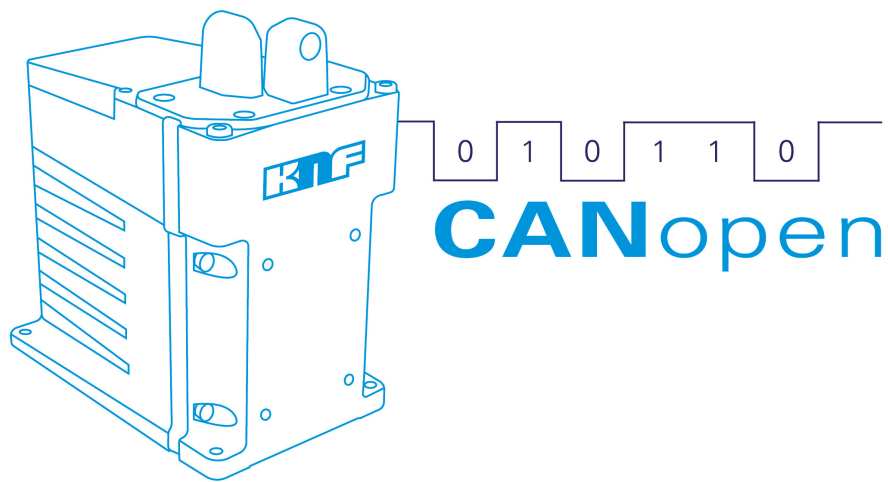




FD 1.200 – Product Documentation

Object Description



Firmware Version: V01_01_00

March 19, 2026

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Chapter 1

Application Specific Information

1.1 Key controlled Objects

The most commonly used objects to control the FD-System:

Measurement Value	Index	SubIndex	Data Type	Unit	Chapter
Speed Prime	0x301a	0x01	float32	Hz	2.3.4.6
Direction Flow	0x301c	0x01	uint8_t	0=forward	2.6.2.2
Target Volume	0x3017	0x01	float32	l	2.6.2.26
Frequency Dosing Cycle	0x3018	0x01	float32	Hz	2.6.2.4
Ratio Suction Dosing Cycle	0x3019	0x01	float32		2.6.2.11
Numbers Dosing Cycle	0x301b	0x01	uint32_t	Shots	2.6.2.10
State Dosing Pump	0x2804	0x04	uint8_t		2.6.2.24
Command Dosing Task	0x5f08	0x03	uint8_t		2.2.1.1
Command Dosing Task State	0x5f08	0x01	uint32_t		2.2.1.2

1.2 Common Use Cases

This section describes the most common functions of the FD-Systems.

1.2.1 Prime

To fill or empty the system, the prime mode can be used. In this mode, the pump runs in continuous rotary operation.

1. Set flow direction

- Direction Flow [2.6.2.2](#)
- CANopen: [0x301c-0x01](#) on page [159](#)
- ValueToWrite: 0x00, 0 - forward, see section [4.6](#)

2. Set the speed prime for the desired motor speed.

- Speed Prime [2.3.4.6](#)
- CANopen: [0x301a-0x01](#) on page [159](#)
- ValueToWrite: 0x40a00000 float representation of 5.0[Hz] - 300[rpm]

Code Example:

```

1   sendCANopen(0x301c, 0x01, 0);           // Set direction to forward
2   sendCANopen(0x301a, 0x01, 0x40a00000); // Set prime speed to 300 rpm
3   // Wait for 5 seconds
4   sendCANopen(0x301a, 0x01, 0x00000000); // Stop prime with speed to 0

```

Listing 1: Prime mode example: runs the pump in rotary mode for 5 seconds to quickly fill the system.

1.2.2 Dispense 2ml with symmetric suction ratio in 20 seconds

Dispenses 2ml fluid within 20s.

1. Set the target dispense volume per dosing cycle.
 - Target Volume [2.6.2.26](#)
 - CANopen: [0x3017-0x01](#) on page [158](#)
 - ValueToWrite: [0x3951b717](#) float representation of $0.0002[l] = 200[\mu l]$
2. Set the frequency for the dosing cycles.
 - Frequency Dosing Cycle [2.6.2.4](#)
 - CANopen: [0x3018-0x01](#) on page [158](#)
 - ValueToWrite: [0x3f000000](#) float representation of $0.5[Hz]$
3. Set the suction ratio for the dosing cycles.
 - Ratio Suction Dosing Cycle [2.6.2.11](#)
 - CANopen: [0x3019-0x01](#) on page [159](#)
 - ValueToWrite: [0x3f000000](#) float representation of 0.5
4. Set the number of the dosing cycles.
 - Numbers Dosing Cycle [2.6.2.10](#)
 - CANopen: [0x301b-0x01](#) on page [159](#)
 - ValueToWrite: [0x0000000a](#) uint32 representation for 10 [Dosing Cycles]
5. Set dosing mode.
 - Command Dosing Task [2.2.1.1](#)
 - CANopen: [0x5f08-0x03](#) on page [160](#)
 - ValueToWrite: [0x03](#), Dosing-Mode, see section [4.2](#)
6. Send dosing command.
 - Command Dosing Task State [2.2.1.2](#)
 - CANopen: [0x5f08-0x01](#) on page [160](#)
 - ValueToWrite: [0x01](#), Dosing-Mode, see section [4.1](#)
7. Read the pump state.
 - State Dosing Pump [2.6.2.24](#)
 - CANopen: [0x2804-0x04](#) on page [156](#)
 - ValueToRead: [0x04](#) uint8 representation for examples Dosing, see section [4.13](#)
8. Read the number of completed dosing cycles.
 - Number Complete Dosing Cycle [2.6.2.9](#)
 - CANopen: [0x301b-0x02](#) on page [159](#)
 - ValueToRead: [0x00000001](#) uint32 representation for examples for one shot.

```

1 // First dosing
2 sendCANopen(0x3017, 0x01, 0x3951b717); // Dispense Volume 0.0002ul
3 sendCANopen(0x3018, 0x01, 0x3f000000); // Cycle Frequency
4 sendCANopen(0x3019, 0x01, 0x3f000000); // Suction Ratio
5 sendCANopen(0x301b, 0x01, 0x0000000a); // Number of cycles: 10
6 sendCANopen(0x5f08, 0x03, 0x03); // Set dosing mode
7 sendCANopen(0x5f08, 0x01, 0x01); // Command Start
8 while (idle != readCANopen(0x2804, 0x04)) {
9     // Wait until all 10 cycles are finished
10     performedDosingCycles = readCANopen(0x301b, 0x02);
11 }

```

Listing 2: Code for dosing a specific volume: delivering 10 shots within 20 seconds

1.2.3 Dispense 125 μ l with 75% Suction Ratio

Use the same object like in the example above, but use other values for dispense volume, number of dosing cycle and suction ratio.

```
1      // Second dosing sequence
2      sendCANopen(0x3017, 0x01, 0x3951b717);      // Dispense volume: 125  $\mu$ L
3      sendCANopen(0x3018, 0x01, 0x3f000000);      // Cycle frequency: 0.5 Hz
4      sendCANopen(0x3019, 0x01, 0x3f400000);      // Suction ratio: 75%
5      sendCANopen(0x301b, 0x01, 0x00000001);      // Number of cycles: 1
6      sendCANopen(0x5f08, 0x03, 0x03);           // Set dosing mode
7      sendCANopen(0x5f08, 0x01, 0x01);           // Start dosing
8
9      while (idle != readCANopen(0x2804, 0x04)) {
10         // wait unit 1 cycles are done
11         performedDosingCycles = readCANopen(0x301b, 0x02)
12     }
```

Listing 3: Code for dosing a specific volume: delivering one shot with an unsymmetrical suction ratio.

Chapter 2

Parameters

2.1 Access Control

2.1.1 Device

2.1.1.1 Authentication Device Challenge 0

Key	AuthenticationDeviceChallenge0		
ID	494		
Name	Authentication Device Challenge 0		
Description	First 4 Bytes of the Authentication Challenge		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x5f0b-0x02 on page 160		

2.1.1.2 Authentication Device Challenge 1

Key	AuthenticationDeviceChallenge1		
ID	495		
Name	Authentication Device Challenge 1		
Description	Second 4 Bytes of the Authentication Challenge		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x5f0b-0x03 on page 160		

2.1.1.3 Authentication Device Challenge 2

Key	AuthenticationDeviceChallenge2		
ID	496		
Name	Authentication Device Challenge 2		
Description	Third 4 Bytes of the Authentication Challenge		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x5f0b-0x04 on page 160		

2.1.1.4 Authentication Device Challenge 3

Key	AuthenticationDeviceChallenge3		
ID	497		
Name	Authentication Device Challenge 3		
Description	Last 4 Bytes of the Authentication Challenge. Writing this field triggers the encryption.		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x5f0b-0x05 on page 160 Callback: post-write		

2.1.1.5 Authentication Device Cypher Text 0

Key	AuthenticationDeviceCypherText0		
ID	498		
Name	Authentication Device Cypher Text 0		
Description	First 4 Bytes of the Encrypted Data		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x5f0b-0x06 on page 160		

2.1.1.6 Authentication Device Cypher Text 1

Key	AuthenticationDeviceCypherText1		
ID	499		
Name	Authentication Device Cypher Text 1		
Description	Second 4 Bytes of the Encrypted Data		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x5f0b-0x07 on page 160		

2.1.1.7 Authentication Device Cypher Text 2

Key	AuthenticationDeviceCypherText2		
ID	500		
Name	Authentication Device Cypher Text 2		
Description	Third 4 Bytes of the Encrypted Data		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x5f0b-0x08 on page 160		

2.1.1.8 Authentication Device Cypher Text 3

Key	AuthenticationDeviceCypherText3		
ID	501		
Name	Authentication Device Cypher Text 3		
Description	Last 4 Bytes of the Encrypted Data		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x5f0b-0x09 on page 160		

2.1.2 User

2.1.2.1 Command Authentication User Authenticated

Key	CommandAuthenticationUserAuthenticated
ID	587
Name	Command Authentication User Authenticated
Description	The actual authenticated user
Category	Operational Value / Parameter
Type	uint8
Enum	Typ: Users , see section 4.16 on page 102 Def: Users::Unauthenticated
Read / Write	1 / 0
Refs / Callback	CANopen: 0x5f0f-0x0b on page 161

2.1.2.2 Command Authentication User Authentication State

Key	CommandAuthenticationUserAuthenticationState
ID	777
Name	Command Authentication User Authentication State
Description	Command / State of the user authentication.
Category	Operational Value / Parameter
Type	int32
Enum	Typ: CommandActionsStates , see section 4.1 on page 94 Def: CommandActionsStates::Idle
Read / Write	1 / 1
Refs / Callback	CANopen: 0x5f0f-0x01 on page 161 Callback: post-write

2.1.2.3 Command Authentication User Challenge 0

Key	CommandAuthenticationUserChallenge0		
ID	579		
Name	Command Authentication User Challenge 0		
Description	First 4 Bytes of the Authentication Challenge		
Category	Measurement		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x5f0f-0x03 on page 161		

2.1.2.4 Command Authentication User Challenge 1

Key	CommandAuthenticationUserChallenge1		
ID	580		
Name	Command Authentication User Challenge 1		
Description	Second 4 Bytes of the Authentication Challenge		
Category	Measurement		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x5f0f-0x04 on page 161		

2.1.2.5 Command Authentication User Challenge 2

Key	CommandAuthenticationUserChallenge2		
ID	581		
Name	Command Authentication User Challenge 2		
Description	Third 4 Bytes of the Authentication Challenge		
Category	Measurement		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x5f0f-0x05 on page 161		

2.1.2.6 Command Authentication User Challenge 3

Key	CommandAuthenticationUserChallenge3		
ID	582		
Name	Command Authentication User Challenge 3		
Description	Last 4 Bytes of the Authentication Challenge		
Category	Measurement		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x5f0f-0x06 on page 161		

2.1.2.7 Command Authentication User Cypher Text 0

Key	CommandAuthenticationUserCypherText0		
ID	583		
Name	Command Authentication User Cypher Text 0		
Description	First 4 Bytes of the Encrypted Data		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x5f0f-0x07 on page 161 CANopen: 0x5f14-0x03 on page 162		

2.1.2.8 Command Authentication User Cypher Text 1

Key	CommandAuthenticationUserCypherText1		
ID	584		
Name	Command Authentication User Cypher Text 1		
Description	Second 4 Bytes of the Encrypted Data		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x5f0f-0x08 on page 161 CANopen: 0x5f14-0x04 on page 162		

2.1.2.9 Command Authentication User Cypher Text 2

Key	CommandAuthenticationUserCypherText2		
ID	585		
Name	Command Authentication User Cypher Text 2		
Description	Third 4 Bytes of the Encrypted Data		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x5f0f-0x09 on page 161 CANopen: 0x5f14-0x05 on page 162		

2.1.2.10 Command Authentication User Cypher Text 3

Key	CommandAuthenticationUserCypherText3		
ID	586		
Name	Command Authentication User Cypher Text 3		
Description	Last 4 Bytes of the Encrypted Data		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x5f0f-0x0a on page 161 CANopen: 0x5f14-0x06 on page 162		

2.1.2.11 Command Authentication User Selection

Key	CommandAuthenticationUserSelection
ID	752
Name	Command Authentication User Selection
Description	Selected user for the user access rights configuration
Category	Operational Value / Parameter
Type	uint8
Enum	Typ: Users , see section 4.16 on page 102 Def: Users::Unauthenticated
Read / Write	1 / 1
Refs / Callback	CANopen: 0x5f0f-0x0c on page 161 CANopen: 0x5f14-0x07 on page 162

2.2 Command

2.2.1 Dosing Task

2.2.1.1 Command Dosing Task

Key	CommandDosingTask
ID	401
Name	Command Dosing Task
Description	Defines the action to be executed in the context of the <code>CommandDosingTaskState</code> command. Select the task according the enum.
Category	Operational Value / Parameter
Type	uint8
Enum	Typ: CommandsDosingTask , see section 4.2 on page 94 Def: CommandsDosingTask::NoCommand
Read / Write	1 / 1
Refs / Callback	CANopen: 0x5f08-0x03 on page 160

2.2.1.2 Command Dosing Task State

Key	CommandDosingTaskState
ID	402
Name	Command Dosing Task State
Description	Commands the next dosing action. The action is specified in <code>CommandDosingTask</code> . Write 'Start' to trigger the command. Read the current execution state from this parameter.
Category	Operational Value / Parameter
Type	int32
Enum	Typ: CommandActionsStates , see section 4.1 on page 94 Def: CommandActionsStates::Idle
Read / Write	1 / 1
Refs / Callback	CANopen: 0x5f08-0x01 on page 160 Callback: post-write

2.2.2 Reset

2.2.2.1 Command Reset State

Key	CommandResetState
ID	101
Name	Command Reset State
Description	Triggers a system reset. Write 'Start' to trigger the command. Reading the current execution state is not possible since the system does reset.
Category	Operational Value / Parameter
Type	int32
Enum	Typ: CommandActionsStates , see section 4.1 on page 94 Def: CommandActionsStates::Idle
Read / Write	1 / 1
Refs / Callback	CANopen: 0x5f02-0x01 on page 160 Callback: post-write

2.2.3 Storage

2.2.3.1 Command Storage Parameter

Key	CommandStorageParameter
ID	30
Name	Command Storage Parameter
Description	The command to be executed when triggered.
Category	Operational Value / Parameter
Type	uint8
Enum	Typ: CommandsStorageParameter , see section 4.3 on page 94 Def: CommandsStorageParameter::NoCommand
Read / Write	1 / 1
Refs / Callback	CANopen: 0x5f11-0x03 on page 161

2.2.3.2 Command Storage Parameter State

Key	CommandStorageParameterState
ID	29
Name	Command Storage Parameter State
Description	Command and state interface for persistent parameter storage. Write 'Start' to initiate the command. Read the current execution state from this parameter.
Category	Operational Value / Parameter
Type	int32
Enum	Typ: CommandActionsStates , see section 4.1 on page 94 Def: CommandActionsStates::Idle
Read / Write	1 / 1
Refs / Callback	CANopen: 0x5f11-0x01 on page 161 Callback: post-write

2.3 Drive

2.3.1 Current Control

2.3.1.1 Current Motor Actual

Key	CurrentMotorActualCia402		
ID	75		
Name	Current Motor Actual		
Description	Actual total current supplied to the motor.		
Category	Measurement		
Type	int16		
Numeric Communication	[%]	Def:	0
		Min:	-3000
		Max:	3000
Numeric UI	[%]	Def:	0
		Min:	-3000
		Max:	3000
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x6878-0x00 on page 157 Function: Current Motor Actual		

2.3.1.2 Current Motor DAxis Actual

Key	CurrentMotorDAxisActual		
ID	527		
Name	Current Motor DAxis Actual		
Description	Actual Current d-Axis		
Category	Measurement		
Type	float32		
Numeric Communication	[A]	Def:	0.0
		Min:	-10.0
		Max:	10.0
Numeric UI	[A]	Def:	0
		Min:	-10
		Max:	10
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x2801-0x08 on page 155		

2.3.1.3 Current Motor DAxis Reference

Key	CurrentMotorDAxisReference		
ID	526		
Name	Current Motor DAxis Reference		
Description	Current Reference d-Axis		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[A]	Def:	0.0
		Min:	-10.0
		Max:	10.0
Numeric UI	[A]	Def:	0
		Min:	-10
		Max:	10
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x2801-0x06 on page 155		

2.3.1.4 Current Motor QAxis Actual

Key	CurrentMotorQAxisActual		
ID	529		
Name	Current Motor QAxis Actual		
Description	Actual Current q-Axis		
Category	Measurement		
Type	float32		
Numeric Communication	[A]	Def:	0.0
		Min:	-10.0
		Max:	10.0
Numeric UI	[A]	Def:	0
		Min:	-10
		Max:	10
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x2801-0x09 on page 156		

2.3.1.5 Current Motor QAxis Reference

Key	CurrentMotorQAxisReference		
ID	528		
Name	Current Motor QAxis Reference		
Description	Current Reference q-Axis		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[A]	Def:	0.0
		Min:	-10.0
		Max:	10.0
Numeric UI	[A]	Def:	0
		Min:	-10
		Max:	10
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x2801-0x07 on page 155		

2.3.1.6 Voltage DAxis Reference

Key	VoltageDAxisReference		
ID	530		
Name	Voltage DAxis Reference		
Description	Voltage Reference d-Axis		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[V]	Def:	0.0
		Min:	-50.0
		Max:	50.0
Numeric UI	[V]	Def:	0
		Min:	-50
		Max:	50
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x2801-0x0a on page 156		

2.3.1.7 Voltage QAxis Reference

Key	VoltageQAxisReference		
ID	531		
Name	Voltage QAxis Reference		
Description	Voltage Reference a-Axis		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[V]	Def:	0.0
		Min:	-50.0
		Max:	50.0
Numeric UI	[V]	Def:	0
		Min:	-50
		Max:	50
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x2801-0x0b on page 156		

2.3.2 Motor

2.3.2.1 Torque Actual

Key	TorqueActualCia402		
ID	65		
Name	Torque Actual		
Description	Actual torque at the motor axle, calculated based on current and motor data.		
Category	Operational Value / Parameter		
Type	int16		
Numeric Communication	[%]	Def:	0
		Min:	-3000
		Max:	3000
Numeric UI	[%]	Def:	0
		Min:	-3000
		Max:	3000
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x6877-0x00 on page 157 Function: Current Motor QAxis Actual Filtered		

2.3.2.2 Torque Demand

Key	TorqueDemandCia402		
ID	64		
Name	Torque Demand		
Description	Demanded torque at the motor axle, calculated based on current and motor data.		
Category	Operational Value / Parameter		
Type	int16		
Numeric Communication	[%]	Def:	0
		Min:	-3000
		Max:	3000
Numeric UI	[%]	Def:	0
		Min:	-3000
		Max:	3000
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x6874-0x00 on page 156 Function: Current Motor Demand		

2.3.3 Position Control

2.3.3.1 Position Demand

Key	PositionDemandCia402		
ID	439		
Name	Position Demand		
Description	Current demand position of the next moving. The position depends on the specified PositionTargetCia402.		
Category	Operational Value / Parameter		
Type	int32		
Numeric Communication	[2 ¹⁶ / rotation]	Def:	0
		Min:	-2147483648
		Max:	2147483647
Numeric UI	[2 ¹⁶ / rotation]	Def:	0
		Min:	-2.147483648e+09
		Max:	2.147483647e+09
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x6862-0x00 on page 156		

2.3.3.2 Speed Control Effort Position Controller

Key	SpeedControlEffortPositionControllerCia402		
ID	442		
Name	Speed Control Effort Position Controller		
Description	Speed control effort based on the position controller.		
Category	Operational Value / Parameter		
Type	int32		
Numeric Communication	[mHz]	Def:	0
		Min:	-100000
		Max:	100000
Numeric UI	[rpm]	Def:	0
		Min:	-6000
		Max:	6000
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x68fa-0x00 on page 157 Scaling: $\text{SpeedControlEffortPositionControllerCia402} = \text{SpeedControlEffortPositionController} \cdot 10^3$		

2.3.4 Speed Control

2.3.4.1 Acceleration Profile

Key	AccelerationProfileCia402		
ID	49		
Name	Acceleration Profile		
Description	Maximum acceleration limit defined in the motion profile. See also motor limit AccelerationMaximum.		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[mHz / s]	Def:	50000
		Min:	500
		Max:	5000000
Numeric UI	[rpm / s]	Def:	3000
		Min:	30
		Max:	300000
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x6883-0x00 on page 157 Scaling: $AccelerationProfileCia402 = AccelerationProfile \cdot 10^3$		

2.3.4.2 Current Motor Feed Forward

Key	CurrentMotorFeedForward		
ID	396		
Name	Current Motor Feed Forward		
Description	Defines the torque building feed forward current for motor controller. The current is applied onto the q-axis.		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[A]	Def:	0.0
		Min:	-10.0
		Max:	10.0
Numeric UI	[A]	Def:	0
		Min:	-10
		Max:	10
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x2800-0x10 on page 155		

2.3.4.3 Speed Actual

Key	SpeedActual		
ID	36		
Name	Speed Actual		
Description	Actual measured speed at the motor axis.		
Category	Measurement		
Type	float32		
Numeric Communication	[Hz]	Def:	0.0
		Min:	-100.0
		Max:	100.0
Numeric UI	[rpm]	Def:	0
		Min:	-6000
		Max:	6000
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x2800-0x0b on page 155		

2.3.4.4 Speed Actual

Key	SpeedActualCia402		
ID	39		
Name	Speed Actual		
Description	Actual speed measured at the motor axis.		
Category	Measurement		
Type	int32		
Numeric Communication	[mHz]	Def:	0
		Min:	-100000
		Max:	100000
Numeric UI	[rpm]	Def:	0
		Min:	-6000
		Max:	6000
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x686c-0x00 on page 156 Scaling: $SpeedActualCia402 = SpeedActualFiltered \cdot 10^3$		

2.3.4.5 Speed Controller Integral Gain

Key	SpeedControllerIntegralGain		
ID	424		
Name	Speed Controller Integral Gain		
Description	Integral gain of the speed controller.		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[-]	Def:	1.0
		Min:	0.01
		Max:	100.0
Numeric UI	[-]	Def:	1
		Min:	0.01
		Max:	100
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x2800-0x08 on page 155 Storage File Name: Parameter on page 174		

2.3.4.6 Speed Prime

Key	SpeedPrime		
ID	629		
Name	Speed Prime		
Description	Set Speed for priming Application		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[Hz]	Def:	0.0
		Min:	0.0
		Max:	5.0
Numeric UI	[rpm]	Def:	0
		Min:	0
		Max:	300
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x301a-0x01 on page 159 Storage File Name: Parameter on page 174		

2.3.4.7 Speed Target

Key	SpeedTargetCia402		
ID	32		
Name	Speed Target		
Description	Target speed for the motor. This value is passed to the trajectory generator.		
Category	Operational Value / Parameter		
Type	int32		
Numeric Communication	[mHz]	Def:	0
		Min:	-100000
		Max:	100000
Numeric UI	[rpm]	Def:	0
		Min:	-6000
		Max:	6000
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x68ff-0x00 on page 157 Scaling: $SpeedTargetCia402 = SpeedTarget \cdot 10^3$		

