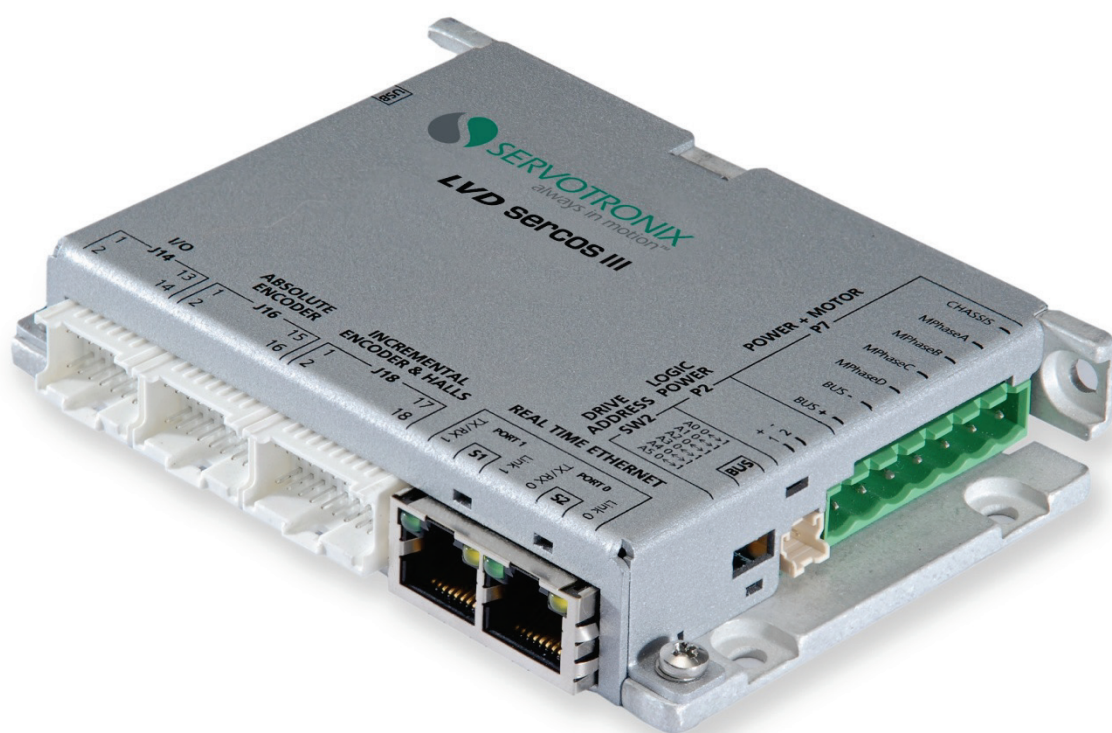


LVD Sercos III Servo Drive

IDN Reference Manual

Revision 5.0



Revision History

Doc. Rev.	Date	Remarks
5.0	Nov.2013	Preliminary release
4.1	Aug. 2012	Additional updates
4	July 2012	Updated to firmware version 3.0.10rc12
3	Apr. 2011	Updated to firmware version 3.0.7rc4
2	Dec. 2010	Updated to latest version
1	Oct. 2010	Initial release

Firmware Revision	Software (GUI) Revision

Copyright Notice

© 2013 Servotronix Motion Control Ltd.

All rights reserved. No part of this work may be reproduced or transmitted in any form or by any means without prior written permission of Servotronix.

Disclaimer

The information in this manual was accurate and reliable at the time of its release. Servotronix Motion Control Ltd. reserves the right to change the specifications of the product described in this manual without notice at any time.

Trademarks

is a trademark of Sercos International.

All other proprietary names mentioned in this manual are the trademarks of their respective owners.

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 LVD Sercos III drive, contact Servotronix technical support:
tech.support@servotronix.com

Contents

1	Introduction	11
1.1	About This Manual	11
1.2	Manual Format	11
	Predefined Constants	12
2	IDNs	13
2.1	Sercos IDNs	13
	S-0-0011 – Class 1 diagnostic (C1D)	13
	S-0-0012 – Class 2 diagnostic (C2D)	14
	S-0-0017 – IDN-list of all operation data	14
	S-0-0025 – IDN-list of all procedure commands	14
	S-0-0032 – Primary operation mode	14
	S-0-0033 – Secondary operation mode 1	15
	S-0-0034 – Secondary operation mode 2	15
	S-0-0035 – Secondary operation mode 3	15
	S-0-0036 – Velocity command value	15
	S-0-0040 – Velocity feedback value 1	16
	S-0-0041 – Homing velocity	16
	S-0-0042 – Homing acceleration	16
	S-0-0044 – Velocity data scaling type	16
	S-0-0045 – Velocity data scaling factor	17
	S-0-0046 – Velocity data scaling exponent	17
	S-0-0047 – Position command value	17
	S-0-0049 – Positive position limit value	17
	S-0-0050 – Negative position limit value	18
	S-0-0051 – Position feedback value 1 (motor feedback)	18
	S-0-0053 – Position feedback value 2 (external feedback)	18
	S-0-0055 – Position polarity parameter	18
	S-0-0057 – Position window	19
	S-0-0076 – Position data scaling type	19
	S-0-0077 – Linear position data scaling factor	19
	S-0-0078 – Linear position data scaling exponent	19
	S-0-0079 – Rotational position resolution	20
	S-0-0080 – Torque command value	20
	S-0-0081 – Additive torque command value	20
	S-0-0084 – Torque feedback value	20
	S-0-0086 – Torque/force data scaling type	21
	S-0-0091 – Bipolar velocity limit value	21
	S-0-0092 – Bipolar torque limit value	21
	S-0-0093 – Torque/force data scaling factor	21
	S-0-0094 – Torque/force data scaling exponent	21
	S-0-0095 – Diagnostic message	22
	S-0-0099 – Reset class 1 diagnostic	22
	S-0-0101 – Velocity loop integral action time	22
	S-0-0104 – Position loop proportional gain	22
	S-0-0106 – Current loop proportional gain 1	23
	S-0-0107 – Current loop integral action time 1	23
	S-0-0110 – Amplifier peak current	23
	S-0-0111 – Motor rated current	23
	S-0-0116 – Resolution of feedback 1	24
	S-0-0121 – Input revolutions of load gear	24
	S-0-0122 – Output revolutions of load gear	24
	S-0-0129 – Manufacturer class 1 diagnostic	24
	S-0-0134 – Drive control	25

S-0-0135	– Drive status	26
S-0-0138	– Bipolar acceleration limit value	26
S-0-0147	– Homing parameter	27
S-0-0148	– Drive controlled homing procedure command	28
S-0-0150	– Reference offset 1	28
S-0-0157	– Velocity window	28
S-0-0159	– Monitoring window	28
S-0-0160	– Acceleration data scaling type	29
S-0-0161	– Acceleration data scaling factor	29
S-0-0162	– Acceleration data scaling exponent	29
S-0-0187	– IDN-list of configurable data as producer	29
S-0-0188	– IDN-list of configurable data as consumer	30
S-0-0189	– Following distance.....	30
S-0-0191	– Cancel reference point procedure command	30
S-0-0192	– IDN-list of all backup operation data	30
S-0-0203	– Amplifier shut-down temperature.....	31
S-0-0256	– Multiplication factor 1	31
S-0-0262	– Load Defaults procedure command	31
S-0-0263	– Load working memory procedure command	32
S-0-0264	– Backup working memory procedure command.....	32
S-0-0265	– Language selection	32
S-0-0271	– Drive ID	32
S-0-0297	– Homing distance.....	33
S-0-0336	– Status 'In position'.....	33
S-0-0348	– Position loop feed forward acceleration term gain	33
S-0-0380	– DC bus voltage.....	33
S-0-0384	– Amplifier temperature	34
S-0-0390	– Diagnostic number.....	34
S-0-0400	– Home switch	34
S-0-0403	– Position feedback value status.....	34
S-0-1000.0.0	– List of SCP classes and version	35
S-0-1019	– MAC address	35
S-0-1020	– IP address	35
S-0-1020.0.1	– Current IP address	35
S-0-1021	– Subnet Mask	36
S-0-1021.0.1	– Current subnet mask	36
S-0-1022	– Gateway address	36
S-0-1022.0.1	– Current active gateway address	36
S-0-1040	– Sercos address.....	37
S-0-1300-0-3	– Vendor code.....	37
S-0-1300-0-4	– Device name	37
S-0-1300-0-5	– Vendor device ID	37
S-0-1300-0-9	– Software revision.....	38
S-0-1302-0-1	– FSP type and version.....	38
S-0-1302-0-3	– Application Type	38
P-0-0001	– PWM Frequency	39
2.2	Product-Specific IDNs.....	40
P-0-0018	– Motor Poles	40
P-0-0019	– Micro-step resolution	40
P-0-0020	– Stepper current reduction value.....	41
P-0-0021	– Stepper current reduction time	41
P-0-0038	– Current demand Value.....	41
P-0-0040	– Position loop feed forward velocity term gain.....	42
P-0-0043	– Current actual value.....	42
P-0-0048	– Velocity demand value.....	42
P-0-0049	– Velocity loop out.....	42
P-0-0051	– Motor KT factor.....	43

