 0 to 15 |
| Default value | 15 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | MOVESMOOTHAVG MOVESMOOTHLPFHZ MOVESMOOTHMODE |

MPHASE

| | |
|----------------------|---|
| Definition | Commutation Offset |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the resolver/encoder phase relative to the standard commutation table.</p> <p>This variable can be used to compensate for resolver offset and should be set to 0 if there is no resolver offset. Changing MPHASE shifts the internal commutation table without affecting the feedback reading.</p> |
| Syntax | <p>Read: MPHASE</p> <p>Write: MPHASE <value></p> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 to 359 |
| Default value | 0 |
| Unit | Electrical degree |
| Note | If the drive system detects an electronic motor nameplate (such as used in the sensAR magnetic encoder), the value of parameter MPHASE is loaded directly from the encoder memory to the drive RAM at power-up. |
| Non-volatile | Yes |
| See also | PHASEFIND ZERO |
| CANopen | 2043h , sub-index 0 |

MPITCH

| | |
|----------------------|---|
| Definition | Motor Pitch |
| Type | Variable (R/W) |
| Description | Gets/sets linear motor's pitch. When the value of MPITCH is changed, CONFIG is required. |
| Note | Applicable only for drives that support linear servo motors. |
| Syntax | Read: MPITCH Write: MPITCH <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0.000 to 100000.000 |
| Default value | 32.000 |
| Note | If the drive system detects an electronic motor nameplate (such as used in the sensAR magnetic encoder), the value of parameter MPITCH is loaded directly from the encoder memory to the drive RAM at power-up. |
| Unit | mm |
| Non-volatile | Yes |
| See also | MENCRES MMASS MOTORTYPE PFB UNITSLINPOS |
| CANopen | 207Dh , sub-index 0 |

MPOLES

| | |
|----------------------|--|
| Definition | Motor Poles |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the number of motor poles. This variable is used for commutation control and represents the number of individual magnetic poles of the motor (not pole pairs).</p> <p>When MOTORTYPE =2 (linear motor), this variable will be forced to a value of 2.</p> <p>When the value of MPOLES is changed, CONFIG is required.</p> |
| Syntax | <p>Read: MPOLES</p> <p>Write: MPOLES <value></p> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | <p>Drive supporting rotary motor: 2 to 20</p> <p>Drive supporting linear and rotary motors: 2 to 200</p> |
| Default value | 2 |
| Note | If the drive system detects an electronic motor nameplate (such as used in the sensAR magnetic encoder), the value of parameter MPOLES is loaded directly from the encoder memory to the drive RAM at power-up. |
| Unit | poles |
| Non-volatile | Yes |
| See also | ELECTANGLE MECHANGLE PHASEFIND ZERO |
| CANopen | 207Eh, sub-index 0 |

MR

| | |
|----------------------|---|
| Definition | Motor Resistance |
| Type | Variable (R/W) |
| Description | The motor resistance. When the value of MR is changed, CONFIG is required. |
| Syntax | Read: MR Write: MR <value> |
| Firmware | 1.2.12 |
| Drive status | Disabled |
| Range | 0 to 75 |
| Default value | 0.000 |
| Note | If the drive system detects an electronic motor nameplate (such as used in the sensAR magnetic encoder), the value of parameter MR is loaded directly from the encoder memory to the drive RAM at power-up. |
| Unit | Ohm |
| Non-volatile | Yes |
| See also | ML |
| CANopen | 207Fh, sub-index 0 |

MRESPOLES

| | |
|----------------------|--|
| Definition | Motor Resolver Poles |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the number of individual poles in the resolver feedback device. This variable is used for the commutation function, as well as for velocity feedback scaling, and represents the number of individual poles, not pole pairs.</p> <p>When the value of MRESPOLES is changed, CONFIG is required.</p> |
| Syntax | <p>Read: MRESPOLES</p> <p>Write: MRESPOLES <value></p> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 2 to 80 |
| Default value | 2 |
| Unit | poles |
| Non-volatile | Yes |
| See also | FEEDBACKTYPE HWPOS MECHANGLE |
| CANopen | 2080h , sub-index 0 |

MSGPROMPT

| | |
|----------------------|--|
| Definition | Drive Messages and Prompts |
| Type | Variable (R/W) |
| Description | <p>Defines whether drive messages and prompts are enabled or disabled.</p> <p>MSGPROMPT 1 is required for proper operation of the graphic interface software.</p> <p>MSGPROMPT 0 will result in a loss of communication with the graphic interface software. Use with caution.</p> |
| Syntax | <p>Read: MSGPROMPT</p> <p>Write: MSGPROMPT <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | <p>0 = Messages and prompts disabled.</p> <p>1 = Messages and prompts enabled.</p> |
| Default value | 1 |
| Unit | Not applicable |
| Non-volatile | Yes |
| See also | ADDR ECHO |

MSININT

| | |
|----------------------|--|
| Definition | Motor Sine Interpolation |
| Type | Read/Write |
| Description | <p>MSININT is used to define the resolution of the analog signals of sine encoders (SinCos), and sets the interpolation level of the drive. The equivalent number of counts per revolution is calculated from:</p> $2^{\text{MSININT}} \times \text{MENCRES}$ <p>The equivalent number of counts per revolution is limited by:</p> $2^{\text{MSININT}} \times \text{MENCRES} \leq 2^{30}$ <p>When the value of MSININT is changed, CONFIG is required.</p> |
| Syntax | <p>Read: MSININT</p> <p>Write: MSININT <value></p> |
| Firmware | 1.4.4 |
| Drive status | Disabled |
| Range | 2 to 16 |
| Default value | 16 |
| Unit | bits |
| Non-volatile | Yes |
| See also | FEEDBACKTYPE MENCRES MENCTYPE MPITCH |

MSPEED

| | |
|----------------------|---|
| Definition | Motor Maximum Speed |
| Type | Variable (R/W) |
| Description | Gets/sets the maximum velocity of the motor. When the value of MSPEED is changed, CONFIG is required. |
| Syntax | Read: MSPEED Write: MSPEED <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | If MOTORTYPE 0 (Rotary): 0 to 239999.999 If MOTORTYPE 2 (Linear): 0 to 127999.999 |
| Default value | If MOTORTYPE 0 (Rotary): 0 If MOTORTYPE 2 (Linear): 0 |
| Note | If the drive system detects an electronic motor nameplate (such as used in the sensAR magnetic encoder), the value of parameter MSPEED is loaded directly from the encoder memory to the drive RAM at power-up. |
| Unit | If MOTORTYPE 0 (Rotary): rpm If MOTORTYPE 2 (Linear): mm/s |
| Non-volatile | Yes |
| See also | MVANGLF MVANGLH VLIM VMAX |
| CANopen | 2080h , sub-index 0 |

MTANGLC

| | |
|----------------------|--|
| Definition | Torque Commutation Angle Advance at Motor Continuous Current |
| Type | Variable (R/W) |
| Description | Gets/sets the value of the torque-related commutation angle advance at the motor's continuous current rating (MICONTR). This variable helps increase reluctance torque. For surface magnet motors, a typical value is 5. For motors with embedded magnets, a typical value is 8 to 10. |
| Syntax | Read: MTANGLC Write: MTANGLC <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 to 45 |
| Default value | 0 |
| Unit | Electrical degree |
| Non-volatile | Yes |
| See also | MTANGLP MVANGLF MVANGLH |
| CANopen | 2083h , sub-index 0 |

MTANGLP

| | |
|----------------------|--|
| Definition | Torque Commutation Angle Advance at Motor Peak Current |
| Type | Variable (R/W) |
| Description | Gets/sets the value of the torque-related commutation angle advance at the motor's peak current (MIPEAK). This variable helps increase reluctance torque. For surface magnet motors, a typical value is 10. For motors with embedded magnets, a typical value is 23 to 25. |
| Syntax | Read: MTANGLP Write: MTANGLP <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 to 45 |
| Default value | 0 |
| Unit | Electrical degree |
| Non-volatile | Yes |
| See also | MTANGLC MVANGLF MVANGLH |
| CANopen | 2084h , sub-index 0 |

MTPMODE

| | |
|----------------------|--|
| Definition | Electronic Motor Nameplate Mode |
| Type | Variable (R/W) |
| Description | <p>MTPMODE defines whether motor and feedback data is obtained from the feedback device's non-volatile memory, referred to as an electronic motor nameplate (MTP). The electronic motor nameplate enables automatic setup of motor and current loop parameters.</p> <p>The drive is factory-configured without motor parameters. If the drive system detects an electronic motor nameplate (such as used in the sensAR magnetic encoder), certain motor and feedback parameters are loaded directly from the encoder memory to the drive RAM after power-up.</p> <p>If MTPMODE \neq 0, motor and current loop parameters cannot be manipulated by user.</p> |
| Syntax | Read: MTPMODE Write: MTPMODE <value> |
| Firmware | 1.15.xx |
| Drive status | Disabled |
| Range | 0 = Electronic motor nameplate not in use 1 = sensAR encoder 2 = HIPERFACE encoder; only the MPHASE data is read from the feedback device 3 = sensAR and HIPERFACE encoders |
| Default value | 3 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | FEEDBACKTYPE |

MTPST

| | |
|----------------------|---|
| Definition | Electronic Motor Nameplate Status |
| Type | Variable (R) |
| Description | Indicates if and how the electronic motor nameplate (MTP) data is used. |
| Syntax | MTPST |
| Firmware | 1.40.0 |
| Drive status | Enabled Disabled |
| Range | 0 = MTP not in use 1 = MTP in use and read correctly 2 = MTP in use but not read correctly 3 = MTP cannot be read; power cycle or clear faults required 4 = MTP in use; reading in progress |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | MTPMODE |

MTTURNRESET

| | |
|----------------------|--|
| Definition | Multi-turn Encoder Reset |
| Type | Command |
| Description | Resets the position counter of an absolute multi-turn encoder, and clears battery low voltage fault. |
| Syntax | MTTURNRESET |
| Firmware | 1.41.x |
| Drive status | Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | FEEDBACKTYPE MENCTYPE |

MVANGLF

| | |
|----------------------|---|
| Definition | Velocity Commutation Angle Advance at Motor Maximum Speed |
| Type | Variable (R/W) |
| Description | Gets/sets the value of the velocity-related commutation angle advance to be used when the motor is operating at motor maximum speed (MSPEED). Between MSPEED/2 and MSPEED, the angle advance will be linearly interpolated based on MVANGLH and MVANGLF. When the value of MVANGLF is changed, CONFIG is required. |
| Syntax | Read: MVANGLF Write: MVANGLF <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 to 90 |
| Default value | 0 |
| Unit | Electrical degree |
| Non-volatile | Yes |
| See also | MTANGLC MTANGLP MVANGLH |
| CANopen | 2085h, sub-index 0 |

MVANGLH

| | |
|----------------------|--|
| Definition | Velocity Commutation Angle Advance at Motor Maximum Speed/2 |
| Type | Variable (R/W) |
| Description | Gets/sets the value of the velocity-related commutation angle advance to be used when the motor is operating at motor maximum speed/2 (MSPEED/2). Between 0 rpm and MSPEED/2, the angle advance will be linearly interpolated based on MVANGLH . When the value of MVANGLH is changed, CONFIG is required |
| Syntax | Read: MVANGLH Write: MLVANGH <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 to 90 |
| Default value | 0 |
| Unit | Electrical degree |
| Non-volatile | Yes |
| See also | MTANGLC MTANGLP MVANGLF |
| CANopen | 2086h , sub-index 0 |

NLAFFLPFHZ

| | |
|----------------------|---|
| Definition | HD Spring Filter |
| Type | Variable (R/W) |
| Description | <p>Used (with NLPEAFF) to reduce the vibrations induced to the load by abrupt changes in acceleration (jerk), and reduce tracking error; can also be used to minimize overshoot and settling time.</p> <p>NLAFFLPFHZ applies a low pass filter on the acceleration of the command position used to perform the compensation. This acceleration is calculated from the input command position, and may be noisy if the input command position has a relatively low resolution, as for example a pulse train input.</p> <p>Application of the low pass filter NLAFFLPFHZ smooths the calculated acceleration of the command position, and should be used whenever noisy operation is observed while applying the parameter NLPEAFF.</p> <p>Practical value: $NLAFFLPFHZ = 3 \times KNLD$</p> |
| Syntax | <p>Read: NLAFFLPFHZ</p> <p>Write: NLAFFLPFHZ <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 10 to 7000 |
| Default value | 7000 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | NLNOTCHBW NLNOTCHCENTER NLPEAFF POSCONTROLMODE |
| CANopen | 2087h, sub-index 0 |

NLANTIVIBGAIN

| | |
|----------------------|--|
| Definition | HD Anti-Vibration 1 Filter – Gain |
| Type | Variable (R/W) |
| Description | Gets/sets the HD position control loop anti-vibration module 1 filter – gain. |
| Syntax | Read: NLANTIVIBGAIN Write: NLANTIVIBGAIN <value> |
| Firmware | 1.3.2 |
| Drive status | Enabled Disabled |
| Range | 0 to 10000 |
| Default value | 0.000 |
| Unit | (Rad×10 ⁻³)/Nm |
| Non-volatile | Yes |
| See also | NLANTIVIBGAIN2 NLANTIVIBGAIN3 NLANTIVIBHZ NLANTIVIBQ3 NLANTIVIBSHARP |
| CANopen | 200Ch, sub-index 0 |

NLANTIVIBGAIN2

| | |
|----------------------|---|
| Definition | HD Anti-Vibration 2 Filter – Gain |
| Type | Variable (R/W) |
| Description | Gets/sets the HD position control loop anti-vibration module 3 filter – gain |
| Syntax | Read: NLANTIVIBGAIN2 Write: NLANTIVIBGAIN2 <value> |
| Firmware | 1.3.2 |
| Drive status | Enabled Disabled |
| Range | 0 to 99 |
| Default value | 0.000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | NLANTIVIBGAIN NLANTIVIBGAIN3 NLANTIVIBHZ NLANTIVIBQ3 NLANTIVIBSHARP |
| CANopen | 200Ah , sub-index 0 |

NLANTIVIBGAIN3

| | |
|----------------------|---|
| Definition | HD Anti-Vibration 3 Filter – Gain |
| Type | Variable (R/W) |
| Description | Gets/sets the HD position control loop anti-vibration module 3 filter – gain |
| Syntax | Read: NLANTIVIBGAIN3 Write: NLANTIVIBGAIN3 <value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 0 to 6 |
| Default value | 0.000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | NLANTIVIBGAIN NLANTIVIBGAIN2 NLANTIVIBHZ NLANTIVIBQ3 NLANTIVIBSHARP |

NLANTIVIBHZ

| | |
|----------------------|--|
| Definition | HD Anti-Vibration 1 Filter – Center Frequency |
| Type | Variable (R/W) |
| Description | Gets/sets the HD position control loop anti-vibration module 1 filter – center frequency. |
| Syntax | Read: NLANTIVIBHZ Write: NLANTIVIBHZ <value> |
| Firmware | 1.3.2 |
| Drive status | Enabled Disabled |
| Range | 5 to 400 |
| Default value | 400.000 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | NLANTIVIBGAIN NLANTIVIBGAIN2 NLANTIVIBGAIN3 NLANTIVIBQ3 NLANTIVIBSHARP |
| CANopen | 2096h, sub-index 0 |

NLANTIVIBHZ2

| | |
|----------------------|---|
| Definition | HD Anti-Vibration 2 Filter – Center Frequency |
| Type | Variable (R/W) |
| Description | Gets/sets the HD position control loop anti-vibration module 2 filter – center frequency. |
| Syntax | Read: NLANTIVIBHZ2 Write: NLANTIVIBHZ2 <value> |
| Firmware | 1.3.2 |
| Drive status | Enabled Disabled |
| Range | 5 to 800 |
| Default value | 400.000 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | NLANTIVIBGAIN NLANTIVIBHZ NLANTIVIBHZ3 NLANTIVIBQ3 NLANTIVIBSHARP |
| CANopen | 2097h, sub-index 0 |

NLANTIVIBHZ3

| | |
|----------------------|---|
| Definition | HD Anti-Vibration 3 Filter – Center Frequency |
| Type | Variable (R/W) |
| Description | Gets/sets the HD position control loop anti-vibration module 3 filter – center frequency. |
| Syntax | Read: NLANTIVIBHZ3 Write: NLANTIVIBHZ3 <value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 5 to 800 |
| Default value | 400.000 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | NLANTIVIBGAIN NLANTIVIBHZ NLANTIVIBHZ2 NLANTIVIBQ3 NLANTIVIBSHARP |

NLANTIVIBLMJR

| | |
|----------------------|---|
| Definition | HD Anti-Vibration – Load to Motor Inertia Ratio |
| Type | Variable (R/W) |
| Description | Gets/sets the HD position control loop anti-vibration filter – load to motor inertia ratio. |
| Syntax | Read: NLANTIVIBLMJR Write: NLANTIVIBLMJR <value> |
| Firmware | 1.3.2 |
| Drive status | Enabled Disabled |
| Range | 0 to 600 |
| Default value | 0.000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | — |
| CANopen | 210Bh, sub-index 0 |

NLANTIVIBN

| | |
|----------------------|--|
| Definition | HD Anti-Vibration Filter - Divider |
| Type | Variable (R/W) |
| Description | Gets/sets the HD position control loop anti-vibration filter – divider |
| Syntax | Read: NLANTIVIBN Write: NLANTIVIBN <value> |
| Firmware | 1.3.2 |
| Drive status | Enabled Disabled |
| Range | 0.01 to 100 |
| Default value | 2.000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | — |
| CANopen | 210Ch, sub-index 0 |

NLANTIVIBQ3

| | |
|----------------------|--|
| Definition | HD Anti-Vibration Filter - Factor |
| Type | Variable (R/W) |
| Description | Gets/sets the HD position control loop anti-vibration filter – factor |
| Syntax | Read: NLANTIVIBQ3 Write: NLANTIVIBQ3 <value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 1 to 10 |
| Default value | 1.000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | NLANTIVIBGAIN NLANTIVIBHZ NLANTIVIBSHARP NLANTIVIBSHARP2 NLANTIVIBSHARP3 |

NLANTIVIBSHARP

| | |
|----------------------|---|
| Definition | HD Anti-Vibration 1 Filter – Sharpness |
| Type | Variable (R/W) |
| Description | Gets/sets the HD position control loop anti-vibration module 1 filter – sharpness. |
| Syntax | Read: NLANTIVIBSHARP Write: NLANTIVIBSHARP <value> |
| Firmware | 1.3.2 |
| Drive status | Enabled Disabled |
| Range | 0.01 to 10 |
| Default value | 0.500 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | NLANTIVIBGAIN NLANTIVIBHZ NLANTIVIBQ3 NLANTIVIBSHARP2 NLANTIVIBSHARP3 |
| CANopen | 200Bh, sub-index 0 |

NLANTIVIBSHARP2

| | |
|----------------------|--|
| Definition | HD Anti-Vibration 2 Filter – Sharpness |
| Type | Variable (R/W) |
| Description | Gets/sets the HD position control loop anti-vibration module 2 filter – sharpness. |
| Syntax | Read: NLANTIVIBSHARP2 Write: NLANTIVIBSHARP2 <value> |
| Firmware | 1.3.2 |
| Drive status | Enabled Disabled |
| Range | 0.01 to 10 |
| Default value | 0.500 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | NLANTIVIBGAIN NLANTIVIBHZ NLANTIVIBQ3 NLANTIVIBSHARP NLANTIVIBSHARP3 |
| CANopen | 212Dh , sub-index 0 |

NLANTIVIBSHARP3

| | |
|----------------------|--|
| Definition | HD Anti-Vibration 3 Filter – Sharpness |
| Type | Variable (R/W) |
| Description | Gets/sets the HD position control loop anti-vibration module 3 filter – sharpness. |
| Syntax | Read: NLANTIVIBSHARP3 Write: NLANTIVIBSHARP3 <value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 0.01 to 10 |
| Default value | 0.200 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | NLANTIVIBGAIN NLANTIVIBHZ NLANTIVIBQ3 NLANTIVIBSHARP NLANTIVIBSHARP2 |

NLFILTDAMPING

| | |
|----------------------|--|
| Definition | HD Current Filter Damping |
| Type | Variable (R/W) |
| Description | NLFILTDAMPING is used in the HD control loop to maintain the bandwidth of the filter up to the cutoff frequency. A practical value = $30 < \text{NLFILTDAMPING} < 95$ Ideally, NLFILTDAMPING = maximum value |
| Syntax | Read: NLFILTDAMPING Write: <i><value></i> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 100 |
| Default value | 30 |
| Unit | % |
| Non-volatile | Yes |
| See also | NLFILTT1 POSCONTROLMODE |
| CANopen | 2060h, sub-index 0 |

NLFILTT1

| | |
|----------------------|---|
| Definition | HD Current Filter Low Pass Filter Rise Time |
| Type | Variable (R/W) |
| Description | NLFILTT1 is used in the HD control loop to define the inverse of the cutoff frequency. Ideally, NLFILTT1 = minimum value |
| Syntax | Read: NLFILTT1 Write: NLFILTT1<value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 30 |
| Default value | 3.000 |
| Unit | ms |
| Non-volatile | Yes |
| See also | NLFILTDAMPING POSCONTROLMODE |
| CANopen | 210Dh, sub-index 0 |

NLMAXGAIN

| | |
|----------------------|---|
| Definition | HD Maximum Adaptive Gain |
| Type | Variable (R/W) |
| Description | <p>Autotuning automatically sets the variable gain according to the encoder resolution. This is the recommended value.</p> <p>Low resolution: wide range (Example: 13 bit: NLMAXGAIN=2.7)</p> <p>High resolution: narrow range (Example: 22 bit: NLMAXGAIN=1.6)</p> <p>Other resolutions can be extrapolated accordingly.</p> |
| Syntax | <p>Read: NLMAXGAIN</p> <p>Write: NLMAXGAIN <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 1 to 5 |
| Default value | 1.600 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | KNLP KNLUSERGAIN POSCONTROLMODE |
| CANopen | 208Ah , sub-index 0 |

NLNOTCH2BW

| | |
|----------------------|--|
| Definition | HD Current Filter – Second Notch Filter Bandwidth |
| Type | Variable (R/W) |
| Description | NLNOTCH2BW is used in the HD control loop to define the width (sharpness) of an additional high frequency that is causing system vibrations. If not used, set NLNOTCHBW=0 |
| Syntax | Read: NLNOTCH2BW Write: NLNOTCH2BW <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 500 |
| Default value | 0 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | NLNOTCH2CENTER POSCONTROLMODE |
| CANopen | 208Bh , sub-index 0 |

NLNOTCH2CENTER

| | |
|----------------------|--|
| Definition | HD Current Filter – Second Notch Filter Center |
| Type | Variable (R/W) |
| Description | NLNOTCH2CENTER is used in the HD control loop to block an additional high frequency that is causing system vibrations. |
| Syntax | Read: NLNOTCH2CENTER Write: NLNOTCH2CENTER <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 5 to 1800 |
| Default value | 100 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | NLNOTCH2BW POSCONTROLMODE |
| CANopen | 208Ch , sub-index 0 |

NLNOTCHBW

| | |
|----------------------|---|
| Definition | HD Current Filter – Notch Filter Bandwidth |
| Type | Variable (R/W) |
| Description | NLNOTCHBW is used in the HD control loop to define the width (sharpness) of a high frequency that is causing system vibrations. If not used, set NLNOTCHBW=0 |
| Syntax | Read: NLNOTCHBW Write: NLNOTCHBW <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 500 |
| Default value | 0 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | NLNOTCH2CENTER POSCONTROLMODE |
| CANopen | 2062h , sub-index 0 |

NLNOTCHCENTER

| | |
|----------------------|---|
| Definition | HD Current Filter – Notch Filter Center |
| Type | Variable (R/W) |
| Description | NLNOTCHCENTER is used in the HD control loop to block a high frequency that is causing system vibrations. |
| Syntax | Read: NLNOTCHCENTER Write: NLNOTCHCENTER <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 5 to 1800 |
| Default value | 100 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | NLNOTCH2BW POSCONTROLMODE |
| CANopen | 2061h , sub-index 0 |