2.4 IO

2.4.1 MPIO 1

2.4.1.1 Mpio 1 Input Mode

Key	Mpio1InputMode
ID	509
Name	Mpio 1 Input Mode
Description	Set Input Mode of Mpio 1
Category	Operational Value / Parameter
Type	uint8
Enum	Typ: MpioInputModes , see section 4.10 on page 101 Def: MpioInputModes::Disabled
Read / Write	1 / 1
Refs / Callback	CANopen: 0x2005-0x02 on page 153 Storage File Name: Parameter on page 174 Callback: post-write

2.4.1.2 Mpio 1 Input Value

Key	Mpio1InputValue		
ID	257		
Name	Mpio 1 Input Value		
Description	The value measured on MPIO1 input.		
Category	Measurement		
Type	float32		
Numeric Communication	[-]	Def:	0.0
		Min:	-9999999.0
		Max:	9999999.0
Numeric UI	[-]	Def:	0
		Min:	-9999999
		Max:	9999999
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x6403-0x15 on page 154		

2.4.1.3 Mpio 1 Input Value Offset

Key	Mpio1InputValueOffset		
ID	256		
Name	Mpio 1 Input Value Offset		
Description	The offset for calculating the input value.		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[-]	Def:	0.0
		Min:	-9999999.0
		Max:	9999999.0
Numeric UI	[-]	Def:	0
		Min:	-9999999
		Max:	9999999
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x642e-0x15 on page 154 Storage File Name: Parameter on page 174		

2.4.1.4 Mpio 1 Input Value Scaling

Key	Mpio1InputValueScaling		
ID	255		
Name	Mpio 1 Input Value Scaling		
Description	The scaling factor for calculating the input value.		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[-]	Def:	3.20588235
		Min:	-9999999.0
		Max:	9999999.0
Numeric UI	[-]	Def:	3.20588235
		Min:	-9999999
		Max:	9999999
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x642f-0x15 on page 155 Storage File Name: Parameter on page 174		

2.4.1.5 Mpio 1 Level

Key	Mpio1Level
ID	508
Name	Mpio 1 Level
Description	Set the voltage level of the Mpio 1
Category	Operational Value / Parameter
Type	uint8
Enum	Typ: MpioLevels , see section 4.11 on page 101 Def: MpioLevels::24V
Read / Write	1 / 1
Refs / Callback	CANopen: 0x2005-0x01 on page 153 Storage File Name: Parameter on page 174 Callback: post-write

2.4.2 MPIO 2

2.4.2.1 Mpio 2 Input Mode

Key	Mpio2InputMode
ID	516
Name	Mpio 2 Input Mode
Description	Set Input Mode of Mpio 2
Category	Operational Value / Parameter
Type	uint8
Enum	Typ: MpioInputModes , see section 4.10 on page 101 Def: MpioInputModes::Disabled
Read / Write	1 / 1
Refs / Callback	CANopen: 0x2006-0x02 on page 153 Storage File Name: Parameter on page 174 Callback: post-write

2.4.2.2 Mpio 2 Input Value

Key	Mpio2InputValue		
ID	260		
Name	Mpio 2 Input Value		
Description	The value measured on MPIO2 input.		
Category	Measurement		
Type	float32		
Numeric Communication	[-]	Def:	0.0
		Min:	-9999999.0
		Max:	9999999.0
Numeric UI	[-]	Def:	0
		Min:	-9999999
		Max:	9999999
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x6403-0x16 on page 154		

2.4.2.3 Mpio 2 Input Value Offset

Key	Mpio2InputValueOffset		
ID	259		
Name	Mpio 2 Input Value Offset		
Description	The offset for calculating the input value.		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[-]	Def:	0.0
		Min:	-9999999.0
		Max:	9999999.0
Numeric UI	[-]	Def:	0
		Min:	-9999999
		Max:	9999999
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x642e-0x16 on page 154 Storage File Name: Parameter on page 174		

2.4.2.4 Mpio 2 Input Value Scaling

Key	Mpio2InputValueScaling		
ID	258		
Name	Mpio 2 Input Value Scaling		
Description	The scaling factor for calculating the input value.		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[-]	Def:	3.20588235
		Min:	-9999999.0
		Max:	9999999.0
Numeric UI	[-]	Def:	3.20588235
		Min:	-9999999
		Max:	9999999
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x642f-0x16 on page 155 Storage File Name: Parameter on page 174		

2.4.2.5 Mpio 2 Level

Key	Mpio2Level		
ID	515		
Name	Mpio 2 Level		
Description	Set the voltage level of the Mpio 2		
Category	Operational Value / Parameter		
Type	uint8		
Enum	Typ: MpioLevels , see section 4.11 on page 101 Def: MpioLevels::24V		
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x2006-0x01 on page 153 Storage File Name: Parameter on page 174 Callback: post-write		

2.4.3 MPIO 3

2.4.3.1 Mpio 3 Input Mode

Key	Mpio3InputMode
ID	566
Name	Mpio 3 Input Mode
Description	Set Input Mode of Mpio 3
Category	Operational Value / Parameter
Type	uint8
Enum	Typ: MpioInputModes , see section 4.10 on page 101 Def: MpioInputModes::Disabled
Read / Write	1 / 1
Refs / Callback	CANopen: 0x2007-0x02 on page 154 Storage File Name: Parameter on page 174 Callback: post-write

2.4.3.2 Mpio 3 Input Value

Key	Mpio3InputValue		
ID	553		
Name	Mpio 3 Input Value		
Description	The value measured on MPIO3 input.		
Category	Measurement		
Type	float32		
Numeric Communication	[-]	Def:	0.0
		Min:	-9999999.0
		Max:	9999999.0
Numeric UI	[-]	Def:	0
		Min:	-9999999
		Max:	9999999
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x6403-0x17 on page 154		

2.4.3.3 Mpio 3 Input Value Offset

Key	Mpio3InputValueOffset		
ID	552		
Name	Mpio 3 Input Value Offset		
Description	The offset value for calculating the input value.		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[-]	Def:	0.0
		Min:	-9999999.0
		Max:	9999999.0
Numeric UI	[-]	Def:	0
		Min:	-9999999
		Max:	9999999
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x642e-0x17 on page 155 Storage File Name: Parameter on page 174		

2.4.3.4 Mpio 3 Input Value Scaling

Key	Mpio3InputValueScaling		
ID	551		
Name	Mpio 3 Input Value Scaling		
Description	The scaling factor for calculating the input value.		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[-]	Def:	3.20588235
		Min:	-9999999.0
		Max:	9999999.0
Numeric UI	[-]	Def:	3.20588235
		Min:	-9999999
		Max:	9999999
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x642f-0x17 on page 155 Storage File Name: Parameter on page 174		

2.4.3.5 Mpio 3 Level

Key	Mpio3Level
ID	565
Name	Mpio 3 Level
Description	Set the voltage level of the Mpio 3
Category	Operational Value / Parameter
Type	uint8
Enum	Typ: MpioLevels , see section 4.11 on page 101 Def: MpioLevels::24V
Read / Write	1 / 1
Refs / Callback	CANopen: 0x2007-0x01 on page 153 Storage File Name: Parameter on page 174 Callback: post-write

2.4.4 MPIO 4

2.4.4.1 Mpio 4 Input Mode

Key	Mpio4InputMode
ID	573
Name	Mpio 4 Input Mode
Description	Set Input Mode of Mpio 4
Category	Operational Value / Parameter
Type	uint8
Enum	Typ: MpioInputModes , see section 4.10 on page 101 Def: MpioInputModes::Disabled
Read / Write	1 / 1
Refs / Callback	CANopen: 0x2008-0x02 on page 154 Storage File Name: Parameter on page 174 Callback: post-write

2.4.4.2 Mpio 4 Input Value

Key	Mpio4InputValue		
ID	556		
Name	Mpio 4 Input Value		
Description	The value measured on MPIO4 input.		
Category	Measurement		
Type	float32		
Numeric Communication	[-]	Def:	0.0
		Min:	-9999999.0
		Max:	9999999.0
Numeric UI	[-]	Def:	0
		Min:	-9999999
		Max:	9999999
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x6403-0x18 on page 154		

2.4.4.3 Mpio 4 Input Value Offset

Key	Mpio4InputValueOffset		
ID	555		
Name	Mpio 4 Input Value Offset		
Description	Offset for calculating the input value		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[-]	Def:	0.0
		Min:	-9999999.0
		Max:	9999999.0
Numeric UI	[-]	Def:	0
		Min:	-9999999
		Max:	9999999
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x642e-0x18 on page 155 Storage File Name: Parameter on page 174		

2.4.4.4 Mpio 4 Input Value Scaling

Key	Mpio4InputValueScaling		
ID	554		
Name	Mpio 4 Input Value Scaling		
Description	Scaling factor for calculating the input value		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[-]	Def:	7.40914
		Min:	-9999999.0
		Max:	9999999.0
Numeric UI	[-]	Def:	7.40914
		Min:	-9999999
		Max:	9999999
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x642f-0x18 on page 155 Storage File Name: Parameter on page 174		

2.4.4.5 Mpio 4 Level

Key	Mpio4Level		
ID	572		
Name	Mpio 4 Level		
Description	Set the voltage level of the Mpio 4		
Category	Operational Value / Parameter		
Type	uint8		
Enum	Typ: MpioLevels , see section 4.11 on page 101 Def: MpioLevels::24V		
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x2008-0x01 on page 154 Storage File Name: Parameter on page 174 Callback: post-write		

2.5 Info / Statistics

2.5.1 Event Output Digital 1

Key	EventOutputDigital1		
ID	731		
Name	Event Output Digital 1		
Description	State of the event handler, is mapped to digital output 1		
Category	Measurement		
Type	bool		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	1
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	1
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x400e-0x01 on page 152		

2.5.2 Event Output Digital 2

Key	EventOutputDigital2		
ID	732		
Name	Event Output Digital 2		
Description	State of the event handler, is mapped to digital output 2		
Category	Measurement		
Type	bool		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	1
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	1
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x400e-0x02 on page 152		

2.5.3 State Indication Device State

Key	StateIndicationDeviceState		
ID	828		
Name	State Indication Device State		
Description	State Indication Device State		
Category	Measurement		
Type	uint16		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x4013-0x02 on page 153		

2.5.4 State Indication Event Id Severity

Key	StateIndicationEventIdSeverity		
ID	827		
Name	State Indication Event Id Severity		
Description	State Indication Event Id and Severity		
Category	Measurement		
Type	uint16		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x4013-0x01 on page 153		

2.5.5 State Indication Time Stamp

Key	StateIndicationTimeStamp		
ID	829		
Name	State Indication Time Stamp		
Description	State Indication Time Stamp		
Category	Measurement		
Type	uint32		
Numeric Communication	[ms]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[ms]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x4013-0x03 on page 153		

2.5.6 Device Information

2.5.6.1 Serial Number

Key	SerialNumber		
ID	1		
Name	Serial Number		
Description	The serial number assigned during production by the End-of-Line (EoL) system. The EoL retrieves the number from SAP.		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	42
		Min:	0
		Max:	4294967295
Numeric UI	[-]	Def:	42
		Min:	0
		Max:	4.294967295e+09
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x1018-0x04 on page 150 CANopen: 0x4001-0x03 on page 151		

2.5.6.2 Time Operation

Key	TimeOperation		
ID	28		
Name	Time Operation		
Description	Total operating time of the system, typically when the motor was running.		
Category	Measurement		
Type	uint32		
Numeric Communication	[s]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[s]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x400a-0x03 on page 152 Storage File Name: Shutdown on page 173		

2.5.6.3 Time Powered

Key	TimePowered		
ID	27		
Name	Time Powered		
Description	Total time the system has been powered.		
Category	Measurement		
Type	uint32		
Numeric Communication	[s]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[s]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x400a-0x02 on page 152 Storage File Name: Shutdown on page 173		

2.5.6.4 Time Since Boot

Key	TimeSinceBoot		
ID	26		
Name	Time Since Boot		
Description	Time elapsed since the last system start.		
Category	Measurement		
Type	uint32		
Numeric Communication	[s]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[s]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x400a-0x01 on page 152		

2.5.7 Error Information

2.5.7.1 Error Entry 1 Most Recent

Key	ErrorEntry1MostRecent		
ID	5		
Name	Error Entry 1 Most Recent		
Description	This object provides error information and contains the latest error.		
Category	Measurement		
Type	uint32		
Enum	Typ: EventCodes , see section 4.4 on page 94 Def: EventCodes::NoEvent		
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x1003-0x01 on page 150		

2.5.7.2 Error Entry 2

Key	ErrorEntry2
ID	6
Name	Error Entry 2
Description	This object provides error information.
Category	Measurement
Type	uint32
Enum	Typ: EventCodes , see section 4.4 on page 94 Def: EventCodes::NoEvent
Read / Write	1 / 0
Refs / Callback	CANopen: 0x1003-0x02 on page 150

2.5.7.3 Error Entry 3

Key	ErrorEntry3
ID	7
Name	Error Entry 3
Description	This object provides error information.
Category	Measurement
Type	uint32
Enum	Typ: EventCodes , see section 4.4 on page 94 Def: EventCodes::NoEvent
Read / Write	1 / 0
Refs / Callback	CANopen: 0x1003-0x03 on page 150

2.5.7.4 Error Entry 4

Key	ErrorEntry4
ID	8
Name	Error Entry 4
Description	This object provides error information.
Category	Measurement
Type	uint32
Enum	Typ: EventCodes , see section 4.4 on page 94 Def: EventCodes::NoEvent
Read / Write	1 / 0
Refs / Callback	CANopen: 0x1003-0x04 on page 150

2.5.7.5 Error Entry 5

Key	ErrorEntry5
ID	9
Name	Error Entry 5
Description	This object provides error information.
Category	Measurement
Type	uint32
Enum	Typ: EventCodes , see section 4.4 on page 94 Def: EventCodes::NoEvent
Read / Write	1 / 0
Refs / Callback	CANopen: 0x1003-0x05 on page 150

2.5.7.6 Error Entry Count

Key	ErrorEntryCount		
ID	4		
Name	Error Entry Count		
Description	Read and clear the error count and history.		
Category	Measurement		
Type	uint8		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	5
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	5
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x1003-0x00 on page 150 Callback: pre-read Callback: post-write		

2.5.7.7 Error Register

Key	ErrorRegister		
ID	2		
Name	Error Register		
Description	This object provides error information. The most recent error is stored, even if the error is no longer active.		
Category	Measurement		
Type	uint8		
Enum	Typ: EventRegisterFlags , see section 4.5 on page 99 Def: EventRegisterFlags::NoEvent		
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x1001-0x00 on page 150 Callback: pre-read		

2.5.8 Logger

2.5.8.1 Logger Entry

Key	LoggerEntry
ID	428
Name	Logger Entry
Description	Defines the entry to be send by the logger. A logger entry is completed by its level, module ID and a value.
Category	Measurement
Type	?
Enum	Typ: LoggerEntries , see section 4.17 on page 103 Def: LoggerEntries::NoLog
Read / Write	1 / 0
Refs / Callback	CANopen: 0x4004-0x01 on page 152

2.5.8.2 Logger Level Filter

Key	LoggerLevelFilter
ID	432
Name	Logger Level Filter
Description	Bit mask to enable/disable each logging level specifically.
Category	Operational Value / Parameter
Type	uint8
Enum	Typ: LoggerLevels , see section 4.7 on page 100 Def: LoggerLevels::AllLoggerLevels
Read / Write	1 / 1
Refs / Callback	CANopen: 0x4004-0x05 on page 152

2.5.8.3 Logger Module Id

Key	LoggerModuleId
ID	429
Name	Logger Module Id
Description	Defines the module the event occurred in. This module ID is sent along with the logger entry.
Category	Measurement
Type	uint8
Enum	Typ: ModuleIDs , see section 4.8 on page 100 Def: ModuleIDs::Core
Read / Write	1 / 0
Refs / Callback	CANopen: 0x4004-0x02 on page 152

2.5.8.4 Logger Transaction Id

Key	LoggerTransactionId						
ID	430						
Name	Logger Transaction Id						
Description	Defines the transaction ID of the event. The ID is automatically generated. It is used to reassemble the event info sent by multiple PDOs.						
Category	Measurement						
Type	uint8						
Numeric Communication	[-] <table border="1"> <tr> <td>Def:</td> <td>0</td> </tr> <tr> <td>Min:</td> <td>0</td> </tr> <tr> <td>Max:</td> <td>255</td> </tr> </table>	Def:	0	Min:	0	Max:	255
Def:	0						
Min:	0						
Max:	255						
Numeric UI	[-] <table border="1"> <tr> <td>Def:</td> <td>0</td> </tr> <tr> <td>Min:</td> <td>0</td> </tr> <tr> <td>Max:</td> <td>255</td> </tr> </table>	Def:	0	Min:	0	Max:	255
Def:	0						
Min:	0						
Max:	255						
Read / Write	1 / 0						
Refs / Callback	CANopen: 0x4004-0x03 on page 152						

2.5.8.5 Logger Value

Key	LoggerValue		
ID	431		
Name	Logger Value		
Description	Value sent along with the log entry. The value depends on the logger entry. The user must decode it according the logger entry.		
Category	Measurement		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x4004-0x04 on page 152		

2.5.9 Tracer

2.5.9.1 Tracer Output 1

Key	TracerOutput1		
ID	123		
Name	Tracer Output 1		
Description	The tracer copies the first observed value to this parameter. This SDO is mapped to the tracer PDO. The mapping is defined in TracerRecord1SourceCia301		
Category	Measurement		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x4002-0x0c on page 151		

2.5.9.2 Tracer Output 2

Key	TracerOutput2		
ID	124		
Name	Tracer Output 2		
Description	The tracer copies the first second value to this parameter. This SDO is mapped to the tracer PDO. The mapping is defined in TracerRecord2SourceCia301		
Category	Measurement		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x4002-0x0d on page 151		

2.5.9.3 Tracer Output 3

Key	TracerOutput3		
ID	125		
Name	Tracer Output 3		
Description	The tracer copies the third observed value to this parameter. This SDO is mapped to the tracer PDO. The mapping is defined in TracerRecord3SourceCia301		
Category	Measurement		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x4002-0x0e on page 151		

2.5.9.4 Tracer Output 4

Key	TracerOutput4		
ID	126		
Name	Tracer Output 4		
Description	The tracer copies the fourth observed value to this parameter. This SDO is mapped to the tracer PDO. The mapping is defined in TracerRecord4SourceCia301		
Category	Measurement		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x4002-0x0f on page 151		

2.5.9.5 Tracer Record 1 Source

Key	TracerRecord1SourceCia301		
ID	106		
Name	Tracer Record 1 Source		
Description	Index and subindex encoded according CiA301 that identify the 1st parameter that has to be recorded by the tracer.		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x4002-0x01 on page 151 Function: Tracer Record 1 Source		

2.5.9.6 Tracer Record 2 Source

Key	TracerRecord2SourceCia301		
ID	107		
Name	Tracer Record 2 Source		
Description	Index and sub-index encoded according CiA301 that identify the 2nd parameter that has to be recorded by the tracer.		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x4002-0x02 on page 151 Function: Tracer Record 2 Source		

2.5.9.7 Tracer Record 3 Source

Key	TracerRecord3SourceCia301		
ID	108		
Name	Tracer Record 3 Source		
Description	Index and sub-index encoded according CiA301 that identify the 3rd parameter that has to be recorded by the tracer.		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x4002-0x03 on page 151 Function: Tracer Record 3 Source		

2.5.9.8 Tracer Record 4 Source

Key	TracerRecord4SourceCia301		
ID	109		
Name	Tracer Record 4 Source		
Description	Index and sub-index encoded according CiA301 that identify the 4th parameter that has to be recorded by the tracer.		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x4002-0x04 on page 151 Function: Tracer Record 4 Source		

2.5.9.9 Tracer Sampling Rate

Key	TracerSamplingRate		
ID	121		
Name	Tracer Sampling Rate		
Description	Rate at which samples are taken.		
Category	Operational Value / Parameter		
Type	uint16		
Numeric Communication	[-]	Def:	1000
		Min:	1
		Max:	65535
Numeric UI	[-]	Def:	1000
		Min:	1
		Max:	65535
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x4002-0x0b on page 151		

2.5.9.10 Tracer Start

Key	TracerStart		
ID	119		
Name	Tracer Start		
Description	Starts the recording by the tracer.		
Category	Operational Value / Parameter		
Type	uint8		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	1
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	1
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x4002-0x09 on page 151		

2.5.9.11 Tracer State

Key	TracerState		
ID	122		
Name	Tracer State		
Description	Current state of the tracer.		
Category	Operational Value / Parameter		
Type	uint8		
Enum	Typ: TracerStates , see section 4.14 on page 102 Def: TracerStates::Idle		
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x4002-0x10 on page 151		

2.5.9.12 Tracer Stop

Key	TracerStop		
ID	120		
Name	Tracer Stop		
Description	Stops the recording of the tracer.		
Category	Operational Value / Parameter		
Type	uint8		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	1
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	1
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x4002-0x0a on page 151		

2.5.9.13 Tracer Trigger Delay

Key	TracerTriggerDelay		
ID	118		
Name	Tracer Trigger Delay		
Description	Number of cycles by which the recording is delayed after the tracer has been started by the trigger. A negative number represents a pre-trigger.		
Category	Operational Value / Parameter		
Type	int16		
Numeric Communication	[-]	Def:	0
		Min:	-32768
		Max:	32767
Numeric UI	[-]	Def:	0
		Min:	-32768
		Max:	32767
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x4002-0x08 on page 151		

2.5.9.14 Tracer Trigger Mode

Key	TracerTriggerMode
ID	116
Name	Tracer Trigger Mode
Description	Trigger mode of the tracer. It defines the trigger condition of the tracer. The trigger signal is defined in TracerTriggerSource.
Category	Operational Value / Parameter
Type	uint8
Enum	Typ: TracerTriggerModes , see section 4.15 on page 102 Def: TracerTriggerModes::Off
Read / Write	1 / 1
Refs / Callback	CANopen: 0x4002-0x06 on page 151

2.5.9.15 Tracer Trigger Source

Key	TracerTriggerSourceCia301		
ID	114		
Name	Tracer Trigger Source		
Description	Index and subindex that identifies the parameter that is used to trigger the tracer.		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x4002-0x05 on page 151 Function: Tracer Trigger Source		

2.5.9.16 Tracer Trigger Threshold

Key	TracerTriggerThreshold		
ID	117		
Name	Tracer Trigger Threshold		
Description	Threshold value to which the trigger parameter is compared by the tracer trigger. Applies only if trigger mode is 'Above Threshold' or 'Below Threshold'.		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[-]	Def:	0.0
		Min:	-9999999.0
		Max:	9999999.0
Numeric UI	[-]	Def:	0
		Min:	-9999999
		Max:	9999999
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x4002-0x07 on page 151		

2.5.10 Warning Information

2.5.10.1 Warning Entry 1 Most Recent

Key	WarningEntry1MostRecent		
ID	735		
Name	Warning Entry 1 Most Recent		
Description	This object provides warning information.		
Category	Measurement		
Type	uint32		
Enum	Typ: EventCodes , see section 4.4 on page 94 Def: EventCodes::NoEvent		
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x4011-0x01 on page 152		

2.5.10.2 Warning Entry 2

Key	WarningEntry2
ID	736
Name	Warning Entry 2
Description	This object provides warning information.
Category	Measurement
Type	uint32
Enum	Typ: EventCodes , see section 4.4 on page 94 Def: EventCodes::NoEvent
Read / Write	1 / 0
Refs / Callback	CANopen: 0x4011-0x02 on page 152

2.5.10.3 Warning Entry 3

Key	WarningEntry3
ID	737
Name	Warning Entry 3
Description	This object provides warning information.
Category	Measurement
Type	uint32
Enum	Typ: EventCodes , see section 4.4 on page 94 Def: EventCodes::NoEvent
Read / Write	1 / 0
Refs / Callback	CANopen: 0x4011-0x03 on page 152

2.5.10.4 Warning Entry 4

Key	WarningEntry4
ID	738
Name	Warning Entry 4
Description	This object provides warning information.
Category	Measurement
Type	uint32
Enum	Typ: EventCodes , see section 4.4 on page 94 Def: EventCodes::NoEvent
Read / Write	1 / 0
Refs / Callback	CANopen: 0x4011-0x04 on page 152