P-0-0062 – Phase A PWM.....	43
P-0-0063 – Phase B PWM.....	43
P-0-0064 – Phase C PWM	43
P-0-0065 – Phase D PWM	44
P-0-0067 – Phase A current	44
P-0-0068 – Phase B current	44
P-0-0069 – Phase C current	44
P-0-0070 – Phase D current.....	45
P-0-0100 – Velocity loop proportional gain command.....	45
P-0-0101 – Velocity loop proportional gain feedback	45
P-0-0102 – Velocity loop derivative gain command	45
P-0-0103 – Velocity loop derivative gain feedback	46
P-0-0113 – Over voltage fault level.....	46
P-0-0114 – Under voltage fault level.....	46
P-0-0192 – Fault history	46
P-0-0193 – Faults time.....	47
P-0-0194 – Clear faults history	47
P-0-0196 – Time enable	47
P-0-0197 – Time on	47
P-0-0300 – Digital inputs values.....	48
P-0-0301 – Digital inputs #1 value	48
P-0-0302 – Digital inputs #2 value	48
P-0-0303 – Digital inputs #3 value	49
P-0-0304 – Digital inputs #4 value	49
P-0-0321 – Digital input #1 functionality	49
P-0-0322 – Digital input #2 functionality	50
P-0-0323 – Digital input #3 functionality	50
P-0-0324 – Digital input #4 functionality	50
P-0-0341 – Digital input #1 Polarity.....	51
P-0-0342 – Digital input #2 Polarity.....	51
P-0-0343 – Digital input #3 Polarity.....	51
P-0-0344 – Digital input #4 Polarity.....	51
P-0-0360 – Digital output value.....	52
P-0-0361 – Digital output value.....	52
P-0-0371 – Digital output functionality	52
P-0-0381 – Digital output polarity.....	53
P-0-0391 – Digital output high window.....	53
P-0-0401 – Digital output low window	53
P-0-0410 – Real time cycle	53
P-0-0411 – Analog input #1 value	54
P-0-0412 – Analog input #2 value	54
P-0-0413-0-0 – Zero analog input procedure command.....	54
P-0-0413-0-1 – Zero analog input number.....	54
P-0-0421 – Analog input #1 offset.....	55
P-0-0422 – Analog input #2 offset.....	55
P-0-0500 – Current loop derivative gain	55
P-0-0501 – Current loop pole placement.....	55
P-0-0503 – I2T value	56
P-0-0504 – I2T limit.....	56
P-0-0508 – Motor phase	56
P-0-0604 – Phase A current offset	57
P-0-0605 – Phase B current offset	57
P-0-0606 – Phase C current offset	57
P-0-0607 – Phase D current offset	57
P-0-0610 – Position loop integrator input saturation.....	58
P-0-0611 – Halls.....	58
P-0-0615 – Motor type	58

p-0-0620	– Position loop integral gain	58
P-0-0621	– Position loop derivative gain	59
P-0-0625	– Maximum position derivative	59
P-0-0626	– Position error.....	59
P-0-0627	– Remote.....	59
P-0-0628	– Feedback type	60
P-0-0629	– Differential or single-ended encoder	60
P-0-0630	– Encoder direction	60
P-0-0631	– Velocity over-speed.....	61
P-0-0632	– Config	61
P-0-0633	– Find commutation gain	61
P-0-0634	– Find commutation max current	61
P-0-0635	– Find commutation start type.....	62
P-0-0636	– Find commutation procedure command	62
P-0-0637	– PLL state.....	62
P-0-0638	– Regen enable	63
P-0-0639	– Halls filter	63
P-0-0647	– IO filter.....	63
P-0-0649	– PRD.....	64
P-0-0650	– Position loop output.....	64
P-0-0655	– Miss wiring detection procedure command	64
P-0-0658	– Miss wiring detection result	65
P-0-0659	– Automatic gain configuration procedure command	65
P-0-0660	– Find commutation procedure command state.....	66
P-0-0661	– ISAT.....	66
P-0-0720-0-1	– Recorder channel #1 IDN.....	66
P-0-0720-0-2	– Recorder channel #2 IDN.....	66
P-0-0720-0-3	– Recorder channel #3 IDN.....	67
P-0-0720-0-4	– Recorder channel #4 IDN.....	67
P-0-0721	– Recorder number of channels	67
P-0-0722	– Recorder sample time.....	67
P-0-0723-0-1	– Recorder trigger type	68
P-0-0723-0-2	– Recorder condition channel IDN	68
P-0-0723-0-3	– Recorder condition value.....	68
P-0-0723-0-4	– Recorder condition comparator	69
P-0-0723-0-5	– Recorder buffer location.....	69
P-0-0724-0-1	– List of all recordable IDNs	69
P-0-0724-0-2	– Recorder maximum number of points	69
P-0-0725	– Recorder number of points per channel.....	70
P-0-0726-0-1	– Recorder results reset	70
P-0-0726-0-2	– Recorder results buffer	70
P-0-0727-0-0	– Recorder procedure command	71
P-0-0728-0-1	– Recorder channel #1 type.....	71
P-0-0728-0-2	– Recorder channel #2 type.....	71
P-0-0728-0-3	– Recorder channel #3 type.....	72
P-0-0728-0-4	– Recorder channel #4 type.....	72
P-0-1121	– Velocity loop LPF.....	72
3	Recorder	73
3.1	General	73
3.2	Programming the Recorder	73
3.3	Triggering the Recorder	73
3.4	Retrieving the Results	74
4	TCP Channel	75
4.1	File Transfer.....	75
4.2	Firmware Upgrade	75
4.3	Drive Recorder Results Buffer.....	76

5	Diagnostic Messages	77
5.1	Reading the Diagnostic Messages.....	77
5.2	Diagnostic Messages	77

1 Introduction

1.1 About This Manual

This manual presents the IDN set supported by the LVD Sercos III.

1.2 Manual Format

The IDNs are presented in numerical order. IDNs with the prefix **S** indicate standard Sercos implementation, while those with the prefix **P** indicate they are product-specific (manufacturer's IDN).

Each IDN is presented in the following manner:

Version	The earliest version, or specific versions, in which the described functionality is available.	
Description	A short description of the IDN.	
Range	The allowable range of the IDN.	
	Signed 32 bit variable (Long)	Maximum: 2147483647 (MaxS32bit) Minimum: -2147483647 (MinS32bit)
	Signed 16 bit variable (Short)	Maximum: 32767 (MaxS16bit) Minimum: - 32767 (MinS16bit)
	Unsigned 32 bit variable (Long)	Maximum: 4294967296 (MaxU32bit) Minimum: 0 (MinS32bit)
	Unsigned 16 bit variable (Long)	Maximum: 65536 (MaxU16bit) Minimum: 0 (MinU16bit)
	String parameters are based on the 8-bit ASCII character code set, which comprises 256 character codes, with code values from 0 to 255.	
Units	When the IDN values imply units of measure, these units are specified.	
Default value	The IDN's default value.	
Limitations	Read/write access	

Predefined Constants

A number of keywords have been defined in the system to facilitate operation. These keywords, or constants, may be used in place of explicit numeric values in instances where a parameter has a discrete range of allowed values.

The following is a list of constants.

Reserved Name	Value
ON	1
OFF	0
True	1
False	0
MaxCurrent	18022
MaxBusVoltage	60000
MinBusVoltage	11500

2 IDNs

2.1 Sercos IDNs

S-0-0011 – Class 1 diagnostic (C1D)

Version	All versions		
Description	Displays errors of the drive.		
	Bit	Description	Support
	0	Overload shut-down	I2T – ICONT, ILIM
	1	Amplifier over-temperature shut-down	√
	2	Motor over-temperature shut-down	-
	3	Cooling error shut-down	-
	4	Control voltage error	-
	5	Feedback error	√ diagnostic number (S-0-0390) is set to 0xC00F2174
	6	Error in the commutation system	√
	7	Over-current error	√
	8	Over-voltage error	√
	9	Under-voltage error	√
	10	Power supply phase error	-
	11	Excessive position deviation	√ (S-0-0159)
	12	Communication error	not used
	13	Travel range exceeded	-
	14	Reserved	reserved
15	Manufacturer-specific error	√	
Range	0 – MaxU16bit		
Units	Not Applicable		
Default	Not Applicable		
Limitations	Read only		

S-0-0012 – Class 2 diagnostic (C2D)

Version	All versions
Description	The drive does not support warnings.
Range	0 – MaxU16bit
Units	Not Applicable
Default	Not Applicable
Limitations	Read only

S-0-0017 – IDN-list of all operation data

Version	All versions
Description	Displays a list of all IDNs supported by the drive.
Range	Not Applicable
Units	Not Applicable
Default	Not Applicable
Limitations	Read only

S-0-0025 – IDN-list of all procedure commands

Version	All versions
Description	Displays a list of all procedure commands supported by the drive.
Range	Not Applicable
Units	Not Applicable
Default	Not Applicable
Limitations	Read only

S-0-0032 – Primary operation mode

Version	All versions
Description	Gets/sets the primary operation mode of the drive. The operation mode supported by the drive is 11: Position control using position feedback value 1.
Range	11
Units	Not Applicable
Default	11
Limitations	Read/Write

S-0-0033 – Secondary operation mode 1

Version	All versions
Description	Gets/sets the first secondary operation mode of the drive.
Range	Not Applicable
Units	Not Applicable
Default	Not Applicable
Limitations	Currently not supported

S-0-0034 – Secondary operation mode 2

Version	All versions
Description	Gets/sets the second secondary operation mode of the drive.
Range	Not Applicable
Units	Not Applicable
Default	Not Applicable
Limitations	Currently not supported

S-0-0035 – Secondary operation mode 3

Version	All versions
Description	Gets/sets the third secondary operation mode of the drive.
Range	Not Applicable
Units	Not Applicable
Default	Not Applicable
Limitations	Currently not supported

S-0-0036 – Velocity command value

Version	All versions
Description	Velocity command value that is sent from Sercos III master to the drive.
Range	\pm MaxS32bit
Units	S-0-0044, decimal places: S-0-0045, S-0-0046
Default	Not Applicable
Limitations	Read/Write

S-0-0040 – Velocity feedback value 1

Version	All versions
Description	Returns the velocity of the motor as calculated according to the motor feedback.
Range	\pm MaxS32bit
Units	S-0-0044, decimal places: S-0-0045, S-0-0046
Default	Not Applicable
Limitations	Read only

S-0-0041 – Homing velocity

Version	All versions
Description	Sets the velocity of motion during the search for the home switch..
Range	0 – MaxS32bit
Units	S-0-0044, decimal places: S-0-0045, S-0-0046
Default	100000
Limitations	Read/Write

S-0-0042 – Homing acceleration

Version	All versions
Description	Gets/sets the value of acceleration and deceleration for the homing process. The minimum acceleration value is $814/S-0-0116$ [rpm/sec], due to quantization and sample time Limitations. When setting a value that is lower than $814/S-0-0116$, the effective acceleration will be $814/S-0-0116$.
Range	104 – 13,613,568
Units	S-0-0160, decimal places: S-0-0161, S-0-0162
Default	104,719
Limitations	Read/Write

S-0-0044 – Velocity data scaling type

Version	All versions
Description	Scaling of all velocity parameters. The value of IDN S-0-0044 is fixed to the value 2 which means: rotational scaling, at rpm at the motor shaft.
Range	2
Units	Not Applicable
Default	2
Limitations	Read only

