DSA SERCOS^{TM} Drive
Product Interface Specification

Project Number: N/A

Preliminary
Revision 0.03
16 August 2001

Written By:

Approval Signatures:	☐ Date:	☐ Date:	☐ Date:
	☐ Date:	☐ Date:	☐ Date:
	☐ Date:	☐ Date:	☐ Date:

(page intentionally left blank)

Revision History

Rev.	Date/Initials	Location	Description of Change
0.00	16 March, 2000 - tvg	All	Initial Revision
0.01	20 July, 2000 - dkh		
0.02			
0.03	16 Aug, 2001 - dkh		For firmware version 1.14.01

1. INTRODUCTION

1.1. Scope

This document is designed to record a subset of the SERCOS standard interface that is supported by the DSA SERCOS Drive SERCOS drive for Giddings & Lewis. The Giddings & Lewis proprietary IDNs are also assigned and described. This document also attempts to more clearly define the operation of the SERCOS Interface where the SERCOS standard is open to interpretation.

1.2. Abbreviations

IDN	Identification Number (SERCOS parameter)
PISD	Product Interface Specification Document
SERCOS™	Serial Real-time Communications System IEC 1491 (EN 61491) SERCOS is a trademark of the SERCOS interest group. RA is a member of SERCOS N.A. – a promotional alliance for developing the SERCOS protocol and products.
AT	Amplifier Telegram
MDT	Master Data Telegram
MST	Master Synchronization Telegram

1.3. References

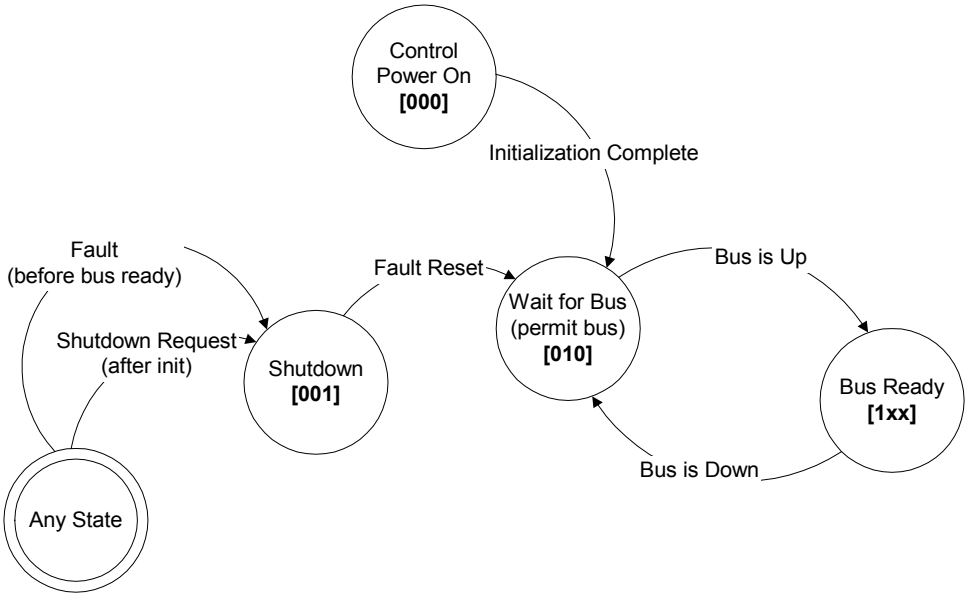
1. IEC 1491 (EN 61491), First Edition, 1995-11

2. SYSTEM BEHAVIOR

2.1. Drive State Behavior

The state of the drive is actually determined by two state machines. At a system level, we monitor the state of the bus which controls/limits the behavior of the axis level.

2.1.1. System State Machine



2.1.1.1. Control Power On

System is running through initialization. Bus not yet permitted by drive.

2.1.1.2. Wait for Bus

Drive has a bus permissive state, waiting for application of power.

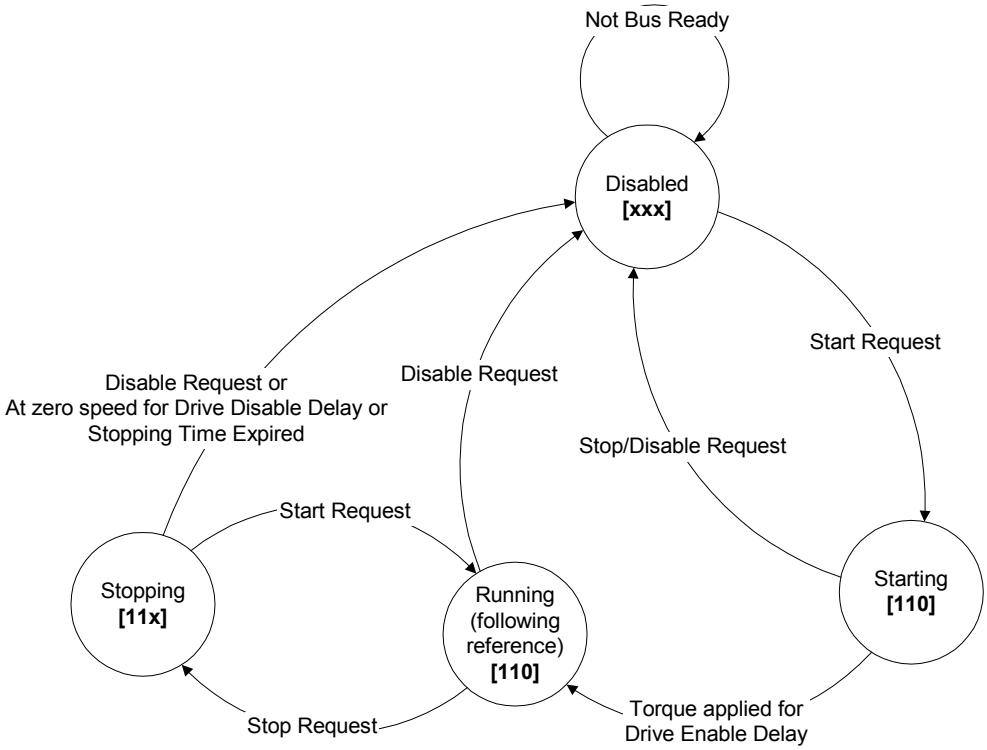
2.1.1.3. Bus Ready

Bus power has been applied, axis state machine can now leave disabled.

2.1.1.4. Shutdown

Drive is no longer permitting bus to be active. This could be due to severe fault or any fault prior to the bus ready state.

2.1.2. Axis State Machine



2.1.2.1. Disabled

Axis is not switching the power device, the motor is free of torque.
Mechanical brake control is active.

2.1.2.2. Starting

Axis is permitted to switch power device.
Ensures it is capable of delivering torque (flux built for induction machines).
De-activates mechanical brake control.
Follows internal zero velocity reference for “drive on delay time” IDN S-0-0206 (allows brake time to release).
This is a transitory internal state of the drive that cannot be observed through the interface.

2.1.2.3. Running

The axis is following the selected customer reference.

2.1.2.4. Stopping

Follows internal zero velocity reference until axis reaches zero speed (as determined by IDN S-0-0124 and indicated by IDNs S-0-0331 & S-0-0013, Bit 1) for “drive off delay time” IDN S-0-0207 (allows brake time to engage).
Fast restart requests are supported by transitioning back to the running state.
Stopping state is only active for a maximum of IDN P-0-0072 (stopping time limit), after which we will immediately transition to the disabled state.

2.1.3. Axis Commands

The axis state machine responds to commands from multiple sources (SERCOS interface, Fault handler, Discrete inputs, etc.). The commands are resolved and prioritized into a single command word; higher priority commands override the affects of lower priority commands.

2.1.3.1. Disable Request (highest priority)

Level sensitive request to immediately remove applied torque to the motor (stop switching).

2.1.3.2. Stop Request

Level sensitive request to stop the axis and then disable.

2.1.3.3. Halt Request

Level sensitive request to stop the axis.

2.1.3.4. Start Request (lowest priority)

Edge sensitive request to start following reference.

2.1.3.5. SERCOS Control Interface

2.1.3.5.1. Commands

The drive will interpret the SERCOS control command as follows.

Bit 15	Bit 14	Bit 13	Reaction
X	0	X	Issue Disable command.
0	1	X	Issue Stop command
1	1	0	Issue Halt command. (Follow local zero velocity reference.)
1	1	1	Issue Start command

2.1.3.5.2. Status

The SERCOS status for bits [15..13] are shown in braces in the state diagram. An “X” indicates that the value is dependent on conditions outside the immediate control of state and is resolved at a system level.

2.1.3.6. Fault Handling

It is assumed that the fault handling mechanism produces commands appropriate to the detected class of fault.

2.1.3.6.1. Standard Faults

Issue a stop command (as controlled by IDN’s P-0-0071 “stopping torque” and P-0-0072 “stopping time limit”).

2.1.3.6.2. Disable Faults

Issue a disable command.

2.1.3.6.3. Shutdown Faults

Request the shutdown of the bus.

A. APPENDIX – STANDARD IDNS

A.1. List of Standard IDNs

The **Class** column refers to the *lowest* IEC 61491 SERCOS compliance class that the respective IDN belongs to. All of the IDNs necessary for compliance classes A and B are included in this list.

Shaded IDNs are not yet completed.

IDN	Class	Name
S-0-0001	B	Control Unit Cycle Time (t_{Ncyc})
S-0-0002	A	Communication Cycle Time (t_{Scyc})
S-0-0003	A	Shortest AT Transmission Starting Time (t_{1min})
S-0-0004	A	Transmit/Receive Transition Time (t_{ATMT})
S-0-0005	B	Minimum Feedback Processing Time (t_5)
S-0-0006	A	AT Transmission Starting Time (t_1)
S-0-0007	B	Feedback Acquisition Capture Point (t_4)
S-0-0008	B	Command Value Valid Time (t_3)
S-0-0009	A	Position of Data Record in MDT
S-0-0010	A	Length of MDT
S-0-0011	A	Class 1 Diagnostic (C1D)
S-0-0012	B	Class 2 Diagnostic (C2D)
S-0-0013	B	Class 3 Diagnostic (C3D)
S-0-0014	A	Interface Status
S-0-0015	A	Telegram Type Parameter
S-0-0016	C	Configuration List of AT
S-0-0017	A	IDN-List of All Operation Data
S-0-0018	A	IDN-List of Operation Data for CP_2
S-0-0019	A	IDN-List of Operation Data for CP_3
S-0-0021	A	IDN-List of Invalid Operation Data for CP_2
S-0-0022	A	IDN-List of Invalid Operation Data for CP_3
S-0-0024	C	Configuration List of MDT
S-0-0025	A	IDN-List of All Procedure Commands
S-0-0028	A	MST Error Counter
S-0-0029	A	MDT Error Counter
S-0-0030		Manufacturer Version
S-0-0032	A	Primary Operation Mode
S-0-0033	B	Secondary Operation Mode 1
S-0-0034		Secondary Operation Mode 2
S-0-0035		Secondary Operation Mode 3
S-0-0036	B-Velocity	Velocity Command Value
S-0-0037		Additive Velocity Command Value
S-0-0038		Positive Velocity Limit Value
S-0-0039		Negative Velocity Limit Value
S-0-0040	B-Velocity	Velocity Feedback Value
S-0-0041	B-Homing	Homing Velocity
S-0-0042	B-Homing	Homing Acceleration
S-0-0043	B-Velocity	Velocity Polarity Parameter
S-0-0044	B-Velocity	Velocity Data Scaling Type
S-0-0045	C	Velocity Data Scaling Factor
S-0-0046	C	Velocity Data Scaling Exponent
S-0-0047	B-Position	Position Command Value

IDN	Class	Name
S-0-0049		Positive Position Limit Value
S-0-0050		Negative Position Limit Value
S-0-0051	B-Position	Position Feedback Value 1 (Motor Feedback)
S-0-0052	B-Position	Reference Distance 1
S-0-0053	C-Position	Position Feedback Value 2 (Auxiliary Feedback)
S-0-0054	C-Homing	Reference Distance 2
S-0-0055	B-Position	Position Polarity Parameter
S-0-0057	B-Position	Position Window
S-0-0076	B-Position	Position Data Scaling Type
S-0-0079	C	Rotational Position Resolution
S-0-0080	B-Torque	Torque Command Value
S-0-0081		Additive Torque Command Value
S-0-0082		Positive Torque Limit Value
S-0-0083		Negative Torque Limit Value
S-0-0084	B-Torque	Torque Feedback Value
S-0-0085	B-Torque	Torque Polarity Parameter
S-0-0086	B-Torque	Torque/Force Data Scaling Type
S-0-0087	A	Transmit to Transmit Recovery Time (t_{MTSY})
S-0-0088	A	Receive to Receive Recovery Time (t_{MTSY})
S-0-0089	A	MDT Transmission Starting Time (t_2)
S-0-0090	B	Command Value Proceeding Time (t_{MTSG})
S-0-0091	B-Velocity	Bipolar Velocity Limit Value
S-0-0092	B-Torque	Bipolar Torque Limit Value
S-0-0093	C	Torque Data Scaling Factor
S-0-0094	C	Torque Data Scaling Exponent
S-0-0095	A	Diagnostic Message
S-0-0096	A	Slave Arrangement (SLKN)
S-0-0097	B	Mask Class 2 Diagnostic
S-0-0098	B	Mask Class 3 Diagnostic
S-0-0099	A	Reset Class 1 Diagnostic
S-0-0100		Velocity Loop Proportional Gain
S-0-0101		Velocity Loop Integral Action Time
S-0-0103		Modulo Value
S-0-0104	B-Position	Position Loop K_V Factor
S-0-0105		Position Loop Integral Action Time
S-0-0109		Motor Peak Current
S-0-0110		Amplifier Peak Current
S-0-0111		Motor Continuous Stall Current
S-0-0112		Amplifier Rated Current
S-0-0116	C-Position	Resolution of Feedback 1
S-0-0117		Resolution of Feedback 2
S-0-0121	C-Position	Input Revolutions of Load Gear
S-0-0122	C-Position	Output Revolutions of Load Gear
S-0-0124	B-Velocity	Standstill Window
S-0-0125	B-Velocity	Velocity Threshold
S-0-0126	C-Thresh	Torque Threshold
S-0-0127	A	CP_3 Transition Check
S-0-0128	A	CP_4 Transition Check
S-0-0129		Manufacturer Class 1 Diagnostic
S-0-0130	C-Probe	Probe Value 1 Positive Edge
S-0-0131	C-Probe	Probe Value 1 Negative Edge
S-0-0132	C-Probe	Probe Value 2 Positive Edge
S-0-0133	C-Probe	Probe Value 2 Negative Edge

IDN	Class	Name
S-0-0134		Master Control Word
S-0-0135		Drive Status Word
S-0-0136		Positive Acceleration Limit Value
S-0-0137		Negative Acceleration Limit Value
S-0-0138	B	Bipolar Acceleration Limit Value
S-0-0140		Controller Type
S-0-0142	A	Application Type
S-0-0143	A	System Interface Version
S-0-0146	C-Homing	Control Unit Controlled Homing Procedure Cmd
S-0-0147	B-Homing	Homing Parameter
S-0-0148	B-Homing	Drive Controlled Homing Procedure Command
S-0-0150	B-Position	Reference Offset 1
S-0-0151	C-Homing	Reference Offset 2
S-0-0157	B-Velocity	Velocity Window
S-0-0159	B-Position	Monitoring Window
S-0-0160	B	Acceleration Data Scaling Type
S-0-0161	C	Acceleration Data Scaling Factor
S-0-0162	C	Acceleration Data Scaling Exponent
S-0-0169	C-Probe	Probe Control Parameter
S-0-0170	C-Probe	Probing Cycle Procedure Command
S-0-0171	C-Homing	Calculate Displacement Procedure Command
S-0-0172	C-Homing	Displacement to the Referenced System Proc Cmd
S-0-0173	C-Homing	Marker Position A
S-0-0175	C-Homing	Displacement Parameter 1
S-0-0176	C-Homing	Displacement Parameter 2
S-0-0179	C-Probe	Probe Status
S-0-0181		Manufacturer Class 2 Diagnostic
S-0-0182		Manufacturer Class 3 Diagnostic
S-0-0185	C	Length of the Configurable Data Record in the AT
S-0-0186	C	Length of the Configurable Data Record in the MDT
S-0-0187	C	IDN-List of the Configurable Data in the AT
S-0-0188	C	IDN-List of the Configurable Data in the MDT
S-0-0189	B-Position	Following Distance
S-0-0191	B-Homing	Cancel Reference Point Procedure Command
S-0-0192		*IDN List of Backup Operation Data*
S-0-0197		Set Coordinate System Procedure Command
S-0-0198		Initial Coordinate Value
S-0-0206	B	Drive On Delay Time
S-0-0207	B	Drive Off Delay Time
S-0-0262		*Load Defaults Procedure Command*
S-0-0263		*Load Working Memory Procedure Command*
S-0-0264		*Backup Working Memory Procedure Command*
S-0-0269		Storage Mode
S-0-0270		*Selected IDN List Of Operation Data To Backup*
S-0-0271		Drive ID
S-0-0293		*Selectively Backup Working Memory Procedure Command*
S-0-0296		Velocity Feedforward Gain
S-0-0298		Home Switch Distance
S-0-0301	B-Homing	Allocation of Real-Time Control Bit 1
S-0-0303	B-Homing	Allocation of Real-Time Control Bit 2
S-0-0305	B-Homing	Allocation of Real-Time Status Bit 1
S-0-0307	B-Homing	Allocation of Real-Time Status Bit 2
S-0-0330	B-Velocity	Status '$n_{feedback} = n_{command}$' (At Speed)

IDN	Class	Name
S-0-0331	B-Velocity	Status '$n_{feedback} = 0$' (At Zero Speed)
S-0-0332	B-Velocity	Status '$n_{feedback} < n_x$' (Velocity Below Threshold)
S-0-0333	C-Thresh	Status '$T \geq T_x$' (Torque Above Threshold)
S-0-0334	B-Torque	Status '$T \geq T_{limit}$' (Torque Above Limit)
S-0-0335	B-Velocity	Status '$n_{ommand} > n_{limit}$' (Velocity Above Limit)
S-0-0336	C-Spin Posn	Status 'In Position'
S-0-0347		Velocity Error
S-0-0380		DC Bus Voltage
S-0-0390		Diagnostic Number
S-0-0400	B-Homing	Home Switch
S-0-0401	C-Probe	Probe 1
S-0-0402	C-Probe	Probe 2
S-0-0403	B-Homing	Position Feedback Value Status
S-0-0404		Position Command Value Status
S-0-0405	C-Probe	Probe 1 Enable
S-0-0406	C-Probe	Probe 2 Enable
S-0-0407	C-Homing	Homing Enable
S-0-0408	C-Homing	Reference Marker Pulse Registered
S-0-0409	C-Probe	Probe 1 Positive Latched
S-0-0410	C-Probe	Probe 1 Negative Latched
S-0-0411	C-Probe	Probe 2 Positive Latched
S-0-0412	C-Probe	Probe 2 Negative Latched