2.5.10.5 Warning Entry 5

Key	WarningEntry5
ID	739
Name	Warning Entry 5
Description	This object provides warning information.
Category	Measurement
Type	uint32
Enum	Typ: EventCodes , see section 4.4 on page 94 Def: EventCodes::NoEvent
Read / Write	1 / 0
Refs / Callback	CANopen: 0x4011-0x05 on page 153

2.5.10.6 Warning Entry Count

Key	WarningEntryCount		
ID	734		
Name	Warning Entry Count		
Description	Read: returns the number of warnings in the warning log. Write 0: clears the warning buffer. Write otherwise: has no effects.		
Category	Measurement		
Type	uint8		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	5
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	5
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x4011-0x00 on page 152 Callback: pre-read Callback: post-write		

2.5.10.7 Warning Register

Key	WarningRegister		
ID	733		
Name	Warning Register		
Description	This object provides warning information.		
Category	Measurement		
Type	uint8		
Enum	Typ: EventRegisterFlags , see section 4.5 on page 99 Def: EventRegisterFlags::NoEvent		
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x4010-0x00 on page 152 Callback: pre-read		

2.6 Pump

2.6.1 Dosing Overpressure

2.6.1.1 Overpressure Pressure Warning Level

Key	OverpressurePressureWarningLevel		
ID	826		
Name	Overpressure Pressure Warning Level		
Description	Overpressure level of warning relative to the maximum pressure limit for the outlet pressure		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[1]	Def:	0.875
		Min:	0.0
		Max:	1.0
Numeric UI	[%]	Def:	87.5
		Min:	0
		Max:	100
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x3015-0x07 on page 158 Storage File Name: Parameter on page 174		

2.6.2 Dosing Sequence

2.6.2.1 Complete Dosing Cycle

Key	CompleteDosingCycle		
ID	767		
Name	Complete Dosing Cycle		
Description	Short time-controlled signal to signalize a complete dosing cycle		
Category	Measurement		
Type	bool		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	1
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	1
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x301b-0x03 on page 159		

2.6.2.2 Direction Flow

Key	DirectionFlow		
ID	493		
Name	Direction Flow		
Description	Describes the flow direction, true == forward, false = reverse		
Category	Operational Value / Parameter		
Type	uint8		
Enum	Typ: FlowDirections , see section 4.6 on page 99 Def: FlowDirections::Forward		
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x301c-0x01 on page 159 Storage File Name: Parameter on page 174		

2.6.2.3 Direction Flow Analog Digital Interface

Key	DirectionFlowAnalogDigitalInterface
ID	780
Name	Direction Flow Analog Digital Interface
Description	Describes the flow direction from the analog digital interface, true == forward, false = reverse. Value from analog digital Interface overrule the direction from the can interface
Category	Operational Value / Parameter
Type	uint8
Enum	Typ: FlowDirections , see section 4.6 on page 99 Def: FlowDirections::Forward
Read / Write	1 / 0
Refs / Callback	CANopen: 0x301c-0x02 on page 159

2.6.2.4 Frequency Dosing Cycle

Key	FrequencyDosingCycle		
ID	491		
Name	Frequency Dosing Cycle		
Description	Frequency of the dosing cycle. How may times a full cycle is executed in one second.		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[Hz]	Def:	2.0
		Min:	0.01
		Max:	3.4
Numeric UI	[Hz]	Def:	2
		Min:	0.01
		Max:	3.4
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x3018-0x01 on page 158 Storage File Name: Parameter on page 174		

2.6.2.5 Frequency Dosing Cycle Maximum

Key	FrequencyDosingCycleMaximum		
ID	720		
Name	Frequency Dosing Cycle Maximum		
Description	Set source maximum for frequency dosing cycle		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[Hz]	Def:	3.3333
		Min:	0.0
		Max:	3.4
Numeric UI	[Hz]	Def:	3.3333
		Min:	0
		Max:	3.4
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x3018-0x06 on page 158 Storage File Name: Parameter on page 174		

2.6.2.6 Frequency Dosing Cycle Minimum

Key	FrequencyDosingCycleMinimum		
ID	719		
Name	Frequency Dosing Cycle Minimum		
Description	Set source minimum for frequency dosing cycle		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[Hz]	Def:	0.1
		Min:	0.01
		Max:	3.4
Numeric UI	[Hz]	Def:	0.1
		Min:	0.01
		Max:	3.4
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x3018-0x05 on page 158 Storage File Name: Parameter on page 174		

2.6.2.7 Frequency Dosing Cycle Offset

Key	FrequencyDosingCycleOffset		
ID	718		
Name	Frequency Dosing Cycle Offset		
Description	Set Source Offset for frequency dosing cycle		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[Hz]	Def:	0.0
		Min:	-9999999.9
		Max:	9999999.9
Numeric UI	[Hz]	Def:	0
		Min:	-9999999.9
		Max:	9999999.9
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x3018-0x04 on page 158 Storage File Name: Parameter on page 174		

2.6.2.8 Frequency Dosing Cycle Scaling

Key	FrequencyDosingCycleScaling		
ID	717		
Name	Frequency Dosing Cycle Scaling		
Description	Set Source Scaling for frequency dosing cycle input		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[Hz]	Def:	0.33333
		Min:	-9999999.9
		Max:	9999999.9
Numeric UI	[Hz]	Def:	0.33333
		Min:	-9999999.9
		Max:	9999999.9
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x3018-0x03 on page 158 Storage File Name: Parameter on page 174		

2.6.2.9 Number Complete Dosing Cycle

Key	NumberCompleteDosingCycle		
ID	784		
Name	Number Complete Dosing Cycle		
Description	Counter for completed dosing cycles for checking the number of performed dosing cycle. Only increments the counter if the parameter NumbersDosingCycle is greater than one. Resets to zero upon receiving a new dosing command.		
Category	Measurement		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x301b-0x02 on page 159		

2.6.2.10 Numbers Dosing Cycle

Key	NumbersDosingCycle		
ID	488		
Name	Numbers Dosing Cycle		
Description	Number of repetitions of dosing stroke.		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	1
		Min:	0
		Max:	4294967295
Numeric UI	[-]	Def:	1
		Min:	0
		Max:	4.294967295e+09
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x301b-0x01 on page 159		

2.6.2.11 Ratio Suction Dosing Cycle

Key	RatioSuctionDosingCycle		
ID	492		
Name	Ratio Suction Dosing Cycle		
Description	Describes the relationship between the pressure stroke and the cycle time, 0.5 = exhaust and suction stroke are the same		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[-]	Def:	0.5
		Min:	0.03
		Max:	0.97
Numeric UI	[-]	Def:	0.5
		Min:	0.03
		Max:	0.97
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x3019-0x01 on page 159 Storage File Name: Parameter on page 174		

2.6.2.12 Ratio Suction Maximum

Key	RatioSuctionMaximum		
ID	728		
Name	Ratio Suction Maximum		
Description	Set max for suction ratio		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[-]	Def:	0.97
		Min:	0.1
		Max:	1.0
Numeric UI	[-]	Def:	0.97
		Min:	0.1
		Max:	1
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x3019-0x06 on page 159 Storage File Name: Parameter on page 174		

2.6.2.13 Ratio Suction Minimum

Key	RatioSuctionMinimum		
ID	727		
Name	Ratio Suction Minimum		
Description	Set minimum for suction ratio		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[-]	Def:	0.03
		Min:	0.1
		Max:	1.0
Numeric UI	[-]	Def:	0.03
		Min:	0.1
		Max:	1
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x3019-0x05 on page 159 Storage File Name: Parameter on page 174		

2.6.2.14 Ratio Suction Offset

Key	RatioSuctionOffset		
ID	726		
Name	Ratio Suction Offset		
Description	Set Source Offset for suction ratio		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[-]	Def:	0.0
		Min:	-1.0
		Max:	1.0
Numeric UI	[-]	Def:	0
		Min:	-1
		Max:	1
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x3019-0x04 on page 159 Storage File Name: Parameter on page 174		

2.6.2.15 Ratio Suction Scaling

Key	RatioSuctionScaling		
ID	725		
Name	Ratio Suction Scaling		
Description	Set Source Scaling for suction ratio		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[-]	Def:	0.1
		Min:	-9999999.9
		Max:	9999999.9
Numeric UI	[-]	Def:	0.1
		Min:	-9999999.9
		Max:	9999999.9
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x3019-0x03 on page 159 Storage File Name: Parameter on page 174		

2.6.2.16 Source Frequency Dosing Cycle

Key	SourceFrequencyDosingCycleCia301		
ID	716		
Name	Source Frequency Dosing Cycle		
Description	Converted source for frequency dosing cycle		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x3018-0x02 on page 158 Function: Source Frequency Dosing Cycle		

2.6.2.17 Source Ratio Suction

Key	SourceRatioSuctionCia301		
ID	724		
Name	Source Ratio Suction		
Description	Converted source for suction ratio		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x3019-0x02 on page 159 Function: Source Ratio Suction		

2.6.2.18 Source Speed Prime

Key	SourceSpeedPrimeCia301		
ID	772		
Name	Source Speed Prime		
Description	Converted Source for speed prime		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x301a-0x02 on page 159 Function: Source Speed Prime		

2.6.2.19 Source Volume Target

Key	SourceVolumeTargetCia301		
ID	708		
Name	Source Volume Target		
Description	Converted Source for reference volume		
Category	Operational Value / Parameter		
Type	uint32		
Numeric Communication	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Numeric UI	[-]	Def:	0
		Min:	0
		Max:	0xffffffff
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x3017-0x02 on page 158 Function: Source Volume Target		

2.6.2.20 Speed Prime Maximum

Key	SpeedPrimeMaximum		
ID	776		
Name	Speed Prime Maximum		
Description	Set max for speed prime		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[Hz]	Def:	5.0
		Min:	0.01
		Max:	5.0
Numeric UI	[rpm]	Def:	300
		Min:	0.6
		Max:	300
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x301a-0x06 on page 159 Storage File Name: Parameter on page 174		

2.6.2.21 Speed Prime Minimum

Key	SpeedPrimeMinimum		
ID	775		
Name	Speed Prime Minimum		
Description	Set minimum for speed prime		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[Hz]	Def:	0.5
		Min:	0.001
		Max:	100.0
Numeric UI	[rpm]	Def:	30
		Min:	0.06
		Max:	6000
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x301a-0x05 on page 159 Storage File Name: Parameter on page 174		

2.6.2.22 Speed Prime Offset

Key	SpeedPrimeOffset		
ID	774		
Name	Speed Prime Offset		
Description	Set Source Offset for speed prime		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[Hz]	Def:	0.0
		Min:	-5.0
		Max:	5.0
Numeric UI	[rpm]	Def:	0
		Min:	-300
		Max:	300
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x301a-0x04 on page 159 Storage File Name: Parameter on page 174		

2.6.2.23 Speed Prime Scaling

Key	SpeedPrimeScaling		
ID	773		
Name	Speed Prime Scaling		
Description	Set Source Scaling for speed prime		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[Hz / V]	Def:	0.769230769
		Min:	-9999999.9
		Max:	9999999.9
Numeric UI	[Hz / V]	Def:	0.769230769
		Min:	-9999999.9
		Max:	9999999.9
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x301a-0x03 on page 159 Storage File Name: Parameter on page 174		

2.6.2.24 State Dosing Pump

Key	StateDosingPump		
ID	417		
Name	State Dosing Pump		
Description	Functional state of the dosing pump.		
Category	Measurement		
Type	uint8		
Enum	Typ: StatesDosingPump , see section 4.13 on page 102 Def: StatesDosingPump::Idle		
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x2804-0x04 on page 156		

2.6.2.25 Time Between Dosing Cycle

Key	TimeBetweenDosingCycle		
ID	487		
Name	Time Between Dosing Cycle		
Description	Pause time between two dosing strokes.		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[s]	Def:	0.00
		Min:	0.0
		Max:	4000000.0
Numeric UI	[s]	Def:	0
		Min:	0
		Max:	4000000
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x3016-0x10 on page 158 Storage File Name: Parameter on page 174		

2.6.2.26 Volume Target

Key	VolumeTarget		
ID	415		
Name	Volume Target		
Description	Preset volume for a single dosing cycle.		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[l]	Def:	0.0002
		Min:	0.000001
		Max:	0.00022
Numeric UI	[μl]	Def:	200
		Min:	1
		Max:	220
Read / Write	1 / 1		
Refs / Callback	CANopen: 0x3017-0x01 on page 158 Storage File Name: Parameter on page 174		

2.6.2.27 Volume Target Maximum

Key	VolumeTargetMaximum		
ID	712		
Name	Volume Target Maximum		
Description	Set max for reference volume		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[]	Def:	0.00021
		Min:	0.000005
		Max:	0.00021
Numeric UI	[μ]	Def:	210
		Min:	5
		Max:	210
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x3017-0x06 on page 158 Storage File Name: Parameter on page 174		

2.6.2.28 Volume Target Minimum

Key	VolumeTargetMinimum		
ID	711		
Name	Volume Target Minimum		
Description	Set minimum for reference volume		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[]	Def:	0.000040
		Min:	0.000005
		Max:	0.0002
Numeric UI	[μ]	Def:	40
		Min:	5
		Max:	200
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x3017-0x05 on page 158 Storage File Name: Parameter on page 174		

2.6.2.29 Volume Target Offset

Key	VolumeTargetOffset		
ID	710		
Name	Volume Target Offset		
Description	Set Source Offset for reference volume		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[l]	Def:	0.0000
		Min:	-0.0002
		Max:	0.0002
Numeric UI	[μl]	Def:	0
		Min:	-200
		Max:	200
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x3017-0x04 on page 158 Storage File Name: Parameter on page 174		

2.6.2.30 Volume Target Scaling

Key	VolumeTargetScaling		
ID	709		
Name	Volume Target Scaling		
Description	Set Source Scaling for reference volume		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[l / V]	Def:	0.000025
		Min:	-9999999.9
		Max:	9999999.9
Numeric UI	[l / V]	Def:	0.000025
		Min:	-9999999.9
		Max:	9999999.9
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x3017-0x03 on page 158 Storage File Name: Parameter on page 174		

2.6.3 Move Planner

2.6.3.1 Time Move Planner Sequence

Key	TimeMovePlannerSequence		
ID	406		
Name	Time Move Planner Sequence		
Description	Time for the full move from PositionMechanicalMovePlannerStart to PositionMechanicalMovePlannerEnd.		
Category	Operational Value / Parameter		
Type	float32		
Numeric Communication	[s]	Def:	0.2
		Min:	0.0
		Max:	1000.0
Numeric UI	[s]	Def:	0.2
		Min:	0
		Max:	1000
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x5efc-0x04 on page 153		

2.6.4 State

2.6.4.1 Motor Control State

Key	MotorControlState		
ID	390		
Name	Motor Control State		
Description	State of motor control		
Category	Measurement		
Type	uint8		
Enum	Typ: MotorControlStates , see section 4.9 on page 100 Def: MotorControlStates::Initializing		
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x2804-0x01 on page 156		

2.7 Sensor

2.7.1 DCLink

2.7.1.1 Voltage Dc Link

Key	VoltageDcLink		
ID	252		
Name	Voltage Dc Link		
Description	The measured DC link voltage.		
Category	Measurement		
Type	float32		
Numeric Communication	[V]	Def:	0.0
		Min:	0.0
		Max:	50.0
Numeric UI	[V]	Def:	0
		Min:	0
		Max:	50
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x6403-0x02 on page 154		

2.7.2 Position

2.7.2.1 Position Electrical

Key	PositionElectrical		
ID	86		
Name	Position Electrical		
Description	Actual electrical position. Used in Clarke/Park transformation.		
Category	Measurement		
Type	int16		
Numeric Communication	[2 ¹⁶ / rotation]	Def:	0
		Min:	-32768
		Max:	32767
Numeric UI	[2 ¹⁶ / rotation]	Def:	0
		Min:	-32768
		Max:	32767
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x6401-0x13 on page 154		

2.7.2.2 Source Position

Key	SourcePosition		
ID	389		
Name	Source Position		
Description	Selects the source of the transformation angle.		
Category	Operational Value / Parameter		
Type	uint8		
Enum	Typ: SourcesPosition , see section 4.12 on page 101 Def: SourcesPosition::Measurement		
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x2803-0x01 on page 156		

2.7.3 Reference

2.7.3.1 Voltage Adc 3 Reference

Key	VoltageAdc3Reference		
ID	834		
Name	Voltage Adc 3 Reference		
Description	The voltage of the ADC reference system.		
Category	Measurement		
Type	float32		
Numeric Communication	[V]	Def:	0.0
		Min:	0.0
		Max:	5.0
Numeric UI	[V]	Def:	0
		Min:	0
		Max:	5
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x6403-0x23 on page 154		

2.7.3.2 Voltage Adc 3 Reference Raw

Key	VoltageAdc3ReferenceRaw		
ID	835		
Name	Voltage Adc 3 Reference Raw		
Description	The raw value of the voltage of the ADC reference system.		
Category	Measurement		
Type	int16		
Numeric Communication	[dig]	Def:	0
		Min:	0
		Max:	4095
Numeric UI	[dig]	Def:	0
		Min:	0
		Max:	4095
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x6401-0x23 on page 154		

2.7.4 Temperature

2.7.4.1 Temperature Board

Key	TemperatureBoard		
ID	324		
Name	Temperature Board		
Description	Board temperature measured on the PCBA.		
Category	Measurement		
Type	float32		
Numeric Communication	[°C]	Def:	0.0
		Min:	-40.0
		Max:	200.0
Numeric UI	[°C]	Def:	0
		Min:	-40
		Max:	200
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x6403-0x04 on page 154		

2.7.4.2 Temperature Cpu

Key	TemperatureCpu		
ID	325		
Name	Temperature Cpu		
Description	Temperature of the internal temperature sensor of the CPU.		
Category	Measurement		
Type	float32		
Numeric Communication	[°C]	Def:	0.0
		Min:	-40.0
		Max:	200.0
Numeric UI	[°C]	Def:	0
		Min:	-40
		Max:	200
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x6403-0x05 on page 154		

Chapter 3

Constants

3.1 Authentication Device Version

Key	AuthenticationDeviceVersion		
ID	71		
Name	Authentication Device Version		
Description	Authentication Device Version		
Category			
Type	uint32		
Numeric Communication	[-]	Def:	0x00000000
		Min:	?
		Max:	?
Numeric UI	[-]	Def:	0x00000000
		Min:	NaN
		Max:	NaN
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x5f0b-0x01 on page 160		

3.2 Command Authentication User Version

Key	CommandAuthenticationUserVersion		
ID	73		
Name	Command Authentication User Version		
Description	Authentication User Version		
Category			
Type	uint32		
Numeric Communication	[-]	Def:	0x00000000
		Min:	?
		Max:	?
Numeric UI	[-]	Def:	0x00000000
		Min:	NaN
		Max:	NaN
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x5f0f-0x02 on page 161		

3.3 Device Name

Key	DeviceName
ID	2
Name	Device Name
Description	Name of the device.
Category	
String Type	Dosing Pump
Read / Write	1 / 0
Refs / Callback	CANopen: 0x1008-0x00 on page 150 CANopen: 0x4001-0x01 on page 151

3.4 Device Type

Key	DeviceType		
ID	1		
Name	Device Type		
Description	This object describes the type of device and its functionality.		
Category			
Type	uint32		
Numeric Communication	[-]	Def:	0xffff0191
		Min:	?
		Max:	?
Numeric UI	[-]	Def:	0xffff0191
		Min:	NaN
		Max:	NaN
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x1000-0x00 on page 150		

3.5 Device Type 401

Key	DeviceType401		
ID	67		
Name	Device Type 401		
Description	Device type for device profile 401, I/O device		
Category			
Type	uint32		
Numeric Communication	[-]	Def:	0x00000191
		Min:	?
		Max:	?
Numeric UI	[-]	Def:	0x00000191
		Min:	NaN
		Max:	NaN
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x67ff-0x00 on page 155		

3.6 Device Type 402

Key	DeviceType402		
ID	68		
Name	Device Type 402		
Description	Device type for device profile 402, drives and motion control		
Category			
Type	uint32		
Numeric Communication	[-]	Def:	0x00000192
		Min:	?
		Max:	?
Numeric UI	[-]	Def:	0x00000192
		Min:	NaN
		Max:	NaN
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x6fff-0x00 on page 157		

3.7 Device Type 434

Key	DeviceType434		
ID	69		
Name	Device Type 434		
Description	Device type for device profile 434, laboratory automation systems		
Category			
Type	uint32		
Numeric Communication	[-]	Def:	0x000001b2
		Min:	?
		Max:	?
Numeric UI	[-]	Def:	0x000001b2
		Min:	NaN
		Max:	NaN
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x77ff-0x00 on page 160		

3.8 Firmware Sap Id

Key	FirmwareSapId		
ID	84		
Name	Firmware Sap Id		
Description	Firmware SAP Number and Revision		
Category			
String Type	undefined		
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x4000-0x05 on page 151		

3.9 Vendor Id

Key	VendorId		
ID	7		
Name	Vendor Id		
Description	The CANopen KNF Vendor ID, the ID is 0x569.		
Category			
Type	uint32		
Numeric Communication	[-]	Def:	0x00000569
		Min:	?
		Max:	?
Numeric UI	[-]	Def:	0x00000569
		Min:	NaN
		Max:	NaN
Read / Write	1 / 0		
Refs / Callback	CANopen: 0x1018-0x01 on page 150		

Chapter 4

Enumerations

4.1 Command Actions States

Command and state register for the commands. To start an action write 'Start'. The other values are states of the current command. Enum data type: int32

Enum Name	Value	Name	Description
Idle	0	Idle	State: No command running, ready to start.
Executed	0	Command Executed	State: (last) command executed successfully
Start	1	Command Start	Action: start command
Running	2	Command Running	State: command is running
Failed	3	Command Failed	State: command failed

4.2 Commands Dosing Task

The command interface for the dosing task. Enum data type: uint8

Enum Name	Value	Name	Description
NoCommand	0	No Command	No command sent.
DoIdle	1	Do Idle	The dosing pump is idle.
DoPrime	2	DoPrime	Prime request.
DoDosing	3	Dosing	Dosing request.
DoManual	4	DoManual	Request for manual operation.

4.3 Commands Storage Parameter

Commands for Parameter Storage Enum data type: uint8

Enum Name	Value	Name	Description
NoCommand	0	NoCommand	No command is sent.
EraseParameterFile	1	EraseParameterFile	Command to erase the parameter file.
StoreParameterFile	2	StoreParameterFile	Command to store the current parameters in flash memory on the device.

4.4 Event Codes

The detailed event codes of all firmware events. Enum data type: uint32

Enum Name	Value	Name	Description
NoEvent	0x00000000	No Event	No event occurred.
Generic	0x00001000	Generic	A generic, unspecified event occurred.
Cia402CurrentDeviceInput	0x00002100	Cia402CurrentDeviceInput	The current device event occurred.
CiA402DcLinkOverVoltage	0x00003210	CiA402 DC Link Over Voltage	There is an over voltage event, the DCL link voltage is too high.