NLPEAFF

| | |
|----------------------|---|
| Definition | HD Flexibility Compensation |
| Type | Variable (R/W) |
| Description | <p>Used by the parameter NLPEDFFRATIO.</p> <p>Used (with NLAFFLPHZ) to reduce the vibrations induced to the load by abrupt changes in acceleration (jerk), and reduce tracking error; can also be used to minimize overshoot and settling time.</p> <p>NLPEAFF is set according to the rigidity of the system. Rigid systems require a high value. Systems with high load inertia and flexible couplings require lower values; the normal range is 400 to 30 Hz. If not used, set to 5000 Hz.</p> |
| Syntax | <p>Read: NLPEAFF</p> <p>Write: NLPEAFF <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 5000 |
| Default value | 5000.00 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | NLPEDFFRATIO NLAFFLPHZ POSCONTROLMODE |
| CANopen | 208Fh, sub-index 0 |

NLPEDFFRATIO

| | | | | | | | | | | | |
|----------------------|---|---|--|-------------|---|---|---|----------------|---|---|--|
| Definition | HD Acceleration/Deceleration Spring Filter Gain | | | | | | | | | | |
| Type | Variable (R/W) | | | | | | | | | | |
| Description | <p>Determines the acceleration/deceleration spring filter gain according to the value of NLPEDFFRATIO=$\langle n \rangle$, as follows:</p> <table> <tr> <td>0</td><td>NLPEAFF used during acceleration. NLPEAFF not used during deceleration.</td></tr> <tr> <td>$0 < n < 1$</td><td>NLPEAFF used during acceleration. $n \times$ NLPEAFF used during deceleration.</td></tr> <tr> <td>1</td><td>NLPEAFF used during both acceleration and deceleration.</td></tr> <tr> <td>$1 < n \leq 2$</td><td>NLPEAFF used during deceleration. $(2-n) \times$ NLPEAFF used during acceleration.</td></tr> <tr> <td>2</td><td>NLPEAFF used during deceleration. NLPEAFF not used during acceleration.</td></tr> </table> | 0 | NLPEAFF used during acceleration. NLPEAFF not used during deceleration. | $0 < n < 1$ | NLPEAFF used during acceleration. $n \times$ NLPEAFF used during deceleration. | 1 | NLPEAFF used during both acceleration and deceleration. | $1 < n \leq 2$ | NLPEAFF used during deceleration. $(2-n) \times$ NLPEAFF used during acceleration. | 2 | NLPEAFF used during deceleration. NLPEAFF not used during acceleration. |
| 0 | NLPEAFF used during acceleration. NLPEAFF not used during deceleration. | | | | | | | | | | |
| $0 < n < 1$ | NLPEAFF used during acceleration. $n \times$ NLPEAFF used during deceleration. | | | | | | | | | | |
| 1 | NLPEAFF used during both acceleration and deceleration. | | | | | | | | | | |
| $1 < n \leq 2$ | NLPEAFF used during deceleration. $(2-n) \times$ NLPEAFF used during acceleration. | | | | | | | | | | |
| 2 | NLPEAFF used during deceleration. NLPEAFF not used during acceleration. | | | | | | | | | | |
| Syntax | Read: NLPEDFFRATIO Write: NLPEDFFRATIO $\langle value \rangle$ | | | | | | | | | | |
| Firmware | 1.2.12 | | | | | | | | | | |
| Drive status | Enabled Disabled | | | | | | | | | | |
| Range | 0 to 2 | | | | | | | | | | |
| Default value | 1 | | | | | | | | | | |
| Unit | Not Applicable | | | | | | | | | | |
| Non-volatile | Yes | | | | | | | | | | |
| See also | ACC NLPEAFF NLPEDFFRATIO | | | | | | | | | | |
| CANopen | 2091h, sub-index 0 | | | | | | | | | | |

NLVELLIM

| | |
|----------------------|---|
| Definition | HD Velocity Control Standstill Tolerance |
| Type | Variable (R/W) |
| Description | <p>Applicable for use only in Analog Velocity operation mode (OPMODE 1) with the HD velocity control (VELCONTROLMODE 5, 6).</p> <p>Gets/sets a threshold value for the input command voltage. When the input command voltage drops below NLVELLIM, the integral and integral-derivative gains of the controller are reduced by half, hence improving standstill stability. Ideally, NLVELLIM should be set slightly above the analog input "0" noise level.</p> |
| Syntax | Read: NLVELLIM Write: NLVELLIM <value> |
| Firmware | 1.4.4 |
| Drive status | Disabled |
| Range | -3.815 to 3.815 |
| Default value | 0.000 |
| Unit | V |
| Non-volatile | Yes |
| See also | ANIN1VSCALE OPMODE VELCONTROLMODE |

OPMODE

| | |
|----------------------|--|
| Definition | Drive Operation Mode |
| Type | Variable (R/W) |
| Description | Gets/sets a value that defines the drive operation mode. |
| Syntax | Read: OPMODE Write: OPMODE <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 = Velocity control, using serial commands 1 = Velocity control, using analog input 2 = Current control, using serial commands 3 = Current control, using analog input 4 = Position control, using gearing input 8 = Position control, using serial commands |
| Default value | 2: If a drive-motor parameter bundle is not detected 8: If a drive-motor parameter bundle is detected |
| Note | Certain parameters may be stored in a drive-motor parameter bundle on an electronic motor nameplate, such as used in the sensAR magnetic encoder. When detected, the value of these parameters are loaded directly from the encoder memory to the drive RAM at power-up. |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | ANIN2MODE COMMODE GEARMODE POSCONTROLMODE VELCONTROLMODE |

OPMODESWITCH

| | |
|----------------------|--|
| Definition | Operation Mode Change While Drive Enabled |
| Type | Variable (R/W) |
| Description | <p>The drive operation mode can be changed while the drive is enabled. The parameter INMODE <i><input#></i> 32 is used to activate this functionality.</p> <p>OPMODESWITCH defines whether the switch to another operation mode occurs immediately (on-the-fly) or whether a stop occurs (in standstill) prior to the switch.</p> <p>Standstill mode (OPMODESWITCH=0)</p> <p>In this mode, the operation mode is switched as follows:</p> <ol style="list-style-type: none"> 1. The drive receives OPMODE change request. 2. The drive initiates HOLD. 3. The drive waits for a standstill condition (with a timeout of 10 second). 4. After reaching standstill or after the timeout, the drive changes the mode of operation; <p>If the change in operation mode is defined to occur after a stop, it is important to define at the speed at which the motor is considered at standstill.</p> <p>Adjust parameters PEINPOS and PEINPOSTIME to achieve a standstill state; for example: PEINPOS=0.025[rev] and PEINPOSTIME=50 [ms]. A standstill condition will be generated if the motor does not move more than 0.025 rev within 50 ms (that is, $V=0.025[\text{rev}]/50[\text{ms}] = 0.5 [\text{rps}] = 30 [\text{rpm}]$).</p> <p>On-the-fly mode (OPMODESWITCH 1)</p> <p>In this mode, the drive performs the actions needed to continue executing the currently pending motion, such as applying the actual velocity as a command velocity when switching to Velocity operation mode.</p> <p>Note that the motor continues moving according to the actual torque/speed at the time the operation mode switch until a new command values arrives in the drive.</p> |
| Syntax | Read: OPMODESWITCH Write: <i><value></i> |
| Firmware | 1.40.0 |
| Drive status | Enabled Disabled |
| Range | 0 = Mode change at standstill 1 = Mode change on-the-fly |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |

| | |
|-----------------|---|
| See also | IN32OPMODES IN32SWITCH INMODE OPMODE PEINPOS PEINPOSTIME |
| CANopen | |

OUT

| | |
|----------------------|--|
| Definition | Output Status |
| Type | Variable (R); (R/W in OUTMODE 0) |
| Description | Gets/sets the state of a digital output. |
| Syntax | Read: OUT <output#> Write: OUT <output#> <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | <i>output#</i> = 1 to 7 <i>value</i> : 0 = Output off 1 = Output on |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | No |
| Exampled | -->out 1 0 -->out 1 1 -->out 1 1 --> |
| See also | OUTINV OUTMODE OUTPUTS |
| CANopen | 60FEh, sub-index 1 |

OUTBRAKE

| | |
|----------------------|--|
| Definition | Manual Brake by Output |
| Type | Variable (R/W) |
| Description | Gets/sets the state of the dedicated output that causes the motor brake to engage. Requires OUTBRAKEMODE 0. |
| Note | Applicable only for CDHD 400/480 VAC models with Brake interface (P4). |
| Syntax | Read: OUTBRAKE Write: OUTBRAKE <value> |
| Firmware | 1.41.0 |
| Drive status | Enabled Disabled |
| Range | 0 = Output off disengages the brake (normal polarity) 1 = Output on engages the brake (normal polarity) |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | OUTBRAKEINV OUTBRAKEMODE OUTMODE |
| CANopen | |

OUTBRAKEINV

| | |
|----------------------|---|
| Definition | Manual Brake by Output Inverse |
| Type | Variable (R/W) |
| Description | Inverts the polarity of the dedicated output that controls the motor brake. |
| Note | Applicable only for CDHD 400/480 VAC models with Brake interface (P4). |
| Syntax | Read: OUTBRAKEINV Write: OUTBRAKEINV <value> |
| Firmware | 1.41.0 |
| Drive status | Enabled Disabled |
| Range | 0 = Normal polarity 1 = Inverts output polarity |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | OUTBRAKE OUTBRAKEMODE |
| CANopen | |

OUTBRAKEMODE

| | |
|----------------------|--|
| Definition | Manual Brake by Output Mode |
| Type | Variable (R/W) |
| Description | <p>Defines whether the motor brake is operated automatically by the drive or manually by the user.</p> <p>It may be necessary to control the motor brake manually in certain instances, such as during replacement of a motor.</p> |
| Note | Applicable only for CDHD 400/480 VAC models with Brake interface (P4). |
| Syntax | Read: OUTBRAKEMODE Write: OUTBRAKEMODE <value> |
| Firmware | 1.41.0 |
| Drive status | Enabled Disabled |
| Range | 0 = Manual control of motor brake 1 = Normal brake operation; motor brake disengaged when drive enabled; motor brake engaged when drive disabled. |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | OUTBRAKE OUTBRAKEINV |
| CANopen | |

OUTFLTLVL

| | |
|----------------------|---|
| Definition | Force Digital Output State on Fault |
| Type | Variable (R/W) |
| Description | <p>Used to force digital outputs to a certain state when the drive is disabled due to a fault.</p> <p>This command can be used to override the digital output mode during a fault condition. It also overrides a potential inversion setting by the user (see also OUTINV).</p> <p>This command is considered bitwise, in which 2 bits define the behavior of a given output. Bit 0 and 1 define the behavior of output 1, bit 2 and 3 define the behavior of output 2, and so on.</p> <p>Bit 0: Defines the state of digital output 1 during a fault; that is, bit 1 is true: 0 = Low level 1 = High level</p> <p>Bit 1: If true, digital output 1 is set to the state defined in bit 0. If false, output 1 is set according to the defined output mode.</p> <p>Bit 2: Defines the state of digital output 2 during a fault; that is, bit 3 is true: 0 = Low level 1 = High level</p> <p>Bit 3: If true, digital output 2 is set to the state defined in bit 0. If false, output 2 is set according to the defined output mode</p> <p>For example: A fault has occurred and the drive is disabled. Digital outputs 1 and 3 are 0. Digital outputs 5 and 6 are 1. The remaining digital outputs function according to their dedicated output modes.</p> <p>Setting: 0b00 11 11 00 10 00 10 = 0xF22 = 3874</p> |
| Syntax | Read: OUTFLTLVL Write: OUTFLTLVL <value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 0 to 4294967295 |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| Example | <pre>-->OUTFLTLVL 3847 --> OUTFLTLVL 3874 --></pre> |

| | |
|-----------------|---|
| See also | OUT OUTMODE OUTPUTS |
| CANopen | 2158h, sub-index 0 |

OUTILVL1

| | |
|----------------------|--|
| Definition | Current Level 1 for Digital Output Definition |
| Type | Variable (R/W) |
| Description | Gets/sets the first current level used for a condition that controls a digital output. |
| Syntax | Read: OUTILVL1 Write: OUTILVL1<value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 150 |
| Default value | 0.000 |
| Unit | A |
| Non-volatile | Yes |
| See also | OUTILVL2 OUTINV OUTMODE OUTPUTS |
| CANopen | 2099h , sub-index 0 |

OUTILVL2

| | |
|----------------------|--|
| Definition | Current Level 2 for Digital Output Definition |
| Type | Variable (R/W) |
| Description | Gets/sets the second current level used for a condition that controls a digital output. |
| Syntax | Read: OUTILVL2 Write: OUTILVL2<value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 150 |
| Default value | 0.000 |
| Unit | A |
| Non-volatile | Yes |
| See also | OUTILVL1 OUTINV OUTMODE OUTPUTS |
| CANopen | 209Ah , sub-index 0 |

OUTINV

| | |
|----------------------|--|
| Definition | Output Inversion |
| Type | Variable (R/W) |
| Description | Gets/sets the inversion of each of the digital outputs. |
| Syntax | Read: OUTINV <output#> Write: OUTINV <output#> <invert> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | <i>output#</i> = 1 to 7 <i>invert</i> : 0 = Output not inverted 1 = Output inverted |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| Example | -->outinv 3 0 -->outinv 3 1 -->outinv 3 1 |
| See also | OUT OUTMODE OUTPUTS |
| CANopen | 209Bh, sub-index 1 |

OUTMODE

| | |
|---------------------|---|
| Definition | Output Mode |
| Type | Variable (R/W) |
| Description | Gets/sets a value that defines the condition which will activate the specified digital output. |
| Syntax | Read: OUTMODE <output#> Write: OUTMODE <output#> <condition> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | <p><i>output#</i> = 1 to 7</p> <p><i>condition</i>:</p> <ul style="list-style-type: none"> 0 = Idle 1 = Active (enabled) 2 = Brake release signal 3 = Alarm for any fault 4 = In position indication matching INPOS 5 = Stopped indication (matching STOPPED=2) 6 = Foldback indication (motor or drive) (fault or FOLD) 7 = Average current exceeds OUTILVL1 8 = Average current is above OUTILVL1 and below OUTILVL2 9 = Velocity exceeds OUTVLVL1. Output will be activated when velocity exceeds the level set by OUTVLVL1. 10 = Velocity is above OUTVLVL1 and below OUTVLVL2. Output will be activated when velocity is above the level set by OUTVLVL1 and below the level set by OUTVLVL2. 11 = Position (PFB) is above OUTPLVL1. Output will be activated when position exceeds the level set by OUTPLVL1. 12 = Position (PFB) is above OUTPLVL1 and below OUTPLVL2. Output will be activated when position is above the level set by OUTPLVL1 and below the level set by OUTPLVL2. 13 = Encoder battery low voltage fault 14 = Warning on 15 = Faults or disabled 16 = Encoder battery low voltage warning 17 = Phase find succeeded 18 = Over-current fault exists 19 = Over-voltage fault exists 20 = Under-voltage fault exists 21 = Phase find required 22 = Alarm for any fault except phase find failure 23 = Homing complete |

| | |
|----------------------|---|
| | <p>24 = Encoder simulation index*</p> <p>25 = Zero position after homing</p> <p>Modes 9, 10, 11 and 12 accept negative values and operate accordingly; that is, they are direction-sensitive.</p> |
| Note | <p>OUTMODE 24 limitations:</p> <p>CDHD AP, AF, EC models: Supported for fast outputs 3 and 6 only. Propagation delay is 1 μs</p> <p>CDHD EB model: Supported for fast outputs 3 and 6 only. Propagation delay is 1 μs</p> <p>DDHD: Supported for all standard outputs. Propagation delay is 1 ms.</p> |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | <p>OUT</p> <p>OUTINV</p> <p>OUTPUTS</p> |
| CANopen | 209Ch, sub-index 1 |

OUTPLVL1

| | |
|----------------------|---|
| Definition | Position Level 1 for Digital Output Definition |
| Type | Variable (R/W) |
| Description | Gets/sets the first position level used for a condition that controls a digital output. |
| Syntax | Read: OUTPLVL1 Write: OUTPLVL1 <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev] If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch] |
| Default value | 0 |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | Yes |
| See also | OUTINV OUTMODE OUTPLVL2 OUTPUTS |
| CANopen | 209Dh , sub-index 0 |

OUTPLVL2

| | |
|----------------------|---|
| Definition | Position Level 2 for Digital Output Definition |
| Type | Variable (R/W) |
| Description | Gets/sets the second position level used for a condition that controls a digital output. |
| Syntax | Read: OUTPLVL2 Write: OUTPLVL2 <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev] If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch] |
| Default value | 0 |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | Yes |
| See also | OUTINV OUTMODE OUTPLVL1 OUTPUTS |
| CANopen | 209Eh , sub-index 0 |

OUTPUTS

| | |
|----------------------|---|
| Definition | Outputs Status |
| Type | Variable (R) |
| Description | Indicates the state of all digital outputs. A header lines identifies each of the outputs. |
| Syntax | OUTPUTS |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Output off 1 = Output on X = Not configured (CDHD 200V) |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| Example | -->OUTPUTS 1 2 3 4 5 6 7 0 0 0 0 0 0 X |
| See also | OUT OUTINV OUTMODE |

OUTVLVL1

| | |
|----------------------|--|
| Definition | Velocity Level 1 for Digital Output Definition |
| Type | Variable (R/W) |
| Description | Gets/sets the first velocity level used for a condition that controls a digital output. |
| Syntax | Read: OUTVLVL1 Write: OUTVLVL1<value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | ±192000 [rpm] |
| Default value | 0 |
| Unit | If MOTORTYPE 0 (Rotary): If UNITSROTVEL 0 = rps If UNITSROTVEL 1 = rpm If UNITSROTVEL 2 = deg/s If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = mm/s |
| Non-volatile | Yes |
| See also | OUTINV OUTMODE OUTPUTS OUTVLVL2 |
| CANopen | 209Fh, sub-index 0 |

OUTVLVL2

| | |
|----------------------|--|
| Definition | Velocity Level 2 for Digital Output Definition |
| Type | Variable (R/W) |
| Description | Gets/sets the second velocity level used for a condition that controls a digital output. |
| Syntax | Read: OUTVLVL2 Write: OUTVLVL2<value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | ±192000 [rpm] |
| Default value | 0 |
| Unit | If MOTORTYPE 0 (Rotary): If UNITSROTVEL 0 = rps If UNITSROTVEL 1 = rpm If UNITSROTVEL 2 = deg/s If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = mm/s |
| Non-volatile | Yes |
| See also | OUTINV OUTMODE OUTPUTS OUTVLVL1 |
| CANopen | 20A0h , sub-index 0 |

OVTHRESH

| | |
|----------------------|---|
| Definition | Over-Voltage Threshold |
| Type | Variable (R) |
| Description | Indicates the threshold level for bus over-voltage detection. |
| Syntax | OVTHRESH |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | V |
| Non-volatile | Yes |
| See also | UVTHRESH VBUS VBUSREADOUT |
| CANopen | 20A1h , sub-index 0 |

PASSWORD

| | |
|----------------------|--|
| Definition | Password |
| Type | Command |
| Description | Sets the privilege level of the allowable commands. There are two levels of protection. "factory" – allows all drive commands to be used. "master" – allows certain additional commands to be used. Issue of incorrect password resumes password protection. |
| Syntax | PASSWORD { <i>password</i> } |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | VER |

PATHACC

| | |
|----------------------|---|
| Definition | Path Acceleration Rate |
| Type | Variable (R/W) |
| Description | Gets/sets the acceleration value for path execution. |
| Syntax | Read: PATHACC <path#> Write: PATHACC <path#> <value> |
| Firmware | 1.4.4 |
| Drive status | Enable Disable |
| Range | Path#: 0 - 31 Value: If MOTORTYPE 0 (Rotary): UNITSROTACC 0 = 0.004 to 16666.666 UNITSROTACC 1 = 0.23 to 1000000 UNITSROTACC 2 = 1.38 to 6000000 If MOTORTYPE 2 (Linear): UNITSLINACC 1 = 0.12 to 533333.333 |
| Default value | 600 [rpm/s] |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTACC 0 = rps/s UNITSROTACC 1 = rpm/s UNITSROTACC 2 = deg/s ² If MOTORTYPE 2 (Linear): UNITSLINACC 1 = mm/s ² |
| Non-volatile | Yes |
| Example | --> PATHACC 4 600.000 [rpm/s] --> PATHACC 4 700 --> PATHACC 4 700.000 [rpm/s] |
| See also | PATHCTRL PATHDEC PATHDELAY PATHPOS PATHSPEED |

PATHCTRL

| Definition | Path Control | | | | | | | | | | |
|---------------------------|---|------------------|--------------|----------|---------|------------------------|-----------|-------------|------------|---------------------------|------------|
| Type | Variable (R/W) | | | | | | | | | | |
| Description | <p>Gets/sets the behavior for executing the path.</p> <p>A path is a user-defined move command saved in drive memory, which is triggered by a digital input signal from an external device.</p> <p>Path control is defined by a word of 8 bits in which bit 4 sets the blending option and bit 7 sets the move type.</p> <p>Recommended values:</p> <p>Bit 4: Blending (insertion):</p> <ul style="list-style-type: none"> 0 = Off (default = sequential execution) 1 = On <p>Bit 7: Move type:</p> <ul style="list-style-type: none"> 0 = Absolute (default) 1 = Incremental <p>Path control options:</p> <table> <thead> <tr> <th><u>Move Type</u></th><th><u>Value</u></th></tr> </thead> <tbody> <tr> <td>Absolute</td><td>0x0 (0)</td></tr> <tr> <td>Absolute with blending</td><td>0x10 (16)</td></tr> <tr> <td>Incremental</td><td>0x80 (128)</td></tr> <tr> <td>Incremental with blending</td><td>0x90 (144)</td></tr> </tbody> </table> <p>Use INMODE to execute the path.</p> <p>Allocate up to 5 digital inputs as path bits (INMODE 20 – 24) and one digital input as path trigger (INMODE 25).</p> <p>Configure the path bit inputs according to the path number.</p> <p>To execute the path, switch the state of the path trigger input from off to on.</p> | <u>Move Type</u> | <u>Value</u> | Absolute | 0x0 (0) | Absolute with blending | 0x10 (16) | Incremental | 0x80 (128) | Incremental with blending | 0x90 (144) |
| <u>Move Type</u> | <u>Value</u> | | | | | | | | | | |
| Absolute | 0x0 (0) | | | | | | | | | | |
| Absolute with blending | 0x10 (16) | | | | | | | | | | |
| Incremental | 0x80 (128) | | | | | | | | | | |
| Incremental with blending | 0x90 (144) | | | | | | | | | | |
| Syntax | <p>Read: PATHCTRL <path#></p> <p>Write: PATHCTRL <path#> <value></p> | | | | | | | | | | |
| Firmware | 1.4.4 | | | | | | | | | | |
| Drive status | Enable Disable | | | | | | | | | | |
| Range | <p>Path#: 0 to 31</p> <p>Value: Not Applicable</p> | | | | | | | | | | |
| Default value | 0 | | | | | | | | | | |
| Unit | See Description, above. | | | | | | | | | | |
| Non-volatile | Yes | | | | | | | | | | |

| | |
|-----------------|---|
| Example | Define path number 4 as an incremental move with blending: -->PATHCTRL 4 0 -->PATHCTRL 4 h90 -->PATHCTRL 4 144 |
| See also | INMODE (20 – 25) PATHACC PATHDEC PATHDELAY PATHPOS PATHSPEED |

PATHDEC

| | |
|----------------------|--|
| Definition | Path Deceleration Rate |
| Type | Variable (R/W) |
| Description | Gets/sets the deceleration value for path execution. |
| Syntax | Read: PATHDEC <path#> Write: PATHDEC <path#> <value> |
| Firmware | 1.4.4 |
| Drive status | Enable Disable |
| Range | <i>Path#</i> : 0 to 31 <i>Value</i> : If MOTORTYPE 0 (Rotary): UNITSROTACC 0 = 0.004 to 16666.666 UNITSROTACC 1 = 0.23 to 1000000 UNITSROTACC 2 = 1.38 to 6000000 If MOTORTYPE 2 (Linear): UNITSLINACC 1 = 0.12 to 533333.333 |
| Default value | 600 [rpm/s] |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTACC 0 = rps/s UNITSROTACC 1 = rpm/s UNITSROTACC 2 = deg/s ² If MOTORTYPE 2 (Linear): UNITSLINACC 1 = mm/s ² |
| Non-volatile | Yes |
| Example | <pre>-->PATHDEC 4 600.000 [rpm/s] -->PATHDEC 4 500 -->PATHDEC 4 500.000 [rpm/s]</pre> |
| See also | PATHACC PATHCTRL PATHDELAY PATHPOS PATHSPEED |

