Centurion® SERCOS Drives

IDN Manual

Part Number 108-31051-00

Giddings & Lewis

Giddings & Lewis Controls, Measurement & Sensing

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CHAPTER 1-SERCOS Operation

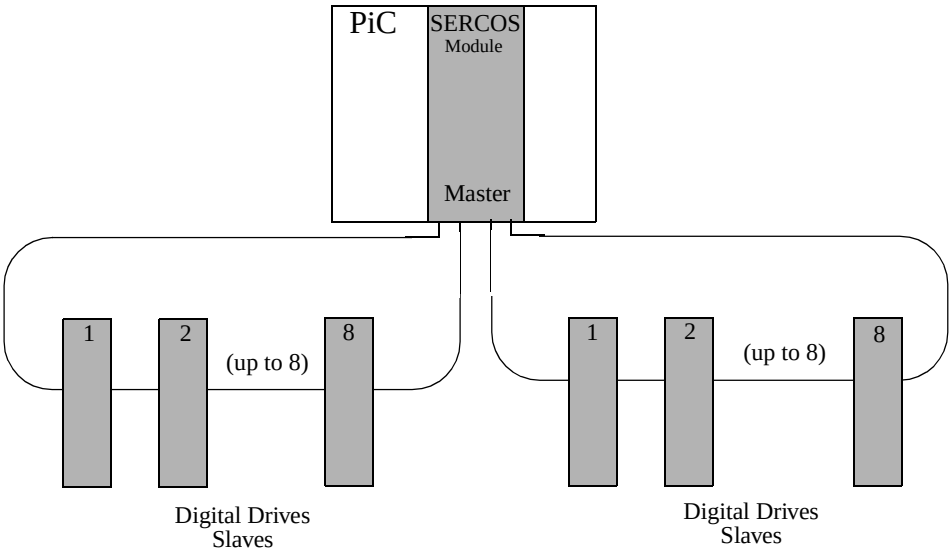
CHAPTER 2-IDNs

CHAPTER 1 SERCOS Operation

Hardware Information

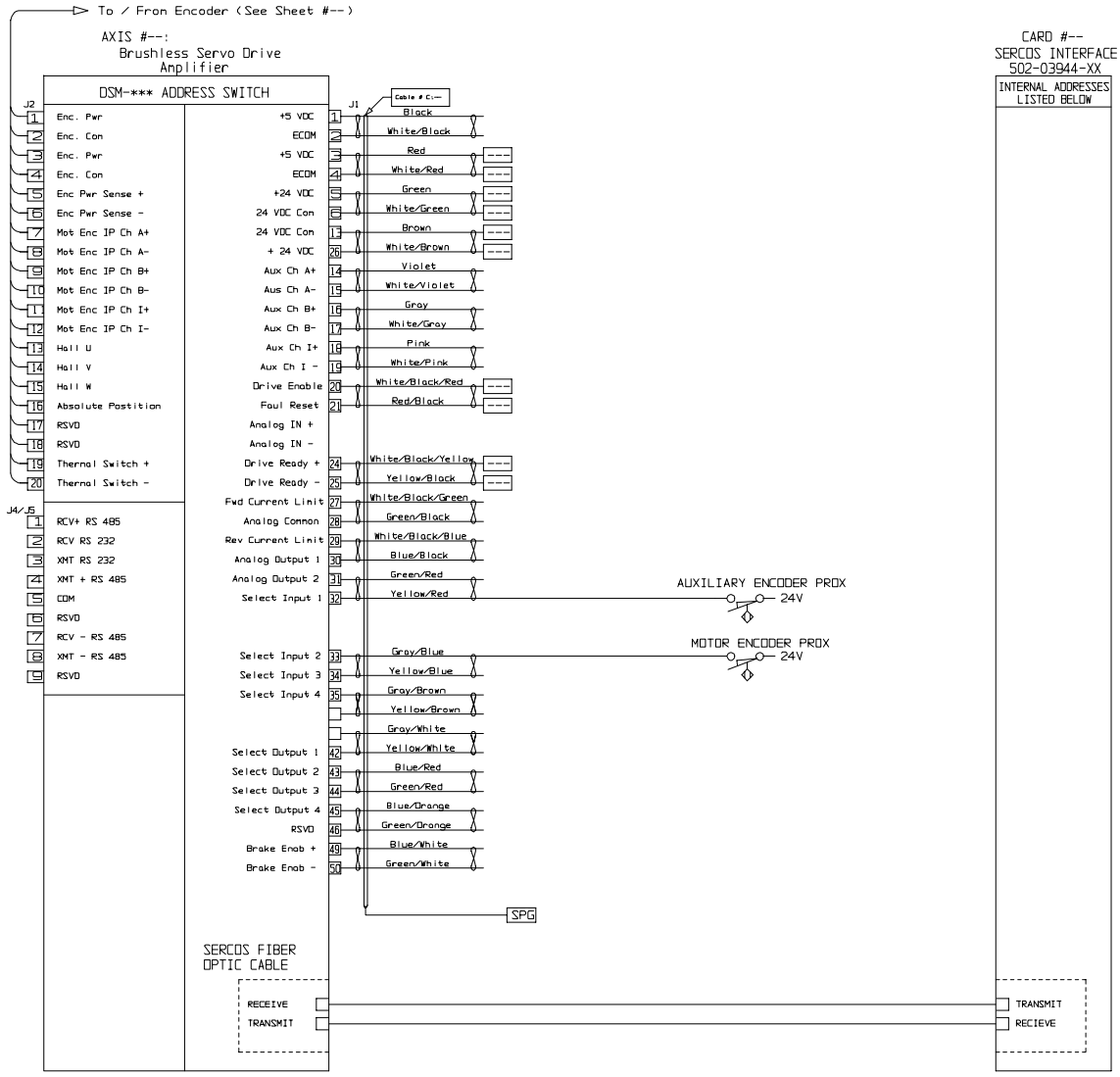
SERCOS is a SErial Realtime COmmunication System developed to interface with Centurion digital drives and controls. It allows you to create a digital instead of an analog motion control network. A typical PiC/SERCOS network is illustrated below. The network consists of up to eight drives connected to one master in a ring topology in which messages travel unidirectionally. The network can support two fiber optic rings from one SERCOS module.

FIGURE 1 - 1. PiC/SERCOS Network



Fiber optic cables are used to transmit data serially allowing for improved noise immunity and fast update times. SERCOS allows motion control in velocity, torque, or position modes.

FIGURE 1 - 2. Drive Connections



Refer to the Centurion DSM100 Hardware and Installation Manual (Part Number 108-30083-00) for additional hardware information, the PiCPro for Windows Software Manual (Part Number 108-31048-00) for SERCOS background and software information, and the Function/Function Block Reference Guide (Part Number 108-31005-00) for SERCOS function/block information.

IDN Lists

The following acronyms are used in the IDN lists that follow. Chapter 2 defines the IDNs found in these lists. All SERCOS interface IDNs are identified with an “S” preceding the IDN number. All product-specific IDNs are identified with a “P” preceding the IDN number.

(AT) indicates an IDN that can be transmitted cyclically via the AT

(MDT) indicates an IDN that can be transmitted cyclically via the MDT

(RTC) indicates an IDN that can be set up as a real-time control bit

(RTS) indicates an IDN that can be set up as a real-time status bit

SERCOS Communication Parameters

These are the standard IDNs used by the master to set up the communication times, and bring the communication ring up to phase 4.

IDNs	Description
S0001	Control unit cycle time (t_{Ncyc})
S0002	Communication cycle time (t_{Scyc})
S0003	Shortest AT transmission starting time (t_{1min})
S0004	Transmit/Receive transition time (t_{ATMT})
S0005	Minimum feedback processing time (t_5)
S0006	AT transmission starting time (t_1)
S0007	Feedback acquisition capture point (t_4)
S0008	Command value valid time (t_3)
S0009	Position of data record in MDT
S0010	Length of MDT
S0017	IDN-list of all operation data
S0018	IDN-list of all operation data for CP_2
S0019	IDN-list of all operation data for CP_3
S0021	IDN-list of invalid operation data for CP_2
S0022	IDN-list of invalid operation data for CP_3
S0025	IDN-list of all procedure commands
S0087	Transmit to transmit recovery time (t_{ATAT})
S0088	Receive to receive recovery time (t_{MTSY})
S0089	MDT transmission starting time (t_2)
S0090	Command value proceeding time (t_{MTSG})
S0096	Slave arrangement (SLKN)
S0127	Communication phase 3 transistion check
S0128	Communication phase 4 transistion check
S0134	Master control word
S0135	Drive status word
S0143	SYSTEM interface version

Diagnostic Parameters

IDNs	Description
S0011	Class 1 diagnostic
S0012	Class 2 diagnostic
S0013	Class 3 diagnostic
S0014	Interface status
S0028 (AT)	MST error counter
S0029 (AT)	MDT error counter
S0095	Diagnostic message
S0097	Mask class 2 diagnostic
S0098	Mask class 3 diagnostic
S0099	Reset class 1 diagnostic
S0129	Manufacturer class 1 diagnostic
S0181	Manufacturer class 2 diagnostic
S0182	Manufacturer class 3 diagnostic
S0390	Diagnostic number
P0002	Mask manufacturer class 2 diagnostic
P0003	Mask manufacturer class 3 diagnostic

Trajectory Parameters

The drive can operate in position, velocity, and torque modes with cyclic data, and velocity and torque modes with service channel data. The master uses IDNs S0032 - S0035 to describe the different modes, and then uses the two mode select bits in the master control word to select which mode to use. If the master selects a mode with cyclic data, the drive does not check to see if the required data is part of the MDT (IDN S0047 for position mode, IDN S0036 for velocity mode, and IDN S0080 for torque mode).

Scaling can be applied to the position, velocity, acceleration, and torque parameters. Only rotational scaling is supported. All values are stored internally in drive units, so if the scaling is changed (can only be changed if the drive is disabled), all trajectory parameters will change to reflect the new scaling.

Internally, the drive runs its position loop at 1 ms (if set up for position mode). If the master sends position commands more than 1 ms apart, the drive performs linear interpolation every millisecond to determine the intermediate points.

IDNs	Description
S0032	Primary operation mode
S0033	Secondary operation mode 1
S0034	Secondary operation mode 2
S0035	Secondary operation mode 3
S0036 (MDT)	Velocity command value
S0040 (AT)	Velocity feedback value
S0043	Velocity polarity parameter
S0044	Velocity data scaling type
S0045	Velocity data scaling factor
S0046	Velocity data scaling exponent
S0047 (MDT)	Position command value
S0051(AT)	Position feedback value 1
S0053(AT)	Position feedback value 2
S0055	Position polarity parameter
S0076	Position data scaling type
S0079	Rotational position resolution
S0080	Torque command value
S0085	Torque polarity parameter
S0086	Torque data scaling type
S0093	Torque data scaling factor
S0094	Torque data scaling exponent

S0138	Bipolar acceleration limit value
S0160	Acceleration data scaling type
S0161	Acceleration data scaling factor
S0162	Acceleration data scaling exponent

Drive Info parameters

These IDNs give general information about the drive. Two of these IDNs - S0142, Application Type, and P0018, Drive Name- are general purpose text strings that the master can write to for its own purposes. IDN S0140, Controller type, is a read-only string describing the model number of the drive.

IDN S0271, Drive ID, is a 32-bit value that is stored in NVRAM. The factory default for this value is 0. the master could use this to determine if a drive has been replaced on the ring by setting it to a non-zero value after initializing the NVRAM parameters for the first time. Then, when bringing up the communication ring, the master could read this value from all the drives. If the value is zero, that drive must be a new drive that replaced an existing drive, and its NVRAM parameters need to be initialized.

IDN P0020, Drive Software Address, is used to define the drive's node address when the rotary address switch is set to 'F'.

IDNs	Description
S0030	Manufacturer version
S0140	Controller type
S0142	Application type
S0271	Drive ID
P0010	Product type
P0011	Power-up status
P0012	Main version
P0013	Boot version
P0014	BCM revision
P0015	PAM revision
P0016	Final revision
P0017	Serial number
P0018	Drive name
P0019	Drive type
P0020	Drive software address
P0021	Service clock
P0022	Fault history
P0138	Command Position from Master Controller

Filter parameters

These IDNs are used to set up the loop filters for the drive. They can be written to by the master, or they could be initialized with the autotuning and manual tuning tools in DSMPro.

The position loop feed-forward term (P0059, Position KFF) is enabled or disabled by bit 3 of the drive operation mode word (S0032 - S0035) for position mode.

IDNs	Description
P0056	Position KP
P0057	Position KI
P0058	Position KD
P0059	Position KFF
P0060	Position integrator zone
P0061	Velocity KP
P0062	Velocity KI
P0063	Velocity KD
P0064	Velocity loop update period
P0065	Low pass filter BW
P0066 (RTC/MDT)	Low pass filter enable
P0067	Drive mode

Motor parameters

These IDNs are used to define the motor connected to the drive. IDN P0068 is used to select the type of motor. If it is a motor that the drive has a definition for, the other IDNs become read-only values that show the values for that motor. If a custom motor is selected, the other IDNs are used to define the characteristics for that motor. *Extreme caution must be used when defining custom motors.*

IDN P0068 is only write-enabled when the drive is disabled, and IDNs P0069 - 84 are only write-enabled when the drive is disabled and IDN P0068 is set for a custom motor. The values for IDNs P0068-84 are stored in non-volatile memory (NVM), and they are written to the NVM whenever the corresponding IDN is written to, regardless of the state of IDN S0269, Storage Mode. This is because the drive must be reset (see IDN P0119, Reset Drive) before the new parameters are used. If the values weren't saved in NVM first, they would be lost when the drive is reset.

IDNs P0085-86 are read-only values that provide information on the motor table located in the drive, which gives the definitions for various motors.

IDNs	Description
P0068	Motor number
P0069	Encoder lines
P0070	Motor maximum speed
P0071	Motor maximum peak current
P0072	Motor maximum continuous peak current
P0073	Motor Kt
P0074	Motor Jm
P0075	Motor Ke
P0076	Motor winding resistance
P0077	Motor winding inductance
P0078	Motor thermostat
P0079	Motor commutation type
P0080	Motor thermal time constant
P0081	Motor thermal time constant enable
P0082	Motor pole count
P0083	Motor hall offset
P0084	Motor index offset
P0085	Motor table number
P0086	Motor table version

Digital input parameters

Each of the digital inputs can be connected to various flags that affect the drive's operation, or they can be used as general purpose inputs that the master can read. The flags are:

- Torque Override - When active, it disables the velocity loop
- Intergrator Inhibit - When active, it zeros the velocity loop integrator
- Forward Enable - When active, it allows motion in the forward direction
- Reverse Enable - When active, it allows motion in the reverse direction
- Fault Reset - When active, it resets the drives faults (similar to procedure IDN S0099)

Each input can be assigned to any, all, or none of these flags. The four digital inputs and the Fault Reset Input act essentially the same, with the following exceptions:

1. The factory default setting for the Fault Reset input has it tied to the Fault Reset flag, while the factory default setting for the other inputs doesn't have them tied to any flag.
2. Input 2 is also used as Probe 1 and as the Home Switch.
3. Input 1 is also used as Probe 2.

The digital inputs can be read as a group via IDN P0040, or individually via IDNs P0111 - 0116. The flags described above can be read via IDN P0109.

IDNs	Description
P0023	Digital input 1 configuration
P0024	Digital input 2 configuration
P0025	Digital input 3 configuration
P0026	Digital input 4 configuration
P0027	Fault reset input configuration
P0032	Enable Input Override
P0040 (AT)	Digital input status
P0109 (AT)	Input flags
P0111 (RTS)	Reset faults input
P0112 (RTS)	Enable input
P0113 (RTS)	Input 1
P0114 (RTS)	Input 2
P0115 (RTS)	Input 3
P0116 (RTS)	Input 4

Digital output parameters

Four of the drive's digital output (Digital Outputs 1 - 4) can be connected to various status flags, or they can be used as general purpose outputs that the master can write to. The flags are:

- In-Position (IDN P0124)
- Within Position Window (IDN S0336)
- Zero Speed (IDN S0331)
- Within Speed Window (IDN S0330)
- Positive Ilimit (IDN P0122)
- Negative Ilimit (P0123)
- At Speed (Inverse of IDN S0332)
- Drive enabled
- DC Bus Charged
- Disabling Fault

Each output can be tied to any, all, or none of these flags. If an output is tied to multiple flags, if any of the flags is active, that output is active. The Brake and Ready outputs are dedicated to their respective functions (unless used as general purpose outputs).

The Brake output goes active when the drive is enabled, and goes inactive when the drive is disabled (i.e., an active Brake output should disable a mechanical brake). The time delay between the drive being enabled/disabled and the brake output going active/inactive can be configured using IDNs P0038 (Brake Output Active Delay) and P0039 (Brake Output Inactive Delay).

To use the outputs (Digital Output 1- 4, Brake, and Ready outputs) as general purpose outputs, IDN P0036 (Digital Outputs Override) must be set to 1. At this point, the outputs can be written to using IDN P0037, which writes all the bits simultaneously, or be IDNs P0130 - 0135, which writes each output individually (NOTE: Before setting the Digital Outputs Override, set IDN P0037 to the desired state first).

The current state of the outputs can be read from IDN P0041.

IDNs	Description
P0028	Digital output 1 configuration
P0029	Digital output 2 configuration
P0030	Digital output 3 configuration
P0031	Digital output 4 configuration
P0036 (RTC/MDT)	Digital outputs override
P0037 (MDT)	User digital outputs
P0038	Brake output active delay
P0039	Brake output inactive delay
P0041	Digital output status
P0130 (RTC/MDT)	Ready output
P0131 (RTC/MDT)	Brake output
P0132 (RTC/MDT)	Output 1
P0133 (RTC/MDT)	Output 2
P0134 (RTC/MDT)	Output 3
P0134 (RTC/MDT)	Output 4

Analog input parameters

There are three analog inputs on the drive. Two of these are dedicated to adjusting the current limit level, one in the forward direction and one in the reverse direction. The third input is typically used as the command input for the standard drive, but since a SERCOS drive receives its commands via the SERCOS network, this analog input is not used, and can be used by the master as a general-purpose analog input.

The two current limit inputs return values in units of Amps (reflecting the current limit level), and the other input returns values in Volts.

IDNs	Description
P0053 (AT)	Analog command input
P0054 (AT)	Analog FCL input
P0055 (AT)	Analog RCL input

Analog output parameters

There are two analog outputs on the drive, and they can be connected to various parameters within the drive, or they can be written to directly by the master. The possible variable are:

- Current Command - The output of the velocity loop after filtering and current limiting
- Current - Average Command - The average value of Current - Command
- Current - Positive Peak - The positive peak output of the velocity control loop
- Current - Negative Peak - The negative peak output of the velocity control loop
- Positive Ilimit - The forward current limit (FCL) input A/D setting
- Negative Ilimit - The reverse current limit (RCL) input A/D setting
- Motor Velocity - The actual motor velocity
- Velocity Command - the commanded motor velocity
- Velocity Error - The difference between commanded and actual motor velocity
- Motor Position - The actual motor position
- Position Command - The commanded motor position
- Position Error - The difference between commanded and actual motor position
- Position - Peak Positive Error - The positive peak position error
- Position - Peak Negative Error - The negative peak position error
- Master Position - The master input position
- Position Loop Output - The output of the position control loop
- Velocity Loop Output - The output of the velocity control loop
- Filter Output - The output of the low-pass filter
- R Phase Current - The current in the R-phase of the motor
- T Phase Current - The current in the T-phase of the motor
- Torque Current - The actual torque-producing current of the motor
- Field Current - The actual field-producing current of the motor
- Torque Voltage - The torque-producing voltage of the motor
- Field Voltage - The field-producing voltage of the motor
- A/D Command Value - The analog COMMAND input
- Bus Voltage - The DC power bus voltage

The scaling and offset for the two outputs can also be adjusted with IDNs P004 - P0047. The values currently at the outputs can be read from IDNs P0051 and P0052.