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Enum Name	Value	Name	Description
CiA402DcLinkUnderVoltage	0x00003220	CiA402 DC Link Under Voltage	The DCL link voltage is too low. An under voltage error occurred.
CiA402Speed	0x00007310	CiA402 Speed	The drive speed is out of range.
TemperatureMediaOutOfRange	0x00004000	Temperature Media Out Of Range	The media temperature is out of the tolerable range.
DeviceHardwareSensorFailure	0x00005001	Device Hardware Sensor Failure	A hardware sensor is faulty. The value are no longer reliable.
DeviceHardwareMpioInputModeNotSupported	0x00005002	Device Hardware MPIO Input Mode Not Supported	The MPIO does not support the requested input mode.
DeviceHardwareMpioOutputModeNotSupported	0x00005003	Device Hardware MPIO Output Mode Not Supported	The MPIO does not support the requested output mode.
DeviceSoftwareAssert	0x00006001	Device Software Assert	A device firmware assert did occur. Signaled after the reboot.
DeviceSoftwareIndependentWatchdog	0x00006002	Device Software Independent Watchdog	The independent watchdog did reset the device. Signaled after the reboot.
DeviceSoftwareWindowWatchdog	0x00006003	Device Software Window Watchdog	The software watchdog did reset the device. Signaled after the reboot.
DeviceSoftwareLowPowerReset	0x00006004	Device Software Low Power Reset	The software did reset due to low power. Signaled after the reboot.
DeviceSoftwareOptionByteReset	0x00006005	Device Software Option Byte Reset	Reset due to incorrect software option byte. Signaled after the reboot.
DeviceSoftwareUnexpectedReset	0x00006006	Device Software Unexpected Reset	Software reset due to unknown reason. Signaled after the reboot.
DeviceSoftwareDataSetFileSystemSetupFailed	0x00006301	Device Software Data Set File System Setup Failed	The file system setup failed.
DeviceSoftwareDataSetFileSystemCleanupFailed	0x00006302	Device Software Data Set File System Cleanup Failed	The file system cleanup did fail.
DeviceSoftwareDataSetShutdownFileWritingFailed	0x00006303	Device Software Data Set Shutdown File Writing Failed	The shutdown file could is not properly written. The operating hours counter are no longer correct.
DeviceSoftwareDataSetShutdownFileReadingFailed	0x00006304	Device Software Data Set Shutdown File Reading Failed	The shutdown file could is not be read. The operating hours counter are no longer correct.
DeviceSoftwareDataSetShutdownFileRemoveFailed	0x00006305	Device Software Data Set Shutdown File Remove Failed	The shutdown file could not be removed.
DeviceSoftwareDataSetShutdownFileFormatVersionInvalid	0x00006306	Device Software Data Set Shutdown File Format Version Invalid	The file version of the shutdown file is not valid. The operating hours counter is unreliable.
DeviceSoftwareDataSetShutdownFileLengthInvalid	0x00006307	Device Software Data Set Shutdown File Length Invalid	The file length of the shutdown file is not valid. The operating hours counter is unreliable.
DeviceSoftwareDataSetParameterFileWritingFailed	0x00006308	Device Software Data Set Parameter File Writing Failed	The parameters could not be permanently stored to flash memory.
DeviceSoftwareDataSetParameterFileReadingFailed	0x00006309	Device Software Data Set Parameter File Reading Failed	The parameters could not be read from permanent flash memory.

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Enum Name	Value	Name	Description
DeviceSoftware-DataSetParameterFileRemoveFailed	0x0000630a	Device Software Data Set Parameter File Remove Failed	The parameter file with the permanent parameters could not be erased.
DeviceSoftware-DataSetParameterFileFormatVersionInvalid	0x0000630b	Device Software Data Set Parameter File Format Version Invalid	The parameter file version is invalid. The parameters may not be read correctly from permanent flash memory.
DeviceSoftware-DataSetParameterFileLengthInvalid	0x0000630c	Device Software Data Set Parameter File Length Invalid	The parameter file length is invalid. The parameters may not be read correctly from permanent flash memory.
DeviceSoftwareDataSetParameterInvalid	0x0000630d	Device Software Data Set Parameter Invalid	The parameter set is invalid.
DeviceSoftwareDataSetSensorSetupFailed	0x0000630e	Device Software Sensor Data Set Parameter Invalid	The sensor data set is invalid.
DeviceSoftware-DataSetSensorBoardFileReadingFailed	0x0000630f	Device Software Data Set Sensor Board File Reading Failed	The sensor board parameter file could not be read.
DeviceSoftwareDataSetSensorBoardFileFormatVersionInvalid	0x00006310	Device Software Data Set Sensor Board File Format Version Invalid	The sensor board parameter file version is invalid.
DeviceSoftware-DataSetSensorBoardFileLengthInvalid	0x00006311	Device Software Data Set Sensor Board File Length Invalid	The sensor board parameter file length is.
DeviceSoftwareDataSetSensorFileReadingFailed	0x00006312	Device Software Data Set Sensor File Reading Failed	The sensor parameter file could not be read.
DeviceSoftware-DataSetSensorFileFormatVersionInvalid	0x00006313	Device Software Data Set Sensor File Format Version Invalid	The sensor parameter file version is invalid.
DeviceSoftwareDataSetSensorFileLengthInvalid	0x00006314	Device Software Data Set Sensor File Length Invalid	The sensor parameter file length is invalid.
DeviceSoftware-DataSetEventConfigurationFileWritingFailed	0x00006315	Device Software Data Set Event Configuration File Writing Failed	The event configuration file could not be written.
DeviceSoftware-DataSetEventConfigurationFileReadingFailed	0x00006316	Device Software Data Set Event Configuration File Reading Failed	The event configuration file could not be read.
DeviceSoftware-DataSetEventConfigurationFileRemoveFailed	0x00006317	Device Software Data Set Event Configuration File Remove Failed	The event configuration file could not be removed.
DeviceSoftware-DataSetEventConfigurationFileFormatVersionInvalid	0x00006318	Device Software Data Set Event Configuration File Format Version Invalid	The event configuration file version is invalid.
DeviceSoftware-DataSetEventConfigurationFileLengthInvalid	0x00006319	Device Software Data Set Event Configuration File Length Invalid	The event configuration file length is invalid.
DeviceSoftware-DataSetCalibrationFileRemoveFailed	0x0000631a	Device Software Data Set Calibration File Remove Failed	The calibration file could not be removed.

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Enum Name	Value	Name	Description
DeviceSoftware-DataSetCalibrationFile-FormatVersionInvalid	0x0000631b	Device Software Data Set Calibration File Format Version Invalid	The calibration file version is invalid.
DeviceSoftware-DataSetCalibrationFile-LengthInvalid	0x0000631c	Device Software Data Set Calibration File Length Invalid	The calibration file length is invalid.
DeviceSoftwareDataSet-CalibrationInvalid	0x0000631d	Device Software Data Set Calibration Invalid	The calibration file is invalid.
DeviceSoftware-DataSetCalibrationFileWritingFailed	0x0000631e	Device Software Data Set Calibration File Writing Failed	The calibration file version is invalid.
DeviceSoftware-DataSetCalibrationFileReadingFailed	0x0000631f	Device Software Data Set Calibration File Reading Failed	The calibration file could not be read.
DeviceSoftwareDataSetUserAccessConfigurationReadingFailed	0x00006320	Device Software Data Set User Access Configuration File Reading Failed	The file storing specific user access rights could not be read.
DeviceSoftwareDataSetUserAccessConfigurationRemoveFailed	0x00006321	Device Software Data Set User Access Configuration File Remove Failed	The file storing specific user access rights could not be removed.
DeviceSoftwareDataSetUserAccessConfigurationFormatVersionInvalid	0x00006322	Device Software Data Set User Access Configuration File Format Version Invalid	The file version storing specific user access rights is invalid.
DeviceSoftwareDataSetUserAccessConfigurationLengthInvalid	0x00006323	Device Software Data Set User Access Configuration File Length Invalid	The file length storing specific user access rights is invalid.
DeviceSoftwareDataSetUserAccessConfigurationWritingFailed	0x00006324	Writing user access configuration file failed	The file storing specific user access rights could not be written.
CiA402MotorBlocked	0x00007121	The drive might be blocked	The motor might be blocked. It did not turn under expected conditions.
CiA402Position	0x00007320	CiA402 Position	The position is invalid.
CiA402FollowingError	0x00008611	CiA402 FollowingError	The control deviation of the PID controller is too big.
MonitoringCommunication	0x00008100	Monitoring Communication	The communication is not properly working.
PDOLengthExceeded	0x00008220	PDO Length Exceeded	A PDO exceeds the allowable range.
GenericErrorPumpApplication	0x0000f050	Generic Error Pump Application	Generic error of dilutor, dispenser or pump application.
DeviceSpecificFlowSensorCommunicationReceiveCrcError	0x0000ff01	Device Specific Flow Sensor Communication Receive CRC Error	The flow communication to the flow sensor is not working. There is a CRC error detected.
DeviceSpecificFlowSensorCommunicationReceiveLengthError	0x0000ff02	Device Specific Flow Sensor Communication Receive Length Error	The flow communication to the flow sensor is not working. The received frame has invalid length.
DeviceSpecificFlowSensorCommunicationCommunicationOverrun	0x0000ff03	Device Specific Flow Sensor Communication Communication Overrun	The flow communication to the flow sensor is not working. The receive buffer did overrun.
KIPCommunication-Timeout	0x0000ff04	I2C Communication Timeout	The I2C communication did timeout.

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Enum Name	Value	Name	Description
DeviceSpecificFlowSensorIncompatibleProcessingFirmwareVersion	0x0000ff05	Incompatible Processing Firmware Version	Processing Firmware Version is Incompatible
TemperaturesOutOfRange	0x0000ff06	Temperatures Out Of Range	The measured temperatures are out of the expected value range.
TemperatureTooHigh	0x0000ff07	Temperature Too High	The measured temperature is higher than the maximum allowed temperature.
KiPCommunicationReadRequestFailed	0x0000ff08	KiP Communication Read Request Failed	The I2C read request failed.
KiPCommunicationWriteRequestFailed	0x0000ff09	KiP Communication Write Request Failed	The I2C write request failed.
KiPCommunicationDriverError	0x0000ff0a	KiP Communication Driver Error	An internal I2C communication driver error did occur.
KiPCommunicationJobDefinitionQueueOverrun	0x0000ff0b	KiP Communication Job Definition Queue Overrun	The internal job definition queue did overrun. Not all requests could be stored.
KiPCommunicationQueuingThreadQueueOverrun	0x0000ff0c	KiP Communication Queuing Thread Queue Overrun	The internal queuing thread queue did overrun. Not all jobs could be executed.
SensorError	0x0000ff0d	Sensor Error	A sensor is in a error state
InputFrequencyTooHigh	0x0000ff0e	Input Frequency Too High	The measured input frequency is too high.
AirDetectedMediumLevel	0x0000ff0f	Air Detected Medium Level	Medium level of air was detected in the system. Normal operation possible.
AirDetectedExtremeLevel	0x0000ff10	Air Detected Extreme Level	Extreme level of air was detected in the system. Normal operation no longer possible.
FlowControllerOutOfRange	0x0000ff11	Flow Controller Out Of Range	The flow controller is out of range. The control deviation is too big.
CommandAuthenticationConfigurationFailed-NoFreeEntries	0x0000ff12	Command Authentication Configuration Failed No Free Entries	Command for user authentication configuration failed: There are no free entries available.
CommandAuthenticationConfigurationFailedRequestedEntryNot-Found	0x0000ff13	Command Authentication Configuration Failed Requested Entry Not Found	User access entry not found.
CommandAuthenticationConfigurationFailedRequestedConfigura-tionNot-Found	0x0000ff14	Command Authentication Configuration Failed Requested Configuration Not Found	User access configuration not found.
CommandAuthenticationUserWrongPassword	0x0000ff15	Command Authentication User Wrong Password	User authentication failed due to wrong password
CommandAuthenticationUserNoFileHandler	0x0000ff16	Command Authentication User No File Handler	There is no user configuration file handler. Therefore authentication of a user other than admin is not possible.

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Enum Name	Value	Name	Description
CommandAuthenticationUserNoUserAccessConfiguration	0x0000ff17	Command Authentication User No User Access Configuration	There is no user access configuration. Therefore authentication of a user other than admin is not possible.
CommandAuthenticationUserReadingUserAccessConfigurationFailed	0x0000ff18	Command Authentication User Reading User Access Configuration Failed	Reading user access configuration failed.
RatioSuctionAutomaticallyAdjusted	0x0000ff19	Moving time to short adjust suction ratio	The calculated moving time with the given suction ratio was to short, so the suction ratio was adjusted
EstimatedPressureAboveLimit	0x0000ff1a	Estimated pressure is above pressure limit	The estimated pressure in the pump head has been above the limit pressure
EstimatedPressureAboveWarningLevel	0x0000ff1b	Estimated pressure is above warning level	The estimated pressure in the pump head has been above the warning level
FlowCalculationError	0x0000ff1c	Flow Calculation Error	The Flowrate calculation is not possible due to wrong parameters
ViscosityCalculationError	0x0000ff1d	Viscosity Calculation Error	The Viscosity calculation is not possible due to wrong parameters
GenericPidControllerActualValueMonitorUpperLimitExceeded	0x0000ff1e	Generic Pid Controller Actual Value Monitor Upper Limit Exceeded	The actual value controlled by the PID controller exceeded the maximal value.
GenericPidControllerActualValueMonitorLowerLimitExceeded	0x0000ff1f	Generic Pid Controller Actual Value Monitor Lower Limit Exceeded	The actual value controlled by the PID controller exceeded the minimal value.

4.5 Event Register Flags

Enum which holds the CANopen event register definition of CiA301 Enum data type: uint8

Enum Name	Value	Name	Description
NoEvent	0x00	No Event	No event occurred.
Generic	0x01	Generic	A generic event is signaled.
Current	0x02	Current	A current related event is signaled.
Voltage	0x04	Voltage	A voltage related event is signaled.
Temperature	0x08	Temperature	A temperature related event is signaled.
Communication	0x10	Communication	A communication related event is signaled.
DeviceProfileSpecific	0x20	Device Profile Specific	A device profile related event is signaled.
Reserved	0x40	Reserved	Reserved events.
ManufacturerSpecific	0x80	Manufacturer Specific	A manufacturer specific event is signaled.

4.6 Flow Directions

Direction from the dosing flow Enum data type: uint8

Enum Name	Value	Name	Description
Forward	0	Forward	Dosing direction is forward.
Backward	1	Backward	Dosing direction is backwards.

4.7 Logger Levels

Defines the severity of log messages. Enum data type: uint8

Enum Name	Value	Name	Description
None	0	None	The no log message.
Error	0x01	Error	The logger level: Error
Warning	0x02	Warning	The logger level: Warning
Info	0x04	Info	The logger level: Info
Verbose	0x08	Verbose	The logger level: Verbose
TimeStamp	0x10	TimeStamp	The logger level: TimeStamp. Introduced to filter and having the timestamps distinct from errors, warnings, ...
AllLoggerLevels	0xff	All Logger Levels	Used to select all logger levels.

4.8 Module IDs

Identifier of FW modules. Used to identify the modules on logger messages. The protocol reserves 8 bits for this enum. Enum data type: uint8

Enum Name	Value	Name	Description
None	0	None	No / invalid module ID
Core	1	Core	Core
FlashStorage	2	FlashStorage	The persistent storage infrastructure including the flash.
MotorControl	3	MotorControl	The motor control unit of the CSWP firmware.
Sensor	4	Sensor	Sensor
Communication	5	Communication	Communication
EventHandler	6	Event Handler	Event handler module
PumpControl	7	Pump Control	Pump control: Flow or pressure control
Tracer	8	Tracer	Tracer
UnknwonModule	253	Unknown Module	The module is unknown. Is used in tests, should not be used otherwise.
Test	254	Test	Test Module
AllModules	0xff	AllModules	Used to select all modules.

4.9 Motor Control States

States of motor control Enum data type: uint8

Enum Name	Value	Name	Description
Initializing	0	Initializing	Motor control is initializing, not ready to run yet
Idle	1	Idle	Motor control is idle (not running but ready to start)
Running	2	Running	Motor control is running
Stopped	3	Stopped	Motor control has been stopped due to error condition (not ready to start before error is cleared)

4.10 Mpio Input Modes

Enumeration describing the MPIO input modes Enum data type: uint8

Enum Name	Value	Name	Description
Disabled	0	Disabled	MPIO input is disabled. An output mode may be configured.
Analog	1	Analog Input	The MPIO acts as analog input.
Digital	2	Digital Input	The MPIO acts as digital input.
PWM	3	PWM Input	The MPIO acts as PWM input.
Frequency	4	Frequency Input	The MPIO acts as frequency input.
AnalogFast	5	Analog Fast	The MPIO acts as analog input without filter.

4.11 Mpio Levels

Voltage Levels for MPIO Enum data type: uint8

Enum Name	Value	Name	Description
3V3	0	Level 3.3V	The MPIO is configured to accept 3.3V input voltages.
5V	1	Level 5V	The MPIO is configured to accept 5V input voltages.
24V	2	Level 24V	The MPIO is configured to accept 24V input voltages.

4.12 Transformation Angle Sources

Defines the source of the transformation angle for the d/q transformation. Enum data type: uint8

Enum Name	Value	Name	Description
Measurement	0	Measurement	The position sensor defines the angle for the transformation.
ConstantFrequency	1	Constant Frequency	The angle is continuously increased for the transformation.
FromSpeedReference	2	From Speed Reference	The angle is calculated from the speed reference.
Vibrator	3	Vibrator	The angle is moved back and forth.

4.13 States Dosing Pump

Defines the states of the dosing pump. Enum data type: uint8

Enum Name	Value	Name	Description
Init	0	Init	The dosing pump is initialization phase.
Idle	1	Idle	The dosing pump is idle.
CalibrationSensor	2	CalibrationSensor	The calibration of the sensor is ongoing.
Prime	3	Prime	The dosing pump primes.
Dosing	4	Dosing	The dosing pump executes a dosing cycle.
Manual	5	Manual	The dosing pump is in manual mode.
TransitionToIdle	6	TransitionToIdle	The dosing pump reaches for idle state.
Error	7	Error	The dosing pump is in error state. Normal operation is not possible.

4.14 Tracer States

State of the Tracer Enum data type: uint8

Enum Name	Value	Name	Description
Idle	0	Idle	Idle
WaitReady	1	WaitReady	WaitReady
Setup	2	Setup	Setup
WaitForTrigger	3	WaitForTrigger	WaitForTrigger
Delay	4	Delay	Delay
Sampling	5	Sampling	Sampling
Stopped	6	Stopped	Stopped
WaitingTransmission-Done	7	Waiting Transmission Done	Waiting until the remaining data in the Buffer is transmitted.

4.15 Tracer Trigger Modes

Tracer Trigger Modes Enum data type: uint8

Enum Name	Value	Name	Description
Off	0	Off	Off
AboveThreshold	1	Above Threshold	Tracer starts when Value is above threshold
BelowThreshold	2	Below Threshold	Tracer starts when value is below threshold

4.16 Users

User types which can log in Enum data type: uint8

Enum Name	Value	Name	Description
Unauthenticated	0	Unauthenticated	No user is authenticated
Admin	1	Admin	The admin user which has predefined access rights
Projectier	2	Projectier	The projectier user which has configurable access rights
User1	3	User1	The customer user 1 which has configurable access rights
User2	4	User2	The customer user 2 which has configurable access rights

4.17 Logger Entries

Logger entries Enum data type: uint16

Enum Name	Value	Name	Description
NoLog	0	No Log	No Log
TimeStamp	1	Time Stamp	Time Stamp
TimeStampOverflow	2	Time Stamp Overflow	Time Stamp overflow after 49.7 days
HdlcReadFailed	3	Hdlc Read Failed	Reading of a HDLC frame with given sequence failed
MotorControlState-Transition	4	Motor Control State Transition	New motor state (1 idle, 2 running)
RotorPositionMeasurementStateTransition	5	Rotor Position Measurement State Transition	New rotor position state
I2CState	6	I2C State	I2C state (0 disabled, 1 enabled)
SensorFailure	7	Sensor Failure	Sensor Failure (number)
SensorBoardReading	8	Sensor Board Reading	Reading Sensor Board (number)
SensorCreation	9	Sensor Creation	Sensor created (number)
SetupStarted	10	Setup Started	Setup Started
SetupFinished	11	Setup Finished	Setup Finished (free blocks)
CleanupStarted	12	Cleanup Started	Cleanup Started
CleanupFinished	13	Cleanup Finished	Cleanup Finished
BlockNotErased	14	Block Not Erased	Not Erased Block found (block number)
BlockCorrupt	15	Block Corrupt	Corrupt Block found (block number)
FileMoved	16	File Moved	File Moved (file ID)
FileDuplicated	17	File Duplicated	Duplicated File found (file ID)
CpuTemperature-TooHigh	18	Cpu Temperature Too High	Measured CPU temperature is above tolerated value
HotspotTemperature-TooHigh	19	Hotspot Temperature Too High	Measured Hotspot temperature is above tolerated value
FileIncomplete	20	File Incomplete	Incomplete File found (file ID)
FileStored	21	File Stored	File stored (file ID)
FileRemoved	22	File Removed	File removed (file ID)
FileRead	23	File Read	File has been read (file ID)
EventHandlerWarning	24	Event Handler Warning	Warning occurred
EventHandlerError	25	Event Handler Error	Error occurred
FlowRateReferenceStateTransition	26	Flow Rate Reference State Transition	New flow rate reference state
SpeedControllerVoltage-OutputStateTransition	27	Speed Controller Voltage Output State Transition	New state of speed controller

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Enum Name	Value	Name	Description
PidControllerState-Transition	28	Pid Controller State Transition	New state of Pid Controller
TracerRemainingSamples	29	Tracer Remaining Samples	Remaining samples to transmit
PosValue	0xfffc	Pos Value	Pos measurement value
LogEventUnknown	0xfffd	Log Event Unknown	There is no translation available. Used in tests, should not be used otherwise.
UnitAndIntegrationTest	0xfffe	Unit And Integration Test	Reserved for unit and integration tests
Maximum	0xffff	Maximum	Maximum

4.18 Event Ids

Event Ids Enum data type: uint16

Enum Name	Value	Name	Description
NoEvent	0	No Event	No Event
ShutDown	1	Shut Down	System has been shut-down due to an under voltage trigger.
FirmwareAssert	2	Firmware Assert	A firmware assert occurred.
FlowSensorIncompatibleProcessingFirmware-Version	3	Flow Sensor Incompatible Processing Firmware Version	The processing firmware of the flow sensor is incompatible.
WindowWatchdog	4	Window Watchdog	The MCU was reset due to the window watchdog.
IndependentWatchdog	5	Independent Watchdog	The MCU was reset due to the independent watchdog.
LowPower	6	Low Power	The MCU was reset due to low power.
OptionByte	7	Option Byte	The MCU was reset due to option bytes.
UnexpectedReset	8	Unexpected Reset	The MCU was reset due to unexpected reason.
TemperatureHigh	9	Temperature High	Temperature is too high.
TemperatureOut-OfRange	10	Temperature Out of Range	Temperature is out of measurement range.
PDOLengthExceeded	11	PDO Length Exceeded	PDO length was exceeded.
CommunicationLayer-GeneralError	12	Communication Layer General Error	General error of communication layer.
CommunicationLayer-InvalidData	13	Communication Layer Invalid Data	Invalid data detected by communication layer
CommunicationLayer-RemoteDetectedInvalid-Data	14	Communication Layer Remote Detected Invalid Data	Invalid data detected by the communication layer of the remote node.
ShutdownFileWriting-Failed	15	Shutdown File Writing Failed	The writing of the shut-down file failed.
ShutdownFileReading-Failed	16	Shutdown File Reading Failed	The reading of the shut-down file failed.
ShutdownFileLengthInvalid	17	Shutdown File Length Invalid	The shut-down file has invalid length.
ShutdownFileFormatVersionInvalid	18	Shutdown File Format Version Invalid	The shut-down file has invalid version.