PATHDELAY

| | |
|----------------------|---|
| Definition | Path Delay |
| Type | Variable (R/W) |
| Description | Gets/sets a delay value for path execution. If execution is sequential (and not blended), the delay value is the time that will elapse, in milliseconds, between the end of the currently executed path and the start of the next path to be executed. |
| Syntax | Read: PATHDELAY <path#> Write: PATHDELAY <path#> <value> |
| Firmware | 1.4.4 |
| Drive status | Enable Disable |
| Range | Path#: 0 to 31 Value: 0 = 32767 |
| Default value | 0 |
| Unit | ms |
| Non-volatile | Yes |
| Example | -->PATHDELAY 4 0 [ms] -->PATHDELAY 4 1500 -->PATHDELAY 4 1500 [ms] |
| See also | PATHACC PATHCTRL PATHDEC PATHPOS PATHSPEED |

PATHPOS

| | |
|----------------------|--|
| Definition | Path Position |
| Type | Variable (R/W) |
| Description | Gets/sets the value of the target position to be reached by the path execution. A path is a user-defined move command saved in drive memory, which is triggered by a digital input signal from an external device. To define a path, you must configure six parameters: <ul style="list-style-type: none"> ■ PATHPOS (position) ■ PATHSPEED (speed) ■ PATHACC (acceleration) ■ PATHDEC (deceleration) ■ PATHDELAY (delay) ■ PATHCTRL (control) |
| Syntax | Read: PATHPOS <path#> Write: PATHPOS <path#> <value> |
| Firmware | 1.4.4 |
| Drive status | Enable Disable |
| Range | If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev] If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch] |
| Default value | 0 |
| Unit | Path#: 0 to 31 Value: If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | Yes |
| Example | Define the target value of path number 4 as 12345 (counts): --> PATHPOS 4 0.000 [Counts] --> PATHPOS 4 12345 --> PATHPOS 4 12345.000 [Counts] |

See also

[PATHACC](#)
[PATHCTRL](#)
[PATHDEC](#)
[PATHDELAY](#)
[PATHSPEED](#)

PATHSPEED

| | |
|----------------------|--|
| Definition | Path Speed |
| Type | Variable (R/W) |
| Description | Gets/sets the speed value for path execution. |
| Syntax | Read: PATHSPEED <path#> Write: PATHSPEED <path#> <value> |
| Firmware | 1.4.4 |
| Drive status | Enable Disable |
| Range | Path#: 0 to 31 Value: \pm VLIM |
| Default value | 227.5 [rpm] |
| Unit | If MOTORTYPE 0 (Rotary): If UNITSROTVEL 0 = rps If UNITSROTVEL 1 = rpm If UNITSROTVEL 2 = deg/s If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = mm/s |
| Non-volatile | Yes |
| Example | -->PATHSPEED 4 227.500 [rpm] -->PATHSPEED 4 555.5 -->PATHSPEED 4 555.500 [rpm] |
| See also | PATHACC PATHCTRL PATHDEC PATHDELAY PATHPOS |

PCMD

| | |
|----------------------|--|
| Definition | Position Command |
| Type | Variable (R) |
| Description | Gets the value of the position reference command. |
| Note | <p>The HWPEXT/PCMD ratio is not maintained under the following condition:</p> <p>GEAROUT=1</p> <p>GEARIN>5000</p> <p>No warning is issued.</p> |
| Syntax | PCMD |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | <p>If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev]</p> <p>If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch]</p> |
| Default value | Not Applicable |
| Unit | <p>If MOTORTYPE 0 (Rotary):</p> <p>UNITSROTPOS 0 = rev</p> <p>UNITSROTPOS 1 = count</p> <p>UNITSROTPOS 2 = deg</p> <p>If MOTORTYPE 2 (Linear):</p> <p>UNITSLINPOS 0 = pitch</p> <p>UNITSLINPOS 1 = count</p> <p>UNITSLINPOS 3 = mm</p> |
| Non-volatile | No |
| See also | GEARMODE MOVEINC PE PFB |
| CANopen | 208Eh, sub-index 0 |

PCMDFBRAW

| | |
|----------------------|--|
| Definition | Raw Position Command from Fieldbus |
| Type | Variable (R) |
| Description | Gets the value of the raw target position command sent from the fieldbus, in fieldbus units. |
| Syntax | PCMDFBRAW |
| Firmware | 1.20.6 |
| Drive status | Enabled Disabled |
| Range | If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev] If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch] |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | |

PCMDRAW

| | |
|----------------------|---|
| Definition | Raw Position Command |
| Type | Variable (R) |
| Description | The value of the position command before smoothing. Useful for debugging. Reads the raw target data from the fieldbus. |
| Syntax | PCMDRAW |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | No |
| See also | PCMD |

PDEN

| | |
|----------------------|--|
| Definition | Feed Constant (Unit Conversion) Denominator |
| Type | Variable (R/W) |
| Description | <p>The feed constant is the positional movement for any motor movement and is calculated as the following:</p> $\text{Feed constant} = \text{Feed} \div \text{Driving shaft revolutions}$ <p>PDEN defines the denominator (revolutions) of the ratio.</p> <p>Used for scaling the motor revolution (rotary motors) or the motor pitch (linear motors), according to the type of motor (MOTORTYPE).</p> |
| Syntax | Read: PDEN Write: PDEN <value> |
| Firmware | 1.2.12 |
| Drive status | Enabled Disabled |
| Range | 1 to 4294967295 |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | PCMD PNUM |
| CANopen | 6092h, sub-index 2 |

PE

| | |
|----------------------|---|
| Definition | Position Error |
| Type | Variable (R) |
| Description | Gets the value of the position error. The position error is calculated as the difference between PCMD and PFB. |
| Syntax | PE |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev] If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch] |
| Default value | Not Applicable |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | No |
| See also | PCMD PFB PFBOFFSET |
| CANopen | 60F4h, sub-index 0 |

PEINPOS

| | |
|----------------------|---|
| Definition | In Position Error Tolerance |
| Type | Variable (R/W) |
| Description | Gets/sets the error tolerance for declaring an “in position” state. The motor is considered settled when PE has remained below PEINPOS for a time defined by PEINPOSTIME. |
| Syntax | Read: PEINPOS Write: PEINPOS <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev] If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch] |
| Default value | 0.25 [rev] |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | Yes |
| See also | INPOS MOVEINC PEINPOSTIME PEMAX STOPPED |
| CANopen | 6067h, sub-index 0 |

PEINPOSTIME

| | |
|----------------------|--|
| Definition | In Position Time |
| Type | Variable (R/W) |
| Description | PEINPOSTIME specifies the duration of INPOS=1 at the end of a commanded movement that results in STOPPED=2 ("Profile completed and drive is in position"). |
| Syntax | Read: PEINPOSTIME Write: PEINPOSTIME <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 1000 |
| Default value | 1 |
| Unit | ms |
| Non-volatile | Yes |
| See also | INPOS MOVEABS MOVEINC PE PEINPOS STOPPED |
| CANopen | 6068h, sub-index 0 |

PELOOP

| | |
|----------------------|---|
| Definition | Position Loop Position Error |
| Type | Variable (R) |
| Description | Position error value used by the position loop |
| Syntax | PELOOP |
| Firmware | 1.2.12 |
| Drive status | Enabled Disabled |
| Range | If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev] If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch] |
| Default value | Not Applicable |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | No |
| See also | PE |
| CANopen | 20A3h, sub-index 0 |

PEMAX

| | |
|----------------------|---|
| Definition | Maximum Position Error |
| Type | Variable (R/W) |
| Description | Maximum position error value that does not produce a fault. |
| Syntax | Read: PEMAX Write: PEMAX <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev] If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch] |
| Default value | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = 0.500 UNITSROTPOS 1 = 8192.000 UNITSROTPOS 2 = 360.000 If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = 1.000 UNITSLINPOS 1 = 8192.000 UNITSLINPOS 3 = 32.000 |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | Yes |
| See also | INPOS MOVEINC PEINPOS STOPPED |
| CANopen | 6065h, sub-index 0 |

PFB

| | |
|----------------------|---|
| Definition | Position |
| Type | Variable (R) |
| Description | Gets the value of the primary (motor) feedback, in user-defined units, including any offsets that have been added. PFB is the actual position, according to the motor feedback. |
| Syntax | PFB |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev] If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch] |
| Default value | Not Applicable |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | No |
| See also | PCMD PE PFB OFFSET |
| CANopen | 6064h, sub-index 0 |

PFBBACKUP

| | |
|----------------------|---|
| Definition | Position Backup |
| Type | Command |
| Description | Reads the PFB values from non-volatile memory that were saved by the PFB backup process. |
| Syntax | PFBBACKUP |
| Firmware | 1.3.2 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | Not Applicable |
| See also | PFB PFBBACKUPMODE |
| CANopen | 2088h , sub-index 0 |

PFBBACKUPMODE

| | |
|----------------------|--|
| Definition | Position Backup Mode |
| Type | Variable (R/W) |
| Description | Enables and disables the position (PFB) backup process. In the event of an emergency stop, the PFB backup process saves PFB to non-volatile memory, and restores it at the next power up. |
| Syntax | Read: PFBBACKUPMODE Write: PFBBACKUPMODE<value> |
| Firmware | 1.3.2 |
| Drive status | Enabled Disabled |
| Range | 0 = PFB backup process disabled 1 = PFB backup process enabled |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | PFB PFBBACKUP |
| CANopen | 2089h, sub-index 0 |

PFBOFFSET

| | |
|----------------------|---|
| Definition | Position Offset |
| Type | Variable (R/W) |
| Description | Gets/sets a feedback offset that is added to the internal cumulative position counter, to give the value of PFB. When using count units, only integer values can be entered. |
| Syntax | Read: PFBOFFSET Write: PFBOFFSET <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev] If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch] |
| Default value | 0 |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | Yes |
| See also | PCMD PE PFB |
| CANopen | 2095h , sub-index 0 |

PHASEFIND

| | |
|----------------------|---|
| Definition | Phase Find Command |
| Type | Command |
| Description | Initiates a procedure that initializes commutation for incremental encoder systems. See PHASEFINDMODE for the execution options. |
| Note | Although highly unlikely, it is possible that PHASEFIND will produce an incorrect commutation angle, resulting in a runaway condition. Therefore, when using the PHASEFIND procedure, it is strongly recommended that the commutation error detection mechanism be enabled by setting appropriate values for COMMERRTTHRESH and COMMERRVTHRESH. |
| Syntax | PHASEFIND |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | FEEDBACKTYPE MENCRES MENCTYPE MPHASE PHASEFINDGAIN PHASEFINDI PHASEFINDMODE PHASEFINDST ZERO |
| CANopen | 20A4h , sub-index 0 |

PHASEFINDANGLE

| | |
|----------------------|---|
| Definition | Forced Electrical Position |
| Type | Variable (R/W) |
| Description | Gets/sets the position in one revolution. Applicable only for MENCTYPE 11. |
| Syntax | Read: PHASEFINDANGLE Write: PHASEFINDANGLE <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 65535 |
| Default value | 0 |
| Unit | 65536/(electrical cycle) |
| Non-volatile | Yes |
| See also | PHASEFIND PHASEFINDMODE |
| CANopen | 20A5h , sub-index 0 |

PHASEFINDDELTA

| | |
|----------------------|---|
| Definition | Delta Angle for Phase Find Tuning |
| Type | Variable (R/W) |
| Description | Delta angle for phase find tuning. |
| Syntax | Read: PHASEFINDDELTA Write: PHASEFINDDELTA <value> |
| Firmware | 1.4.4 |
| Drive status | Enabled Disabled |
| Range | 0 to 359 |
| Default value | 5 |
| Unit | Electrical degree |
| Non-volatile | No |
| See also | PHASEFINDMODE |

PHASEFINDGAIN

| | |
|----------------------|--|
| Definition | Phase Find Gain |
| Type | Variable (R/W) |
| Description | Adjusts the gain of the phase finding mechanism. |
| Syntax | Read: PHASEFINDGAIN Write: PHASEFINDGAIN <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0.1 to 10 |
| Default value | 10.000 |
| Unit | Not applicable |
| Non-volatile | Yes |
| See also | PHASEFIND PHASEFINDMODE |
| CANopen | 20A6h , sub-index 0 |

PHASEFINDI

| | |
|----------------------|--|
| Definition | Phase Find Current |
| Type | Variable (R/W) . |
| Description | Adjusts the current of the phase finding mechanism. |
| Syntax | Read: PHASEFINDI Write: PHASEFINDI <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 to IMAX |
| Default value | 0.848 |
| Unit | A |
| Non-volatile | Yes |
| See also | PHASEFIND PHASEFINDMODE |
| CANopen | 20A7h , sub-index 0 |

PHASEFINDMODE

| | |
|---------------------|---|
| Definition | Phase Find Mode |
| Type | Variable (R/W) |
| Description | Gets/sets the commutation Phase Find mode. |
| Note | Although highly unlikely, it is possible that PHASEFIND will produce an incorrect commutation angle, resulting in a commutation error (runaway motor) condition. Therefore, when using the PHASEFIND procedure, it is strongly recommended that the commutation error detection mechanism be enabled by setting appropriate values for COMMERRTTRESH and COMMERRVTRESH. |
| Syntax | Read: PHASEFINDMODE Write: PHASEFINDMODE <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | <p>PHASEFINDMODE 2 [Soft start]. Default.</p> <p>Also referred to as a Wake-No-Shake routine.</p> <p>Sets current command and searches for angle at which no movement occurs, and then adds 90 degrees to this angle. Uses PI controller where velocity is an input and commutation angle is an output.</p> <p>Note: The angle found may cause movement in the wrong direction; therefore, the process is performed twice to avoid incorrect detection.</p> <p>Use this mode with motors that have non-limited motion.</p> <ol style="list-style-type: none"> Set PHASEFINDI - range (0 to IMAX) [A peak]. If value is 0, drive will overwrite it to $0.15 \times \text{MIN}(\text{DICON}, \text{MICONT})$. A high value provides a more exact result but causes a higher rotor jump at start of process. Set PHASEFINDGAIN - range (0.1 to 10). Use a lower value for systems with high inertia, and vice versa. Set PHASEFINDTIME - range (0 to 16000) [ms]. Use a higher value for systems with high inertia, and vice versa. Type PHASEFIND, and then EN. <p>PHASEFINDMODE 4 [Smooth start]</p> <p>Sets commutation angle to 180 degrees and increases current until a movement of 1 electrical angle is detected. Divides the angle by half and sets the appropriate sign to move in the opposite direction. Increases current until a movement of 1 electrical angle is detected. Repeats until no movement occurs at maximum current. Adds 90 degree to the found angle.</p> <p>The maximum current value used during the process is limited by MICONT.</p> <p>Use this mode with motors that have non-limited motion.</p> <ol style="list-style-type: none"> Set PHASEFINDGAIN — range (0.1 - 10). In this mode |

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| | <p>the parameter is used as a factor for total movement. The larger factor will provide less movement but will take more time to execute PHASEFIND process. In systems with low inertia and cogging the actual movement will be unpredictable but never more than 90 electrical degrees. Use a higher value for systems with high inertia, and vice versa.</p> <p>2. Type PHASEFIND, and then EN.</p> |
| | <p>PHASEFINDMODE 5 [High torque start]</p> <p>Sets commutation angle to 180 degrees and increases current until a movement of 1 electrical angle is detected. Divides the angle by half and sets the appropriate sign to move in the opposite direction. Increases current until a movement of 1 electrical angle is detected. Repeats until no movement occurs at maximum current. Adds 90 degree to the found angle.</p> <p>The maximum current value used during the process is limited by IMAX.</p> <p>Use this mode with motors that have non-limited motion.</p> <p>Use this mode when a high torque is required for initial motion.</p> <p>1. Set PHASEFINDGAIN — range (0.1 - 10). In this mode the parameter is used as a factor for total movement. The larger factor will provide less movement but will take more time to execute PHASEFIND process. In systems with low inertia and cogging the actual movement will be unpredictable but never more than 90 electrical degrees. Use a higher value for systems with high inertia, and vice versa.</p> <p>2. Type PHASEFIND, and then EN.</p> |

| | |
|----------------------|---|
| | <p>PHASEFINDMODE 11 [Manual commutation]</p> <p>Commutation is defined by the value of PHASEFINDANGLE.</p> <ol style="list-style-type: none"> 1. Set PHASEFINDANGLE — range (0 to 65535), where 1 electrical angle is 65535/359. 2. Type PHASEFIND, and then EN. <p>Use this mode if the angle is known. For example:</p> <ol style="list-style-type: none"> 1. Set shaft to zero electrical degrees (be sure MPHASE = 0). Use the ZERO command to set the shaft to zero electrical degree placement. 2. Set PHASEFINDANGLE = 0 3. Type PHASEFIND, and then EN |
| | <p>PHASEFINDMODE 12 [Zeroing]</p> <p>Applies the ZERO command and uses the resulting MPHASE. Supports systems with Z-axis.</p> <p>Utilizes the following parameters:</p> <p>PHASEFINDI – Current applied to phases, in amperes. Minimum is 0; maximum is IMAX; default is 0.1×MICON. A higher current will provide a more exact result, but will cause more aggressive behavior during the PHASEFIND process. Current value should be high enough to hold the load of the Z-axis.</p> <p>PHASEFINDDELTA – Allowable movement before PHASEFIND starts, in electrical degrees. Minimum is 0; maximum is 359; default is 5.</p> <p>PHASEFINDTIME – Timeout time, in milliseconds. Minimum is 30 seconds; maximum is 60 seconds; default is 30 seconds. Can be modified by user in the event of a timeout fault. For example, if PHASEFINDI is high and motor has a load, rotor oscillations during PHASEFIND may require more than 30 seconds for settling.</p> <p>WNSERR – Faults. For example: “Not enough motion detected”. Possibly due to hard stop, low PHASEFINDI, locked rotor, high load. “Motor Settling Timeout”. Due to rotor oscillations during PHASEFIND process. Try increasing PHASEFINDTIME. Verify PEINPOS is not 0 (this parameter is used to define settling status).</p> <p>PEINPOS– A lower value will provide a more exact result.</p> <p>Type PHASEFIND, and then EN. Wait for movement greater than <i>n</i> electrical degrees, where <i>n</i> is defined by PHASEFINDDELTA. If no movement is detected within 1 second, then start the phasing process. Apply ZERO command and use the resulting MPHASE.</p> |
| Default value | 2 |
| Unit | Not applicable |
| Non-volatile | Yes |

| | |
|-----------------|--|
| See also | FEEDBACKTYPE MENCTYPE MPHASE PHASEFIND (Modes 0, 2, 4, 11) PHASEFINDANGLE (Mode 11) PHASEFINDI (Mode 2) PHASEFINDGAIN (Modes 2, 4) PHASEFINDST (Modes 0, 2, 4,11) PHASEFINDTIME (Mode 2) WNSERR (Modes 2,4) ZERO |
| CANopen | 20A8h, sub-index 0 |

PHASEFINDST

| | |
|----------------------|--|
| Definition | Phase Find Status |
| Type | Variable (R) |
| Description | Indicates the state of the commutation Phase Find procedure for incremental encoders. |
| Syntax | PHASEFINDST |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 = Not started 1 = Running 2 = Succeeded 3 = Failed |
| Default value | Not applicable |
| Unit | Not applicable |
| Non-volatile | No |
| See also | FEEDBACKTYPE MENCTYPE PHASEFIND PHASEFINDMODE ZERO |
| CANopen | 20A9h , sub-index 0 |

PHASEFINDTIME

| | |
|----------------------|---|
| Definition | Phase Find Duration |
| Type | Variable (R/W) |
| Description | Gets/set the duration of the phase finding mechanism in a soft start (PHASEFINDMODE 2). |
| Syntax | Read: PHASEFINDTIME Write: PHASEFINDTIME <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 to 60000 |
| Default value | 100 |
| Unit | ms |
| Non-volatile | Yes |
| See also | PHASEFIND PHASEFINDMODE |
| CANopen | 20AAh , sub-index 0 |

PNUM

| | |
|----------------------|---|
| Definition | Feed Constant (Unit Conversion) Numerator |
| Type | Variable (R/W) |
| Description | <p>The feed constant is the positional movement for any motor movement and is calculated as the following:</p> $\text{Feed constant} = \text{Feed} \div \text{Driving shaft revolutions}$ <p>PNUM defines the numerator (feed) of the ratio.</p> <p>Used for scaling the motor revolution (rotary motors) or the motor pitch (linear motors), according to the type of motor (MOTORTYPE).</p> |
| Syntax | <p>Read: PNUM</p> <p>Write: PNUM <value></p> |
| Firmware | 1.2.12 |
| Drive status | Enabled Disabled |
| Range | 1 to 4294967295 |
| Default value | 360000 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | PCMD PDEN |
| CANopen | 6092h , sub-index 1 |

POSCONTROLMODE

| | |
|----------------------|--|
| Definition | Position Loop Controller Mode |
| Type | Variable (R/W) |
| Description | <p>Gets/sets a value that defines the type of position loop controller.</p> <p>POSCONTROLMODE 5 is recommended for all new applications. It replaces POSCONTROLMODE 1 and 2 used in previous firmware versions.</p> <p>POSCONTROLMODE 5 allows the HD controller to run at 8 kHz (250 μs sampling rate), enabling higher settings of HD controllers gains. This mode improves overall performance, such as faster settling times and smaller position errors.</p> |
| Note | Due to differences in sample rates, if switching from POSCONTROLMODE 2 to 5, or 5 to 2, it is recommended that the HD controller gains be retuned. |
| Syntax | Read: POSCONTROLMODE Write: POSCONTROLMODE <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 = Linear control loop 1 = HD control loop; for backward compatibility only 2 = HD control loop with 250 μ s sample rate 3 = Reserved 4 = Reserved 5 = HD control loop with 125 μ s sample rate; recommended for all new applications |
| Default value | 5 |
| Unit | Not applicable |
| Non-volatile | Yes |
| See also | OPMODE VELCONTROLMODE |
| CANopen | 20ABh, sub-index 0 |

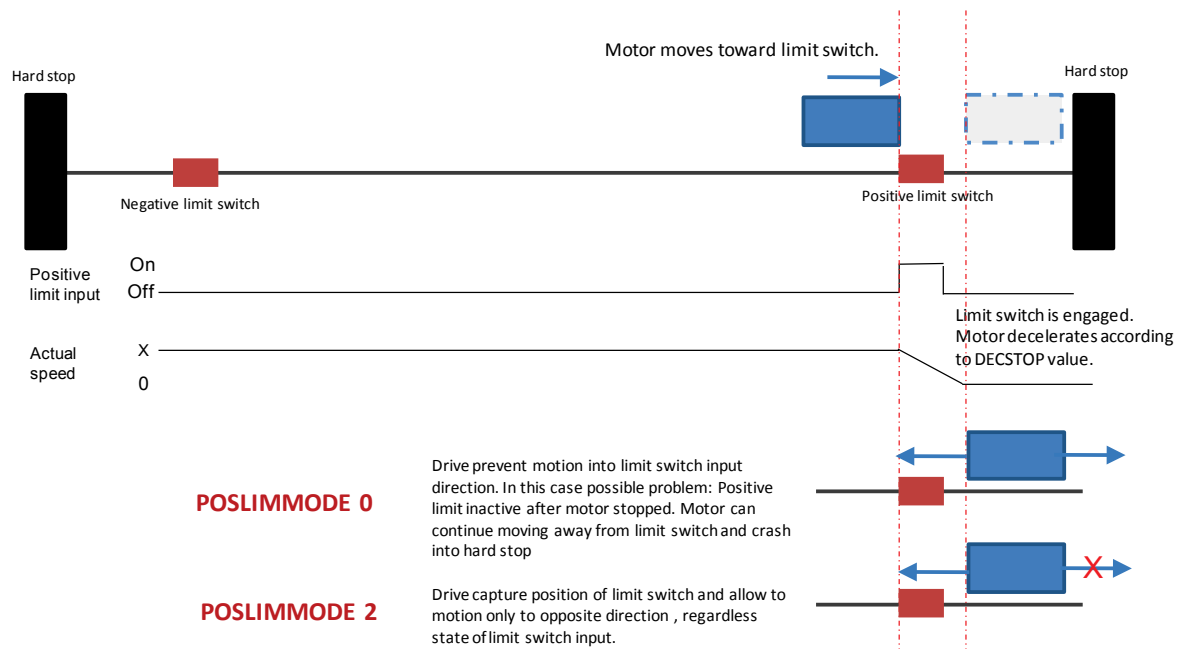
POSLIMHYST

| | |
|----------------------|--|
| Definition | Software Position Limit Switch Hysteresis Value |
| Type | Variable (R/W) |
| Description | Hysteresis value around the software position limit switch. Serves to prevent false activation of a software limit switch due to an unstable control loop. |
| Syntax | Read: POSLIMHYST Write: POSLIMHYST <value> |
| Firmware | 1.15.xx |
| Drive status | Disabled |
| Range | 0 to 1/36 (0.278) |
| Default value | 0.003 |
| Unit | If MOTORTYPE 0 (Rotary): revolution If MOTORTYPE 2 (Linear): pitch |
| Non-volatile | Yes |
| See also | POSLIMMODE |
| CANopen | 214A h, sub-index 0 |