To write to the outputs directly, the Analog Output Override Enable (IDN P0048) must be set, and the values written to the User Analog Output 1/2 Value (IDNs P0049/P0050).

IDNs	Description
P0042	Analog output 1 configuration
P0043	Analog output 2 configuration
P0044	Analog output 1 offset
P0045	Analog output 2 offset
P0046	Analog output 1 scale
P0047	Analog output 2 scale
P0048 (RTC/MDT)	Analog output override enable
P0049 (MDT)	User analog output 1 value
P0050 (MDT)	User analog output 2 value
P0051 (AT)	Analog output 1 value
P0052 (AT)	Analog output 2 value

Drive-controlled Homing procedure

During the homing cycle, the drive automatically accelerates the motor up to speed, during which time it is looking for the home switch (Digital Input 2), the encoder marker, or both (if looking for both, it looks for the home switch first and then the marker). After it sees the specified event(s), it decelerates the motor to a stop. At this point, it defines a reference point which is a distance away from these event(s) - this distance is specified by Reference Offset 1. It then changes the actual position of this point to be the Reference Distance 1, and adjusts the command and actual positions of the motor relative to this new position. Once that is done, it sets the Position Feedback Value Status and also the Procedure Done flag.

During this procedure, the drive ignores any position command values received either cyclically or via the service channel. before cancelling the homing procedure command, the master must read the command position value (IDN S0047) from the drive and use that as its position command. Otherwise, the motor will jump to the position being commanded.

If the home switch is active when the procedure command is started, and the home switch is enabled and Home Switch Sensor Backoff is selected, the motor will turn in the opposite direction until the home switch goes inactive, ramp down to a stop, reverse direction, and start the homing cycle as usual.

If both the home switch and encoder marker are selected, the distance between these two events is stored in the Home Index Distance parameter.

IDNs	Description
S0041	Homing velocity
S0042	Homing acceleration
S0052	Reference distance 1
S0147	Homing parameter
S0148	Drive-controlled homing procedure command
S0150	Reference offset 1
S0400 (RTS/AT)	Home switch
S0403 (RTS/AT)	Position feedback value status
P0001	Extended homing parameter
P0136 (AT)	Home Index Distance

Probe Cycle procedure

During the Probe Cycle procedure, Probe 1 (Digital Input 2) and Probe 2 (Digital Input 1) are used to capture the motor and auxiliary encoder positions, respectively. The encoder marker inputs (one per encoder) can also be used to capture the position of their respective encoders.

To perform a probe cycle, the master first sets up the probe control parameter (S0169), or the extended probe control parameter (IDN P0004). With these, the master can select which edge of the probe input to use to capture position (rising, falling, both, or none) and whether to latch the marker position as well. If capturing both edges of the probe input, the master can select which edge to capture first (rising or falling). If one edge of the probe input is selected and the marker position is selected, the probe input will be captured first and then the first marker position following the probe input will be captured. (There must be at least 2 ms between the probe input and the marker, or else the first marker position may be missed and the second one captured instead. This could be detected as the distance between the probe input and the marker position would be more than one revolution apart.) If both edges and the marker are selected, the two probe input positions would be captured first and then the marker position would be captured (the same 2 ms limitation applies). If no edges are selected but the marker is selected, the first marker position would be captured.

Once the probe control parameter is set up, the Probe Cycle procedure (IDN S0170) is activated in the normal SERCOS manner. The master then starts the position captures by enabling the probes (IDN S0405 for probe 1 and IDN S0406 for probe 2). Even if only the marker position is being captured (i.e., the probe input is not being used), the probe must be enabled to start the capture. The various status IDNs (S0179, S0409 - S0412, P0005, P0008, P0009) can be monitored to see when the various position captures have occurred. When a position capture occurs, the associated IDN (S0130 - S0133, P0006, P0007) is updated with the new position. Only one “set” of captures occurs while the probe is enabled. To capture a new set of positions, the master can change the probe control parameter bits associated with that probe to capture different information. The probe must be disabled at least 2 ms before being re-enabled.

If at least one edge of the probe input is enabled, along with the marker position, the difference between the probe position (or the second edge if both edges are selected) and the marker position is stored in the Probe x Index Position Offset IDN (P0117 for probe 1 and P0118 for probe 2).

IDNs	Description
S0130 (AT)	Probe value 1 positive edge
S0131 (AT)	Probe value 1 negative edge
S0132 (AT)	Probe value 2 positive edge
S0133 (AT)	Probe value 2 negative edge
S0169	Probe control parameter
S0170	Probing cycle procedure command
S0179 (AT)	Probe status
S0401 (RTS/AT)	Probe 1
S0402 (RTS/AT)	Probe 2
S0405 (RTC/MDT)	Probe 1 enable
S0406 (RTC/MDT)	Probe 2 enable
S0409 (RTS/AT)	Probe 1 positive latched
S0410 (RTS/AT)	Probe 1 negative latched
S0411 (RTS/AT)	Probe 2 positive latched
S0412 (RTS/AT)	Probe 2 negative latched
P0004	Extended probe control parameter
P0005 (AT)	Extended probe status
P0006 (AT)	Probe value 1 index position
P0007 (AT)	Probe value 2 index position
P0008 (RTS)	Probe 1 index latched
P0009 (RTS)	Probe 2 index latched
P0117 (AT)	Probe 1 index position offset
P0118 (AT)	Probe 2 index position offset

Reset Peaks Procedure

The drive internally keeps track of the peak (largest) positive and negative position errors and current commands, which can be read from their associated IDNs (P0094 - P0097). These peak values can be reset by activating the Reset Peaks procedure (IDN P0098). This procedure sets both the positive and negative peak position error values to the present position error, and both the positive and negative peak current command values to the present position error, and both the positive and negative peak current command values to the present current command.

IDNs	Description
P0095 (AT)	Homing velocity
P0095 (AT)	Homing acceleration
P0096 (AT)	Reference distance 1
P0097 (AT)	Homing parameter
P0098	Drive-controlled homing procedure command

NVRAM Procedures

The drive stores many of its parameters in on-board non-volatile memory (NVRAM), and uses a copy in volatile RAM as its working value. The list of these values can be found in IDN S0192, IDN-list of backup operation data. Upon power-up, the drive copies the values from the NVRAM and stores them in the working RAM copy. If the RAM value is modified, its value is lost when power is lost (or the drive is reset by IDN P0119) unless it is also saved in NVRAM as well.

There are several methods for storing values in NVRAM. One method is to use IDN S0269, Storage Mode. When this is 0, writing a value to an IDN writes the value to both the working RAM copy and also the NVRAM (for those IDNs listed in S0192), and when it is one, the writes only affect the working RAM copy. There are a couple of caveats to be aware of when using this method for saving values. First, writes to NVRAM take several milliseconds, and during this time, any other service channel transfers to the drive are blocked, so it will slow down data transfer. Second, the NVRAM has a limited number of write cycles (the drive only writes the data to the NVRAM if it is different than what is already there, to eliminate unnecessary writes), so this method should not be used for values that change frequently. The default value for IDN S0269 is one, which does not write data to NVRAM.

NOTE: Regardless of the state of IDN S0192, values written cyclically do not get written to the NVRAM. Only values written via the service channel are affected by IDN S0192.

Another method is to use the Backup Working Memory procedure command (IDN S0264), which copies all values from the working RAM to the NVRAM for those IDNs listed in IDN S0192.

A third method is to use the Selectively Backup Working Memory procedure command (IDN S0293), which copies user- selected values from the working RAM to the NVRAM. To do this, the list of IDNs to backup must be written to IDN S0270, Selected IDN List of Operation Data to Backup, and then the procedure can be started in the normal SERCOS manner. Any IDNs written to S0270 that are not listed in IDN S0192 are ignored. When all the specified values are written, the procedure status will change to “complete”.

The working RAM can be re-initialized to the values in NVRAM with the Load Working Memory procedure (IDN S0263), and the NVRAM can be re-initialized to the factory default values with the Load Defaults procedure (S0262), which also initialize the working RAM to these values. These two procedures can only be executed when the drive is disabled.

IDNs	Description
S0192	IDN-list of backup operation data
S0262	Load defaults procedure command
S0263	Load working memory procedure command
S0264	Backup working memory procedure command
S0269	Storage mode
S0270	Selected IDN list of operation data to backup
S0293	Selectively backup working memory procedure command

Status Information

Various status information can be obtained with these IDNs. Some of them set up parameters for the status information, such as defining windows and times. The other IDNs return the status information, such as the current value or state of the information, whether they are within the defined windows and times, etc.

Many of these IDNs are related to the CxD and manufacturer-CxD bits (see “Diagnostic parameters”, above). Some return the states of individual bits, while others define the conditions under which these bits go active or inactive.

IDNs	Description
S0057	Position window
S0091	Bipolar velocity limit value
S0124	Standstill window
S0125	Velocity threshold n_x
S0157	Velocity window
S0189 **(AT)**	Following distance
S0330 **(RTS)**	Status ‘$n_{feedback} = n_{command}$’
S0331 **(RTS)**	Status ‘$n_{feedback} =0$’
S0332 **(RTS)**	Status ‘$n_{feedback} < n_x$’
S0333 **(RTS)**	Status ‘$T = T_{limit}$’
S0334 **(RTS)**	Status ‘$n_{feedback} = n_{command}$’
S0335 **(RTS)**	Status ‘$n_{command} < n_{command}$’
S0336 **(RTS)**	Status ‘In position’
S0347 **(AT)**	Velocity error
S0380 **(AT)**	DC bus voltage
P0087	Position window time
P0088	Position error time
P0089	Velocity error limit
P0090	Velocity error time
P0091	Overspeed limit
P0092 **(AT)**	Current command
P0093 **(AT)**	Average current command
P0099 **(AT)**	Field current
P0100 **(AT)**	Torque current
P0101 **(AT)**	R-phase current

P0102 **(AT)**	T-phase current
P0103 **(AT)**	Field voltage command
P0104 **(AT)**	Torque voltage command
P0105	Motor thermal filter
P0106 **(AT)**	Average field current
P0107	Run state
P0108	Fault status
P0110 **(AT)**	Output flags
P0120 **(RTS)**	Forward enabled
P0121 **(RTS)**	Reverse enabled
P0122 **(RTS)**	In forward current limit
P0123 **(RTS)**	In reverse current limit
P0124 **(RTS)**	In position
P0125 **(RTS)**	Brake active (see P0131)
P0126 **(RTS)**	DC bus charged

Cyclic Data

These IDNs are used to select which IDNs to transfer cyclically in the MDT and the AT when telegram type 7 is selected in IDN S0015. The IDNs in this document with **(MDT)** can be used in the MDT, and the ones with **(AT)** can be used in the AT. Up to 32 bytes of data may be transmitted cyclically, and up to 32 bytes may be received cyclically. The real limit, however, may be lower based on the processor time available. Some factors which affect this limit are the SERCOS communication cycle time, the type of data that is being transferred, the scaling of the data being transferred, the use of real-time control and status bits, and other functions of the drive that consume processor time (e.g., the analog output monitors use quite a bit of time if they are used to monitor internal drive signals - the default if for them not to do this (see IDN P0048, Analog Output Override).

The drive tries to monitor how much time is used, and if it is too much, it will set bit 12 of IDN 129, Manufacturer Class 1 Diagnostic, which causes the loops to open. If the drive runs out of time before it has a chance to detect this, it will result in a drive fault of E56 or E13 - 05, which require that the drive be reset to recover.

In addition, even if there is adequate time for the cyclic data, there is a finite amount of time available for cyclic data and service channel communications. The cyclic data has priority over the service channel, so if the cyclic data is occupying a large quantity of time, the service channel performance will degrade. The user should verify that with the desired amount of cyclic data being transferred, the service channel performance is adequate for their application.

IDNs	Description
S0015	Telegram type parameter
S0016	Configuration list of AT
S0024	Configuration list of MDT
S0185	Length of the configurable data in the AT
S0186	Length of the configurable data in the MDT
S0187	IDN list of configurable data in the AT
S0188	IDN list of configurable data in the MDT

Real-Time Bits

These IDNs are used to select which IDNs to use for the real-time bits in the Master Control Word and the Drive Status Word. the IDNs in this document with **(RTS)** can be used as real-time status bits and the ones with **(RTC)** can be used as real-time control bits.

IDNs	Description
S0301	Allocation of real-time control bit 1
S0303	Allocation of real-time control bit 2
S0305	Allocation of real-time status bit 1
S0307	Allocation of real-time status bit 2

Other

IDNs	Description
S0092	Bipolar torque limit value
S0206	Drive on delay time
S0207	Drive off delay time
P0127 (MDT)	Positive current limit
P0128 (MDT)	Negative current limit
P0129	Fault current limit
P0137	SERCOS baud select

CHAPTER 2 IDNs

Introduction

This chapter defines the IDN set that is available for use with your SERCOS system. The format used to define the IDNs is shown below:

IDN (Identification Number)	***Descriptive Name***							
	A short description of the purpose of the IDN.							
	Name:	*"Abbreviated Name"*	***Attr:*** *0x00000000 (The attribute defining the scaling, data length, how to display it, etc.)*			*(Display format of attribute)*		
	Units:	*"IDN units"*	***Phase 2:***	*Read or Write*	***Phase 3:***	*Read or Write*	***Phase 4:***	*Read or Write*
	Min:	*minimum value*	***Value:***	*IDN value*				
	Max:	*maximum value*						
Notes:	*Additional information*							
See Also:	*Related IDNs (If you are viewing this document on a PC, you may click on any IDN listed here and go directly to its definition.)*							

Not all the fields will apply to all IDNs.

IDN Set

S0001	**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 sent it--the master could send the same value several times). This value must be an integer multiple of the communication cycle time (t_{Ncyc} - IDN S0002). It must be sent from the master to the slave during Phase 2.					
	Name:	"Tncyc"	**Attr:** 0x00110001			(16-bit unsigned decimal)
	Units:	"µs"	**Phase 2:**	RW	**Phase 3:** RO	**Phase 4:** RO
	Min:	1,000	**Value:**	(Written by master)		
	Max:	65,500				
Notes:						
See Also:	See "S0002""Communication cycle time (t Scyc)" on page 2-1.					

S0002	**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, 250 µs, up to 65,500 µs in steps of 250 µs. This value must be sent during Phas 2.					
	Name:	"Tscyc"	**Attr:** 0x00110001			(16-bit unsigned decimal)
	Units:	"µs"	**Phase 2:**	RW	**Phase 3:** RO	**Phase 4:** RO
	Min:	1,000	**Value:**	(Written by master)		
	Max:	65,500				
Notes:	This value is currently limited to 1 ms or greater. It can handle non-integer multiples of 1 ms (i.e., Granularity 2 or 3), such as 1.5 ms.					
See Also:	See "S0001""Control unit cycle time (t Ncyc)" on page 2-1.					

S0003	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: "T1min"	**Attr:** 0x00110001			(16-bit unsigned decimal)
	Units: "µs"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO	
	Min: 0	**Value:** 20			
	Max: 65,535				
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. Elements 5 and 6 are supported because the IAM master software tries to read all the elements from this IDN and if there are any errors reading them (i.e., they are not supported), it thinks there is an error on the ring and does not continue.				
See Also:	See "S0006""AT transmission starting time (t 1)" on page 2-3.				

S0004	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: "Tatmt"	**Attr:** 0x00110001			(16-bit unsigned decimal)
	Units: "µs"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO	
	Min: Not supported	**Value:** 10			
	Max: Not supported				
Notes:	According to the IAM slave software, the SERCON minimum is 2 µs and use the value of 10.				
See Also:					

S0005	Minimum feedback processing time (t_5)				
	This is the minimum time required by the slave from 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: "T5"	**Attr:** 0x00110001			(16-bit unsigned decimal)
	Units: "µs"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO	
	Min: Not supported	**Value:** 200 (this may need to change)			
	Max: Not supported				
Notes:	On the Centurion DSM100 SERCOS drive, the feedback value is being latched based on an interrupt from the SERCON chip and then processing it (i.e., scale it and load into the SERCON chip) on the next 200 µs timer interrupt. Therefore, it could take up to 200 µs to get the timer interrupt and then however long it takes to scale the value and load it into the SERCON dhip.				
See Also:	See "S0007""Feedback acquisition capture point (t 4)" on page 2-3.				

S0006	AT transmission starting time (t_1)				
	This value specifies when the slave should send its AT during Phases 3 and 4. It is sent by the master during Phase 2.				
	Name:	"T1"	**Attr:** 0x00110001		(16-bit unsigned decimal)
	Units:	"µs"	**Phase 2:** RW	**Phase 3:** RO	**Phase 4:** RO
	Min:	20	**Value:**	(Written by master)	
	Max:	IDN S0002 Value			
Notes:					
See Also:	See "S0003""Shortest AT transmission starting time (t 1min)" on page 2-2.				

S0007	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:	"T4"	**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 S0002 Value			
Notes:					
See Also:	See "S0005""Minimum feedback processing time (t 5)" on page 2-2.				

S0008	Command value valid time (t_3)				
	This specifies at what time the slave can access the new command values. This could be used to syncronize multiple drives. The master sends this value during Phase 2.				
	Name:	"T3"	**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 S0002 Value			
Notes:					
See Also:	See "S0090""Command value proceeding time (tMTSG)" on page 2-21.				

S0009	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:	"Pos in MDT"	**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			
Notes:					
See Also:	See "S0010""Length of MDT" on page 2-4.				

S0010	Length of MDT					
	This specifies the overall length of the MDT, in bytes. It is sent by the master during Phase 2.					
	Name:	"Length of MDT"	**Attr:** 0x00110001			(16-bit unsigned decimal)
	Units:	Not supported	**Phase 2:**	RW	**Phase 3:** RO	**Phase 4:** RO
	Min:	4	**Value:**	(Written by master)		
	Max:	65,534				
Notes:						
See Also:	See "S0009""Position of data record in MDT" on page 2-3.					

S0011	Class 1 diagnostic					
	Drive shutdown error flags.					
	Name:	"C1D"	**Attr:** 0x00010001			(16-bit binary)
	Units:	Not supported	**Phase 2:**	RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:**	Class 1 diagnostics: (1 = active, 0 = inactive_		
			Bit 0:	Not used		
			Bit 1:	IPM fault (overtemp/overcurrent/short circuit)		
			Bit 2:	Motor overtemp shutdown (Motor thermostat open)		
			Bit 3-4:	Not used		
			Bit 5:	Feedback error		
			Bit 6:	Commutation error		
			Bit 7:	Not used		
			Bit 8:	Overvoltage error		
			Bit 9:	Undervoltage error		
			Bit 10:	Not used		
			Bit 11:	Excessive position deviation		
			Bit 12:	Communication error		
			Bit 13-14:	Not used		
			Bit 15:	Manufacturer-specific error		
	Max:	Not supported				
Notes:	A bit is '1' when the associated error is active.					
See Also:	See "S0012""Class 2 diagnostic" on page 2-5. See "S0013""Class 3 diagnostic" on page 2-5. See "S0099""Reset class 1 diagnostic" on page 2-24. See "S0129""Manufacturing class 1 diagnostic" on page 2-26.					

S0012	Class 2 diagnostic				
	Drive shutdown warning flags.				
	Name:	"C2D"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:**	Class 2 diagnostics: (1 = active, 0 = inactive_	
			Bit 0-14:	Not used	
			Bit 15:	Manufacturer-specific warning	
	Max:	Not supported			
Notes:	A bit is '1' when the associated error is active.				
See Also:	See "S0011""Class 1 diagnostic" on page 2-4. See "S0013""Class 3 diagnostic" on page 2-5. See "S0097""Mask class 2 diagnostic" on page 2-24. See "S0181""Manufacturer class 2 diagnostic" on page 2-36.				