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Enum Name	Value	Name	Description
ShutdownFileFormatHashInvalid	19	Shutdown File Format Hash Invalid	The shut-down file has invalid format hash.
ShutdownFileRemovingFailed	20	Shutdown File Removing Failed	Removing the shut-down file failed.
ParameterFileWritingFailed	21	Parameter File Writing Failed	The writing of the parameter file failed.
ParameterFileReadingFailed	22	Parameter File Reading Failed	The reading of the parameter file failed.
ParameterFileLengthInvalid	23	Parameter File Length Invalid	The parameter file has invalid length.
ParameterFileFormatVersionInvalid	24	Parameter File Format Version Invalid	The parameter file has invalid version.
ParameterFileFormatHashInvalid	25	Parameter File Format Hash Invalid	The parameter file has invalid format hash.
ParameterFileRemovingFailed	26	Parameter File Removing Failed	Removing the parameter file failed.
FileSystemSetupFailed	27	File System Setup Failed	The setup of the file system failed.
FileSystemCleanupFailed	28	File System Cleanup Failed	The cleanup of the file system failed.
RotorPositionNoEdgeDetected	29	Rotor Position No Edge Detected	No edge detected by rotor position measurement.
RotorPositionUnexpectedEdge	30	Rotor Position Unexpected Edge	Unexpected edge detected by rotor position measurement.
SupplyCurrentHigh	31	Supply Current High	The estimated supply current is too high.
VoltageDcLinkHigh	32	Voltage Dc Link High	The DC link voltage is too high.
VoltageDcLinkLow	33	Voltage Dc Link Low	The DC link voltage is too low.
PidControllerDataSourceInvalid	34	Pid Controller Data Source Invalid	PID controller has invalid data source.
PidControllerSensorFailure	35	Pid Controller Sensor Failure	Sensor failure detected by PID controller
SensorSetupFailed	36	Sensor Setup Failed	Setup of the sensor failed.
SensorBoardFileReadingFailed	37	Sensor Board File Reading Failed	Reading of the sensor board file failed.
SensorBoardFileLengthInvalid	38	Sensor Board File Length Invalid	Sensor board file has invalid length.
SensorBoardFileFormatVersionInvalid	39	Sensor Board File Format Version Invalid	Sensor board file has invalid version
SensorFileReadingFailed	40	Sensor File Reading Failed	Reading of sensor file failed.
SensorFileLengthInvalid	41	Sensor File Length Invalid	Sensor file has invalid length.
SensorFileFormatVersionInvalid	42	Sensor File Format Version Invalid	Sensor file has invalid version.
EventConfigurationFileWritingFailed	43	Event Configuration File Writing Failed	Writing the event configuration file failed.
EventConfigurationFileReadingFailed	44	Event Configuration File Reading Failed	Reading the event configuration file failed.
EventConfigurationFileLengthInvalid	45	Event Configuration File Length Invalid	Event configuration file has invalid length.
EventConfigurationFileFormatVersionInvalid	46	Event Configuration File Format Version Invalid	Event configuration file has invalid version.

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Enum Name	Value	Name	Description
EventConfigurationFileFormatHashInvalid	47	Event Configuration File Format Hash Invalid	Event configuration file has invalid format hash.
EventConfigurationFileRemovingFailed	48	Event Configuration File Removing Failed	Removing event configuration file failed.
CalibrationFileWritingFailed	49	Calibration File Writing Failed	Writing of the calibration file failed.
CalibrationFileReadingFailed	50	Calibration File Reading Failed	Reading the calibration file failed.
CalibrationFileLengthInvalid	51	Calibration File Length Invalid	The calibration file has invalid length.
CalibrationFileFormatVersionInvalid	52	Calibration File Format Version Invalid	The calibration file has invalid version.
CalibrationFileFormatHashInvalid	53	Calibration File Format Hash Invalid	The calibration file has invalid format hash.
CalibrationFileRemovingFailed	54	Calibration File Removing Failed	Removing the calibration file failed.
IncorrectCalibrationDetected	55	Incorrect Calibration Detected	Rotor position measurement detected incorrect calibration.
TimeDosingCycleCalculationFailed	56	Time Dosing Cycle Calculation Failed	The calculation of the moving time failed.
KiPCommunicationTimedOut	57	KiP Communication Timed Out	KNF I2C communication request timed out.
KiPCommunicationReadRequestFailed	58	KiP Communication Read Request Failed	KNF I2C communication read request could not be started.
KiPCommunicationWriteRequestFailed	59	KiP Communication Write Request Failed	KNF I2C communication write request could not be started.
KiPCommunicationDriverError	60	KiP Communication Driver Error	KNF I2C driver reported internal error.
KiPCommunicationJobDefinitionQueueOverrun	61	KiP Communication Job Definition Queue Overrun	KNF I2C driver reported overrun of the job definition queue.
KiPCommunicationQueuingThreadQueueOverrun	62	KiP Communication Queuing Thread Queue Overrun	KNF I2C driver reported overrun of the queuing thread queue.
PositioningControllerFollowingError	63	Positioning Controller Following Error	Position error of the position controller is too high.
MpioInputModeNotSupported	64	Mpio Input Mode Not Supported	The MPIO input mode is not supported.
MpioOutputModeNotSupported	65	MPIO Output Mode Not Supported	The MPIO output mode is not supported.
SensorError	66	Sensor Error	A sensor is in error state.
TemperatureMediaOutOfRange	67	Temperature Media Out Of Range	The media temperature is out of range.
DriveSpeedTooHigh	68	Drive Speed Too High	The drive speed is too high.
InputFrequencyTooHigh	69	Input Frequency Too High	The input frequency is too high.
MotorBlocked	70	Motor Blocked	The motor might be blocked.
UserAccessConfigurationWritingFailed	71	User Access Configuration Writing Failed	Writing the user access configuration file failed.
UserAccessConfigurationReadingFailed	72	User Access Configuration Reading Failed	Reading the user access configuration file failed.

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Enum Name	Value	Name	Description
UserAccessConfigurationLengthInvalid	73	User Access Configuration Length Invalid	The user access configuration file has invalid length.
UserAccessConfigurationFormatVersionInvalid	74	User Access Configuration Format Version Invalid	The user access configuration file has invalid version
UserAccessConfigurationFormatHashInvalid	75	User Access Configuration Format Hash Invalid	The user access configuration file has invalid format hash.
UserAccessConfigurationRemovingFailed	76	User Access Configuration Removing Failed	Removing the user access configuration file failed.
AirDetectedMediumLevel	77	Air Detected Medium Level	Medium level of air was detected.
AirDetectedExtremeLevel	78	Air Detected Extreme Level	Extreme level of air was detected.
FlowControllerOutOfRange	79	Flow Controller Out Of Range	Flow controller is out of range.
CommandAuthenticationConfigurationFailedNoFreeEntries	80	Command Authentication Configuration Failed No Free Entries	The command for authentication configuration failed because there was no entry left.
CommandAuthenticationConfigurationFailedRequestedEntryNotFound	81	Command Authentication Configuration Failed Requested Entry Not Found	The command for authentication configuration failed because the requested entry was not found.
CommandAuthenticationConfigurationFailedRequestedConfigurationNotFound	82	Command Authentication Configuration Failed Requested Configuration Not Found	Command for authentication configuration failed because the requested configuration was not found.
PositionSensorDisturbed	83	Position Sensor Disturbed	The position sensor is disturbed by an external influence.
CommandAuthenticationUserWrongPassword	84	Command Authentication User Wrong Password	The user authentication command failed due to wrong password.
CommandAuthenticationUserNoFileHandler	85	Command Authentication User No File Handler	The user authentication command failed due to missing file handler.
CommandAuthenticationUserNoUserAccessConfiguration	86	Command Authentication User No User Access Configuration	The user authentication command failed due to missing access configuration.
CommandAuthenticationUserReadingUserAccessConfigurationFailed	87	Command Authentication User Reading User Access Configuration Failed	The user authentication command failed because the user access configuration file could not be read.
RatioSuctionAutomaticallyAdjusted	88	Ratio Suction Automatically Adjusted	Calculated moving time from cycle time and suction ratio is too short. Suction ratio is adjusted automatically.
TargetSpeedNotReached	89	Target Speed Not Reached	The target speed was not reached within the defined time.
EstimatedPressureAboveLimit	90	Estimated Pressure Above Limit	The estimated pressure is too high.

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Enum Name	Value	Name	Description
EstimatedPressureAboveWarningLevel	91	Estimated Pressure Above Warning Level	The estimated pressure has reached the warning level.
FlowCalculationError	92	Flow Calculation Error	The Flowrate calculation is not possible due to wrong parameters
ViscosityCalculationError	93	Viscosity Calculation Error	The Viscosity calculation is not possible due to wrong parameters
GenericPidControllerActualValueMonitorUpperLimitExceeded	94	Generic Pid Controller Actual Value Monitor Upper Limit Exceeded	The actual value controlled by the PID Controlled exceeded the maximum value.
GenericPidControllerActualValueMonitorLowerLimitExceeded	95	Generic Pid Controller Actual Value Monitor Lower Limit Exceeded	The actual value controlled by the PID Controlled exceeded the minimum value.
Invalid	0x7ffe	Invalid Event	Invalid event used for integration test.
Test	0x7fff	Test Event	Event used for integration test.

4.19 Actions

Actions Enum data type: uint32

Enum Name	Value	Name	Description
NoAction	0x00000000	No Action	No Action
Stop	0x00000001	Stop	Stops the operation of the pump.
PreOperational	0x00000002	Pre Operational	Sets the CANopen node state to pre-operational.
LoggerLogWarning	0x00000004	Logger Log Warning	Sends the logger message "Warning occurred".
LoggerLogError	0x00000008	Logger Log Error	Sends the logger message "Error occurred".
HistoryLogWarning	0x00000010	History Log Warning	Logs the warning in the warning history.
HistoryLogError	0x00000020	History Log Error	Logs the error in the error history.
EmergencyMessage	0x00000040	Emergency Message	Sends the CANopen emergency message.
SelfReset	0x00000080	Self Reset	The event is reset after reset time when no new event has received by event handler.
LedOff	0x00000100	Led Off	All LEDs are switched off.
LedRedOn	0x00000200	Led Red On	Red LED is switched on, green LED is switched off.
LedRedBlink	0x00000400	Led Red Blink	Red LED blinks.
LedGreenBlink	0x00000800	Led Green Blink	Green LED blinks.
SetOutputDigital1	0x00001000	Set Output Digital 1	Sets the digital output 1.
SetOutputDigital2	0x00002000	Set Output Digital 2	Sets the digital output 2.
IndicateErrorState	0x00004000	Indicate Error State	Indicate error state by state PDO
IndicateWarningState	0x00008000	Indicate Warning State	Indicate warning state by state PDO
EventActiveBlockFurtherImmediateActions	0x40000000	Event Active Block Further Immediate Actions	The event is active -> block further immediate actions.
EventActiveBlockFurtherBackgroundActions	0x80000000	Event Active Block Further Background Actions	The event is active -> block further background actions.

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Enum Name	Value	Name	Description
AllActions	0xffffffff	All Actions	Bit mask selecting all actions. Internal use only.

4.20 Parameter Unique Ids

Parameter Unique Ids Enum data type: uint16

Enum Name	Value	Name	Description
SerialNumber	1	Serial Number	The serial number assigned during production by the End-of-Line (EoL) system. The EoL retrieves the number from SAP.
ErrorRegister	2	Error Register	This object provides error information. The most recent error is stored, even if the error is no longer active.
StateRegister	3	State Register	This object provides state information.
ErrorEntryCount	4	Error Entry Count	Read and clear the error count and history.
ErrorEntry1MostRecent	5	Error Entry 1 Most Recent	This object provides error information and contains the latest error.
ErrorEntry2	6	Error Entry 2	This object provides error information.
ErrorEntry3	7	Error Entry 3	This object provides error information.
ErrorEntry4	8	Error Entry 4	This object provides error information.
ErrorEntry5	9	Error Entry 5	This object provides error information.
GuardTime	10	Guard Time	This entry defines the guard time.
LifeTimeFactor	11	Life Time Factor	The lifetime factor multiplied by the guard time defines the device's lifetime.
CobIdEmergency	12	Cob Id Emergency	COB-ID used for emergency messages (Emergency Server).
CobIdClientToServer	13	Cob Id Client To Server	COB-ID for transmitting data from client to server, specifically for firmware data reception. (COB: Communication Object)
CobIdServerToClient	14	Cob Id Server To Client	COB-ID for transmitting data from server to client, specifically for firmware data transmission. (COB: Communication Object)
ResetReason	15	Reset Reason	The last reset reason. Available only if power was maintained to preserve RAM contents.
ResetReasonAssertReason	16	Reset Reason Assert Reason	The trigger source of the last assert. Available only if power was maintained to preserve RAM contents.

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Enum Name	Value	Name	Description
ResetReasonAssertAddress	17	Reset Reason Assert Address	The call stack address during the last assert. Available only if power was maintained to preserve RAM contents.
TestParameterUint8	18	Test Parameter Uint8	A test parameter of data type Uint8.
TestParameterUint16	19	Test Parameter Uint16	A test parameter of data type Uint16.
TestParameterUint32	20	Test Parameter Uint32	A test parameter of data type Uint32. Also used for PDO tests (Nmt_integrationtest.cpp).
TestParameterInt8	21	Test Parameter Int8	A test parameter of data type Int8.
TestParameterInt16	22	Test Parameter Int16	A test parameter of data type Int16.
TestParameterInt32	23	Test Parameter Int32	A test parameter of data type Int32.
TestParameterFloat	24	Test Parameter Float	A test parameter of data type float.
TestParameterBool	25	Test Parameter Bool	A test parameter of data type boolean.
TimeSinceBoot	26	Time Since Boot	Time elapsed since the last system start.
TimePowered	27	Time Powered	Total time the system has been powered.
TimeOperation	28	Time Operation	Total operating time of the system, typically when the motor was running.
CommandStorageParameterState	29	Command Storage Parameter State	Command and state interface for persistent parameter storage. Write 'Start' to initiate the command. Read the current execution state from this parameter.
CommandStorageParameter	30	Command Storage Parameter	The command to be executed when triggered.
SpeedTarget	31	Speed Target	Target speed for the motor. This value is passed to the trajectory generator.
SpeedTargetCia402	32	Speed Target	Target speed for the motor. This value is passed to the trajectory generator.
TargetSourceSpeedController	33	Target Source Speed Controller	Defines the source of the target speed.
SpeedReference	34	Speed Reference	Actual reference speed. May differ from the target speed due to limitations and ramp generation.
SpeedReferenceCia402	35	Speed Reference	Actual reference speed. May differ from the target speed due to limitations and ramp generation.
SpeedActual	36	Speed Actual	Actual measured speed at the motor axis.
SpeedSensorTimeValue	37	Speed Sensor Time Value	Raw frequency input value used to determine motor speed.
SpeedActualFiltered	38	Speed Actual Filtered	Actual speed measured at the motor axis. The speed is low pass filtered.
SpeedActualCia402	39	Speed Actual	Actual speed measured at the motor axis.
TestParameterConversionCustom	40	Test Parameter Conversion Custom	Test parameter for custom parameter conversion. To be removed.

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Enum Name	Value	Name	Description
TestParameterConversionLinear	41	Test Parameter Conversion Linear	A test parameter to test the linear conversion.
TestParameterConversionScaling	42	Test Parameter Conversion Scaling	Test parameter for scale conversion.
TestParameterConversionFunction	43	Test Parameter Conversion Function	A test parameter to test the function conversion.
SpeedProfileMaximum	44	Speed Profile Maximum	Maximum motor speed defined in the speed profile. See also SpeedMotorMaximum.
SpeedProfileMaximum-Cia402	45	Speed Profile Maximum	Maximum motor speed defined in the speed profile. See also SpeedMotorMaximum.
SpeedMotorMaximum	46	Speed Motor Maximum	Maximum motor speed. See also SpeedProfileMaximum.
SpeedMotorMaximum-Cia402	47	Speed Motor Maximum	Maximum motor speed. See also SpeedProfileMaximum.
AccelerationProfile	48	Acceleration Profile	Maximum acceleration limit defined in the motion profile. See also motor limit AccelerationMaximum.
AccelerationProfile-Cia402	49	Acceleration Profile	Maximum acceleration limit defined in the motion profile. See also motor limit AccelerationMaximum.
DecelerationProfile	50	Deceleration Profile	Maximum deceleration limit defined in the motion profile. See also motor limit DecelerationMaximum.
DecelerationProfile-Cia402	51	Deceleration Profile	Maximum deceleration limit defined in the motion profile. See also motor limit DecelerationMaximum.
DecelerationQuickStop	52	Deceleration Quick Stop	Deceleration used for quick motor stop.
DecelerationQuickStop-Cia402	53	Deceleration Quick Stop	Deceleration used for quick motor stop.
AccelerationMaximum	54	Acceleration Maximum	Maximum acceleration limit defined in the motion profile. See also motor limit AccelerationProfile.
AccelerationMaximum-Cia402	55	Acceleration Maximum	Maximum acceleration for the specified motor. See also motor limit AccelerationProfile.
DecelerationMaximum	56	Deceleration Maximum	Maximum deceleration for the specified motor. See also motor limit DecelerationProfile.
DecelerationMaximum-Cia402	57	Deceleration Maximum	Maximum deceleration for the specified motor. See also motor limit DecelerationProfile.
TorqueRated	58	Torque Rated	Rated torque for the specified motor.
TorqueRatedCia402	59	Torque Rated	Rated torque for the specified motor.
TorqueTargetCia402	60	Torque Target	Target torque applied to the motor.
TorqueMaximumCia402	61	Torque Maximum	Maximum applicable torque for the specified motor.
TorqueMaximumPositiveCia402	62	Torque Maximum Positive	Maximum positive torque value for the motor.
TorqueMaximumNegativeCia402	63	Torque Maximum Negative	Maximum negative torque value for the motor.

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Enum Name	Value	Name	Description
TorqueDemandCia402	64	Torque Demand	Demanded torque at the motor axle, calculated based on current and motor data.
TorqueActualCia402	65	Torque Actual	Actual torque at the motor axle, calculated based on current and motor data.
CurrentMotorRated	66	Current Motor Rated	Rated motor current value.
CurrentMotorRated-Cia402	67	Current Motor Rated	Rated motor current value.
CurrentMotorMaximum	68	Current Motor Maximum	Maximum motor current value. The controller limits current to this value.
CurrentMotorMaximumCia402	69	Current Motor Maximum	Maximum motor current value. The controller limits current to this value.
CurrentMotorQAxis-MaximumPositive	70	Current Motor QAxis Maximum Positive	Positive maximum current on the q-axis. The controller limits current to this value.
CurrentMotorQAxis-MaximumNegative	71	Current Motor QAxis Maximum Negative	Negative maximum current on the q-axis. The controller limits current to this value.
CurrentMotorTarget	72	Current Motor Target	Target motor current requested by the higher-level controller (e.g., speed controller). This value is subject to limiters and not directly fed to the current controller.
CurrentMotorDemand	73	Current Motor Demand	Demand motor current. This is the reference value for the current controller and may differ from CurrentMotorTarget due to applied limits.
CurrentMotorActual	74	Current Motor Actual	Actual total current supplied to the motor.
CurrentMotorActual-Cia402	75	Current Motor Actual	Actual total current supplied to the motor.
CurrentMotorQAxisActualFiltered	76	Current Motor QAxis Actual Filtered	Actual current on the q-axis, low-pass filtered.
VoltageDcLinkFiltered	77	Voltage Dc Link Filtered	Measured and filtered DC link voltage. Internally used to generate appropriate motor voltages.
VoltageDcLinkFiltered-Cia402	78	Voltage Dc Link Filtered	Measured and filtered DC link voltage. Internally used to generate appropriate motor voltages.
VoltageControlReferenceFiltered	79	Voltage Control Reference Filtered	Reference voltage of the system. The value is low-pass filtered.
PositionElectricalOffset	80	Position Electrical Offset	Position offset in the electrical coordinate system. Compensates for the hall sensor's position offset. Used in Clarke/Park transformation.
PositionElectricalOffsetCia401	81	Position Electrical Offset	Position offset in the electrical coordinate system. Compensates for the hall sensor's position offset. Used in Clarke/Park transformation.
PositionMechanicalOffset	82	Position Mechanical Offset	Position offset in the mechanical coordinate system. Used to compensate rotor position.

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Enum Name	Value	Name	Description
PositionMechanicalOffsetCia401	83	Position Mechanical Offset	Position offset in the mechanical coordinate system. Used to compensate rotor position.
PositionMechanical	84	Position Mechanical	Actual mechanical position of the rotor.
PositionMechanical-Cia401	85	Position Mechanical	Actual mechanical position of the rotor.
PositionElectrical	86	Position Electrical	Actual electrical position. Used in Clarke/Park transformation.
PolePairs	87	Pole Pairs	Number of pole pairs of the motor.
SpeedMotorMinimum	88	Speed Motor Minimum	Minimum motor speed. Defines the lower limit of the operating range for motors that do not function properly at low speeds.
SpeedControllerTimeConstantLowSpeed	89	Speed Controller Time Constant Low Speed	Up to SpeedControllerFrequencyLowSpeed, speed controller has a time constant of SpeedControllerTimeConstant-LowSpeed. Between SpeedControllerFrequencyLowSpeed and SpeedControllerFrequencyHighSpeed, the time constant is linearly change between SpeedControllerTimeConstantLowSpeed and SpeedControllerTimeConstantHighSpeed. Above SpeedControllerFrequencyHighSpeed, speed controller has a time constant of SpeedControllerTimeConstantHighSpeed.
SpeedControllerFrequencyLowSpeed	90	Speed Controller Frequency Low Speed	Up to SpeedControllerFrequencyLowSpeed, speed controller has a time constant of SpeedControllerTimeConstant-LowSpeed. Between SpeedControllerFrequencyLowSpeed and SpeedControllerFrequencyHighSpeed, the time constant is linearly change between SpeedControllerTimeConstantLowSpeed and SpeedControllerTimeConstantHighSpeed. Above SpeedControllerFrequencyHighSpeed, speed controller has a time constant of SpeedControllerTimeConstantHighSpeed.
SpeedControllerFilterConstant	91	Speed Controller Filter Constant	Time constant of the first-order low-pass filter applied to the speed sensor signal.

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Enum Name	Value	Name	Description
SpeedControllerTimeConstantHighSpeed	92	Speed Controller Time Constant High Speed	Up to SpeedControllerFrequencyLowSpeed, speed controller has a time constant of SpeedControllerTimeConstantLowSpeed. Between SpeedControllerFrequencyLowSpeed and SpeedControllerFrequencyHighSpeed, the time constant is linearly change between SpeedControllerTimeConstantLowSpeed and SpeedControllerTimeConstantHighSpeed. Above SpeedControllerFrequencyHighSpeed, speed controller has a time constant of SpeedControllerTimeConstantHighSpeed.
SpeedControllerFrequencyHighSpeed	93	Speed Controller Frequency High Speed	Up to SpeedControllerFrequencyLowSpeed, speed controller has a time constant of SpeedControllerTimeConstantLowSpeed. Between SpeedControllerFrequencyLowSpeed and SpeedControllerFrequencyHighSpeed, the time constant is linearly change between SpeedControllerTimeConstantLowSpeed and SpeedControllerTimeConstantHighSpeed. Above SpeedControllerFrequencyHighSpeed, speed controller has a time constant of SpeedControllerTimeConstantHighSpeed.
SpeedControllerFrequencyGenerateMaximumRampStart	94	Speed Controller Frequency Generate Maximum Ramp Start	Above the frequency defined by 'SpeedControllerFrequencyGenerateMaximumRampStart', the generation current limit is linearly reduced from the maximum allowed current to zero at 'SpeedControllerFrequencyGenerateMaximumRampEnd'. The controller compensates for pump effects at low speeds while allowing greater deviation at higher speeds.
SpeedControllerFrequencyGenerateMaximumRampEnd	95	Speed Controller Frequency Generate Maximum Ramp End	Above the frequency defined by 'SpeedControllerFrequencyGenerateMaximumRampStart', the generation current limit is linearly reduced from the maximum allowed current to zero at 'SpeedControllerFrequencyGenerateMaximumRampEnd'. The controller compensates for pump effects at low speeds while allowing greater deviation at higher speeds.

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Enum Name	Value	Name	Description
CommandMemoryState	96	Command Memory State	Command and state register for the memory command. Write 'Start' to trigger the command. Read the current execution state from this parameter.
CommandMemoryResponse	97	Command Memory Response	Returns the 32 bit value at address specified by 'CommandMemory'.
CommandMemoryAddress	98	Command Memory Address	Defines the address the memory command is going read from.
CommandSimulateEventState	99	Command Simulate Event State	Command to simulate events like errors or warnings. Write 'Start' to trigger the command. Read the current execution state from this parameter.
CommandSimulateEventId	100	Command Simulate Event Id	Defines the event to be triggered on the target.
CommandResetState	101	Command Reset State	Triggers a system reset. Write 'Start' to trigger the command. Reading the current execution state is not possible since the system does reset.
CommandBootloaderState	102		
CommandBootloaderFirmwareIdentifier	103		
CommandSimulateAssertState	104	Command Simulate Assert State	Triggers an assert. Write 'Start' to trigger the assert. Reading the current execution state from this parameter is not possible since the system resets.
CommandSimulatePowerLossState	105	Command Simulate Power Loss State	Simulates a power loss. Write 'Start' to trigger the command. Read the current execution state from this parameter.
TracerRecord1SourceCia301	106	Tracer Record 1 Source	Index and subindex encoded according Cia301 that identify the 1st parameter that has to be recorded by the tracer.
TracerRecord2SourceCia301	107	Tracer Record 2 Source	Index and sub-index encoded according Cia301 that identify the 2nd parameter that has to be recorded by the tracer.
TracerRecord3SourceCia301	108	Tracer Record 3 Source	Index and sub-index encoded according Cia301 that identify the 3rd parameter that has to be recorded by the tracer.
TracerRecord4SourceCia301	109	Tracer Record 4 Source	Index and sub-index encoded according Cia301 that identify the 4th parameter that has to be recorded by the tracer.
TracerRecord1Source	110	Tracer Record 1 Source	Unique parameter ID of the 1st parameter that has to be recorded by the tracer.
TracerRecord2Source	111	Tracer Record 2 Source	Unique parameter ID of the 2nd parameter that has to be recorded by the tracer.