S-0-0045 – Velocity data scaling factor

Version	All versions
Description	Scaling factor of all velocity parameters.
Range	1
Units	Not Applicable
Default	1
Limitations	Read only

S-0-0046 – Velocity data scaling exponent

Version	All versions
Description	Scaling exponent of all velocity parameters.
Range	-4
Units	Not Applicable
Default	-4
Limitations	Read only

S-0-0047 – Position command value

Version	All versions
Description	Position command that is sent from Sercos III master to the drive.
Range	\pm MaxS32bit
Units	S-0-0076, decimal places: S-0-0077, S-0-0078
Default	Not Applicable
Limitations	Read/Write

S-0-0049 – Positive position limit value

Version	All versions
Description	Gets/sets maximum position limit for motion. The drive will not accept movement commands beyond this position. Upon reaching this limit, the drive executes a STOP command.
Range	\pm MaxS32bit
Units	S-0-0076, decimal places: S-0-0077, S-0-0078
Default	+MaxS32bit
Limitations	Read/Write

S-0-0050 – Negative position limit value

Version	All versions
Description	Gets/sets the minimum position limit for motion. The drive will not accept movement commands beyond this position. Upon reaching this limit, the drive executes a Stop command.
Range	±MaxS32bit
Units	S-0-0076, decimal places: S-0-0077, S-0-0078
Default	-MaxS32bit
Limitations	Read/Write

S-0-0051 – Position feedback value 1 (motor feedback)

Version	All versions
Description	Returns the motor position feedback from the feedback device.
Range	±MaxS32bit
Units	S-0-0076, decimal places: S-0-0077, S-0-0078
Default	Not Applicable
Limitations	Read only

S-0-0053 – Position feedback value 2 (external feedback)

Version	All versions
Description	Returns the external position feedback from the feedback device. Currently not connected.
Range	±MaxS32bit
Units	S-0-0076, decimal places: S-0-0077, S-0-0078
Default	Not Applicable
Limitations	Read only. Currently not connected.

S-0-0055 – Position polarity parameter

Version	All versions
Description	Defines if software limits are enabled. Only bit 4 is supported; if bit 4 is set, software limits are enabled.
Range	0 = Position limit values are disabled 16 = Position limit values are enabled
Units	Not Applicable
Default	0
Limitations	Read/Write

S-0-0057 – Position window

Version	All versions
Description	Sets the threshold position error for the S-0-0336 flag. If P-0-0626 is less than S-0-0057, the S-0-0336 switch is set, indicating that the drive is in position (see S-0-0336). If P-0-0626 is greater than S-0-0057, the S-0-0336 switch is not set.
Range	±MaxS32bit
Units	S-0-0076, decimal places: S-0-0077, S-0-0078
Default	100
Limitations	Read/Write

S-0-0076 – Position data scaling type

Version	All versions
Description	Scaling of all position parameters. Currently, the supported configuration is the value 0x42: rotational scaling, at the motor shaft.
Range	0x42
Units	Not Applicable
Default	0x42
Limitations	Read only

S-0-0077 – Linear position data scaling factor

Version	All versions
Description	Scaling factor of all linear position parameters. The scaling factor is currently fixed to value 1.
Range	1
Units	Not Applicable
Default	1
Limitations	Read only

S-0-0078 – Linear position data scaling exponent

Version	All versions
Description	Scaling exponent of all linear position parameters. Currently not used, and fixed to the value -4.
Range	-4
Units	Not Applicable
Default	-4
Limitations	Read only

S-0-0079 – Rotational position resolution

Version	All versions
Description	Rotational position resolution for of all rotational position parameters.
Range	1 – MaxU32bit
Units	Not Applicable
Default	3,600,000
Limitations	Read only

S-0-0080 – Torque command value

Version	All versions
Description	Torque command value.
Range	±30000
Units	S-0-0086, decimal places: S-0-0093, S-0-0094
Default	0
Limitations	Read/Write

S-0-0081 – Additive torque command value

Version	All versions
Description	Additive torque command value.
Range	0 – Max16bit
Units	S-0-0086, decimal places: S-0-0093, S-0-0094
Default	0
Limitations	Read/Write

S-0-0084 – Torque feedback value

Version	All versions
Description	Torque feedback value.
Range	0 – Max16bit
Units	S-0-0086, decimal places: S-0-0093, S-0-0094
Default	Not Applicable
Limitations	Read only

S-0-0086 – Torque/force data scaling type

Version	All versions
Description	Scaling of all torque parameters.
Range	2 = Rotational scaling, preferred scaling, Nm/100 at the motor shaft.
Units	Not Applicable
Default	2
Limitations	Read only

S-0-0091 – Bipolar velocity limit value

Version	All versions
Description	Gets/sets the velocity limit. IDN P-0-0048 will be clamped to this IDN value in the velocity loop.
Range	0 – MaxS32bit
Units	S-0-0044, decimal places: S-0-0045, S-0-0046
Default	10000000
Limitations	Read/Write

S-0-0092 – Bipolar torque limit value

Version	All versions
Description	Gets/sets current saturation value.
Range	0 – MaxS16bit
Units	S-0-0086, decimal places: S-0-0093, S-0-0094
Default	1000
Limitations	Read/Write

S-0-0093 – Torque/force data scaling factor

Version	All versions
Description	Scaling factor of all torque parameters.
Range	1
Units	Not Applicable
Default	1
Limitations	Read only

S-0-0094 – Torque/force data scaling exponent

Version	All versions
Description	Scaling exponent of all torque parameters.

Range	-2
Units	Not Applicable
Default	-2
Limitations	Read only

S-0-0095 – Diagnostic message

Version	All versions
Description	Diagnostic message and the diagnostic number concerning the current state of the drive. Refer to chapter Diagnostic Messages.
Range	Not Applicable
Units	Not Applicable
Default	Not Applicable
Limitations	Read only

S-0-0099 – Reset class 1 diagnostic

Version	All versions
Description	Clears the drive.
Range	Procedure command
Units	Not Applicable
Default	Not Applicable
Limitations	Not Applicable

S-0-0101 – Velocity loop integral action time

Version	All versions
Description	Gets/sets the integral gain for the velocity loop.
Range	0 – 2 ²⁴
Units	TBD
Default	Not Applicable
Limitations	Read/Write

S-0-0104 – Position loop proportional gain

Version	All versions
Description	Gets/sets the proportional gain for the Position PID loop.
Range	0 – MaxS32bit
Units	(rpm/100)/Counts
Default	1000
Limitations	Read/Write

S-0-0106 – Current loop proportional gain 1

Version	All versions
Description	Gets/sets the proportional gain for the current controller.
Range	0 – MaxS32bit
Units	PWM duty cycle/mA
Default	1000
Limitations	Read/Write

S-0-0107 – Current loop integral action time 1

Version	All versions
Description	Gets/sets the integral gain for the current controller.
Range	0 – MaxS32bit
Units	
Default	1000
Limitations	Read/Write

S-0-0110 – Amplifier peak current

Version	All versions
Description	Gets/sets the value of the maximum peak current for the drive. If the motor current exceeds 120% of this value, the drive will issue a fault.
Range	0 – MaxCurrent
Units	mA
Default	MaxCurrent/2
Limitations	Read/Write

S-0-0111 – Motor rated current

Version	All versions
Description	Gets/sets the value of the maximum continuous current for the drive. The maximum continuous energy limit (P-0-0503, P-0-0504) is calculated according to S-0-0111.
Range	0 – MaxCurrent
Units	mA
Default	MaxCurrent/4
Limitations	Read/Write

S-0-0116 – Resolution of feedback 1

Version	All versions
Description	Gets/sets the resolution of the motor encoder, in number of lines per revolution of the motor. The number of encoder counts per revolution is obtained by multiplying the value S-0-0116 by 4. When the value of S-0-0116 is changed, P-0-0632 procedure command is required.
Range	4 – 2500000
Units	Encoder lines
Default	2048
Limitations	Write protection in CP4

S-0-0121 – Input revolutions of load gear

Version	All versions
Description	Input revolutions of load gear.
Range	1 – 0xFFFF
Units	Not Applicable
Default	1
Limitations	Read/Write

S-0-0122 – Output revolutions of load gear

Version	All versions
Description	Output revolutions of load gear.
Range	1 – 0xFFFF
Units	Not Applicable
Default	1
Limitations	Read/Write

S-0-0129 – Manufacturer class 1 diagnostic

Version	All versions
Description	The drive manufacturer can define additional shut-down errors in manufacturer class 1 diagnostic. If an error is set in the manufacturer class 1 diagnostic, the manufacturer-specific error bit in class 1 diagnostic (see S-0-0011) is set as well.
Range	0/1
Units	Not Applicable
Default	0
Limitations	Write protected at CP2, CP3 and CP4

S-0-0134 – Drive control

Version	All versions		
Description	Controls the drive behavior		
	Bit	Description	Support
	0-7	Reserved	
	8-10	Operation mode	Only Primary operation mode (000) is supported)
	11-12	Reserved	
	13	Drive halt	Not supported
	14	Drive enable	Immediately enables the drive (if but 15 is set to 1 as well)
	15	Drive ON/OFF	Immediately enables the drive (if but 14 is set to 1 as well). When setting this bit to 0, the power stage is disabled.
Range	0 – MaxU16bit		
Units	Not Applicable		
Default	Not Applicable		
Limitations	Read/Write		

S-0-0135 – Drive status

Version	All versions		
Description	Displays status of the drive as follows:		
	Bit	Description	Support
	0-2	Reserved	
	3	Status command value processing	√
	4	Drive halt	Not supported
	5	Position feedback value status	√
	6	Reserved	
	7	Emergency stop	Not supported
	8-10	Current Operation mode	Only Primary operation mode (000) is supported)
	11	Reserved	
	12	Warning in C2D	The drive does not have C2D warnings
	13	Drive shut-down error in C1D	No shut-down process, the drive is disabled as a result of C1D error.
14-15	Ready to operate	Supported modes: 10 – Drive ready and disabled 11 – Drive enabled	
Range	0 – MaxU16bit		
Units	Not		
Default	Not		
Limitations	Read only		

S-0-0138 – Bipolar acceleration limit value

Version	All versions
Description	Gets/sets the maximum acceleration/deceleration value.
	If the drive detects acceleration or deceleration that is a higher than this value, it will issue a fault.
	Setting this value to zero disables this functionality.
Range	0 – 130000
Units	S-0-0160, decimal places: S-0-0161, S-0-0162
Default	0
Limitations	Read/Write