S0013	Class 3 diagnostic				
	Drive operation status flags.				
	Name:	"C3D"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:**	Class 3 diagnostics: (1 = active, 0 = inactive_	
			Bit 0:	In speed window (IDN S0330)	
			Bit 1:	At zero speed (IDN S0331)	
			Bit 2:	Below speed (IDN S0332)	
			Bit 3:	Not used	
			Bit 4:	T = T limit (IDN S0334)	
			Bit 5:	Vel command below vel limit (IDN S0335)	
			Bit 6:	In position window (IDN S0336)	
			Bit 7-14:	Not used	
			Bit 15:	Manufacturer-specific operation status (IDN S0182)	
	Max:	Not supported			
Notes:	A bit is '1' when the associated error is active.				
See Also:	See "S0011""Class 1 diagnostic" on page 2-4. See "S0012""Class 2 diagnostic" on page 2-5. See "S0098""Mask class 3 diagnostic" on page 2-24. See "S0182""Manufacturer class 3 diagnostic" on page 2-36.				

S0014	Interface status				
	If a communication error is flagged in C1D (IDN S0011), this IDN contains the specific communication flags.				
	Name:	"Interface status"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:** TBD		
	Max:	Not supported			
Notes:	For bits 3-15, a bit is '1'when associated error is active.				
See Also:	See "S0011""Class 1 diagnostic" on page 2-4. See "S0099""Reset class 1 diagnostic" on page 2-24.				

S0015	Telegram type parameter				
	This specifies which telegram type to use. See section 8.3 in the SERCOS specification for descriptions of each of the telegram types. It is sent by the master.				
	Name:	"Telegram type"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:** (Written by master)		
	Max:	Not supported			
Notes:	All telegrams including custom telegrams are supported.				
See Also:	See "S0016""Configuration list of AT" on page 2-6. See "S0024""Configuration list of MDT" on page 2-8.				

S0016	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 S0187) can be used here. The amount of data that can be transmitted cyclically is limited, and defined by "Length of the Configurable Data in the AT (IDN S0185).				
	Name:	"Conf of AT"	**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:	See "S0185""Length of the configurable data in the AT" on page 2-37. See "S0187""IDN List of configurabe data in the AT" on page 2-37.				

S0017	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:	"All 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 all supported data IDNs)	
	Max:	Not supported			
Notes:	This is a list of all operation data IDNs. The IAM slave software also inclues all the procedure IDNs as well.				
See Also:	See "S0025""IDN-list of procedure commands" on page 2-9.				

S0018	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:	"Op data for 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 IDNs)	
	Max:	Not supported			
Notes:					
See Also:	See "S0019""IDN-list of all operation data for CP3" on page 2-7. See "S0021""IDN-list of invalid operation data for CP2" on page 2-8. See "S0127""Communication phase 3 transition check" on page 2-25.				

S0019	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 3.				
	Name:	"Op data for 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 IDNs)	
	Max:	Not supported			
Notes:					
See Also:	See "S0018""IDN-list of all operation data for CP2" on page 2-7. See "S0022""IDN-list of invalid operation data for CP3" on page 2-8. See "S0128""Communication phase 4 transition check" on page 2-26.				

S0021	IDN-list of invalid operation data for CP_2				
	After the Phase 3 Transition Check procedure (IDN S0127) has been executed, this IDN contains a list of all the IDNs that have invalid values, if any.				
	Name:	"Invalid data of 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 IDNs {built during CP_3 Transition Check})	
	Max:	Not supported			
Notes:					
See Also:	See "S0018""IDN-list of all operation data for CP2" on page 2-7. See "S0127""Communication phase 3 transition check" on page 2-25.				

S0022	IDN-list of invalid operation data for CP_3				
	After the Phase 4 Transition Check procedure (IDN S0128) has been executed, this IDN contains a list of all the IDNs that have invalid values, if any.				
	Name:	"Invalid data of 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 IDNs {built during CP_4 Transition Check})	
	Max:	Not supported			
Notes:					
See Also:	See "S0019""IDN-list of all operation data for CP3" on page 2-7. See "S0128""Communication phase 4 transition check" on page 2-26.				

S0024	Configuration list of MDT				
	This IDN contains a list of IDNs whos data will be transmitted cyclically in the MDT. Only IDNs present in the "IDN Configurable Data in the MDT" (IDN S0188) can be used here. The amount of data that can be transmitted cyclically is limited, and defined by "Length of the Configurable Data Record in the MDT" (IDN S0186).				
	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 the master)	
	Max:	Not supported			
Notes:					
See Also:	See "S0186""Length of the configurable data in the MDT" on page 2-37. See "S0188""IDN List of configurabe data in the MDT" on page 2-38.				

S0025	IDN-list of procedure commands				
	This is a list of all the IDNs supported by the slave. The master can read this at any time.				
	Name:	"All proc cmds"	**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:	See "S0017""IDN-list of all operation data" on page 2-7.				

S0028	MST error counter				
	This IDN is the count of all invalid MST's in Phases 3 and 4.				
	Name:	"MST error cntr"	**Attr:** 0x00110001		(16-bit unsigned decimal)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:** (Number of errors)		
	Max:	Not supported			
Notes:					
See Also:	See "S0029""MDT error counter" on page 2-9.				

S0029	MDT error counter				
	This IDN is the count of all invalid MDT's in Phases 3 and 4.				
	Name:	"MDT error cntr"	**Attr:** 0x00110001		(16-bit unsigned decimal)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:** (Number of errors)		
	Max:	Not supported			
Notes:					
See Also:	See "S0028""MST error counter" on page 2-9.				

S0030	Manufacturer version					
	This is the version of the main firmware and the boot firmware in the drive. The same information is returned by IDNs P0012 and P0013, but in a hex format rather than ASCII.					
	Name:	"Manufacturer version"	**Attr:** 0x00440001			(Variable-length text array)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO	
	Min:	Not supported	**Value:**	Text string of the form: "Main = MM.mm, Boot = BB.bb", where MM and BB are the major versions and mm and bb are the minor versions.		
	Max:	Not supported				
Notes:						
See Also:	See "P0012""Main version" on page 2-58. See "P0013""Boot version" on page 2-58. See "P0014""BCM revision" on page 2-58. See "P0015""PAM revision" on page 2-58. See "P0016""Final revision" on page 2-59.					

S0032	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. See the description of IDN S0032 in the SERCOS specification for a description of the bits for this IDN.					
	Name:	"Pri.op mode"	**Attr:** 0x00010001			(16-bit binary)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RO	
	Min:	Not supported	**Value:**	(Written by master)		
	Max:	Not supported				
Notes:	For IDNs S0032 - S0035, the modes supported include position control using motor feedback, velocity control, and torque control. Cyclic command values for all of these modes and service channel commands for velocity mode and torque mode are supported. For position mode, bit 3 enables or disables the position loop's feed forward term.					
See Also:	See "S0033""Secondary operation mode 1" on page 2-11. See "S0034""Secondary operation mode 2" on page 2-11. See "S0035""Secondary operation mode 3" on page 2-11.					

S0033	Secondary operation mode 1					
	Defines the secondary operating mode 1 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. See the description of IDN S0032 in the SERCOS specification for a description of the bits for this IDN.					
	Name:	"Sec.op mode"	**Attr:** 0x00010001			(16-bit binary)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RO	
	Min:	Not supported	**Value:** (Written by master)			
	Max:	Not supported				
Notes:	(See note for IDN S0032 - Primary operation mode)					
See Also:	See "S0032""Primary operation mode" on page 2-10. See "S0034""Secondary operation mode 2" on page 2-11. See "S0035""Secondary operation mode 3" on page 2-11.					

S0034	Secondary operation mode 2					
	Defines the secondary operating mode 2 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. See the description of IDN S0032 in the SERCOS specification for a description of the bits for this IDN.					
	Name:	"Sec.op mode 2"	**Attr:** 0x00010001			(16-bit binary)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RO	
	Min:	Not supported	**Value:** (Written by master)			
	Max:	Not supported				
Notes:	(See note for IDN S0032 - Primary operation mode)					
See Also:	See "S0032""Primary operation mode" on page 2-10. See "S0033""Secondary operation mode 1" on page 2-11. See "S0035""Secondary operation mode 3" on page 2-11.					

S0035	Secondary operation mode 3					
	Defines the secondary operating mode 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. See the description of IDN S0032 in the SERCOS specification for a description of the bits for this IDN.					
	Name:	"Sec.op mode 3"	**Attr:** 0x00010001			(16-bit binary)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RO	
	Min:	Not supported	**Value:** (Written by master)			
	Max:	Not supported				
Notes:	(See note for IDN S0032 - Primary operation mode)					
See Also:	See "S0032""Primary operation mode" on page 2-10. See "S0033""Secondary operation mode 1" on page 2-11. See "S0034""Secondary operation mode 2" on page 2-11.					

S0036	Velocity command value						
	This is the command velocity value from the master. The scaling for this value is selected by IDN S0044.						
	Name:	"Vel cmd"	**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:	Velocity min	**Value:**	(Written by master)			
	Max:	Velocity max					
Notes:	Element 6 limits the velocity command to the motor's maximum velocity.						
See Also:	See "S0044""Velocity data scaling type" on page 2-14.						

S0040	Velocity feedback value						
	This is the actual velocity of the motor. The scaling for this value is selected by IDN S0044.						
	Name:	"Vel fdbk"	**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:	Not supported	**Value:**	(Velocity value)			
	Max:	Not supported					
Notes:							
See Also:	See "S0044""Velocity data scaling type" on page 2-14.						

S0041	Homing velocity						
	Velocity used during "Drive Controlled Homing Procedure (IDN S0148). This is a positive-only value, with the direction of rotation defined by IDN S0147 (Homing parameter).						
	Name:	"Homing vel"	**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:	(Velocity max)					
Notes:	(See note for IDN S0036 - Velocity command value). Read/write at all time (except when Drive contolled homing procedure command is active).						
See Also:	See "S0042""Homing acceleration" on page 2-13. See "S0044""Velocity data scaling type" on page 2-14. See "S0147""Homing parameter" on page 2-30. See "S0148""Drive-controlled homing procedure command" on page 2-31.						

S0042	Homing acceleration				
	Acceleration used during “Drive Controlled Homing Procedure (IDN S0148).				
	Name:	“Homing acc”	**Attr:** 0x0X22XXXX		(32-bit signed decimal, C.F. changes based on scaling)
	Units:	(Accel. units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	0	**Value:**	(Written by master)	
	Max:	(Accel. max)			
Notes:	Read/write at all time (except when Drive controlled homing procedure command is active).				
See Also:	See "S0041"“Homing velocity” on page 2-12. See "S0138"“Bipolar acceleration limit value” on page 2-29. See "S0147"“Homing parameter” on page 2-30. See "S0148"“Drive-controlled homing procedure command” on page 2-31. See "S0160"“Acceleration data scaling type” on page 2-33.				

S0043	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:	Not supported	**Value:**	Velocity parameter: Bit 0: Velocity command value 0 - non-inverted, 1 - inverted Bit 1: (Reserved) Bit 2: Velocity feedback value 0 - non-inverted, 1 - inverted All other bits are reserved.	
	Max:	Not supported			
Notes:	RO when drive is enabled.				
See Also:	See "S0044"“Velocity data scaling type” on page 2-14.				

S0044	Velocity data scaling type					
	This selects the scaling method to use on velocity values (e.g., IDN's S0036, S0040, and S0041).					
	Name:	"Vel scaling type"	**Attr:** 0x00010001			(16-bit binary)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW	
	Min:	Not supported	**Value:**	Scaling type:		
			Bit 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:	0 - revolutions; 1 - (reserved)		
			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.		
	Max:	Not supported				
Notes:	RO when drive is enabled. IDNs S0045 and S0046 should have valid values before IDN S0044 is written. Preferred scaling is 1x10-4 RPM if bit 5 is cleared or 1x10-6 RPS if bit 5 is set. No scaling is (1000/65536) encoder counts/second.					
See Also:	See "S0045""Velocity data scaling factor" on page 2-14. See "S0046""Velocity data scaling exponent" on page 2-15. See "S0076""Position data scaling type" on page 2-18. See "S0160""Acceleration data scaling type" on page 2-33.					

S0045	Velocity data scaling factor					
	This defines the scaling factor for all velocity data.					
	Name:	"Vel.scaling factor"	**Attr:** 0x00110001			(16-bit unsigned binary)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW	
	Min:	1	**Value:**	(Written by master)		
	Max:	65,535				
Notes:	RO when drive is enabled.					
See Also:	See "S0044""Velocity data scaling type" on page 2-14. See "S0046""Velocity data scaling exponent" on page 2-15.					

S0046	Velocity data scaling exponent				
	This defines the scaling exponent for all velocity data.				
	Name:	"Vel.scaling exponent"	**Attr:** 0x00210001		(16-bit signed decimal)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	-15	**Value:**	(Written by master)	
	Max:	0			
Notes:	RO when drive is enabled.				
See Also:	See "S0044""Velocity data scaling type" on page 2-14. See "S0045""Velocity data scaling factor" on page 2-14.				

S0047	Position command value				
	This is the command position value from the master. The scaling for this value is selected by IDN S0076.				
	Name:	"Pos cmd"	**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:	(Position min)	**Value:**	(Written by master)	
	Max:	(Position max)			
Notes:					
See Also:	See "S0051""Position feedback value 1" on page 2-15. See "S0055""Position polarity parameter" on page 2-17. See "S0076""Position data scaling type" on page 2-18.				

S0051	Position feedback value 1				
	This is the actual position value of the motor encoder. The scaling for this value is selected by IDN S0076.				
	Name:	"Pos fdbk 1"	**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:**	(Motor encoder position)	
	Max:	Not supported			
Notes:					
See Also:	See "S0040""Velocity feedback value" on page 2-12. See "S0047""Position command value" on page 2-15. See "S0053""Position feedback value 2" on page 2-16. See "S0076""Position data scaling type" on page 2-18.				

S0052	Reference distance 1				
	The master used this value to specify the distance between the Reference point and the Machine zero point. It is used (along with the Reference Offset, IDN S0151) by the drive during the Drive Controlled Homing Procedure (IDN S0148) 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:	(Position min)	**Value:**	(Written by master)	
	Max:	(Position max)			
Notes:	RW at all time (except when Drive controlled homing procedure command is active).				
See Also:	See "S0076""Position data scaling type" on page 2-18. See "S0147""Homing parameter" on page 2-30. See "S0148""Drive-controlled homing procedure command" on page 2-31. See "S0150""Reference offset 1" on page 2-31.				

S0053	Position feedback value 2				
	This is the actual position value of the auxiliary encoder. The scaling for this value is selected by IDN S0076.				
	Name:	"Pos fdbk 2"	**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:**	(aux encoder position)	
	Max:	Not supported			
Notes:					
See Also:	See "S0051""Position feedback value 1" on page 2-15. See "S0076""Position data scaling type" on page 2-18.				

S0055	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. To cause CCW to be positive, a value of 2#101 should be sent.				
	Name:	"Pos polarity"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	Not supported	**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	
				All other bits are reserved.	
	Max:	Not supported.			
Notes:	RO when the drive is enabled. This does not affect IDN S0147 - Reference Direction				
See Also:	See "S0076""Position data scaling type" on page 2-18.				

S0057	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 S0013) is set.				
	Name:	"Pos window"	**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:	(16-bit Position max)			
Notes:	This value is stored internally as a 16-bit value in units of encoder counts. The maximum value will be such that, with the current scaling, the value translated to encoder counts will be less than 32,767.				
See Also:	See "S0013""Class 3 diagnostic" on page 2-5. See "S0047""Position command value" on page 2-15. See "S0051""Position feedback value 1" on page 2-15. See "S0076""Position data scaling type" on page 2-18.				

S0076	Position data scaling type				
	This selects the scaling method to use on position values (e.g., IDN's 00047, 00051, and 00053).				
	Name:	"Pos scaling type"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	Not supported	**Value:** Scaling type: Bit 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 (must be 0) 0 - degrees; 1 - (reserved) Bit 5: (reserved) Bit 6: Data reference (must be 0) 0 - at the motor shaft; 1 - at the load (not implemented) Bit 7: Processing format (must be 0) 0 - absolute format; 1 - modulo format (not implemented) All other bits are reserved.		
	Max:	Not supported			
Notes:	RO when the drive is enabled. IDN S0079 should have a valid value before IDN S0076 is written. Preferred scaling is 0.001°. No scaling is one encoder count.				
See Also:	See "S0044""Velocity data scaling type" on page 2-14. See "S0055""Position polarity parameter" on page 2-17. See "S0079""Rotational position resolution" on page 2-18. See "S0160""Acceleration data scaling type" on page 2-33.				

S0079	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 S0079)				
	Name:	"Rotational pos res"	**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:	2,147,483,647			
Notes:	RO when the drive is enabled.				
See Also:	See "S0076""Position data scaling type" on page 2-18.				

S0080	Torque command value					
	This is the command value when operating in torque mode.					
	Name:	"Trq cmd"	**Attr:** 0x0X21XXXX			(16-bit signed decimal, C.F. changes based on scaling)
	Units:	Not supported	**Phase 2:**	RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	1	**Value:**	(Written by master)		
	Max:	2,147,483,647				
Notes:						
See Also:	See "S0085""Torque polarity parameter" on page 2-19. See "S0086""Torque data scaling type" on page 2-20. See "S0093""Torque data scaling factor" on page 2-22. See "S0094""Torque data scaling exponent" on page 2-23.					

S0085	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:	"Pos polarity"	**Attr:** 0x00010001			(16-bit binary)
	Units:	Not supported	**Phase 2:**	RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	Not supported	**Value:**	Torque parameter: Bit 0: Bit 1: Bit 2:	Torque command value 0 - non-inverted, 1 - inverted (Reserved) Torque feedback value 0 - non-inverted, 1 - inverted All other bits are reserved.	
	Max:	Not supported				
Notes:	RO when the drive is enabled.					
See Also:	See "S0086""Torque data scaling type" on page 2-20.					

S0086	Torque data scaling type				
	This selects the scaling method to use on torque values (e.g., IDN's 00080 and 00092).				
	Name: "Trq scaling type"	**Attr:** 0x00010001			(16-bit binary)
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW	
	Min: Not supported	**Value:** Scaling type: Bit 2-0: **Scaling method** 000 - no scaling 001 - linear scaling (not supported) 010 - rotational scaling (torque) Bit 3: 0 - preferred scaling 1 - parameter scaling Bit 4: **Units (must be 0)** 0 - Newton meter (Nm) 1 - inch pound force (lbf) Bit 5: **(Reserved)** Bit 6: **Data reference (must be 0)** 0 - at the motor shaft 1 - at the load (not implemented) **All other bits are reserved**.			
	Max: Not supported				
Notes:	RO when the drive is enabled. IDN S0093 and S0094 should have valid values before IDN S0086 is written. Preferred scaling is 0.01 Nm or 0.1 inlbf, dpending on the units selected. Percentage scaling is 0.1% of the continuous stall torque of the motor. The accuracy of the torque values is dependent on the accuracy of the motor Kt value (IDN P0073).				
See Also:	See "S0085""Torque polarity parameter" on page 2-19. See "S0093""Torque data scaling factor" on page 2-22. See "S0094""Torque data scaling exponent" on page 2-23. See "P0072""Motor maximum continuous current" on page 2-76. See "P0073""Motor Kt" on page 2-76.				