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Enum Name	Value	Name	Description
TracerRecord3Source	112	Tracer Record 3 Source	Unique parameter ID of the 3rd parameter that has to be recorded by the tracer.
TracerRecord4Source	113	Tracer Record 4 Source	Unique parameter ID of the 4th parameter that has to be recorded by the tracer.
TracerTriggerSource-Cia301	114	Tracer Trigger Source	Index and subindex that identifies the parameter that is used to trigger the tracer.
TracerTriggerSource	115	Tracer Trigger Source	Unique parameter ID of the parameter that is used to trigger the tracer.
TracerTriggerMode	116	Tracer Trigger Mode	Trigger mode of the tracer. It defines the trigger condition of the tracer. The trigger signal is defined in TracerTriggerSource.
TracerTriggerThreshold	117	Tracer Trigger Threshold	Threshold value to which the trigger parameter is compared by the tracer trigger. Applies only if trigger mode is 'Above Threshold' or 'Below Threshold'.
TracerTriggerDelay	118	Tracer Trigger Delay	Number of cycles by which the recording is delayed after the tracer has been started by the trigger. A negative number represents a pre-trigger.
TracerStart	119	Tracer Start	Starts the recording by the tracer.
TracerStop	120	Tracer Stop	Stops the recording of the tracer.
TracerSamplingRate	121	Tracer Sampling Rate	Rate at which samples are taken.
TracerState	122	Tracer State	Current state of the tracer.
TracerOutput1	123	Tracer Output 1	The tracer copies the first observed value to this parameter. This SDO is mapped to the tracer PDO. The mapping is defined in TracerRecord1SourceCia301
TracerOutput2	124	Tracer Output 2	The tracer copies the first second value to this parameter. This SDO is mapped to the tracer PDO. The mapping is defined in TracerRecord2SourceCia301
TracerOutput3	125	Tracer Output 3	The tracer copies the third observed value to this parameter. This SDO is mapped to the tracer PDO. The mapping is defined in TracerRecord3SourceCia301
TracerOutput4	126	Tracer Output 4	The tracer copies the fourth observed value to this parameter. This SDO is mapped to the tracer PDO. The mapping is defined in TracerRecord4SourceCia301
TargetSourceCurrent-ControllerMotor	127	Target Source Current Controller Motor	Source of the d-axis and/or q-axis current target.
Sensor-Board1FlashAddress	128	Sensor Board 1 Flash Address	Flash memory address of Sensor Board 1
Sensor-Board1SerialNumber	129	Sensor Board 1 Serial Number	Serial number of Sensor Board 1

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Enum Name	Value	Name	Description
Sensor-Board1IdManufacturer	130	Sensor Board 1 Id Manufacturer	Manufacturer ID of Sensor Board 1
Sensor-Board1SerialNumberManufacturerPart1	131	Sensor Board 1 Serial Number Manufacturer Part 1	First segment of the manufacturer-defined serial number for Sensor Board 1
Sensor-Board2FlashAddress	132	Sensor Board 2 Flash Address	Flash memory address of Sensor Board 2
Sensor-Board2SerialNumber	133	Sensor Board 2 Serial Number	Serial number of Sensor Board 2
Sensor-Board2IdManufacturer	134	Sensor Board 2 Id Manufacturer	Manufacturer ID of Sensor Board 2
Sensor-Board2SerialNumberManufacturerPart1	135	Sensor Board 2 Serial Number Manufacturer Part 1	First segment of the manufacturer-defined serial number for Sensor Board 2
Sensor-Board3FlashAddress	136	Sensor Board 3 Flash Address	Flash memory address of Sensor Board 3
Sensor-Board3SerialNumber	137	Sensor Board 3 Serial Number	Serial number of Sensor Board 3
Sensor-Board3IdManufacturer	138	Sensor Board 3 Id Manufacturer	Manufacturer ID of Sensor Board 3
Sensor-Board3SerialNumberManufacturerPart1	139	Sensor Board 3 Serial Number Manufacturer Part 1	First segment of the manufacturer-defined serial number for Sensor Board 3
Sensor-Board4FlashAddress	140	Sensor Board 4 Flash Address	Flash memory address of Sensor Board 4
Sensor-Board4SerialNumber	141	Sensor Board 4 Serial Number	Serial number of Sensor Board 4
Sensor-Board4IdManufacturer	142	Sensor Board 4 Id Manufacturer	Manufacturer ID of Sensor Board 4
Sensor-Board4SerialNumberManufacturerPart1	143	Sensor Board 4 Serial Number Manufacturer Part 1	First segment of the manufacturer-defined serial number for Sensor Board 4
Sensor1Enable	144	Sensor 1 Enable	Enables or disables the sensor
Sensor1BoardNumber	145	Sensor 1 Board Number	Specifies the sensor board on which the sensor is mounted.
Sensor1BoardIndex	146	Sensor 1 Board Index	Index of the sensor on the sensor board.
Sensor1CommunicationInterval	147	Sensor 1 Communication Interval	Communication interval for this sensor.
Sensor1Type	148	Sensor 1 Type	Sensor type
Sensor1SerialNumber	149	Sensor 1 Serial Number	Serial number of the sensor as defined by the manufacturer.
Sensor1Address	150	Sensor 1 Address	I ² C address of the sensor.
Sensor1State	151	Sensor 1 State	Current operational state of the sensor
Sensor1CalibrationDate	152	Sensor 1 Calibration Date	Timestamp of the last calibration in Unix format.
Sensor1Value	153	Sensor 1 Value	Actual sensor value. The unit depends on sensor type.
Sensor1Offset	154	Sensor 1 Offset	Offset value for sensor. May be used to adjust the sensor. The unit depends on the sensor type.
Sensor1Scaling	155	Sensor 1 Scaling	Scaling factor for sensor. May be used to adjust the sensor. The unit depends on the sensor type.

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Enum Name	Value	Name	Description
Sensor2Enable	156	Sensor 2 Enable	Enables or disables the sensor
Sensor2BoardNumber	157	Sensor 2 Board Number	Specifies the sensor board on which the sensor is mounted.
Sensor2BoardIndex	158	Sensor 2 Board Index	Index of the sensor on the sensor board.
Sensor2CommunicationInterval	159	Sensor 2 Communication Interval	Communication interval for this sensor.
Sensor2Type	160	Sensor 2 Type	Sensor type
Sensor2SerialNumber	161	Sensor 2 Serial Number	Serial number of the sensor as defined by the manufacturer.
Sensor2Address	162	Sensor 2 Address	I ² C address of the sensor.
Sensor2State	163	Sensor 2 State	Current operational state of the sensor
Sensor2CalibrationDate	164	Sensor 2 Calibration Date	Timestamp of the last calibration in Unix format.
Sensor2Value	165	Sensor 2 Value	Actual sensor value. The unit depends on sensor type.
Sensor2Offset	166	Sensor 2 Offset	Offset value for sensor. May be used to adjust the sensor. The unit depends on the sensor type.
Sensor2Scaling	167	Sensor 2 Scaling	Scaling factor for sensor. May be used to adjust the sensor. The unit depends on the sensor type.
Sensor3Enable	168	Sensor 3 Enable	Enables or disables the sensor
Sensor3BoardNumber	169	Sensor 3 Board Number	Specifies the sensor board on which the sensor is mounted.
Sensor3BoardIndex	170	Sensor 3 Board Index	Index of the sensor on the sensor board.
Sensor3CommunicationInterval	171	Sensor 3 Communication Interval	Communication interval for this sensor.
Sensor3Type	172	Sensor 3 Type	Sensor type
Sensor3SerialNumber	173	Sensor 3 Serial Number	Serial number of the sensor as defined by the manufacturer.
Sensor3Address	174	Sensor 3 Address	I ² C address of the sensor.
Sensor3State	175	Sensor 3 State	Current operational state of the sensor
Sensor3CalibrationDate	176	Sensor 3 Calibration Date	Timestamp of the last calibration in Unix format.
Sensor3Value	177	Sensor 3 Value	Actual sensor value. The unit depends on sensor type.
Sensor3Offset	178	Sensor 3 Offset	Offset value for sensor. May be used to adjust the sensor. The unit depends on the sensor type.
Sensor3Scaling	179	Sensor 3 Scaling	Scaling factor for sensor. May be used to adjust the sensor. The unit depends on the sensor type.
Sensor4Enable	180	Sensor 4 Enable	Enables or disables the sensor
Sensor4BoardNumber	181	Sensor 4 Board Number	Specifies the sensor board on which the sensor is mounted.
Sensor4BoardIndex	182	Sensor 4 Board Index	Index of the sensor on the sensor board.
Sensor4CommunicationInterval	183	Sensor 4 Communication Interval	Communication interval for this sensor.
Sensor4Type	184	Sensor 4 Type	Sensor type

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Enum Name	Value	Name	Description
Sensor4SerialNumber	185	Sensor 4 Serial Number	Serial number of the sensor as defined by the manufacturer.
Sensor4Address	186	Sensor 4 Address	I ² C address of the sensor.
Sensor4State	187	Sensor 4 State	Current operational state of the sensor
Sensor4CalibrationDate	188	Sensor 4 Calibration Date	Timestamp of the last calibration in Unix format.
Sensor4Value	189	Sensor 4 Value	Actual sensor value. The unit depends on sensor type.
Sensor4Offset	190	Sensor 4 Offset	Offset value for sensor. May be used to adjust the sensor. The unit depends on the sensor type.
Sensor4Scaling	191	Sensor 4 Scaling	Scaling factor for sensor. May be used to adjust the sensor. The unit depends on the sensor type.
Sensor5Enable	192	Sensor 5 Enable	Enables or disables the sensor
Sensor5BoardNumber	193	Sensor 5 Board Number	Specifies the sensor board on which the sensor is mounted.
Sensor5BoardIndex	194	Sensor 5 Board Index	Index of the sensor on the sensor board.
Sensor5CommunicationInterval	195	Sensor 5 Communication Interval	Communication interval for this sensor.
Sensor5Type	196	Sensor 5 Type	Sensor type
Sensor5SerialNumber	197	Sensor 5 Serial Number	Serial number of the sensor as defined by the manufacturer.
Sensor5Address	198	Sensor 5 Address	I ² C address of the sensor.
Sensor5State	199	Sensor 5 State	Current operational state of the sensor
Sensor5CalibrationDate	200	Sensor 5 Calibration Date	Timestamp of the last calibration in Unix format.
Sensor5Value	201	Sensor 5 Value	Actual sensor value. The unit depends on sensor type.
Sensor5Offset	202	Sensor 5 Offset	Offset value for sensor. May be used to adjust the sensor. The unit depends on the sensor type.
Sensor5Scaling	203	Sensor 5 Scaling	Scaling factor for sensor. May be used to adjust the sensor. The unit depends on the sensor type.
Sensor6Enable	204	Sensor 6 Enable	Enables or disables the sensor
Sensor6BoardNumber	205	Sensor 6 Board Number	Specifies the sensor board on which the sensor is mounted.
Sensor6BoardIndex	206	Sensor 6 Board Index	Index of the sensor on the sensor board.
Sensor6CommunicationInterval	207	Sensor 6 Communication Interval	Communication interval for this sensor.
Sensor6Type	208	Sensor 6 Type	Sensor type
Sensor6SerialNumber	209	Sensor 6 Serial Number	Serial number of the sensor as defined by the manufacturer.
Sensor6Address	210	Sensor 6 Address	I ² C address of the sensor.
Sensor6State	211	Sensor 6 State	Current operational state of the sensor
Sensor6CalibrationDate	212	Sensor 6 Calibration Date	Timestamp of the last calibration in Unix format.
Sensor6Value	213	Sensor 6 Value	Actual sensor value. The unit depends on sensor type.

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Enum Name	Value	Name	Description
Sensor6Offset	214	Sensor 6 Offset	Offset value for sensor. May be used to adjust the sensor. The unit depends on the sensor type.
Sensor6Scaling	215	Sensor 6 Scaling	Scaling factor for sensor. May be used to adjust the sensor. The unit depends on the sensor type.
Sensor7Enable	216	Sensor 7 Enable	Enables or disables the sensor
Sensor7BoardNumber	217	Sensor 7 Board Number	Specifies the sensor board on which the sensor is mounted.
Sensor7BoardIndex	218	Sensor 7 Board Index	Index of the sensor on the sensor board.
Sensor7CommunicationInterval	219	Sensor 7 Communication Interval	Communication interval for this sensor.
Sensor7Type	220	Sensor 7 Type	Sensor type
Sensor7SerialNumber	221	Sensor 7 Serial Number	Serial number of the sensor as defined by the manufacturer.
Sensor7Address	222	Sensor 7 Address	I ² C address of the sensor.
Sensor7State	223	Sensor 7 State	Current operational state of the sensor
Sensor7CalibrationDate	224	Sensor 7 Calibration Date	Timestamp of the last calibration in Unix format.
Sensor7Value	225	Sensor 7 Value	Actual sensor value. The unit depends on sensor type.
Sensor7Offset	226	Sensor 7 Offset	Offset value for sensor. May be used to adjust the sensor. The unit depends on the sensor type.
Sensor7Scaling	227	Sensor 7 Scaling	Scaling factor for sensor. May be used to adjust the sensor. The unit depends on the sensor type.
Sensor8Enable	228	Sensor 8 Enable	Enables or disables the sensor
Sensor8BoardNumber	229	Sensor 8 Board Number	Specifies the sensor board on which the sensor is mounted.
Sensor8BoardIndex	230	Sensor 8 Board Index	Index of the sensor on the sensor board.
Sensor8CommunicationInterval	231	Sensor 8 Communication Interval	Communication interval for this sensor.
Sensor8Type	232	Sensor 8 Type	Sensor type
Sensor8SerialNumber	233	Sensor 8 Serial Number	Serial number of the sensor as defined by the manufacturer.
Sensor8Address	234	Sensor 8 Address	I ² C address of the sensor.
Sensor8State	235	Sensor 8 State	Current operational state of the sensor
Sensor8CalibrationDate	236	Sensor 8 Calibration Date	Timestamp of the last calibration in Unix format.
Sensor8Value	237	Sensor 8 Value	Actual sensor value. The unit depends on sensor type.
Sensor8Offset	238	Sensor 8 Offset	Offset value for sensor. May be used to adjust the sensor. The unit depends on the sensor type.
Sensor8Scaling	239	Sensor 8 Scaling	Scaling factor for sensor. May be used to adjust the sensor. The unit depends on the sensor type.
CommandI2cEnable	240	Command I2c Enable	Enables or disables the I2C Interface.

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Enum Name	Value	Name	Description
CommandQuickStop-State	241	Command Quick Stop State	Triggers a quick stop. The drive decelerates with high deceleration. Write 'Start' to trigger the command. Read the current execution state from this parameter.
TestParameterEnumeration	242	Test Parameter Enumeration	Test Parameter Enumeration
CurrentMotor-Phase1Scaling	243	Current Motor Phase 1 Scaling	The scaling of the motor current measurement for phase 1.
CurrentMotor-Phase1Offset	244	Current Motor Phase 1 Offset	The offset of the motor current measurement for phase 1.
CurrentMotorPhase1	245	Current Motor Phase 1	The current measured on motor phase 1.
CurrentMotor-Phase2Scaling	246	Current Motor Phase 2 Scaling	The offset of the motor current measurement for phase 2.
CurrentMotor-Phase2Offset	247	Current Motor Phase 2 Offset	The offset of the motor current measurement for phase 2.
CurrentMotorPhase2	248	Current Motor Phase 2	The current measured on motor phase 2.
CurrentMotorPhase3	249	Current Motor Phase 3	The current measured on motor phase 3.
VoltageDcLinkScaling	250	Voltage Dc Link Scaling	The scaling of the DC link measurement.
VoltageDcLinkOffset	251	Voltage Dc Link Offset	The offset of the DC link measurement.
VoltageDcLink	252	Voltage Dc Link	The measured DC link voltage.
VoltageDcLinkMinimum	253	Voltage Dc Link Minimum	The lower limit of DC link voltage. The system shutdown is prepared in case the DC link voltage drops below this threshold. This parameter is read before initialization of file system. Thus, this parameter must not be changed at runtime.
VoltageDcLinkMaximum	254	Voltage Dc Link Maximum	The upper limit of DC link voltage. An event is thrown in case the DC link voltage exceeds this threshold. The default configuration stops the motor.
Mpio1InputValueScaling	255	Mpio 1 Input Value Scaling	The scaling factor for calculating the input value.
Mpio1InputValueOffset	256	Mpio 1 Input Value Offset	The offset for calculating the input value.
Mpio1InputValue	257	Mpio 1 Input Value	The value measured on MPIO1 input.
Mpio2InputValueScaling	258	Mpio 2 Input Value Scaling	The scaling factor for calculating the input value.
Mpio2InputValueOffset	259	Mpio 2 Input Value Offset	The offset for calculating the input value.
Mpio2InputValue	260	Mpio 2 Input Value	The value measured on MPIO2 input.
Mpio1OutputValueScaling	261	Mpio 1 Output Value Scaling	The scaling factor for calculating the output value.
Mpio1OutputValueOffset	262	Mpio 1 Output Value Offset	The offset for calculating the output value.
Mpio1OutputValue	263	Mpio 1 Output Value	The value on MPIO 1 output.

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Enum Name	Value	Name	Description
Mpio2OutputValueScaling	264	Mpio 2 Output Value Scaling	The scaling factor for calculating the output value.
Mpio2OutputValueOffset	265	Mpio 2 Output Value Offset	The offset for calculating the output value.
Mpio2OutputValue	266	Mpio 2 Output Value	The value on MPIO 2 output.
VoltageControlReferenceScaling	267	Voltage Control Reference Scaling	The scaling of the voltage reference measurement.
VoltageControlReferenceOffset	268	Voltage Control Reference Offset	The offset of the voltage reference measurement.
VoltageControlReference	269	Voltage Control Reference	The voltage measured in the voltage reference input. Value is used as reference for all AD converters.
SpeedTargetSourceScalingAnalog	270	Speed Target Source Scaling Analog	The scaling of the analog speed target source. Defines the gradient of the voltage to speed mapping.
SpeedTargetSourceOffsetAnalog	271	Speed Target Source Offset Analog	The offset of the analog speed target source. Defines the offset of the voltage to speed mapping.
VoltageHysteresisControllerThreshold	272	Voltage Hysteresis Controller Threshold	The threshold of the voltage comparator. It defines the threshold, not the hysteresis.
VoltageHysteresisControllerHysteresis	273	Voltage Hysteresis Controller Hysteresis	The hysteresis of the voltage comparator. It defines the hysteresis.
GenericPidControllerInterval	274	Generic Pid Controller Interval	The control interval for the generic PID controller. Every interval a new control output is calculated.
GenericPidControllerEnable	275	Generic Pid Controller Enable	Command to enable or disable PID controller.
GenericPidControllerReference	276	Generic Pid Controller Reference	Reference value for generic PID controller.
GenericPidControllerReferenceSource	277	Generic Pid Controller Reference Source	Defines the source for generic PID controller reference value. The PID controller fetches the reference value from the source defined by this parameter. The internal unique parameter ID is used.
GenericPidControllerReferenceSourceCia301	278	Generic Pid Controller Reference Source	Defines the source for generic PID controller reference value. The PID controller fetches the reference value from the source defined by this parameter. Use CANopen address to specify the source in the format (0xIIISS00 - IIII: Index / SS: Subindex)
GenericPidControllerReferenceSourceScaling	279	Generic Pid Controller Reference Source Scaling	The scaling for the reference value. Scales the reference input of the generic PID controller.
GenericPidControllerReferenceSourceOffset	280	Generic Pid Controller Reference Source Offset	The offset for the reference value of the generic PID controller.
GenericPidControllerActualValueFiltered	281	Generic Pid Controller Actual Value Filtered	The actual value filtered and provided to the generic PID controller.
GenericPidControllerActualValueRipple	282	Generic Pid Controller Actual Value Ripple	The peak-peak ripple measured on the actual value of the generic PID controller.

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Enum Name	Value	Name	Description
GenericPidController-OutputValue	283	Generic Pid Controller Output Value	The output value of the generic PID controller. The value is used in the TargetSourceSpeedController if PID Control is selected. Therefore the unit is always Hz.
GenericPidController-ProportionalGain	284	Generic Pid Controller Proportional Gain	The proportional gain of the generic PID controller.
GenericPidController-IntegralTimeConstant	285	Generic Pid Controller Integral Time Constant	The integral time constant of the generic PID controller.
GenericPidControllerDerivationTimeConstant	286	Generic Pid Controller Derivation Time Constant	The derivative time constant of the generic PID controller.
GenericPidController-ActualValueSource	287	Generic Pid Controller Actual Value Source	The value source for the generic PID controller (parameter unique ID)
GenericPidControllerActualValueSourceCia301	288	Generic Pid Controller Actual Value Source	The value source for the generic PID controller. Use CANopen address to specify the source in the format (0xIIIISS00 - IIII: Index / SS: Subindex)
GenericPidController-ActualValueFilterTimeConstant	289	Generic Pid Controller Actual Value Filter Time Constant	The filter time constant for the generic PID controller.
SpeedMediaRaw	290	Speed Media Raw	The raw value of the media speed measured by the ultrasonic sensor.
SpeedMediaSlopeLimited	291	Speed Media Slope Limited	The media speed limited by the defined maximal slope. The maximal rate limit is defined in RateLimitSpeedMedia.
SpeedMediaAverage	292	Speed Media Average	The averaged media speed, the media speed is averaged over an motor rotation.
TemperatureMedia	293	Temperature Media	The temperature of the medium. The temperature of the medium is measured using a non-contact method, without physical interaction with the medium.
Subsystem1CommunicationState	294	Subsystem 1 Communication State	The communication state of the communication link to subsystem 1.
Subsystem1State	295	Subsystem 1 State	The system state of subsystem 1.
SoundSpeed	296	Sound Speed	The speed of sound measured by the flow sensor.
FlowRateSensorRaw	297	Flow Rate Sensor Raw	The flow rate raw value from sensor.
FlowRateAverage	298	Flow Rate Average	The flow rate average value. The value is averaged over a motor rotation.
FlowRateCompensatedAverage	299	Flow Rate Compensated Average	The compensated and averaged flow rate. The value is averaged over a motor rotation and compensated by the medium temperature.
VoltageAmplitudeFlowSensorSignal	300	Voltage Amplitude Flow Sensor Signal	Voltage at the output of the flow sensor. The value is the control signal transmitted to the motor.
FlowRateAveragePulsation	301	Flow Rate Average Pulsation	The averaged pulsation of the flow over one motor turn.