S-0-0147 – Homing parameter

Version	All versions		
Description	Sets the homing flags		
Bit	Value	Description	Support
10		Homing with Positive Stop	
	0	without positive stop	√
	1	with positive stop	-
9		Homing with Limit switch	
	0	without limit switch	√
	1	with limit switch	-
7 & 8		Position after drive controlled homing	
	00	After homing, drive is positioned at an arbitrary position	√
	01	Drive is positioned at the home point	√
	10	Drive is positioned at the homing distance (IDN S-0-0297)	√
	11	Not allowed	-
6		Evaluation of position feedback marker pulse	
	0	marker pulse is evaluated	√
	1	marker pulse is not evaluated	√
5		Evaluation of home switch	
	0	home switch is evaluated	√
	1	home switch is not evaluated	√
4		Interpretation in the drive	
	0	home switch and homing enable	-
	1	homing enable only	-
3		Homing	
	0	using motor feedback	√
	1	using external feedback	-
2		Home switch (S-0-0400)	
	0	connected to the control unit	-
	1	connected to the drive	√
1		Position feedback marker pulse	
	0	first marker pulse after the positive edge of the home switch	√
	1	first marker pulse after the negative edge of the home switch	√
0		Homing direction	
	0	positive: increasing position values	√
	1	negative: decreasing position values	√

Range	0 – MaxU16bit
Units	Not Applicable
Default	0
Limitations	Read/Write

S-0-0148 – Drive controlled homing procedure command

Version	All versions
Description	Initiates the homing process.
Range	Procedure command
Units	Not Applicable
Default	Not Applicable
Limitations	Not Applicable

S-0-0150 – Reference offset 1

Version	All versions
Description	Sets the value that will be applied to S-0-0051 at the end of the homing procedure command (S-0-0148).
Range	\pm MaxS32bit
Units	S-0-0076, decimal places: S-0-0077, S-0-0078
Default	0
Limitations	Read/Write

S-0-0157 – Velocity window

Version	All versions
Description	Gets/sets the maximum value for the velocity error. Value 0 disables velocity error monitoring.
Range	\pm MaxS32bit
Units	S-0-0044, decimal places: S-0-0045, S-0-0046
Default	0
Limitations	Read/Write

S-0-0159 – Monitoring window

Version	All versions
Description	Gets/sets the position error value that triggers the position error fault.
Range	0 – MaxS32bit
Units	S-0-0076, decimal places: S-0-0077, S-0-0078
Default	100
Limitations	Read/Write

S-0-0160 – Acceleration data scaling type

Version	All versions
Description	Scaling of all acceleration parameters.
Range	0 – MaxU16bit
Units	Not Applicable
Default	0x42
Limitations	Read only

S-0-0161 – Acceleration data scaling factor

Version	All versions
Description	Scaling factor of all acceleration parameters.
Range	1 – MaxU16bit
Units	Not Applicable
Default	1
Limitations	Read only

S-0-0162 – Acceleration data scaling exponent

Version	All versions
Description	Scaling exponent of all acceleration parameters.
Range	1 – MaxU16bit
Units	Not Applicable
Default	-3
Limitations	Not Applicable

S-0-0187 – IDN-list of configurable data as producer

Version	All versions
Description	This IDN list contains the IDNs of operation data of the producer which can be processed by the drive cyclically.
Range	Not Applicable
Units	Not Applicable
Default	Not Applicable
Limitations	Read only

S-0-0188 – IDN-list of configurable data as consumer

Version	All versions
Description	This IDN list contains the IDNs of operation data of the consumer which can be processed by the drive cyclically.
Range	Not Applicable
Units	Not Applicable
Default	Not Applicable
Limitations	Read only

S-0-0189 – Following distance

Version	All versions
Description	Returns the position error of the position loop. If the value is greater than S-0-0159, the drive is disabled and a fault is generated.
Range	\pm MaxS32bit
Units	S-0-0076, decimal places: S-0-0077, S-0-0078
Default	Not Applicable
Limitations	Read only

S-0-0191 – Cancel reference point procedure command

Version	All versions
Description	Sets bits 0 and 1 in IDN S-0-0403 (Position feedback value status) to 0.
Range	Procedure command
Units	Not Applicable
Default	Not Applicable
Limitations	Read only

S-0-0192 – IDN-list of all backup operation data

Version	All versions
Description	Displays a list of all IDNs that are saved to the non-volatile memory of the drive.
Range	Not Applicable
Units	Not Applicable
Default	Not Applicable
Limitations	Read only

S-0-0203 – Amplifier shut-down temperature

Version	All versions
Description	Maximum allowed temperature of the drive. The drive generates an over temperature fault when temperature of the drive is above this value.
Range	900
Units	0.1 degrees Celsius
Default	900
Limitations	Read only

S-0-0256 – Multiplication factor 1

Version	All versions
Description	Defines the factor that the motor feedback signal is multiplied by in the drive.
Range	4
Units	Not Applicable
Default	4
Limitations	The value and minimum and maximum values are fixed to 4

S-0-0262 – Load Defaults procedure command

Version	All versions
Description	Loads the factory Default values for all non-volatile parameters. List of non-volatile parameters is in IDN S-0-0192.
Range	Procedure command
Units	Not Applicable
Default	Not Applicable
Limitations	Write protect at phase 4

S-0-0263 – Load working memory procedure command

Version	All versions
Description	Loads the values of all saved parameters from the non-volatile memory (EEPROM) to the active memory. This command will cause the currently active parameters values to be overwritten. List of non-volatile parameters is in IDN S-0-0192.
Range	Procedure command
Units	Not Applicable
Default	Not Applicable
Limitations	Not Applicable

S-0-0264 – Backup working memory procedure command

Version	All versions
Description	Saves the current values of all the non-volatile parameters to the non-volatile memory (EEPROM). This command will cause the previously saved parameters to be overwritten. List of non-volatile parameters is in IDN S-0-0192.
Range	Procedure command
Units	Not Applicable
Default	Not Applicable
Limitations	Not Applicable

S-0-0265 – Language selection

Version	All versions
Description	Selects one of the languages of the drive.
Range	1 = English
Units	Not Applicable
Default	1
Limitations	Read only

S-0-0271 – Drive ID

Version	All versions
Description	Allows the Sercos master to set a specific ID to the drive. This ID is saved in the non-volatile memory.
Range	0 – MaxS32bit
Units	Not Applicable
Default	0
Limitations	Read/Write

S-0-0297 – Homing distance

Version	All versions
Description	The distance that the drive will move after home is performed.
Range	\pm MaxS32bit
Units	S-0-0076, decimal places: S-0-0077, S-0-0078
Default	0
Limitations	Read/Write

S-0-0336 – Status 'In position'

Version	All versions
Description	Returns a value that indicates whether the drive position error (S-0-0189) is more or less than the threshold position error (S-0-0057).
Range	0 = Position error is greater than S-0-0057 value 1 = Position error is less than S-0-0057 value
Units	Not Applicable
Default	Not Applicable
Limitations	Read only

S-0-0348 – Position loop feed forward acceleration term gain

Version	All versions
Description	Gets/sets the feed-forward acceleration term gain of the position control loop.
Range	0 – MaxS32bit
Units	Counts/(250 μ s) ² /2 ⁸
Default	0
Limitations	Read/Write

S-0-0380 – DC bus voltage

Version	All versions
Description	Returns the bus voltage as measured by the drive
Range	0 – MaxU16bit
Units	mV
Default	Not Applicable
Limitations	Read only

S-0-0384 – Amplifier temperature

Version	All versions
Description	Returns the value of the drive power board temperature.
Range	-500 – 2500
Units	0.1 degrees Celsius
Default	Not Applicable
Limitations	Read Only

S-0-0390 – Diagnostic number

Version	3.0.7
Description	Returns the number of the active fault in the drive. Refer to the table in Appendix A for the faults number and descriptions.
Range	0 – MaxS32bit
Units	Not Applicable
Default	Not Applicable
Limitations	Read Only

S-0-0400 – Home switch

Version	All versions
Description	Returns the value of the home switch signal.
Range	0 1
Units	Not Applicable
Default	Not Applicable
Limitations	Read Only

S-0-0403 – Position feedback value status

Version	All versions
Description	Returns the home status of the drive.
Range	0 = Not homed 3 = feedback 1 is homed 5 = feedback 2 is homed (currently not supported)
Units	Not Applicable
Default	0
Limitations	Read Only

S-0-1000.0.0 – List of SCP classes and version

Version	All versions
Description	This IDN contains a list of all classes with the dedicated version supported by the device.
Range	Not Applicable
Units	Not Applicable
Default	0x0201 0x0301 0x0A01
Limitations	Read Only

S-0-1019 – MAC address

Version	All versions
Description	The MAC address of the device. Each device has a unique MAC address which consists of 6 bytes, and assigned at production.
Range	Not Applicable
Units	Not Applicable
Default	Not Applicable
Limitations	Read Only

S-0-1020 – IP address

Version	All versions
Description	The IP address of the device. The IP starts with the 3 octets: 192.168.0. The last octet is the device's Sercos address value.
Range	192.168.0.1 – 192.168.0.63
Units	Not Applicable
Default	Not Applicable
Limitations	Modifying this IDN is not supported yet.

S-0-1020.0.1 – Current IP address

Version	All versions
Description	The current activated IP address of the device. The IP starts with the 3 octets: 192.168.0. The last octet is the device's Sercos address value.
Range	192.168.0.1 – 192.168.0.63
Units	Not Applicable
Default	192.168.0.X (where X is Sercos address).
Limitations	Modifying this IDN is not supported yet.

S-0-1021 – Subnet Mask

Version	All versions
Description	The subnet mask of the device. The value is fixed to 255.255.255.0.
Range	0.0.0.0 – 255.255.255.255
Units	Not Applicable
Default	255.255.255.0
Limitations	Modifying this IDN is not supported yet.

S-0-1021.0.1 – Current subnet mask

Version	All versions
Description	The current activated subnet mask of the device. The value is fixed to 255.255.255.0.
Range	0.0.0.0 – 255.255.255.255
Units	Not Applicable
Default	255.255.255.0
Limitations	Read Only

S-0-1022 – Gateway address

Version	All versions
Description	The gateway address of the device. The value is fixed to 192.168.0.254.
Range	0.0.0.0 – 255.255.255.255
Units	Not Applicable
Default	192.168.0.254
Limitations	Modifying this IDN is not supported yet.