S0087	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: "Tatmt"	**Attr:** 0x00110001			(16-bit unsigned decimal)
	Units: "µs"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO	
	Min: Not supported	**Value:** 10			
	Max: Not supported				
Notes:					
See Also:					

S0088	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: "Tmtsy"	**Attr:** 0x00110001			(16-bit unsigned decimal)
	Units: "µs"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO	
	Min: Not supported	**Value:** 10			
	Max: Not supported				
Notes:	According to the IAM slave software, the SERCON minimum is 2 µs and they use the value of 10.				
See Also:					

S0089	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: "T2"	**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 S0002 Value)				
Notes:					
See Also:					

S0090	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 S0008)				
	Name: "Tmtsg"	**Attr:** 0x00110001			(16-bit unsigned decimal)
	Units: "µs"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO	
	Min: Not supported	**Value:** 100			
	Max: Not supported				
Notes:					
See Also:	See "S0008""Command value valid time (t 3)" on page 2-3.				

S0091	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 S0013) is set.				
	Name:	"Bipolar 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:**	(Written by master)	
	Max:	(Velocity max)			
Notes:	The motor's velocity is not limited to this value. This value just specifies when the C3D bit should be set.				
See Also:	See "S0013""Class 3 diagnostic" on page 2-5. See "S0335""Status 'ncommand > nlimit'" on page 2-44.				

S0092	Bipolar torque limit value				
	Sets the torque limit symmetrically in both directions. When the actual torque exceeds this value, bit 4 in C3D (IDN S0013) is set.				
	Name:	"Bipolar trq limit"	**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:	(Torque max)			
Notes:	The motor's torque is not limited to this value. This value just specifies when the C3D bit should be set.				
See Also:	See "S0013""Class 3 diagnostic" on page 2-5. See "S0334""Status 'T = Tlimit'" on page 2-44.				

S0093	Torque data scaling factor				
	This defines the scaling factor for all torque data.				
	Name:	"Trq scaling factor"	**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			
Notes:	RO when drive is enabled.				
See Also:	See "S0086""Torque data scaling type" on page 2-20. See "S0094""Torque data scaling exponent" on page 2-23.				

S0094	Torque data scaling exponent				
	This defines the scaling exponent for all torque data.				
	Name:	"Trq scaling exponent"	**Attr:** 0x00210001		(16-bit signed decimal)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	-15	**Value:**	(Written by master)	
	Max:	0			
Notes:	RO when the drive is enabled.				
See Also:	See "S0086""Torque data scaling type" on page 2-20. See "S0093""Torque data scaling factor" on page 2-22.				

S0095	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:	Due to ROM limitations in the drive, if an error occurs, this IDN just refers the master to IDN S0390, which returns the number associated with the current error condition. The master can use this number to display an error message of its own.				
See Also:	See "S0390""Diagnostic number" on page 2-46.				

S0096	Slave arrangement (SLKN)				
	Specifies whether this drive is controlled by a slave which controls more than one drive and, if so, what the address of the next drive is. See the description of this IDN in the SERCOS spec for more information.				
	Name:	"SLKN"	**Attr:** 0x00310001		(16-bit hexadecimal)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:**	(Determined by address)	
	Max:	Not supported			
Notes:					
See Also:					

S0097	Mask class 2 diagnostic				
	This IDN is used to mask specific C2D flags (IDN S0012) from affecting the C2D Change bit in the Drive Status Word. The bit map for this IDN matches that for IDN S0012, 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:	Not supported	**Value:** (tbd)		
	Max:	Not supported			
Notes:					
See Also:	See "S0012""Class 2 diagnostic” on page 2-5.				

S0098	Mask class 3 diagnostic				
	This IDN is used to mask specific C3D flags (IDN S0013) from affecting the C3D Change bit in the Drive Status Word. The bit map for this IDN matches that for IDN S0013, 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:	Not supported	**Value:** (tbd)		
	Max:	Not supported			
Notes:					
See Also:	See "S0013""Class 3 diagnostic” on page 2-5.				

S0099	Reset class 1 diagnostic				
	This is a procedure command which clears the Class 1 Diagnostic bits, the Interface Status, the Manufacturere’s C1D, the drive shutdown error bit, and the drive shutdown mechanism in the drive, if the corresponding errors are no longer present.				
	Name:	“Reset C1D”	**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:	See "S0011""Class 1 diagnostic” on page 2-4. See "S0014""Interface status” on page 2-6.				

S0124	**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 S0331) in C3D.					
	Name:	"Standstill 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:	(Velocity max)				
Notes:						
See Also:	See "S0013""Class 3 diagnostic" on page 2-5. See "S0331""Status 'nfeedback = 0'" on page 2-43.					

S0125	**Velocity threshold n_x**					
	This specifies the velocity threshold limit. If the motor velocity is less than this limit, the drive sets the status $n_{feedback} < n_x$ (IDN S0331) in C3D.					
	Name:	"Standstill 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:	(Velocity max)				
Notes:						
See Also:	See "S0013""Class 3 diagnostic" on page 2-5. See "S0332""Status 'nfeedback < 0'" on page 2-43.					

S0127	**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 S0021.					
	Name:	"CP3 Tran Check	**Attr:** 0x00090001			(16-bit binary, C.F. 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:						
See Also:	See "S0018""IDN-list of all operation data for CP2" on page 2-7. See "S0021""IDN-list of invalid operation data for CP2" on page 2-8. See "S0128""Communication phase 4 transition check" on page 2-26.					

S0128	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 S0022.					
	Name:	"CP4 Tran Check	**Attr:** 0x00090001			(16-bit binary, C.F. 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:						
See Also:	See "S0019""IDN-list of all operation data for CP3" on page 2-7. See "S0022""IDN-list of invalid operation data for CP3" on page 2-8. See "S0127""Communication phase 3 transition check" on page 2-25.					

S0129	Manufacturing class 1 diagnostic					
	These are additional shutdown errors. If an error is set, it sets the corresponding bit here and also sets the manufacturer-specific error bit in C1D (IDN S0011). The drive clears these bits only after the error has been eliminated and the procedure "Reset class 1 diagnostics" (IDN S0099) has been executed.					
	Name:	"MC1D"	**Attr:** 0x00010001			(16-bit binary)
	Units:	Not supported	**Phase 2:**	RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:**	MC1D: (1 = active, 0 = inactive_		
			Bit 0:	+24 VDC fuse blown		
			Bit 1:	+5 VDC fuse blown		
			Bit 2:	Encoder power fuse blown		
			Bit 3:	Motor overtemp (calculated)		
			Bit 4:	Amp overtemp (calculated)		
			Bit 5:	Excessive average current		
			Bit 6:	Motor overspeed		
			Bit 7:	Excessive velocity error		
			Bit 8:	Auxiliary encoder state error		
			Bit 9:	No motor selected		
			Bit 10:	Invalid motor selected		
			Bit 11:	Unused subprocessor interrupt		
			Bit 12:	Insufficient processor time		
			Bit 13-15:	Not used		
	Max:	Not supported				
Notes:						
See Also:	See "S0011""Class 1 diagnostic" on page 2-4. See "S0181""Manufacturer class 2 diagnostic" on page 2-36. See "S0182""Manufacturer class 3 diagnostic" on page 2-36.					

S0130	Probe value 1 positive edge				
	During the Probe Cycle Procedure (IDN S0170), 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 S0169).				
	Name:	"Probe 1 pos edge"	**Attr:** 0x0X22XXXX		(32-bit signed decimal, C.F. procedure command)
	Units:	(Position units)	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:**	(Position of probe 1 positive edge)	
	Max:	Not supported			
Notes:	Probe 1 (Input 2) can only latch the motor encoder value. It cannot latch the auxiliary encoder value.				
See Also:	See "S0076""Position data scaling type" on page 2-18. See "S0131""Probe value 1 negative edge" on page 2-27. See "S0169""Probe control parameter" on page 2-34. See "S0170""Probing cycle procedure command" on page 2-35.				

S0131	Probe value 1 negative edge				
	During the Probe Cycle Procedure (IDN S0170), the drive stores the position of Probe 1's negative edge in this value (if Probe 1's negative edge is enabled in bit 0 of IDN S0169).				
	Name:	"Probe 1 neg edge"	**Attr:** 0x0X22XXXX		(32-bit signed decimal, C.F. procedure command)
	Units:	(Position units)	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:**	(Position of probe 1 negative edge)	
	Max:	Not supported			
Notes:	Probe 1 (Input 2) can only latche the motor encoder value. It cannot latch the auxiliary encoder value.				
See Also:	See "S0076""Position data scaling type" on page 2-18. See "S0130""Probe value 1 positive edge" on page 2-27. See "S0169""Probe control parameter" on page 2-34. See "S0170""Probing cycle procedure command" on page 2-35.				

S0132	Probe value 2 positive edge				
	During the Probe Cycle Procedure (IDN S0170), the drive stores the position of Probe 2's positive edge in this value (if Probe 2's positive edge is enabled in bit 0 of IDN S0169).				
	Name:	"Probe 2 pos edge"	**Attr:** 0x0X22XXXX		(32-bit signed decimal, C.F. procedure command)
	Units:	(Position units)	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:**	(Position of probe 2 positive edge)	
	Max:	Not supported			
Notes:	Probe 2 (Input 1) can only latch the auxiliary encoder value. It cannot latch the motor encoder value.				
See Also:	See "S0076""Position data scaling type" on page 2-18. See "S0133""Probe value 2 negative edge" on page 2-28. See "S0169""Probe control parameter" on page 2-34. See "S0170""Probing cycle procedure command" on page 2-35.				

S0133	Probe value 2 negative edge				
	During the Probe Cycle Procedure (IDN S0170), the drive stores the position of Probe 2's negative edge in this value (if Probe 2's negative edge is enabled in bit 0 of IDN S0169).				
	Name:	"Probe 2 neg edge"	**Attr:** 0x0X22XXXX		(32-bit signed decimal, C.F. procedure command)
	Units:	(Position units)	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:**	(Position of probe 2 negative edge)	
	Max:	Not supported			
Notes:	Probe 2 (Input 1) can only latch the auxiliary encoder value. It cannot latch the motor encoder value.				
See Also:	See "S0076""Position data scaling type" on page 2-18. See "S0132""Probe value 2 positive edge" on page 2-27. See "S0169""Probe control parameter" on page 2-34. See "S0170""Probing cycle procedure command" on page 2-35.				

S0134	Master control word				
	This is the last Master Control Word received from the master. It is stored here mainly for debugging purposes.				
	Name:	"Master ctrl word"	**Attr:** 0x00010001		(16-bit binary)
	Units:	(Position units)	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:**	(Position of probe 1 negative edge)	
	Max:	Not supported			
Notes:					
See Also:	See "S0135""Drive status word" on page 2-28.				

S0135	Drive status word				
	This is the last Drive Status Word sent to the master. It is stored here mainly for debugging purposes.				
	Name:	"Drive status word"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:**	(Current Drive Status Word)	
	Max:	Not supported			
Notes:					
See Also:	See "S0134""Master control word" on page 2-28.				

S0138	**Bipolar acceleration limit value**				
	This parameter sets the acceleration and deceleration limits for the drive. Only in effect when operating in velocity mode.				
	Name:	"Bipolar accel limit"	**Attr:** 0x0X22XXX		(32-bit signed decimal, C.F. procedure command)
	Units:	(Acceleration units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	0	**Value:**	(Written by master)	
	Max:	(Acceleration max)			
Notes:	If set to zero, maximum acceleration will be allowed.				
See Also:	See "S0160""Acceleration data scaling type" on page 2-33.				

S0140	**Controller type**				
	This IDN contains the type of the controller				
	Name:	"Controller type"	**Attr:** 0x00440001		(Variable-length text array)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:**	(Depends on the drive type)	
	Max:	Not supported			
Notes:	Possible values are: "G & L DSM110-SERCOS" "G & L DSM120-SERCOS" "G & L DSM130-SERCOS" "G & L DSM175-SERCOS" "G & L DSM1150-SERCOS"				
See Also:					

S0142	**Application type**				
	This IDN contains the type of drive application.				
	Name:	"App type"	**Attr:** 0x00440001		(Variable-length text array)
	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:					

S0143	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:					

S0147	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:	Not supported	**Value:**	(Written by master - all reserved bits should be written to '0')	
			Bit 0:	**(Homing Direction):** 0 - motor shaft turns clockwise 1 - motor shaft turns counter-clockwise	
			Bit 1:	**(Home Switch Edge Select):** 0 - First marker pulse after positive edge of home switch 1 - First marker pulse after negative edge of home swith	
			Bit 2:	**(Home Switch):** (Must be 1 - connected to drive)	
			Bit 3:	**(Feedback Select):** (Must be 0 - motor feedback)	
			Bit 4:	**(Reserved)**	
			Bit 5:	**(Evaluation of Home Switch):** 0 - Home switch is evaluated 1 - Home switch is not evaluated	
			Bit 6:	**(Evaluation of Marker Pulse):** 0 - Marker pulse is evaluated 1 - Marker pulse is not evaluated	
				All other bits are reserved.	
	Max:	Not supported			
Notes:	RO while homing procedure is active. IDN P0001 (Extended homing parameter) has additional bits defined.				
See Also:	See "S0148""Drive-controlled homing procedure command" on page 2-31. See "P0001""Extended homing parameter" on page 2-51.				

S0148	Drive-controlled homing procedure command				
	The maste5 uses this IDN to start, monitor, and halt the drive-controlled homing procedure.				
	Name:	"Drive-ctrl homing proc"	**Attr:** 0x00090001		(16-bit binary, procedure command)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:** (Written by master)		
	Max:	Not supported			
Notes:	Since the homing procedure and the probing procedure (IDN S0170) both use the same input on the drive, they cannot be active at the same time. If one is active, the other is write-protected.				
See Also:	See "S0041"“Homing velocity” on page 2-12. See "S0042"“Homing acceleration” on page 2-13. See "S0052"“Reference distance 1” on page 2-16. See "S0147"“Homing parameter” on page 2-30. See "S0150"“Reference offset 1” on page 2-31. See "S0403"“Position feedback value status” on page 2-48. See "P0001"“Extended homing parameter” on page 2-51.				

S0150	Reference offset 1				
	This is the distance between the reference marker pulse and the reference position.				
	Name:	"Ref offset 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:	(Position min)	**Value:** (Written by master)		
	Max:	(Position max)			
Notes:	RW at all time, except when Drive controlled homing procedure is active.				
See Also:	See "S0052"“Reference distance 1” on page 2-16. See "S0076"“Position data scaling type” on page 2-18. See "S0148"“Drive-controlled homing procedure command” on page 2-31.				

S0157	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 set the status '$n_{feedback} = n_{command}$' (IDN S0330) in the C3D.					
	Name:	"Vel 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:	(Velocity max)				
Notes:						
See Also:	See "S0013""Class 3 diagnostic" on page 2-5. See "S0330""Status 'nfeedback = ncommand'" on page 2-43.					

S0159	Monitoring window					
	When the position error exceeds the value specified by this IDN, the drive sets the Excessive Position Deviation flag in C1D (IDN S0011).					
	Name:	"Monitoring window"	**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:	(Position max)				
Notes:						
See Also:	See "S0011""Class 1 diagnostic" on page 2-4.					

S0160	Acceleration data scaling type				
	This selects the type of scaling for acceleration parameters.				
	Name:	"Acc scaling type"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	Not supported	**Value:**	**Scaling type:**	
			Bit 2-0:	**Scaling method**	
				000 - no scaling	
				001 - linear scaling (not supported)	
				010 - rotational scaling (torque)	
			Bit 3:	0 - preferred scaling	
				1 - parameter scaling	
			Bit 4:	**Units (must be 0)**	
				0 - radians)	
				1 - (reserved)	
			Bit 5:	**Time (must be 0)**	
				0 - seconds	
				1 - (reserved)	
			Bit 6:	**Data reference (must be 0)**	
				0 - at the motor shaft	
				1 - at the load (not implemented)	
				All other bits are reserved.	
	Max:	Not supported			
Notes:	RO when the drive is enabled. IDNs S0161 and S0162 should have valid values before IDN S0160 is written. Preferred scaling is $1x10^{-3}$ rad/s^2. No scaling is (10^6/65536) encoder counts/second^2.				
See Also:	See "S0044""Velocity data scaling type" on page 2-14. See "S0076""Position data scaling type" on page 2-18.				

S0161	Acceleration data scaling factor				
	This defines the scaling factor for all acceleration data.				
	Name:	"Acc scaling factor"	**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			
Notes:	RO when the drive is enabled.				
See Also:	See "S0160""Acceleration data scaling type" on page 2-33. See "S0162""Acceleration data scaling exponent" on page 2-34.				

S0162	Acceleration data scaling exponent				
	This defines the scaling exponent for all acceleration data.				
	Name:	"Acc scaling exponent"	**Attr:** 0x00210001		(16-bit signed decimal)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	-15	**Value:**	(Written by master)	
	Max:	0			
Notes:	RO when the drive is enabled.				
See Also:	See "S0160""Acceleration data scaling type" on page 2-33. See "S0161""Acceleration data scaling factor" on page 2-33.				

S0169	Probe control parameter				
	This IDN selects which probe edges to use during the probing cycle procedurel If both edges for a given probe are selected, the edges need to be at least 400 µs apart.				
	Name:	"Probe ctrl parameter"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	Not supported	**Value:**	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 negative edge** 0 - negative edge is not active 1 - negative edge is active	
				All other bits are reserved.	
	Max:	Not supported			
Notes:	IDN P0004 (Extended Probe Control Parameter) has additional bits defined.				
See Also:	See "S0130""Probe value 1 positive edge" on page 2-27. See "S0131""Probe value 1 negative edge" on page 2-27. See "S0132""Probe value 2 positive edge" on page 2-27. See "S0133""Probe value 2 negative edge" on page 2-28. See "S0170""Probing cycle procedure command" on page 2-35. See "P0004""Extended probe control parameter" on page 2-53.				

S0170	Probing cycle procedure command				
	The master uses this IDN to start, monitor, and stop the probing cycle procedure.				
	Name: "Probe cycle 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:	Since the probing procedure and the homing procedure (IDN S0147) both use the same input on the drive, the cannot be active at the same time. If one is active, the other is write-protected.				
See Also:	See "S0130"“Probe value 1 positive edge” on page 2-27. See "S0131"“Probe value 1 negative edge” on page 2-27. See "S0169"“Probe control parameter” on page 2-34.				

S0179	Probe status				
	This IDN shows the status of all the probe latches during the Probe Cycle procedure.				
	Name: "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) **All other bits are reserved and their values are undefined.**			
	Max: Not supported				
Notes:	IDN P0005 (Extended Probe Status) has additional bits defined.				
See Also:	See "S0409"“Probe 1 positive latched” on page 2-49. See "S0410"“Probe 1 negative latched” on page 2-49. See "S0411"“Probe 2 positive latched” on page 2-50. See "S0412"“Probe 2 negative latched” on page 2-50. See "P0005"“Extended probe status” on page 2-54.				

S0181	Manufacturer class 2 diagnostic					
	These are manufacturer-specific C2D flags (see C2D, IDN S0012).					
	Name:	"MC2D"	**Attr:** 0x00010001			(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO	
	Min:	Not supported	**Value:**	MC2D: (1 = active, 0 = inactive)		
			Bits 0-15:	Not Used		
	Max:	Not supported				
Notes:						
See Also:	See "S0012""Class 2 diagnostic" on page 2-5. See "S0129""Manufacturing class 1 diagnostic" on page 2-26. See "S0182""Manufacturer class 3 diagnostic" on page 2-36.					