POSLIMMODE

| Definition | Position Limiting Mode | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------|--|-------|------------|-------|-------|---|---|---|------------|---|---|---|------------|---|---|---|------------|---|---|---|------------|---|---|---|------------|---|---|---|------------|---|---|---|------------|---|---|---|------------|
| Type | Variable (R/W) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Description | Defines whether software position limits and/or transient position limits and/or homing limits are applied. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <p>The value of POSLIMMODE depends on the bit values:</p> <table><tr><th>Bit 2</th><th>Bit 1</th><th>Bit 0</th><th>Value</th></tr><tr><td>0</td><td>0</td><td>0</td><td>= 0</td></tr><tr><td>0</td><td>0</td><td>1</td><td>= 1</td></tr><tr><td>0</td><td>1</td><td>0</td><td>= 2</td></tr><tr><td>0</td><td>1</td><td>1</td><td>= 3</td></tr><tr><td>1</td><td>0</td><td>0</td><td>= 4</td></tr><tr><td>1</td><td>0</td><td>1</td><td>= 5</td></tr><tr><td>1</td><td>1</td><td>0</td><td>= 6</td></tr><tr><td>1</td><td>1</td><td>1</td><td>= 7</td></tr></table> <p>bit 0: 0 = Software position limits disabled 1 = Software position limits enabled</p> <p>bit 1: 0 = Transient limits are used for all motion 1 = Transient limits are ignored during any motion</p> <p>bit 2: 0 = Transient limits are used for homing 1 = Transient limits are ignored during homing</p> <p>Software position limits (bit 0) can be set only after a successful homing has been performed.</p> <p>If bit 0 = 1, POSLIMNEG and POSLIMPOS serve as motion limits. When either limit is crossed, a deceleration occurs according to the value of DECSTOPTIME, unless it exceeds the value of DECSTOP. Once a limit is crossed, only motion commands in the reverse direction can be executed.</p> <p>When a software limit switch is engaged, the 7-segment LED display shows either L4 or L5. If both switches are engaged, the display shows L6.</p> <p>Software position limits and the Disable mode use the same deceleration settings.</p> <p>If bit 1 = 0, transient limits serve as motion limits. Transient limits are set when the respective hardware limit input is set; at the same time, the actual position is captured internally. The transient limits are maintained until the hardware limit input is reset and the actual position is closer to the travel range than the captured position above. For example, if a transient positive limit bit is set, this bit will be reset when the hardware positive limit input is reset and the actual position is less than the position that was captured</p> | Bit 2 | Bit 1 | Bit 0 | Value | 0 | 0 | 0 | = 0 | 0 | 0 | 1 | = 1 | 0 | 1 | 0 | = 2 | 0 | 1 | 1 | = 3 | 1 | 0 | 0 | = 4 | 1 | 0 | 1 | = 5 | 1 | 1 | 0 | = 6 | 1 | 1 | 1 | = 7 |
| Bit 2 | Bit 1 | Bit 0 | Value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 0 | 0 | = 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 0 | 1 | = 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 1 | 0 | = 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 1 | 1 | = 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 0 | = 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 1 | = 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1 | 0 | = 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1 | 1 | = 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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|----------------------|--|
| | when the positive hardware limit input was originally set. The drive will respond to the presence of a transient limit bit as if the respective hardware limit input is set. |
| Syntax | Read: POSLIMMODE Write: POSLIMMODE <value> |
| Firmware | 1.2.12; 1.40.0 |
| Drive status | Enabled Disabled |
| Range | 0 to 7 Note: Values 4 and 5 (where bit 1 = 0 and bit 2= 1) should not be used, since they do not represent any backward compatible configuration. |
| Default value | 6 |
| Unit | Not Applicable |
| Non-volatile | Yes No |
| See also | DECSTOP DECSTOPTIME POSLIMNEG POSLIMPOS LIMSWITCHNEG LIMSWITCHPOS |
| CANopen | 20ACh, sub-index 0 |



Limit switch is OFF

L1 = Hardware negative limit switch is open

L2 = Hardware positive limit switch is open

POSLIMNEG

| | |
|----------------------|---|
| Definition | Software Position Limit Minimum |
| Type | Variable (R/W) |
| Description | The minimum position for software limit. |
| Syntax | Read: POSLIMNEG Write: POSLIMNEG <value> |
| Firmware | 1.2.12 |
| Drive status | Disabled |
| Range | If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev] If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch] |
| Default value | 0 |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | Yes |
| See also | POSLIMMODE POSLIMPOS |
| CANopen | 607Dh, sub-index 1 |

POSLIMPOS

| | |
|----------------------|---|
| Definition | Software Position Limit Maximum |
| Type | Variable (R/W) |
| Description | The maximum position for software limit |
| Syntax | Read: POSLIMPOS Write: POSLIMPOS <value> |
| Firmware | 1.2.12 |
| Drive status | Disabled |
| Range | If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev] If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch] |
| Default value | 0 |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | Yes |
| See also | POSLIMMODE POSLIMNEG |
| CANopen | 607Dh, sub-index 2 |

PRBFRQ

| | |
|----------------------|---|
| Definition | PRB Generator Frequency |
| Type | Variable (R/W) |
| Description | <p>Defines the frequency for PRB (pseudo-random binary) excitation.</p> <p>For pseudo binary noise (PRBPARAM 1), PRBFRQ has no effect.</p> <p>For sine and square wave generators (PRBPARAM 2, PRBPARAM 3), PRBFRQ defines the frequency of the sine and square wave generator, respectively.</p> |
| Syntax | <p>Read: PRBFRQ</p> <p>Write: PRBFRQ <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 5000 |
| Default value | 100.000 |
| Unit | Hz |
| Non-volatile | No |
| See also | PRBMODE PRBPARAM |
| CANopen | 20ADh, sub-index 0 |

PRBMODE

| | |
|----------------------|--|
| Definition | PRB Activation Mode |
| Type | Variable (R/W) |
| Description | Get/sets the activation mode of the PRB signal generator. PRB can either be disabled (PRBMODE 0), continuously activated (PRBMODE 2), or activated only when recording has been triggered (PRBMODE 1). |
| Syntax | Read: PRBMODE Write: PRBMODE <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = PRB generator not activated 1 = PRB generator activated only during recording 2 = PRB generator activated continuously |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | PRBFRQ PRBPARAM RECORD RECTRIG |
| CANopen | 20AEh , sub-index 0 |

PRBPARAM

| | |
|----------------------|--|
| Definition | PRB Generator Configuration |
| Type | Command |
| Description | The PRB (pseudo-random binary) generator enables several advanced tests on the controlled axis. These tests include injecting sine or square wave signals of specified frequency in addition to the current and velocity commands. The PRB noise generator is used to excite the system with a wide uniform spectrum signal for identification purposes. |
| Syntax | PRBPARAM { <i>Signal_type</i> } { <i>Icmd_amp</i> } { <i>Vcmd_amp</i> } { <i>Update_ratio</i> } |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | <i>Signal_type</i> : 0 = Not activated 1 = Pseudo random binary 2 = Sine wave 3 = Square wave <i>Icmd_amp</i> = torque amplitude in [A]. <i>Vcmd_amp</i> = velocity amplitude in velocity units (as defined by UNITSROTVEL or UNITSLINVEL) <i>Update_ratio</i> = update ratio relative to current loop update rate. |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | PRBFRQ PRBMODE |
| CANopen | 20AFh, sub-index 1 |

PROBECONFIG

| | |
|----------------------|---|
| Definition | Touch Probe Configuration |
| Type | Command |
| Description | Defines the probe functionality. |
| Syntax | PROBECONFIG < <i>probe number</i> > queries the configuration PROBECONFIG {< <i>probe number</i> > < <i>enable trigger</i> > < <i>capture method</i> > < <i>trigger source</i> > < <i>capture edge</i> > < <i>sampled variable</i> >} |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | <i>probe number</i> : 1 = First probe <i>enable trigger</i> : 0 = Disable triggering 1 = Enable triggering <i>capture method</i> : 0 = Trigger first event (single) 1 = Continuous (repeated) <i>trigger source</i> : 0 = Digital input 1 = Encoder index <i>capture edge</i> : 0 = Idle (use before changing edge event configuration and before reactivating one-shot probing) 1 = Rising edge 2 = Falling edge <i>sampled variable</i> (0x00 to 0x0F): 0x00 No variable to sample 0x01 Position feedback 0x02 Position error 0x04 Velocity 0x08 Current Q axis |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| Example | Rejection of the command because probe functionality has not been assigned to any of the digital inputs. <pre>PROBECONFIG 1 1 0 0 1 H0F ERR 260 No input assigned to touch probe</pre> |
| Example | Configuring probe 1 to capture the values of all specified variables once a single event of rising edge occurs. <pre>INMODE 2 27 PROBECONFIG 1 1 0 0 1 HF</pre> |

| | |
|-----------------|--|
| Example | Configuring probe 1 to continuously capture position and velocity at each falling edge event. INMODE 2 27 PROBECONFIG 1 1 1 0 2 H05 |
| Example | Setting probe 1 to idling to prevent capturing. PROBECONFIG 1 1 1 0 0 H05 |
| Example | Setting probe 1 to idling to prevent capturing. PROBECONFIG 1 1 1 0 0 H05 |
| Example | Continuously probing by using the feedback index at rising edge. PROBECONFIG 1 1 1 1 1 H05 |
| See also | PROBECOUNTER PROBEDATAFALL PROBEDATARISE PROBELEVELPRD PROBESTATUS |
| CANopen | 60B8h, sub-index 1 |

PROBECOUNTER

| | |
|----------------------|---|
| Definition | Touch Probe Event Counter |
| Type | Variable (R) |
| Description | Returns the number of captured events. PROBECOUNTER variable is incremented each time a configured event occurs. |
| Syntax | PROBECOUNTER |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 0 to 65535 |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | No |
| Example | -->PROBECOUNTER Rise edge events: 0 Fall edge events: 0 |
| See also | PROBECONFIG PROBESTATUS |
| CANopen | 2131h , sub-index 0 |

PROBEDATAFALL

| | |
|----------------------|---|
| Definition | Touch Probe Sampled Data Falling |
| Type | Command |
| Description | Reads and stores the captured data from the last event on the falling edge. |
| Syntax | PROBEDATAFALL {1 2} |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 1 = Probe 1 2 = Probe 2 |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| Example | <p>PROBECONFIG 1 1 0 0 2 h0F</p> <p>Before edge event:</p> <pre>probedatafall 1 0.000 [Counts] ->position 0.000 [Counts] ->position error 0.000 [rpm] ->velocity 0.000 [A] ->iq</pre> <p>After event occurred:</p> <pre>probedatafall 1 434041.314 [Counts] 0.000 [Counts] 497.667 [rpm] 0.068 [A]</pre> |
| Example | <p>PROBECONFIG 1 1 0 0 2 h05</p> <p>After event occurred:</p> <pre>probedatafall 1 1278100.564 [Counts] 482.546 [rpm]</pre> |
| See also | PROBECONFIG PROBEDATARISE |
| CANopen | 2148h, sub-index 0 |

PROBEDATARISE

| | |
|----------------------|---|
| Definition | Touch Probe Sampled Data Rising |
| Type | Variable (R) |
| Description | Reads and stores the captured data from the last event on the rising edge. |
| Syntax | PROBEDATARISE {1 2} |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 1 = Probe 1 2 = Probe 2 |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| Example | <p>PROBECONFIG 1 1 0 0 1 h0F</p> <p>Before edge event:</p> <pre>probedatarise 1 0.000 [Counts] ->position 0.000 [Counts] ->position error 0.000 [rpm] ->velocity 0.000 [A] ->iq</pre> <p>After event occurred:</p> <pre>probedatarise 1 434041.314 [Counts] 0.000 [Counts] 497.667 [rpm] 0.068 [A]</pre> |
| Example | <p>PROBECONFIG 1 1 0 0 1 h05</p> <p>After event occurred:</p> <pre>probedatarise 1 434041.314 [Counts] ->position 49497.667 [rpm] ->iq</pre> |
| See also | PROBECONFIG PROBEDATAFALL |
| CANopen | 2147h, sub-index 0 |

PROBELEVELPRD

| | |
|----------------------|---|
| Definition | Touch Probe Stable Input Level Duration |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the minimum length of time required for a stable input level after a trigger event.</p> <p>Serves to overcome the bouncing effect of a switch.</p> |
| Syntax | <p>Read: PROBELEVELPRD</p> <p>Write: PROBELEVELPRD <value></p> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 2 to 32 |
| Default value | 5 |
| Unit | 31.25 μ s |
| Non-volatile | Yes |
| See also | PROBECONFIG PROBESTATUS |
| CANopen | 214Bh , sub-index 0 |

PROBESTATUS

| | |
|----------------------|--|
| Definition | Touch Probe Status |
| Type | Variable (R) |
| Description | Indicates whether the probe is enabled and which type of edge event has occurred. |
| Syntax | PROBESTATUS |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| Example | <p>Probe is switched off:</p> <pre>PROBECONFIG 1 0 0 0 2 h05 PROBESTATUS Probe -1 Is Switched Off No positive edge data stored No negative edge data stored</pre> |
| Example | <p>Probe is switched on:</p> <pre>PROBECONFIG 1 1 0 0 2 h05 PROBESTATUS Probe -1 Is Switched On No positive edge data stored Negative edge data stored</pre> <p>After edge event occurred:</p> <pre>PROBESTATUS Probe -1 Is Switched On No positive edge data stored Negative edge data stored</pre> |
| Example | <p>Probe is switched on:</p> <pre>PROBECONFIG 1 1 0 0 1 h05 PROBESTATUS Probe -1 Is Switched On No positive edge data stored Negative edge data stored</pre> <p>After edge event occurred:</p> <pre>PROBESTATUS Probe -1 Is Switched On Positive edge data stored Negative edge data stored</pre> |

| | |
|-----------------|---|
| Example | Loading capture edge with idle value will clear the status: PROBECONFIG 1 1 0 0 0 h05 Probe -1 Is Switched On No positive edge data stored No Negative edge data stored |
| See also | PROBECONFIG PROBECOUNTER PROBEDATAFALL PROBEDATARISE PROBELEVELPRD |
| CANopen | 60B9h, sub-index 0 |

PROTARY

| | |
|----------------------|---|
| Definition | Position Modulo Limits |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the range of the modulo.</p> <p>When the modulo is enabled, PFB and PCMD remain within this range. Upon reaching one of the limits, the position feedback rolls over to the other limit.</p> <p>PROTARY accepts two arguments. The first one selects the limit (1 or 2). The second argument sets the value of that limit in counts.</p> |
| Syntax | <p>Read: PROTARY <limit#></p> <p>Write: PROTARY <limit#> <value></p> |
| Firmware | 1.15.xx |
| Drive status | Disabled |
| Range | <p>Limit#: 1 – 2</p> <p>Value: $\pm(2^{31}-1)$ [count]</p> |
| Default value | 0 |
| Unit | <p>Limit#: Not Applicable</p> <p>Value: Count</p> |
| Non-volatile | Yes |
| Example | <pre>--> PROTARY 1 0 [counts] --> PROTARY 2 360000 --> PROTARY 2 360000 [counts]</pre> |
| See also | MODMODE |

PTPTE

| | |
|----------------------|---|
| Definition | PTP Generator Target Error |
| Type | Variable (R) |
| Description | Reports the target error during a motion profile, which is the distance remaining to the destination in a point-to-point move. |
| Syntax | PTPTE |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev] If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch] |
| Default value | Not Applicable |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | No |
| See also | MOVEABS MOVEINC PCMD PE PTPVCMD |
| CANopen | 20B0h , sub-index 0 |

PTPVCMC

| | |
|----------------------|--|
| Definition | Position Command Generator Velocity Command |
| Type | Variable (R) |
| Description | <p>Reports the derivative of the position command profile in velocity units. PTPVCMD is useful for recording and viewing the actual velocity and the velocity command, which is available only as a derivative of the position profile.</p> <p>PTPVCMD is the trajectory velocity command applicable to all position loops.</p> <p>VCMD is the output velocity command of the linear controller. VCMD is not used in HD control (POSCONTROLMODE 2 or 1).</p> <p>In linear control (POSCONTROLMODE 0), the variable VCMD shows a value similar to PTPVCMD. However, since VCMD is issued by the position controller as a command to the velocity control, it is not strictly a reference signal (as it includes the response of the position control to PFB).</p> |
| Syntax | PTPVCMD |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | <p>If MOTORTYPE 0 (Rotary): $\pm(2^{31}-1)$ [rev]</p> <p>If MOTORTYPE 2 (Linear): $\pm(2^{31}-1)$ [pitch]</p> |
| Default value | Not Applicable |
| Unit | <p>If MOTORTYPE 0 (Rotary):</p> <ul style="list-style-type: none"> If UNITSROTVEL 0 = rps If UNITSROTVEL 1 = rpm If UNITSROTVEL 2 = deg/s <p>If MOTORTYPE 2 (Linear):</p> <ul style="list-style-type: none"> UNITSLINVEL 1 = mm/s |
| Non-volatile | No |
| See also | MOVEABS MOVEINC PCMD PTPTE VCMD |
| CANopen | 20B1h, sub-index 0 |

PWMFRQ

| | |
|----------------------|--|
| Definition | PWM Frequency |
| Type | Variable (R) |
| Description | Gets the frequency of the PWM signals. |
| Syntax | PWMFRQ |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 16.000 |
| Default value | 16.000 |
| Unit | kHz |
| Non-volatile | No |
| See also | DIPEAKVBUS |
| CANopen | 20B2h, sub-index 0 |

RAMAXERRCNT

| | |
|--------------------|---|
| Definition | Runaway Detection Maximum Error Counter Value |
| Description | Replaced by COMMERRMAXCNT . |

RATTHRESH

| | |
|--------------------|--|
| Definition | Runaway Detection Time Threshold Value |
| Type | Variable (R/W) |
| Description | Replaced by COMMERRTTHRESH . |

RAVTHRESH

| | |
|--------------------|--|
| Definition | Runaway Detection Velocity Threshold Value |
| Type | Variable (R/W) |
| Description | Replaced by COMMERRVTHRESH . |

READY

| | |
|----------------------|--|
| Definition | Drive Ready |
| Type | Variable (R) |
| Description | Indicates whether the drive is ready for activation with only external remote enable switch still required (ACTIVE). |
| Syntax | READY |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Faults exist or SWEN 0 1 = No faults exist and SWEN 1 |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | ACTIVE EN FLT K REMOTE ST SWEN |
| CANopen | 2113h, sub-index 0 |

RECDONE

| | |
|----------------------|--|
| Definition | Recording Done |
| Type | Variable (R) |
| Description | Indicates whether the RECORD command is done and data is available. |
| Syntax | RECDONE |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Recording not finished 1 = Recording done; data available |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | GET RECING RECOFF RECORD RECRDY RECTRIG |
| CANopen | 20E6h, sub-index 0 |

RECING

| | |
|----------------------|--|
| Definition | Recording |
| Type | Variable (R) |
| Description | Indicates if data recording is in progress. |
| Syntax | RECING |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Recording not in progress 1 = Recording in progress |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | RECDONE RECOFF RECORD RECRDY RECTRIG |
| CANopen | 20EBh, sub-index 0 |

RECLIST

| | |
|----------------------|---|
| Definition | Recordable Variables List |
| Type | Command |
| Description | Returns a list of all variables that can be recorded by the RECORD command. |
| Syntax | RECLIST |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | RECORD |

RECOFF

| | |
|----------------------|--|
| Definition | Cancel Recording |
| Type | Command |
| Description | Cancels an active recording. |
| Syntax | RECOFF |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | RECDONE RECING RECORD RECRDY RECTRIG |
| CANopen | 20E9h, sub-index 0 |

RECORD

| | |
|----------------------|---|
| Definition | Record |
| Type | Command |
| Description | Captures real-time variables to memory for retrieval/ display by the GET command. RECORD must be set up before the RECTRIG command is used. RECLIST returns the list of the recordable variables. |
| Syntax | <p>RECORD <i>sample_time num_points var1</i> [<i>var2 ... var6</i>]</p> <p><i>sample_time</i> = 0 to 1000000 (multiples of 31.25 μs)</p> <p><i>num_points</i> = 1 to 2000</p> <p><i>var</i> = Name of a recordable system variable that appears in RECTRIGLIST. System variables must be preceded by a quotation mark (").</p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable. Refer to Syntax, above. |
| Default value | Not Applicable |
| Unit | Refer to Syntax, above |
| Non-volatile | No |
| Example | <p>RECORD 32 100 "VCMD "V "ICMD</p> <p>Records 100 points for VCMD, V, and ICMD every 1 milliseconds</p> |
| See also | GET RECDONE RECING RECLIST RECOFF RECRDY RECTRIG |
| CANopen | 20EAh, sub-index 1 |

RECRDY

| | |
|----------------------|--|
| Definition | Ready to Record |
| Type | Variable (R) |
| Description | Indicates the ready status of the RECORD function. This variable can be polled after a RECORD command is issued to determine if the system is waiting for RECTRIG. |
| Syntax | RECRDY |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = RECTRIG has been received and record function is armed. 1 = Record function is waiting to be armed by RECTRIG command. |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | RECDONE RECING RECOFF RECORD RECTRIG |
| CANopen | 20ECh, sub-index 0 |

RECTRIG

| | |
|----------------------|---|
| Definition | Trigger Recording |
| Type | Command |
| Description | <p>Triggers the recorder. RECORD must be set up before a RECTRIG command is issued.</p> <p>The recording mechanism tracks the value of a system variable and starts the recording as soon as the value goes above or below the specified value. The recorder can also record a specified number of points before the trigger condition occurs.</p> <p>Known Limitation: If a trigger occurs before the pre-trigger buffer has been filled, the beginning of the recording will have garbage data.</p> |
| Syntax | <p>RECTRIG <i>var level pre-trig {above under}</i></p> <p><i>var</i> = Name of a recordable system variable that appears in RECTRIGLIST. System variables must be preceded by a quotation mark (").</p> <p><i>level</i> = Threshold value for the trigger</p> <p><i>pre-trig</i> = number of points to be recorded prior to trigger</p> <p><i>above under</i> = defines whether trigger occurs when value is above or below the threshold</p> <p>RECTRIG "IMM = starts the recording immediately</p> <p>RECTRIG "CMD = starts the recording as soon as the next command is sent to the drive.</p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | GET RECDONE RECING RECOFF RECORD RECRDY RECTRIGLIST |

| | |
|----------------|---|
| Note | <p>Activation commands</p> <ul style="list-style-type: none">■ RECORD defines the variables to be recorded and the recording time span and sample time.■ RECTRIG defines the triggering condition for starting a recording, and also pre-trigger duration.■ RECOFF turns active recording off. <p>Utility information</p> <ul style="list-style-type: none">■ RECLIST lists all the variables that can be recorded by the record function.■ RECTRIGLIST lists all the options for triggering the recording. <p>Status flags</p> <ul style="list-style-type: none">■ RECRDY indicates that a recording is armed and ready.■ RECING indicates that a trigger condition has occurred and that a recording is active.■ RECDONE indicates that the recording is completed <p>Data retrieval</p> <ul style="list-style-type: none">■ GETMODE defines the format for the recorded data (binary/ascii)■ GET retrieves the recorded data |
| CANopen | 20E8h, sub-index 1 |