S-0-1022.0.1 – Current active gateway address

Version	All versions
Description	The current activated gateway address of the device. The value is fixed to 192.168.0.254.
Range	0.0.0.0 – 255.255.255.255
Units	Not Applicable
Default	192.168.0.254
Limitations	Read Only

S-0-1040 – Sercos address

Version	All versions
Description	This IDN contains the Sercos address of the device. The value is set according to the DIP switch state. Changing the DIP switch requires a device restart, for activating the new address.
Range	1 – 63
Units	Not Applicable
Default	DIP switch state
Limitations	Not Applicable

S-0-1300-0-3 – Vendor code

Version	All versions
Description	The vendor code is a unique number assigned to each vendor and helps identifying a Sercos device installed in the Sercos ring.
Range	Not Applicable
Units	Not Applicable
Default	0
Limitations	Read Only

S-0-1300-0-4 – Device name

Version	All versions
Description	The name of the device
Range	string
Units	Not Applicable
Default	LVD_Network.
Limitations	Read Only

S-0-1300-0-5 – Vendor device ID

Version	All versions
Description	The ID of the device that is given by the manufacturer.
Range	string
Units	Not Applicable
Default	LVD_Network.
Limitations	Read Only

S-0-1300-0-9 – Software revision

Version	All versions
Description	Returns a string of the firmware version of the drive
Range	Not Applicable
Units	Not Applicable
Default	Not Applicable
Limitations	Read Only

S-0-1302-0-1 – FSP type and version

Version	All versions
Description	Indicates the function specific type and the function dependent version of the resource.
Range	0 – MaxU32bit
Units	Not Applicable
Default	0x20001
Limitations	Read Only.

S-0-1302-0-3 – Application Type

Version	All versions
Description	Gets/sets the application type string of the drive. This string can be programmed by the user and it is saved into the non-volatile memory.
Range	Not Applicable
Units	Not Applicable
Default	“Default”
Limitations	String length is limited to 50 characters.

P-0-0001 – PWM Frequency

Version	All versions
Description	Sets the PWM frequency of the drive. Note: The drive must be restarted to allow the change to take place. Two PWM frequencies are supported: 16 KHz standard 100 KHz for low inductance motors
Range	0 = 16 KHz 1 = 100 KHz
Units	Not Applicable
Default	0
Limitations	Read/Write

2.2 Product-Specific IDNs

P-0-0018 – Motor Poles

Version	All versions
Description	Gets/sets the number of motor poles. P-0-0018 is used for commutation control and represents the number of individual magnetic poles of the motor (not pole pairs). When the value is changed, the drive will require an activation of the CONFIG procedure command (see P-0-0632).
Range	2 – 400; must be even number
Units	Not Applicable
Default	2
Limitations	Read/Write Not used in DC motors.

P-0-0019 – Micro-step resolution

Version	All versions
Description	Sets the micro-step resolution of a stepper motor.
Range	0 = 256 μ steps for full step (1.8° or 0.9° depends on the motor) 1 = 128 μ steps for full step (1.8° or 0.9° depends on the motor) 2 = 64 μ steps for full step (1.8° or 0.9° depends on the motor) 3 = 32 μ steps for full step (1.8° or 0.9° depends on the motor) 4 = 16 μ steps for full step (1.8° or 0.9° depends on the motor) 5 = 8 μ steps for full step (1.8° or 0.9° depends on the motor) 6 = 4 μ steps for full step (1.8° or 0.9° depends on the motor) 7 = 2 μ steps for full step (1.8° or 0.9° depends on the motor) 8 = Full step mode (1.8° or 0.9° depends on the motor)
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0020 – Stepper current reduction value

Version	All versions
Description	Stepper current reduction value is the value of the current needed to hold position when stepper motor stops in open loop commutation. This current is applied when the time that is defined in P-0-0021 has elapsed.
Range	0 – MAX_CURRENT
Units	mA
Default	1000
Limitations	Applicable only for open loop stepper only P-0-0615 (motor type) value 3.

P-0-0021 – Stepper current reduction time

Version	All versions
Description	Sets the time delay for a reduction of the motor current to P20 value (used in open loop stepper). S-0-0047 (position command value) must remain constant for the duration defined by P-0-0021 before applying P-0-0020 (stepper current reduction value).
Range	0 – MaxS16bit
Units	ms
Default	0
Limitations	Write protect at CP4 Applicable only for open loop stepper only P-0-0615 (motor type) value 3.

P-0-0038 – Current demand Value

Version	All versions
Description	Gets the current command for the current loop.
Range	±MaxS16bit
Units	mA
Default	Not Applicable
Limitations	Read Only

P-0-0040 – Position loop feed forward velocity term gain

Version	All versions
Description	Gets/sets feed-forward velocity term gain of the position control loop.
Range	0 – MaxS32bit
Units	Counts/250 μ s/2 ⁸
Default	0
Limitations	Read/Write

P-0-0043 – Current actual value

Version	All versions
Description	Returns the magnitude of the current vector flowing through the motor. The phases current (P-0-0067, P-0-0068, P-0-0069) are sampled at 16KHz rate, and the total current is calculated at 4KHz rate.
Range	0 – MaxS16bit
Units	mA
Default	Not Applicable
Limitations	Read Only

P-0-0048 – Velocity demand value

Version	All versions
Description	Gets/sets the velocity command of the motor.
Range	\pm MaxS16bit
Units	S-0-0044, decimal places: S-0-0045, S-0-0046
Default	Not Applicable
Limitations	Read only

P-0-0049 – Velocity loop out

Version	All versions
Description	Returns the value of the velocity loop output (control effort)
Range	\pm MaxS32bit
Units	mA
Default	Not Applicable
Limitations	Read only

P-0-0051 – Motor KT factor

Version	All versions
Description	Gets/sets the value for the motor KT factor.
Range	±MaxS16bit
Units	Nm/mA
Default	1000
Limitations	Read/Write

P-0-0062 – Phase A PWM

Version	All versions
Description	Returns the value of Phase A PWM
Range	0 – MaxS16bit
Units	Not Applicable
Default	Not Applicable
Limitations	Read Only

P-0-0063 – Phase B PWM

Version	All versions
Description	Returns the value of Phase B PWM
Range	0 – MaxS16bit
Units	Not Applicable
Default	Not Applicable
Limitations	Read Only

P-0-0064 – Phase C PWM

Version	All versions
Description	Returns the value of Phase C PWM
Range	0 – MaxS16bit
Units	Not Applicable
Default	Not Applicable
Limitations	Read Only

P-0-0065 – Phase D PWM

Version	All versions
Description	Returns the value of Phase D PWM
Range	0 – MaxS16bit
Units	Not Applicable
Default	Not Applicable
Limitations	Read Only

P-0-0067 – Phase A current

Version	All versions
Description	Returns the total current flowing through phase A of the motor. Sampled at 16 KHz sample rate.
Range	±MaxS16bit
Units	mA
Default	Not Applicable
Limitations	Read only

P-0-0068 – Phase B current

Version	All versions
Description	Reads the total current flowing through phase B of the motor. Sampled at 16 KHz rate.
Range	±MaxS16bit
Units	mA
Default	Not Applicable
Limitations	Read only

P-0-0069 – Phase C current

Version	All versions
Description	Reads the total current flowing through phase C of the motor. Sampled at 16KHz sample rate.
Range	±MaxS16bit
Units	mA
Default	Not Applicable
Limitations	Read only

P-0-0070 – Phase D current

Version	All versions
Description	Reads the total current flowing through phase D of the motor. Sampled at 16KHz sample rate.
Range	$\pm \text{MaxS16bit}$
Units	mA
Default	Not Applicable
Limitations	Read only

P-0-0100 – Velocity loop proportional gain command

Version	All versions
Description	Gets/sets the command proportional gain of the velocity loop.
Range	$0 - 2^{24}$
Units	$\text{mA}/(\text{rpm}/100)/2^{16}$
Default	1000
Limitations	Read/Write

P-0-0101 – Velocity loop proportional gain feedback

Version	All versions
Description	Gets/sets the feedback proportional gain of the velocity loop.
Range	$0 - 2^{24}$
Units	$\text{mA}/(\text{rpm}/100)/2^{16}$
Default	1000
Limitations	Read/Write

P-0-0102 – Velocity loop derivative gain command

Version	All versions
Description	Gets/sets the command derivative gain of the velocity loop.
Range	$0 - 2^{24}$
Units	$\text{mA}/\text{rpm}/100/125\mu\text{s}/2^{16}$
Default	1000
Limitations	Read/Write

P-0-0103 – Velocity loop derivative gain feedback

Version	All versions
Description	Gets/sets the feedback derivative gain of the velocity loop.
Range	0 – 2 ²⁴
Units	mA/rpm/100/125μs/2 ¹⁶
Default	1000
Limitations	Read/Write

P-0-0113 – Over voltage fault level

Version	All versions
Description	Gets/sets the over-voltage fault limit for the bus voltage. This value must be greater than P-0-0114.
Range	MinBusVoltage – MaxBusVoltage
Units	mV
Default	MaxBusVoltage
Limitations	Read/Write

P-0-0114 – Under voltage fault level

Version	All versions
Description	Gets/sets the under-voltage fault limit for the bus voltage. This value must be less than P-0-0113.
Range	MinBusVoltage – MaxBusVoltage
Units	mV
Default	MinBusVoltage
Limitations	Read/Write

P-0-0192 – Fault history

Version	All versions
Description	Returns a list of the last 10 error codes. P-0-0193 holds the time stamp of each error (in the same order as P-0-0192).
Range	Not Applicable
Units	Not Applicable
Default	Not Applicable
Limitations	Read only

P-0-0193 – Faults time

Version	All versions
Description	Returns the time stamp of the last 10. The time stamps correspond to the time in P-0-0197. P-0-0192 holds the error code (in the same order as P-0-0193).
Range	Not Applicable
Units	sec/10
Default	Not Applicable
Limitations	Read only

P-0-0194 – Clear faults history

Version	All versions
Description	Clears the lists of faults (P-0-0192 and P-0-0193) from the non-volatile memory (EEPROM). All the values in P-0-0192 and P-0-0193 will be reset.
Range	Procedure command
Units	Not Applicable
Default	Not Applicable
Limitations	Not Applicable