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Enum Name	Value	Name	Description
Subsystem1FirmwareVersionMajor	302	Subsystem 1 Firmware Version Major	The major version of the firmware on sub system 1.
Subsystem1FirmwareVersionMinor	303	Subsystem 1 Firmware Version Minor	The minor version of the firmware on sub system 1.
Subsystem1FirmwareVersionBugfix	304	Subsystem 1 Firmware Version Bugfix	The build version of the firmware on sub system 1.
Subsystem1HardwareVersion	305	Subsystem 1 Hardware Version	The hardware version of sub system 1.
Subsystem1ErrorState	306	Subsystem 1 Error State	The error state of sub system 1.
CommandFlowSensorState	307	Command Flow Sensor State	Command to read or write parameters from the flow sensor. Write 'Start' to trigger the command. Read the current execution state from this parameter. Read or write is specified in CommandFlowSensor.
CommandFlowSensor	308	Command Flow Sensor	Specifies the command to be executed on the flow sensor sub system.
FlowSensorType	309	Flow Sensor Type	Specifies the flow sensor type.
ViscosityMediaCompensated	310	Viscosity Media Compensated	The temperature compensated viscosity of the fluid. The flow sensor's temperature measurement is used to measure the temperature of the fluid. The temperature is used calculate the viscosity.
PulsesPerRevolution	311	Pulses Per Revolution	Pulses per revolution of the connected motor. Parameter is used for external motors. For internal motor control the parameter is not used.
FactorAViscosityCompensation	312	Factor A Viscosity Compensation	Factor A used in the viscosity compensation model.
FactorBViscosityCompensation	313	Factor B Viscosity Compensation	Factor B used in the viscosity compensation model.
FactorAFlowRateCompensation	314	Factor A Flow Rate Compensation	Factor A used in the flowrate compensation model.
FactorBFlowRateCompensation	315	Factor B Flow Rate Compensation	Factor B used in the flowrate compensation model.
FactorCFlowRateCompensation	316	Factor C Flow Rate Compensation	Factor C used in the flowrate compensation model.
FactorDFlowRateCompensation	317	Factor D Flow Rate Compensation	Factor D used in the flowrate compensation model.
ViscosityMedia	318	Viscosity Media	Viscosity of the medium at 20 degree Celsius.
AirLevelRaw	319	Air Level Raw	Amount of air in the flow system. The raw value measured by the sensor.
AirLevel	320	Air Level	Amount of air in the flow system. The AirLevelRaw is processed and mapped to this parameter.
FlowRateSlopeLimited	321	Flow Rate Slope Limited	The rate limited flow rate. The rate is limited by the parameter FlowRateSlopeMaximum.

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Enum Name	Value	Name	Description
FlowRateSlopeMaximum	322	Flow Rate Slope Maximum	The flow is rate limited by this parameter. The rate limited flow may be read in parameter FlowRateSlopeLimited.
RateLimitSpeedMedia	323	Rate Limit Speed Media	Maximum value for the media speed rate limiter.
TemperatureBoard	324	Temperature Board	Board temperature measured on the PCBA.
TemperatureCpu	325	Temperature Cpu	Temperature of the internal temperature sensor of the CPU.
CurrentMotor-Phase1Raw	326	Current Motor Phase 1 Raw	Raw value of the current in motor phase 1.
CurrentMotor-Phase2Raw	327	Current Motor Phase 2 Raw	Raw value of the current in motor phase 2.
VoltageDcLinkRaw	328	Voltage Dc Link Raw	Raw value of the DC link voltage.
Mpio1InputValueRaw	329	Mpio 1 Input Value Raw	Raw value of the MPIO 1 input. The value is in digits.
Mpio2InputValueRaw	330	Mpio 2 Input Value Raw	Raw value of the MPIO 2 input. The value is in digits.
VoltageControlReferenceRaw	331	Voltage Control Reference Raw	Raw value of the voltage reference input. The value is in digits.
TemperatureBoardRaw	332	Temperature Board Raw	Raw value of the board temperature. The value is in digits.
TemperatureCpuRaw	333	Temperature Cpu Raw	Raw value of the CPU internal temperature. The value is in digits.
VoltageAdc12Reference	334	Voltage Adc 12 Reference	Voltage of the ADC reference voltage.
VoltageAdc12ReferenceRaw	335	Voltage Adc 12 Reference Raw	Raw value of the ADC reference. The value is in digits.
CurrentMotor-PhaseARaw	336	Current Motor Phase A Raw	Raw value of the motor current in phase A. Used in stepper motor control and Varistroke. The value is in digits.
CurrentMotorPhaseBRaw	337	Current Motor Phase B Raw	Raw value of the motor current in phase B. Used in stepper motor control and Varistroke. The value is in digits.
CurrentMotorPhaseA	338	Current Motor Phase A	Motor current in phase A. Used in stepper motor control and Varistroke.
CurrentMotorPhaseB	339	Current Motor Phase B	Motor current in phase B. Used in stepper motor control and Varistroke.
CurrentMotor-PhaseAOffset	340	Current Motor Phase A Offset	Offset for motor current in phase A. Used for stepper motors and Varistroke.
CurrentMotorPhaseBOffset	341	Current Motor Phase B Offset	Offset for motor current in phase B. Used for stepper motors and Varistroke.
CurrentMotor-PhaseAScaling	342	Current Motor Phase A Scaling	Scaling for motor current in phase A. Used for stepper motors and Varistroke.
CurrentMotorPhaseBScaling	343	Current Motor Phase B Scaling	Scaling for motor current in phase B. Used for stepper motors and Varistroke.

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Enum Name	Value	Name	Description
CurrentValve1Raw	344	Current Valve 1 Raw	Raw value of the actual current in valve 1. The value is in digits.
CurrentValve2Raw	345	Current Valve 2 Raw	Raw value of the actual current in valve 2. The value is in digits.
CurrentValve1	346	Current Valve 1	Offset for the current in valve 2.
CurrentValve2	347	Current Valve 2	Scaling for the current in valve 1.
CurrentValve1Offset	348	Current Valve 1 Offset	Offset for the current in valve 1.
CurrentValve2Offset	349	Current Valve 2 Offset	Offset for the current in valve 2.
CurrentValve1Scaling	350	Current Valve 1 Scaling	Scaling for the current in valve 1.
CurrentValve2Scaling	351	Current Valve 2 Scaling	Scaling for the current in valve 2.
FluxMotorSynchronous	352	Flux Motor Synchronous	Flux linkage of the synchronous motor.
ResistanceMotorSynchronous	353	Resistance Motor Synchronous	The resistance of the synchronous motor measured from terminal to terminal.
InductanceMotorSynchronousDAxis	354	Inductance Motor Synchronous DAxis	The d-axis inductance of motor.
InductanceMotorSynchronousQAxis	355	Inductance Motor Synchronous QAxis	The q-axis inductance of motor.
CurrentControllerMotorTimeConstant	356	Current Controller Motor Time Constant	Time constant of the closed loop current controller.
CurrentControllerMotorAttenuation	357	Current Controller Motor Attenuation	Attenuation of the closed loop current controller.
CurrentControllerMotorProportionalGain	358	Current Controller Motor Proportional Gain	Proportional gain of the motor current controller.
CurrentControllerMotorIntegralGain	359	Current Controller Motor Integral Gain	Integral gain of the motor current controller.
InductanceValve1	360	Inductance Valve 1	Inductance of the coil on Valve 1. For dosing, this corresponds to the suction side.
CurrentController-Valve1TimeConstant	361	Current Controller Valve 1 Time Constant	Time constant of the closed-loop current controller for Valve 1. For dosing, this corresponds to the suction side.
CurrentController-Valve1Attenuation	362	Current Controller Valve 1 Attenuation	Attenuation factor of the closed-loop current controller for Valve 1. For dosing, this corresponds to the suction side.
CurrentController-Valve1ProportionalGain	363	Current Controller Valve 1 Proportional Gain	Proportional gain parameter of the current controller for Valve 1. For dosing, this corresponds to the suction side.
CurrentController-Valve1IntegralGain	364	Current Controller Valve 1 Integral Gain	Integral gain parameter of the current controller for Valve 1. For dosing, this corresponds to the suction side.
CurrentValve1Pull	365	Current Valve 1 Pull	Defines the pull current applied to Valve 1 during the pull phase. This value serves as the reference for the current controller. For dosing, this corresponds to the suction side.

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Enum Name	Value	Name	Description
CurrentValve1Hold	366	Current Valve 1 Hold	Defines the hold current applied to Valve 1 during the hold phase. This value serves as the reference for the current controller. For dosing, this corresponds to the suction side.
TimeValve1Pull	367	Time Valve 1 Pull	Duration in seconds of the pull phase for Valve 1. During this phase, CurrentValve1Pull is applied. For dosing, this corresponds to the suction side.
TimeValve1Hold	368	Time Valve 1 Hold	Duration in seconds of the hold phase for Valve 1. During this phase, CurrentValve1Hold is applied. For dosing, this corresponds to the suction side.
StartValve1Sequence	369	Start Valve 1 Sequence	Write true to trigger a controlled current sequence: first the pull current is applied, followed by the hold current. Afterwards, the current is set to zero. For dosing, this corresponds to the suction side.
InductanceValve2	370	Inductance Valve 2	Inductance of the coil on Valve 2. For dosing, this corresponds to the pressure side.
CurrentController-Valve2TimeConstant	371	Current Controller Valve 2 Time Constant	Time constant of the closed-loop current controller for Valve 2. For dosing, this corresponds to the pressure side.
CurrentController-Valve2Attenuation	372	Current Controller Valve 2 Attenuation	Attenuation factor of the closed-loop current controller for Valve 2. For dosing, this corresponds to the pressure side.
CurrentController-Valve2ProportionalGain	373	Current Controller Valve 2 Proportional Gain	Proportional gain parameter of the current controller for Valve 2. For dosing, this corresponds to the pressure side.
CurrentController-Valve2IntegralGain	374	Current Controller Valve 2 Integral Gain	Integral gain parameter of the current controller for Valve 2. For dosing, this corresponds to the pressure side.
CurrentValve2Pull	375	Current Valve 2 Pull	Defines the pull current applied to Valve 2 during the pull phase. This value serves as the reference for the current controller. For dosing, this corresponds to the pressure side.
CurrentValve2Hold	376	Current Valve 2 Hold	Defines the hold current applied to Valve 2 during the hold phase. This value serves as the reference for the current controller. For dosing, this corresponds to the pressure side.
TimeValve2Pull	377	Time Valve 2 Pull	Duration in seconds of the pull phase for Valve 2. During this phase, CurrentValve2Pull is applied. For dosing, this corresponds to the pressure side.

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Enum Name	Value	Name	Description
TimeValve2Hold	378	Time Valve 2 Hold	Duration in seconds of the hold phase for Valve 2. During this phase, CurrentValve2Hold is applied. For dosing, this corresponds to the pressure side.
StartValve2Sequence	379	Start Valve 2 Sequence	Write true to trigger a controlled current sequence: first the pull current is applied, followed by the hold current. Afterwards, the current is set to zero. For dosing, this corresponds to the pressure side.
VoltageMotorMaximumFactor	380	Voltage Motor Maximum Factor	This factor multiplies the filtered DC-link voltage to determine the upper voltage limit. It is used to constrain the voltage during modulation.
PositionInputValueSin	381	Position Input Value Sin	Sinus value of the position encoder signal. The value is scaled and offset compensated based on PositionInputValueSinRaw.
PositionInputValueSinRaw	382	Position Input Value Sin Raw	Raw value of the sinus of position encoder signal.
PositionInputValueSinOffset	383	Position Input Value Sin Offset	Offset to calculate the value of the sinus component of the position encoder.
PositionInputValueSinScaling	384	Position Input Value Sin Scaling	Scalar to calculate the value of the sinus component of the position encoder.
PositionInputValueCos	385	Position Input Value Cos	Cosine value of the position encoder signal. The value is scaled and offset compensated based on PositionInputValueCosRaw.
PositionInputValueCosRaw	386	Position Input Value Cos Raw	Raw value of the cosine of position encoder signal.
PositionInputValueCosOffset	387	Position Input Value Cos Offset	Offset to calculate the value of the cosine component of the position encoder.
PositionInputValueCosScaling	388	Position Input Value Cos Scaling	Scalar to calculate the value of the cosine component of the position encoder.
SourcePosition	389	Source Position	Selects the source of the transformation angle.
MotorControlState	390	Motor Control State	State of motor control
NumberSineWavesPerRevolutionPositionMeasurement	391	Number Sine Waves Per Revolution Position Measurement	Number of sine waves per mechanical revolution of the encoder.
SpeedTargetInternal	392	Speed Target Internal	The target speed defined internally. The parameter is used if internal special functions need control of the speed reference value. For example to execute calibration moves.

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Enum Name	Value	Name	Description
MotorControllerEnableInternal	393	Motor Controller Enable Internal	Enables or disables the motor controller internally. The parameter is used if internal special functions need enable or disable the motor controller. For example to execute calibration moves.
CurrentMotorDAxisReferenceInternal	394	Current Motor DAxis Reference Internal	Provides a reference value for the d current internally. The parameter is used if internal special functions need define a current. For example if firmware internal calibration or tests are executed.
CurrentMotorQAxisReferenceInternal	395	Current Motor QAxis Reference Internal	Provides a reference value for the q current internally. The parameter is used if internal special functions need define a current. For example if firmware internal calibration or tests are executed.
CurrentMotorFeedForward	396	Current Motor Feed Forward	Defines the torque building feed forward current for motor controller. The current is applied onto the q-axis.
CurrentMotorFeedForwardFactor	397	Current Motor Feed Forward Factor	Factor for current feed forward calculation. The calculated feed forward current is multiplied with this factor. A value of 0 disables feed forward.
CommandPositionRotorMeasurementState	398	Command Position Rotor Measurement State	Triggers the rotor position measurement. Write 'Start' to trigger the command. Read the current execution state from this parameter.
CommandPositionRotorMeasurement	399	Command Position Rotor Measurement	Defines the action to be executed in the context of the 'CommandPositionRotorMeasurementState' command. Select the task according the enum.
StateRotorPositionCalibration	400	State Rotor Position Calibration	Represents whether the rotor position is calibrated or not.
CommandDosingTask	401	Command Dosing Task	Defines the action to be executed in the context of the CommandDosingTaskState command. Select the task according the enum.
CommandDosingTaskState	402	Command Dosing Task State	Commands the next dosing action. The action is specified in CommandDosingTask. Write 'Start' to trigger the command. Read the current execution state from this parameter.
TimeAcceleration	403	Time Acceleration	Defines the time for the acceleration phase. The value is input for the move planner.
PositionMechanicalMovePlannerStart	404	Position Mechanical Move Planner Start	Defines the start position to plan the next move.

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Enum Name	Value	Name	Description
PositionMechanical-MovePlannerEnd	405	Position Mechanical Move Planner End	Defines the end position to plan the next move.
TimeMovePlannerSequence	406	Time Move Planner Sequence	Time for the full move from PositionMechanicalMovePlannerStart to PositionMechanicalMovePlannerEnd.
StartMovePlannerSequence	407	Start Move Planner Sequence	Trigger move planner to calculate the next move.
PositionReference	408	Position Reference	Required position calculated by the move planner. Is the input value to the position controller.
SpeedRequired	409	Speed Required	Required speed calculated by the move planner. It is used for speed and position control.
AccelerationRequired	410	Acceleration Required	Required acceleration calculated by the move planner. It is used for speed and position control.
PositionMechanical-PrimeModeDeadBand	411	Position Mechanical Prime Mode Dead Band	Dead band for prime mode only. In the dead band, no valve is active to calm down the flow.
PositionMechanical-PrimeModeDeadBand-Cia401	412	Position Mechanical Prime Mode Dead Band	Dead band for prime mode only. In the dead band, no valve is active to calm down the flow.
ExcentricityPumpHead	413	Excentricity Pump Head	Excentric of the excenter of the pump.
VolumePumpHead	414	Volume Pump Head	Volume of the pump head for a single stroke
VolumeTarget	415	Volume Target	Preset volume for a single dosing cycle.
EnableVolumePlanner	416	Enable Volume Planner	Defines the active kind of volume planner.
StateDosingPump	417	State Dosing Pump	Functional state of the dosing pump.
StateDosingCycle	418	State Dosing Cycle	State of the current dosing cycle.
CommandFirmware-DownloadState	419	Command Firmware Download State	Command register to download new firmware. Defines the action to be executed.
CommandFirmware-DownloadData	420	Command Firmware Download Data	Data register to download the new firmware.
MomentInertia	421	Moment Inertia	Moment of inertia for the whole system. Used to configure the speed controller and the feed forward path.
StateRotorPosition-Measurement	422	State Rotor Position Measurement	State of rotor position measurement.
SpeedControllerProportionalGain	423	Speed Controller Proportional Gain	Proportional gain of the speed controller.
SpeedControllerIntegralGain	424	Speed Controller Integral Gain	Integral gain of the speed controller.
SpeedControllerDifferentialGain	425	Speed Controller Differential Gain	Differential gain of the speed controller.
SpeedControllerAttenuation	426	Speed Controller Attenuation	Attenuation of the transfer function of closed loop speed control.
MotorControllerEnable	427	Motor Controller Enable	Command to enable/disable speed controller for the flow sensor. In case the controller is disabled, the flow system operates in feed forward mode.

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Enum Name	Value	Name	Description
LoggerEntry	428	Logger Entry	Defines the entry to be send by the logger. A logger entry is completed by its level, module ID and a value.
LoggerModuleId	429	Logger Module Id	Defines the module the event occurred in. This module ID is sent along with the logger entry.
LoggerTransactionId	430	Logger Transaction Id	Defines the transaction ID of the event. The ID is automatically generated. It is used to reassemble the event info sent by multiple PDOs.
LoggerValue	431	Logger Value	Value sent along with the log entry. The value depends on the logger entry. The user must decode it according the logger entry.
LoggerLevelFilter	432	Logger Level Filter	Bit mask to enable/disable each logging level specifically.
PositionInput Value1Raw	433	Position Input Value 1 Raw	Raw value of the position measurement channel 1.
PositionInput Value2Raw	434	Position Input Value 2 Raw	Raw value of the position measurement channel 2.
PositionInput Value3Raw	435	Position Input Value 3 Raw	Raw value of the position measurement channel 3.
InvertMotorFieldSenseOfRotation	436	Invert Motor Field Sense Of Rotation	This parameter affects motor field only. It is used to set the correct sense of rotation according to the KNF definition: When looking at the motor's drive side: positive speed = positive angle change = CCW rotation. See also: InvertPositionMeasurementSenseOfRotation
InvertPositionMeasurementSenseOfRotation	437	Invert Position Measurement Sense Of Rotation	This parameter affects the angle measurement only. It is used to set the correct sense of rotation according to the KNF definition: When looking at the motor's drive side: positive speed = positive angle change = CCW rotation. See also: InvertMotorFieldSenseOfRotation
PositionTargetCia402	438	Position Target	Target position of the next move.
PositionDemandCia402	439	Position Demand	Current demand position of the next moving. The position depends on the specified PositionTargetCia402.
PositionMechanicalAbsoluteMultiTurn	440	Position Mechanical Absolute Multi Turn	Position mechanical absolute multi turn
SpeedControlEffortPositionController	441	Speed Control Effort Position Controller	Speed reference value from control effort of position controller.
SpeedControlEffortPositionControllerCia402	442	Speed Control Effort Position Controller	Speed control effort based on the position controller.
PositionControllerTimeConstant	443	Position Controller Time Constant	Time constant of the position controller.
PositionControllerAttenuation	444	Position Controller Attenuation	Attenuation of position controller.
PositionControllerProportionalGain	445	Position Controller Proportional Gain	Proportional Gain of position controller.

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Enum Name	Value	Name	Description
PositionControllerIntegralGain	446	Position Controller Integral Gain	Integral gain of the position controller.
TargetSourcePositionController	447	Target Source Position Controller	Position reference source for the position controller.
PositionWindow	448	Position Window	Symmetrical range around target position. If the actual position is within this window the target position is considered as reached.
CommandDurationMeasurementState	449	Command Duration Measurement State	Starts and resets the duration measurements. Write 'Start' to trigger the command. Read the current execution state from this parameter.
CommandDurationMeasurement	450	Command Duration Measurement	Specifies the command for duration measurements.
Duration100us	451	Duration 100us	Current measured duration of the 100us task.
Duration100usAverage	452	Duration 100us Average	Average measured duration of the 100us task.
Duration100usMinimum	453	Duration 100us Minimum	Minimal measured duration of the 100us task.
Duration100usMaximum	454	Duration 100us Maximum	Maximal measured duration of the 100us task.
Duration1ms	455	Duration 1ms	Current measured duration of the 1ms task.
Duration1msAverage	456	Duration 1ms Average	Average measured duration of the 1ms task.
Duration1msMinimum	457	Duration 1ms Minimum	Minimal measured duration of the 1ms task.
Duration1msMaximum	458	Duration 1ms Maximum	Maximal measured duration of the 1ms task.
Duration1msLowPrio	459	Duration 1ms Low Prio	Current measured duration of the 1ms low priority task.
Duration1msLowPrioAverage	460	Duration 1ms Low Prio Average	Average measured duration of the 1ms low priority task.
Duration1msLowPrioMinimum	461	Duration 1ms Low Prio Minimum	Minimum measured duration of the 1ms low priority task.
Duration1msLowPrioMaximum	462	Duration 1ms Low Prio Maximum	Maximum measured duration of the 1ms low priority task.
Duration1s	463	Duration 1s	Current measured duration of the 1s task.
Duration1sAverage	464	Duration 1s Average	Average measured duration of the 1s task.
Duration1sMinimum	465	Duration 1s Minimum	Minimum measured duration of the 1s task.
Duration1sMaximum	466	Duration 1s Maximum	Maximum measured duration of the 1s task.
Duration1sLowPrio	467	Duration 1s Low Prio	Current measured duration of the 1s low priority task.
Duration1sLowPrioAverage	468	Duration 1s Low Prio Average	Average measured duration of the 1s low priority task.
Duration1sLowPrioMinimum	469	Duration 1s Low Prio Minimum	Minimal measured duration of the 1s low priority task.
Duration1sLowPrioMaximum	470	Duration 1s Low Prio Maximum	Maximal measured duration of the 1s low priority task.

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Enum Name	Value	Name	Description
DurationMeasurement-Mode	471	Duration Measurement Mode	Defines the mode of the duration measurement, whether the duration or the period of a task is measured.
CommandSimulateLoggerState	472	Command Simulate Logger State	Simulates a logger entry and sends it to the superior controller. Used to inject logging messages. Specify all parameter of the log message then write 'Start' to trigger the command. Read the current execution state from this parameter.
CommandSimulateLoggerEntry	473	Command Simulate Logger Entry	Simulated logger entry to be sent by logger command.
CommandSimulateLoggerModuleId	474	Command Simulate Logger Module Id	Simulated module ID to be sent by logger command.
CommandSimulateLoggerLevel	475	Command Simulate Logger Level	Simulated logging level of the message to be sent by logger command.
CommandSimulateLoggerValue	476	Command Simulate Logger Value	Simulated value to be sent by the logger command.
CommandSimulateLoggerAddTimeStamp	477	Command Simulate Logger Add Time Stamp	Simulated timestamp to the message sent by the logger command if set to true.
TimeSuctionValveOpening	478	Time Suction Valve Opening	Opening time of the suction valve. Defines the duration of the open state.
TimeSuctionStroke	479	Time Suction Stroke	Move time of the suction stroke.
TimeSuctionValveClosing	480	Time Suction Valve Closing	The closing time of the suction valve. Defines the duration of the closing state.
TimeValveDeadTime	481	Time Valve Dead Time	Dead time between closing of suction valve and opening of exhaust valve. Defines the state duration.
TimeStrokeTransient-DeadTime	482	Time Stroke Transient Dead Time	Time to steady the flow. During this time there is no motor and no valve motion.
TimeExhaust-ValveOpening	483	Time Exhaust Valve Opening	Opening time of the exhaust valve. Defines the duration of the open state of the valve.
TimeExhaustStroke	484	Time Exhaust Stroke	Move time of exhaust stroke.
TimeExhaustValve-Closing	485	Time Exhaust Valve Closing	Closing time of the Exhaust valve. Defines the duration of the closing state.
TimeDosingCycleDead-Time	486	Time Dosing Cycle Dead Time	time after exhaust to calm fluid system
TimeBetweenDosing-Cycle	487	Time Between Dosing Cycle	Pause time between two dosing strokes.
NumbersDosingCycle	488	Numbers Dosing Cycle	Number of repetitions of dosing stroke.
PositionDosingCycle-SuctionStrokeStart	489	Position Dosing Cycle Suction Stroke Start	Idle position dosing
PositionDosingCycle-SuctionStrokeEnd	490	Position Dosing Cycle Suction Stroke End	End position suction stroke dosing
FrequencyDosingCycle	491	Frequency Dosing Cycle	Frequency of the dosing cycle. How may times a full cycle is executed in one second.