RECTRIGLIST

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|--|-------------|--|-------|----|----|-------|-------|--------|-------|---------|-----|------|-----------------|-------|------|----|---------|------------|----|--------|------|----|---------|--------|-----------|-------|--------------|-------|---|-------------|--------|-------------|---|-----------------|------|------|------|----|--------|--------------|--|-----------|--------------|--|
| Definition | Recording Trigger Variables List | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Type | Command | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Description | <p>Returns a list of all trigger variables and options.</p> <p>Any variable that can be read easily and quickly can serve as a recording trigger. The variables listed below are the most commonly used trigger sources. To view the complete list of trigger variables, issue the command to the drive.</p> <p>The recording trigger is defined by RECTRIG.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Note | <p>Some factory variables and commands, not intended for users, may appear in the list.</p> <p>Do not attempt to manipulate parameters that are not described in the product documentation or Help.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Syntax | RECTRIGLIST | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Firmware | 1.0.6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Drive status | Enabled Disabled | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Range | <p>Commonly used dynamic signal variables:</p> <table><tr><td>ANIN1</td><td>ID</td><td>PE</td></tr><tr><td>ANIN2</td><td>IFOLD</td><td>PELOOP</td></tr><tr><td>ANOUT</td><td>ILIMACT</td><td>PFB</td></tr><tr><td>CLVD</td><td>IN (IN1 – IN11)</td><td>PTPTE</td></tr><tr><td>CLVQ</td><td>IQ</td><td>PTPVCMD</td></tr><tr><td>ELECTANGLE</td><td>IU</td><td>REMOTE</td></tr><tr><td>FOLD</td><td>IV</td><td>STOPPED</td></tr><tr><td>HWPEXT</td><td>MECHANGLE</td><td>THERM</td></tr><tr><td>HWPEXTCNTRLR</td><td>MFOLD</td><td>V</td></tr><tr><td>HWPEXTMACHN</td><td>MIFOLD</td><td>VBUSREADOUT</td></tr><tr><td>I</td><td>OUT (OUT1– OUT7</td><td>VCMD</td></tr><tr><td>ICMD</td><td>PCMD</td><td>VE</td></tr></table> <p>Commonly used status variables:</p> <table><tr><td>ACTIVE</td><td>LIMSWITCHNEG</td><td></td></tr><tr><td>HOMESTATE</td><td>LIMSWITCHPOS</td><td></td></tr></table> | | | ANIN1 | ID | PE | ANIN2 | IFOLD | PELOOP | ANOUT | ILIMACT | PFB | CLVD | IN (IN1 – IN11) | PTPTE | CLVQ | IQ | PTPVCMD | ELECTANGLE | IU | REMOTE | FOLD | IV | STOPPED | HWPEXT | MECHANGLE | THERM | HWPEXTCNTRLR | MFOLD | V | HWPEXTMACHN | MIFOLD | VBUSREADOUT | I | OUT (OUT1– OUT7 | VCMD | ICMD | PCMD | VE | ACTIVE | LIMSWITCHNEG | | HOMESTATE | LIMSWITCHPOS | |
| ANIN1 | ID | PE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ANIN2 | IFOLD | PELOOP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ANOUT | ILIMACT | PFB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CLVD | IN (IN1 – IN11) | PTPTE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CLVQ | IQ | PTPVCMD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ELECTANGLE | IU | REMOTE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FOLD | IV | STOPPED | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HWPEXT | MECHANGLE | THERM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HWPEXTCNTRLR | MFOLD | V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HWPEXTMACHN | MIFOLD | VBUSREADOUT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| I | OUT (OUT1– OUT7 | VCMD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ICMD | PCMD | VE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ACTIVE | LIMSWITCHNEG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HOMESTATE | LIMSWITCHPOS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Default value | Not Applicable | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Unit | Not Applicable | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Non-volatile | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| See also | RECTRIG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

REFOFFSETVAL

| | |
|----------------------|---|
| Definition | Offset After Homing |
| Type | Variable (R/W) |
| Description | Internal offset after homing. When using an absolute encoder, this value is (saved and) used to maintain a home reference position when drive power is cycled. |
| Syntax | Read: REFOFFSETVAL Write: REFOFFSETVAL <value> |
| Firmware | 1.15.xx |
| Drive status | Disabled |
| Range | Not Applicable |
| Default value | 0 |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | Yes |
| See also | ABSOFFSET HOMETYPE PFBOFFSET |
| CANopen | 217Ch, sub-index 1 |

REGENFLTMODE

| | |
|----------------------|---|
| Definition | Regeneration Resistor Fault Mode |
| Type | Variable (R/W) |
| Description | Defines how the drive responds to an excessive on-time condition of the regeneration resistor. Allows the user to set parameter to protect the external regeneration resistor. |
| Syntax | Read: REGENFLTMODE Write: REGENFLTMODE<value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 0 = Warning 1 = Fault |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | REGENMAXONTIME REGENMAXPOW REGENPOW REGENRES |

REGENMAXONTIME

| | |
|----------------------|---|
| Definition | Regeneration Resistor Maximum On Time |
| Type | Variable (R/W) |
| Description | The maximum time for which the regeneration resistor may be continually activated (on), in milliseconds. |
| Syntax | Read: REGENMAXONTIME Write: REGENMAXONTIME <value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 10 to 100 |
| Default value | 40 |
| Unit | ms |
| Non-volatile | Yes |
| See also | REGENFLTMODE REGENMAXPOW REGENPOW REGENRES |

REGENMAXPOW

| | |
|----------------------|--|
| Definition | Regeneration Resistor Maximum Power |
| Type | Variable (R) |
| Description | Maximum calculated power of the regeneration resistor, in watts. |
| Syntax | REGENMAXPOW |
| Firmware | 1.20.6 |
| Drive status | Enabled Disabled |
| Range | -1 to 32767 |
| Default value | -1 |
| Unit | W |
| Non-volatile | No |
| See also | REGENFLTMODE REGENMAXONTIME REGENPOW REGENRES |

REGENPOW

| | |
|----------------------|---|
| Definition | Regeneration Resistor Power |
| Type | Variable (R/W) |
| Description | Power of the regeneration resistor, in watts. Use REGENPOW -1 if the system does not have a regenerationresistor. |
| Note | If the system has a regeneration resistor, a value of -1 for either REGENRES or REGENPOW deactivates the regeneration resistor overload protection algorithm. |
| Syntax | Read: REGENPOW Write: REGENPOW <value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | -1 to 32767 |
| Default value | -1 |
| Unit | W |
| Non-volatile | Yes |
| Example | -->regenpow 2 [W] -->regenpow -1 -->regenpow -1 [W] |
| See also | REGENFLTMODE REGENMAXONTIME REGENMAXPOW REGENRES |

REGENRES

| | |
|----------------------|---|
| Definition | Regeneration Resistor Resistance |
| Type | Variable (R/W) |
| Description | Resistance of the regeneration resistor, in ohms. Use REGENRES -1 if the system does not have a regenerationresistor. |
| Note | If the system has a regeneration resistor, a value of -1 for either REGENRES or REGENPOW deactivates the regeneration resistor overload protection algorithm. |
| Syntax | Read: REGENRES Write: REGENRES <value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | -1 to 32767 |
| Default value | -1 |
| Unit | Ohm |
| Non-volatile | Yes |
| Example | -->regenres 2 [Ohm] -->regenres -1 -->regenres -1 [Ohm] |
| See also | REGENFLTMODE REGENMAXONTIME REGENMAXPOW REGENPOW |

RELAY

| | |
|----------------------|---|
| Definition | Fault Relay Status |
| Type | Variable (R) |
| Description | Indicates the state of the fault relay. |
| Syntax | RELAY |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Relay open 1 = Relay closed |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | ACTIVE CLEARFAULTS FLT RELAYMODE REMOTE |
| CANopen | 20B8h, sub-index 0 |

RELAYMODE

| | |
|----------------------|--|
| Definition | Relay Fault Mode |
| Type | Variable (R/W) |
| Description | Gets/sets a value that defines how the fault relay operates. |
| Syntax | Read: RELAYMODE Write: RELAYMODE <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Relay opens upon fault. 1 = Relay opens upon disable. 2 = Deactivated (RELAY not supported; typically due to hardware limitation). |
| Default value | 0 |
| Unit | Not applicable |
| Non-volatile | Yes |
| See also | ACTIVE CLEARFAULTS FLT RELAY REMOTE |
| CANopen | 20B9h, sub-index 0 |

REMOTE

| | |
|----------------------|---|
| Definition | Remote Hardware Enable Status |
| Type | Variable (R) |
| Description | Indicates the state of the external hardware enable input line. |
| Syntax | REMOTE |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Remote enable input off. 1 = Remote enable input on. |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | ACTIVE READY RELAY RELAYMODE |
| CANopen | 20BAh, sub-index 0 |

RESAMPLRANGE

| | |
|----------------------|---|
| Definition | Resolver Amplitude Range |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the acceptable range of resolver sine/cosine signals, expressed as a percentage, around their nominal value.</p> <p>The default value of 10% means the sine/cosine signals are allowed to deviate up to 10% from the nominal before an Out-Of-Range Fault is declared.</p> |
| Syntax | <p>Read: RESAMPLRANGE</p> <p>Write: RESAMPLRANGE <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 100 |
| Default value | 35 |
| Unit | % |
| Non-volatile | Yes |
| See also | FEEDBACKTYPE RESBW SININIT SINPARAM |
| CANopen | 20BBh, sub-index 0 |

RESBW

| | |
|----------------------|---|
| Definition | Resolver Conversion Bandwidth |
| Type | Variable (R/W) |
| Description | <p>Get/sets the resolver conversion bandwidth. High bandwidth produces better dynamic tracking and less phase lag in high frequencies. Lower bandwidth results in better noise reduction.</p> <p>Resolvers typically enable slower dynamic tracking than encoders. RESBW sets the most balanced value according to specific application requirements.</p> |
| Syntax | Read: RESBW Write: RESBW <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 200 to 800 |
| Default value | 300 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | FEEDBACKTYPE SININIT VELFILTMODE |
| CANopen | 20BCh, sub-index 0 |

RESFILTMODE

| | |
|----------------------|--|
| Definition | Resolver Interpolation Mode |
| Type | Variable (R/W) |
| Description | Defines whether or not feedback position interpolation is performed on the resolver feedback in order to generate a continuous stream of data. The interpolation mode is useful since the resolver excitation signal is slower than the feedback sampling. |
| Syntax | Read: RESFILTMODE Write: RESFILTMODE <value> |
| Firmware | 1.4.6 |
| Drive status | Disabled |
| Range | 0 = No interpolation 1 = Interpolation |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | FEEDBACKTYPE RESBW |

SAVE

| | |
|----------------------|---|
| Definition | Save Parameters |
| Type | Command |
| Description | <p>Copies all system configuration variables from working RAM to non-volatile memory.</p> <p>This command must be executed in order to retain setting changes during power cycling.</p> |
| Syntax | SAVE |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | DUMP FACTORYRESTORE LOAD |
| CANopen | 1010h, sub-index 1 |

SFB

| | |
|----------------------|--|
| Definition | Secondary Feedback Position |
| Type | Variable (R) |
| Description | <p>Gets the value of the secondary feedback, including any offsets that have been added.</p> <p>SFB is the actual position, according to the secondary feedback.</p> |
| Syntax | SFB |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | User defined |
| Non-volatile | No |
| See also | SFB2MOTORDEN SFB2MOTORNUM SFBCMD SFBMODE SFBOFFSET SFBPEMAX |
| CANopen | 2161h, sub-index 0 |

SFB2MOTORDEN

| | |
|----------------------|--|
| Definition | Secondary Feedback Scaling Denominator |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the denominator of the secondary feedback scaling ratio.</p> <p>SFB2MOTORNUM and SF2MOTORDEN configure the relationship between the primary (motor) and secondary feedbacks. Along with SFB OFFSET, they are used to convert the analog voltage of the secondary feedback device (SFBTYPE=1) into an absolute position SFB.</p> |
| Syntax | <p>Read: SFB2MOTORDEN</p> <p>Write: SFB2MOTORDEN <value></p> |
| Firmware | 1.15.xx |
| Drive status | Disabled |
| Range | 1 to 2147483647 |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | SFB SFB2MOTORNUM SFBMODE |
| CANopen | 213Ch, sub-index 0 |

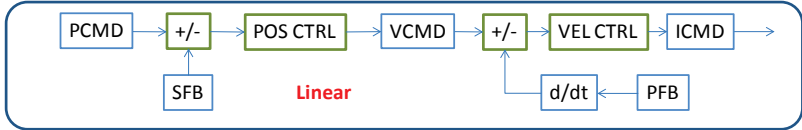
SFB2MOTORNUM

| | |
|----------------------|---|
| Definition | Secondary Feedback Scaling Numerator |
| Type | Variable (R/W) |
| Description | Gets/sets the numerator of the secondary feedback scaling ratio. SFB2MOTORNUM and SF2MOTORDEN configure the relationship between the primary (motor) and secondary feedbacks. Along with SFB OFFSET, they are used to convert the analog voltage of the secondary feedback device (SFBTYPE=1) into an absolute position SFB. |
| Syntax | Read: SFB2MOTORNUM Write: SFB2MOTORNUM <value> |
| Firmware | 1.15.xx |
| Drive status | Disabled |
| Range | -2147483647 to 2147483647 |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | SFB SFB2MOTORDEN SFBMODE |
| CANopen | 213Bh , sub-index 0 |

SFBCMD

| | |
|----------------------|--|
| Definition | Secondary Feedback Position Command |
| Type | Variable (R) |
| Description | Indicates the value of the position command, in secondary feedback position units. |
| Syntax | SFBCMD |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | User defined |
| Non-volatile | No |
| See also | SFB SFBMODE |
| CANopen | 2165h, sub-index 0 |

SFBMODE

| | |
|----------------------|---|
| Definition | Secondary Feedback Mode |
| Type | Variable (R/W) |
| Description | <p>Defines whether the secondary feedback is enabled and whether it is used for the control loop.</p> <p>Note: Dual loop control is applicable only to linear position controller (POSCONTROLMODE 0).</p> <p>In a dual loop application, motor feedback is used for the velocity control loop and commutation, and secondary feedback is used for the position loop.</p> <p>PFB is the position generated by the motor feedback. SFB is the position generated by the secondary feedback.</p> <p>The drive supports secondary feedback devices whose output is an analog voltage (SFBTYPE=1). The secondary feedback analog voltage is converted, via SFB2MOTORNUM, SFB2MOTORDEN and SFBOFFSET, into an absolute position, SFB.</p> <p>Dual loop configuration requires scaling of the secondary feedback relative to the motor feedback, along with a particular tuning method, as shown in the diagram below.</p> <p>The secondary feedback mode must be disabled (SFBMODE=0) during the calibration of the secondary feedback voltage correction (SFBVCMODE).</p>  |
| Syntax | Read: SFBMODE Write: SFBMODE <value> |
| Firmware | 1.15.xx |
| Drive status | Disabled |
| Range | 0 = Secondary feedback disabled; dual loop mode inactive. 1 = Secondary feedback enabled; dual loop mode active. Secondary feedback is used for the position control loop; primary (motor) feedback is used for the velocity control loop and commutation. 2 = Secondary feedback enabled; dual loop mode inactive. SFB is calculated and can be read, but is not applied to the control loop. The primary (motor) feedback PFB is used for the position control loop. |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |

| | |
|-----------------|---|
| See also | SFB SFBOFFSET SFBPEMAX SFBPETHRESH SFBPETIME SFBTYPE SFBUNITSDEN SFBUNITSNUM SFBVEL |
| CANopen | 2139h, sub-index 0 |

SFBOFFSET

| | |
|----------------------|---|
| Definition | Secondary Feedback Offset |
| Type | Variable (R/W) |
| Description | Gets/sets the offset value added to the secondary feedback. |
| Syntax | Read: SFBOFFSET Write: SFBOFFSET <value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | 0.000 [SFB user unit] |
| Non-volatile | Yes |
| See also | SFB SFBMODE |
| CANopen | 2162h , sub-index 0 |

SFBPEMAX

| | |
|----------------------|---|
| Definition | Secondary Feedback Maximum Position Error |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the secondary feedback maximum position error without producing a fault.</p> <p>While the drive is enabled, SFBPEMAX monitors the increase of the error between SFB and PFB.</p> <p>While the drive is disabled, a correction offset is computed in order to zero the error.</p> <ul style="list-style-type: none">■ If the error exceeds SFBTHRESH for a period of SFBPETIME [ms], the drive issues a fault.■ As soon as the error exceeds SFBPEMAX, the drive issues a fault. |
| Syntax | Read: SFBPEMAX Write: SFBPEMAX <value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 0 |
| Default value | 0.000 [SFB user unit] |
| Unit | User defined |
| Non-volatile | Yes |
| See also | SFB SFBMODE |
| CANopen | 2163h , sub-index 0 |

SFBPETHRESH

| | |
|----------------------|--|
| Definition | Secondary Feedback Position Error Threshold |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the threshold for the position error between load and motor.</p> <p>While the drive is enabled, SFBPEMAX monitors the increase of the error between SFB and PFB.</p> <p>While the drive is disabled, a correction offset is computed in order to zero the error.</p> <ul style="list-style-type: none"> ■ If the error exceeds SFBTHRESH for a period of SFBPETIME [ms], the drive issues a fault. ■ As soon as the error exceeds SFBPEMAX, the drive issues a fault. |
| Syntax | <p>Read: SFBPETHRESH</p> <p>Write: SFBPETHRESH <value></p> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 0 |
| Default value | 0.000 [SFB user unit] |
| Unit | User defined |
| Non-volatile | Yes |
| See also | SFB SFBMODE |
| CANopen | 2164h , sub-index 0 |

SFBPETIME

| | |
|----------------------|---|
| Definition | Secondary Feedback Position Error Time |
| Type | Variable (R/W) |
| Description | <p>While the drive is enabled, SFBPEMAX monitors the increase of the error between SFB and PFB.</p> <p>While the drive is disabled, a correction offset is computed in order to zero the error.</p> <ul style="list-style-type: none">■ If the error exceeds SFBTHRESH for a period of SFBPETIME [ms], the drive issues a fault.■ As soon as the error exceeds SFBPEMAX, the drive issues a fault. |
| Syntax | Read: SFBPETIME Write: SFBPETIME <value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 0 to 2000 |
| Default value | 1 |
| Unit | ms |
| Non-volatile | Yes |
| See also | SFB SFBMODE |
| CANopen | 2146h, sub-index 0 |

SFBPFBPE

| | |
|----------------------|--|
| Definition | Secondary Feedback Position Error |
| Type | Variable (R) |
| Description | Secondary feedback position error, displayed in secondary feedback position units. |
| Syntax | SFBPFBPE |
| Firmware | 1.20.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | User defined |
| Non-volatile | No |
| See also | SFB SFBMODE |
| CANopen | 2166h, sub-index 0 |

SFBTYPE

| | |
|----------------------|---|
| Definition | Secondary Feedback Type |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the type of secondary feedback.</p> <p>Note: Secondary feedback type 1 cannot be used with analog operation modes (OPMODE 1, OPMODE 3).</p> |
| Syntax | <p>Read: SFBTYPE</p> <p>Write: SFBTYPE <value></p> |
| Firmware | 1.15.xx |
| Drive status | Disabled |
| Range | 1 = Analog input 1 ($\pm 10V$) |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | SFB SFBMODE |
| CANopen | 213Ah, sub-index 0 |

SFBUNITSDEN

| | |
|----------------------|---|
| Definition | Secondary Feedback Unit Conversion Denominator |
| Type | Variable (R/W) |
| Description | <p>Defines the number of user-defined position units per one volt.</p> <p>SFBUNITSDEN and SFBUNITSNUM enable the setting of user-defined units, such as degrees or millimeters, for SFB, SFBOFFSET, and related position variables.</p> |
| Syntax | <p>Read: SFBUNITSDEN</p> <p>Write: SFBUNITSDEN <value></p> |
| Firmware | 1.15.xx |
| Drive status | Disabled |
| Range | 1 to 2147483647 |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | SFB SFBUNITSNUM |
| CANopen | 213Eh, sub-index 0 |

SFBUNITSNUM

| | |
|----------------------|--|
| Definition | Secondary Feedback Unit Numerator |
| Type | Variable (R/W) |
| Description | Defines the number of volts per SFBUNITSNUM position unit. SFBUNITSDEN and SFBUNITSNUM enable the setting of user-defined units, such as degrees or millimeters, for SFB, SFBOFFSET, and related position variables. |
| Syntax | Read: SFBUNITSNUM Write: SFBUNITSNUM <value> |
| Firmware | 1.15.xx |
| Drive status | Disabled |
| Range | -2147483647 to 2147483647 |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | SFB SFBUNITSDEN |
| CANopen | 213Dh, sub-index 0 |

SFBVCBLDIST

| | |
|----------------------|---|
| Definition | Backlash Distance During Calibration of SFB Voltage Correction |
| Type | Variable (R/W) |
| Description | <p>Defines the distance of a motor movement in the opposite direction when either a positive or negative hard stop or limit switch is reached during the calibration of the voltage correction.</p> <p>This movement is used to compensate for the backlash of a gear-box.</p> <p>Afterward the movement, the drive measures U_{POS} or U_{NEG}.</p> <p>If SFBVCBLDIST is set to 0, it has no effect.</p> |
| Syntax | Read: SFBVCBLDIST Write: SFBVCBLDIST <value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | 0 |
| Unit | If MOTORTYPE 0 (Rotary): UNITSROTPOS 0 = rev UNITSROTPOS 1 = count UNITSROTPOS 2 = deg If MOTORTYPE 2 (Linear): UNITSLINPOS 0 = pitch UNITSLINPOS 1 = count UNITSLINPOS 3 = mm |
| Non-volatile | Yes |
| See also | SFB SFBVCDWELLTIME SFBVCILIM SFBVCINFO SFBVCINFO2 SFBVCMANUAL SFBVCMODE SFBVCSECT SFBVCSECT2 SFBVCSPDFAST SFBVCSPDSLOW SFBVCVLOW SFBVCVUP |
| CANopen | 215Dh, sub-index 0 |

SFBVCDWELLTIME

| | |
|----------------------|--|
| Definition | Dwell Time During Calibration of SFB Voltage Correction |
| Type | Variable (R/W) |
| Description | <p>Defines a dwell time before execution of a voltage measurement during the calibration process.</p> <p>The dwell time ensures the motor has stopped before the voltage is measured.</p> |
| Syntax | <p>Read: SFBVCDWELLTIME</p> <p>Write: SFBVCDWELLTIME <value></p> |
| Firmware | 1.20.6 |
| Drive status | Enable/Disable |
| Range | 0 to 20000 |
| Default value | 100 |
| Unit | ms |
| Non-volatile | No |
| See also | SFB SFBVCBLDIST SFBVCILIM SFBVCINFO SFBVCINFO2 SFBVCMANUAL SFBVCMODE SFBVCSECT SFBVCSECT2 SFBVCSPDFAST SFBVCSPDSLOW SFBVCVLOW SFBVCVUP |
| CANopen | 2167h, sub-index 0 |

SFBVCILIM

| | |
|----------------------|--|
| Definition | Current Limit During Calibration of SFB Voltage Correction |
| Type | Variable (R/W) |
| Description | <p>Defines the maximum current for the motor during the calibration of the voltage correction.</p> <p>This limit serves to protect the system when it moves against a hard stop.</p> <p>The user current limit ILIM is set to the value of SFBVCILIM for the duration of the calibration. ILIM is restored to its original value once the calibration is completed, or if the calibration is aborted.</p> <p>If SFBVCILIM is set to 0, it has no effect.</p> |
| Syntax | Read: SFBVCILIM Write: SFBVCILIM <value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 0 to [Minimum motor or drive peak current] |
| Default value | 0.000 |
| Unit | A |
| Non-volatile | Yes |
| See also | SFB SFBVCBLDIST SFBVCDWELLTIME SFBVCINFO SFBVCINFO2 SFBVCMANUAL SFBVCMODE SFBVCSECT SFBVCSECT2 SFBVCSPDFAST SFBVCSPDSLOW SFBVCVLOW SFBVCVUP |
| CANopen | 215Eh, sub-index 0 |

SFBVCINFO

| | |
|----------------------|---|
| Definition | SFB Voltage Correction Calibration Info for Analog Input 1 |
| Type | Command |
| Description | Returns information about the calibration of the secondary feedback voltage correction. Applicable when Analog Input 1 is used as the secondary feedback. |
| Syntax | SFBVCINFO |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| Example | <pre>-->sfbvcinfo Feature: On Calibration state: 0 Number of sectors: 6 Identified sector: 2 Sanity check error-code: 0 Voltage array: 0.0414[V], 1.1414[V], 2.3414[V], 3.5414[V], 4.3414[V], 5.2414[V], 6.0414[V], Gains: 0.909, 0.833, 0.833, 1.249, 1.111, 1.249, PFB_pos: 35.378 / PFB_neg: 3.960 in [rev] U_measured: 8234[Counts] = 3.1412[V] U_corrected: 7097[Counts] = 2.7073[V] NV save status: 0 --></pre> |

Line 1: indicates whether the calibration process is running.