P-0-0196 – Time enable

Version	All versions
Description	Returns the accumulated time in which the drive has been enabled.
Range	Not Applicable
Units	sec/10
Default	Not Applicable
Limitations	Read only

P-0-0197 – Time on

Version	All versions
Description	Returns the accumulated time in which the drive has been powered.
Range	Not Applicable
Units	sec/10
Default	Not Applicable
Limitations	Read only

P-0-0300 – Digital inputs values

Version	All versions	
Description	Returns the values of the digital inputs.	
	Bit	Value
	0	Digital input #1
	1	Digital input #2
	2	Digital input #3
	3	Digital input #4
	4...14	Reserved
	15	Control enable
Range	0 or 1 for bits zero to three and bit 15 0 for bits 4...14	
Units	Not Applicable	
Default	Not Applicable	
Limitations	Read only	

P-0-0301 – Digital inputs #1 value

Version	All versions
Description	Returns the state of the digital input 1.
Range	0 = Off 1 = On
Units	Not Applicable
Default	Not Applicable
Limitations	Read only

P-0-0302 – Digital inputs #2 value

Version	All versions
Description	Returns the state of the digital input 2.
Range	0 = Off 1 = On
Units	Not Applicable
Default	Not Applicable
Limitations	Read only

P-0-0303 – Digital inputs #3 value

Version	All versions
Description	Returns the state of the digital input 3.
Range	0 = Off 1 = On
Units	Not Applicable
Default	Not Applicable
Limitations	Read only

P-0-0304 – Digital inputs #4 value

Version	All versions
Description	Returns the state of the digital input 4.
Range	0 = Off 1 = On
Units	Not Applicable
Default	Not Applicable
Limitations	Read only

P-0-0321 – Digital input #1 functionality

Version	All versions
Description	Gets/sets the functionality of digital input 1.
Range	0 = Disabled 1 = General 2 = Homing 3 = Positive Limit Switch 4 = Negative Limit Switch 5 = Remote Enable (controls enable/disable operation state)
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0322 – Digital input #2 functionality

Version	All versions
Description	Gets/sets the functionality of digital input 2.
Range	0 = Disabled 1 = General 2 = Homing 3 = Positive Limit Switch 4 = Negative Limit Switch 5 = Remote Enable (controls enable/disable operation state)
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0323 – Digital input #3 functionality

Version	All versions
Description	Gets/sets the functionality of digital input 3.
Range	0 = Disabled 1 = General 2 = Homing 3 = Positive Limit Switch 4 = Negative Limit Switch 5 = Remote Enable (controls enable/disable operation state)
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0324 – Digital input #4 functionality

Version	All versions
Description	Gets/sets the functionality of digital input 4.
Range	0 = Disabled 1 = General 2 = Homing 3 = Positive Limit Switch 4 = Negative Limit Switch 5 = Remote Enable (controls enable/disable operation state)
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0341 – Digital input #1 Polarity

Version	All versions
Description	Inverts the polarity of digital input 1.
Range	0 = Polarity inverted. 1 = Polarity not inverted.
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0342 – Digital input #2 Polarity

Version	All versions
Description	Inverts the polarity of digital input 2.
Range	0 = Polarity inverted. 1 = Polarity not inverted.
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0343 – Digital input #3 Polarity

Version	All versions
Description	Inverts the polarity of digital input 3.
Range	0 = Polarity inverted. 1 = Polarity not inverted.
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0344 – Digital input #4 Polarity

Version	All versions
Description	Inverts the polarity of digital input 4.
Range	0 = Polarity inverted. 1 = Polarity not inverted.
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0360 – Digital output value

Version	All versions
Description	Gets/sets the value of the digital output.
Range	0 = Off 1 = On
Units	Not Applicable
Default	Not Applicable
Limitations	Read/Write

P-0-0361 – Digital output value

Version	All versions
Description	Gets/sets the value of the digital output.
Range	0 = Off 1 = On
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0371 – Digital output functionality

Version	All versions
Description	Gets/sets the functionality of the digital output.
Range	0 = The digital output is always low. 1 = MotorSpeedSet. If the velocity value is greater than P-0-0401, the output is set to high. 2 = Current. If the current value is greater than P-0-0401, the output is set to high. 3 = Reserved 4 = MotorSpeedSetClr. If the velocity value is less than P-0-0391 and greater than P-0-0401, the output is set to high. 5 = Reserved 6 = Reserved. 7 = In Position. Set according to S-0-0336. 8 = Zero Speed. If the velocity absolute value is less than or equal to P-0-0401, the output is set to high. 9 = Soft Position Limit. If the position value is less than P-0-0391 and greater than P-0-0401, the output is set to high. 10 = Active. Sets output to high if drive is enabled. 11 = Reserved. 12 = Reserved 13 = Set according to the value set in P-0-0361.

Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0381 – Digital output polarity

Version	All versions
Description	Inverts the polarity of digital output 1.
Range	0 = Polarity inverted. 1 = Polarity not inverted.
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0391 – Digital output high window

Version	All versions
Description	Gets/sets the high value of the window for the digital output.
Range	\pm MaxS32bit
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0401 – Digital output low window

Version	All versions
Description	Gets/sets the low value of the window for the digital output.
Range	\pm MaxS32bit
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0410 – Real time cycle

Version	All versions
Description	Gets the real-time cycle of the drive.
Range	Not Applicable
Units	nano-seconds
Default	Not Applicable
Limitations	Read only

P-0-0411 – Analog input #1 value

Version	All versions
Description	Returns the value of analog input 1.
Range	±20000
Units	mV
Default	Not Applicable
Limitations	Read only

P-0-0412 – Analog input #2 value

Version	All versions
Description	Returns the value of analog input 2.
Range	±20000
Units	mV
Default	Not Applicable
Limitations	Read only

P-0-0413-0-0 – Zero analog input procedure command

Version	All versions
Description	Sets the analog input offset to reflect a zero reading of the analog input. The analog input that is used is defined in IDN P-0-0413-0-1
Range	Procedure command
Units	mV
Default	Not Applicable
Limitations	Not Applicable

P-0-0413-0-1 – Zero analog input number

Version	All versions
Description	Sets the analog input number that will be used for the zero analog input procedure command.
Range	1 (analog input 1)
Units	Not Applicable
Default	1
Limitations	Read/Write

P-0-0421 – Analog input #1 offset

Version	All versions
Description	Gets/sets a value that is added to the drive's analog input reading. This value compensates for the analog input offset. The value of P-0-0421 can be set automatically by P-0-0413-0-0. The value of P-0-0421 can also be set manually, in which case it overwrites the P-0-0413-0-0 procedure command setting.
Range	±20000
Units	mV
Default	11538
Limitations	Read/Write

P-0-0422 – Analog input #2 offset

Version	All versions
Description	Gets/sets a value that is added to the drive's analog input reading. This value compensates for the analog input offset.
Range	±20000
Units	mV
Default	11538
Limitations	Read/Write

P-0-0500 – Current loop derivative gain

Version	All versions
Description	Gets/sets the derivative gain for the current controller.
Range	0 – MaxS32bit
Units	PWM duty cycle/mA/62.5uSec/2 ¹⁶
Default	0
Limitations	Read/Write

P-0-0501 – Current loop pole placement

Version	All versions
Description	Gets/sets the separation term for gain paths of the current controller.
Range	0 – MaxU16bit
Units	Not Applicable
Default	MaxU16bit
Limitations	Read/Write

P-0-0503 – I2T value

Version	All versions
Description	If the energy delivered to the motor is higher than the maximum continuous energy limit, the surplus energy is integrated over time as follows: $I2T = \int (I_{con} - I)^2 dt$
Range	0 – MaxS32bit
Units	A ² × ms
Default	Not Applicable
Limitations	Read only

P-0-0504 – I2T limit

Version	All versions
Description	Gets/sets I2T integrator limit value. The drive will generate a fault if this value is exceeded. Setting to 0 to disable this feature.
Range	0 – MaxS32bit
Units	A ² × ms
Default	Not Applicable
Limitations	Read/Write

P-0-0508 – Motor phase

Version	All versions
Description	Gets/sets the motor phase offset. P-0-0508 value must be obtained from motor data sheet. The motor phase offset is the angle between the motor magnets and Hall sensors placement.
Range	0 – 360
Units	Electrical degrees
Default	0
Limitations	Not applicable when using DC motor (P-0-0615 = 1).

P-0-0604 – Phase A current offset

Version	All versions
Description	Returns the phase A offset value. Phase A offset is automatically calculated during the startup of the drive.
Range	\pm MaxS16bit
Units	mA
Default	Not Applicable
Limitations	Read only

P-0-0605 – Phase B current offset

Version	All versions
Description	Returns the phase B offset value. Phase B offset is automatically calculated during the startup of the drive.
Range	\pm MaxS16bit
Units	mA
Default	Not Applicable
Limitations	Read only

P-0-0606 – Phase C current offset

Version	All versions
Description	Returns the phase C offset value. Phase C offset is automatically calculated during the startup of the drive.
Range	\pm MaxS16bit
Units	mA
Default	Not Applicable
Limitations	Read only

P-0-0607 – Phase D current offset

Version	All versions
Description	Returns the phase D offset value. Phase D offset is automatically calculated during the startup of the drive.
Range	\pm MaxS16bit
Units	mA
Default	Not Applicable
Limitations	Read only

P-0-0610 – Position loop integrator input saturation

Version	All versions
Description	Gets/sets the input saturation level for the position loop integrator increment.
Range	0 – MaxS32bit
Units	Counts
Default	100000
Limitations	Read/Write

P-0-0611 – Halls

Version	All versions
Description	Returns the current state of the Hall sensors.
Range	Not Applicable
Units	Not Applicable
Default	Not Applicable
Limitations	Read Only

P-0-0615 – Motor type

Version	All versions
Description	Defines the type of motor.
Range	0 = BLDC motor 1 = DC motor 2 = Closed loop stepper 3 = Open loop stepper
Units	Not Applicable
Default	0
Limitations	Read/Write

p-0-0620 – Position loop integral gain

Version	All versions
Description	Gets/sets integral gain for the position control loop
Range	0 – MaxS32bit
Units	TBD
Default	10
Limitations	Read/Write