S0182	Manufacturer class 3 diagnostic					
	These are manufacturer-specific C3D flags (see C3D, IDN S0013).					
	Name:	"MC3D"	**Attr:** 0x00010001			(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO	
	Min:	Not supported	**Value:**	MC3D: (1 = active, 0 = inactive)		
			Bit 0:	Fault Reset input (IDN P0111)		
			Bit 1:	Enable input (IDN P0112)		
			Bit 2:	Input 1 (IDN P0113)		
			Bit 3:	Input 2 (IDN P0114)		
			Bit 4:	Input 3 (IDN P0115)		
			Bit 5:	Input 4 (IDN P0116)		
			Bit6:	Forward enabled (IDN P0120)		
			Bit 7:	Reverse enabled (IDN P0121)		
			Bit 8:	In forward current limit (IDN P0122)		
			Bit 9:	In reverse current limit (IDN P0123)		
			Bit 10:	In position (IDN P0124)		
			Bit 11:	Brake active (IDN P0125)		
			Bit 12:	DC bus charged (IDN P0126)		
			Bit	Not used		
	Max:	Not supported				
Notes:						
See Also:	See "S0013""Class 3 diagnostic" on page 2-5. See "S0129""Manufacturing class 1 diagnostic" on page 2-26. See "S0181""Manufacturer class 2 diagnostic" on page 2-36.					

S0185	Length of the configurable data in the AT				
	This specifies the maximum length, in bytes, of the configurable part of the AT.				
	Name:	"Length of AT"	**Attr:** 0x00110001		(16-bit unsigned decimal)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:** 32		
	Max:	Not supported			
Notes:					
See Also:					

S0186	Length of the configurable data in the MDT				
	This specifies the maximum length, in bytes, of the configurable part of the MDT.				
	Name:	"Length of MDT"	**Attr:** 0x00110001		(16-bit unsigned decimal)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:** 32		
	Max:	Not supported			
Notes:					
See Also:	See "S0015"“Telegram type parameter” on page 2-6. See "S0016"“Configuration list of AT” on page 2-6. See "S0186"“Length of the configurable data in the MDT” on page 2-37. See "S0187"“IDN List of configurabe data in the AT” on page 2-37.				

S0187	IDN List of configurabe data in the AT				
	This is the list of IDN’s which can be sent in the configurable part of the AT.				
	Name:	“Config data in 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 IDN’s)		
	Max:	Not supported			
Notes:					
See Also:	See "S0015"“Telegram type parameter” on page 2-6. See "S0024"“Configuration list of MDT” on page 2-8. See "S0185"“Length of the configurable data in the AT” on page 2-37. See "S0188"“IDN List of configurabe data in the MDT” on page 2-38.				

S0188	IDN List of configurabe data in the MDT				
	This is the list of IDN's which can be sent in the configurable part of the MDT.				
	Name:	"Config data in 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 IDN's)	
	Max:	Not supported			
Notes:					
See Also:	See "S0015""Telegram type parameter" on page 2-6. See "S0024""Configuration list of MDT" on page 2-8. See "S0186""Length of the configurable data in the MDT" on page 2-37. See "S0187""IDN List of configurabe data in the AT" on page 2-37.				

S0189	Following distance				
	This is the difference between the commanded position and the feedback position.				
	Name:	"Folowing 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:	Not supported	**Value:**	(Current following distance)	
	Max:	Not supported			
Notes:					
See Also:	See "S0047""Position command value" on page 2-15. See "S0051""Position feedback value 1" on page 2-15. See "S0076""Position data scaling type" on page 2-18.				

S0192	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:	See "S0269""Storage mode" on page 2-40. See "S0270""Select IDN list of operation data to backup" on page 2-41. See "S0293""Selectively backup working memory procedure command" on page 2-41.				

S0262	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:	See "S0192""IDN-list of backup operation data" on page 2-38. See "S0264""Backup working memory procedure command" on page 2-40. See "S0269""Storage mode" on page 2-40. See "S0270""Select IDN list of operation data to backup" on page 2-41. See "S0293""Selectively backup working memory procedure command" on page 2-41.				

S0263	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:	See "S0192""IDN-list of backup operation data" on page 2-38. See "S0264""Backup working memory procedure command" on page 2-40. See "S0269""Storage mode" on page 2-40. See "S0270""Select IDN list of operation data to backup" on page 2-41. See "S0293""Selectively backup working memory procedure command" on page 2-41.				

S0264	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:	See "S0192""IDN-list of backup operation data" on page 2-38. See "S0264""Backup working memory procedure command" on page 2-40. See "S0269""Storage mode" on page 2-40. See "S0293""Selectively backup working memory procedure command" on page 2-41.				

S0269	Storage mode				
	This selects whether writes to IDNs whose data is located in NVM (see IDN S0192 - IDN-list of backup operation data) 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:	Not supported	**Value:** Bit 0: Bit 1-15:	Storage mode: 0 = Data saved in NVM 1 = Data saved in RAM Not used	
	Max:	Not supported			
Notes:	Data that is written to RAM can be saved in NVM by clearing this IDN and rewriting the data or by IDN S0293 - Selectively backup working memory procedure. Motor parameters are not affected (their values are always copied to NVM).				
See Also:	See "S0192""IDN-list of backup operation data" on page 2-38. See "S0263""Load working memory procedure command" on page 2-39. See "S0264""Backup working memory procedure command" on page 2-40. See "S0293""Selectively backup working memory procedure command" on page 2-41.				

S0270	Select 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:	RO while Selectively backup working memory procedure is active.				
See Also:	See "S0192""IDN-list of backup operation data" on page 2-38. See "S0263""Load working memory procedure command" on page 2-39. See "S0264""Backup working memory procedure command" on page 2-40. See "S0269""Storage mode" on page 2-40. See "S0293""Selectively backup working memory procedure command" on page 2-41.				

S0271	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:					

S0293	Selectively backup working memory procedure command				
	Copies data from the IDN's 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:	See "S0192""IDN-list of backup operation data" on page 2-38. See "S0263""Load working memory procedure command" on page 2-39. See "S0264""Backup working memory procedure command" on page 2-40. See "S0269""Storage mode" on page 2-40. See "S0270""Select IDN list of operation data to backup" on page 2-41.				

S0301	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:	Not supported	**Value:** (Written by master)		
	Max:	Not supported			
Notes:					
See Also:	See "S0305""Allocation of real-time status bit 1" on page 2-42. See "S0307""Allocation of real-time status bit 2" on page 2-42.				

S0303	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:	Not supported	**Value:** (Written by master)		
	Max:	Not supported			
Notes:					
See Also:	See "S0301""Allocation of real-time control bit 1" on page 2-42. See "S0307""Allocation of real-time status bit 2" on page 2-42.				

S0305	Allocation of real-time status bit 1				
	This specifies which IDN to assign to real-time control bit 1.				
	Name:	"Alloc RTS1"	**Attr:** 0x00510001		(IDN number)
	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:	See "S0301""Allocation of real-time control bit 1" on page 2-42. See "S0307""Allocation of real-time status bit 2" on page 2-42.				

S0307	Allocation of real-time status bit 2				
	This specifies which IDN to assign to real-time status bit 2.				
	Name:	"Alloc RTS2"	**Attr:** 0x00510001		(IDN number)
	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:	See "S0303""Allocation of real-time control bit 2" on page 2-42. See "S0305""Allocation of real-time status bit 1" on page 2-42.				

S0330	**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 S0157). It is the same as C3D bit 0.				
	Name:	"n_fdbk = n_cmd"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:** Status bit: Bit 0: 0 - Inactive 1 - Active		
	Max:	Not supported			
Notes:					
See Also:					

S0331	**Status '$n_{feedback} = 0$'**				
	This bit is set when the actual velocity is less than the standstill window (IDN S0124). It is the same as C3D bit 1.				
	Name:	"n_fdbk = 0"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:** Status bit: Bit 0: 0 - Inactive 1 - Active		
	Max:	Not supported			
Notes:					
See Also:					

S0332	**Status '$n_{feedback} < 0$'**				
	This bit is set when the actual velocity is less than the velocity threshold n_x (IDN S0125). It is the same as C3D bit 2. It is the same as C3D bit 1.				
	Name:	"n_fdbk < n_x"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:** Status bit: Bit 0: 0 - Inactive 1 - Active		
	Max:	Not supported			
Notes:					
See Also:					

S0334	**Status 'T = T_{limit}'**					
	This bit is set when the actual torque is greater than the torque limit (IDN S0092). It is the same as C3D bit 4.					
	Name:	"T = T_limit"	**Attr:** 0x00010001			(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO	
	Min:	Not supported	**Value:** Status bit: Bit 0: 0 - Inactive 1 - Active			
	Max:	Not supported				
Notes:						
See Also:						

S0335	**Status '$n_{command} > n_{limit}$'**					
	This bit is set when the command velocity is greater than the velocity limit (IDN S0091). It is the same as C3D bit 5.					
	Name:	"n_cmd > n_limit"	**Attr:** 0x00010001			(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO	
	Min:	Not supported	**Value:** Status bit: Bit 0: 0 - Inactive 1 - Active			
	Max:	Not supported				
Notes:	This bit is only active when in velocity mode.					
See Also:	See "S0013""Class 3 diagnostic" on page 2-5. See "S0091""Bipolar velocity limit value" on page 2-22.					

S0336	**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 S0057). Also, if the position window time (IDN P0087) is non-zero, the position error must be less than the position window for at least this status bit to be set. 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:	Not supported	**Value:** Status bit: Bit 0: 0 - Inactive 1 - Active			
	Max:	Not supported				
Notes:	The position window time is not standard SERCOS, but setting IDN P0087 to zero will make this bit behave like standard SERCOS. The factory default value for the position window time is 5 ms.					
See Also:						

S0347	Velocity error				
	This is the difference between the commanded velocity and the actual velocity.				
	Name:	"Vel 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:	Not supported	**Value:**	(Current velocity error)	
	Max:	Not supported			
Notes:					
See Also:					

S0380	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:	Not supported	**Value:**	(Current DC bus voltage)	
	Max:	Not supported			
Notes:					
See Also:					

S0390	**Diagnostic number**				
	This IDN returns the 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 +24 VDC Fuse Blown 02 +5 VDC Fuse Blown 03 Encoder Power Fuse Blown 04 Motor Overtemperature, Thermostat 05 IPM Fault (Overtemperature/Overcurrent/Short Circuit) 06 ChannelIM Line Break 07 Channel BM Line Break 08 Channel AM Line Break 09 Bus Undervoltage 10 Bus Overvoltage 11 Illegal Hall State 12 Sub processor Unused Interrupt 13 Main processor Unused Interrupt 17 Excessive Average Current 18 Motor Overspeed 19 Excessive Following Error 20 Motor Encoder State Error 21 Master Encoder State Error 22 Motor Thermal Protection 23 IPM Thermal Protection 28 Enabled with No Motor Selected 29 Motor Selection not in Table 30 Personality Write Error 31 Service Write Error 32 CPU Communication Error			
	Max: Not supported				
Notes:					
See Also:	See "S0095""Diagnostic message" on page 2-23. See "P0022""Fault history" on page 2-61. See "P0107""Run state" on page 2-86.				

S0400	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: Not supported	**Value:** State of home input Bit 0: 0 - Home input inactive 1 - Home input active			
	Max: Not supported				
Notes:	The home switch input is the same as Probe 1. It is hardware input 2.				
See Also:	See "S0401"“Probe 1” on page 2-47.				

S0401	Probe 1				
	This IDN returns the state 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: Not supported	**Value:** State of Probe 1 input Bit 0: 0 - Probe 1 inactive 1 - Probe 1 active			
	Max: Not supported				
Notes:	The Probe 1 input is the same as the Home switch input. It is hardware input 2.				
See Also:	See "S0130"“Probe value 1 positive edge” on page 2-27. See "S0131"“Probe value 1 negative edge” on page 2-27. See "S0169"“Probe control parameter” on page 2-34. See "S0170"“Probing cycle procedure command” on page 2-35. See "S0405"“Probe 1 enable” on page 2-48. See "S0409"“Probe 1 positive latched” on page 2-49. See "S0410"“Probe 1 negative latched” on page 2-49.				

S0402	Probe 2				
	This IDN returns the state 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: Not supported	**Value:** State of Probe 2 input Bit 0: 0 - Probe 2 inactive 1 - Probe 2 active			
	Max: Not supported				
Notes:	The Probe 2 input is the same as hardware input 1.				
See Also:	See "S0132"“Probe value 2 positive edge” on page 2-27. See "S0133"“Probe value 2 negative edge” on page 2-28. See "S0169"“Probe control parameter” on page 2-34. See "S0170"“Probing cycle procedure command” on page 2-35. See "S0406"“Probe 2 enable” on page 2-48. See "S0411"“Probe 2 positive latched” on page 2-50. See "S0412"“Probe 2 negative latched” on page 2-50.				

S0403	Position feedback value status				
	This IDN indicates if the position feedback values are referenced to the machine zero point.				
	Name:	"Pos fdbk status"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:** State of position feedback Bit 0: 0 - Position feedback value not referenced to machine zero point 1 - Position feedback value referenced to machine zero point		
	Max:	Not supported			
Notes:					
See Also:	See "S0148""Drive-controlled homing procedure command" on page 2-31.				

S0405	Probe 1 enable				
	The master enables Probe 1 via this IDN. When disabling Probe 1 to reset the latches, it needs to remain disabled for at least 2 ms before enabling it.				
	Name:	"Probe 1 enable"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RW
	Min:	Not supported	**Value:** State of Probe 1 enable: Bit 0: 0 - Probe 1 not enabled 1 - Probe 1 enabled		
	Max:	Not supported			
Notes:					
See Also:	See "S0401""Probe 1" on page 2-47.				

S0406	Probe 2 enable				
	The master enables Probe 2 via this IDN. When disabling Probe 2 to reset the latches, it needs to remain disabled for at least 2 ms before enabling it.				
	Name:	"Probe 2 enable"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RW
	Min:	Not supported	**Value:** State of Probe 2 enable: Bit 0: 0 - Probe 2 not enabled 1 - Probe 2 enabled		
	Max:	Not supported			
Notes:					
See Also:	See "S0402""Probe 2" on page 2-47.				

S0409	**Probe 1 positive latched**				
	The IDN indicates if a position has been latched by the positive edge of Probe 1.				
	Name:	"Probe 1 pos 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 positive latched: Bit 0: 0 - Probe 1 positive not latched 1 - Probe 1 positive latched		
	Max:	Not supported			
Notes:					
See Also:	See "S0130"“Probe value 1 positive edge” on page 2-27. See "S0169"“Probe control parameter” on page 2-34. See "S0170"“Probing cycle procedure command” on page 2-35. See "S0401"“Probe 1” on page 2-47. See "S0405"“Probe 1 enable” on page 2-48. See "S0410"“Probe 1 negative latched” on page 2-49.				

S0410	**Probe 1 negative latched**				
	The IDN indicates if a position has been latched by the negative edge of Probe 1.				
	Name:	"Probe 1 neg 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 negative latched: Bit 0: 0 - Probe 1 negative not latched 1 - Probe 1 negative latched		
	Max:	Not supported			
Notes:					
See Also:	See "S0131"“Probe value 1 negative edge” on page 2-27. See "S0169"“Probe control parameter” on page 2-34. See "S0170"“Probing cycle procedure command” on page 2-35. See "S0401"“Probe 1” on page 2-47. See "S0405"“Probe 1 enable” on page 2-48. See "S0409"“Probe 1 positive latched” on page 2-49.				

S0411	Probe 2 positive latched				
	The IDN indicates if a position has been latched by the positive edge of Probe 2.				
	Name:	"Probe 2 pos 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 positive latched: Bit 0: 0 - Probe 2 positive not latched 1 - Probe 2 positive latched		
	Max:	Not supported			
Notes:					
See Also:	See "S0132""Probe value 2 positive edge" on page 2-27. See "S0169""Probe control parameter" on page 2-34. See "S0170""Probing cycle procedure command" on page 2-35. See "S0402""Probe 2" on page 2-47. See "S0406""Probe 2 enable" on page 2-48. See "S0412""Probe 2 negative latched" on page 2-50.				

S0412	Probe 2 negative latched				
	The IDN indicates if a position has been latched by the negative edge of Probe 2.				
	Name:	"Probe 2 neg 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 negative latched: Bit 0: 0 - Probe 2 negative not latched 1 - Probe 2 negative latched		
	Max:	Not supported			
Notes:					
See Also:	See "S0133""Probe value 2 negative edge" on page 2-28. See "S0169""Probe control parameter" on page 2-34. See "S0170""Probing cycle procedure command" on page 2-35. See "S0402""Probe 2" on page 2-47. See "S0406""Probe 2 enable" on page 2-48. See "S0411""Probe 2 positive latched" on page 2-50.				

P0001	**Extended homing parameter**				
	The master uses this parameter to define how the Drive-Controlled Homing Procedure will operate. It is an extension to IDN S0147. This IDN adds a bit for “Sensor Backoff”. This is only used if the home switch is evaluated (bit 5 is ‘1’). Selecting the sensor backoff tells the drive to evaluate the state of the home switch at the start of the homing sequence. If the home switch is active and the positive edge is selected (bit 1 is a “0”), or the switch is inactive and the negative edge is selected, the drive will go in the reverse direction (using the homing velocity and acceleration) until home switch transitions to the opposite state, at which point it will reverse the motor and start the normal homing sequence.				
	Name: “Ext homing parameter”	**Attr:** 0x00110001 (16-bit binary)			
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW	
	Min: Not supported	**Value:** Written by master - all reserved bits should be written to ‘0’) Bit 0: **(Homing Direction):** 0 - Motor shaft turns clockwise 1 - Motor shaft turns counteclockwise Bit 1: **(Home Switch Edge Select):** 0 - First marker pulse after positive edge of home switch 1 - First marker pulse after negative edge of home switch Bit 2: **(Home Switch):** (Must be 1 - connected to drive) Bit 3: **(Feedback Select):** (Must be 0 - motor feedback) Bit 4: **(Reserved)** Bit 5: **(Evaluation of Home Switch):** 0 - Home switch is evaluated 1 - Home switch is not evaluated Bit 6: **(Evalutation of Marker Pulse):** 0 - Marker pulse is evaluated 1 - Marker pulse is not evaluated Bit 7 - 14 **(Reserved)** Bit 15 **(Home Switch Sensor Backoff):** 0 - Sensor backoff is disabled 1 - Sensor backoff is enabled			
	Max: Not supported				
Notes:	RO while homing procedure is active. Bits 0 - 6 are identical to IDN S0147.				
See Also:	See "S0147"“Homing parameter” on page 2-30. See "S0148"“Drive-controlled homing procedure command” on page 2-31.				

P0002	Mask manufacturer class 2 diagnostic				
	This IDN is used to mask specific MC2D flags (IDN S0181) from affecting the C2D Change bit in the Drive Status Word. The bit map for this IDN matches that for IDN S0181 and any ‘0’s mask the corresponding flag.				
	Name:	“Mask MC2D”	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	Not supported	**Value:**	(Written by master, see IDN0181 bit pattern)	
	Max:	Not supported			
Notes:	The Manufacturer-specific warning bit (bit 15) of C2D must be unmasked for any MC2D bits to have any affect on the C2D Change bit.				
See Also:	See "S0012""Class 2 diagnostic” on page 2-5. See "S0181""Manufacturer class 2 diagnostic” on page 2-36.				

P0003	Mask manufacturer class 3 diagnostic				
	This IDN is used to mask specific MC3D flags (IDN S0182) from affecting the C3D Change bit in the Drive Status Word. The bit map for this IDN matches that for IDN S0182 and any ‘0’s mask the corresponding flag.				
	Name:	“Mask MC3D”	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	Not supported	**Value:**	(Written by master, see IDN0182 bit pattern)	
	Max:	Not supported			
Notes:	The Manufacturer-specific warning bit (bit 15) of C3D must be unmasked for any MC3D bits to have any affect on the C3D Change bit.				
See Also:	See "S0013""Class 3 diagnostic” on page 2-5. See "S0182""Manufacturer class 3 diagnostic” on page 2-36.				