Line 2: indicates the current state of the SFB voltage correction calibration process. Possible states:

```
// Idle
// Prepare the calibration process (e.g., set ILIM to SFBVCILIM)
2 // Initiate a movement in positive direction
3 // Wait for a stop condition in positive direction
4 // Initialize negative backlash compensation move
5 // Wait until the negative backlash move has been finalized
6 // Measure voltage UPOS at positive stop
7 // Initiate a movement in negative direction
8 // Wait for a stop condition in negative direction
9 // Initialize positive backlash compensation move
10 // Wait until the positive backlash move has been finalized
11 // Measure voltage UNEG at negative stop
12 // Init a stroke move, which is a movement by one section
13 // Wait for PTPVCMD to become unequal 0
14 // Wait for PTPVCMD to become 0
15 // Measure voltage at the border of the sector
16 // Save the voltage correction table
17 // Calculate SFB2MOTORNUM and SFB2MOTORDEN
18 // Finalize the calibration process (e.g., restore ILIM)
```

Line 3: user parameter, number of sections (minimum = 2, a value below 2 deactivates the process)

Line 4: the sector currently being processed:

0 ... (Number_of_sectors - 1): within the table
-1 or (Number_of_sectors): outside the table

This line is displayed only if voltage correction calibration is active.

Line 5: for developers; displays a specific error code if the voltage array fails the sanity check

Line 6: displays the measured voltages.

Line 7: displays the gains for each sector.

Line 8: displayed after the calibration process finds the upper and/or lower end position, where U_{POS} and U_{NEG} have been measured.

Lines 9 and 10: (displayed if calibration is active) displays the actual measured and the corrected voltage in internal units (26214[Counts] = 10[V]) and in volts.

Line 11: displays the status and error code of the non-volatile save at the end of the calibration process. A value of 1 means the calibration data has been properly saved to the non-volatile memory.

| | |
|-----------------|---|
| See also | SFB SFBVCBLDIST SFBVCDWELLTIME SFBVCILIM SFBVCINFO2 SFBVCMANUAL SFBVCMODE SFBVCSECT SFBVCSECT2 SFBVCSPDFAST SFBVCSPDSLOW SFBVCVLOW SFBVCVUP |
| CANopen | 2171h, sub-index 0 |

SFBVCINFO2

| | |
|----------------------|--|
| Definition | SFB Voltage Correction Calibration Info for Analog Input 2 |
| Type | Command |
| Description | Returns information about the manual calibration of the secondary feedback voltage correction. Applicable when Analog Input 2 is used. |
| Syntax | SFBVCINFO2 |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | SFB SFBVCBLDIST SFBVCDWELLTIME SFBVCILIM SFBVCINFO SFBVCMANUAL SFBVCMODE SFBVCSECT SFBVCSECT2 SFBVCSPDFAST SFBVCSPDSLOW SFBVCVLOW SFBVCVUP |
| CANopen | 2172h, sub-index 0 |

SFBVCMANUAL

| | |
|----------------------|---|
| Definition | Manual Calibration of SFB Voltage Correction |
| Type | Command |
| Description | <p>This command is used to manually simulate the calibration of the voltage correction.</p> <p>Applicable when Analog Input 2 is used. However, analog input 2 may not be connected to the motor, and is never used for dual loop control. It is for read-only purposes.</p> <p>The procedure is as follows:</p> <ol style="list-style-type: none"> 1. Set SFBVCSECT2 to the number of sectors into which the voltage range for analog input 2 will be divided. 2. Move the system to the far left (the position at which U_{NEG} will be measured), and issue the command SFBVCMANUAL 0. 3. Move the system to the next point (where U_1 is located) and issue SFBVCMANUAL 1. 4. Continually repeat step 3, incrementing the value of SFBVCMANUAL each time. 5. When complete, save the data to the non-volatile memory by issuing SFBVCMANUAL 65535. <p>Make sure the system moves the same distance for each movement (to generate equidistant strokes).</p> |
| | <p>Example of a manual calibration process with 4 sectors:</p> <ol style="list-style-type: none"> 1. Issue SFBVCSECT2 4. 2. Move system to far left position; issue SFBVCMANUAL 0. 3. Move system to next position; issue SFBVCMANUAL 1. 4. Move system to next position; issue SFBVCMANUAL 2. 5. Move system to next position; issue SFBVCMANUAL 3. 6. Move system to the next position, which is the far right in this example, and issue SFBVCMANUAL 4. 7. Finally, issue SFBVCMANUAL 65535. |
| Syntax | SFBVCMANUAL {value} |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 0 to 65535 |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |

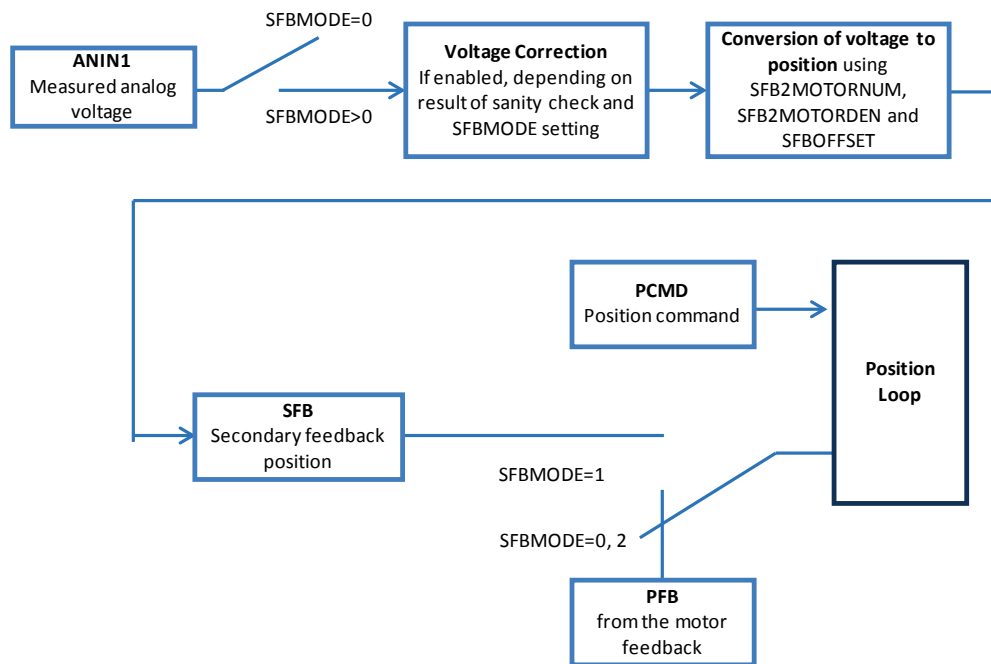
| | |
|-----------------|---|
| See also | SFB SFBMODE SFBTYPE SFBVCBLDIST SFBVCDWELLTIME SFBVCILIM SFBVCINFO SFBVCINFO2 SFBVCMODE SFBVCSECT SFBVCSECT2 SFBVCSPDFAST SFBVCSPDSLOW SFBVCVLOW SFBVCVUP |
| CANopen | 2157h, sub-index 0 |

SFBVCMODE

| | |
|----------------------|--|
| Definition | Start Calibration of SFB Voltage Correction |
| Type | Command |
| Description | <p>When secondary feedback is enabled (SFBMODE 1 or 2) and the secondary feedback signal is generated by an analog voltage (SFBTYPE 1), it may be necessary to correct the voltage read by the drive, to ensure accuracy in determining the actual position (PFB).</p> <p>SFMBVCMOVE initiates a calibration process, in which the motor is moved to designated positions and the voltage on analog input 1 is measured. The drive then adjusts the voltage values according to a correction table.</p> <p>For the calibration, the drive must be in Position Control mode (OPMODE 8) since the motor needs to move in equidistant strokes.</p> <p>In addition, secondary feedback must be deactivated (SFBMODE 0) before the calibration is initiated since the calibration uses the primary (motor) feedback to generate PFB.</p> <p>When the calibration process is completed, the secondary feedback can be reactivated and the dual loop applies the corrected voltage.</p> |
| Syntax | SFBVCMODE |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | SFB SFBMODE SFBTYPE SFBVCBLDIST SFBVCDWELLTIME SFBVCILIM SFBVCINFO SFBVCINFO2 SFBVCMANUAL SFBVCSECT SFBVCSECT2 SFBVCSPDFAST SFBVCSPDSLOW SFBVCVLOW SFBVCVUP |

CANopen

2151h, sub-index 0



SFBVCSECT

| | |
|----------------------|---|
| Definition | Sectors for Calibration of SFB Voltage Correction |
| Type | Variable (R/W) |
| Description | Defines the number of sectors into which the voltage range is divided for calibrating the secondary feedback analog voltage correction. |
| Syntax | Read: SFBVCSECT Write: SFBVCSECT <value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 0 to 10 0 = disabled |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | SFB SFBVCBLDIST SFBVCDWELLTIME SFBVCILIM SFBVCINFO SFBVCINFO2 SFBVCMANUAL SFBVCMODE SFBVCSECT2 SFBVCSPDFAST SFBVCSPDSLOW SFBVCVLOW SFBVCVUP |
| CANopen | 2152h, sub-index 0 |

SFBVCSECT2

| | |
|----------------------|--|
| Definition | Sectors for Calibration of Manual SFB Voltage Correction |
| Type | Variable (R/W) |
| Description | <p>Defines the number of sectors into which the voltage range is divided for manually calibrating the analog voltage correction.</p> <p>SFBVCSECT2 is used to perform a manual calibration when analog input 2 is used for reading a voltage, but is not connected to the motor.</p> |
| Syntax | Read: SFBVCSECT2 Write: SFBVCSECT2 <value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 0 to 10 0 = disabled |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | SFB SFBVCBLDIST SFBVCDWELLTIME SFBVCILIM SFBVCINFO SFBVCINFO2 SFBVCMANUAL SFBVCMODE SFBVCSECT SFBVCSPDFAST SFBVCSPDSLOW SFBVCVLOW SFBVCVUP |
| CANopen | 2155h, sub-index 0 |

SFBVCSPDFAST

| | |
|----------------------|---|
| Definition | Fast Speed During Calibration of SFB Voltage Correction |
| Type | Variable (R/W) |
| Description | <p>Defines the speed of the motor to be used during the calibration if the measured voltage on analog input 1 is between SFBVCVUP and SFBVCVLOW.</p> <p>Serves to speed up the calibration process.</p> <p>Movement during the calibration is at a speed of 60 rpm if any of the following conditions are true:</p> <p>ANIN1 <= SFBVCVLOW</p> <p>ANIN1 >= SFBVCVUP</p> <p>SFBVCVLOW = SFBVCVUP</p> <p>Movement during the calibration is at speed SFBVCSPDFAST if SFBVCVLOW < ANIN1 < SFBVCVUP.</p> <p>The calibration always uses SFBVCSPDFAST for the stroke movements (to the positions at which U_1, U_2 .. U_n are measured).</p> |
| Syntax | <p>Read: SFBVCSPDFAST</p> <p>Write: SFBVCSPDFAST <value></p> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 0 to VLIM |
| Default value | 600.000 (rpm) |
| Unit | According to MOTORTYPE and UNITSROTVEL/UNITSLINVEL |
| Non-volatile | Yes |
| See also | SFB SFBVCBLDIST SFBVCDWELLTIME SFBVCILIM SFBVCINFO SFBVCINFO2 SFBVCMANUAL SFBVCMODE SFBVCSECT SFBVCSPDFAST SFBVCSPDSLOW SFBVCVLOW SFBVCVUP |
| CANopen | 215Fh, sub-index 0 |

SFBVCSPDSLOW

| | |
|----------------------|--|
| Definition | Slow Speed During Calibration of SFB Voltage Correction |
| Type | Variable (R/W) |
| Description | Defines the speed of the motor to be used during the calibration if the measured voltage on analog input 1 is higher than SFBVCVUP or less than SFBVCVLOW. Serves to speed up the calibration process. |
| Syntax | Read: SFBVCSPDSLOW Write: SFBVCSPDSLOW <value> |
| Firmware | 1.20.6 |
| Drive status | Enabled Disabled |
| Range | 0 to VLIM |
| Default value | 60.000 (rpm) |
| Unit | According to MOTORTYPE and UNITSROTVEL/UNITSLINVEL |
| Non-volatile | Yes |
| See also | SFB SFBVCBLDIST SFBVCDWELLTIME SFBVCILIM SFBVCINFO SFBVCINFO2 SFBVCMANUAL SFBVCMODE SFBVCSECT SFBVCSECT2 SFBVCSPDFAST SFBVCSPDSLOW SFBVCVLOW SFBVCVUP |
| CANopen | 2160h, sub-index 0 |

SFBVCVLOW

| | |
|----------------------|---|
| Definition | Lower Voltage for Speed During Calibration of SFB Voltage Correction |
| Type | Variable (R/W) |
| Description | Defines the lower voltage level at which the calibration process changes the speed from SFBVCSPDFAST to 60 rpm. Serves to speed up the calibration process when trying to find the positive and the negative end stops (positions at which U_{POS} and U_{NEG} are measured). |
| Syntax | Read: SFBVCVLOW Write: SFBVCVLOW <value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | -10 to 10 |
| Default value | 0.000 |
| Unit | V |
| Non-volatile | Yes |
| See also | SFB SFBVCBLDIST SFBVCDWELLTIME SFBVCILIM SFBVCINFO SFBVCINFO2 SFBVCMANUAL SFBVCMODE SFBVCSECT SFBVCSECT2 SFBVCSPDFAST SFBVCSPDSLOW SFBVCVUP |
| CANopen | 2153h, sub-index 0 |

SFBVCVUP

| | |
|----------------------|--|
| Definition | Upper Voltage for Speed During Calibration of SFB Voltage Correction |
| Type | Variable (R/W) |
| Description | Defines the upper voltage level at which the calibration process changes the speed from SFBVCSPDFAST to 60 rpm. Serves to speed up the calibration process when trying to find the positive and the negative end stops (positions at which U_{POS} and U_{NEG} are measured). |
| Syntax | Read: SFBVCVUP Write: SFBVCVUP <value> |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | 0 to 10 |
| Default value | 0.000 |
| Unit | V |
| Non-volatile | Yes |
| See also | SFB SFBVCBLDIST SFBVCDWELLTIME SFBVCILIM SFBVCINFO SFBVCINFO2 SFBVCMANUAL SFBVCMODE SFBVCSECT SFBVCSECT2 SFBVCSPDFAST SFBVCSPDSLOW SFBVCVLOW |
| CANopen | 2154h, sub-index 0 |

SFBVEL

| | |
|----------------------|--|
| Definition | Secondary Feedback Velocity |
| Type | Variable (R) |
| Description | Indicates the velocity of the motor as measured by the secondary feedback. |
| Syntax | SFBVEL |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | user-defined velocity unit per second |
| Non-volatile | No |
| See also | SFB SFBMODE |
| CANopen | 2141h, sub-index 0 |

SININIT

| | |
|----------------------|--|
| Definition | Sine/Cosine Calibration Command |
| Type | Command |
| Description | <p>Activates a procedure that calibrates sine encoder or resolver sine and cosine signals. The calibration serves to reduce harmonic errors in the sine encoder or resolver reading.</p> <p>The procedure averages sine encoder or resolver signals over several motor turns to determine the gain and offset correction.</p> <p>The progress of the procedure is reported by the SININITST command, and the resulting calibration gains and offsets are reported by SINPARAM.</p> |
| Syntax | SININIT |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | FEEDBACKTYPE RESBW SININITMODE SININITST SINPARAM |
| CANopen | 20BEh, sub-index 0 |

SININITMODE

| | |
|----------------------|---|
| Definition | Sine/Cosine Calibration Mode |
| Type | Variable (R/W) |
| Description | Enables/disables the automatic calibration of sine encoder or resolver sine and cosine signals at power up. |
| Syntax | Read: SININITMODE Write: SININITMODE <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Automatic calibration of sine and cosine signals disabled 1 = Automatic calibration of sine and cosine signals enabled |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | FEEDBACKTYPE RESBW SININITST SINPARAM |
| CANopen | 20BFh, sub-index 0 |

SININITST

| | |
|----------------------|---|
| Definition | Sine/Cosine Calibration Status |
| Type | Variable (R) |
| Description | Reports the status of the sine encoder or resolver calibration procedure. |
| Syntax | SININITST |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Not started, or completed 1 = In progress 2 = Velocity is too high |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | FEEDBACKTYPE HWPOS RESBW SINPARAM SININITMODE |
| CANopen | 20C0h , sub-index 0 |

SINPARAM

| | |
|----------------------|--|
| Definition | Sine/Cosine Calibration Parameters |
| Type | Variable (R) |
| Description | Returns the parameters that are used for calibrating sine encoder or resolver sine and cosine signals. The parameters are in hexadecimal representation. |
| Syntax | SINPARAM |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | SINPARAM SININITST FEEDBACKTYPE |
| CANopen | 20C1h , sub-index 0 |

SKTEMPVOLT

| | |
|----------------------|--|
| Definition | Sankyo Temperature and Battery Voltage |
| Type | Variable (R) |
| Description | <p>Reads the temperature of the Sankyo encoder and the voltage of the backup battery.</p> <p>The values are not calibrated and should be used for trend indication only, and not as accurate indications.</p> <p>The battery voltage is read only once, at power up.</p> |
| Syntax | SKTEMPVOLT |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | |
| Default value | |
| Unit | °C |
| Non-volatile | No |
| See also | SKTURNRESET THERM TMTEMP |

SKTURNRESET

| | |
|----------------------|--|
| Definition | Sankyo Multi-Turn Reset |
| Type | Command |
| Description | <p>Resets the counter of a Sankyo multi-turn encoder.</p> <p>SKTURNRESET clears the encoder's internal faults and resets the multi-turn counter. This prevents unpredictable values in the multi-turn position counter if the backup battery becomes disconnected and the encoder is not being powered by the drive.</p> <p>If the backup battery is disconnected while the encoder is not connected to the drive, an Absolute Encoder Battery Fault is issued. To clear this fault, use the SKTURNRESET command, and then use the CLEARFAULT command.</p> |
| Syntax | SKTURNRESET |
| Firmware | 1.15.xx |
| Drive status | Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | CLEARFAULTS SKTEMPVOLT |
| CANopen | 215Ah, sub-index 0 |

SRVSNSINFO

| | |
|----------------------|--|
| Definition | sensAR Encoder Info |
| Type | Variable (R) |
| Description | <p>Returns information about the sensAR encoder.</p> <p>A valid response includes the following data:</p> <ul style="list-style-type: none"> ■ Production information – serial and product numbers of the device ■ Hardware – PCB and BOM revisions ■ Software – Firmware version info and sensAR protocol version ■ Online data: <ul style="list-style-type: none"> Temperature reading Raw velocity and in-turn position values Current sensAR faults and warnings information |
| Syntax | SRVSNSINFO |
| Firmware | 1.15.xx |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| Example | <pre>-->SRVSNSINFO sensAR Magnetic Encoder ----- Production Information: Encoder: P/N: PRDr0099000z-02 Rev: 01 S/N: I1914_00000015 Stator Assembly: P/N: PRDr0099STAT-02 Rev: 01 S/N: S1314_00000015 Hardware: PCB Rev: H0003 BOM Rev: H0000 Software: FW Version: 2.0.7 FW Version Date: 20140922 Comm Protocol Version: 002.005.006</pre> |

| | |
|-----------------|--|
| | Online data: Device Temperature: 39C Raw in-turn position value: 3978751 Raw velocity value: 0 No faults exist on sensAR |
| See also | |
| CANopen | 214Ch, sub-index 1 |

ST

| | |
|----------------------|---|
| Definition | Drive Status Messages |
| Type | Command |
| Description | Returns detailed drive status messages. |
| Syntax | ST |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| Example | -->st Drive Active |
| See also | ACTIVE FLT FLTHIST READY REMOTE SWEN |
| CANopen | 2114h, sub-index 1 |

STALLTIME

| | |
|----------------------|--|
| Definition | Stall Time |
| Type | Variable (R/W) |
| Description | <p>The minimum length of time at which a stall condition generates a stall fault.</p> <p>A stall condition occurs when $[I > \text{MICONT}]$ and $[I > 0.9 \times \text{ILIM}]$ and $[V < \text{STALLVEL}]$.</p> <p>A stall fault occurs whenever the duration of a stall condition exceeds STALLTIME.</p> <p>The drive's 7-segment display shows F3 when a stall fault occurs.</p> |
| Syntax | Read: STALLTIME Write: STALLTIME <value> |
| Firmware | 1.3.2 |
| Drive status | Enabled Disabled |
| Range | 0 to 10000 |
| Default value | 0 = Fault inhibited |
| Unit | ms |
| Non-volatile | Yes |
| See also | STALLVEL |

STALLVEL

| | |
|----------------------|---|
| Definition | Stall Velocity |
| Type | Variable (R/W) |
| Description | <p>The velocity threshold for entering a stall condition.</p> <p>A stall condition occurs when $[I > \text{MICONT}]$ and $[I > 0.9 \times \text{ILIM}]$ and $[V < \text{STALLVEL}]$.</p> <p>A stall fault occurs whenever a stall condition exceeds STALLTIME.</p> |
| Syntax | <p>Read: STALLVEL</p> <p>Write: STALLVEL<value></p> |
| Firmware | 1.3.2 |
| Drive status | Enabled Disabled |
| Range | <p>If MOTORTYPE 0 (Rotary): $(2^{31} - 1)$ [rpm]</p> <p>If MOTORTYPE 2 (Linear): $(2^{31} - 1)$ [mm/s]</p> |
| Default value | 10.000 rpm |
| Unit | <p>If MOTORTYPE 0 (Rotary):</p> <ul style="list-style-type: none"> If UNITSROTVEL 0 = rps If UNITSROTVEL 1 = rpm If UNITSROTVEL 2 = deg/s <p>If MOTORTYPE 2 (Linear):</p> <ul style="list-style-type: none"> UNITSLINVEL 1 = mm/s |
| Non-volatile | Yes |
| See also | STALLTIME |

STAT

| | |
|----------------------|--|
| Definition | Drive Status Summary Word |
| Type | Command |
| Description | Outputs a drive status summary word. |
| Firmware | 1.0.6 |
| Syntax | STAT |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Hexadecimal |
| Non-volatile | No |
| Example | -->stat H0023 --> |
| See also | ST STATUS |

STATUS

| | |
|----------------------|--|
| Definition | Drive Status Detail Words |
| Type | Command |
| Description | Outputs a series of drive status summary words. |
| Syntax | STATUS |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Hexadecimal |
| Non-volatile | No |
| Example | -->status H0009 H00000000000060800 H00C0 H0000 H0000 H0000 --> |
| See also | ST STAT |

STEP

| | |
|----------------------|---|
| Definition | Step Command |
| Type | Command |
| Description | Generates a step or square wave velocity command. This command is similar to the J command, but allows repetition of STEP to create a square wave velocity command. |
| Syntax | STEP { <i>duration1</i> } { <i>velocity1</i> } [<i>duration2</i> <i>velocity2</i>] |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | <i>duration</i> 1/2 = unlimited positive value <i>velocity</i> 1/2 = -VLIM to +VLIM |
| Default value | Not Applicable |
| Unit | <i>Duration</i> = ms <i>Velocity</i> = If MOTORTYPE 0 (Rotary): If UNITSROTVEL 0 = rps If UNITSROTVEL 1 = rpm If UNITSROTVEL 2 = deg/s If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = mm/s |
| Non-volatile | Not Applicable |
| See also | ACC J OPMODE RECORD STOP VLIM |

STOP

| | |
|----------------------|---|
| Definition | Stop Motion Command |
| Type | Command |
| Description | <p>Stops motion in OPMODE 0 (J and STEP commands) and OPMODE 2 (T command). Unlike the K command, the drive is not disabled using the STOP command.</p> <p>In OPMODE 1 or 3, STOP is ignored.</p> |
| Note | <p>Do not use STOP to stop motion generated by HOMECMD. To stop a homing procedure, use the command HOMECMD 0.</p> |
| Syntax | STOP |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | DEC DECSTOP J STEP |

STOPPED

| | |
|----------------------|---|
| Definition | Position Motion Ended |
| Type | Variable (R) |
| Description | <p>Reports whether the position profile generated by MOVEINC and MOVEABS has been completed, therefore allowing the next command to be issued.</p> <p>STOPPED is updated while drive is operating in OPMODE 8. It is also updated in OPMODE 0 provided the HD velocity controller is active (VELCONTROLMODE=7).</p> |
| Syntax | STOPPED |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | <p>-1 = Movement was interrupted (e.g., due to Disable or Hold)</p> <p>0 = Not completed</p> <p>1 = Profile completed</p> <p>2 = Profile completed and drive is in position (INPOS=1)</p> |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | HOLD PEINPOS PEINPOSTIME PEMAX PTPVCMD V VCMD VELCONTROLMODE |
| CANopen | 2116h, sub-index 0 |