P-0-0621 – Position loop derivative gain

Version	All versions
Description	Gets/sets the derivative gain for the position control loop.
Range	0 – MaxS32bit
Units	(rpm/100)/Counts/250 μ s/2 ⁸
Default	0
Limitations	Read/Write

P-0-0625 – Maximum position derivative

Version	All versions
Description	Gets/sets the value of the maximum allowed position derivative for the position command that is received from the Sercos master. Setting this value to zero disables this functionality.
Range	0 – MaxS3bit
Units	Encoder Counts per communication cycle time
Default	0
Limitations	Read/Write

P-0-0626 – Position error

Version	All versions
Description	Returns the position error of the position loop. If the value is greater than S-0-0159, the drive is disabled and a fault is generated.
Range	\pm MaxS32bit
Units	S-0-0076, decimal places: S-0-0077, S-0-0078
Default	Not Applicable
Limitations	Read only

P-0-0627 – Remote

Version	All versions
Description	Returns the state of the external hardware enable input signal.
Range	0 = Remote enable input is off 1 = Remote enable input is on
Units	Not Applicable
Default	Not Applicable
Limitations	Read only

P-0-0628 – Feedback type

Version	All versions
Description	Selects the motor's encoder type.
Range	0 = ABEncoderHalls_Feedback 1 = ABIndexEncoderHalls_Feedback 2 = ABEncoder_Feedback 3 = ABIndexEncoder_Feedback 4 = Halls_Feedback
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0629 – Differential or single-ended encoder

Version	All versions
Description	Gets/sets the encoder type. Encoder line break detection is only available with differential encoder.
Range	0 = Single Ended Encoder 1 = Differential Encoder
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0630 – Encoder direction

Version	All versions
Description	Gets/sets the encoder's count direction (this is the same as swapping A and B signals).
Range	0 = Swapped 1 = Not swapped
Units	Not Applicable
Default	1
Limitations	Read/Write

P-0-0631 – Velocity over-speed

Version	All versions
Description	Gets/sets the velocity value that triggers the over-speed protection fault. When the value of P-0-0041 is greater than the value of P-0-0631, the drive is disabled, and a fault is generated.
Range	0-MaxS32bit
Units	S-0-0044, decimal places: S-0-0045, S-0-0046
Default	2000000
Limitations	Read/Write

P-0-0632 – Config

Version	All versions
Description	Configures the value of unit scaling and commutation according to IDNs S-0-0116, P-0-0611 and P-0-0018.
Range	Procedure command
Units	Not Applicable
Default	Not Applicable
Limitations	Not Applicable

P-0-0633 – Find commutation gain

Version	All versions
Description	Sets the gain for the find commutation procedure command (IDN P-0-0636).
Range	0-MaxS16bit
Units	Not Applicable
Default	3000
Limitations	Read/Write

P-0-0634 – Find commutation max current

Version	All versions
Description	Sets the maximum current for the find commutation procedure command (IDN P-0-0636).
Range	0 – MaxCurrent
Units	Not Applicable
Default	MaxCurrent/4
Limitations	Read/Write

P-0-0635 – Find commutation start type

Version	All versions
Description	Sets the start type for the find commutation procedure command (IDN P-0-0636).
Range	0 = Manual – the functionality is started by executing procedure command P-0-0636. 1 = Automatic – the functionality is started on first enable of the drive.
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0636 – Find commutation procedure command

Version	All versions
Description	Finds the commutation for a motor without Halls. This procedure must be used in with BLDC and open loop motor types (P-0-0615 values 0 and 3).
Version	All versions
Range	Procedure command
Units	Not Applicable
Default	Not Applicable
Limitations	Not Applicable

P-0-0637 – PLL state

Version	All versions
Description	Displays the state of the PLL which is used to synchronize the drive to the Sercos III master.
Range	0 = PLL is unlocked. 1 = PLL is currently locking. 2 = PLL is locked. 3 = PLL lost its locking.
Units	Not Applicable
Default	Not Applicable
Limitations	Read only

P-0-0638 – Regen enable

Version	All versions
Description	Enables/disables the regen functionality of the drive.
Range	0 = Off 1 = On
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0639 – Halls filter

Version	All versions
Description	Filters the HALLs inputs (P-0-0611) based on the following: Sampling frequency = $100\text{Mhz}/(2 \times (\text{P-0-0639}))$
Range	1 – 0xFF
Units	Not Applicable
Default	1
Limitations	Not Applicable

P-0-0647 – IO filter

Version	All versions
Description	Filters the digital inputs based on the following: Sampling frequency = $100\text{Mhz}/(2 \times (\text{P-0-0639}))$
Range	1 – 0xFF
Units	Not Applicable
Default	1
Limitations	Not Applicable

P-0-0649 – PRD

Version	All versions
Description	Displays the position (angle) of the motor shaft within one mechanical motor revolution. PRD increments from 0 to 65535 in the course of one mechanical motor shaft revolution (360 degrees). The Range of PRD does not change. Its resolution is dependent upon the feedback device resolution. $PRD/65535 \times 360 = \text{Angle}$.
Range	0 – MaxU16bit
Units	1/182°
Default	Not Applicable
Limitations	Read only

P-0-0650 – Position loop output

Version	All versions
Description	The output value of the position loop.
Range	$\pm \text{MaxS32bit}$
Units	S-0-0044, decimal places: S-0-0045, S-0-0046
Default	Not Applicable
Limitations	Read only

P-0-0655 – Miss wiring detection procedure command

Version	All versions
Description	Initiates the miss-wiring detection process.
Range	Procedure command
Units	Not Applicable
Default	Not Applicable
Limitations	Not Applicable

P-0-0658 – Miss wiring detection result

Version	All versions
Description	The result of the P-0-0655 procedure command. 0 = Procedure did not detect problems Bit 0 = 1: Hall A disconnected Bit 1 = 1: Hall B disconnected Bit 2 = 1: Hall C disconnected Bit 3 = 1: Motor Phase A disconnected Bit 4 = 1: Motor Phase B disconnected Bit 5 = 1: Motor Phase C disconnected Bit 6 = 1: Motor Phase D disconnected Bit 7 = 1: Motor Halls misaligned Bit 8 = 1: Encoder incorrect direction Bit 9 = 1: Halls incorrect direction Bit 10 = 1: Encoder disconnected Bit 11 = 1: Encoder CNT Direction error Bit 12 = 1: Wrong setting for P-0-0018 or S-0-0116 parameters
Range	0 – 0x1FFF
Units	Not Applicable
Default	0
Limitations	Read only

P-0-0659 – Automatic gain configuration procedure command

Version	All versions
Description	Initiates the automatic current loop gains configuration procedure command.
Range	Procedure command
Units	Not Applicable
Default	Not Applicable
Limitations	Not Applicable

P-0-0660 – Find commutation procedure command state

Version	All versions
Description	The state of the P-0-0636 procedure command.
Range	0 = Commutation not found 1 = P-0-0636 procedure command is in initialization stage 2 = P-0-0636 procedure command is in first stage 3 = P-0-0636 procedure command is in second stage 4 = Commutation found successfully
Units	Not Applicable
Default	0
Limitations	Read only

P-0-0661 – ISAT

Version	All versions
Description	The Drive current limit value.
Range	0 – MaxCurrent
Units	Not Applicable
Default	MaxCurrent/4
Limitations	Write protect in CP3 and CP4

P-0-0720-0-1 – Recorder channel #1 IDN

Version	All versions
Description	The IDN of the first channel to be recorded. Refer to the chapter Recorder for a detailed description of the recorder operation.
Range	0 – MaxU32bit
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0720-0-2 – Recorder channel #2 IDN

Version	All versions
Description	The IDN of the second channel to be recorded. Refer to the chapter Recorder for a detailed description of the recorder operation.
Range	0 – MaxU32bit
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0720-0-3 – Recorder channel #3 IDN

Version	All versions
Description	The IDN of the third channel to be recorded. Refer to the chapter Recorder for a detailed description of the recorder operation.
Range	0 – MaxU32bit
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0720-0-4 – Recorder channel #4 IDN

Version	All versions
Description	The IDN of the fourth channel to be recorded. Refer to the chapter Recorder for a detailed description of the recorder operation.
Range	0 – MaxU32bit
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0721 – Recorder number of channels

Version	All versions
Description	The number of channels that will be recorded in the next recording. Refer to the chapter Recorder for a detailed description of the recorder operation.
Range	1 – 4
Units	Not Applicable
Default	1
Limitations	Read/Write

P-0-0722 – Recorder sample time

Version	All versions
Description	Recorder sample cycle is multiplied by the value of P-0-0410 (Real Time Cycle) to produce recording sample period; i.e., every recorder sample cycle × the value of P-0-0410 the recorder will add a new sample into its recording buffer.
Range	1 – 1000
Units	Not Applicable
Default	1
Limitations	Read/Write

P-0-0723-0-1 – Recorder trigger type

Version	All versions
Description	Determines how the recording will start.
Range	1 = Immediate. Recording will start immediately after the recording procedure command (IDN P-0727) is activated. 2 = Conditional. Recording will start immediately after the recording procedure command (IDN P-0727) is activated and the condition defined by IDNs P-0-0723-0-2, P-0-0723-0-3 and P-0-0723-0-4 are fulfilled. 3 = Fault. Recording will start immediately after the recording procedure command (IDN P-0727) is activated and a fault occurs in the drive.
Units	Not Applicable
Default	1
Limitations	Read/Write

P-0-0723-0-2 – Recorder condition channel IDN

Version	All versions
Description	The IDN of the parameter which will trigger the recording.
Range	0 – MaxU32bit
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0723-0-3 – Recorder condition value

Version	All versions
Description	Value of the condition to be met for recorder trigger type 2 (conditional).
Range	-MaxS32bit – MaxS32bit
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0723-0-4 – Recorder condition comparator

Version	All versions
Description	The recording condition comparator direction
Range	0 = rising edge 1 = falling edge
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0723-0-5 – Recorder buffer location

Version	All versions
Description	Location of the condition/fault in the recording buffer of points.
Range	0 – Number of channels × number of points per channel – 1
Units	Not Applicable
Default	0
Limitations	Applicable for condition and fault recording types only (values 2 and 3 in P-0-0723-0-1).