P0004	**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. If both edges are selected for a given probe, there needs to be at least 400 µs between edges.				
	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 negative edge)** 0 - negative edge is not active 1 - negative edge is active Bit 4 - 11: **(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:	See "S0169"“Probe control parameter” on page 2-34. See "S0170"“Probing cycle procedure command” on page 2-35. See "P0006"“Probe value 1 index position” on page 2-54. See "P0007"“Probe value 2 index position” on page 2-55.				

P0005	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)** Bit 4 - 13: **(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:	See "S0170""Probing cycle procedure command" on page 2-35. See "P0004""Extended probe control parameter" on page 2-53.				

P0006	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 5 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:	Probe 1 (Input 2) can only latch the motor encoder value. It cannot latch the auxiliary encoder value.				
See Also:	See "S0076""Position data scaling type" on page 2-18. See "S0130""Probe value 1 positive edge" on page 2-27. See "S0131""Probe value 1 negative edge" on page 2-27. See "S0169""Probe control parameter" on page 2-34. See "S0170""Probing cycle procedure command" on page 2-35. See "P0004""Extended probe control parameter" on page 2-53. See "P0005""Extended probe status" on page 2-54.				

P0007	**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 7 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. It cannot latch the motor encoder value.				
See Also:	See "S0076"“Position data scaling type” on page 2-18. See "S0132"“Probe value 2 positive edge” on page 2-27. See "S0133"“Probe value 2 negative edge” on page 2-28. See "S0169"“Probe control parameter” on page 2-34. See "S0170"“Probing cycle procedure command” on page 2-35. See "P0004"“Extended probe control parameter” on page 2-53. See "P0005"“Extended probe status” on page 2-54.				

P0008	**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: Bit 0: 0 - Probe 1 index not latched 1 - Probe 1 index latched			
	Max: Not supported				
Notes:					
See Also:	See "S0170"“Probing cycle procedure command” on page 2-35. See "S0401"“Probe 1” on page 2-47. See "S0405"“Probe 1 enable” on page 2-48. See "S0409"“Probe 1 positive latched” on page 2-49. See "S0410"“Probe 1 negative latched” on page 2-49. See "P0004"“Extended probe control parameter” on page 2-53. See "P0006"“Probe value 1 index position” on page 2-54.				

P0009	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: Bit 0: 0 - Probe 2 index not latched 1 - Probe 2 index latched		
	Max:	Not supported			
Notes:					
See Also:	See "S0170""Probing cycle procedure command" on page 2-35. See "S0402""Probe 2" on page 2-47. See "S0406""Probe 2 enable" on page 2-48. See "S0411""Probe 2 positive latched" on page 2-50. See "S0412""Probe 2 negative latched" on page 2-50. See "P0004""Extended probe control parameter" on page 2-53. See "P0007""Probe value 2 index position" on page 2-55.				

P0010	Product type				
	This returns a number corresponding to the type of drive. Currently, for SERCOS, only the standard size drive is defined.				
	Name:	"Product type"	**Attr:** 0x00110001		(16-bit unsigned decimal)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:** 4(DSM, Standard Size)		
	Max:	Not supported			
Notes:					
See Also:	See "P0019""Drive type" on page 2-60.				

P0011	**Power-up status**				
	Returns the status of the drive during power up testing				
	Name: "Powerup status"	**Attr:** 0x00110001 (16-bit unsigned decimal)			
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO	
	Min: Not supported	**Value:**			
		00 Successful Power-Up			
		51 Program Memory Boot Block Error			
		52 Program Memory Main Block Error			
		53 Uninitialized Personality EEPROM Error			
		54 Personality EEPROM Read Error			
		55 Personality EEPROM Data Corruption Error			
		56 Main Processor Watchdog Error			
		57 Sub Processor Watchdog Error			
		58 Main Processor RAM Error			
		59 Sub Processor RAM Error			
		60 Uninitialized Service EEPROM Error			
		61 Service EEPROM Read Error			
		62 Service EEPROM Data Corruption Error			
		63 Main Processor A/D Converter Error			
		64 Sub Processor A/D Converter Error			
		65 ANALOG1 Output Error			
		66 Gate Array Error			
		67 ANALOG2 Output Error			
		68 Inter-Processor Communication Error			
		69 Sub Processor Initialization Error			
		70 Sub Processor SRAM Error			
		71 Sub Processor Code Loading Error			
		72 Sub Processor Startup Error			
		73 Sub Processor Checksum Error			
		74 Personality EEPROM Write Error			
		75 Service EEPROMWrite Error			
		76 Software Clock Error			
		77 Sub Processor Communication Checksum Error			
		78 Sine Table Generation Error			
		79 Personality Data Out of Range			
		80 Service Data Out of Range			
		81 Motor Block Checksum Error			
	Max: Not supported				
Notes:	If there is an error at power-up, SERCOS will not run.				
See Also:					

P0012	Main version				
	Returns the version of the “main” firmware block.				
	Name:	“Main version”	**Attr:** 0x00310001		(16-bit hexadecimal)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:** The version number in the following format: Bits 15 - 8: Major version Bits 7 - 0 Minor version		
	Max:	Not supported			
Notes:					
See Also:					

P0013	Boot version				
	Returns the version of the “boot” firmware block.				
	Name:	“Boot version”	**Attr:** 0x00310001		(16-bit hexadecimal)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:** The version number in the following format: Bits 15 - 8: Major version Bits 7 - 0 Minor version		
	Max:	Not supported			
Notes:					
See Also:					

P0014	BCM revision				
	This is the revision of the BCM PWA.				
	Name:	“BCM revision”	**Attr:** 0x00440001		(Variable-length text array)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:** Version text string		
	Max:	Not supported			
Notes:					
See Also:					

P0015	PAM revision				
	This is the revision of the BCM PWA.				
	Name:	“PAM revision”	**Attr:** 0x00440001		(Variable-length text array)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value:** Version text string		
	Max:	Not supported			
Notes:					
See Also:					

P0016	Final revision				
	This is the revision of the final assembley of the drive.				
	Name:	"Final revision"	**Attr:** 0x00440001		(Variable-length text array)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value** Version text string		
	Max:	Not supported			
Notes:					
See Also:					

P0017	Serial number				
	This is the serial number of the drive.				
	Name:	"S/N"	**Attr:** 0x00440001		(Variable-length text array)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value** Serial number text string		
	Max:	Not supported			
Notes:					
See Also:					

P0018	Drive name				
	This is the user-specified name for the drive. This information is not necessary for drive operation. It is included for convenient axis identification in installations which contain mutliple drives.				
	Name:	"Drive name"	**Attr:** 0x00440001		(Variable-length text array)
	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:					

P0019	Drive type				
	This is the type of drive.				
	Name:	"Drive type"	**Attr:** 0x00110001		(16-bit unsigned decimal)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value**	Drive type, as follows: With Product Type (IDN P0010) = 4:	
			00	DSM 110-SERCOS	
			01	DSM 120-SERCOS	
			02	DSM 130-SERCOS	
			03	DSM 175-SERCOS	
			04	DSM 1150-SERCOS	
	Max:	Not supported			
Notes:	For other product types, the return values will have different meanings.				
See Also:	See "P0010""Product type" on page 2-56.				

P0020	Drive software address				
	This is the drive's SERCOS address when the rotary address switch is set to position "F". Any changes to the address only take effect after the SERCOS communication ring is restarted at phase 0.				
	Name:	"Drive addr"	**Attr:** 0x00110001		(16-bit unsigned decimal)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	0	**Value**	The drive address (written by the master)	
	Max:	255			
Notes:	This is also the serial port address. The value is stored in NVM when weitten, regardless of the state of IDN S00269 (Storage mode).				
See Also:					

P0021	Service clock				
	This is the drive's time in service.				
	Name:	"Service clock"	**Attr:** 0x0012000A		(32-bit decimal, S.F. = $10x10^0$)
	Units:	"minutes"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value**	The drive's service time.	
	Max:	Not supported			
Notes:	This has a 10 minute resolution.				
See Also:					

P0022	**Fault history**				
	This returns up to 20 of the most recent faults detected in the drive. The first record is the most recent.				
	Name:	"Fault history"	**Attr:** 0x0036001		(Variable-length hex32 array)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value**	An array of fault records, wth the following format:	
			Bits 31 - 8	Time of fault (* 10 minutes)	
			Bits 7 - 0	Fault ID	
	Max:	Not supported			

Notes: Time is in terms of the drive's service time (IDN P0021). Possible fault values.

01 - +24 VDC Fuse Blown	36 (54) - Pers. EEPROM Read Error
02 - +5 VDC Fuse Blown	37 (55) - Pers. EEROM Data Corrupt Error
03 - Encoder Power Fuse Blown	38 (56) - Main Processor Watchdog Error
04 - Motor Overtemperature, Thermostat	39 (57) - Sub Processor Watchdog Error
05 - IPM Fault (Overtemp/Overcur/Short Circt.)	3A (58) - Main Processor RAM Error
06 - Channel IM Line Break	3B (59) - Sub Processor RAM Error
07 - Channel BM Line Break	3C (60) - Uninitialized Serv. EEPROM Err
08 - Channel AM Line Break	3D (61) - Service EEPROM Read Error
09 - Bus Undervoltage	3E (62) - Service EEPROM Data Cor. Err.
0A (10) - Bus Overvoltage	3F (63) - Main Proc. A/D Converter Err
0B (11) - Illegal Hall State	40 (64) - Sub Processor A/D Converter Err
0C (12) - Sub Processor Unused Interrupt	41 (65) - ANALOG1 Output Error
0D (13) - Main Processor Unused Interrupt	42 (66) - Gate Array Error
11 (17) - Excessive Average Current	43 (67) - ANALOG2 Output Error
12 (18) - Motor Overspeed	44 (68) - Inter-Processor Comm. Error
13 (19) - Excessive Following Error	45 (69) - Sub Processor Initialization Error
14 (20) - Motor Encoder State Error	46 (70) - Sub Processor SRAM Error
15 (21) - Master Encoder State Error	47 (71) - Sub Processor Code Load Error
16 (22) - Motor Thermal Protection	48 (72) - Sub Processor Startup Error
17 (23) - IPM Thermal Protection	49 (73) - Sub Processor Checksum Error
1C (28) - Enabled with No Motor Selected	4A (74) - Personality EEPROM Write Err
1D (29) - Motor Selection not in Table	4B (75) - Service EEPROM Write Error
1E (30) - Personality Write Error	4C (76) - Software Clock Error
1F (31) - Service Write Error	4D (77) - Sub Proc. Com Checksum Error
20 (32) - CPU Communications Error	4E (78) - Sine Table Generation Error
33 (51) - Program Memory Boot Block Error	4F (79) - Pers. Data Out of Range Err
34 (52) - Program Memory Main Block Error	50 (80) - Service Data Out of Range Error
35 (53) - Uninitializes Personality EEPROM Error	51 (81) - Motor Block Checksum Error

See Also:

P0023 **P0024** **P0025** **P0026** **P0027**	**Digital input 1 configuration** **Digital input 2 configuration** **Digital input 3 configuration** **Digital input 4 configuration** **Fault reset input configuration**					
	Defines which flags are controlled by corresponding digital input. If no bits are specified, the input is unassigned. Multiple bits can be assigned for each input.					
	Name:	"Input 1 cfg" "Input 2 cfg" "Input 3 cfg" "Input 4 cfg" "Fault reset input cfg"	**Attr:** 0x0001001			(16-bit binary)
	Units:	Not supported	**Phase 2:**	RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	Not supported	**Value** Bit 0 - Bit 1 - Bit 2 - Bit 3 - Bit 4 - Bit 5 - Bit 6 - 13 Bit 14 Bit 15	Flag number: Torque Override Integrator Inhibit (Reserved) Forward Enable Reverse Enable Operation Mode Override (Reserved) Fault Reset (Reserved)		
	Max:	Not supported				
Notes:	Input 1 is also used as Probe 2 and Input 2 is used as Probe 1/HomeSwitch.					
See Also:	See "P0109""Input flags" on page 2-88.					

P0028 **P0029** **P0030** **P0031**	**Digital Output 1 configuration** **Digital Output 2 configuration** **Digital Output 3 configuration** **Digital Output 4 configuration**				
	Defines which flags are monitored on the corresponding digital output. If no bits are assigned for an output, it is unassigned. Multiple bits can be assigned for each output.				
	Name:	"Digital output 1 cfg" "Digital output 2 cfg" "Digital output 3 cfg" "Digital output 4 cfg"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	Not supported	**Value** Flag number: Bit 0 - In-Position (IDN P0124) Bit 1 - Within Position Window (IDN S0336) Bit 2 - Zero Speed (IDN S03331) Bit 3 - Within Speed Window (IDN S0330) Bit 4 - Positive ILimit (IDN P0122) Bit 5 - Negative ILimit (IDN P0123) Bit 6 - At Speed (IDN S0332) Bit 7 - Drive Enabled Bit 8 - DC Bus Charged Bit 9 - Disabling Fault Bit 10 - 15 (Reserved)		
	Max:	Not supported			
Notes:	RO when the drive is enabled.				
See Also:	See "P0036""Digital outputs override" on page 2-64.				

P0032	**Enable Input Override**				
	Overrides the requirement for a hardwired enable signal.				
	Name:	"Enable Input Override"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	Not supported	**Value** 0 or 1		
	Max:	Not supported			
Notes:	Setting the value to 1 will cause the enable signal to be ignored.				
See Also:					

P0036	Digital outputs override				
	Allows the digital outputs to be set to user-specifiec states (via IDN P0037), rather thatn by the flags specified by IDNs P0028 - P0031.				
	Name:	"Digital outputs override"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	Not supported	**Value**	Digital output override enable:	
			Bit 0 -	0 = Normal (outputs defined by flags) 1 = Override (outputs defined by IDN P0037)	
	Max:	Not supported			
Notes:					
See Also:	See "P0037""User digital outputs" on page 2-64. See "P0130""Ready output" on page 2-93. See "P0131""Brake output" on page 2-93. See "P0132""Output 1" on page 2-94. See "P0133""Output 2" on page 2-94. See "P0134""Output 3" on page 2-94. See "P0135""Output 4" on page 2-95.				

P0037	User digital outputs				
	Defines the values to be assigned to the digital putputs if the "Digital outputs override" (IDN P0036) is enabled. The individual bits are also accessable from IDNs P0130 - P0135.				
	Name:	"User digital outputs"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	Not supported	**Value**	Output states: (1 = active; 0 = inactive)	
			Bit 0 -	READY Output State (P0130)	
			Bit 1 -	BRAKE Output State (P0132)	
			Bit 2 -	OUTPUT 1 Output State (P0132)	
			Bit 3 -	OUTPUT 2 Output State (P0133)	
			Bit 4 -	OUTPUT 3 Output State (P0134)	
			Bit 5 -	OUTPUT 4 Output State (P0135)	
	Max:	Not supported			
Notes:					
See Also:	See "P0036""Digital outputs override" on page 2-64.				

P0038	Brake output active delay				
	Defines the time delay between enabling the drive and activating the BRAKE output. Negative values indicate the time that the BRAKE is active before enabling the drive.				
	Name:	"Brake active delay"	**Attr:** 0x0021001		(16-bit signed decimal)
	Units:	"milliseconds"	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	-32,767	**Value**	(Written by the master)	
	Max:	32,767			
Notes:	An active BRAKE output should release the mechanical brake on the load. RO when the drive is enabled.				
See Also:					

P0039	Brake output inactive delay				
	Defines the time delay between disabling the drive and deactivating the BRAKE output. Negative values indicate the time that the BRAKE is inactive before disabling the drive.				
	Name:	"Brake inactive delay"	**Attr:** 0x0021001		(16-bit signed decimal)
	Units:	"milliseconds"	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	-32,767	**Value**	(Written by the master)	
	Max:	32,767			
Notes:	An inactive BRAKE output should activate the mechanical brake on the load. RO when the drive is enabled.				
See Also:					

P0040	Digital input status				
	This is the present state of the digital inputs.				
	Name:	"Digital input status"	**Attr:** 0x0001001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value** Bit 0 - Bit 1 - Bit 2 - Bit 3 - Bit 4 - Bit 5 -	Digital input states: (1 = active; 0 = inactive) RESET FAULTS Input State ENABLE Input State INPUT1 Input State INPUT2 Input State INPUT3 Input State INPUT4 Input State	
	Max:	Not supported			
Notes:					
See Also:					

P0041	Digital output status				
	This is the present state of the digital outputs.				
	Name:	"Digital output status"	**Attr:** 0x0001001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value** Bit 0 - Bit 1 - Bit 2 - Bit 3 - Bit 4 - Bit 5 -	Digital output states: (1 = active; 0 = inactive) READY output State BRAKE output State OUTPUT1 Output State OUTPUT2 Output State OUTPUT3 Output State OUTPUT4 Output State	
	Max:	Not supported			
Notes:					
See Also:					

P0042 P0043	**Analog output 1 configuration** **Analog output 2 configuration**				
	Defines which signal is monitored on the specified analog output.				
	Name:	"Analog output 1 cfg" "Analog output 2 cfg"	**Attr:** 0x0011001		(16-bit unsigned decimal)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	0	**Value**	Signal number:	
			00	Current Command	
			01	Current - Average Command	
			02	Current - Positive Peak	
			03	Current - Negative Peak	
			04	Positive ILimit	
			05	Negative ILimit	
			06	Motor Velocity	
			07	Velocity Command	
			08	Velocity Error	
			09	Motor Position	
			10	Position Command	
			11	Position Error	
			12	Position - Peak Positive Error	
			13	Position - Peak Negative Error	
			20	Master Position	
			21	Position Loop Output	
			22	Velocity Loop Output	
			23	Filter Output	
			24	Not Used	
			25	R Phase Current	
			26	T Phase Current	
			27	Torque Current	
			28	Field Current	
			29	Torque Voltage	
			30	Field Voltage	
			31	A/D Command Value	
			32	Bus Voltage	
	Max:	32			
Notes:					
See Also:					

P0044 P0045	**Analog output 1 offset** **Analog output 2 offset**				
	Defines the amount of offset applied to the corresponding analog output.				
	Name:	"Analog output 1 offset" Analog output 2 offset"	**Attr:** 0x0021001		(16-bit signed decimal)
	Units:	"millivolts"	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	-32,767	**Value**	Offset value (written by the master)	
	Max:	32,767			
Notes:					
See Also:					

P0046 P0047	**Analog output 1 scale** **Analog output 2 scale**				
	Defines the scale applied to the corresponding analog output.				
	Name:	"Analog output 1 scale" Analog output 2 scalet"	**Attr:** 0x0021001		(16-bit signed decimal)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	-32,767	**Value**	Scale value (written by the master)	
	Max:	32,767			
Notes:	Units are dependent on selected trigger source. Torque, current (Amps x 128) Velocity (counts/msec) Position (counts) Other (x 1)				
See Also:					

P0048	**Analog output override enable**				
	This allows the to be written to directly from the master rather than following the signal selected by IDNs P0042 and P0043.				
	Name:	"Analog outputs override"	**Attr:** 0x0001001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	Not supported	**Value** Bit 0 -	Digital output override enable: 0 = Normal (outputs defined by flags) 1 = Override (outputs defined by IDNs P0049 and P0050)	
	Max:	Not supported			
Notes:					
See Also:					

P0049 P0050	**User analog output 1 value** **User analog output 2 value**				
	Defines the value to write to the corresponding analog output when the “Analog output override” (IDN P0048) is enabled.				
	Name:	“User analog output 1 value” User analog output 2 value”	**Attr:** 0x0021001		(16-bit signed decimal)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	-10,000	**Value** (Written by the master)		
	Max:	10,000			
Notes:					
See Also:					