A.2. Description of Standard IDNs

S00001	**Control unit cycle time (t_{Ncyc})**			
	This defines how often the master will generate a new command value for the drive (as opposed to how often it will send it – the master could send the same value several times). This value must be an integer multiple of the communication cycle time (t_{Scyc}- IDN S00002). It must be sent from the master to the slave during Phase 2.			
	Name: "Master Cyc Time"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: "µs"	**Phase 2:** RW	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 62	**Value:** (Written by master)		
	Max: ≤ 65,500	**Scaling:** 1		
Notes: DSA's minimum value is 1000				
See Also: IDN S00002 – Communication cycle time (t_{Scyc})				

S00002	**Communication cycle time (t_{Scyc})**			
	This defines how often the master will send the command values and cyclic data. According to the SERCOS spec, this value can be 62 µs, 125 µs, and 250 µs up to 65500 µs in steps of 250 µs. This value must be sent during Phase 2.			
	Name: "Ring Comm Time"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: "µs"	**Phase 2:** RW	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 62	**Value:** (Written by master)		
	Max: ≤ 65,500	**Scaling:** 1		
Notes: DSA's minimum value is 1000				
See Also: IDN S00001 – Control unit cycle time (t_{Ncyc})				

S00003	**Shortest AT transmission starting time (t_{1min})**			
	This is the time required by the slave from the end of the MST to when it can start sending its AT. This value is read by the master during Phase 2 for its timing calculations.			
	Name: "AT Start Time "	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: "µs"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 0	**Value:** (Shortest AT starting time)		
	Max: ≤ 65,535	**Scaling:** 1		
Notes: This is largely a function of the SERCON chip. According to the IAM slave software, the SERCON minimum is 12 µs, and they use the value of 20.				
See Also: IDN S00006 – AT transmission starting time (t_1)				

S00004	**Transmit/Receive transition time (t_{ATMT})**			
	This is the time required by the slave to switch from transmitting the AT to receiving the MST (this is a function of the SERCON chip). It is read by the master during Phase 2 for its timing calculations.			
	Name: "Xmit/Rec Tr Time "	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: "µs"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 0	**Value:** (Transmit/receive transition time)		
	Max: ≤ 65,535	**Scaling:** 1		
Notes: According to the IAM slave software, the SERCON minimum is 2 µs, and they use a value of 10.				
See Also:				

S00005	**Minimum feedback processing time (t_5)**			
	This is the minimum time required by the slave between the start of the feedback acquisition to the end of the next MST. The master reads this during Phase 2 for its timing calculations.			
	Name: "Min Fb Proc Time"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: "µs"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 0	**Value:** (Minimum feedback processing time)		
	Max: ≤ 65,535	**Scaling:** 1		
Notes:				
See Also: IDN S00007 – Feedback acquisition capture point (t_4)				

S00006	**AT transmission starting time (t_1)**			
	This value specifies when the slave should send its AT during Phases 3 & 4. It is sent by the master during Phase 2.			
	Name: "At Trans St Time"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: "µs"	**Phase 2:** RW	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ (IDN S00003 Value)	**Value:** (Written by master)		
	Max: ≤ (IDN S00002 Value)	**Scaling:** 1		
Notes:				
See Also: IDN S00003 – Shortest AT transmission starting time (t_{1min})				

S00007	**Feedback acquisition capture point (t_4)**			
	This specifies at what time the slave should latch its feedback position. Typically, all slaves would have the same value so that all the feedback values the master gets would be from the same point in time. The master sends this value during Phase 2.			
	Name: "Fb Capture Pt"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: "µs"	**Phase 2:** RW	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 0	**Value:** (Written by master)		
	Max: ≤ (IDN S00002 Value)	**Scaling:** 1		
Notes:				
See Also: IDN S00005 – Minimum feedback processing time (t_5)				

S00008	**Command value valid time (t_3)**			
	This specifies at what time the slave can access the new command values. This could be used to synchronize multiple drives. The master sends this value during Phase 2.			
	Name: "Command Valid Tm"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: "µs"	**Phase 2:** RW	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 0	**Value:** (Written by master)		
	Max: ≤ (IDN S00002 Value)	**Scaling:** 1		
Notes:				
See Also: IDN S00090 – Command value proceeding time (t_{MTSG})				

S00009	**Position of data record in MDT**			
	This specifies where the data for this slave is in the MDT. It is in units of bytes, and the first byte is number 1. It is sent by the master during Phase 2.			
	Name: "MDT Drive Pos"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 1	**Value:** (Written by master)		
	Max: ≤ 65,531	**Scaling:** 1		
Notes:				
See Also: IDN S00010 – Length of MDT				

S00010	**Length of MDT**			
	This specifies the overall length of the MDT, in bytes. It is sent by the master during Phase 2.			
	Name: "MDT Length "	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 4	(Written by master)		
	Max: ≤ 65,534	**Scaling:** 1		
Notes:				
See Also: IDN S00009 – Position of data record in MDT				

S00011	**Class 1 diagnostic**			
	Drive shutdown error flags.			
	Name: "Shut Down Errors "	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0000	**Value:** Class 1 diagnostics: (1 = active, 0 = inactive)		
	Max: 0xFFFF	Bit 0: Overload Shutdown (motor thermal model exceeds IDN S00114)		
		Bit 1: Drive Overtemperature Shutdown (drive thermal switch OR calculated thermal model)		
		Bit 2: Motor Overtemperature Shutdown (motor thermal switch)		
		Bits 3-4: Not used		
		Bit 5: Feedback Error		
		Bit 6: Commutation Error (hall effect angle, commutation angle, θ angle)		
		Bit 7: DC Bus Overcurrent Error (instantaneous overcurrent, desat)		
		Bit 8: DC Bus Overvoltage Error		
		Bit 9: DC Bus Undervoltage Error		
		Bit 10: AC Input Phase-Loss Error		
		Bit 11: Excessive Position Deviation (IDN S00159)		
		Bit 12: Communication error (IDN S00014)		
		Bit 13 Overtravel Limit Exceeded (IDNs S00049, S00050)		
		Bit 14: Not used		
		Bit 15: Manufacturer-specific error (IDN S00129)		
Notes: DSA doesn't support bit 10				
See Also: IDN S00099 – Reset class 1 diagnostic IDN S00129 – Manufacturer class 1 diagnostic				

S00012	**Class 2 diagnostic**			
	Drive shutdown warning flags.			
	Name: "Drive Warnings "	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0000	**Value:** Class 2 diagnostics: (1 = active, 0 = inactive)		
	Max: 0x8000	Bits 0-14: Not used		
		Bit 15: Manufacturer-specific warning		
Notes:				
See Also: IDN S00097 – Mask class 2 diagnostic IDN S00181 – Manufacturer class 2 diagnostic				

S00013	**Class 3 diagnostic**			
	Drive operation status flags.			
	Name: "Drive Status "	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0000	**Value:** Class 3 diagnostics: (1 = active, 0 = inactive)		
	Max: 0x8FFF	Bit 0: In speed window (IDN S00330)		
		Bit 1: At zero speed (IDN S00331)		
		Bit 2: Below speed (IDN S00332)		
		Bit 3: Torque Over Threshold (IDN S00333)		
		Bit 4: Torque Over Limit (IDN S00334)		
		Bit 5: Velocity Command Above Velocity Limit (IDN S00335)		
		Bit 6: In position window (IDN S00336)		
		Bits 8-7: Not used		
		Bit 9: Speed Below Minimum Spindle Speed (IDN S00339)		
		Bit 10: Speed Above Maximum Spindle Speed (IDN S00340)		
		Bits 14-11: Not Used		
		Bit 15: Manufacturer-specific operation status (IDN S00182)		
Notes: DSA doesn't support bits 9 or 10				
See Also: IDN S00098 – Mask class 3 diagnostic IDN S00182 – Manufacturer class 3 diagnostic				

S00014	**Interface status**			
	If a communication error is flagged in C1D (IDN S00011), this IDN contains the specific communication error flags.			
	Name: "Commun Errors"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0000	**Value:** Interface Status: (1 = active, 0 = inactive)		
	Max: 0x07FF	Bits 2-0: Communication Phase Bit 3: MST Failure Bit 4: MDT Failure Bit 5: Invalid Phase Bit 6: Error During Phase Upshift Bit 7: Error During Phase Downshift Bit 8: Phase Switch without Ready Acknowledge Bit 9: Switching to Uninitialized Operation Mode Bit 10: Drives with the same Address in the Ring Bits 15-11: Not Used		
Notes: For bits 3-15, a bit is 1 when the associated error is active.				
See Also: IDN S00011 – Class 1 diagnostic IDN S00099 – Reset class 1 diagnostic				

S00015	**Telegram type parameter**			
	This specifies which telegram type to use. See section 8.3 in the SERCOS spec for descriptions of each of the telegram types. The telegram type is sent by the master.			
	Name: "TelegramType "	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0	**Value:** Telegram Type: (Written by master)		
	Max: 0xF	Bits 3-0: 0000 – Standard Telegram 0 (No cyclic data) 0001 – Standard Telegram 1 (Torque Cmd) 0010 – Standard Telegram 2 (Velocity Cmd, Velocity Fdbk) x011 – Standard Telegram 3 (Velocity Cmd, Position (x) Fdbk) x100 – Standard Telegram 4 (Position Cmd, Position (x) Fdbk) x101 – Standard Telegram 5 (Pos & Vel Cmd, Pos (x) & Vel Fdbk) 0111 – Application Telegram (IDN S00016, S00024) | 0 – Motor Feedback 1 – Auxiliary Feedback		
Notes:				
See Also: IDN S00016 – Configuration list of AT IDN S00024 – Configuration list of MDT				

S00016	**Configuration list of AT**			
	This IDN contains a list of IDNs whose data will be transmitted cyclically in the AT. Only IDNs present in the "IDN List of Configurable Data in the AT" (IDN S00187) can be used here. The amount of data that can be transmitted cyclically is limited, and defined by IDN S00185 (Length of the configurable data in the AT).			
	Name: "IDN List AT"	**Attr:** 0x00550001 (Variable-length IDN array)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** (List of IDNs in AT)		
	Max: Not supported			
Notes:				
See Also: IDN S00185 – Length of the configurable data in the AT IDN S00187 – IDN List of configurable data in the AT				

S00017	**IDN-list of all operation data**			
	This is a list of all the operation data IDNs supported by the slave. The master can read this at any time.			
	Name: "IDN List Dr Data"	**Attr:** 0x00550001 (Variable-length IDN array)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** (List of all supported data IDNs)		
	Max: Not supported			
Notes:				
See Also: IDN S00025 – IDN-list of all procedure commands				

S00018	**IDN-list of all operation data for CP_2**			
	This is a list of all the IDNs the slave needs initialized before it can go into Phase 3.			
	Name: "IDN List Dr Cp2 "	**Attr:** 0x00550001 (Variable-length IDN array)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** (List of CP_2 IDNs)		
	Max: Not supported			
Notes:				
See Also: IDN S00019 – IDN-list of all operation data for CP_3 IDN S00021 – IDN-list of invalid operation data for CP_2 IDN S00127 – Communication phase 3 transition check				

S00019	**IDN-list of all operation data for CP_3**			
	This is a list of all the IDNs the slave needs initialized before it can go into Phase 4.			
	Name: "IDN List Dr Cp3 "	**Attr:** 0x00550001 (Variable-length IDN array)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** (List of CP_3 IDNs)		
	Max: Not supported			
Notes:				
See Also: IDN S00018 – IDN-list of all operation data for CP_2 IDN S00022 – IDN-list of invalid operation data for CP_3 IDN S00128 – Communication phase 4 transition check				

S00021	**IDN-list of invalid operation data for CP_2**			
	After the Phase 3 Transition Check procedure (IDN S00127) has been executed, this IDN contains a list of all the IDNs that have invalid values, if any.			
	Name: "IDN List Cp2 Inv"	**Attr:** 0x00550001 (Variable-length IDN array)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** (List of IDNs {built during CP_3 Transition Check})		
	Max: Not supported			
Notes:				
See Also: IDN S00018 – IDN-list of all operation data for CP_2 IDN S00127 – Communication phase 3 transition check				

S00022	**IDN-list of invalid operation data for CP_3**			
	After the Phase 4 Transition Check procedure (IDN S00128) has been executed, this IDN contains a list of all the IDNs that have invalid values, if any.			
	Name: "IDN List Cp3 Inv"	**Attr:** 0x00550001 (Variable-length IDN array)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** (List of IDNs {built during CP_4 Transition Check})		
	Max: Not supported			
Notes:				
See Also: IDN S00019 – IDN-list of all operation data for CP_3 IDN S00128 – Communication phase 4 transition check				

S00024	**Configuration list of MDT**			
	This IDN contains a list of IDNs whose data will be transmitted cyclically in the MDT. Only IDNs present in the "IDN List of Configurable Data in the MDT" (IDN S00188) can be used here. The amount of data that can be transmitted cyclically is limited, and defined by IDN S00186 (Length of the configurable data record in the MDT).			
	Name: "Config of MDT "	**Attr:** 0x00550001 (Variable-length IDN array)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** (Written by master)		
	Max: Not supported			
Notes:				
See Also: IDN S00186 – Length of the configurable data record in the MDT IDN S00188 – IDN list of configurable data in the MDT				

S00025	**IDN-list of all procedure commands**			
	This is a list of all the IDNs supported by the slave. The master can read this at any time.			
	Name: "IDN List Proceed "	**Attr:** 0x00550001 (Variable-length IDN array)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** (List of all supported procedure IDNs)		
	Max: Not supported			
Notes:				
See Also: IDN S00017 – IDN-list of all operation data				

S00028	**MST error counter**			
	This IDN is the count of all invalid MST's in Phases 3 & 4			
	Name: "MST Errors"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 0	**Value:** (Number of errors)		
(AT)	**Max:** ≤ 65,535	**Scaling:** 1		
Notes:				
See Also: IDN S00029 – MDT error counter				

S00029	**MDT error counter**			
	This IDN is the count of all invalid MDT's in Phases 3 & 4			
	Name: "MDT Errors"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 0	**Value:** (Number of errors)		
(AT)	**Max:** ≤ 65,535	**Scaling:** 1		
Notes:				
See Also: IDN S00028 – MST error counter				

S00030	**Manufacturer Version**			
	This IDN is used to display a data string containing the drive firmware version and checksum.			
	Name: "Version Data"	**Attr:** 0x00450001 (variable length 16-bit data strings, character)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** Manufacturer version:		
	Max: Not supported	Version = X.xx		
		If the firmware is an interim, non-released version the string will read:		
		Version = X.xx (Interim version xx)		
Notes:				
See Also:				

S00032	**Primary operation mode**			
	Defines the primary operating mode for the slave. The master selects whether to use the primary operating mode or one of the secondary operating modes via two bits in the Master Control Word.			
	Name: "Prime OP Mode"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RO
	Min: 0x0	**Value:** Primary Operation Mode: (Written by master)		
	Max: 0xE	Bits 2-0: 000 – No mode of operation defined		
		001 – Torque control		
		010 – Velocity control		
		011 – Position control using motor feedback		
		101 – Position control using auxiliary feedback		
		110 – Position control using motor and auxiliary feedback		
		Bit 3: 0 – Position control with following error		
		1 – Position control without following error		
Notes:	Bits 15-4 are further defined in the IEC 61491 specification. DSA doesn't support Position Control using auxiliary feedback. Torque control, Velocity control, and Position control using motor & aux fdbk (dual-loop) not fully functional yet.			
See Also: IDN S00033 – Secondary operation mode 1				

S00033 **S00034** **S00035**	**Secondary operation mode 1** **Secondary operation mode 2** **Secondary operation mode 3**			
	Defines the secondary operating modes1-3 for the slave. The master selects whether to use the primary operating mode or one of the secondary operating modes via two bits in the Master Control Word.			
	Name: "Sec OpMode 1" "Sec OpMode 2" "Sec OpMode 3"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RO
	Min: 0x0 **Max:** 0xE	**Value:** Secondary Operation Mode: (Written by master) Bits 2-0: 000 – No mode of operation defined 001 – Torque control 010 – Velocity control 011 – Position control using motor feedback 101 – Position control using auxiliary feedback 110 – Position control using motor and auxiliary feedback Bit 3: 0 – Position control with following error 1 – Position control without following error		
Notes: Bits 15-4 are further defined in the IEC 61491 specification. See Notes for S0032.				
See Also: IDN S00032 – Primary operation mode IDN S00034 – Secondary operation mode 2 IDN S00035 – Secondary operation mode 3				

S00036	**Velocity command value**			
	This is the command velocity value from the master.			
	Name: "Velocity Command "	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Velocity units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ -2^{31} **Max:** ≤ $2^{31}-1$	**Value:** (Written by master) **Scaling type:** IDN S00044 **Scaling factor:** IDN S00045 **Scaling exponent:** IDN S00046		
(AT) **(MDT)**				
Notes:				
See Also: IDN S00044 – Velocity Data Scaling Type IDN S00045 – Velocity Data Scaling Factor IDN S00046 – Velocity Data Scaling Exponent				

S00037	**Additive velocity command value**			
	This is an additional velocity offset which is to be added to the velocity command value from the master.			
	Name: "Velocity Offset "	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Velocity units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ -2^{31} **Max:** ≤ $2^{31}-1$	**Value:** (velocity offset) **Scaling type:** IDN S00044 **Scaling factor:** IDN S00045 **Scaling exponent:** IDN S00046		
(MDT)				
Notes:				
See Also: IDN S00044 – Velocity Data Scaling Type IDN S00045 – Velocity Data Scaling Factor IDN S00046 – Velocity Data Scaling Exponent				

S00038	**Positive velocity limit value**			
	This is describes the maximum allowable velocity in the positive direction. If the velocity limit is exceeded, the drive responds by setting bit 5 in the C3D (IDN S00013).			
	Name: "+Vel Limit"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Velocity units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (positive velocity limit)		
	Max: ≤ $2^{31}-1$	**Scaling type:** IDN S00044		
		Scaling factor: IDN S00045		
		Scaling exponent: IDN S00046		
Notes:				
See Also: IDN S00044 – Velocity Data Scaling Type IDN S00045 – Velocity Data Scaling Factor IDN S00046 – Velocity Data Scaling Exponent				

S00039	**Negative velocity limit value**			
	This is describes the maximum allowable velocity in the negative direction. If the velocity limit is exceeded, the drive responds by setting bit 5 in the C3D (IDN S00013).			
	Name: "-Vel Limit"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Velocity units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ -2^{31}	**Value:** (negative velocity limit)		
	Max: ≤ 0	**Scaling type:** IDN S00044		
		Scaling factor: IDN S00045		
		Scaling exponent: IDN S00046		
Notes:				
See Also: IDN S00044 – Velocity Data Scaling Type IDN S00045 – Velocity Data Scaling Factor IDN S00046 – Velocity Data Scaling Exponent				