STOPPEDDURATE

| | |
|----------------------|--|
| Definition | Position Motion Ended |
| Type | Variable (R/W) |
| Description | Gets/sets the time, in millisenconds, for which the output that is configured to indicate "stopped" status (OUTMODE <i>n</i> 5) remains triggered. |
| Syntax | Read: STOPPEDDURATE Write: STOPPEDDURATE < <i>value</i> > |
| Firmware | 1.41.9 |
| Drive status | Enabled Disabled |
| Range | 1 to 1000 |
| Default value | 0 |
| Unit | ms |
| Non-volatile | Yes |
| See also | OUTMODE |
| CANopen | |

SWEN

| | |
|----------------------|---|
| Definition | Software Enable Status |
| Type | Variable (R) |
| Description | Indicates the state of software enable. This condition can be toggled using the EN and K commands. |
| Syntax | SWEN |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Software enable switch off (K command has been issued) 1 = Software enable switch on (EN command has been issued) |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | ACTIVE EN FLT K READY REMOTE ST SWENMODE |
| CANopen | 20A2h, sub-index 0 |

SWENMODE

| | |
|----------------------|---|
| Definition | Software Enable on Power-Up |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the state of the Software Enable switch when the drive is powered up.</p> <p>Requires COMMODE=0.</p> <p>SWENMODE is applicable only to drives using serial communication (COMMODE=0).</p> <p>SWENMODE is not applicable to drives using CANopen and EtherCAT communication (COMMODE=1).</p> |
| Syntax | <p>Read: SWENMODE</p> <p>Write: SWENMODE <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | <p>0 = Software Enable is off at power-up</p> <p>1 = Software Enable is on at power-up</p> |
| Default value | 0 |
| Unit | Not applicable |
| Non-volatile | Yes |
| See also | ACTIVE COMMODEEN READY SWEN |

SYNCSOURCE

| | |
|----------------------|---|
| Definition | Synchronization Mode |
| Type | Variable (R/W) |
| Description | <p>Sets the method used to synchronize the drive clock to an external sync signal.</p> <p>When the drive detects a SYNC signal from EtherCAT or CANopen, it automatically sets SYNCSOURCE to a value of 5 or 6, respectively.</p> |
| Syntax | <p>Read: SYNCSOURCE</p> <p>Write: SYNCSOURCE <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | <p>0 = Disabled; no sync</p> <p>1 = Sync drive clock to controller based on fast digital input 5</p> <p>2 = Sync drive clock to controller based on fast digital input 6</p> <p>3 = Sync drive clock based on pulse differential input (Pulse & Direction)</p> <p>4 = Sync signal source is pulse input from Machine I/F</p> <p>5 = Automatically set in EtherCAT drive (EC and EB models). Read only.</p> <p>6 = Automatically set in CAN drive (AF model). Read only.</p> |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | INMODE |
| CANopen | 20C2h, sub-index 0 |

T

| | | |
|----------------------|---|-------------------|
| Definition | Current Command | |
| Type | Command | |
| Description | <p>Sets the current in OPMODE 2 (serial current mode). This command is subject to current limits, clamps, and digital filtering, and it is set to zero whenever the drive is enabled or disabled.</p> <p>The commands STOP and K , and changing the operating mode, also zero the value of T.</p> | |
| Syntax | T T { <i>current</i> [<i>duration</i>]} | Queries Writes |
| Firmware | 1.0.6 | |
| Drive status | Enabled | |
| Range | Not Applicable | |
| Default value | Not Applicable | |
| Unit | <i>current</i> = A (peak) <i>duration</i> = ms | |
| Non-volatile | Not Applicable | |
| See also | I ICMD ILIM OPMODE | |
| CANopen | 6071h, sub-index 0 | |

TF

| | |
|----------------------|--|
| Definition | Tracking Factor |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the derivative factor for tracking with PDFF velocity controller.</p> <p>0 = No derivative factor</p> <p>100 = Derivative factor to match bandwidth and not overshoot.</p> <p>200 = Derivative factor to match PI control; may overshoot. Intermediate values are interpolated.</p> |
| Syntax | <p>Read: TF</p> <p>Write: TF <value></p> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 200 |
| Default value | 100 |
| Unit | % |
| Non-volatile | Yes |
| See also | <p>BW</p> <p>LMJR</p> <p>MJ</p> <p>VELCONTROLMODE</p> |
| CANopen | 20C3h, sub-index 0 |

THERM

| | |
|----------------------|---|
| Definition | Motor Over-Temperature |
| Type | Variable (R) |
| Description | The state of the motor thermostat input, which indicates whether an over-temperature condition exists. |
| Syntax | THERM |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Thermostat input closed (normal) or ignored (THERMODE 3). 1 = Thermostat input open, indicating overheating |
| Default value | Not Applicable |
| Unit | Not applicable |
| Non-volatile | No |
| See also | THERMODE THERMREADOUT THERMTRIPLEVEL THERMCLEARLEVEL THERMTIME THERMTYPE |
| CANopen | 20C4h , sub-index 0 |

THERMCLEARLEVEL

| | |
|----------------------|---|
| Definition | Motor Over-Temperature Clear Fault Level |
| Type | Variable (R/W) |
| Description | The level at which a motor over-temperature fault is cleared. |
| Syntax | Read: THERMCLEARLEVEL Write: THERMCLEARLEVEL <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 1000000 |
| Default value | 100 |
| Unit | Ohm |
| Non-volatile | Yes |
| See also | THERMODE THERMTRIPLEVEL |
| CANopen | 20C5h , sub-index 0 |

THERMODE

| | |
|----------------------|--|
| Definition | Motor Over-Temperature Mode |
| Type | Variable (R/W) |
| Description | Gets/sets a value that defines how the drive will respond to an over-temperature fault. |
| Syntax | Read: THERMODE Write: THERMODE <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Disable drive immediately. 3 = Ignore thermostat input. 4 = Issue warning only. 5 = Issue warning; if condition persists after THERMTIME, issue fault. |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | THERM THERMCLEARLEVEL THERMREADOUT THERMTIME THERMTRIPLELEVEL THERMTYPE |
| CANopen | 20C6h , sub-index 0 |

THERMREADOUT

| | |
|----------------------|---|
| Definition | Motor Temperature |
| Type | Variable (R) |
| Description | Indicates the value of the motor temperature. |
| Syntax | THERMREADOUT |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 1000000 |
| Default value | Not Applicable |
| Unit | Ohm |
| Non-volatile | No |
| See also | THERM THERMODE THERMTIME THERMTYPE |
| CANopen | 20C7h, sub-index 0 |

THERMTIME

| | |
|----------------------|---|
| Definition | Motor Over-Temperature Time |
| Type | Variable (R/W) |
| Description | Gets/sets the number of seconds the drive will wait after motor over-temperature detection before it opens the fault relay. |
| Syntax | Read: THERMTIME Write: THERMTIME <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 300 |
| Default value | 30 |
| Unit | second |
| Non-volatile | Yes |
| See also | THERM THERMODE THERMREADOUT THERMTYPE |
| CANopen | 20C8h , sub-index 0 |

THERMTRIPLEVEL

| | |
|----------------------|---|
| Definition | Motor Over-Temperature Fault Level |
| Type | Variable (R/W) |
| Description | Indicates the motor over-temperature fault level. |
| Syntax | THERMTRIPLEVEL |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 1000000 |
| Default value | 150 |
| Unit | Ohm |
| Non-volatile | Yes |
| See also | THERMCLEARLEVEL THERMODE |
| CANopen | 20C9h, sub-index 0 |

THERMTYPE

| | |
|----------------------|--|
| Definition | Motor Over-Temperature Type |
| Type | Variable (R/W) |
| Description | Gets/sets the value that indicates the type of motor temperature sensor. |
| Syntax | Read: THERMTYPE Write: THERMTYPE <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Positive temperature coefficient (PTC) 1 = Negative temperature coefficient (NTC) |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | THERM THERMODE THERMREADOUT THERMTIME |
| CANopen | 20CAh, sub-index 0 |

TMTEMP

| | |
|----------------------|--|
| Definition | Tamagawa Temperature |
| Type | Variable (R) |
| Description | Indicates the temperature of the Tamagawa encoder. |
| Note | If the drive is not connected to a Tamagawa encoder, the response to TMTEMP will be "MENCTYPE Mismatch". |
| Syntax | TMTEMP |
| Firmware | 1.2.12 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | °C (relevant for Tamagawa encoder only) |
| Non-volatile | No |
| See also | MENCTYPE TMTURNRESET |

TMTURNRESET

| | |
|----------------------|--|
| Definition | Tamagawa Multi-Turn Reset |
| Type | Command |
| Description | Resets the position counter of a Tamagawa multi-turn encoder. |
| Note | When using a Tamagawa 17-bit multi-turn encoder, TMTURNRESET must be issued prior to a CLEARFAULT command. |
| Syntax | TMTURNRESET |
| Firmware | 1.2.12 |
| Drive status | Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| See also | FEEDBACKTYPE MENCTYPE MTTURNRESET |
| CANopen | 20CBh, sub-index 0 |

TRUN

| | |
|----------------------|---|
| Definition | Run Time |
| Type | Variable (R) |
| Description | A counter that reports the total elapsed runtime of the drive (in both enabled and disabled state) since production. Cannot be reset. |
| Syntax | TRUN |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | hours:minutes:seconds |
| Non-volatile | No |
| See also | DRIVENAME |
| CANopen | 20CCh, sub-index 0 |

UNITSLINACC

| | |
|----------------------|--|
| Definition | Units Linear Acc/Dec |
| Type | Variable (R/W) |
| Description | Gets/sets a value that defines the units of acceleration and deceleration variables in a linear system. |
| Syntax | Read: UNITSLINACC Write: UNITSLINACC <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 1 = mm/s ² |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | MOTORTYPE UNITSLINPOS UNITSLINVEL UNITSROTACC |
| CANopen | 2117h , sub-index 0 |

UNITSLINPOS

| | |
|----------------------|--|
| Definition | Units Linear Position |
| Type | Variable (R/W) |
| Description | Gets/sets a value that defines the units of position variables in a linear system. |
| Syntax | Read: UNITSLINPOS Write: UNITSLINPOS <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = pitch (motor cycles) 1 = count (pulses per revolution - PPR lines) 3 = mm |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | MOTORTYPE UNITSLINACC UNITSLINVEL UNITSROTPOS |
| CANopen | 2118h , sub-index 0 |

UNITSLINVEL

| | |
|----------------------|--|
| Definition | Units Linear Velocity |
| Type | Variable (R/W) |
| Description | Gets/sets a value that defines the units of velocity variables in a linear system. |
| Syntax | Read: UNITSLINVEL Write: UNITSLINVEL <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 1 = mm/s |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | MOTORTYPE UNITSLINACC UNITSLINPOS UNITSROTVEL |
| CANopen | 2119h , sub-index 0 |

UNITSROTACC

| | |
|----------------------|---|
| Definition | Units Rotary Acc/Dec |
| Type | Variable (R/W) |
| Description | Gets/sets a value that defines the units of acceleration and deceleration variables in a rotary system. |
| Syntax | Read: UNITSROTACC Write: UNITSROTACC <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = rps/s 1 = rpm/s 2 = deg/s ² |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | ACC DEC DECSTOP UNITSROTPOS UNITSROTVEL |
| CANopen | 211Ah, sub-index 0 |

UNITSROTPOS

| | |
|----------------------|--|
| Definition | Units Rotary Position |
| Type | Variable (R/W) |
| Description | Gets/sets a value that defines the units of position variables in a rotary system. |
| Syntax | Read: UNITSROTPOS Write: UNITSROTPOS <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = (rev) Motor revolutions 1 = (count) Motor feedback counts, multiplied as follows: <ul style="list-style-type: none"> • Incremental motor feedback = multiplied by 4 (quad) • Resolver motor feedback = multiplied by MRESPOLES • Sine motor feedback = multiplied by 4 and the interpolation level of the sine encoder 2 = (deg) Degrees |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | UNITSROTACC UNITSROTVEL |
| CANopen | 211Bh, sub-index 0 |

UNITSROTVEL

| | |
|----------------------|---|
| Definition | Units Rotary Velocity |
| Type | Variable (R/W) |
| Description | Gets/sets a value that defines the units of velocity variables in a rotary system. |
| Syntax | Read: UNITSROTVEL Write: UNITSROTVEL <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = rps 1 = rpm 2 = deg/s |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | UNITSROTACC UNITSROTPOS V VCMD |
| CANopen | 211Ch, sub-index 0 |

UVMODE

| | |
|----------------------|---|
| Definition | Under-Voltage Mode |
| Type | Variable (R/W) |
| Description | Gets/sets a value that defines how the drive will respond to an under-voltage condition. |
| Syntax | Read: UVMODE Write: UVMODE <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Latches fault immediately if drive disabled or enabled. 1 = Issues warning if drive enabled. Ignores if drive disabled. 2 = Issues warning if drive enabled, then waits UVTIME before latching the fault. Ignores if drive disabled. 3 = Issues warning if drive disabled. Latches fault immediately if drive enabled. |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | UVRECOVER UVTHRESH UVTIME VBUS VBUSREADOUT |
| CANopen | 20CDh, sub-index 0 |

UVRECOVER

| | |
|----------------------|--|
| Definition | Under-Voltage Recovery Mode |
| Type | Variable (R/W) |
| Description | Gets/sets a value that defines how the drive will recover from an under-voltage fault. |
| Syntax | Read: UVRECOVER Write: UVRECOVER <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 = Recovers by toggling drive from disable to enable condition after the under-voltage condition clears. 1 = Automatically recovers when the under-voltage condition clears. |
| Default value | 0 |
| Unit | Not applicable |
| Non-volatile | Yes |
| See also | UVMODE UVTHRESH UVTIME VBUS VBUSREADOUT |
| CANopen | 20CEh, sub-index 0 |

UVTHRESH

| | |
|----------------------|--|
| Definition | Under-Voltage Threshold |
| Type | Variable (R/W) |
| Description | Gets/set the level for detection of an under-voltage condition. |
| Syntax | Read: UVTHRESH Write: UVTHRESH <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 90 to 1000 |
| Default value | 100 |
| Unit | V |
| Non-volatile | Yes |
| See also | UVMODE UVRECOVER UVTIME VBUS VBUSREADOUT |
| CANopen | 20CFh, sub-index 0 |

UVTIME

| | |
|----------------------|---|
| Definition | Under-Voltage Time |
| Type | Variable (R/W) |
| Description | Gets/sets the amount of time that an under-voltage warning will be displayed ("u") before it is latched in UVMODE 2. In UVMODE 3, the time begins when the drive is enabled. |
| Syntax | Read: UVTIME Write: UVTIME <value> |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 0 to 300 |
| Default value | 30 |
| Unit | second |
| Non-volatile | Yes |
| See also | UVMODE UVRECOVER UVTHRESH VBUS VBUSREADOUT |
| CANopen | 20D0h , sub-index 0 |

V

| | |
|----------------------|--|
| Definition | Velocity |
| Type | Variable (R) |
| Description | Indicates the velocity of the motor measured by the primary feedback. |
| Syntax | V |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | If MOTORTYPE 0 (Rotary): $(2^{31} - 1)$ [rpm] If MOTORTYPE 2 (Linear): $(2^{31} - 1)$ [mm/s] |
| Default value | Not Applicable |
| Unit | If MOTORTYPE 0 (Rotary): If UNITSROTVEL 0 = rps If UNITSROTVEL 1 = rpm If UNITSROTVEL 2 = deg/s If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = mm/s |
| Non-volatile | No |
| See also | UNITSROTVEL VCMD |
| CANopen | 606Ch, sub-index 0 |

VBUS

| | |
|----------------------|--|
| Definition | Bus Voltage (DC) |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the drive bus voltage, used for current controller design. VBUS also affects the value of VMAX.</p> <p>When the value of VBUS is changed, CONFIG is required.</p> |
| Syntax | <p>Read: VBUS</p> <p>Write: VBUS <value></p> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 10 to 850 |
| Default value | 320 |
| Unit | V |
| Non-volatile | Yes |
| See also | OVTHRESH UVMODE UVTHRESH VBUSREADOUT |
| CANopen | 20D1h, sub-index 0 |

VBUSREADOUT

| | |
|----------------------|--|
| Definition | Bus Voltage Measured |
| Type | Variable (R) |
| Description | Indicates the bus voltage measured by sensors on the power module. |
| Syntax | VBUSREADOUT |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | Hardware-defined |
| Default value | Not Applicable |
| Unit | V |
| Non-volatile | No |
| See also | OVTHRESH UVMODE UVTHRESH VBUS |
| CANopen | 6079h , sub-index 0 |

VCMD

| | |
|----------------------|--|
| Definition | Velocity Command |
| Type | Variable (R) |
| Description | Indicates the velocity command generated either directly (serial or analog), or as the output of the position controller. |
| Syntax | VCMD |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | If MOTORTYPE 0 (Rotary): $(2^{31} - 1)$ [rpm] If MOTORTYPE 2 (Linear): $(2^{31} - 1)$ [mm/s] |
| Default value | Not Applicable |
| Unit | If MOTORTYPE 0 (Rotary): If UNITSROTVEL 0 = rps If UNITSROTVEL 1 = rpm If UNITSROTVEL 2 = deg/s If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = mm/s |
| Non-volatile | No |
| See also | OPMODE UNITSROTVEL V |
| CANopen | 606Bh, sub-index 0 |

VD

| | |
|----------------------|--|
| Definition | Advanced Pole Placement D Polynomial |
| Type | Variable (R/W) |
| Description | Extended velocity controller D-polynomial. |
| Syntax | Read: VD Write: VD 0 0 0 0 0 0 0 |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | 0 0 0 0 0 0 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | VELCONTROLMODE VF VH VR |

VE

| | |
|----------------------|---|
| Definition | Velocity Error |
| Type | Variable (R) |
| Description | The velocity error of velocity loop |
| Syntax | VE |
| Firmware | 1.2.12 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | If MOTORTYPE 0 (Rotary): If UNITSROTVEL 0 =rps If UNITSROTVEL 1 =rpm If UNITSROTVEL 2 =deg/s If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = mm/s |
| Non-volatile | No |
| See also | V VCMD |
| CANopen | 20D3h, sub-index 0 |

VELCMDMOVEAVG

| | |
|----------------------|--|
| Definition | Velocity Command Moving Average Filter |
| Type | Variable (R/W) |
| Description | This command sets the moving average filter that is applied to the velocity command value in OPMODE 0 and OPMODE 1. The moving average filter is applied immediately after the ramp generator. |
| Syntax | Read: VELCMDMOVEAVG Write: VELCMDMOVEAVG <value> |
| Firmware | 1.40.0 |
| Drive status | Disabled |
| Range | 0 to 255875 |
| Default value | 0 |
| Unit | µs (must be a multiple of 125) |
| Non-volatile | Yes |
| Example | --> VELCMDMOVEAVG 750 -->BAUDRATE 1125 --> |
| See also | |

VELCONTROLMODE

| | |
|----------------------|--|
| Definition | Velocity Loop Controller |
| Type | Variable (R/W) |
| Description | Gets/sets a value that defines the type of velocity loop controller. |
| Syntax | Read: VELCONTROMODE Write: VELCONTROMODE <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 = PI controller (uses KVP, KVI) 1 = PDFF controller (uses KVP, KVI, KVFR) 2 = Standard pole placement controller (uses MJ, MKT, BW, LMJR, TF) 7 = HD velocity loop with integrator (uses KNLD, KNLP) |
| Note | VELCONTROLMODE 7 provides the advantages of the HD nonlinear controller for velocity control. Use the Autotuning procedure to first tune the position loop, and then switch to the velocity loop (VELCONTROLMODE 7) |
| Default value | 7 |
| Unit | Not applicable |
| Non-volatile | Yes |
| See also | ICMD IGRAV VF |
| CANopen | 20D4h, sub-index 0 |

VELCONTROLOUT

| | |
|----------------------|---------------------------------|
| Definition | Velocity Loop Controller Output |
| Type | Variable (R) |
| Description | Velocity loop controller output |
| Syntax | VELCONTROLOUT |
| Firmware | 1.4.4 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | A |
| Non-volatile | No |
| See also | VELFILTMODE |

VELDESIGN

| | |
|----------------------|--|
| Definition | Velocity Design Conversion |
| Type | Command |
| Description | Returns a conversion of the internal velocity controller as set by one of the standard velocity control modes to a general extended polynomial controller structure. Applicable only to linear position controller (POSCTRLMODE 0). |
| Syntax | VELDESIGN |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| Example | <pre>-->veldesign VD = 0 0 0 0 0 32767 VH = 31644 20 0 0 0 0 0 0 VR = 31644 20 0 0 0 0</pre> |
| See also | FILTMODE POSCTRLMODE VD VELCTRLMODE VF VH VR |
| CANopen | 20D5h, sub-index 0 |

VELFILTRQ

| | |
|----------------------|--|
| Definition | Velocity Filter Pole Frequency |
| Type | Variable (R/W) |
| Description | When VELFILTMODE=1, sets the first order filter, which is applied to the velocity feedback signal before applying the velocity controller. |
| Syntax | VELFILTRQ <value> |
| Firmware | 1.3.2 |
| Drive status | Disabled |
| Range | 20 to 2000 |
| Default value | 440 |
| Unit | Hz |
| Non-volatile | Yes |
| See also | |
| CANopen | 211Dh, sub-index 0 |

VELFILTMODE

| | |
|----------------------|---|
| Definition | Velocity Filter Mode |
| Type | Variable (R/W) |
| Description | Gets/sets the type of filter that is used for extraction of a velocity signal from the position feedback. |
| Syntax | Read: VELFILTMODE Write: VELFILTMODE <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 = No filter 1 = First order filter |
| Default value | 1 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | FILTMODE V VELCONTROLMODE |
| CANopen | 20D6h, sub-index 0 |

VEMAX

| | |
|----------------------|--|
| Definition | Maximum Velocity Error |
| Type | Variable (R/W) |
| Description | Maximum velocity error value that does not produce a fault. |
| Syntax | Read: VEMAX Write: VEMAX <value> |
| Firmware | 1.4.4 |
| Drive status | Enabled Disabled |
| Range | 0 to 6000 [rpm] |
| Default value | 0 |
| Unit | If MOTORTYPE 0 (Rotary): If UNITSROTVEL 0 = rps If UNITSROTVEL 1 = rpm If UNITSROTVEL 2 = deg/s If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = mm/s |
| Non-volatile | Yes |
| See also | PEMAX VLIM |

VER

| | |
|----------------------|---|
| Definition | Drive Version |
| Type | Command |
| Syntax | VER |
| Description | Displays the firmware version. |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | Not Applicable |
| Example | <pre>-->ver Digital Servo Drive ----- Firmware Version: 1.15.19 FPGA Version : 1.79 November 12 2014 Resident Version: 1.2.1 --></pre> |
| See also | INFO |
| CANopen | 20D7h, sub-index 1 |

VF

| | |
|----------------------|--|
| Definition | Velocity Loop Output Filter |
| Type | Variable (R/W) |
| Description | User defined velocity loop output filter. Requires FILTMODE 6. or controller output filter in VELCONTROLMODE 3). |
| Syntax | Read: VF Write: VF 1 0 0 0 0 0 0 |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | 1 0 0 0 0 0 0 |
| Unit | Not applicable |
| Non-volatile | Yes |
| See also | FILTMODE VD VELCONTROLMODE VH VR |
| CANopen | 20D8h, sub-index 1 |

VFI

| | |
|----------------------|--|
| Definition | Velocity Loop Input Filter |
| Type | Variable (R/W) |
| Description | User defined velocity loop input filter. |
| Syntax | Read: VFI Write: VFI 1 0 0 0 0 0 0 |
| Firmware | 1.2.12 |
| Drive status | Disabled |
| Range | Not Applicable |
| Default value | 1 0 0 0 0 0 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | VELCONTROLMODE VF |
| CANopen | 20D9h, sub-index 1 |

VH

| | |
|----------------------|--|
| Definition | Advanced Pole Placement H Polynomial |
| Type | Variable (R/W) |
| Description | Extended velocity controller H-polynomial. |
| Syntax | Read: VH Write: VH 0 0 0 0 0 0 0 0 0 0 0 |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | 0 0 0 0 0 0 0 0 0 0 0 |
| Unit | Not applicable |
| Non-volatile | Yes |
| See also | VD VELCONTROLMODE VF VR |
| CANopen | 20DAh, sub-index 1 |