P-0-0724-0-1 – List of all recordable IDNs

Version	All versions
Description	List of all the IDNs that can be recorded by the recorder or be used as condition channel for conditional recording. This list applies to the recorder channels (IDNs P-0-0720-0-x) and condition channel (IDN P-0-0723-0-2).
Range	Not Applicable
Units	Not Applicable
Default	Not Applicable
Limitations	Read only

P-0-0724-0-2 – Recorder maximum number of points

Version	All versions
Description	Maximum number of points that can be recorded by the recorder. This number indicates the maximum length of a recording, i.e. number of channels × number of points per channel must not exceed this IDN value.
Range	102000
Units	Not Applicable
Default	102000
Limitations	Read only

P-0-0725 – Recorder number of points per channel

Version	All versions
Description	The number of points that will be recorded for each channel in the next recording. Note that number of used channels (P-0-0721) × the value of P-0-0725 must not exceed the value of IDN P-0-0724.
Range	1 – Total number of points / number of used channels.
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0726-0-1 – Recorder results reset

Version	All versions
Description	When a recording is finished (procedure command P-0-0727 has finished successfully), write 1 into this IDN in order to set the recording results buffer to the beginning.
Range	0 = no action 1 = set the recording results buffer to the beginning
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0726-0-2 – Recorder results buffer

Version	All versions
Description	When a recording is finished (Procedure command P-0-0727 has finished successfully) and the results buffer was reset (IDN P-0-0726-0-1), read the recording results by repeatedly reading this IDN. On each read the IDN will return the next 100 recorded points. Continually read this IDN according to the number of points in the current recording (Number of used channels × Number of points per channel). In addition to this IDN the recorder results buffer can be retrieved via the TCP channel of the drive. The TCP method is much faster and therefore more recommended. Please refer to the Recorder section for more information.
Range	Not Applicable.
Units	Not Applicable
Default	Not Applicable
Limitations	Only read this IDN after a successful recording operation.

P-0-0727-0-0 – Recorder procedure command

Version	All versions
Description	This procedure command starts and stops the recoding process. When recording finishes, the procedure command state will be set to success or failure values. Once the procedure command was finished successfully, the results buffer can be retrieved.
Range	Procedure command.
Units	Not Applicable
Default	Not Applicable
Limitations	Not Applicable

P-0-0728-0-1 – Recorder channel #1 type

Version	All versions
Description	The type of data to record in the first channel.
Range	0 = Record channel (P-0-0720.0.1) value is an IDN. 1 = Record channel (P-0-0720.0.1) value is an address of a 16 bit variable. 2 = Record channel (P-0-0720.0.1) value is an address of a 32 bit variable.
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0728-0-2 – Recorder channel #2 type

Version	All versions
Description	The type of data to record in the second channel.
Range	0 = Record channel (P-0-0720.0.2) value is an IDN. 1 = Record channel (P-0-0720.0.2) value is an address of a 16 bit variable. 2 = Record channel (P-0-0720.0.2) value is an address of a 32 bit variable.
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0728-0-3 – Recorder channel #3 type

Version	All versions
Description	The type of data to record in the third channel.
Range	0 = Record channel (P-0-0720.0.3) value is an IDN. 1 = Record channel (P-0-0720.0.3) value is an address of a 16 bit variable. 2 = Record channel (P-0-0720.0.3) value is an address of a 32 bit variable.
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-0728-0-4 – Recorder channel #4 type

Version	All versions
Description	The type of data to record in the fourth channel.
Range	0 = Record channel (P-0-0720.0.4) value is an IDN. 1 = Record channel (P-0-0720.0.4) value is an address of a 16 bit variable. 2 = Record channel (P-0-0720.0.4) value is an address of a 32 bit variable.
Units	Not Applicable
Default	0
Limitations	Read/Write

P-0-1121 – Velocity loop LPF

Version	All versions
Description	Gets/sets the low pass filter cutoff frequency for the velocity loop
Range	1 – 30000
Units	Hz
Default	450
Limitations	Read/Write

3 Recorder

3.1 General

The LVD Sercos III drive has an integral recorder that enables recording of up to four different IDNs at run time.

The recorder can start the recording on command or by evaluation of a condition.

3.2 Programming the Recorder

The recorder can record up to four different channels; therefore, set the number of channels that will be recorded in the next recording. This value must be between 1 and 4 (P-0-0721).

Set IDNs P-0-0720-0-1 through P-0-0720-0-4 to the IDNs numbers that will be recorded.

A list of all IDNs that can be recorded is held in IDN P-0-0724-0-1.

Next, set the number of points that will be recorded for each channel (P-0-0725). This value must not exceed the maximum number of available points divided by number of channels.

Finally, set the sample time of the recorder (P-0-0722). This value determines the frequency of the recording in multiples of 62.5 μ s.

3.3 Triggering the Recorder

The recorder has three triggers types (P-0-0723-0-1):

1. **Immediate.** The recording will start as soon as the recorder procedure command (P-0-0727) has started.
2. **By condition IDN.** The recording will start as soon as the recorder procedure command (P-0-0727) has started and the condition has been met. The condition consists of three elements:
 - Condition IDN (P-0-0723-0-2): the IDN number of the inspected condition.
 - Condition value (P-0-0723-0-3): the value that must be passed by the condition IDN in order to trigger the recorder
 - Condition comparator (P-0-0723-0-4): the passing direction of the value (rising edge or falling edge).

Buffer location: the position of the trigger in the recorder results buffer (i.e., all points preceding this value were recorded before the condition occurred).

3. **By fault** – The recording will start as soon as the recorder procedure command (P-0-0727) has started and a fault occurred. The trigger consists of 1 element:

Buffer location: the position of the trigger in the recorder results buffer (i.e., all points preceding this value were recorded before the condition occurred).

3.4 Retrieving the Results

Once the recorder procedure command (P-0-0727) has finished successfully, the recorder results buffer can be retrieved.

There are 2 methods for retrieving the results:

- **Via service channel.** Reset the buffer index by writing 1 to IDN P-0-0726-0-1. Next, read IDN P-0-0726-0-2 to retrieve each point's value. To retrieve the entire buffer IDN P-0-0726-0-2 must be read $P-0-0721 \times P-0-0725$ times. On each read operation the buffer is automatically advanced to the next point.

Note that this method is less preferable as is much slower than using the TCP channel.

- **Via TCP channel.** Using the TCP channel for retrieving the recorder results buffer is described in the chapter TCP Channel.

This method is preferable as it is much faster than using the service channel.

4 TCP Channel

4.1 File Transfer

The LVD Sercos III drive has the capability of receiving files, and can hold of up to 6 MB of files.

To send a file to the drive, do the following:

1. Open a socket to the drive according to its assigned IP.
2. Connect to port number 6556.
3. Send the file name.

The file name is an 8.3 type, and must consist of alphanumeric characters only. The file name can have less than 8 characters but the file name string must be padded with blanks (e.g., file1.dat will be sent as: "file1.dat "). The extension must contain exactly 3 characters.

4. Send UINT32 which holds the file length (number of bytes in file).
5. Send UINT32 which holds the file checksum (all bytes of the file summed into a UINT32).
6. Send 27 UINT32 with a value of zero (this is the remainder of the of the file header, which is reserved for future purposes).
7. Send the file data.
8. Once the file data is sent, read a result string from the port.
The result string may be one of the following strings:

File transferred successfully	Operation completed successfully.
Error: Disk full	The file system on the drive is full. Delete some files to make space.
Error: Invalid file name	File name is not compliant.
Error: Checksum mismatch	The received file's checksum is not the same as the one that was sent.
Error: File size mismatch	The received file's size is not the same as the one that was sent.
Error: Unspecified error (<error code>)	An unspecified error occurred. Error code is attached.

4.2 Firmware Upgrade

The LVD Sercos III firmware can be upgraded by sending a new firmware file via the file transfer mechanism.

The file must be named **lvdware .bin** (Note the padding of the string to 8.3 format.)

Refer to the section File Transfer for instructions on transferring files..

Once the new firmware file has been sent to the drive successfully, the drive must cycle power in order to load the new firmware.

4.3 Drive Recorder Results Buffer

The LVD Sercos III includes an integral recorder that allows recording various IDNs at run time.

The recorder can record up to 8166 points.

It is recommended to retrieve the points via the TCP channel, as follows:

1. Open socket to the drive according to its assigned IP.
2. Connect to port number 6557.
3. Send the string **"get"** to start the process.
4. The drive will start sending the points (as text) in the following format:

```
<point 1>,<point 2>...<point N>
<point N+1>,<point N+2>,...<point N+N>
.
.
.
<point M>,<point M+1>,...<point MxN>
```

Where:

N = number of recorded channels (P-0-0721)

M = number of points per channel (P-0-0725)

The process ends when the drive has not sent any new data for more than 2 seconds.

The retrieved data must be handled as text.

In the event of an error, if possible, the drive will return a text message as follows:

Error: Unrecognized command"	The connection expected a "get" command but a different command arrived.
Error: Unspecified error (<error code>)	An unspecified error occurred. Error code is attached.

5 Diagnostic Messages

5.1 Reading the Diagnostic Messages

Use the following IDN's to read the active fault and the fault history:

IDN S-0-0095: Diagnostic message.

IDN S-0-0390: Diagnostic number.

IDN P-0-0192: Fault history.

IDN P-0-0193: Fault time.

5.2 Diagnostic Messages

Diagnostic number	Diagnostic message
0x00000000	No Faults
0xC00F2018	Over Temperature
0xC00F2174	Encoder Line Break
0xC00F8028	Over Current
0xC00F2025	Over Voltage
0xC00F2026	Under Voltage
0xC00F2036	Position Error
0xC00F8079	Over Speed
0x000F0100	Acc Dec Violation
0x000F0200	Velocity Error
0x000F0300	EEPROM Checksum Fault
0x000F0400	EEPROM Reading Fault
0x000F0500	EEPROM Writing Fault
0x000F0600	PLL is Unlocked While Drive is Enabled
0x000F0700	Illegal Halls
0x000F0800	Position Command Error
0x000F0900	Bus Voltage is Higher than Regen Threshold
0x000F0A00	Commutation Fault
0x000F0B00	I2T Limit

LVD Sercos III IDN Reference Manual

Rev. 5.0



Servotronic - 21C Yagia Kapayim St.
POB 3919 Petach Tikva 49130, Israel
Tel: 972-3-927-3800
info@servotronic.com
www.servotronic.com