S00040 **(AT)**	**Velocity feedback value**			
	This is the actual velocity of the motor.			
	Name: "Velocity Fback"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Velocity units)	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ -2^{31}	**Value:** (Velocity feedback value)		
	Max: ≤ $2^{31}-1$	**Scaling type:** IDN S00044		
		Scaling factor: IDN S00045		
		Scaling exponent: IDN S00046		
Notes:				
See Also: IDN S00044 – Velocity Data Scaling Type IDN S00045 – Velocity Data Scaling Factor IDN S00046 – Velocity Data Scaling Exponent				

S00041	**Homing velocity**			
	This is the velocity used during Drive Controlled Homing Procedure (IDN S00148).			
	Name: "Homing Velocity"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Velocity units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ -2^{31}	**Value:** (Written by master)		
	Max: ≤ $2^{31}-1$	**Scaling type:** IDN S00044		
		Scaling factor: IDN S00045		
		Scaling exponent: IDN S00046		
Notes: Read/write at all times (except when Drive controlled homing procedure command is active).				
See Also: IDN S00044 – Velocity Data Scaling Type IDN S00045 – Velocity Data Scaling Factor IDN S00046 – Velocity Data Scaling Exponent				

S00042	**Homing acceleration**			
	This is the acceleration used during Drive Controlled Homing Procedure (IDN S00148)			
	Name: "Homing Accel"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Acceleration units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0	**Value:** (Written by master)		
	Max: $\leq 2^{31}-1$	**Scaling type:** IDN S00160 **Scaling factor:** IDN S00161 **Scaling exponent:** IDN S00162		
Notes: Read/write at all times (except when Drive controlled homing procedure command is active).				
See Also: IDN S00041 – Homing velocity IDN S00138 – Bipolar acceleration limit IDN S00147 – Homing parameter IDN S00148 – Drive-controlled homing procedure command				

S00043	**Velocity polarity parameter**			
	This IDN is used to switch polarities of position data. The motor shaft turns clockwise when there is a positive position command and no inversion is programmed.			
	Name: "Vel Polarity"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x0	**Value:** Velocity parameter:		
	Max: 0x7	Bit 0: Velocity command value 0 – non-inverted 1 – inverted Bit 1: Additive velocity command value 0 – non-inverted 1 -- inverted Bit 2: Velocity feedback value 0 – non-inverted 1 – inverted All other bits are reserved.		
Notes: RO when drive is enabled				
See Also: IDN S00044 – Velocity data scaling type				

S00044	**Velocity data scaling type**			
	This selects the scaling method to use on velocity values (e.g., IDN's 00036, 00040, and 00041).			
	Name: "Vel Scaling Type"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x00	**Value:** Scaling type:		
	Max: 0x7F	Bits 2-0: Scaling method 000 – no scaling 001 – linear scaling (not supported) 010 – rotational scaling		
		Bit 3: 0 – preferred scaling 1 – parameter scaling		
		Bit 4: Units for rotary 0 – revolutions 1 – (reserved)		
		Bit 4: Units linear 0 – meters 1 – inches		
		Bit 5: Time 0 – minutes 1 – seconds		
		Bit 6: Data reference (must be 0) 0 – at the motor shaft 1 – at the load (not implemented)		
		All other bits are reserved.		
Notes:	Read-only when drive is enabled. IDNs S00045 and S00046 should have valid values before IDN S00044 is written.			
See Also:	IDN S00045 – Velocity data scaling factor IDN S00046 – Velocity data scaling exponent IDN S00076 – Position data scaling type IDN S00160 – Acceleration data scaling type			

S00045	**Velocity data scaling factor**			
	This defines the scaling factor for all velocity data.			
	Name: "Vel Scaling Fact"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 1	**Value:** (Written by master)		
	Max: ≤ 65,535	**Scaling:** 1		
Notes:	Read-only when drive is enabled			
See Also:	IDN S00044 – Velocity data scaling type IDN S00046 – Velocity data scaling exponent			

S00046	**Velocity data scaling exponent**			
	This defines the scaling exponent for all velocity data.			
	Name: "Vel Scaling Exp"	**Attr:** 0x00210001 (16-bit signed decimal)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ -2^{15}	**Value:** (Written by master)		
	Max: ≤ $2^{15} - 1$	**Scaling:** 1		
Notes:	Read-only when drive is enabled			
See Also:	IDN S00044 – Velocity data scaling type IDN S00045 – Velocity data scaling factor			

S00047	**Position command value**			
	This is the command position value from the master.			
	Name: "Position Command"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ -2^{31}	**Value:** (Written by master)		
(AT) (MDT)	**Max:** ≤ $2^{31}-1$	**Scaling type:** IDN S00076		
		Rotational position resolution: IDN S00079		
Notes:				
See Also: IDN S00051 – Position feedback value 1 (motor feedback) IDN S00055 – Position polarity parameter IDN S00076 – Position Data Scaling Type IDN S00079 – Rotational Position Resolution				

S00049	**Positive position limit value**			
	This is the maximum allowable distance in the positive direction. When the positive position limit value is exceeded, the drive sets error bit 13 of the C1D (IDN S00011).			
	Name: "+Position Limit"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ -2^{31}	**Value:** (positive position limit)		
	Max: ≤ $2^{31}-1$	**Scaling type:** IDN S00076		
		Rotational position resolution: IDN S00079		
Notes:				
See Also: IDN S00051 – Position feedback value 1 (motor feedback) IDN S00055 – Position polarity parameter IDN S00076 – Position Data Scaling Type IDN S00079 – Rotational Position Resolution				

S00050	**Negative position limit value**			
	This is the maximum allowable distance in the negative direction. When the negative position limit value is exceeded, the drive sets error bit 13 of the C1D (IDN S00011).			
	Name: "-Position Limit"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ -2^{31}	**Value:** (negative position limit)		
	Max: ≤ $2^{31}-1$	**Scaling type:** IDN S00076		
		Rotational position resolution: IDN S00079		
Notes:				
See Also: IDN S00051 – Position feedback value 1 (motor feedback) IDN S00055 – Position polarity parameter IDN S00076 – Position Data Scaling Type IDN S00079 – Rotational Position Resolution				

S00051	**Position feedback value 1**			
	This is the actual position value of the motor encoder.			
	Name: "Motor Posn Fback"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ -2^{31}	**Value:** (motor position feedback)		
(AT)	**Max:** ≤ $2^{31}-1$	**Scaling type:** IDN S00076		
		Rotational position resolution: IDN S00079		
Notes:				
See Also: IDN S00053 – Position feedback value 2 (external feedback) IDN S00076 – Position Data Scaling Type IDN S00079 – Rotational Position Resolution				

S00052	**Reference distance 1**			
	The master uses this value to specify the distance between the Reference point and the Machine zero point related to the motor feedback. It is used (along with the Reference Offset 1, IDN S00150) by the drive during the Drive Controlled Homing Procedure (IDN S00148) to calculate the actual position value.			
	Name: "Ref Dist 1"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ -2^{31}	**Value:** (Written by master)		
	Max: ≤ $2^{31}-1$	**Scaling type:** IDN S00076		
		Rotational position resolution: IDN S00079		
Notes: Read/write at all times (except when Drive controlled homing procedure command is active)				
See Also: IDN S00076 – Position data scaling type IDN S00147 – Homing parameter IDN S00148 – Drive-controlled homing procedure command IDN S00150 – Reference offset 1				

S00053	**Position feedback value 2**			
	This is the actual position value of the auxiliary feedback.			
	Name: "Aux Posn Fback"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ -2^{31}	**Value:** (auxiliary position feedback)		
	Max: ≤ $2^{31}-1$	**Scaling type:** IDN S00076		
(AT)		**Rotational position resolution:** IDN S00079		
Notes:				
See Also: IDN S00051 – Position feedback value 1 (motor feedback) IDN S00076 – Position data scaling type IDN S00079 – Rotational Position Resolution				

S00054	**Reference distance 2**			
	The master uses this value to specify the distance between the Reference point and the Machine zero point related to the auxiliary feedback. It is used (along with the Reference Offset 2, IDN S00151) by the drive during the Drive Controlled Homing Procedure (IDN S00148) to calculate the actual position value.			
	Name: "Ref Dist 2"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ -2^{31}	**Value:** (Written by master)		
	Max: ≤ $2^{31}-1$	**Scaling type:** IDN S00076		
		Rotational position resolution: IDN S00079		
Notes: Read/write at all times (except when Drive controlled homing procedure command is active)				
See Also: IDN S00076 – Position data scaling type IDN S00147 – Homing parameter IDN S00148 – Drive-controlled homing procedure command IDN S00151 – Reference offset 2				

S00055	**Position polarity parameter**			
	This IDN is used to switch polarities of position data. The motor shaft turns clockwise when there is a positive position command and no inversion is programmed.			
	Name: "Posn Polarity"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x00 **Max:** 0x1F	**Value:** Polarity parameter: Bit 0: Position command value 0 – non-inverted 1 – inverted Bit 1: (Reserved) Bit 2: Position feedback value 1 0 – non-inverted 1 – inverted Bit 3: Position feedback value 2 0 – non-inverted 1 – inverted Bit 4: Position limit values 0 – disabled 1 – enabled All other bits are reserved.		
Notes: RO when drive is enabled				
See Also: IDN S00076 – Position data scaling type				

S00057	**Position window**			
	When the absolute value of the position error (the difference between the commanded position and the feedback position) is less than the amount specified by this IDN, the "In position" bit (bit 6 of C3D, IDN S00013) is set.			
	Name: "In Posn Value"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0 **Max:** $\leq 2^{31}-1$	**Value:** (written by master) **Scaling type:** IDN S00076 **Rotational position resolution:** IDN S00079		
Notes:				
See Also: IDN S00013 – Class 3 diagnostic IDN S00047 – Position command value IDN S00051 – Position feedback value 1 (motor feedback) IDN S00076 – Position data scaling type				

S00076	**Position data scaling type**			
	This selects the scaling method to use on position values (e.g., IDN's S00047, S00051, and S00053).			
	Name: "Pos Scaling Type"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x00	**Value:** Scaling type:		
	Max: 0xFF	Bits 2-0: Scaling method 000 – no scaling 001 – linear scaling (not supported yet) 010 – rotational scaling		
		Bit 3: 0 – preferred scaling 1 – parameter scaling		
		Bit 4: Linear Units 0 – meters 1 – inches		
		Bit 4: Rotational Units (must be 0) 0 – degrees 1 – (reserved)		
		Bit 5: (reserved)		
		Bit 6: Data reference 0 – at the motor shaft 1 – at the load		
		Bit 7: Processing format 0 – absolute format 1 – modulo format		
		All other bits are reserved.		
Notes: Read-only when drive is enabled. IDN S00079 should have a valid value before IDN S00076 is written.				
See Also: IDN S00044 – Velocity data scaling type IDN S00055 – Position polarity parameter IDN S00079 – Rotational position resolution				

S00079	**Rotational position resolution**			
	This defines the rotational position resolution for all position data. Basically, it specifies how many "counts" are in one revolution. One LSB for position data = (360° / IDN S00079).			
	Name: "Rot Posn Resolut"	**Attr:** 0x00220001 (32-bit signed decimal)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥1	**Value:** (written by master)		
	Max: ≤ 2^{32} -1	**Scaling:** 1		
Notes: Read-only when drive is enabled. The minimum value for DSA is 4X the encoder line count.				
See Also:				

S00080 (AT) (MDT)	**Torque command value**			
	This is the command value when operating in torque mode.			
	Name: "Torque Command"	**Attr:** 0x0X21XXXX (16-bit signed decimal, C.F. changes based on scaling)		
	Units: (Torque units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ -2^{15}	**Value:** (written by master)		
	Max: ≤ 2^{15} –1	**Scaling type:** IDN S00086 **Scaling factor:** IDN S00093 **Scaling exponent:** IDN S00094		
Notes:				
See Also: IDN S00085 – Torque polarity parameter IDN S00086 – Torque scaling type IDN S00093 – Torque scaling factor IDN S00094 – Torque scaling exponent				

S00081	**Additive torque command value**			
	This is an additional function for torque control in the drive. The additive torque command value is added to the torque command value (IDN S00080) in the drive.			
	Name: "Torque Offset"	**Attr:** 0x0X21XXXX (16-bit signed decimal, C.F. changes based on scaling)		
	Units: (Torque units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: $\geq -2^{15}$	**Value**: (written by master)		
	Max: $\leq 2^{15}-1$	**Scaling type:** IDN S00086		
		Scaling factor: IDN S00093		
(MDT)		**Scaling exponent:** IDN S00094		
Notes:				
See Also: IDN S00085 – Torque polarity parameter IDN S00086 – Torque scaling type IDN S00093 – Torque scaling factor IDN S00094 – Torque scaling exponent				

S00082	**Positive torque limit value**			
	This is the maximum torque in the positive direction. If the torque limit is exceeded, the drive sets bit 4 of C3D (IDNS00013).			
	Name: "+Torque Limit"	**Attr:** 0x0X21XXXX (16-bit signed decimal, C.F. changes based on scaling)		
	Units: (Torque units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (written by master)		
	Max: $\leq 2^{15}-1$	**Scaling type:** IDN S00086		
		Scaling factor: IDN S00093		
		Scaling exponent: IDN S00094		
Notes:				
See Also: IDN S00086 – Torque scaling type IDN S00093 – Torque scaling factor IDN S00094 – Torque scaling exponent				

S00083	**Negative torque limit value**			
	This is the maximum torque in the negative direction. If the torque limit is exceeded, the drive sets bit 4 of C3D (IDNS00013).			
	Name: "-Torque Limit"	**Attr:** 0x0X21XXXX (16-bit signed decimal, C.F. changes based on scaling)		
	Units: (Torque units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: $\geq -2^{15}$	**Value:** (written by master)		
	Max: ≤ 0	**Scaling type:** IDN S00086		
		Scaling factor: IDN S00093		
		Scaling exponent: IDN S00094		
Notes:				
See Also: IDN S00086 – Torque scaling type IDN S00093 – Torque scaling factor IDN S00094 – Torque scaling exponent				

S00084	**Torque feedback value**			
	This is the torque feedback value when operating in torque mode.			
	Name: "Torque Fback"	**Attr:** 0x0X21XXXX (16-bit signed decimal, C.F. changes based on scaling)		
	Units: (Torque units)	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: $\geq -2^{15}$	**Value:** (torque feedback value)		
	Max: $\leq 2^{15}-1$	**Scaling type:** IDN S00086		
		Scaling factor: IDN S00093		
(AT)		**Scaling exponent:** IDN S00094		
Notes:				
See Also: IDN S00085 – Torque polarity parameter IDN S00086 – Torque scaling type IDN S00093 – Torque scaling factor IDN S00094 – Torque scaling exponent				

S00085	**Torque polarity parameter**			
	This IDN is used to switch polarities of torque data. The motor shaft turns clockwise when there is a positive torque command difference and no inversion is programmed.			
	Name: "Torque Polarity"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x0	**Value:** Torque parameter:		
	Max: 0x7	Bit 0: Torque command value 0 – non-inverted 1 – inverted		
		Bit 1: Additive torque command value 0 – non-inverted 1 – inverted		
		Bit 2: Torque feedback value 0 – non-inverted 1 – inverted		
		All other bits are reserved.		
Notes: RO when drive is enabled				
See Also: IDN S00086 – Torque data scaling type				

S00086	**Torque data scaling type**			
	This selects the scaling method to use on torque values (e.g., IDN's 00080 and 00092).			
	Name: "Torque Scaling"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x00	**Value:** Scaling type:		
	Max: 0x7F	Bits 2-0: Scaling method 000 – percentage scaling 001 – linear scaling (force) 010 – rotational scaling (torque)		
		Bit 3: 0 – preferred scaling 1 – parameter scaling		
		Bit 4: Units 0 – Newton meter (Nm) 1 – inch pound force (lbf)		
		Bit 5: (reserved)		
		Bit 6: Data reference 0 – at the motor shaft 1 – at the load		
		All other bits are reserved.		
Notes: Read-only when drive is enabled. IDNs S00093 and S00094 should have valid values before IDN S00086 is written. DSA only supports percentage scaling.				
See Also: IDN S00085 – Torque polarity parameter IDN S00093 – Torque data scaling factor IDN S00094 – Torque data scaling exponent				

S00087	**Transmit to transmit recovery time (t_{ATAT})**			
	This specifies the minimum time required by the slave between AT transmissions. It only applies to slaves that control two or more drives. It is a function of the SERCON chip.			
	Name: "Tr-Tr Recov Time "	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: "µs"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 0	**Value:** 10		
	Max: $\leq 2^{16}-1$	**Scaling:** 1		
Notes: According to the IAM slave software, the SERCON minimum is 2 µs, and they use the value of 10.				
See Also:				

S00088	**Receive to receive recovery time (t_{MTSY})**			
	This is the time required by the slave between receiving the MDT and receiving the following MST. It is a function of the SERCON chip. The master reads this during phase 2 for its timing calculations.			
	Name: "Drive MDT/MST Tm"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: "µs"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 0	**Value:** 10		
	Max: ≤ 2^{16} -1	**Scaling:** 1		
Notes: According to the IAM slave software, the SERCON minimum is 2 µs, and they use the value of 10.				
See Also:				

S00089	**MDT transmission starting time (t_2)**			
	This is the time at which the master will send the MDT. It is sent by the master during phase 2.			
	Name: "MDT Start Time"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: "µs"	**Phase 2:** RW	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 0	**Value:** (Written by master)		
	Max: ≤ (IDN S00002 Value)	**Scaling:** 1		
Notes:				
See Also:				

S00090	**Command value proceeding time (t_{MTSG})**			
	This is the time required by the slave to process and transfer the command value to the drive. It is read by the master during phase 2 to determine the Command Value Valid time (t_3 – IDN S00008).			
	Name: "Command Exec Tm"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: "µs"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 0	**Value:** 100		
	Max: ≤ 2^{16} -1	**Scaling:** 1		
Notes:				
See Also: IDN S00008 – Command value valid time (t_3)				

S00091	**Bipolar velocity limit value**			
	Sets the velocity limit symmetrically in both directions. When in velocity mode, if the command velocity exceeds this value, bit 5 in C3D (IDN S00013) is set.			
	Name: "Bipolar Vel Lmt "	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Velocity units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0	**Value:** (Written by master)		
	Max: ≤ 2^{31} –1	**Scaling type:** IDN S00044 **Scaling factor:** IDN S00045 **Scaling exponent:** IDN S00046		
Notes:				
See Also: IDN S00013 – Class 3 diagnostics IDN S00335 – Status '$n_{command} > n_{limit}$'				