P0051 P0052	**Analog output 1 value** **Analog output 2 value**				
	Returns the value of the corresponding analog output.				
	Name:	“Analog output 1” “Analog output 2”	**Attr:** 0x0021001		(16-bit signed decimal)
	Units:	“millivolts”	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	Not supported	**Value** (Value of analog output)		
	Max:	Not supported			
Notes:					
See Also:					

P0053	**Analog command input**				
	This is the value of the analog “Command” input before the scale and offset are applied.				
	Name:	“Analog command input”	**Attr:** 0x0021001		(16-bit signed decimal)
	Units:	“millivolts”	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value** Value of command input		
	Max:	Not supported			
Notes:					
See Also:					

P0054	Analog FCL input				
	This is the value of the Forward Current Limit analog input (+ILIMIT)				
	Name:	"Analog FCL input"	**Attr:** 0x06111E85		(16-bit unsigned decimal, S.F. = $7813x10^{-6}$)
	Units:	"Amps"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value** FCL input value		
	Max:	Not supported			
Notes:					
See Also:					

P0055	Analog RCL input				
	This is the value of the Reverse Current Limit analog input (-ILIMIT)				
	Name:	"Analog RCL input"	**Attr:** 0x06111E85		(16-bit unsigned decimal, S.F. = $7813x10^{-6}$)
	Units:	"Amps"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value** RCL input value		
	Max:	Not supported			
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 the 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 refect load disturbances.				
	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 the 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 the 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 the 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 unsigned decimal)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	0	**Value** (Written by the 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 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 the 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 the 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 the 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 the master)		
	Max:	1,000			
Notes:					
See Also:					

P0064	Velocity loop update period				
	This is the velocity loop execution period.				
	Name:	"Vel loop update period"	**Attr:** 0x00110001		(16-bit unsigned decimal)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4:** RW
	Min:	0	**Value**	Velocity loop update period:	
			00:	200 µs	
			01:	400 µs	
			02:	600 µs	
			03:	800 µs	
			04:	1000 µs	
			05:	1200 µs	
			06:	1400 µs	
			07:	1600 µs	
	Max:	7			
Notes:	RO when the drive is enabled.				
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 P066) 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 the 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:	
			Bit 0:	0 = Disabled	
				1 = Enabled	
	Max:	Not supported			
Notes:					
See Also:					

P0067	Drive mode						
	This indicates if the velocity control loop is active while in position mode.						
	Name:	"Drive mode"	**Attr:** 0x00110001				(16-bit unsigned decimal)
	Units:	Not supported	**Phase 2:**	RW	**Phase 3:**	RW	**Phase 4:** RW
	Min:	0	**Value**	Mode: 00 = Velocity mode (velocity loop active) 01 = Torque mode (velocity loop inactive)			
	Max:	1					
Notes:	RO when the drive is enabled.						
See Also:							

P0068	Motor number						
	This is the motor in the drive's motor parameter table currently being used. The word is separated into various groups of bit fields to specify the encoder resolution, motor type, and table ID. The setting 0 (0000) indicates that no motor has been selected and the setting 65535 (FFFF) indicates motor parameters were set individually and not read from the drive's motor parameter table.						
	Name:	"Motor number	**Attr:** 0x00110001				(16-bit binary)
	Units:	Not supported	**Phase 2:**	RW	**Phase 3:**	RW	**Phase 4:** RW
	Min:	Not supported	**Value**	Motor ID: Bits 15-12: Motor table ID Bits 11 -8: Encoder resolution Bit 7: Type 0 = synchronous 1 = induction Bits 6-0: Motor number			
	Max:	Not supported					
Notes:	RO when the drive is enabled. After a new motor number and/or a new motor parameter is written, the drive must be reset for the change to take effect (the drive cannot be enabled until it is reset). Currently, only the value of 0 for Motor table ID is supported. The values for Encoder resolution are motor table-specific. For motor table 0, the following values are used: 0 => 2000 lines 1=> 1000 lines 2 =>2500 lines 3 =>5000 lines 4 =>500 lines 5 =>3000 lines 6 =>1500 lines 7 =>1024 lines (8 - 15 not used)						
See Also:	See "P0119""Reset drive" on page 2-90.						

P0069	Encoder lines				
	This is the number of lines on the motor encoder.				
	Name:	"Encoder lines"	**Attr:** 0x00110001		(16-bit unsigned decimal)
	Units:	"lines/rev"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	100	**Value** Number of encoder lines		
	Max:	15,000			
Notes:	RW when custom motor is selected and the drive is disabled. After a new motor number and/or new motor parameter is written, the drive must be reset for the change to take effect (the drive cannot be enabled until it is reset).				
See Also:	See "P0119""Reset drive" on page 2-90.				

P0070	Motor maximum speed				
	This is the maximum safe operating speed of the motor.				
	Name:	"Motor max speed"	**Attr:** 0x09123B9B		(32-bit unsigned decimal, S.F. = $15259x10^{-9}$)
	Units:	"RPM"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	0	**Value** Maximum motor speed		
	Max:	2,147,483,6f47			
Notes:	RW when custom motor is selected and the drive is disabled. After a new motor number and/or a new motor parameter is written, the drive must be reset for the change to take effect (the drive cannot be enabled until it is reset).				
See Also:	See "P0119""Reset drive" on page 2-90.				

P0071	Motor maximum peak current				
	This is the peak current rating of the motor.				
	Name:	"Motor peak current"	**Attr:** 0x06111E85		(16-bit unsigned decimal, S.F. = $7813x10^{-6}$)
	Units:	"Amps"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	0	**Value** Motor peak current		
	Max:	32,767			
Notes:	RW when custom motor is selected and the drive is disabled. After a new motor number and/or a new motor parameter is written, the drive must be reset for the change to take effect (the drive cannot be enabled until it is reset).				
See Also:	See "P0119""Reset drive" on page 2-90.				

P0072	Motor maximum continuous current				
	This is the continuous current rating of the motor.				
	Name:	"Motor cont current"	**Attr:** 0x06111E85		(16-bit unsigned decimal, S.F. = $7813x10^{-6}$)
	Units:	"Amps"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	0	**Value**	Motor continuous current	
	Max:	32,767			
Notes:	RW when custom motor is selected and the drive is disabled. After a new motor number and/or a new motor parameter is written, the drive must be reset for the change to take effect (the drive cannot be enabled until it is reset).				
See Also:	See "P0119""Reset drive" on page 2-90.				

P0073	Motor Kt				
	This is the sine wave torque constant (Kt) of the motor.				
	Name:	"Motor Kt"	**Attr:** 0x08115F5E		(16-bit unsigned decimal, S.F. = $24414x10^{-8}$)
	Units:	"N-m/Amp"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	1	**Value**	Motor's Kt	
	Max:	65,535			
Notes:	RW when custom motor is selected and the drive is disabled. After a new motor number and/or a new motor parameter is written, the drive must be reset for the change to take effect (the drive cannot be enabled until it is reset).				
See Also:	See "P0119""Reset drive" on page 2-90.				

P0074	Motor Jm				
	This is the motor's rotor inertia (Jm).				
	Name:	"Motor Jm"	**Attr:** 0x06113D09		(16-bit unsigned decimal, S.F. = $15625x10^{-6}$)
	Units:	"kg-cm2"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	1	**Value**	Motor's Jm	
	Max:	65,535			
Notes:	RW when custom motor is selected and the drive is disabled. After a new motor number and/or a new motor parameter is written, the drive must be reset for the change to take effect (the drive cannot be enabled until it is reset).				
See Also:	See "P0119""Reset drive" on page 2-90.				

P0075	Motor Ke				
	This is the back EMF constant (Ke).				
	Name:	"Motor Ke"	**Attr:** 0x07119897		(16-bit unsigned decimal, S.F. = $39063x10^{-7}$)
	Units:	"Volts/kRPM"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	1	**Value** Motor's Ke		
	Max:	65,535			
Notes:	RW when custom motor is selected and the drive is disabled. After a new motor number and/or a new motor parameter is written, the drive must be reset for the change to take effect (the drive cannot be enabled until it is reset).				
See Also:	See "P0119""Reset drive" on page 2-90.				

P0076	Motor winding resistance				
	This is the phase to phase resistance of the motor windings.				
	Name:	"Motor winding res"	**Attr:** 0x07119897		(16-bit unsigned decimal, S.F. = $39063x10^{-7}$)
	Units:	"Ohms"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	1	**Value** Motor's winding resistance		
	Max:	65,535			
Notes:	RW when custom motor is selected and the drive is disabled. After a new motor number and/or a new motor parameter is written, the drive must be reset for the change to take effect (the drive cannot be enabled until it is reset).				
See Also:	See "P0119""Reset drive" on page 2-90.				

P0077	Motor winding inductance				
	This is the phase to phase inductance of the motor windings.				
	Name:	"Motor winding ind"	**Attr:** 0x07119897		(16-bit unsigned decimal, S.F. = $39063x10^{-7}$)
	Units:	"mH"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	1	**Value** Motor's winding inductance		
	Max:	65,535			
Notes:	RW when custom motor is selected and the drive is disabled. After a new motor number and/or a new motor parameter is written, the drive must be reset for the change to take effect (the drive cannot be enabled until it is reset).				
See Also:	See "P0119""Reset drive" on page 2-90.				

P0078	Motor thermostat					
	This indicates if the motor contains a thermostat.					
	Name:	"Motor thermostat"	**Attr:** 0x00010001			(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO	
	Min:	Not supported	**Value**	Motor thermostat flag:		
			00:	No thermostat present		
			01:	Thermostat present		
	Max:	65,535				
Notes:	RW when custom motor is selected and the drive is disabled. After a new motor number and/or a new motor parameter is written, the drive must be reset for the change to take effect (the drive cannot be enabled until it is reset).					
See Also:	See "P0119""Reset drive" on page 2-90.					

P0079	Motor commutation type					
	This is the commutation type of the motor.					
	Name:	"Motor commutation type"	**Attr:** 0x00110001			(16-bit unsigned decimal)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO	
	Min:	0	**Value**	Commutation type:		
			00:	Induction motor		
			01:	Six Step ABS/Index		
			02:	Eight Step ABS/Index		
			03:	Hall/Index		
			04:	Hall/Hall		
	Max:	4				
Notes:	RW when custom motor is selected and the drive is disabled. After a new motor number and/or a new motor parameter is written, the drive must be reset for the change to take effect (the drive cannot be enabled until it is reset).					
See Also:	See "P0119""Reset drive" on page 2-90.					

P0080	Motor thermal time constant					
	This is the thermal time constant for protecting the motor.					
	Name:	"Motor thermal TC"	**Attr:** 0x00110001			(16-bit unsigned decimal)
	Units:	"sec"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO	
	Min:	0	**Value**	Thermal time constant		
	Max:	65,535				
Notes:	RW when custom motor is selected and the drive is disabled. After a new motor number and/or a new motor parameter is written, the drive must be reset for the change to take effect (the drive cannot be enabled until it is reset).					
See Also:	See "P0119""Reset drive" on page 2-90.					

P0081	Motor thermal time constant enable				
	This enables the use of the thermal time constant (IDN P0080) for protecting the motor.				
	Name:	"Motor thermal TC enable	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value** Thermal TC enable flag: Bit 0: 0 - Disabled 1 - Enabled		
	Max:	Not supported			
Notes:	RW when custom motor is selected and the drive is disabled. After a new motor number and/or a new motor parameter is written, the drive must be reset for the change to take effect (the drive cannot be enabled until it is reset).				
See Also:	See "P0119"“Reset drive” on page 2-90.				

P0082	Motor pole count				
	This is the number of poles in the motor.				
	Name:	"Motor pole count"	**Attr:** 0x00110001		(16-bit unsigned decimal)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	0	**Value** Number of motor poles: 00: Two poles 01: Four poles 02: Six poles 03: Eight poles		
	Max:	3			
Notes:	RW when custom motor is selected and the drive is disabled. After a new motor number and/or a new motor parameter is written, the drive must be reset for the change to take effect (the drive cannot be enabled until it is reset).				
See Also:	See "P0119"“Reset drive” on page 2-90.				

P0083	Motor hall offset				
	This is the offset of the Hall-effect sensor.				
	Name:	"Motor hall offset:	**Attr:** 0x00110001		(16-bit unsigned decimal)
	Units:	“degrees”	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	0	**Value** Hall offset		
	Max:	359			
Notes:	RW when custom motor is selected and the drive is disabled. After a new motor number and/or a new motor parameter is written, the drive must be reset for the change to take effect (the drive cannot be enabled until it is reset).				
See Also:	See "P0119"“Reset drive” on page 2-90.				

P0084	Motor index offset						
	This is the offset of the motor encoder index.						
	Name:	"Motor index offset"	**Attr:** 0x00110001				(16-bit unsigned decimal)
	Units:	"degrees"	**Phase 2:**	RO	**Phase 3:** RO	**Phase 4:**	RO
	Min:	0	**Value**	Index offset			
	Max:	359					
Notes:	RW when custom motor is selected and the drive is disabled. After a new motor number and/or a new motor parameter is written, the drive must be reset for the change to take effect (the drive cannot be enabled until it is reset).						
See Also:	See "P0119""Reset drive" on page 2-90.						

P0085	Motor table number						
	This is the motor table number.						
	Name:	"Motor table number"	**Attr:** 0x00110001				(16-bit unsigned decimal)
	Units:	Not supported	**Phase 2:**	RO	**Phase 3:** RO	**Phase 4:**	RO
	Min:	Not supported	**Value**	Motor table number			
	Max:	Not supported					
Notes:	Currently, only the motor table 0 is supported.						
See Also:							

P0086	Motor table version						
	This is the version of the motor table in the drive.						
	Name:	"Motor table version"	**Attr:** 0x00310001				(16-bit hexadecimal)
	Units:	Not supported	**Phase 2:**	RO	**Phase 3:** RO	**Phase 4:**	RO
	Min:	Not supported	**Value** Bits 15-8: Bits 7-0:	Motor table version: Major version Minor version			
	Max:	Not supported					
Notes:							
See Also:							

P0087	Position window time						
	This is the minimum time which the position error must be less than the position window size (IDN S0057) to set the In Position flag (IDN S0013, C3D, bit 6)						
	Name:	"Pos window time"	**Attr:** 0x00110001				(16-bit unsigned decimal)
	Units:	"milliseconds"	**Phase 2:**	RW	**Phase 3:** RW	**Phase 4:**	RW
	Min:	0	**Value**	Position window time			
	Max:	255					
Notes:							
See Also:							

P0088	Position error time					
	This is the minimum time which the position error must be greater than the Monitoring Window (IDN (S0159) to cause an Excess Position Error fault. (IDN 0011, C1D, bit 11)					
	Name:	"Pos error time"	**Attr:** 0x00110001			(16-bit unsigned decimal)
	Units:	"milliseconds"	**Phase 2:** RW	**Phase 3:** RW	**Phase 4**	RW
	Min:	0	**Value**	Position error time		
	Max:	65,535				
Notes:						
See Also:						

P0089	Velocity error limit					
	This is the minimum velocity error which allows the Excess Velocity Error flag to remain clear (IDN S0129, MC1D, bit 7)					
	Name:	"Vel error limit"	**Attr:** 0x0X22XXXX			(32-bit unsigned decimal, C.F. changes based on scaling)
	Units:	"Velocity units)	**Phase 2:** RW	**Phase 3:** RW	**Phase 4**	RW
	Min:	0	**Value**	Velocity error limit		
	Max:	(Velocity max)				
Notes:						
See Also:						

P0090	Velocity error time					
	This is the minimum time which the velocity error must be greater than the Velocity Error Limit to cause an Excess Velocity Error fault. (IDN S0129, MC1D, bit 7)					
	Name:	"Vel error time"	**Attr:** 0x00110001			(16-bit unsigned decimal)
	Units:	"milliseconds"	**Phase 2:** RW	**Phase 3:** RW	**Phase 4**	RW
	Min:	0	**Value**	Velocity error time		
	Max:	65,535				
Notes:						
See Also:						

P0091	Overspeed limit					
	This is the minimum motor velocity which causes the Overspeed fault to occur. (IDN S0129, MC1D, Bit 6)					
	Name:	"Overspeed 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**	Overspeed limit		
	Max:	(Velocity max)				
Notes:						
See Also:						

P0092	Current command						
	This is the output of the velocity loop after filtering and current limiting.						
	Name:	"Icmd"	**Attr:** 0x06211E85				(16-bit signed decimal, S.F. = $7813x10^{-6}$)
	Units:	(Amps)	**Phase 2:**	RW	**Phase 3:**	RW	**Phase 4** RW
	Min:	0	**Value**	Overspeed limit			
	Max:	(Velocity max)					
Notes:							
See Also:							

P0093	Average current command						
	This is the average output of the velocity control loop after filtering and current limiting.						
	Name:	"Icmd avg"	**Attr:** 0x06211E85				(16-bit signed decimal, S.F. = $7813x10^{-6}$)
	Units:	"Amps"	**Phase 2:**	RO	**Phase 3:**	RO	**Phase 4** RO
	Min:	Not supported	**Value**	Average current command			
	Max:	Not supported					
Notes:							
See Also:							

P0094	Peak positive position error						
	This is the maximum amount the position command has led the motor position.						
	Name:	"Peak + pos err"	**Attr:** 0x0X22XXX				(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**	Peak positive position error			
	Max:	Not supported					
Notes:							
See Also:							

P0095	Peak negative position error						
	This is the maximum amount the position command has lagged the motor position.						
	Name:	"Peak - pos err"	**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**	Peak negative position error			
	Max:	Not supported					
Notes:							
See Also:							

P0096	**Peak positive current command**				
	This is the positive peak output of the velocity control loop.				
	Name: "Peak + Icmd"	**Attr:** 0x06211E85			(16-bit signed decimal, S.F. = $7813x10^{-6}$)
	Units: "Amps"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4** RO	
	Min: Not supported	**Value** Peak positive current command			
	Max: Not supported				
Notes:					
See Also:					

P0097	**Peak negative current command**				
	This is the negative peak output of the velocity control loop.				
	Name: "Peak - Icmd"	**Attr:** 0x06211E85			(16-bit signed decimal, S.F. = $7813x10^{-6}$)
	Units: "Amps"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4** RO	
	Min: Not supported	**Value** Peak negative current command			
	Max: Not supported				
Notes:					
See Also:					

P0098	**Reset peaks procedure command**				
	This procedure resets the peak values - positive position error (P0094), negative position error (P0095), positive current command (P0096), and negative current command (P0097).				
	Name: "Reset peaks"	**Attr:** 0x00090001			(16-bit binary, procedure command)
	Units: Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4** RW	
	Min: Not supported	**Value** (Procedure command bit pattern)			
	Max: Not supported				
Notes:					
See Also:					

P0099	**Field current**				
	This is the actual field-producing current of the motor.				
	Name: "I field"	**Attr:** 0x06211E85			(16-bit signed decimal, S.F. = $7813x10^{-6}$)
	Units: "Amps"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4** RO	
	Min: Not supported	**Value** Field current			
	Max: Not supported				
Notes:					
See Also:					

P0100	**Torque current**					
	This is the actual torque-producing current of the motor.					
	Name:	"I trq"	**Attr:** 0x06211E85			(16-bit signed decimal, S.F. = $7813x10^{-6}$)
	Units:	"Amps"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4** RO	
	Min:	Not supported	**Value** Torque current			
	Max:	Not supported				
Notes:						
See Also:						