VLIM

| | |
|----------------------|---|
| Definition | User Velocity Limit |
| Type | Variable (R/W) |
| Description | <p>Gets/sets the application velocity limit, allowing the user to limit the motor's maximum velocity.</p> <p>VLIM limits the velocity command that will be accepted from the user (using the J command in OPMODE 0) or issued by the control loops (in OPMODE 1). VLIM is an independent variable that is not calculated from hardware parameters. However, VLIM cannot exceed the maximum speed of the motor, as defined by MSPEED. VLIM is similar to ILIM (used in OPMODE 2 and OPMODE 3).</p> <p>VLIM serves the following purposes:</p> <ul style="list-style-type: none"> ■ Protects delicate loads (equipment). If the actual motor speed exceeds the value of VLIM, the drive will issue an over-speed fault. ■ Limits the CANopen/EtherCAT reference command. If the reference command exceeds the value of VLIM, the drive will issue a fault. ■ Limits the speed of internal profile position (MOVEINC, MOVEABS) and profile velocity commands (J, STEP). <p>When the value of VLIM is changed, CONFIG is required.</p> <p>When using EtherCAT/CANopen communication, changing the value of object 607h does not require configuration.</p> |
| Syntax | Read: VLIM Write: VLIM <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 10 to VMAX |
| Default value | If MOTORTYPE 0 (Rotary): UNITSROTVEL 0 = 16.667 UNITSROTVEL 1 = 10.000 UNITSROTVEL 2 = 6000.000 If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = 533.333 |
| Unit | If MOTORTYPE 0 (Rotary): If UNITSROTVEL 0 = rps If UNITSROTVEL 1 = rpm If UNITSROTVEL 2 = deg/s If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = mm/s |
| Non-volatile | Yes |
| See also | MSPEED VMAX |
| CANopen | 607Fh, sub-index 0 |

VMAX

| | |
|----------------------|--|
| Definition | Maximum Velocity |
| Type | Variable (R) |
| Description | Displays the maximum velocity for a drive and motor combination. VMAX is based on maximum motor speed. |
| Syntax | VMAX |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | 10 to MSPEED |
| Default value | If MOTORTYPE 0 (Rotary): UNITSROTVEL 0 = 161.166 UNITSROTVEL 1 = 9669.946 UNITSROTVEL 2 = 58019.675 If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = 5157.304 |
| Unit | If MOTORTYPE 0 (Rotary): If UNITSROTVEL 0 = rps If UNITSROTVEL 1 = rpm If UNITSROTVEL 2 = deg/s If MOTORTYPE 2 (Linear): UNITSLINVEL 1 = mm/s |
| Non-volatile | No |
| See also | MKT MSPEED VBUSVLIM |
| CANopen | 20EEh, sub-index 0 |

VR

| | |
|----------------------|--|
| Definition | Advanced Pole Placement R Polynomial |
| Type | Variable (R/W) |
| Description | Extended velocity controller R-polynomial. |
| Syntax | Read: VR Write: VR 0 0 0 0 0 0 0 0 0 0 |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | Not Applicable |
| Default value | 0 0 0 0 0 0 0 0 0 0 |
| Unit | Not Applicable |
| Non-volatile | Yes |
| See also | VELCONTROLMODE |
| CANopen | 20DBh, sub-index 1 |

WNSERR

| | |
|----------------------|---|
| Definition | Wake No Shake Status |
| Type | Variable (R) |
| Description | PHASEFINDMODE 2 state. |
| Syntax | WNSERR |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Not Applicable |
| Non-volatile | No |
| See also | PHASEFIND PHASEFINDMODE PHASEFINDST |
| CANopen | 20DCh, sub-index 0 |

WRN

| | |
|----------------------|---|
| Definition | Display Warnings |
| Type | Command |
| Description | Lists the warnings that have occurred since the buffer was last cleared. |
| Syntax | WRN |
| Firmware | 1.0.6 |
| Drive status | Enabled Disabled |
| Range | Not applicable |
| Default value | Not applicable |
| Unit | Not applicable |
| Non-volatile | Not applicable |
| Example | <pre>-->wrn WRN 7 Encoder init: Halls switch not found WRN 8 Encoder init: Index not detected --></pre> |
| See also | FLT FLTHIST |
| CANopen | 20DDh, sub-index 0 |

XENCRES

| | |
|----------------------|---|
| Definition | External Encoder Resolution |
| Type | Variable (R/W) |
| Description | Gets/sets the resolution of the external encoder, in number of pulses per revolution. For sine encoder, gets/sets the number of sine cycles per revolution of the motor. |
| Syntax | Read: XENCRES Write: XENCRES <value> |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 100 to 10000000 |
| Default value | 2048 |
| Unit | MOTORTYPE=0 (Rotary): lines per revolution (LPR) MOTORTYPE=2 (Linear): lines per pitch (LPP) |
| Non-volatile | Yes |
| See also | GEARIN GEARMODE GEAROUT |
| CANopen | 20DEh , sub-index 0 |

ZERO

| | |
|----------------------|--|
| Definition | Zeroing Command |
| Type | Command |
| Description | <p>Activates Zeroing mode, which locks the rotor in place by passing a fixed current through two phases. This is useful for determining the commutation offset (MPHASE) on motors that have a resolver or absolute encoder.</p> <p>When Zeroing is activated, the drive rotates and locks the motor at the fixed electrical angle with a fixed current (IZERO). Locking occurs after stopping briefly at a temporary location to overcome static friction or after starting at an electrical angle 180° away from the final locked position.</p> <p>The number of motor electrical cycles per one mechanical revolution is equal to the number of pairs of magnets. Each pair of magnets in the motor creates a 0—360 degree electrical cycle. Therefore, if the motor has 8 individual magnetic poles (MPOLES), the motor can be locked at four different places in one mechanical revolution.</p> <p>After the motor has locked (meaning it is in a position at which PE is less than PEINPOS), ZEROST returns a suggested MPHASE value according to the procedure, but does not automatically set it.</p> |
| Syntax | ZERO {0 1} |
| Firmware | 1.0.6 |
| Drive status | Disabled |
| Range | 0 = Zeroing not activated 1 = Zeroing activated |
| Default value | 0 |
| Unit | Not Applicable |
| Non-volatile | Not applicable |
| Example | <pre>-->k -->zero 1 -->en -->zerost Zero Ended, MPHASE = 28 -->k -->mphase 28 -->en</pre> |
| See also | FEEDBACKTYPE IZERO MPHASE MPOLES PHASEFIND ZEROST |

| | |
|----------------|-----------------------------------|
| CANopen | 20DF, sub-index 0 |
|----------------|-----------------------------------|

ZEROST

| | |
|----------------------|--|
| Definition | Zeroing MPHASE Value |
| Type | Variable (R) |
| Description | After running ZERO command, querying ZEROST returns the value of MPHASE that should be set for proper commutation. This may be useful when MOTORSETUP is unsuccessful. The accuracy of the commutation which is initialized this way depends on the load and friction of the system. |
| Syntax | ZEROST |
| Firmware | 1.4.4 |
| Drive status | Enabled |
| Range | Not Applicable |
| Default value | Not Applicable |
| Unit | Electrical degree |
| Non-volatile | No |
| See also | MOTORSETUP MPHASE ZERO |
| CANopen | 217Bh, sub-index 1 |

4 Serial Communication

Serial Communication Overview

The serial communication link enables communication between the drive and host (terminal, PC, or high-level controller) using ASCII-coded messages transmitted over an asynchronous, multi-drop line.

When the host and drive communicate through serial communication, a proprietary set of commands and variables, called **VarCom**, are used to configure, control and monitor the drive.

The communication interface can be a graphical software interface, such as ServoStudio, or a user-designed application, or a basic terminal.

This chapter describes the serial communication protocol used by the drive and its host.

Serial Communication Specifications

| | |
|---------------------|------------------------------|
| Communications port | RS232, USB |
| Baud rate | 115200 bits per second (bps) |
| Start bits | 1 |
| Data bits | 8 |
| Stop bits | 1 |
| Parity | None |
| Hardware handshake | None |
| Software handshake | None |
| Character | ASCII code |
| Data error check | 8-bit checksum |

Control Code Definitions

| Name | Symbol | Hex |
|-----------------|--------|---|
| Line feed | <LF> | 0Ah |
| Carriage return | <CR> | 0Dh |
| Space | <SP> | 20h |
| Delay | <DLY> | Indicates delay due to internal drive processing of information |

Communication Summary

| Drive-to-Terminal Transmission | Terminal-to-Drive Transmission | Protocol Flags (Variables) |
|--|---|-------------------------------|
| <ul style="list-style-type: none"> ■ Character echoes ■ Prompts ■ Variable values ■ Error/fault messages | <ul style="list-style-type: none"> ■ Commands ■ Variable values ■ Variable queries | ECHO MSGPROMPT CHECKSUM |

Data Transmission Format

To enable proper serial communication between the drive and the host, they must both use the same data transmission format:

- Full-duplex
- 8 bits per character
- No parity
- 1 start bit
- 1 stop bit
- Baud rate: 115200 bps
- Hardware: RS232 or USB serial port

Drive Addressing

For more information, refer to the drive user manual.

CDHD: The drive can be addressed and controlled on a single-line RS232 (C7 interface), or on a daisy-chained RS232 (C8 interface), or a USB (C1 interface) line. The CDHD has two rotary switches for setting the drive address.

DDHD: The DDHD can be addressed and controlled on a daisy-chained RS232 line. The DDHD has a rotary switch for setting the node address.

Single-Line Configuration

In a single-line RS232 configuration, the drive is connected to the C7 interface, and assigned address 0 by setting both rotary switches to 0.

By default, the rotary switches are set to 0, and the drive assumes a single-line configuration.

Daisy-Chain (Multi-Drop) Configuration

In a daisy-chain RS232 configuration, all drives must be daisy-chained through the C8 interface. Each drive must have a unique address to enable its identification on the network. When configuring a daisy-chain, address 0 cannot be used.

You can communicate with any or all drives on the daisy-chain from any RS232 or USB port on any of the daisy-chained drives.

- To communicate with an individual drive in a daisy-chain, enter the following at the prompt:

\x <Enter>

Where **x** = the address setting of the drive.

- To communicate simultaneously with all drives on the chain, enter the following at the prompt:

* <Enter>

This is called global addressing. When using global addressing, no character echo to the terminal occurs.

Variables and Commands

When the host and drive are communicating through a serial connection, VarCom is used to configure, control and monitor the drive. The VarCom set of functions includes:

- **Commands:** instruct the drive to perform an operation.
- **Read-only variables:** calculated and/or set by the drive, and used to monitor the drive and its operational status.

To read a variable, type the VarCom mnemonic followed by <Enter> (carriage return, CR). The drive returns the value of the variable.

- **Read/Write variables:** used to configure and monitor the drive.

To set a variable value, type the VarCom mnemonic, a space (or =), the value, and then <Enter> (carriage return, CR).

Data Control

The drive can process approximately 16 characters per millisecond (at 115200 baud rate).

The operating system recognizes backspaces and resets upon receipt of an <Esc> character.

The following VarCom variables allow you to configure communication responses between drive and host.

| | |
|------------------|--|
| ECHO | <p>Enables/disables the serial port character echo. If echo is enabled, characters received via the serial port are echoed back to the serial port and displayed on the computer monitor.</p> <p>ECHO 0 = Serial port echo disabled</p> <p>ECHO 1 = Serial port echo enabled</p> <p>ECHO allows the host to check the validity of the information received by the drive.</p> |
| MSGPROMPT | <p>Defines whether asynchronous messages and the prompt from the drive are sent to the serial port (and to the host computer)</p> <p>0 = Messages and prompt disabled</p> <p>1 = Messages and prompt enabled</p> |
| CHECKSUM | <p>Enables/disables checksum protection on the message.</p> <p>0 = Message checksum disabled (default)</p> <p>1 = Message checksum enabled</p> <p>The checksum is an 8-bit value, displayed within brackets < >. For example, 0x1F checksum is displayed as <1F> at the end of the message before the carriage return.</p> |

Message Format

The message format is the structure by which the drive processes ASCII-coded messages. Messages from the host to the drive are used to send commands, to set variables, or to query the drive. Messages from the drive to the host contain the response to queries.

This message format has two main elements: **message unit** and **message termination**, as shown in the following figure.

The checksum utility is optional.

Note: *Start* has no significance; it simply represents the drive waiting for the host to send a message.

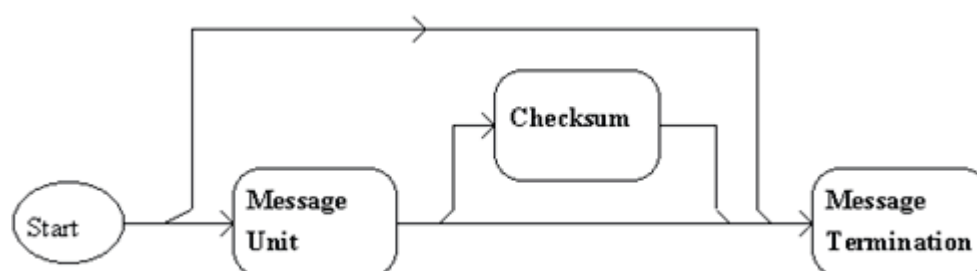


Figure 4-1. Message Format

Message Unit

A message unit is a block of information that is transmitted on the communications link. The basic message unit is shown in the following figure.

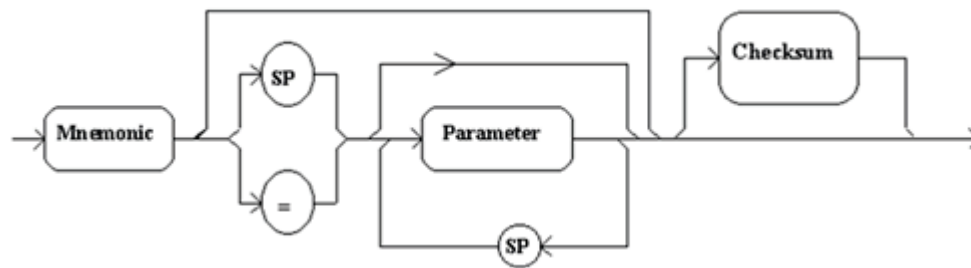


Figure 4-2. Message Unit

A message unit includes a header (VarCom mnemonic) with or without parameters. The header defines the context of the parameters that follow it. Messages sent from the host to the drives always have headers. Messages from the drive to the host do not generally include a header.

When used, parameters are separated from the mnemonic by either a space or an assignment operator. Parameters must be separated by spaces.

The drive can receive only a single message unit in a message format.

Message Termination

Message termination refers to the end of the message being sent.

Messages transmitted by the host are terminated by a carriage return (CR) – ASCII character 0DH.



Figure 4-3. Host Message Termination Format

Messages transmitted by the drive are terminated by a carriage return/line feed (CR/LF) combination – ASCII characters 0DH/0AH.



Figure 4-4. Drive Message Termination Format

The drive also accepts a message termination sent without any additional information.

Complete Message Format with Checksum

The CHECKSUM block is used only when CHECKSUM command is set.

The drive is configured to accept incoming messages with or without checksum, and to append checksum to outgoing message according to the CHECKSUM variable.

Checksum is represented by two ASCII digits within brackets <> preceding the <CR>.

The complete message format is shown in the following figure.

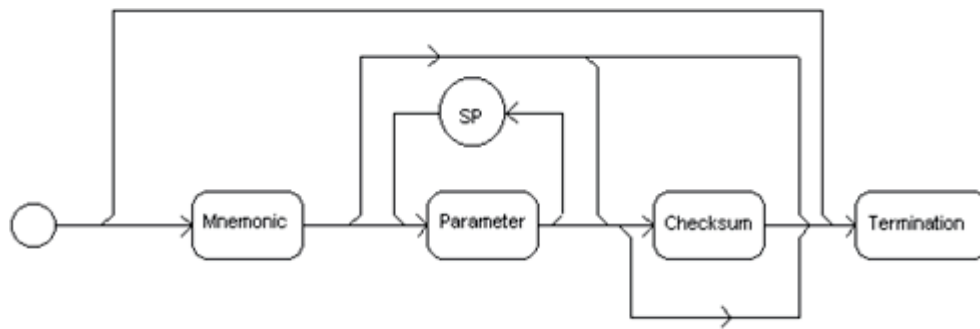


Figure 4-5. Complete Message Format

Units

Within a message or command, units are enclosed in brackets []. For example:

- Message to drive: MPOLES
- Message from drive: 4 [poles]

When a command from the host contains units, the drive ignores the unit information.

Asynchronous Error Messages

The asynchronous error message function is enabled by the variable MSGPROMPT.

- If this function is enabled, and an error or fault occurs, the drive transmits a brief error message to the host.
- If the function is disabled, the error message is transmitted after a <CR> message termination is detected by the drive. This occurs whenever the host sends a message to the drive.

The variable MSGPROMPT also controls the prompt sent by the drive at the end of a message.

- If echoing is enabled, the characters in the message are all echoed before the error message is transmitted. Even though an error has occurred and its message returned to the host, the drive still accepts new incoming messages and attempts to execute them.
- If echoing is disabled, the error message is transmitted after the <CR> message termination is detected by the drive.

The drive must detect a new error or fault before transmitting an error message.

Examples of Serial Protocol

The following examples demonstrate serial protocol between the drive and a host.

Issuing a Command or Variable

In Examples 1 through 5, drive parameters are defined as:

```
ADDR 0
CHECKSUM 0
```

ECHO 1

MSGPROMPT 1

Example 1 – Command

EN (drive enable)

| Sequence # | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---------------|---|---|---|---|------|------|------|-------|---|----|----|
| User Enters | E | | N | | <CR> | | | | | | |
| Drive Returns | | E | | N | | <CR> | <LF> | <DLY> | - | - | > |

Displayed on terminal:

-->EN

-->

Example 2 – Command/Variable – Returns Multiple Lines of Values

This type of command typically has a longer delay due to the large amount of data that is output to the screen.

DUMP (return drive parameter values)

| Sequence # | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---|---|---|---|---|---|---|---|------|------|
| User Enters | D | | U | | M | | P | | <CR> | |
| Drive Returns | | D | | U | | M | | P | | <CR> |

| Sequence # | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---------------|------|-------|--------|------|--------|------|------|--------|
| User Enters | | | | | | | | |
| Drive Returns | <LF> | <DLY> | <VAR1> | <SP> | <VAL1> | <CR> | <LF> | <VAR2> |

| Sequence # | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
|---------------|------|--------|------|------|--------|------|--------|------|
| User Enters | | | | | | | | |
| Drive Returns | <SP> | <VAL2> | <CR> | <LF> | <VARn> | <SP> | <VALn> | <LF> |

| Sequence # | 27 | 28 | 29 | 30 |
|---------------|------|----|----|----|
| User Enters | | | | |
| Drive Returns | <CR> | - | - | > |

Displayed on terminal:

-->DUMP

-->var1 val1

-->var2 val2

-->varn valn

Example 3 – Command/Variable – Returns Multiple Values

J (jog)

| Sequence # | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---|---|------|------|------|-------|--------|------|--------|------|
| User Enters | J | | <CR> | | | | | | | |
| Drive Returns | | J | | <CR> | <LF> | <DLY> | <VAL1> | <SP> | <VAL2> | <CR> |

| | | | | |
|---------------|------|----|----|----|
| Sequence # | 11 | 12 | 13 | 14 |
| User Enters | | | | |
| Drive Returns | <LF> | - | - | > |

Displayed on terminal:

```
-->J
-->nnnnn nnnnn
-->
```

Example 4 – Reading a Variable Value

MPOLES (single pole motor with value 2)

| | | | | | | | | | | |
|---------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Sequence # | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| User Enters | M | | P | | O | | L | | E | |
| Drive Returns | | M | | P | | O | | L | | E |

| | | | | | | | | | | |
|---------------|----------|----------|------|------|------|-------|----------|------|----------|----------|
| Sequence # | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| User Enters | S | | <CR> | | | | | | | |
| Drive Returns | | S | | <CR> | <LF> | <DLY> | 2 | <SP> | [| p |

| | | | | | | | | | | | |
|---------------|----------|----------|----------|----------|----------|------|------|-------|----|----|----|
| Sequence # | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| User Enters | | | | | | | | | | | |
| Drive Returns | o | l | e | s |] | <CR> | <LF> | <DLY> | - | - | > |

Displayed on terminal:

```
-->MPOLES
2 [poles]
-->
```

Example 5 – Defining a Variable Value

ACC (acceleration with value 50000)

| | | | | | | | | | | |
|---------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Sequence # | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| User Enters | A | | C | | C | | = | | 5 | |
| Drive Returns | | A | | C | | C | | = | | 5 |

| | | | | | | | | | | |
|---------------|----------|----------|----------|----------|----------|----------|----------|----------|------|------|
| Sequence # | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| User Enters | 0 | | 0 | | 0 | | 0 | | <CR> | |
| Drive Returns | | 0 | | 0 | | 0 | | 0 | | <CR> |

| | | | | | |
|---------------|------|-------|----|----|----|
| Sequence # | 21 | 22 | 23 | 24 | 25 |
| User Enters | | | | | |
| Drive Returns | <LF> | <DLY> | - | - | > |

Displayed on terminal:

```
-->ACC=50000
-->
```

Multi-Drop Mode

In Examples 6 and 7, drive parameter values are defined as:

```
ADDR 3
ECHO 1
MSGPROMPT 1
```

Example 6 – Addressing a Daisy-Chained Drive

The range of values for ADDR is 0 to 99. A value other than 0 puts the system in Multi-drop mode, which results in a different prompt.

| Sequence # | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---------------|---|---|----------|----------|------|------|------|-------|----------|----|----|
| User Enters | \ | | 3 | | <CR> | | | | | | |
| Drive Returns | | \ | | 3 | | <CR> | <LF> | <DLY> | 3 | - | > |

Displayed on terminal:

```
-->\3
3->
```

Example 7 – Reading a Variable

IMAX (drive current limit)

| Sequence # | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|----------|----------|----------|----------|----------|----------|----------|----------|------|------|
| User Enters | I | | M | | A | | X | | <CR> | |
| Drive Returns | | I | | M | | A | | X | | <CR> |

| Sequence # | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---------------|------|----------|----------|----|----------|----------|----------|------|------|-------|
| User Enters | | | | | | | | | | |
| Drive Returns | <LF> | 1 | 5 | . | 6 | 9 | 7 | <CR> | <LF> | <DLY> |

| Sequence # | 21 | 22 | 23 |
|---------------|----------|----|----|
| User Enters | | | |
| Drive Returns | 3 | - | > |

Displayed on terminal:

```
-->IMAX
3->15.697
3->
```

Serial Checksum

Example 8 – Variable

In this example, drive parameters are defined as:

```
ADDR 0
CHECKSUM 1
ECHO 1
MSGPROMPT 1
```

ACC (acceleration) with value 25000

| Sequence # | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| User Enters | A | | C | | C | | = | | 2 | |
| Drive Returns | | A | | C | | C | | = | | 2 |

| Sequence # | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---------------|----------|----------|----------|----------|----------|----------|----------|----------|-------------|-------------|
| User Enters | 5 | | 0 | | 0 | | 0 | | < | |
| Drive Returns | | 5 | | 0 | | 0 | | 0 | | < |

| Sequence # | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|---------------|----------|----------|----------|----------|-------------|-------------|-------------------|-------------------|----------|----------|-------------|
| User Enters | F | | B | | > | | <CR> | | | | |
| Drive Returns | | F | | B | | > | | <CR> | - | - | > |

| Character | Hex Value | ASCII Value |
|-----------|-----------|-------------|
| A | 41 | 65 |
| C | 43 | 67 |
| C | 43 | 67 |
| = | 3D | 61 |
| 2 | 32 | 50 |
| 5 | 35 | 53 |
| 0 | 30 | 48 |
| 0 | 30 | 48 |
| 0 | 30 | 48 |

```
Checksum=0xFF& (0x41+0x43+0x43+0x3d+0x32+0x35+0x30+0x30+0x30)
=0xFF & 0x01FB=0xFB
```

Note: Enter the last two characters of the HEX VALUE sum before the <CR>. Between brackets < >

Displayed on terminal:

```
//setting the checksum
-->CHECKSUM 1
//sending command to the drive with checksum appended
-->ACC=25000<FB>
//checking the actual value stored at the drive
-->ACC
//the reply is appended by checksum
25000.000[rpm/s]<7E>
-->
```


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