S00092	**Bipolar torque limit value**			
	Sets the torque limit symmetrically in both directions. When the actual torque exceeds this value, bit 4 in C3D (IDN S00013) is set.			
	Name: "Bipolar Trq Lmt "	**Attr:** 0x0X11XXXX (16-bit unsigned decimal, C.F. changes based on scaling)		
	Units: (Torque units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0	**Value:** (Written by master)		
	Max: ≤ 2^{15} –1	**Scaling type:** IDN S00086 **Scaling factor:** IDN S00093 **Scaling exponent:** IDN S00094		
Notes:				
See Also: IDN S00013 – Class 3 diagnostics IDN S00334 – Status '$T \geq T_{limit}$'				

S00093	**Torque data scaling factor**			
	This defines the scaling factor for all torque data.			
	Name: "Torque Scaling"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 1	**Value:** (Written by master)		
	Max: $\leq 2^{16}-1$	Bits 15-0: factor		
Notes: Read-only when drive is enabled				
See Also: IDN S00086 – Torque data scaling type IDN S00094 – Torque data scaling exponent				

S00094	**Torque data scaling exponent**			
	This defines the scaling exponent for all torque data.			
	Name: "Torque Exponent"	**Attr:** 0x00210001 (16-bit signed decimal)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: $\geq -2^{15}$	**Value:** (Written by master)		
	Max: $\leq 2^{15}-1$	Bit 15: Sign of the exponent 0 – positive 1 – negative		
		Bits 14-0: Exponent		
Notes: Read-only when drive is enabled				
See Also: IDN S00086 – Torque data scaling type IDN S00093 – Torque data scaling factor				

S00095	**Diagnostic message**			
	Any drive-specific message concerning the operation of the drive can be stored here, and the master can read it at any time.			
	Name: "Diagnostic Msg"	**Attr:** 0x00440001 (Variable-length text array)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** (Message from drive)		
	Max: Not supported			
Notes:				
See Also:				

S00096	**Slave arrangement (SLKN)**			
	Specifies whether this drive is controlled by a slave which controls more than one drive.			
	Name: "Slave Arrange"	**Attr:** 0x00310001 (16-bit hexadecimal)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0000	**Value:** (slave arrangement)		
	Max: 0xFEFE (65,278)	Bits 15-8: Intrinsic drive address (0x01 → 0xFE)		
		Bits 7-0: Next drive's address (0x01→ 0xFE)		
Notes:				
See Also:				

S00097	**Mask class 2 diagnostic**			
	This IDN is used to mask specific C2D flags (IDN S00012) from affecting the C2D Change bit in the Drive Status Word. The bit map for this IDN matches that for IDN S00012, and any '0's mask the corresponding flag.			
	Name: "Mask C2D"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x0000	**Value:** (C2D mask)		
	Max: 0xFFFF	Bits 15-0: all 0's – masked warning all 1's – unmasked warning		
Notes:				
See Also: IDN S00012 – Class 2 diagnostic				

S00098	**Mask class 3 diagnostic**			
	This IDN is used to mask specific C3D flags (IDN S00013) from affecting the C3D Change bit in the Drive Status Word. The bit map for this IDN matches that for IDN S00013, and any '0's mask the corresponding flag.			
	Name: "Mask C3D"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x0000	**Value:** (C3D mask)		
	Max: 0xFFFF	Bits 15-0: all 0's – masked warning all 1's – unmasked warning		
Notes:				
See Also: IDN S00013 – Class 3 diagnostic				

S00099	**Reset class 1 diagnostic**			
	This is a procedure command which clears the Class 1 Diagnostic bits, the Interface Status, the Manufacturer's C1D, the drive shutdown error bit, and the drive shutdown mechanism in the drive, if the corresponding errors are no longer present. This also clears associated power supply faults.			
	Name: "Drive Err Reset"	**Attr:** 0x00090001 (16-bit binary, procedure command)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: Not supported	**Value:** (Written by master)		
	Max: Not supported			
Notes: Refer to the "*Structure of Procedure Command Control/Acknowledgement*" (IEC 61491 Tables 16 &17, 7.4.4) for more information on procedure command operation.				
See Also: IDN S00011 – Class 1 diagnostic IDN S00014 – Interface status				

S00100	**Velocity loop proportional gain**			
	This is the velocity loop proportional gain value. (1 $msec^{-1}$ = 60 (m/min)/mm)			
	Name: "Vel Prop Gain"	**Attr:** 0x00210001 (16-bit signed decimal)		
	Units: (m/min)/mm	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0	**Value:** (velocity loop proportional gain)		
	Max: $\leq 2^{16}-1$	**Scaling:** 10^{-2}		
Notes:				
See Also:				

S00101	**Velocity loop integral action time**			
	This is the velocity loop integral action time. This is defined as the ratio of Kp/Ki. When the value is $2^{16}-1$, Ki = 0.			
	Name: "Vel Integ Time"	**Attr:** 0x01210001 (16-bit signed decimal)		
	Units: ms	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0	**Value:** (velocity loop integral action time)		
	Max: $\leq 2^{16}-1$	**Scaling:** 10^{-1}		
Notes:				
See Also:				

S00103	**Modulo Value**			
	If the modulo format is selected in the position data scaling factor (IDN S00076), the modulo value defines the range that the drive & control must implement.			
	Name: "Modulo Value"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 1	**Value:** (written by master)		
	Max: $\leq 2^{31}-1$	**Scaling type:** IDN S00076 **Rotational position resolution:** IDN S00079		
Notes:				
See Also: IDN S00076 – Position data scaling type				

S00104	**Position loop K_v factor**			
	This determines the gain of the position loop regulator throughout the entire velocity range. (1 $msec^{-1}$ = 60 (m/min)/mm)			
	Name: "Pos Loop Gain"	**Attr:** 0x02210001 (16-bit signed decimal)		
	Units: (m/min)/mm	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (position loop proportional gain)		
	Max: ≤ 30000	**Scaling:** 10^{-2}		
Notes:				
See Also:				

S00105	**Position loop integral action time**			
	This determines the position loop integral action time. This is defined as the ratio of Kp/Ki. When the value is $2^{16}-1$, Ki = 0.			
	Name: "Pos Int Time"	**Attr:** 0x01210001 (16-bit signed decimal)		
	Units: ms	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (position loop integral action time)		
	Max: ≤ $2^{16}-1$	**Scaling:** 10^{-1}		
Notes:				
See Also:				

S00109	**Motor peak current**			
	If the motor peak current is less than that of the drive, the drive is automatically limited to the level of the motor peak current.			
	Name: "Mtr Peak Current"	**Attr:** 0x03120001 (32-bit unsigned decimal)		
	Units: Amps	**Phase 2:** RW (see note)	**Phase 3:** RW (see note)	**Phase 4:** RW (see note)
	Min: ≥ 0	**Value:** (motor peak current)		
	Max: ≤ 1000000	**Scaling:** 10^{-3}		
Notes:	If the motor was auto-detected the Phase 2, 3, & 4 status is **R**ead-**O**nly.			
See Also:				

S00110	**Amplifier peak current**			
	The amplifier peak current is limited by the hardware and is initialized at power-up.			
	Name: "Drive Peak Amps"	**Attr:** 0x03120001 (32-bit unsigned decimal)		
	Units: Amps	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 0	**Value:** (drive peak current)		
	Max: ≤ 3000000	**Scaling:** 10^{-3}		
Notes:				
See Also:				

S00111	**Motor continuous stall current**			
	This is the current at which the motor produces continuous standstill torque.			
	Name: "Mtr Cont Current"	**Attr:** 0x03120001 (32-bit unsigned decimal)		
	Units: Amps	**Phase 2:** RW (see note)	**Phase 3:** RW (see note)	**Phase 4:** RW (see note)
	Min: ≥ 0	**Value:** (motor continuous current)		
	Max: ≤ 1000000	**Scaling:** 10^{-3}		
Notes:	If the motor was auto-detected the Phase 2, 3, & 4 status is **R**ead-**O**nly.			
See Also:				

S00112	**Amplifier rated current**			
	The amplifier rated current is the continuous current of the drive.			
	Name: "Drive Cont Amps"	**Attr:** 0x03120001 (32-bit unsigned decimal)		
	Units: Amps	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 0	**Value:** (drive continuous current)		
	Max: ≤ 3000000	**Scaling:** 10^{-3}		
Notes:				
See Also:				

S00116	**Resolution of feedback 1**			
	The resolution parameter of the motor feedback contains the cycles per rev of the motor for rotary feedback. For a linear motor, this is the grid constant.			
	Name: "MtrFdbk Resolution"	**Attr:** 0x00120001 (32-bit unsigned decimal)		
	Units: cycles	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (resolution of motor feedback)		
	Max: ≤ 32000	**Scaling:** 1		
Notes:				
See Also:				

S00117	**Resolution of feedback 2**			
	The resolution parameter of the auxiliary feedback contains the cycles per rev for rotary feedback. For a linear feedback, this is the grid constant.			
	Name: "AuxFdbk Resolution"	**Attr:** 0x00120001 (32-bit unsigned decimal)		
	Units: cycles	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (resolution of auxiliary feedback)		
	Max: ≤ 32000	**Scaling:** 1		
Notes:				
See Also:				

S00121	**Input revolutions of load gear**			
	The value of the gear input revolutions must be entered as an integer.			
	Name: "Gear Input Revs"	**Attr:** 0x00120001 (32-bit unsigned decimal)		
	Units: ***TBD***	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (input revolutions of load gear)		
	Max: ≤ 2^{32} -1	**Scaling:** 1		
Notes:				
See Also:	IDN S00122 – Output revolutions of load gear IDN S00123 – Feed constant			

S00122	**Output revolutions of load gear**			
	The value of the gear output revolutions must be entered as an integer.			
	Name: "Gear Input Revs"	**Attr:** 0x00120001 (32-bit unsigned decimal)		
	Units: ***TBD***	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (output revolutions of load gear)		
	Max: ≤ 2^{32} -1	**Scaling:** 1		
Notes:				
See Also:	IDN S00121 – Input revolutions of load gear IDN S00123 – Feed constant			

S00124	**Standstill window**			
	This specifies the velocity limit for the standstill window. If the motor velocity is less than this limit, the drives sets the status $n_{feedback}$ = 0 (IDN S00331) in C3D.			
	Name: "Zero Spd Window"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Velocity units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (written by master)		
	Max: ≤ 2^{31} -1	**Scaling type:** IDN S00044 **Scaling factor:** IDN S00045 **Scaling exponent:** IDN S00046		
Notes:				
See Also:	IDN S00013 – Class 3 diagnostic IDN S00331 – Status '$n_{feedback}$ = 0' IDN S00044 – Velocity Data Scaling Type IDN S00045 – Velocity Data Scaling Factor IDN S00046 – Velocity Data Scaling Exponent			

S00125	**Velocity threshold n_x**			
	This specifies the velocity threshold limit. If the motor velocity is less than this limit, the drives sets the status $n_{feedback} < n_x$ (IDN S00332) in C3D.			
	Name: "Speed Threshold"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Velocity units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (written by master)		
	Max: ≤ 2^{31} -1	**Scaling type:** IDN S00044 **Scaling factor:** IDN S00045 **Scaling exponent:** IDN S00046		
Notes:				
See Also: IDN S00013 – Class 3 diagnostic IDN S00332 – Status '$n_{feedback} < n_x$' IDN S00044 – Velocity Data Scaling Type IDN S00045 – Velocity Data Scaling Factor IDN S00046 – Velocity Data Scaling Exponent				

S00126	**Torque threshold T_x**			
	If the torque feedback value exceeds the torque threshold, the drive sets the status bit 3 of C3D (IDN S00013).			
	Name: "Torque Threshold"	**Attr:** 0x0X21XXXX (16-bit signed decimal, C.F. changes based on scaling)		
	Units: (Torque units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (written by master)		
	Max: ≤ 2^{15} –1	**Scaling type:** IDN S00086 **Scaling factor:** IDN S00093 **Scaling exponent:** IDN S00094		
Notes:				
See Also: IDN S00333 – Status $T > T_x$ IDN S00086 – Torque scaling type IDN S00093 – Torque scaling factor IDN S00094 – Torque scaling exponent				

S00127	**Communication phase 3 transition check**			
	This is a procedure command which instructs the drive to make sure all necessary parameters have been transferred for phase 3. If there are any problems, the drive builds a list of the bad IDNs in IDN S00021.			
	Name: "SERCOS Phase3 OK"	**Attr:** 0x00090001 (16-bit binary, procedure command)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** (Written by master)		
	Max: Not supported			
Notes: Refer to the "*Structure of Procedure Command Control/Acknowledgement*" (IEC 61491 Tables 16 &17, 7.4.4) for more information on procedure command operation.				
See Also: IDN S00018 – IDN-list of all operation data for CP_2 IDN S00021 – IDN-list of invalid operation data for CP_2 IDN S00128 – Communication phase 4 transition check				

S00128	**Communication phase 4 transition check**			
	This is a procedure command which instructs the drive to make sure all necessary parameters have been transferred for phase 4. If there are any problems, the drive builds a list of the bad IDNs in IDN S00022.			
	Name: "SERCOS Phase4 OK"	**Attr:** 0x00090001 (16-bit binary, procedure command)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RW	**Phase 4:** RO
	Min: Not supported	**Value:** (Written by master)		
	Max: Not supported			
Notes: Refer to the "*Structure of Procedure Command Control/Acknowledgement*" (IEC 61491 Tables 16 &17, 7.4.4) for more information on procedure command operation.				
See Also: IDN S00019 – IDN-list of all operation data for CP_3 IDN S00022 – IDN-list of invalid operation data for CP_3 IDN S00127 – Communication phase 3 transition check				

S00129	**Manufacturer Class 1 Diagnostic**			
	These are additional shutdown erors. If an error is set, it sets the corresponding bit here, and also sets the manufacturer-specific error bit in C1D (IDN S00011).The drive clears these bits only after the error has been eliminated, and the procedure "Reset class 1 diagnostics" (IDN S00099) has been executed.			
	Name: "A Fault**"**	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not Supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0000	**Value:** Manufacturer class 1 diagnostic:		
	Max: 0xFFFF	Bits 15-0: Bit 0: +Soft Overtravel Fault (attempted travel beyond +SW limit) Bit 1: -Soft Overtravel Fault (attempted travel beyond –SW limit) Bit 2: +Hard Overtravel Fault* (positive HW limit switch reached) Bit 3: - Hard Overtravel Fault* (negative HW limit switch reached) Bit 4: Motor Feedback Fault (fdbk loss, wire broken or shorted) Bit 5: Motor Feedback Noise Fault (excessive electrical noise) Bit 6: Auxiliary Feedback Fault (fdbk loss, wire broken or shorted) Bit 7: Auxiliary Feedback Noise Fault (excessive electrical noise) Bits 8-12: reserved Bit 13: Ground Short Fault (imbalance in the DC bus supply current) Bit 14: Drive Hardware Fault (typically a non-recoverable HW error) Bit 15: Overspeed Fault (feedback velocity exceeded limits)		
Notes: If any of these bits are set, bit 15 of IDN S00011 must also be set. * = Only active if IDN P00001 is set to "0".				
See Also: IDN S00011 – Class 1 Diagnostic IDN P00001 – Option Configuration Bits				

S00130	**Probe value 1 positive edge**			
	During the Probe Cycle Procedure (IDN S00170), the drive stores the position of Probe 1's positive edge in this value (if Probe 1's positive edge is enabled in bit 0 of IDN S00169).			
	Name: "Reg Motor Posn+"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ -2^{31}	**Value:** (Position of probe 1 positive edge)		
	Max: ≤ $2^{31}-1$	**Scaling type:** IDN S00076		
(AT)		**Rotational position resolution:** IDN S00079		
Notes:				
See Also: IDN S00076 – Position data scaling type IDN S00131 – Probe value 1 negative edge IDN S00169 – Probe control parameter IDN S00170 – Probing cycle procedure command				

S00131	**Probe value 1 negative edge**			
	During the Probe Cycle Procedure (IDN S00170), the drive stores the position of Probe 1's negative edge in this value (if Probe 1's negative edge is enabled in bit 1 of IDN S00169).			
	Name: "Reg Motor Posn-"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ -2^{31}	**Value:** (Position of probe 1 negative edge)		
	Max: ≤ $2^{31}-1$	**Scaling type:** IDN S00076		
(AT)		**Rotational position resolution:** IDN S00079		
Notes:				
See Also: IDN S00076 – Position data scaling type IDN S00130 – Probe value 1 positive edge IDN S00169 – Probe control parameter IDN S00170 – Probing cycle procedure command				

S00132	**Probe value 2 positive edge**			
	During the Probe Cycle Procedure (IDN S00170), the drive stores the position of Probe 2's positive edge in this value (if Probe 2's positive edge is enabled in bit 2 of IDN S00169).			
	Name: "Reg Aux Posn+"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: $\geq -2^{31}$	**Value:** (Position of probe 2 positive edge)		
	Max: $\leq 2^{31}-1$	**Scaling type:** IDN S00076		
(AT)		**Rotational position resolution:** IDN S00079		
Notes:				
See Also: IDN S00076 – Position data scaling type IDN S00133 – Probe value 2 negative edge IDN S00169 – Probe control parameter IDN S00170 – Probing cycle procedure command				

S00133	**Probe value 2 negative edge**			
	During the Probe Cycle Procedure (IDN S00170), the drive stores the position of Probe 2's negative edge in this value (if Probe 2's negative edge is enabled in bit 3 of IDN S00169).			
	Name: "Reg Aux Posn-"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: $\geq -2^{31}$	**Value:** (Position of probe 2 negative edge)		
	Max: $\leq 2^{31}-1$	**Scaling type:** IDN S00076		
(AT)		**Rotational position resolution:** IDN S00079		
Notes:				
See Also: IDN S00076 – Position data scaling type IDN S00132 – Probe value 2 positive edge IDN S00169 – Probe control parameter IDN S00170 – Probing cycle procedure command				

S00134	**Master control word**			
	This is the Master Control Word received from the master.			
	Name: "Master Ctrl Word"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x00	**Value:** Last Master Control Word received from master		
	Max: 0xFF			
Notes:				
See Also IDN S00135 – Drive status word				

S00135	**Drive status word**			
	This is the Drive Status Word sent to the master.			
	Name: "Drive Status Word"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x00	**Value:** Last Drive Status Word sent to master		
	Max: 0xFF			
Notes:				
See Also IDN S00134 – Master control word				

S00136	**Positive acceleration limit value**			
	This limits the maximum acceleration ability of the drive to the programmed value.			
	Name: "Accel Limit "	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Acceleration units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (Written by master)		
	Max: $\leq 2^{31}-1$	**Scaling type:** IDN S00160		
		Scaling factor: IDN S00161		
		Scaling exponent: IDN S00162		
Notes:				
See Also: IDN S00160 – Acceleration data scaling type IDN S00161 – Acceleration data scaling factor IDN S00162 – Acceleration data scaling exponent				