P0101	**R-phase current**					
	This is the current in the R-phase of the motor.					
	Name:	"I r-phase"	**Attr:** 0x06211E85			(16-bit signed decimal, S.F. = $7813x10^{-6}$)
	Units:	"Amps"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4** RO	
	Min:	Not supported	**Value** R-phase current			
	Max:	Not supported				
Notes:						
See Also:						

P0102	**T-phase current**					
	This is the current in the T-phase of the motor.					
	Name:	"I t-phase"	**Attr:** 0x06211E85			(16-bit signed decimal, S.F. = $7813x10^{-6}$)
	Units:	"Amps"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4** RO	
	Min:	Not supported	**Value** T-phase current			
	Max:	Not supported				
Notes:						
See Also:						

P0103	**Field voltage command**					
	This is the field-producing voltage of the motor.					
	Name:	"V field"	**Attr:** 0x00210001			(16-bit signed decimal)
	Units:	"Volts"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4** RO	
	Min:	Not supported	**Value** Field voltage			
	Max:	Not supported				
Notes:						
See Also:						

P0104	Torque voltage command				
	This is the torque-producing voltage of the motor.				
	Name: "V trq"	**Attr:** 0x00210001			(16-bit signed decimal)
	Units: "Volts"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4** RO	
	Min: Not supported	**Value** Torque voltage			
	Max: Not supported				
Notes:					
See Also:					

P0105	Motor thermal filter				
	This is the value of the motor thermal filter, expressed as a percentage of the maximum value to cause a motor thermal fault (i.e., when this value reaches 100, the motor thermal fault will occur).				
	Name: "Mtr therm filter"	**Attr:** 0x06211E85			(16-bit signed decimal, S.F. = $7813x10^{-6}$)
	Units: "%"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4** RO	
	Min: Not supported	**Value** Current motor thermal filter value			
	Max: Not supported				
Notes:					
See Also:					

P0106 (AT)	Average field current				
	This is the average field current seen by the motor.				
	Name: "I field avg"	**Attr:** 0x06211E85			(16-bit signed decimal, S.F. = $7813x10^{-6}$)
	Units: "Amps"	**Phase 2:** RO	**Phase 3:** RO	**Phase 4** RO	
	Min: Not supported	**Value** Average field current			
	Max: Not supported				
Notes:					
See Also:					

P0107	**Run state**					
	This is the present state of the drive and possible fault conditions. The reported faults are only ones with Fault Mask values set to Disable Drive or Decel, Then Disable Drive. The state values 1...127 are reserved for fault indications. The values 0...-128 are reserved for non-fault state information which is to be indicated, but not shown as a fault.					
	Name:	"Run state"	**Attr:** 0x00210001			(16-bit signed decimal)
	Units:	Not supported	**Phase 2:**	RO	**Phase 3:** RO	**Phase 4** RO
	Min:	Not supported	**Value**	Run state:		
			-1:	Drive Enabled		
			00:	Drive Ready		
			01:	+24 VDC Fuse Blown		
			02:	+5 VDC Fuse Blown		
			03:	Encoder Power Fuse Blown		
			04:	Motor Overtemperature, Thermostat		
			05:	IPM Fault (Overtemperature, Overcurrent, Short Circuit)		
			06:	Channel IM Line Break		
			07:	Channel BM Line Break		
			08:	Channel AM Line Break		
			09:	Bus Undervoltage		
			10:	Bus Overvoltage		
			11:	Illegal Hall State		
			12:	Sub Processor Unused Interrupt		
			13:	Main Processor Unused Interrupt		
			17:	Excessive Average Current		
			18:	Motor Overspeed		
			19:	Excessive Following Error		
			20:	Motor Encoder State Error		
			21:	Master Encoder State Error		
			22:	Motor Thermal Protection		
			23:	IPM Thermal Protection		
			28:	Enabled with No Motor Selected		
			29:	Motor Selection no in Table		
			30:	Personality Write Error		
			31:	Service Write Error		
			32:	CPU Communications Error		
	Max:	Not supported				
Notes:						
See Also:						

P0108	**Fault status**				
	This is the present state of the possible fault conditions. If a specific Fault Group Mask is set to unlatched warning, the appropriate bit is not latched in this register and may clear when the condition is removed. If the specific Fault Group Mask is not set to unlatche warning, the appropriate bit is latched in this register and will remain set until the drive is reset.				
	Name: "Fault status"	**Attr:** 0x00210001			(32-bit binary)
	Units: Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4** RO	
	Min: Not supported	**Value**	Fault status (1 = active, 0 = inactive):		
		Bit 0:	I/O +24 VDC Overcurrent		
		Bit 1:	Encoder +6 VDC Overcurrent		
		Bit 2:	Encoder +7 VDC Overcurrent		
		Bit 3:	Motor Overtemperature, Thermostat		
		Bit 4:	IPM Fault (Overtemp/Overcurrent/Short Circuit		
		Bit 5:	Channel IM Line Break		
		Bit 6:	Channel BM Line Break		
		Bit 7:	Channel AM Line Break		
		Bit 8:	BusUndervoltage		
		Bit 9:	Bus Overvoltage		
		Bit 10:	Illegal Hall State		
		Bit 11:	Sub Processor Unused Interrupt		
		Bit 12:	Main Processor Unused Interrupt		
		Bit 16:	Excessive Average Current		
		Bit 17:	Motor Overspeed		
		Bit 18:	Excessive Following Error		
		Bit 19:	Motor Encoder State Error		
		Bit 20:	Master Encoder State Error		
		Bit 21:	Motor Thermal Protection		
		Bit 22:	IPM Thermal Protection		
		Bit 23:	Velocity Error		
		Bit 24:	Commutation Angle Error		
		Bit 26:	Axis Not Homed		
		Bit 27:	Enabled with No Motor Selected		
		Bit 28:	Motor Selection not in Table		
		Bit 31:	CPU Communications Error		
	Max: Not supported				
Notes:					
See Also:					

P0109 (AT)	**Input flags**						
	This is the status of the various flags that are affected by digital inputs.						
	Name:	"Input flags"	**Attr:** 0x00010001				(16-bit binary)
	Units:	Not supported	**Phase 2:**	RO	**Phase 3:**	RO	**Phase 4** RO
	Min:	Not supported	**Value**	Input flags:			
			Bit 0:	Torque Mode			
			Bit 1:	Integrator Inhibit			
			Bit 2:	(Reserved)			
			Bit 3:	Forward Clamp			
			Bit 4:	Reverse Clamp			
			Bits 5 - 13:	(Reserved)			
			Bit 14:	Reset Faults			
			Bit 15:	Enable Active			
	Max:	Not supported					
Notes:							
See Also:	See "P0023""Digital input 1 configuration" on page 2-62. See "P0024""Digital input 2 configuration" on page 2-62. See "P0025""Digital input 3 configuration" on page 2-62. See "P0026""Digital input 4 configuration" on page 2-62. See "P0027""Fault reset input configuration" on page 2-62.						

P0110 (AT)	**Output flags**						
	This is the status of the various flags that can affect the digital outputs.						
	Name:	"Output flags"	**Attr:** 0x00010001				(16-bit binary)
	Units:	Not supported	**Phase 2:**	RO	**Phase 3:**	RO	**Phase 4** RO
	Min:	Not supported	**Value**	Output flags:			
			Bit 0:	In-position			
			Bit 1:	Within Position Window			
			Bit 2:	Zero Speed			
			Bit 3:	Within Speed Window			
			Bit 4:	Positive ILimit			
			Bit 5:	Negative ILimit			
			Bit 6:	At Speed			
			Bit 7:	Drive Enabled			
			Bit 8:	DC Bus Charged			
			Bits 9 - 14:	(Reserved)			
			Bit 15:	Brake Active			
			Bit 16:	Drive Ready			
	Max:	Not supported					
Notes:							
See Also:	See "P0028""Digital Output 1 configuration" on page 2-63. See "P0029""Digital Output 2 configuration" on page 2-63. See "P0030""Digital Output 3 configuration" on page 2-63. See "P0031""Digital Output 4 configuration" on page 2-63. See "P0036""Digital outputs override" on page 2-64.						

P01101 **P0112** **P0113** **P0114** **P0115** **P0116** **(RTS)**	**Reset faults input** **Enable input** **Input 1** **Input 2** **Input 3** **Input 4**					
	This is the state of the corresponding digital input.					
	Name:	"Rst fault input" "Enable input" "Input1" "Input2" "Input3" "Input4"	**Attr:** 0x00010001			(16-bit binary)
	Units:	Not supported	**Phase 2:**	RO	**Phase 3:** RO	**Phase 4** RO
	Min:	Not supported	**Value** Bit 0:	State of input pin: 0 = Inactive 1 = Active		
	Max:	Not supported				
Notes:						
See Also:						

P0117 **P0118** **(AT)**	**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 enabled, 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:	Not supported	**Value**	(Probe index position offset)		
	Max:	Not supported				
Notes:						
See Also:	See "S0076"“Position data scaling type” on page 2-18. See "S0130"“Probe value 1 positive edge” on page 2-27. See "S0131"“Probe value 1 negative edge” on page 2-27. See "S0132"“Probe value 2 positive edge” on page 2-27. See "S0133"“Probe value 2 negative edge” on page 2-28. See "S0169"“Probe control parameter” on page 2-34. See "S0170"“Probing cycle procedure command” on page 2-35. See "P0004"“Extended probe control parameter” on page 2-53. See "P0005"“Extended probe status” on page 2-54.					

P0119	Reset drive						
	Writing “0x5A87” (23,175) followed by “0x1C24” (7,204) will reset the drive (SERCOS communications will be lost).						
	Name:	“Reset drive”	**Attr:** 0x00310001				(16-bit hexadecimal)
	Units:	Not supported	**Phase 2:**	RW	**Phase 3:**	RW	**Phase 4** RW
	Min:	Not supported	**Value**	(Written by the master)			
	Max:	Not supported					
Notes:							
See Also:							

P0120	Forward enabled						
	This indicates if the drive is enabled to cause the motor to travel in the forward direction.						
	Name:	“Reset drive”	**Attr:** 0x00010001				(16-bit binary)
	Units:	Not supported	**Phase 2:**	RO	**Phase 3:**	RO	**Phase 4** RO
	Min:	Not supported	**Value** Bit 0:	State of the “Forware enabled” flag: 0 = Inactive 1 = Active			
	Max:	Not supported					
Notes:							
See Also:							

P0121	Reverse enabled						
	This indicates if the drive is enabled to cause the motor to travel in the reverse direction.						
	Name:	“Reverse enabled”	**Attr:** 0x00010001				(16-bit binary)
	Units:	Not supported	**Phase 2:**	RO	**Phase 3:**	RO	**Phase 4** RO
	Min:	Not supported	**Value** Bit 0:	State of the “Reverse enabled” flag: 0 = Inactive 1 = Active			
	Max:	Not supported					
Notes:							
See Also:							

P0122	In forward current limit						
	This indicates if the drive output is current limited in the forward direction.						
	Name:	“In + current limit”	**Attr:** 0x00010001				(16-bit binary)
	Units:	Not supported	**Phase 2:**	RO	**Phase 3:**	RO	**Phase 4** RO
	Min:	Not supported	**Value** Bit 0:	State of the “Forward current limit” flag: 0 = Inactive 1 = Active			
	Max:	Not supported					
Notes:							
See Also:							

P0123	**In reverse current limit**				
	This indicates if the drive output is current limited in the reverse direction.				
	Name:	"In - current limit"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4** RO
	Min:	Not supported	**Value**	State of the "Reverse current limit" flag:	
			Bit 0:	0 = Inactive 1 = Active	
	Max:	Not supported			
Notes:					
See Also:					

P0124	**In position**				
	This indicates if the motor is "in position". This is true if the position error is less than the "In position window" (IDN)for longer than the "In position time" (IDN) and the speed is less than the "Zero speed" (IDN).				
	Name:	"In - current limit"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4** RO
	Min:	Not supported	**Value**	State of the "In position" flag:	
			Bit 0:	0 = Inactive 1 = Active	
	Max:	Not supported			
Notes:					
See Also:					

P0125	**Brake active**				
	This indicates the state of the brake output.				
	Name:	"Brake active"	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4** RO
	Min:	Not supported	**Value**	State of the Brake output:	
			Bit 0:	0 = Inactive 1 = Active	
	Max:	Not supported			
Notes:					
See Also:					

P0126	DC bus charged					
	This indicates if the DC bus is energized.					
	Name:	"DC bus charged"	**Attr:** 0x00010001			(16-bit binary)
	Units:	Not supported	**Phase 2:** RO	**Phase 3:** RO	**Phase 4** RO	
	Min:	Not supported	**Value**	State of the DC bus: Bit 0: 0 = DC bus is not energized 1 = DC bus energized		
	Max:	Not supported				
Notes:						
See Also:						

P0127	Positive current limit					
	This is the user-specified positive current limit for the drive. The minimum of this value, the peak rating of the drive, the peak rating of the motor, and the +ILimit analog input is used as the limiting value.					
	Name:	"Positive current limit"	**Attr:** 0x06211E85			(16-bit unsigned decimal, S.F. = $7813x10^{-6}$)
	Units:	"Amps"	**Phase 2:** RW	**Phase 3:** RW	**Phase 4** RW	
	Min:	0	**Value**	Value for positive limit (written by the master)		
	Max:	32,767				
Notes:						
See Also:						

P0128	Negative current limit					
	This is the user-specified negative current limit for the drive. The minimum of this value, the peak rating of the drive, the peak rating of the motor, and the -ILimit analog input is used as the limiting value.					
	Name:	"Positive current limit"	**Attr:** 0x06211E85			(16-bit unsigned decimal, S.F. = $7813x10^{-6}$)
	Units:	"Amps"	**Phase 2:** RW	**Phase 3:** RW	**Phase 4** RW	
	Min:	0	**Value**	Value for negative limit (written by the master)		
	Max:	32,767				
Notes:						
See Also:						

P0129	**Fault current limit**				
	This is the user-specified average current faulting value. This parameter is provided to allow a faulting current value which is less than the capacity of the drive and motor. If the motor current exceeds this limit, the “Excessive average current” bit (bit 5 of MC1D, IDN S0129) will be set.				
	Name:	“Fault current limit”	**Attr:** 0x06211E85		(16-bit unsigned decimal, S.F. = $7813x10^{-6}$)
	Units:	“Amps”	**Phase 2:** RW	**Phase 3:** RW	**Phase 4** RW
	Min:	0	**Value**	Value for negative limit (written by the master)	
	Max:	32,767			
Notes:					
See Also:					

P0130	**Ready output**				
	Defines the value to be assigned to the digital output “Ready” if the “Digital outputs override” (IDN P0036) is enabled.				
	Name:	“Ready output”	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4** RW
	Min:	Not supported	**Value** Bit 0:	Output state: 0 = Inactive 1 = Active	
	Max:	Not supported			
Notes:					
See Also:	See "P0036"“Digital outputs override” on page 2-64. See "P0037"“User digital outputs” on page 2-64.				

P0131	**Brake output**				
	Defines the value to be assigned to the digital output “Brake” if the “Digital outputs override” (IDN P0036) is enabled.				
	Name:	“Brake output”	**Attr:** 0x00010001		(16-bit binary)
	Units:	Not supported	**Phase 2:** RW	**Phase 3:** RW	**Phase 4** RW
	Min:	Not supported	**Value** Bit 0:	Output state: 0 = Inactive 1 = Active	
	Max:	Not supported			
Notes:					
See Also:	See "P0036"“Digital outputs override” on page 2-64. See "P0037"“User digital outputs” on page 2-64.				

P0132	**Output 1**						
	Defines the value to be assigned to the digital output “Output 1” if the “Digital outputs override” (IDN P0036) is enabled.						
	Name:	“Output 1”	**Attr:** 0x00010001				(16-bit binary)
	Units:	Not supported	**Phase 2:**	RW	**Phase 3:**	RW	**Phase 4** RW
	Min:	Not supported	**Value** Bit 0:	Output state: 0 = Inactive 1 = Active			
	Max:	Not supported					
Notes:							
See Also:	See "P0036""“Digital outputs override” on page 2-64. See "P0037""“User digital outputs” on page 2-64.						

P0133	**Output 2**						
	Defines the value to be assigned to the digital output “Output 2” if the “Digital outputs override” (IDN P0036) is enabled.						
	Name:	“Output 2”	**Attr:** 0x00010001				(16-bit binary)
	Units:	Not supported	**Phase 2:**	RW	**Phase 3:**	RW	**Phase 4** RW
	Min:	Not supported	**Value** Bit 0:	Output state: 0 = Inactive 1 = Active			
	Max:	Not supported					
Notes:							
See Also:	See "P0036""“Digital outputs override” on page 2-64. See "P0037""“User digital outputs” on page 2-64.						

P0134	**Output 3**						
	Defines the value to be assigned to the digital output “Output 3” if the “Digital outputs override” (IDN P0036) is enabled.						
	Name:	“Output 3”	**Attr:** 0x00010001				(16-bit binary)
	Units:	Not supported	**Phase 2:**	RW	**Phase 3:**	RW	**Phase 4** RW
	Min:	Not supported	**Value** Bit 0:	Output state: 0 = Inactive 1 = Active			
	Max:	Not supported					
Notes:							
See Also:	See "P0036""“Digital outputs override” on page 2-64. See "P0037""“User digital outputs” on page 2-64.						

P0135	Output 4						
	Defines the value to be assigned to the digital output “Output 4” if the “Digital outputs override” (IDN P0036) is enabled.						
	Name:	“Output 4”	**Attr:** 0x00010001				(16-bit binary)
	Units:	Not supported	**Phase 2:**	RW	**Phase 3:**	RW	**Phase 4** RW
	Min:	Not supported	**Value** Bit 0:	Output state: 0 = Inactive 1 = Active			
	Max:	Not supported					
Notes:							
See Also:	See "P0036"“Digital outputs override” on page 2-64. See "P0037"“User digital outputs” on page 2-64.						

P0136	Home index distance						
	During the Drive-Controlled Homing procedure (IDN S0148), if the Home Switch and the Marker Pulse are both enabled, this IDN will contain the difference between the Marker Pulse and Home Switch positions. It will be valid when the homing procedure is complete.						
	Name:	“Home Index Distance”	**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**	(Home index distance)			
	Max:	Not supported					
Notes:							
See Also:	See "S0147"“Homing parameter” on page 2-30. See "S0148"“Drive-controlled homing procedure command” on page 2-31. See "P0001"“Extended homing parameter” on page 2-51.						

P0137	SERCOS baud rate select						
	Selects the baud rate used in the SERCOS communication ring. This can be either 2 MB or 4 MB and it must match the baud rate used by the master.						
	Name:	“SERCOS baud rate”	**Attr:** 0x00110001				(16-bit unsigned decimal)
	Units:	Not supported	**Phase 2:**	RW	**Phase 3:**	RW	**Phase 4** RW
	Min:	0	**Value**	SERCOS Baud Rate: 0 = 4 MB 1 = 2 MB 2 = Selected by jumper on option board			
	Max:	2					
Notes:	Any baud rate changes will occur the next time the drive goes to phase 0. When writing, this value is always saved in NVRAM so that it will still be in effect when the drive goes into phase 0. The current baud rate is displayed by the decimal point on the 7-segment display. If it is lit, the drive is at 4 MB and if it is not lit, the drive is at 2 MB.						
See Also:							

P0138	Command Position from Master Controller				
	Allows the value sent to the drive from the Master in S00047 to be read.				
	Name:	"Cmd Pos From Master"	**Attr:** 0x0X22XXXX		(32-bit signed decimal, C.F. changes based on scaling)
	Units:	Counts	**Phase 2:** RO	**Phase 3:** RO	**Phase 4:** RO
	Min:	Not supported	**Value** xxxxx		
	Max:	Not supported			
Notes:	Setting the value to 1 will cause the enable signal to be ignored.				
See Also:					