S00137	**Negative acceleration limit value**			
	This limits the maximum acceleration ability of the drive to the programmed value.			
	Name: "Decel Limit "	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Acceleration units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: $\geq -2^{31}$	**Value:** (Written by master)		
	Max: ≤ 0	**Scaling type:** IDN S00160		
		Scaling factor: IDN S00161		
		Scaling exponent: IDN S00162		
Notes:				
See Also:	IDN S00160 – Acceleration data scaling type IDN S00161 – Acceleration data scaling factor IDN S00162 – Acceleration data scaling exponent			

S00138	**Bipolar acceleration limit value**			
	This parameter sets the acceleration and deceleration limits for the drive. This is only in effect when operating in velocity mode.			
	Name: "Bipolar Acel lmt"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Acceleration units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (Written by master)		
	Max: $\leq 2^{31}-1$	**Scaling type:** IDN S00160		
		Scaling factor: IDN S00161		
		Scaling exponent: IDN S00162		
Notes:	If set to zero, maximum acceleration will be allowed.			
See Also:	IDN S00160 – Acceleration data scaling type IDN S00161 – Acceleration data scaling factor IDN S00162 – Acceleration data scaling exponent			

S00140	**Controller Type**			
	This IDN is used to display the catalog number, series, and manufacturer of the drive amplifier.			
	Name: "Drive Data"	**Attr:** 0x00450001 (variable length 16-bit data strings, character)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** Controller type:		
	Max: Not supported			
Notes:				
See Also:				

S00142	**Application Type**			
	This IDN is used to display the type of the drive application.			
	Name: "Application Type"	**Attr:** 0x00450001 (variable length 16-bit data strings, character)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: Not supported	**Value:** Application type:		
	Max: Not supported	Characters 1-64: - Application Type – (Examples: "SERCOS SERVO", "SERCOS SPINDLE")		
Notes:				
See Also:				

S00143	**SYSTEM interface version**			
	This IDN contains the SYSTEM Interface specification that this drive conforms to.			
	Name: "System Version"	**Attr:** 0x00440001 (Variable-length text array)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** "V01.02"		
	Max: Not supported			
Notes:				
See Also:				

S00146	**Control unit controlled homing procedure command**			
	The master uses this IDN to start, monitor, and halt the control unit controlled homing procedure.			
	Name: "Ctrl Homing Proc"	**Attr:** 0x00090001(16-bit binary, procedure command)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RW
	Min: Not supported	**Value:** (Written by master)		
	Max: Not supported			
Notes: Refer to the "*Structure of Procedure Command Control/Acknowledgement*" (IEC 61491 Tables 16 &17, 7.4.4) for more information on procedure command operation.				
See Also: IDN S00400 – Home switch IDN S00407 – Homing enable				

S00147	**Homing parameter**			
	The master uses this parameter to define how the Drive-Controlled Homing Procedure will operate.			
	Name: "Homing Parameter"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x00	**Value:** (written by master)		
	Max: 0xFF	Bit 0: Homing direction 0 – positive: motor turns clockwise 1 – negative: motor turn counter-clockwise		
		Bit 1: Position feedback marker pulse 0 – first marker pulse after positive edge of home switch 1 – first marker pulse after negative edge of home switch		
		Bit 2: Home switch (IDN S00400) 0 – connected to the control unit 1 – connected to the drive		
		Bit 3: Homing 0 – using motor feedback 1 – using auxiliary feedback		
		Bit 4: Interpretation in the drive 0 – home switch and homing enable 1 – homing enable only		
		Bit 5: Evaluation of home switch 0 – home switch is evaluated 1 – home switch is not evaluated		
		Bit 6: Evaluation of position feedback marker pulse 0 – marker pulse is evaluated 1 – marker pulse is not evaluated		
		Bit 7: Position after drive controlled homing 0 – drive is positioned in arbitrary position 1 – drive is positioned in reference position		
		All other bits are reserved.		
Notes: Read-only while homing procedure is active.				
See Also IDN S00148 – Drive-controlled homing procedure command				

S00148	**Drive-controlled homing procedure command**			
	The master uses this IDN to start, monitor, and halt the drive-controlled homing procedure.			
	Name: "Driv Homing Proc"	**Attr:** 0x00090001(16-bit binary, procedure command)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RW
	Min: Not supported	**Value:** (Written by master)		
	Max: Not supported			
Notes: Refer to the "*Structure of Procedure Command Control/Acknowledgement*" (IEC 61491 Tables 16 &17, 7.4.4) for more information on procedure command operation.				
See Also: IDN S00041 – Homing velocity IDN S00042 – Homing acceleration IDN S00052 – Reference distance 1 IDN S00147 – Homing parameter IDN S00150 – Reference offset 1 IDN S00403 – Position feedback value status				

S00150	**Reference offset 1**			
	This is the distance between the reference marker pulse of the motor feedback and the reference position.			
	Name: "Mtr Marker Ofset"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: $\geq -2^{31}$	**Value:** (Written by master)		
	Max: $\leq 2^{31}-1$	**Scaling type:** IDN S00076		
		Rotational position resolution: IDN S00079		
Notes: Read/write at all times, except when Drive controlled homing procedure is active				
See Also: IDN S00052 – Reference distance 1 IDN S00076 – Position data scaling type IDN S00148 – Drive-controlled homing procedure command				

S00151	**Reference offset 2**			
	This is the distance between the reference marker pulse of the auxiliary feedback and the reference position.			
	Name: "Aux Marker Ofset"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: $\geq -2^{31}$	**Value:** (Written by master)		
	Max: $\leq 2^{31}-1$	**Scaling type:** IDN S00076		
		Rotational position resolution: IDN S00079		
Notes: Read/write at all times, except when Drive controlled homing procedure is active				
See Also: IDN S00052 – Reference distance 1 IDN S00076 – Position data scaling type IDN S00148 – Drive-controlled homing procedure command				

S00157	**Velocity window**			
	This defines the limits of the velocity window. If the motor's actual velocity differs from the command velocity by an amount less that this limit, the drive sets the status '$n_{feedback} = n_{command}$' (IDN S00330) in the C3D.			
	Name: "At Spd Window"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Velocity units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (written by master)		
	Max: $\leq 2^{31}-1$	**Scaling type:** IDN S00044		
		Scaling factor: IDN S00045		
		Scaling exponent: IDN S00046		
Notes:				
See Also: IDN S00013 – Class 3 diagnostic IDN S00330 – Status '$n_{feedback} = n_{command}$' IDN S00044 – Velocity Data Scaling Type IDN S00045 – Velocity Data Scaling Factor IDN S00046 – Velocity Data Scaling Exponent				

S00159	**Monitoring window**			
	When the position error exceeds the value specified by this IDN, the drive sets the Excessive Position Deviation flag in C1D (IDN S00011).			
	Name: "Max Foll Error"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (written by master)		
	Max: $\leq 2^{31}-1$	**Scaling type:** IDN S00076		
		Rotational position resolution: IDN S00079		
Notes:				
See Also: IDN S00011 – Class 1 diagnostic IDN S00076 – Position Data Scaling Type IDN S00079 – Rotational Position Resolution				

S00160	**Acceleration data scaling type**			
	This selects the type of scaling for acceleration parameters.			
	Name: "Acc Scale Type"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x00	**Value:** Scaling type:		
	Max: 0x7F	Bits 2-0: Scaling method 000 – no scaling 001 – linear scaling 010 – rotational scaling Bit 3: 0 – preferred scaling 1 – parameter scaling Bit 4: Units 0 – radians 1 – (reserved) Bit 5: Time 0 – seconds 1 – (reserved) Bit 6: Data reference 0 – at the motor shaft 1 – at the load (not implemented) All other bits are reserved.		
Notes: Read-only when drive is enabled. IDNs S00161 and S00162 should have valid values before IDN S00160 is written.				
See Also: IDN S00044 – Velocity data scaling type IDN S00076 – Position data scaling type				

S00161	**Acceleration data scaling factor**			
	This defines the scaling factor for all acceleration data.			
	Name: "Acc Scale Fact"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 1	**Value:** (written by master)		
	Max: $\leq 65{,}535$	Bits 15-0: factor		
Notes: Read-only when drive is enabled				
See Also: IDN S00160 – Acceleration data scaling type IDN S00162 – Acceleration data scaling exponent				

S00162	**Acceleration data scaling exponent**			
	This defines the scaling exponent for all acceleration data.			
	Name: "Acc Scale Exp"	**Attr:** 0x00210001 (16-bit signed decimal)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: $\geq -2^{15}$	**Value:** (written by master)		
	Max: $\leq 2^{15} -1$	Bit 15: Sign of the exponent 0 – positive 1 – negative Bits 14-0: Exponent		
Notes: Read-only when drive is enabled				
See Also: IDN S00160 – Acceleration data scaling type IDN S00161 – Acceleration data scaling factor				

S00169	**Probe control parameter**			
	This IDN selects which probe edges to use during the probing cycle procedure. If both edges for a given probe are selected, the edges need to be at least 2 ms apart.			
	Name: "Probe Options"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x0	**Value:** Probe control parameter: (All reserved bits should be written to '0')		
	Max: 0xF	Bit 0: Probe 1 positive edge 0 – positive edge is not active 1 – positive edge is active		
		Bit 1: Probe 1 negative edge 0 – negative edge is not active 1 – negative edge is active		
		Bit 2: Probe 2 positive edge 0 – positive edge is not active 1 – positive edge is active		
		Bit 3: Probe 2 positive edge 0 – negative edge is not active 1 – negative edge is active		
		(All other bits reserved)		
Notes:				
See Also: IDN S00130 – Probe value 1 positive edge IDN S00131 – Probe value 1 negative edge IDN S00132 – Probe value 2 positive edge IDN S00133 – Probe value 2 negative edge IDN S00170 – Probing cycle procedure command				

S00170	**Probing cycle procedure command**			
	The master uses this IDN to start, monitor, and stop the probing cycle procedure. When this procedure is active, the drive reacts on the probe 1&2 enables (IDNs S00405, S00406) and probe 1&2 (IDNS S00401, S00402) as programmed in the probe control parameter (IDN S00169).			
	Name: "Probe Cycle Req"	**Attr:** 0x00090001 (16-bit binary, procedure command)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RW
	Min: Not supported	**Value:** (Written by master)		
	Max: Not supported			
Notes: Refer to the "*Structure of Procedure Command Control/Acknowledgement*" (IEC 61491 Tables 16 &17, 7.4.4) for more information on procedure command operation.				
See Also: IDNs S00405, S00406 – Probe 1&2 enable IDNs S00401, S00420 – Probe 1&2 IDN S00169 – Probe control parameter IDN S00179 – Probe status				

S00171	**Calculate displacement procedure command**			
	The master uses this IDN to start, monitor, and stop the calculate displacement cycle procedure. When the procedure is active, the drive takes the reference distance 1&2 (IDNs S00052, S00053), reference offset (IDNs S00150, S00151), and marker position A & B (IDNs S00173, S00174) into account to calculate the displacement between the old and the new command/feedback system. The calculated displacement is stored in the displacement parameter 1&2 (IDNs S00175, S00176).			
	Name: "Calc Displacemnt"	**Attr:** 0x00090001 (16-bit binary, procedure command)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RW
	Min: Not supported	**Value:** (Written by master)		
	Max: Not supported			
Notes: Refer to the "*Structure of Procedure Command Control/Acknowledgement*" (IEC 61491 Tables 16 &17, 7.4.4) for more information on procedure command operation.				
See Also: IDNs S00052, S00053 – Reference distance 1&2 IDNs S00150, S00151 – Reference offset 1&2 IDNs S00173, S00174 – Marker position A&B IDNs S00175, S00176 – Displacement parameter 1&2				

S00172	**Displacement to the referenced system procedure command**			
	The master uses this IDN to start, monitor, and stop the displacement to the referenced system procedure. When this procedure is active, the drive switches to the referenced position feedback system and marks this by setting bit "position feedback value status" (IDN S00403). The control unit also switches to the referenced command value system and marks this by setting the bit "position command value status" (IDN S00404).			
	Name: "Ref Sys Displace"	**Attr:** 0x00090001 (16-bit binary, procedure command)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RW
	Min: Not supported	**Value:** (Written by master)		
	Max: Not supported			
Notes: Refer to the "*Structure of Procedure Command Control/Acknowledgement*" (IEC 61491 Tables 16 &17, 7.4.4) for more information on procedure command operation.				
See Also: IDN S00403 – Position feedback value status IDN S00404 – Position command value status				

S00173	**Marker position A**			
	When the drive recognizes the reference marker pulse of position feedback during homing, it stores the instantaneous not referenced position feedback value in this parameter.			
	Name: "Marker Posn A"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: $\geq -2^{31}$	**Value:** (written by master)		
	Max: $\leq 2^{31}-1$	**Scaling type:** IDN S00076 **Rotational position resolution:** IDN S00079		
Notes: .				
See Also:				

S00175	**Displacement parameter 1**			
	This is where the drive stores the difference between the old and new motor position feedback values when the procedure command "calculate displacement" (IDN S00171) is active.			
	Name: "Mtr Posn Delta"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: $\geq -2^{31}$	**Value:** (written by master)		
	Max: $\leq 2^{31}-1$	**Scaling type:** IDN S00076 **Rotational position resolution:** IDN S00079		
Notes: .				
See Also: IDN S00171 – Calculate displacement procedure command				

S00176	**Displacement parameter 2**			
	This is where the drive stores the difference between the old and new auxiliary position feedback values when the procedure command "calculate displacement" (IDN S00171) is active.			
	Name: "Aux Posn Delta"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: $\geq -2^{31}$	**Value:** (written by master)		
	Max: $\leq 2^{31}-1$	**Scaling type:** IDN S00076 **Rotational position resolution:** IDN S00079		
Notes: .				
See Also: IDN S00171 – Calculate displacement procedure command				

S00179	**Probe status**			
	If the drive stores one or more measurement values while the "probing cycle" procedure command (IDN S00170) is active, it also sets the respective bit in the probe status.			
	Name: "Probe Status"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0	**Value:** Probe status:		
	Max: 0xF	Bit 0: Probe 1 positive latched (IDN S00409) 0 – not latched 1 – latched		
		Bit 1: Probe 1 negative latched (IDN S00410) 0 – not latched 1 – latched		
		Bit 2: Probe 2 positive latched (IDN S00411) 0 – not latched 1 – latched		
		Bit 3: Probe 2 negative latched (IDN S00412) 0 – not latched 1 – latched		
(AT)		All other bits are reserved.		
Notes:				
See Also:	IDN S00170 – Probing cycle procedure command IDN S00409 – Probe 1 positive latched IDN S00410 – Probe 1 negative latched IDN S00411 – Probe 2 positive latched IDN S00412 – Probe 2 negative latched			

S00181	**Manufacturer class 2 diagnostic**			
	These are manufacturer-specific C2D flags (see C2D, IDN S00012).			
	Name: "MC2D"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0000	**Value:** MC2D: (1 = active, 0 = inactive)		
	Max: 0xFFFF	Bits 0-15: Not used		
Notes:				
See Also:	IDN S00012 – Class 2 diagnostic IDN S00129 – Manufacturer class 1 diagnostic IDN S00182 – Manufacturer class 3 diagnostic			

S00182	**Manufacturer Class 3 Diagnostic**			
	This IDN is used to define additional manufacturer-specific status conditions.			
	Name: "Drive Status**"**	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not Supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0000	**Value:** Manufacturer class 3 diagnostic:		
	Max: 0xFFFF	Bits 15-0: Bit 0: Servo Action Status (0 = disabled, 1 = servo loops active) Bit 1: Drive Enable Status (0 = disabled, 1 = power structure active) Bit 2: Shutdown Status (0 = inactive, 1 = shutdown state is active) Bit 3: Process Status (0 = inactive, 1 = tuning or testing in process) Bits 5-4: reserved Bit 6: Home Limit Switch State (0 = open, 1 = closed) Bit 7: Registration 1 Input State (0 = open, 1 = closed) Bit 8: Registration 2 Input State (0 = open, 1 = closed) Bit 9: Positive Overtravel Input State (0 = open, 1 = closed) Bit 10: Negative Overtravel Input State (0 = open, 1 = closed) Bit 11: Hardware Enable Input State (0 = open, 1 = closed) Bit 12: Acceleration Limit Status (0 = limit not reached, 1 = at limit) Bit 13: Absolute Reference State* (0 = not referenced, 1 = ref'd) Bits 14-15: reserved		
Notes:	If any of these bits are set, bit 15 of IDN S00013 must also be set. * - The Absolute Referenced State (bit 13) is set after the Set Coordinate System Procedure (IDN S00197) has been executed. The variable used to set this bit MUST be stored in Non-Volatile memory.			
See Also:	IDN S00013 – Class 3 Diagnostic			

S00185	**Length of the configurable data record in the AT.**			
	This parameter indicates the maximum length in bytes the data that can be processed in the configurable data record of the AT.			
	Name: "Length AT Data "	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: Bytes	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 0	**Value:** (Configurable AT Data Length)		
	Max: $\leq 2^{16} - 1$	**Scaling:** 1		
Notes:				
See Also: IDN S00186 – Length of the Configurable Data Record in the MDT				

S00186	**Length of the configurable data record in the MDT.**			
	This parameter indicates the maximum length in bytes the data that can be processed in the configurable data record of the MDT.			
	Name: "Length MDT Data "	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: Bytes	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (Configurable MDT Data Length)		
	Max: $\leq 2^{16} - 1$	**Scaling:** 1		
Notes:				
See Also: IDN S00185 – Length of the Configurable Data Record in the AT				

S00187	**IDN-list of configurable data in AT**			
	This is a list of all the configurable AT operation data IDNs which can be processed by the drive cyclically as feedback values.			
	Name: "IDN List Cfg AT"	**Attr:** 0x00550001 (Variable-length IDN array)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** (List of all configurable AT data IDNs)		
	Max: Not supported			
Notes:				
See Also: IDN S00188 – IDN-list of configurable data in MDT				

S00188	**IDN-list of configurable data in MDT**			
	This is a list of all the configurable MDT operation data IDNs which can be processed by the drive cyclically as command values.			
	Name: "IDN List Cfg MDT"	**Attr:** 0x00550001 (Variable-length IDN array)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** (List of all configurable MDT data IDNs)		
	Max: Not supported			
Notes:				
See Also: IDN S00187 – IDN-list of configurable data in AT				

S00189	**Following distance**			
	This is the difference between the commanded position and the feedback position.			
	Name: "Posn Foll Error"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: $\geq -2^{31}$	**Value:** (Current following distance)		
	Max: $\leq 2^{31} - 1$	**Scaling type:** IDN S00076		
(AT)		**Rotational position resolution:** IDN S00079		
Notes:				
See Also: IDN S00047 – Position command value IDN S00051 – Position feedback value 1 (motor feedback) IDN S00076 – Position data scaling type				

S00191	**Cancel reference point procedure command**			
	The master uses this IDN to start, monitor, and stop the cancel reference point procedure. When the procedure is active, the drive resets the bit "position feedback value status" (IDN S00403).			
	Name: "Cancel Ref Point"	**Attr:** 0x00090001 (16-bit binary, procedure command)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RW
	Min: Not supported	**Value:** (Written by master)		
	Max: Not supported			
Notes: Refer to the "*Structure of Procedure Command Control/Acknowledgement*" (IEC 61491 Tables 16 &17, 7.4.4) for more information on procedure command operation.				
See Also: IDN S00403 – Position feedback value status				

S00192	**IDN-list of backup operation data**			
	This is the list of IDN's that are stored in NVM.			
	Name: "IDN-list of backup op data"	**Attr:** 0x00550001 (Variable-length IDN array)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** (List of IDN's)		
	Max: Not supported			
Notes:				
See Also: IDN S0269 – Storage mode IDN S0270 – Selected IDN list of operation data to backup IDN S0293 – Selectively backup working memory				

S00197	**Set coordinate system procedure command**			
	After activation of the "Set coordinate system procedure command", the drive ignores the position command value and instead transfers the programmed "Initial coordinate value" (IDN 00198) into the drive-internal position command. Additionally, the drive re-calculates all absolute values (feedbacks, position limits, etc.), relating them to the "Initial coordinate value". The position feedback value status (IDN 00403) and position command value status (IDN 00404) are not affected by this command. This command is successfully completed by the drive when all necessary calculations are completed and the drive has based its coordinate system on the "Initial coordinate value" (IDN 00198). Before the control clears the command, it must also adjust its coordinate system to the same value the drive used. After clearing of the command, the drive will once again act upon the position command. The command will terminate with a fault, when the drive detects an error during the command specific calculations.			
	Name: "Set Coord Sys"	**Attr:** 0x00090001 (16-bit binary, procedure command)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RW
	Min: Not supported	**Value:** (Written by master)		
	Max: Not supported			
Notes: Refer to the "*Structure of Procedure Command Control/Acknowledgement*" (IEC 61491 Tables 16 &17, 7.4.4) for more information on procedure command operation.				
See Also: IDN S00198 – Initial coordinate value				

S00198	**Initial coordinate value**			
	The drives coordinate system will be set to the value programmed as the initial coordinate value during the Set coordinate system procedure command (IDN 00197)			
	Name: "Initial Coor Value"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: $\geq -2^{31}$	**Value:** (Coordinate value)		
	Max: $\leq 2^{31}-1$	**Scaling type:** IDN S00076		
		Rotational position resolution: IDN S00079		
Notes:				
See Also: IDN S00076 – Position Data Scaling Type IDN S00079 – Rotational Position Resolution IDN S00197 – Set Coordinate System Procedure Command				

S00206	**Drive on delay time**			
	When the "Drive on" and "Drive enable"bits of the Master Control Word are set, the drive activates the torque but ignores the command values until this time has elapsed. This time allows the motor's brake to release.			
	Name: "Drive On Delay"	**Attr:** 0x01110001 (16-bit unsigned decimal)		
	Units: ms	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (Written by master)		
	Max: $\leq 2^{16} - 1$	**Scaling:** 10^{-1}		
Notes:				
See Also: IDN S00207 – Drive off delay time				

S00207	**Drive off delay time**			
	When the "Drive off" bit of the Master Control Word is reset and the drive decelerates to a minimum speed, the drive maintains torque until this time has elapsed. This time allows the motor's brake to be set.			
	Name: "Drive Off Delay "	**Attr:** 0x01110001 (16-bit unsigned decimal)		
	Units: ms	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (Written by master)		
	Max: $\leq 2^{16} - 1$	**Scaling:** 10^{-1}		
Notes:				
See Also: IDN S00206 – Drive on delay time				

S00262	**Load Defaults Procedure Command**			
	This causes the factory default values for the IDN data that is stored in NVM (see IDN S0192 – IDN-list of backup operation data) to be copied into the NVM and the working RAM.			
	Name: "Load defaults proc"	**Attr:** 0x00090001 (16-bit binary, procedure command)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: Not supported	**Value:** (Written by master)		
	Max: Not supported			
Notes:	Cannot be executed when the drive is enabled. Motor parameters are not affected.			
See Also:	IDN S0192 – IDN-list of backup operation data IDN S0264 – Backup working memory procedure command IDN S0269 – Storage mode IDN S0270 – Selected IDN list of operation data to backup IDN S0293 – Selectively backup working memory procedure command			

S00263	**Load Working Memory Procedure Command**			
	This causes the IDN data that is stored in NVM (see IDN S0192 – IDN-list of backup operation data) to be copied from NVM to the working RAM. The drive does this automatically on power-up. The procedure only needs to be executed if the master has modified some of the values in the working RAM and wants to return to the values stored in NVM.			
	Name: "Load memory proc"	**Attr:** 0x00090001 (16-bit binary, procedure command)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: Not supported	**Value:** (Written by master)		
	Max: Not supported			
Notes:	Cannot be executed when the drive is enabled. Motor parameters are not affected.			
See Also:	IDN S0192 – IDN-list of backup operation data IDN S0264 – Backup working memory procedure command IDN S0269 – Storage mode IDN S0270 – Selected IDN list of operation data to backup IDN S0293 – Selectively backup working memory procedure command			

S00264	**Backup Working Memory Procedure Command**			
	This causes the IDN data that is stored in NVM (see IDN S0192 – IDN-list of backup operation data) to be copied from the working RAM to NVM.			
	Name: "Backup memory proc"	**Attr:** 0x00090001 (16-bit binary, procedure command)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: Not supported	**Value:** (Written by master)		
	Max: Not supported			
Notes: Motor parameters are not affected.				
See Also: IDN S0192 – IDN-list of backup operation data IDN S0263 – Load working memory procedure command IDN S0269 – Storage mode IDN S0293 – Selectively backup working memory procedure command				

S00269	**Storage mode**			
	This parameter selects whether writes to IDNs whose data is located in NVM should go to the volatile RAM copy or the non-volatile NVM copy.			
	Name: "Storage Mode"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0	Value: (written by master)		
	Max: 1	Bit 0: 0 – data saved in NVM 1 – data saved in RAM		
Notes:				
See Also:				

S00270	**Selected IDN List Of Operation Data To Backup**			
	This is the list of IDN's that will be saved in NVM by the Selectively backup working memory procedure (IDN S0293). IDN's in this list must appear in the IDN-list of backup operation data (IDN S0192).			
	Name: "IDN-list of data to backup"	**Attr:** 0x00550001 (Variable-length IDN array)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: Not supported	**Value:** (List of IDN's to backup)		
	Max: Not supported			
Notes: Read-only while Selectively backup working memory procedure is active.				
See Also: IDN S0192 – IDN-list of backup operation data IDN S0263 – Load working memory procedure command IDN S0264 – Backup working memory procedure command IDN S0269 – Storage mode IDN S0293 – Selectively backup working memory procedure				

S00271	**Drive ID**			
	This IDN is basically just a 32-bit number that is always stored in NVM (regardless of the state of the Storage Mode flag (IDN S0269). The master could use this to indicate how the drive is configured, and to see if the drive hasn't been configured yet (factory default value is 0, and is also cleared to zero by the Load Defaults procedure (IDN S0262).			
	Name: "Drive ID"	**Attr:** 0x00120001 (32-bit unsigned decimal)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: Not supported	**Value:** (Written by master)		
	Max: Not supported			
Notes: The master could read this to see if a drive in the ring has been replaced by a drive with a different or no configuration, and update the drive accordingly.				
See Also:				

S00293	**Selectively Backup Working Memory Procedure Command**			
	Copies data from the IDNs in the IDN list IDN S0270 (Selected IDN list of operation data to backup) to NVM.			
	Name: "Selectively backup memory proc"	**Attr:** 0x00090001 (16-bit binary, procedure command)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: Not supported	**Value:** (Written by master)		
	Max: Not supported			
Notes:				
See Also: IDN S0192 – IDN-list of backup operation data IDN S0263 – Load working memory procedure command IDN S0264 – Backup working memory procedure command IDN S0269 – Storage mode IDN S0270 – Selected IDN list of operation data to backup				

S00296	**Velocity feed forward gain**			
	This parameter is active in the 'position control without following error' mode and serves to reduce the velocity-dependent following error.			
	Name: "Vel Fdfwd Gain"	**Attr:** 0x02110001 (16-bit unsigned decimal)		
	Units: %	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (velocity feed forward gain)		
	Max: ≤ 10000	**Scaling:** 10^{-2}		
Notes:				
See Also:				

S00298	**Home switch distance**			
	This parameter is the optimum distance between the marker pulse of a feedback and the home switch. During the first commissioning, this parameter displays the distance the home switch is from the ideal point.			
	Name: "Home Switch Dist"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: $\geq -2^{31}$	**Value:** (written by master)		
	Max: $\leq 2^{31}-1$	**Scaling type:** IDN S00076		
(AT)		**Rotational position resolution:** IDN S00079		
Notes: .				
See Also:				

S00301	**Allocation of real-time control bit 1**			
	This specifies which IDN to assign to real-time control bit 1.			
	Name: "Alloc RTC1"	**Attr:** 0x00510001 (IDN number)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x0	**Value:** (Written by master)		
	Max: 0x1	Bit 0: 0 – bit reset 1 – bit set		
Notes:				
See Also: IDN S00303 – Allocation of real-time control bit 2				

S00303	**Allocation of real-time control bit 2**			
	This specifies which IDN to assign to real-time control bit 2.			
	Name: "Alloc RTC2"	**Attr:** 0x00510001 (IDN number)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x0	**Value:** (Written by master)		
	Max: 0x1	Bit 0: 0 – bit reset 1 – bit set		
Notes:				
See Also: IDN S00301 – Allocation of real-time control bit 1				

S00305	**Allocation of real-time status bit 1**			
	This specifies which IDN to assign to real-time status bit 1.			
	Name: "Alloc RTS1"	**Attr:** 0x00510001 (IDN number)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x0	**Value:** (Written by master)		
	Max: 0x1	Bit 0: 0 – bit reset 1 – bit set		
Notes:				
See Also: IDN S00307 – Allocation of real-time status bit 2				

S00307	**Allocation of real-time status bit 2**			
	This specifies which IDN to assign to real-time status bit 1.			
	Name: "Alloc RTS2"	**Attr:** 0x00510001 (IDN number)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x0	**Value:** (Written by master)		
	Max: 0x1	Bit 0: 0 – bit reset 1 – bit set		
Notes:				
See Also: IDN S00305 – Allocation of real-time status bit 1				

S00330	**Status '$n_{feedback} = n_{command}$'**			
	This bit is set when the difference between the command velocity and the actual velocity is less than the velocity window (IDN S00157). It is the same as C3D bit 0.			
	Name: "At Prog Speed"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0	**Value:** Status bit:		
	Max: 0x1	Bit 0: 0 – Inactive 1 – Active		
(RTS)				
Notes:				
See Also: IDN S00157 – Velocity window IDN S00013 – Class 3 diagostics				

S00331	**Status '$n_{feedback}$ =0'**			
	This bit is set when the actual velocity is less than the standstill window (IDN S00124). It is the same as C3D bit 1.			
	Name: "Zero Speed"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0	**Value:** Status bit:		
	Max: 0x1	Bit 0: 0 – Inactive 1 – Active		
(RTS)				
Notes:				
See Also: IDN S00124 – Standstill window IDN S00013 – Class 3 diagostics				

S00332	**Status '$n_{feedback} < n_x$'**			
	This bit is set when the actual velocity is less than the velocity threshold n_x(IDN S00125). It is the same as C3D bit 2.			
	Name: "Vel Below Thresh"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0	**Value:** Status bit:		
	Max: 0x1	Bit 0: 0 – Inactive 1 – Active		
(RTS)				
Notes:				
See Also: IDN S00125 – Velocity threshold IDN S00013 – Class 3 diagostics				

S00333	**Status '$T \geq T_x$'**			
	This bit is set when the actual torque is greater than the torque threshold (IDN S00126). It is the same as C3D bit 3.			
	Name: "Torq Above Thresh"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0	**Value:** Status bit:		
	Max: 0x1	Bit 0: 0 – Inactive 1 – Active		
(RTS)				
Notes:				
See Also: IDN S00126 – Torque Threshold IDN S00013 – Class 3 diagostics				

S00334	**Status '$T \geq T_{limit}$'**			
	This bit is set when the actual torque is greater than the torque limit (IDN S00092). It is the same as C3D bit 4.			
	Name: "Torq Above Limit"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0	**Value:** Status bit:		
	Max: 0x1	Bit 0: 0 – Inactive 1 – Active		
(RTS)				
Notes:				
See Also: IDN S00092 – Torque Limit IDN S00013 – Class 3 diagostics				

S00335	**Status '$n_{command} < n_{limit}$'**			
	This bit is set when the command velocity is greater than the velocity limit value (IDNs S00038, S00039, S00091). It is the same as C3D bit 5.			
	Name: "Vel Above Limit"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0	**Value:** Status bit:		
	Max: 0x1	Bit 0: 0 – Inactive 1 – Active		
(RTS)				
Notes:				
See Also: IDNs S00038, S00039 – Positive/Negative velocity limit value IDN S00091 – Bipolar velocity limit IDN S00013 – Class 3 diagostics				

S00336	**Status 'In position'**			
	This bit is set when the difference between the command position and the actual position is less than the position window (IDN S00057). It is the same as C3D bit 6.			
	Name: "In Position "	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0	**Value:** Status bit:		
	Max: 0x1	Bit 0: 0 – Inactive 1 – Active		
(RTS)				
Notes:				
See Also: IDN S00057 – Position window IDN S00013 – Class 3 diagostics				

S00347	**Velocity error**			
	This is the difference between the commanded velocity and the actual velocity.			
	Name: "Velocity Error"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Velocity units)	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: $\geq -2^{31}$	**Value:** (Current velocity error)		
	Max: $\leq 2^{31} - 1$	**Scaling type:** IDN S00044 **Scaling factor:** IDN S00045 **Scaling exponent:** IDN S00046		
(AT)				
Notes:				
See Also: IDN S00044 – Velocity Data Scaling Type IDN S00045 – Velocity Data Scaling Factor IDN S00046 – Velocity Data Scaling Exponent				

S00380	**DC bus voltage**			
	This indicates the drive's bus voltage.			
	Name: "DC Bus Voltage"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: Volts	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 0	**Value:** (Current DC bus voltage)		
(AT)	**Max:** ≤ 2^{16} -1	**Scaling:** 1		
Notes:				
See Also:				

S00390	**Diagnostic Number**			
	This IDN returns a number associated with the current fault condition. The master can use this number to display an error message to the user.			
	Name: "Diagnostic number"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** Diagnostic Number: 00 – Drive Ready 01 – Non-Volatile Memory Endurance Exceeded 02 – Position Change Exceeds Position Rollover / 2 03 – Absolute Feedback Range Exceeded 04 – Motor thermostat 05 – IPM hardware fault 06 – Hardware overtravel (SERCOS only) 07 – Motor encoder channel B line break 08 – Motor encoder channel A line break 09 – Bus undervoltage 10 – Bus overvoltage 11 – Illegal hall state 12 – Home search failed 13 – Home position outside limits 14 – Option card communication error 15 – Electrical cycle length limit exceeded 16 – Overtravel (SERCOS only) 17 – User-specified current fault 18 – Motor overspeed 19 – Excess following error 20 – Motor encoder state error 21 – Auxiliary encoder state error 22 – Motor Thermal Protection Filter 23 – IPM Thermal Protection Filter 24 – Excess velocity error 25 – Sensor not assigned 26 – Motor speed limit exceeded 27 – Axis not homed 28 – Blob or Smart encoder parameter error 29 – Encoder output frequency limit exceeded 30 – Encoder communications error 31 – Encoder data corruption error 32 – Encoder input frequency limit exceeded 33 – Absolute Position Exceeds Position Rollover 34 – Ground Short Circuit 35 – Soft-Start fault 36 – Drive Module Overtemperature 37 – AC Input Phase Loss 38 – SERCOS Watchdog Fault 39 – Error Completing Self-Sensing Startup 255 – Drive Disable		
	Max: Not supported			
Notes:				
See Also: IDN S0095 – Diagnostic message				

S00400	**Home switch**			
	This IDN returns the state of the home switch input.			
	Name: "Home Switch "	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0	**Value:** State of home input:		
(AT) (RTS)	**Max:** 0x1	Bit 0: 0 – Home input inactive 1 – Home input active		
Notes:				
See Also:				

S00401	**Probe 1**			
	This IDN returns the status of the Probe 1 input.			
	Name: "Probe 1 "	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0	**Value:** State of Probe 1 input:		
(AT) (RTS)	**Max:** 0x1	Bit 0: 0 – Probe 1 inactive 1 – Probe 1 active		
Notes:				
See Also:	IDN S00130 – Probe value 1 positive edge IDN S00131 – Probe value 1 negative edge IDN S00169 – Probe control parameter IDN S00170 – Probing cycle procedure command IDN S00405 – Probe 1 enable			

S00402	**Probe 2**			
	This IDN returns the status of the Probe 2 input.			
	Name: "Probe 2 "	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0	**Value:** State of Probe 2 input:		
(AT) (RTS)	**Max:** 0x1	Bit 0: 0 – Probe 2 inactive 1 – Probe 2 active		
Notes:				
See Also:	IDN S00132 – Probe value 2 positive edge IDN S00133 – Probe value 2 negative edge IDN S00169 – Probe control parameter IDN S00170 – Probing cycle procedure command IDN S00406 – Probe 2 enable			

S00403	**Position feedback value status**			
	This IDN indicates if the position feedback values are referenced to the machine zero point.			
	Name: "Posn Fdbk Status"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0	**Value:** State of position feedback:		
(AT) (RTS)	**Max:** 0x1	Bit 0: 0 – Pos. feedback value not referenced to machine zero pt 1 – Pos. feedback value referenced to machine zero point		
Notes:				
See Also:	IDN S0148 – Drive-controlled homing procedure command			

S00404	**Position command value status**			
	This IDN indicates if the position command values are referenced to the machine zero point.			
	Name: "Posn Cmd Status"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0	**Value:** State of position feedback:		
(RTS)	**Max:** 0x1	Bit 0: 0 – Pos. feedback value not referenced to machine zero pt 1 – Pos. feedback value referenced to machine zero point		
Notes:				
See Also:				

S00405	**Probe 1 enable**			
	This parameter is used to assign an IDN to probe 1 enable so that it can be assigned to a real-time control bit (IDN S00301).			
	Name: "Probe 1 enable"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RW
	Min: 0x0	**Value:** State of Probe 1 enable:		
(MDT) (RTC)	**Max:** 0x1	Bit 0: 0 – Probe 1 not enabled 1 – Probe 1 enabled		
Notes:				
See Also: IDN S00401 – Probe 1 IDN S00301 – Allocation of real-time control bit 1				

S00406	**Probe 2 enable**			
	This parameter is used to assign an IDN to probe 2 enable so that it can be assigned to a real-time control bit (IDN S00301).			
	Name: "Probe 2 enable"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RW
	Min: 0x0	**Value:** State of Probe 2 enable:		
(MDT) (RTC)	**Max:** 0x1	Bit 0: 0 – Probe 2 not enabled 1 – Probe 2 enabled		
Notes:				
See Also: IDN S00402 – Probe 2 IDN S00301 – Allocation of real-time control bit 1				

S00407	**Homing enable**			
	This parameter is used to assign an IDN to the status of the homing enable so that it can be assigned to a real-time control bit (IDN S00301).			
	Name: "Homing enable"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RW
	Min: 0x0	**Value:** State of homing enable:		
(RTC)	**Max:** 0x1	Bit 0: 0 – Homing not enabled 1 – Homing enabled		
Notes:				
See Also: IDN S00146 – Control unit controlled homing procedure command IDN S00301 – Allocation of real-time control bit 1				

S00408	**Reference marker pulse registered**			
	This parameter is used to assign an IDN to the reference marker pulse registered so that it can be assigned to a real-time status bit (IDN S00305).			
	Name: "Ref Marker Reg"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RW
	Min: 0x0	**Value:** State of reference marker pulse registered:		
(RTS)	**Max:** 0x1	Bit 0: 0 – reference marker pulse not registered 1 – reference marker pulse registered		
Notes:				
See Also: IDN S00146 – Control unit controlled homing procedure command IDN S00305 – Allocation of real-time control bit 1				

S00409	**Probe 1 positive latched**			
	This parameter is used to assign an IDN to the probe1 positive latched so that it can be assigned to a real-time status bit (IDN S00305). This may only be set by the drive when the probing cycle procedure command (S00170) is active.			
	Name: "Reg1 Rise Latch"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0	**Value:** State of probe 1 positive latch:		
(AT) (RTS)	**Max:** 0x1	Bit 0: 0 – probe 1 positive not latched 1 – probe 1 positive latched		
Notes:				
See Also: IDN S00169 – Probe control parameter IDN S00170 – Probing cycle procedure command IDN S00179 – Probe status IDN S00305 – Allocation of real-time status bit 1				

S00410	**Probe 1 negative latched**			
	This parameter is used to assign an IDN to the probe1 negative latched so that it can be assigned to a real-time status bit (IDN S00305). This may only be set by the drive when the probing cycle procedure command (S00170) is active.			
	Name: "Reg1 Fall Latch"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0	**Value:** State of probe 1 negative latch:		
(AT) (RTS)	**Max:** 0x1	Bit 0: 0 – probe 1 negative not latched 1 – probe 1 negative latched		
Notes:				
See Also: IDN S00169 – Probe control parameter IDN S00170 – Probing cycle procedure command IDN S00179 – Probe status IDN S00305 – Allocation of real-time status bit 1				

S00411	**Probe 2 positive latched**			
	This parameter is used to assign an IDN to the probe2 positive latched so that it can be assigned to a real-time status bit (IDN S00305). This may only be set by the drive when the probing cycle procedure command (S00170) is active.			
	Name: "Reg2 Rise Latch"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0	**Value:** State of probe 2 positive latch:		
(AT) (RTS)	**Max:** 0x1	Bit 0: 0 – probe 2 positive not latched 1 – probe 2 positive latched		
Notes:				
See Also: IDN S00169 – Probe control parameter IDN S00170 – Probing cycle procedure command IDN S00179 – Probe status IDN S00305 – Allocation of real-time status bit 1				

S00412	**Probe 2 negative latched**			
	This parameter is used to assign an IDN to the probe2 negative latched so that it can be assigned to a real-time status bit (IDN S00305). This may only be set by the drive when the probing cycle procedure command (S00170) is active.			
	Name: "Reg2 Fall Latch"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0	**Value:** State of probe 2 negative latch:		
(AT) (RTS)	**Max:** 0x1	Bit 0: 0 – probe 2 negative not latched 1 – probe 2 negative latched		
Notes:				
See Also: IDN S00169 – Probe control parameter IDN S00170 – Probing cycle procedure command IDN S00179 – Probe status IDN S00305 – Allocation of real-time status bit 1				

B. APPENDIX - PROPRIETARY IDNS

B.1. List of Giddings & Lewis IDNs

Shaded IDNs are not yet completed.

IDN	Name
P-0-0000	NULL 16
P-0-0001	Option Configuration Bits
P-0-0004	Extended Probe Control
P-0-0005	Extended Probe Status
P-0-0006	Probe 1 Index Position
P-0-0007	Probe 2 Index Position
P-0-0008	Probe 1 Index Latched
P-0-0009	Probe 2 Index Latched
P-0-0011	Operating Hours
P-0-0012	Base Node Firmware Revision
P-0-0017	Id Current Command
P-0-0018	Drive Utilization
P-0-0020	Current Limit Source
P-0-0024	Base Node ID
P-0-0031	Motor Utilization
P-0-0041	Auto Tune Procedure Command
P-0-0042	Auto Tune Torque Limit
P-0-0043	Auto Tune Velocity Limit
P-0-0044	Auto Tune Position Limit
P-0-0046	Auto Tune Configuration
P-0-0047	Auto Tune Status
P-0-0048	Auto Tune Direction
P-0-0049	Auto Tune Acceleration Time
P-0-0050	Auto Tune Deceleration Time
P-0-0056	Position KP
P-0-0057	Position KI
P-0-0058	Position KD
P-0-0059	Position KFF
P-0-0060	Position Integrator Zone
P-0-0061	Velocity KP
P-0-0062	Velocity KI
P-0-0063	Velocity KD
P-0-0065	Low Pass Filter BW
P-0-0066	Low Pass Filter Enable
P-0-0071	Stopping Torque
P-0-0072	Stopping Time Limit
P-0-0073	Torque Scaling Gain
P-0-0081	*Homing Strategy*
P-0-0101	Soft Overtravel Fault Action
P-0-0102	Position Error Fault Action
P-0-0104	Feedback Noise Fault Action
P-0-0105	Drive Thermal Fault Action
P-0-0106	Motor Thermal Fault Action
P-0-0117	Probe 1 Index Position Offset

IDN	Name
P-0-0118	Probe 2 Index Position Offset
P-0-0121	Hookup Test Procedure
P-0-0122	Hookup Test ID
P-0-0123	Hookup Test Increment
P-0-0124	Hookup Test Direction
P-0-0125	Hookup Test Status
P-0-0126	Hookup Test Results
P-0-0138	Position Command From Master
P-0-0161	Digital Output Status Bytes
P-0-0190	Digital Input Status Bytes
P-0-0299	Motor Data File

B.2. Description of Giddings & Lewis IDNs

P00000	**Null 16**			
	This IDN is a 16-bit NULL value.			
	Name: "NULL 16"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: Not Supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
(AT)	**Min:** ≥ 0	**Value:** (NULL 16)		
(MDT)	**Max:** ≤ 0	**Scaling:** 1		
Notes:				
See Also:				

P00001	**Option Configuration Bits**			
	This IDN is used to enable or disable the monitoring of the hard overtravel inputs.			
	Name: "Option Cfg Bits"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: Not supported	**Value:** Drive config bits: Bit 0: Hard overtravel inputs monitoring (0 = monitored, 1 = not monitored) Bits 15-1: Reserved		
	Max: Not supported			
Notes:	For bit 0, when this is set to monitor the hard overtravel inputs, the drive will set an associated fault in IDN S00129 (bits 2 or 3) if a fault condition exists.			
See Also:	IDN S00129 – Manufacturer Class 1 Diagnostic			

P00004	**Extended probe control parameter**			
	This IDN selects which probe edges to use during the probing cycle procedure. It is an extension of IDN S0169 – Probe Control Parameter. This IDN adds a couple of bits for each probe. The first is an edge select. If both edges for a given probe are selected, this bit selects which edge to look for first. The other bit enables the encoder index/marker. When this is selected, the position of the first index after the selected edge(s) is saved as well.			
	Name: "Ext probe ctrl parameter"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: Not supported	**Value:** Extended probe control parameter: (All reserved bits should be written to '0') Bit 0: Probe 1 positive edge 0 – positive edge is not active 1 – positive edge is active Bit 1: Probe 1 negative edge 0 – negative edge is not active 1 – negative edge is active Bit 2: Probe 2 positive edge 0 – positive edge is not active 1 – positive edge is active Bit 3: Probe 2 positive edge 0 – negative edge is not active 1 – negative edge is active Bits 11-4: (Reserved) Bit 12: Probe 1 edge select (only if both bits 0 & 1 are set) 0 – positive edge first 1 – negative edge first Bit 13: Probe 1 index 0 – index is not active 1 – index is active Bit 14: Probe 2 edge select (only if both bits 2 & 3 are set) 0 – positive edge first 1 – negative edge first Bit 15: Probe 2 index 0 – index is not active 1 – index is active		
	Max: Not supported			
Notes:	Bits 0-3 are identical to IDN S0169			
See Also:	IDN S00169 – Probe control parameter IDN S00170 – Probing cycle procedure command IDN P00006 – Probe 1 index position IDN P00007 – Probe 2 index position			

P00005	**Extended probe status**			
	This IDN shows the status of all the probe latches during the Probe Cycle procedure. It is an extension of IDN S0179 – Probe Status. This IDN adds a couple of bits to show when the index/marker position has been latched.			
	Name: "Ext probe status"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** (0 = Not Latched, 1 = Latched) Bit 0 (Probe 1 Positive Latched, IDN S0409) Bit 1 (Probe 1 Negative Latched, IDN S0410) Bit 2 (Probe 2 Positive Latched, IDN S0411) Bit 3 (Probe 2 Negative Latched, IDN S0412) Bits 13-4 (Reserved) Bit 14 (Probe 1 Index Latched, IDN P0008) Bit 15 (Probe 2 Index Latched, IDN P0009)		
	Max: Not supported			
Notes:	Bits 0-3 are identical to IDN S0179 All reserved bit values are undefined.			
See Also:	IDN S00170 – Probing cycle procedure command IDN P00004 – Extended probe control parameter			

P00006	**Probe value 1 index position**			
	During the Probe Cycle Procedure (IDN S0170), the drive stores the position of Probe 1's index/marker in this value (if Probe 1's index is enabled in bit 13 of IDN P0004).			
	Name: "Probe 1 index"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** (Position of probe 1 index)		
	Max: Not supported			
Notes:				
See Also:	IDN S00076 – Position data scaling type IDN S00130 – Probe value 1 positive edge IDN S00131 – Probe value 1 negative edge IDN S00169 – Probe control parameter IDN S00170 – Probing cycle procedure command IDN P00004 – Extended probe control parameter IDN P00005 – Extended probe status			

P00007	**Probe value 2 index position**			
	During the Probe Cycle Procedure (IDN S0170), the drive stores the position of Probe 2's index/marker in this value (if Probe 2's index is enabled in bit 15 of IDN P0004).			
	Name: "Probe 2 index"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** (Position of probe 2 index)		
	Max: Not supported			
Notes:	Probe 2 (Input 1) can only latch the auxiliary encoder value. In cannot latch the motor encoder value.			
See Also:	IDN S00076 – Position data scaling type IDN S00132 – Probe value 2 positive edge IDN S00133 – Probe value 2 negative edge IDN S00169 – Probe control parameter IDN S00170 – Probing cycle procedure command IDN P00004 – Extended probe control parameter IDN P00005 – Extended probe status			

P00008 (RTS)	**Probe 1 index latched**			
	This IDN indicates if a position has been latched by the Probe 1's index.			
	Name: "Probe 1 index latched"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** State of Probe 1 index latch:		
	Max: Not supported	**Bit 0:** 0 – Probe 1 index not latched 1 – Probe 1 index latched		
Notes:				
See Also:	IDN S00170 – Probing cycle procedure command IDN S00401 – Probe 1 IDN S00405 – Probe 1 enable IDN S00409 – Probe 1 positive latched IDN S00410 – Probe 1 negative latched IDN P00004 – Extended probe control parameter IDN P00006 – Probe value 1 index			

P00009	**Probe 2 index latched**			
	This IDN indicates if a position has been latched by the Probe 2's index.			
	Name: "Probe 2 index latched"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: Not supported	**Value:** State of Probe 2 index latch:		
	Max: Not supported	**Bit 0:** 0 – Probe 2 index not latched 1 – Probe 2 index latched		
(RTS)				
Notes:				
See Also:	IDN S00170 – Probing cycle procedure command IDN S00402 – Probe 2 IDN S00406 – Probe 2 enable IDN S00411 – Probe 2 positive latched IDN S00412 – Probe 2 negative latched IDN P00004 – Extended probe control parameter IDN P00007 – Probe value 2 index			

P00011	**Operating Hours**			
	Displays the total number of hours the drive has had control power applied.			
	Name: "Operating Hours"	**Attr:** 0x00320001 (32-bit unsigned decimal)		
	Units: Hours	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 0	**Value:** (operating hours)		
	Max: ≤ $2^{32} - 1$	**Scaling:** 1		
Notes:				
See Also:				

P00012	**Base Node Firmware Revision**			
	This IDN contains the base node firmware revision. The lower 8 bits are the minor revision and the upper 8 bits contain the major revision. (Example: "266" = 0x010A = v1.010)			
	Name: "Base Node FW Rev"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: Not Supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 0	**Value:** (base node firmware major/minor revision)		
	Max: ≤ $2^{16} - 1$	Bits 7-0: Minor Base Node Firmware Revision Bits 15-8: Major Base Node Firmware Revision		
Notes:				
See Also:				

P00017	**Id Current Command**			
	This parameter displays the present level of the Id current reference for the axis.			
	Name: "Id Reference"	**Attr:** 0x02110001 (16-bit unsigned decimal)		
	Units: % Motor Rated	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 0	**Value:** (Id current command)		
	Max: ≤ 10000	**Scaling:** 10^{-2}		
Notes:				
See Also:				

P00018	**Drive Utilization**			
	This parameter displays the present level of the current output to the motor as a percent of drive rated.			
	Name: "Drive Utilized"	**Attr:** 0x02110001 (16-bit unsigned decimal)		
	Units: % Drive Rated	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 0	**Value:** (drive utilization)		
(AT)	**Max:** ≤ 1000	**Scaling:** 10^{-1}		
Notes:				
See Also:				

P00020	**Current Limit Source**			
	This parameter displays the present source (if any) of any current limiting for the axis.			
	Name: "Currnt Limit Src"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not Supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0 **Max:** 0x9	Value: Current limit source: Bits 3-0: 0000 = Not Limited 0001 = Negative User Limit 0010 = Positive User Limit 0011 = Amplifier Peak Limit Limit 0100 = Amplifier I(t) Limit 0101 = Bus Regulator Limit 0110 = Bipolar User Limit 0111 = Motor Peak Limit 1000 = Motor I(t) Limit 1001 = Voltage Limit		
(**AT**)				
Notes:				
See Also:				

P00024	**Base Node ID**			
	This IDN contains the base node ID number. Each base node type has an identifying number which is a registered product code of the device object.			
	Name: "Base Node ID"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: Not Supported	**Phase 2:** RW (see note)	**Phase 3:** RW (see note)	**Phase 4:** RW (see note)
	Min: ≥ 1 **Max:** ≤ 2^{16} -1	**Value:** (base node ID) 0 = DSA 007-230-S – 0.5 kW 1 = DSA 015-230-S – 1 kW 2 = DSA 030-230-S – 2 kW 3 = DSA ???-???-S – 3 kW 4 = DSA ???-???-S – 7.5 kW 5 = DSA ???-???-S – 15 kW 6 = DSA ???-???-S – 3 kW 460V 7 = DSA ???-???-S – 5 kW 460V 8 = DSA ???-???-S – 10 kW 460V 9 = DSA ???-???-S – 15 kW 460V 10 = DSA ???-???-S – 22 kW 460V		
Notes: This parameter reflects the drive type. It accepts writes only if the data being written matches the actual drive type.				
See Also:				

P00031	**Motor Utilization**			
	This parameter displays the present level of the current output to the motor as a percent of motor rated.			
	Name: "Motor Utilized"	**Attr:** 0x02110001 (16-bit unsigned decimal)		
	Units: % Mtr Rated	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 0 **Max:** ≤ 1000	**Value:** (motor utilization) **Scaling:** 10^{-1}		
(**AT**)				
Notes:				
See Also:				

P00041	**Auto Tune Procedure Command**			
	This procedure command initiates a tuning profile consisting of an acceleration ramp to the Auto Tune Velocity Limit (P00043) followed by a deceleration ramp to zero speed. The acceleration and deceleration ramps are generated by outputting the % torque given by the Auto Tune Torque Limit (P00042). The drive measures the Auto Tune Acceleration Time (P00049) and Auto Tune Deceleration Time (P00050) during the tuning profile.			
	Name: "Atune Select"	**Attr:** 0x00090001 (16-bit binary, procedure command)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: Not supported	**Value:** (written by master)		
	Max: Not supported	**Scaling:** N/A		
Notes: Refer to the "*Structure of Procedure Command Control/Acknowledgement*" (IEC 61491 Tables 16 &17, 7.4.4) for more information on procedure command operation.				
See Also: IDN P00042 – Auto Tune Torque Limit IDN P00043 – Auto Tune Velocity Limit IDN P00044 – Auto Tune Position Limit IDN P00048 – Auto Tune Direction IDN P00049 – Auto Tune Acceleration Time IDN P00050 – Auto Tune Deceleration Time				

P00042	**Auto Tune Torque Limit**			
	This parameter specifies the maximum motor torque used while an auto tune cycle is executing.			
	Name: "Atune Trq Limit"	**Attr:** 0x01110001 (16-bit unsigned decimal)		
	Units: % Mtr Rated	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (auto tune torque limit)		
	Max: ≤ 2^{15} –1	**Scaling type:** IDN S00086 **Scaling factor:** IDN S00093 **Scaling exponent:** IDN S00094		
Notes:				
See Also: IDN S00086 – Torque scaling type IDN S00093 – Torque scaling factor IDN S00094 – Torque scaling exponent				

P00043	**Auto Tune Velocity Limit**			
	This parameter specifies the maximum velocity the motor may attain during an auto tune cycle.			
	Name: "Atune Vel Limit"	**Attr:** 0x00220001 (32-bit signed decimal)		
	Units: (velocity units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ -2^{31}	**Value:** (auto tune velocity limit)		
	Max: ≤ 2^{31} –1	**Scaling type:** IDN S00044 **Scaling factor:** IDN S00045 **Scaling exponent:** IDN S00046		
Notes:				
See Also: IDN S00044 – Velocity Data Scaling Type IDN S00045 – Velocity Data Scaling Factor IDN S00046 – Velocity Data Scaling Exponent				

P00044	**Auto Tune Position Limit**			
	This parameter specifies the maximum distance the motor shaft may move while an auto tune cycle is executing.			
	Name: "Atune Posn Limit"	**Attr:** 0x00120001 (32-bit unsigned decimal)		
	Units: (position units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (auto tune position limit)		
	Max: ≤ $+2^{31}$ -1	**Scaling type:** IDN S00076 **Rotational position resolution:** IDN S00079		
Notes:				
See Also: IDN S00076 – Position Data Scaling Type IDN S00079 – Rotational Position Resolution				

P00046	**Auto Tune Configuration**			
	This parameter is the auto tune configuration that may be displayed as a selectable bitfield.			
	Name: "Atune Config"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not Supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x0 **Max:** 0x7	**Value:** Auto tune configuration bitfield: Bits 4-0: Bit 0 : Auto Save 0 – Don't save auto tune parameters 1 – Save the calculated auto tune parameters (default). Bit 1: Calculate Gains 0 – Don't calculate gains 1 – The loop gains will be calculated (default). Bit 2: Inertia Tune 0 – Don't perform an inertial tune 1 – The auto tune procedure performs an inertial tune (default). Bit 3: Analog Offset 0 – Don't calculate an analog offset 1 – The auto tune procedure determines a compensating value for the analog inputs (default). Bit 4: Inertia Mode 0 – Run the inertia tune in both directions 1 – Run the inertia tune in the positive direction only (default).		
Notes:				
See Also:				

P00047	**Auto Tune Status**			
	This parameter indicates the status of the auto tune procedure.			
	Name: "Atune Status"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not Supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0 **Max:** 0x7	**Value:** Auto tune status: Bits 2-0: 000 = Successful – The auto tune process was successful. 001 = In Progress – Auto tuning is active. 010 = Tune Aborted – Auto tuning was cancelled by user. 011 = Tune Timeout – Auto tuning timed-out. 100 = Drive Fault – Auto tuning incomplete because drive faulted. 101 = Travel Limit – Travel limit was exceeded during auto tune. 110 = Polarity Fault – The feedback polarity was incorrect. 111 = Speed Fault – Tuning speed too small to make measurements.		
Notes:				
See Also:				

P00048	**Auto Tune Direction**			
	This parameter is used to set the direction of movement for the auto tune procedure command.			
	Name: "Atune direction"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not Supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x0 **Max:** 0x1	**Value:** Auto tune direction: Bit 0: 0 = CW (rotary) – Positive (linear) 1 = CCW (rotary) – Negative (linear)		
Notes:				
See Also:				

P00049	**Auto Tune Acceleration Time**			
	This parameter is used for setting the acceleration time for the auto tune procedure.			
	Name: "Atune Accel"	**Attr:** 0x00120001 (32-bit unsigned decimal)		
	Units: μsec	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0 **Max:** ≤ 2^{31} –1	**Value:** (auto tune acceleration time) **Scaling:** 1		
Notes:				
See Also:				

P00050	**Auto Tune Deceleration Time**			
	This parameter is used for setting the deceleration time for the auto tune procedure.			
	Name: "Atune Decel"	**Attr:** 0x00120001 (32-bit unsigned decimal)		
	Units: μsec	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (auto tune deceleration time)		
	Max: ≤ 2^{31} –1	**Scaling:** 1		
Notes:				
See Also:				

P0056	**Position KP**			
	This is the Kp gain for the position loop. The Kp gain generates a control signal proportional to the position error. Kp gain affects the response time to a command signal and the velocity loop bandwidth.			
	Name: "Pos loop KP "	**Attr:** 0x06111E85(16-bit unsigned decimal, S.F. = 7813x10^{-6})		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0	**Value:** (written by master)		
	Max: 4,095			
Notes:				
See Also:				

P0057	**Position KI**			
	This is the Ki gain for the position loop. The Ki gain generates a control signal proportional to the integral of the velocity error. I gain eliminates steady state position error, and affects the ability to reject load disturbances.			
	Name: "Pos loop KI "	**Attr:** 0x06111E85(16-bit unsigned decimal, S.F. = 7813x10^{-6})		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0	**Value:** (written by master)		
	Max: 4,095			
Notes:				
See Also:				

P0058	**Position KD**			
	This is the Kd gain for the position loop. The Kd gain generates a control signal proportional to measured velocity. It provides damping to the position loop, which can reduce overshoot.			
	Name: "Pos loop KD "	**Attr:** 0x06111E85(16-bit unsigned decimal, S.F. = 7813x10^{-6})		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0	**Value:** (written by master)		
	Max: 4,095			
Notes:				
See Also:				

P0059	**Position KFF**			
	This is the Kff gain for the position loop. The Kff gain generates a feed forward signal proportional to the commanded speed. It can be used to reduce steady state position error while moving.			
	Name: "Pos loop KFF"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0	**Value:** (written by master)		
	Max: 200			
Notes:				
See Also:				

P0060	**Position integrator zone**			
	This is the maximum position error in which the position loop's integrator is still active. If the position error is greater than the I Zone, the position loop integrator value is reset to zero.			
	Name: "Pos loop I-zone "	**Attr:** 0x00210001 (16-bit signed decimal)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0	**Value:** (written by master)		
	Max: 32,767			
Notes:				
See Also:				

P0061	**Velocity KP**			
	This is the P gain for the velocity loop. The P gain generates a control signal proportional to the velocity error. P gain affects the response time to a command signal and the velocity loop bandwidth.			
	Name: "Vel loop KP "	**Attr:** 0x00210001 (16-bit signed decimal)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0	**Value:** (written by master)		
	Max: 1,000			
Notes:				
See Also:				

P0062	**Velocity KI**			
	This is the I gain for the velocity loop. The I gain generates a control signal proportional to the integral of the velocity error. I gain eliminates steady state velocity error, and affects the ability to reject load disturbances.			
	Name: "Vel loop KI "	**Attr:** 0x00210001 (16-bit signed decimal)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0	**Value:** (written by master)		
	Max: 1,000			
Notes:				
See Also:				

P0063	**Velocity KD**			
	This is the D gain for the velocity loop. The D gain generates a control signal proportional to measured acceleration. Positive D gain reduces velocity overshoot, and negative D gain should only be used in systems that exhibit mechanical resonance.			
	Name: "Vel loop KD "	**Attr:** 0x00210001 (16-bit signed decimal)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: -1,000	**Value:** (written by master)		
	Max: 1,000			
Notes:				
See Also:				

P0065	**Low pass filter BW**			
	This is the cutoff frequency of the low pass filter. The low pass filter must be enabled (IDN P0066) for this to take effect.			
	Name: "LP filter BW"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: "Hz"	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 1	**Value:** (written by master)		
	Max: 992			
Notes:				
See Also:				

P0066	**Low pass filter enable**			
	This indicates if the low pass filter is to be used in the control loop.			
	Name: "LP filter enable"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: Not supported	**Value:** Low pass filter enable:		
	Max: Not supported	Bit 0: 0 = Disabled		
(RTC)		1 = Enabled		
Notes:				
See Also:				

P00071	**Stopping Torque**			
	This parameter is the amount of torque available to stop the motor.			
	Name: "Stopping Torque"	**Attr:** 0x00210001 (16-bit signed decimal)		
	Units: (torque units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ -2^{15}	**Value:** (stopping torque) **Scaling type:** IDN S00086 **Scaling factor:** IDN S00093 **Scaling exponent:** IDN S00094		
	Max: ≤ $2^{15}-1$			
Notes:				
See Also:	IDN S00086 – Torque Data Scaling Type IDN S00093 – Torque Data Scaling Factor IDN S00094 – Torque Data Scaling Exponent			

P00072	**Stopping Time Limit**			
	This parameter is the maximum amount of time that the module will remain enabled while trying to stop. Useful for very slow velocity rate change settings.			
	Name: "Stop Time Limit"	**Attr:** 0x00110001 (16-bit unsigned decimal)		
	Units: sec	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (stopping time limit) **Scaling:** 1		
	Max: ≤ 2^{16} -1			
Notes:				
See Also:				

P00073	**Torque Scaling Gain**			
	This parameter is the value of the torque scaling gain. This gain compensates the velocity loop for the system inertia.			
	Name: "Torq Scale Gain"	**Attr:** 0x02120001 (32-bit unsigned decimal)		
	Units: (% drive rated) / (acceleration units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (torque scaling gain) **Scaling:** 10^{-5}		
	Max: ≤ $+2^{31}$ -1			
Notes:				
See Also:				

P00081	**Homing Strategy**			
	This IDN defines the homing strategy.			
	Name: "Homing Strategy"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not Supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x0	**Value:** Homing strategy: Bit 0: 0 = next marker – proceed to the next marker. 1 = previous marker – stop and return to the last marker.		
	Max: 0x1			
Notes:				
See Also:				

P00101	**Soft Overtravel Fault Action**			
	This IDN is used to define the drive action in response to a soft overtravel fault.			
	Name: "Soft Ovrtrvl Act"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not Supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x0	**Value:** Soft overtravel fault action: Bit 0: 0 = drive handles fault (default) 1 = status only		
	Max: 0x1			
Notes:	When this is set to "status only" the drive should report the fault in IDN S00129 (bits 0 or 1) and let the controller take the appropriate action.			
See Also:	IDN S00129 – Manufacturer Class 1 Diagnostic			

P00102	**Position Error Fault Action**			
	This IDN is used to define the drive action in response to a position error fault.			
	Name: "Pos Err Flt Act"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not Supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x0 **Max:** 0x1	**Value:** Position error fault action: Bit 0: 0 = drive handles fault (default) 1 = status only		
Notes: When this is set to "status only" the drive should report the fault in IDN S00011 (bit 11) and let the controller take the appropriate action.				
See Also: IDN S00011 – Class 1 Diagnostic				

P00104	**Feedback Noise Fault Action**			
	This IDN is used to define the drive action in response to a feedback noise fault.			
	Name: "Fdbk Nse Flt Act"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not Supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x0 **Max:** 0x1	**Value:** Encoder fault action: Bit 0: 0 = drive handles fault 1 = status only (default)		
Notes: When this is set to the default "status only" the drive should report the fault in IDN S00129 (bits 5 or 7) and let the controller take the appropriate action.				
See Also: IDN S00129 – Manufacturer Class 1 Diagnostic				

P00105	**Drive Thermal Fault Action**			
	This IDN is used to define the drive action in response to a drive thermal fault.			
	Name: "Dr Therm Flt Act"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not Supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x0 **Max:** 0x1	**Value:** Drive thermal fault action: Bit 0: 0 = drive handles fault (default) 1 = status only		
Notes: When this is set to "status only" the drive should report the fault in IDN S00011 (bit 1) and let the controller take the appropriate action.				
See Also: IDN S00011 – Class 1 Diagnostic				

P00106	**Motor Thermal Fault Action**			
	This IDN is used to define the drive action in response to a motor thermal fault.			
	Name: "Mt Therm Flt Act"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not Supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x0 **Max:** 0x1	**Value:** Motor thermal fault action: Bit 0: 0 = drive handles fault (default) 1 = status only		
Notes: When this is set to "status only" the drive should report the fault in IDN S00011 (bit 2) and let the controller take the appropriate action.				
See Also: IDN S00011 – Class 1 Diagnostic				

P00117 P00118	**Probe 1 index position offset** **Probe 2 index position offset**			
	During the Probe Cycle Procedure (IDN S0170), if the index is enabled along with one edge of the probe input, the difference between the index position and the probe position is stored here. If both probe edges are enable, it is the difference between the index position and the last probe edge.			
	Name: "Probe 1 position delta" "Probe 2 position delta"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: $\geq -2^{31}$	**Value:** (Probe index position offset)		
	Max: $\leq 2^{31} - 1$			
Notes:				
See Also:	IDN S00076 – Position data scaling type IDN S00130 – Probe value 1 positive edge IDN S00131 – Probe value 1 negative edge IDN S00132 – Probe value 2 positive edge IDN S00133 – Probe value 2 negative edge IDN S00169 – Probe control parameter IDN S00170 – Probing cycle procedure command IDN P00004 – Extended probe control parameter IDN P00005 – Extended probe status			

P00121	**Hookup Test Procedure**			
	This procedure command initiates the hookup test procedure as determined by the Hookup Test ID (P00122).			
	Name: "Hookup Test Sel"	**Attr:** 0x00090001 (16-bit binary, procedure command)		
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: Not supported	**Value:** (written by master)		
	Max: Not supported	**Scaling:** N/A		
Notes:	Refer to the "*Structure of Procedure Command Control/Acknowledgement*" (IEC 61491 Tables 16 &17, 7.4.4) for more information on procedure command operation.			
See Also:	IDN P00122 – Hookup Test ID			

P00122	**Hookup Test ID**			
	This parameter is the hookup test configuration ID that may be displayed as a selectable bitfield.			
	Name: "Hookup Test ID"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not Supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: 0x0	**Value:** Hookup test ID configuration bitfield:		
	Max: 0x7	Bits 2-0: 0 = Motor/Feedback Test – drive moves shaft, drive sees feedback 1 = Feedback Test – manually move shaft, drive sees feedback 2 = Marker Test -- manually move shaft, drive sees marker		
Notes:				
See Also:				

P00123	**Hookup Test Increment**			
	This parameter specifies the distance that the axis needs to travel to indicate a successful test.			
	Name: "Hookup Test Inc"	**Attr:** 0x00120001 (32-bit unsigned decimal)		
	Units: (position units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min: ≥ 0	**Value:** (hookup test increment)		
	Max: $\leq +2^{31} - 1$	**Scaling type:** IDN S00076 **Rotational position resolution:** IDN S00079		
Notes:				
See Also:	I			

P00124	**Hookup Test Direction**			
	This parameter is used to indicate the direction of movement for the hookup test procedure command.			
	Name: "Hookup Test Dir"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not Supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0 **Max:** 0x1	**Value:** Hookup test ID direction: Bit 0: 0 = CW (Rotary) – Positive (Linear) 1 = CCW (Rotary) – Negative (Linear)		
Notes:				
See Also:				

P00125	**Hookup Test Status**			
	This parameter indicates the status of the hookup test procedure.			
	Name: "Hookup Status"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not Supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0 **Max:** 0x4	**Value:** Hookup test status: Bits 3-0: 0000 = Successful – The hookup test process was successful. 0001 = In Progress – Hookup testing is active. 0010 = Test Aborted – Hookup testing was cancelled by user. 0011 = Test Timeout – Hookup testing timed-out (~2 seconds). 0100 = Drive Fault – Hookup testing incomplete due to a drive fault. 0101 = Test Increment Fault – Insufficient test increment. 0110 = Feedback Polarity Fault – S1, S2, S3 or A, B, Q switched 0111 = Feedback Signal Fault – Feedback signal missing 1000 = Feedback Communications Fault – RS485 comm. error 1001 = Feedback Configuration Fault – "Smart" device config error 1010 = Motor Wiring Fault – Motor power wiring error		
Notes:				
See Also:				

P00126	**Hookup Test Results**			
	This parameter displays the results of the hookup test procedure.			
	Name: "Hookup Results"	**Attr:** 0x00020001 (32-bit binary)		
	Units: Not Supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0 **Max:** 0xFFFFFFFF	**Value:** Hookup test results: Bit 0: Power Wiring Error (0 = no error, 1 = error) Bit 1: Hall Effect Device Wiring Error Bit 2: Feedback Wiring Error Bit 3: Feedback Device Communications Wiring Error Bit 4: Feedback Resolution Error (Configured resolution ≠ Actual) Bits 7-5: Reserved Bits 9-8: Hall Effect "S1" Wiring Status 00 = OK 01 = Switch S1 with S2 10 = Reserved 11 = Switch S3 with S1 Bits 11-10: Hall Effect "S2" Wiring Status 00 = OK 01 = Switch S1 with S2 10 = Switch S2 with S3 11 = Reserved Bits 13-12: Hall Effect "S3" Wiring Status 00 = OK 01 = Reserved 10 = Switch S2 with S3 11 = Switch S3 with S1 Bits 15-14: AQB "A" Wiring Status 00 = OK 01 = Reverse Polarity 10 = Not Present 11 = Switch A with B Bits 17-16: AQB "B" Wiring Status 00 = OK 01 = Reverse Polarity 10 = Not Present 11 = Switch B with A Bits 19-18: AQB "Z" Wiring Status 00 = OK 01 = Reverse Polarity 10 = Not Present 11 = Reserved Bits 22-20: Reserved Bits 31-23: Commutation Offset Angle (+/- 180^{O})		
Notes:				
See Also:				

P00138	**Position command from master**			
	This is the command position value sent from the master.			
	Name: "Pos cmd from master"	**Attr:** 0x0X22XXXX (32-bit signed decimal, C.F. changes based on scaling)		
	Units: (Position units)	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: $\geq -2^{31}$ **Max:** $\leq 2^{31}-1$	**Value:** (Probe index position offset)		
Notes: This IDN is mainly used for debugging purposes to be able to read what command position the drive received from the master				
See Also: IDN S00047 – Position command value				

P00161	**Digital Output Status Bytes**			
	This IDN is used to indicate the status of all the digital outputs as two bytes.			
	Name: "Output Image"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not Supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0000 **Max:** 0xFFFF	**Value:** Digital output bytes: Bit 0: Digital Output 1 Bit 1: Digital Output 2 Bit 2: Digital Output 3 Bit 3: Digital Output 4 Bit 4: Relay Output Bits 5-15: Reserved		
Notes:				
See Also:				

P00190	**Digital Input Status Bytes**			
	This IDN is used to indicate the status of all the digital inputs as two bytes.			
	Name: "Input Image"	**Attr:** 0x00010001 (16-bit binary)		
	Units: Not Supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: 0x0000 **Max:** 0xFFFF	**Value:** Digital input bytes: Bit 0: Digital Input 1 Bit 1: Digital Input 2 Bit 2: Digital Input 3 Bit 3: Digital Input 4 Bit 4: Digital Input 5 Bit 5: Digital Input 6 Bit 6: Digital Input 7 Bit 7: Digital Input 8 Bits 8-15: Reserved		
Notes:				
See Also:				

P00299	**Motor Data File**			
	This IDN is a 256 byte array of motor data. This is used to download motor data to the drive from the controller.			
	Name: "Mtr Data File"	**Attr:** 0x00440001 (variable length 8-bit data strings, character)		
	Units: Not Supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min: ≥ 0 **Max:** ≤ 255	**Value:** (motor data file) - 256 byte data array -		
Notes:				
See Also:				