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Enum Name	Value	Name	Description
RatioSuctionDosingCycle	492	Ratio Suction Dosing Cycle	Describes the relationship between the pressure stroke and the cycle time, 0.5 = exhaust and suction stroke are the same
DirectionFlow	493	Direction Flow	Describes the flow direction, true == forward, false = reverse
AuthenticationDeviceChallenge0	494	Authentication Device Challenge 0	First 4 Bytes of the Authentication Challenge
AuthenticationDeviceChallenge1	495	Authentication Device Challenge 1	Second 4 Bytes of the Authentication Challenge
AuthenticationDeviceChallenge2	496	Authentication Device Challenge 2	Third 4 Bytes of the Authentication Challenge
AuthenticationDeviceChallenge3	497	Authentication Device Challenge 3	Last 4 Bytes of the Authentication Challenge. Writing this field triggers the encryption.
AuthenticationDeviceCypherText0	498	Authentication Device Cypher Text 0	First 4 Bytes of the Encrypted Data
AuthenticationDeviceCypherText1	499	Authentication Device Cypher Text 1	Second 4 Bytes of the Encrypted Data
AuthenticationDeviceCypherText2	500	Authentication Device Cypher Text 2	Third 4 Bytes of the Encrypted Data
AuthenticationDeviceCypherText3	501	Authentication Device Cypher Text 3	Last 4 Bytes of the Encrypted Data
RatioRgbRed	502	Ratio Rgb Red	RGB ratio red
RatioRgbGreen	503	Ratio Rgb Green	RGB green
RatioRgbBlue	504	Ratio Rgb Blue	RGB Blue
FrequencyRgbBlinking	505	Frequency Rgb Blinking	RGB blinking frequency
CommandSerialNumberWriteState	506	Command Serial Number Write State	Command to write the serial number. It can be written only if no serial number is specified already. Write 'Start' to trigger the command. Read the current execution state from this parameter.
CommandSerialNumberWriteSerialNumber	507	Command Serial Number Write Serial Number	If no Serial Number is already written to OTP, this parameter writes a new Serial Number to the One-Time-Programmable section
Mpio1Level	508	Mpio 1 Level	Set the voltage level of the Mpio 1
Mpio1InputMode	509	Mpio 1 Input Mode	Set Input Mode of Mpio 1
Mpio1OutputMode	510	Mpio 1 Output Mode	Set Output Mode of Mpio 1
Mpio1OutputSource	511	Mpio 1 Output Source	Set Output Source for Mpio 1
Mpio1OutputSourceCia301	512	Mpio 1 Output Source	Converted Output Source for Mpio 1
Mpio1OutputSourceScaling	513	Mpio 1 Output Source Scaling	Set Output Source Scaling for Mpio 1
Mpio1OutputSourceOffset	514	Mpio 1 Output Source Offset	Set Output Source Offset for Mpio 1
Mpio2Level	515	Mpio 2 Level	Set the voltage level of the Mpio 2
Mpio2InputMode	516	Mpio 2 Input Mode	Set Input Mode of Mpio 2
Mpio2OutputMode	517	Mpio 2 Output Mode	Set Output Mode of Mpio 2
Mpio2OutputSource	518	Mpio 2 Output Source	Set Output Source for Mpio 2
Mpio2OutputSourceCia301	519	Mpio 2 Output Source	Converted Output Source for Mpio 2

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Enum Name	Value	Name	Description
Mpio2OutputSourceScaling	520	Mpio 2 Output Source Scaling	Set Output Source Scaling for Mpio 2
Mpio2OutputSourceOffset	521	Mpio 2 Output Source Offset	Set Output Source Offset for Mpio 2
CurrentMotorTargetAnalogScaling	522	Current Motor Target Analog Scaling	Scaling of analog current reference
CurrentMotorTargetAnalogOffset	523	Current Motor Target Analog Offset	Offset of analog current reference
CurrentMotorReferenceChangeRate	524	Current Motor Reference Change Rate	Maximum change rate of analog current reference.
CurrentMotorReferenceChangeRateCia402	525	Current Motor Reference Change Rate	Maximum change rate of current reference.
CurrentMotorDAxisReference	526	Current Motor DAxis Reference	Current Reference d-Axis
CurrentMotorDAxisActual	527	Current Motor DAxis Actual	Actual Current d-Axis
CurrentMotorQAxisReference	528	Current Motor QAxis Reference	Current Reference q-Axis
CurrentMotorQAxisActual	529	Current Motor QAxis Actual	Actual Current q-Axis
VoltageDAxisReference	530	Voltage DAxis Reference	Voltage Reference d-Axis
VoltageQAxisReference	531	Voltage QAxis Reference	Voltage Reference a-Axis
CurrentSupply	532	Current Supply	Supply current of the motor. This current is not measured but estimated using motor current and loss model.
CurrentSupplyMaximum	533	Current Supply Maximum	Limit of the supply current. If the estimated supply current is above this limit, an error is thrown.
TimeDeadTimeCompensation	534	Time Dead Time Compensation	Dead time used for dead time compensation. This parameter does not actually change the dead time but only it's compensation.
FactorDeadTimeCompensation	535	Factor Dead Time Compensation	Factor used for dead time compensation calculation.
CommandLedState	536	Command Led State	The command sets the new states of the LEDs. Set the LedPatterns for the green and red LED and then trigger this command. Write 'Start' to trigger the command. Read the current execution state from this parameter.
CommandLedRedPattern	537	Command Led Red Pattern	Required state of the red LED
CommandLedGreenPattern	538	Command Led Green Pattern	Required state of the green LED
CommandEventConfigurationState	539	Command Event Configuration State	Change the event configuration. The behavior of a single event may be changed. Define all parameters before triggering the command. Write 'Start' to trigger the command. Read the current execution state from this parameter.

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Enum Name	Value	Name	Description
CommandEvent Configuration	540	Command Event Configuration	Event configuration command to be executed.
CommandEvent ConfigurationEventId	541	Command Event Configuration Event Id	ID of the event to be read / configured.
CommandEvent ConfigurationResetTime	542	Command Event Configuration Reset Time	Specifies the time to self reset
CommandEvent ConfigurationActionsMask	543	Command Event Configuration Actions Mask	Bitmask to configure actions for the event.
CommandEvent ConfigurationSingleAction	544	Command Event Configuration Single Action	Activates / deactivates a single action
VolumePumpHeadCalibrationOffset	545	Volume Pump Head Calibration Offset	Offset from two-point calibration
CommandStorageCalibrationDataState	546	Command Storage Calibration Data State	Store or erase the calibration files persistently. Select the action, then write 'Start' to trigger the command. Read the current execution state from this parameter.
CommandStorageCalibrationData	547	Command Storage Calibration Data	Actual command to be executed
CommandBootloaderSubsystem	548	Command Bootloader Subsystem	Actual bootloader subsystem command to be executed
CommandBootloaderSubsystemFirmware	549	Command Bootloader Subsystem Firmware	Data bytes to be written
CommandBootloaderSubsystemState	550	Command Bootloader Subsystem State	Start the bootloader on the subsystem or erase the application on the subsystem. Select the action, then write 'Start' to trigger the command. Read the current execution state from this parameter.
Mpio3InputValueScaling	551	Mpio 3 Input Value Scaling	The scaling factor for calculating the input value.
Mpio3InputValueOffset	552	Mpio 3 Input Value Offset	The offset value for calculating the input value.
Mpio3InputValue	553	Mpio 3 Input Value	The value measured on MPIO3 input.
Mpio4InputValueScaling	554	Mpio 4 Input Value Scaling	Scaling factor for calculating the input value
Mpio4InputValueOffset	555	Mpio 4 Input Value Offset	Offset for calculating the input value
Mpio4InputValue	556	Mpio 4 Input Value	The value measured on MPIO4 input.
Mpio3OutputValueScaling	557	Mpio 3 Output Value Scaling	The scaling factor for calculating the output value.
Mpio3OutputValueOffset	558	Mpio 3 Output Value Offset	Offset for calculating the output value
Mpio3OutputValue	559	Mpio 3 Output Value	The value send to the MPIO3 output.
Mpio4OutputValueScaling	560	Mpio 4 Output Value Scaling	Scaling factor for calculating the output value
Mpio4OutputValueOffset	561	Mpio 4 Output Value Offset	Offset for calculating the output value

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Enum Name	Value	Name	Description
Mpio4OutputValue	562	Mpio 4 Output Value	The value send to the MPIO4 output.
Mpio3InputValueRaw	563	Mpio 3 Input Value Raw	The raw value measured on MPIO3 input.
Mpio4InputValueRaw	564	Mpio 4 Input Value Raw	The raw value measured on MPIO4 input.
Mpio3Level	565	Mpio 3 Level	Set the voltage level of the Mpio 3
Mpio3InputMode	566	Mpio 3 Input Mode	Set Input Mode of Mpio 3
Mpio3OutputMode	567	Mpio 3 Output Mode	Set Output Mode of Mpio 3
Mpio3OutputSource	568	Mpio 3 Output Source	Set Output Source for Mpio 3
Mpio3OutputSourceCia301	569	Mpio 3 Output Source	Converted Output Source for Mpio 3
Mpio3OutputSourceScaling	570	Mpio 3 Output Source Scaling	Set Output Source Scaling for Mpio 3
Mpio3OutputSourceOffset	571	Mpio 3 Output Source Offset	Set Output Source Offset for Mpio 3
Mpio4Level	572	Mpio 4 Level	Set the voltage level of the Mpio 4
Mpio4InputMode	573	Mpio 4 Input Mode	Set Input Mode of Mpio 4
Mpio4OutputMode	574	Mpio 4 Output Mode	Set Output Mode of Mpio 4
Mpio4OutputSource	575	Mpio 4 Output Source	Set Output Source for Mpio 4
Mpio4OutputSourceCia301	576	Mpio 4 Output Source	Converted Output Source for Mpio 4
Mpio4OutputSourceScaling	577	Mpio 4 Output Source Scaling	Set Output Source Scaling for Mpio 4
Mpio4OutputSourceOffset	578	Mpio 4 Output Source Offset	Set Output Source Offset for Mpio 4
CommandAuthenticationUserChallenge0	579	Command Authentication User Challenge 0	First 4 Bytes of the Authentication Challenge
CommandAuthenticationUserChallenge1	580	Command Authentication User Challenge 1	Second 4 Bytes of the Authentication Challenge
CommandAuthenticationUserChallenge2	581	Command Authentication User Challenge 2	Third 4 Bytes of the Authentication Challenge
CommandAuthenticationUserChallenge3	582	Command Authentication User Challenge 3	Last 4 Bytes of the Authentication Challenge
CommandAuthenticationUserCypherText0	583	Command Authentication User Cypher Text 0	First 4 Bytes of the Encrypted Data
CommandAuthenticationUserCypherText1	584	Command Authentication User Cypher Text 1	Second 4 Bytes of the Encrypted Data
CommandAuthenticationUserCypherText2	585	Command Authentication User Cypher Text 2	Third 4 Bytes of the Encrypted Data
CommandAuthenticationUserCypherText3	586	Command Authentication User Cypher Text 3	Last 4 Bytes of the Encrypted Data
CommandAuthenticationUserAuthenticated	587	Command Authentication User Authenticated	The actual authenticated user
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Enum Name	Value	Name	Description
PositionMechanicalAbsoluteTolerance	588	Position Mechanical Absolute Tolerance	Absolute error tolerance of the mechanic angle from one light barrier edge to the other
AuthenticationParameterUint32Admin	589	Authentication Parameter Uint32 Admin	AuthenticationParameterUint32Admin, used for Tracer tests too (Tracer_integrationtest.h)
BytesUsedMainStackMaximum	590	Bytes Used Main Stack Maximum	Maximum used bytes in the main stack
PositionInputValue1	591	Position Input Value 1	Position measurement channel 1.
PositionInputValue2	592	Position Input Value 2	Position measurement channel 2.
PositionInputValue3	593	Position Input Value 3	Position measurement channel 3.
PositionInput-Value1Offset	594	Position Input Value 1 Offset	Offset of position measurement channel 1.
PositionInput-Value2Offset	595	Position Input Value 2 Offset	Offset of position measurement channel 2.
PositionInput-Value3Offset	596	Position Input Value 3 Offset	Offset of position measurement channel 3.
PositionInput-Value1Scaling	597	Position Input Value 1 Scaling	Scaling factor of position measurement channel 1.
PositionInput-Value2Scaling	598	Position Input Value 2 Scaling	Scaling factor of position measurement channel 2.
PositionInput-Value3Scaling	599	Position Input Value 3 Scaling	Scaling factor of position measurement channel 3.
Mpio1OutputPwmFrequency	600	Mpio 1 Output Pwm Frequency	Set output PWM frequency in case mode is PWM output
Mpio2OutputPwmFrequency	601	Mpio 2 Output Pwm Frequency	Set output PWM frequency in case mode is PWM output
Mpio3OutputPwmFrequency	602	Mpio 3 Output Pwm Frequency	Set output PWM frequency in case mode is PWM output
Mpio4OutputPwmFrequency	603	Mpio 4 Output Pwm Frequency	Set output PWM frequency in case mode is PWM output
Mpio1InputErrorRate	604	Mpio 1 Input Error Rate	Proportion of errors in the input signal [0..1]
Mpio2InputErrorRate	605	Mpio 2 Input Error Rate	Proportion of errors in the input signal [0..1]
Mpio3InputErrorRate	606	Mpio 3 Input Error Rate	Proportion of errors in the input signal [0..1]
Mpio4InputErrorRate	607	Mpio 4 Input Error Rate	Proportion of errors in the input signal [0..1]
Sensor1SiUnit	608	Sensor 1 Si Unit	Si Unit of the sensor 1
Sensor2SiUnit	609	Sensor 2 Si Unit	Si Unit of the sensor 2
Sensor3SiUnit	610	Sensor 3 Si Unit	Si Unit of the sensor 3
Sensor4SiUnit	611	Sensor 4 Si Unit	Si Unit of the sensor 4
Sensor5SiUnit	612	Sensor 5 Si Unit	Si Unit of the sensor 5
Sensor6SiUnit	613	Sensor 6 Si Unit	Si Unit of the sensor 6
Sensor7SiUnit	614	Sensor 7 Si Unit	Si Unit of the sensor 7
Sensor8SiUnit	615	Sensor 8 Si Unit	Si Unit of the sensor 8
Mpio1InputValueSiUnit	616	Mpio 1 Input Value Si Unit	Si Unit of the Mpio 1 input value
Mpio2InputValueSiUnit	617	Mpio 2 Input Value Si Unit	Si Unit of the Mpio 2 input value
Mpio3InputValueSiUnit	618	Mpio 3 Input Value Si Unit	Si Unit of the Mpio 3 input value
Mpio4InputValueSiUnit	619	Mpio 4 Input Value Si Unit	Si Unit of the Mpio 4 input value

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Enum Name	Value	Name	Description
Mpio1OutputValueSiUnit	620	Mpio 1 Output Value Si Unit	Si Unit of the Mpio 1 output value
Mpio2OutputValueSiUnit	621	Mpio 2 Output Value Si Unit	Si Unit of the Mpio 2 output value
Mpio3OutputValueSiUnit	622	Mpio 3 Output Value Si Unit	Si Unit of the Mpio 3 output value
Mpio4OutputValueSiUnit	623	Mpio 4 Output Value Si Unit	Si Unit of the Mpio 4 output value
FrequencyPositionTarget	624	Frequency Position Target	Frequency of position target
AmplitudePositionTarget	625	Amplitude Position Target	Amplitude of position target
PositionTargetOffset	626	Position Target Offset	Offset of the position target
PositionMechanicalAbsoluteMultiTurnFloat	627	Position Mechanical Absolute Multi Turn Float	Position mechanical absolute multi turn float
EnablePhotoInterrupterMonitoring	628	Enable Photo Interrupter Monitoring	Switches monitoring of photo interrupter on / off.
SpeedPrime	629	Speed Prime	Set Speed for priming Application
SerialNumberAssembly	630	Serial Number Assembly	Serial number of the complete assembly.
IdManufacturer1	631	Id Manufacturer 1	Identifier of manufacturer 1.
SerialNumberManufacturer1Part1	632	Serial Number Manufacturer 1 Part 1	Part 1 of the serial number of manufacturer 1.
SerialNumberManufacturer1Part2	633	Serial Number Manufacturer 1 Part 2	Part 2 of the serial number of manufacturer 1.
Sensor-Board1SerialNumberManufacturerPart2	634	Sensor Board 1 Serial Number Manufacturer Part 2	Serial number defined by the manufacturer.
Sensor-Board2SerialNumberManufacturerPart2	635	Sensor Board 2 Serial Number Manufacturer Part 2	Serial number defined by the manufacturer.
Sensor-Board3SerialNumberManufacturerPart2	636	Sensor Board 3 Serial Number Manufacturer Part 2	Serial number defined by the manufacturer.
Sensor-Board4SerialNumberManufacturerPart2	637	Sensor Board 4 Serial Number Manufacturer Part 2	Serial number defined by the manufacturer.
Mpio1InputDigital	638	Mpio 1 Input Digital	The digital input MPIO 1.
Mpio2InputDigital	639	Mpio 2 Input Digital	The digital input MPIO 2.
Mpio3InputDigital	640	Mpio 3 Input Digital	The digital input MPIO 3.
Mpio4InputDigital	641	Mpio 4 Input Digital	The digital input MPIO 4.
SpeedTargetPersistent	642	Speed Target Persistent	Target Speed Persistent. This Target will apply on TargetSourceSpeedController = Fix
SpeedSensorActualValueCia402	643	Speed Sensor Actual Value	Speed sensor actual value
Mpio1OutputDigital	644	Mpio 1 Output Digital	Mpio 1 Output Digital
Mpio2OutputDigital	645	Mpio 2 Output Digital	Mpio 2 Output Digital
Mpio3OutputDigital	646	Mpio 3 Output Digital	Mpio 3 Output Digital
Mpio4OutputDigital	647	Mpio 4 Output Digital	Mpio 4 Output Digital
FlowRateRaw	648	Flow Rate Raw	Flow rate raw value
Do1Level	649	Do 1 Level	Set the voltage level of the Do1
Do1OutputMode	650	Do 1 Output Mode	Set Output Mode of Do1
Do1OutputSource	651	Do 1 Output Source	Set Output Source for Do1

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Enum Name	Value	Name	Description
Do1OutputSourceCia301	652	Do 1 Output Source	Converted Output Source for Do1
Do1OutputSourceScaling	653	Do 1 Output Source Scaling	Set Output Source Scaling for Do1
Do1OutputSourceOffset	654	Do 1 Output Source Offset	Set Output Source Offset for Do1
Do1OutputDigital	655	Do 1 Output Digital	Do1 Output Digital
Do1OutputValue	656	Do 1 Output Value	The value of the digital output 1.
Do2Level	657	Do 2 Level	Set the voltage level of the DO2
Do2OutputMode	658	Do 2 Output Mode	Set Output Mode of Do2
Do2OutputSource	659	Do 2 Output Source	Set Output Source for Do2
Do2OutputSourceCia301	660	Do 2 Output Source	Converted Output Source for Do1
Do2OutputSourceScaling	661	Do 2 Output Source Scaling	Set Output Source Scaling for Do2
Do2OutputSourceOffset	662	Do 2 Output Source Offset	Set Output Source Offset for Do2
Do2OutputDigital	663	Do 2 Output Digital	The digital output 2.
Do2OutputValue	664	Do 2 Output Value	The value of the digital output 2.
Do3Level	665	Do 3 Level	Set the voltage level of the DO3
Do3OutputMode	666	Do 3 Output Mode	Set Output Mode of Do3
Do3OutputSource	667	Do 3 Output Source	Set Output Source for Do3
Do3OutputSourceCia301	668	Do 3 Output Source	Converted Output Source for Do3
Do3OutputSourceScaling	669	Do 3 Output Source Scaling	Set Output Source Scaling for Do3
Do3OutputSourceOffset	670	Do 3 Output Source Offset	Set Output Source Offset for Do3
Do3OutputDigital	671	Do 3 Output Digital	Do3 Output Digital
Do3OutputValue	672	Do 3 Output Value	The value of the digital output 3.
Di1Level	673	Di 1 Level	Set the voltage level of the DI1
Di1InputMode	674	Di 1 Input Mode	Set Input Mode of Di1
Di2Level	675	Di 2 Level	Set the voltage level of the DI2
Di2InputMode	676	Di 2 Input Mode	Set Input Mode of Di2
Di1InputDigital	677	Di 1 Input Digital	DI1 Input Digital
Di2InputDigital	678	Di 2 Input Digital	DI2 Input Digital
EnableAnalogControl	679	Enable Analog Control	Enable analog control, true == enable
Duration10ms	680	Duration 10ms	Duration 10ms
Duration10msAverage	681	Duration 10ms Average	Duration 10ms Average
Duration10msMinimum	682	Duration 10ms Minimum	Duration 10ms Minimum
Duration10msMaximum	683	Duration 10ms Maximum	Duration 10ms Maximum
VoltageAmplitudeTarget	684	Voltage Amplitude Target	Amplitude of the output voltage
FrequencyDriveTarget	685	Frequency Drive Target	Frequency Target of the drive
ResistanceCoil	686	Resistance Coil	Resistance of coil
InductanceCoil	687	Inductance Coil	Inductance of coil
SpeedMotorScaling	688	Speed Motor Scaling	Scale of the motor speed analog control input
SpeedMotorOffset	689	Speed Motor Offset	Offset of the motor speed analog control input
VoltageControlSlope-Maximum	690	Voltage Control Slope Maximum	Maximum slope of motor control voltage

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Enum Name	Value	Name	Description
VoltageControlSlopeMinimum	691	Voltage Control Slope Minimum	Minimum slope of motor control voltage
VoltageControlMinimum	692	Voltage Control Minimum	Minimum control voltage in case of voltage controlled motor
VoltageControlFeedForward	693	Voltage Control Feed Forward	Feed forward for control voltage
VoltageControlSlope	694	Voltage Control Slope	Slope of motor control voltage
VoltageControl	695	Voltage Control	Motor Control Voltage
VoltageControlMaximum	696	Voltage Control Maximum	Maximum control voltage in case of voltage controlled motor
FlowControllerTimeConstant	697	Flow Controller Time Constant	Time Constant of transfer function of closed loop flow control.
FlowControllerAttenuation	698	Flow Controller Attenuation	Attenuation of transfer function of closed loop flow control.
FlowControllerProportionalGain	699	Flow Controller Proportional Gain	Proportional gain of flow controller, used for fine tuning.
FlowControllerIntegralGain	700	Flow Controller Integral Gain	Integral gain of flow controller, used for fine tuning.
SpeedFeedForward	701	Speed Feed Forward	Speed feed forward
FlowControllerAccelerationOutput	702	Flow Controller Acceleration Output	Acceleration reference from Flow Control
FlowRateReference	703	Flow Rate Reference	Reference value for flow rate
FlowRateReferenceSlope	704	Flow Rate Reference Slope	Slope of flow rate reference
FlowRateTargetMaximum	705	Flow Rate Target Maximum	Maximum target flow rate
FlowRateTarget	706	Flow Rate Target	Target flow rate
SourceVolumeTarget	707	Source Volume Target	Reference Volume Source
SourceVolumeTargetCia301	708	Source Volume Target	Converted Source for reference volume
VolumeTargetScaling	709	Volume Target Scaling	Set Source Scaling for reference volume
VolumeTargetOffset	710	Volume Target Offset	Set Source Offset for reference volume
VolumeTargetMinimum	711	Volume Target Minimum	Set minimum for reference volume
VolumeTargetMaximum	712	Volume Target Maximum	Set max for reference volume
VolumeTargetThreshold	713	Volume Target Threshold	Set threshold for reference volume, is the value under this level, the default value will taken
VolumeTargetInput	714	Volume Target Input	Volume target value from an external input
SourceFrequencyDosingCycle	715	Source Frequency Dosing Cycle	Source for frequency dosing cycle, map any other parameter to frequency dosing cycle.
SourceFrequencyDosingCycleCia301	716	Source Frequency Dosing Cycle	Converted source for frequency dosing cycle
FrequencyDosingCycleScaling	717	Frequency Dosing Cycle Scaling	Set Source Scaling for frequency dosing cycle input
FrequencyDosingCycleOffset	718	Frequency Dosing Cycle Offset	Set Source Offset for frequency dosing cycle
FrequencyDosingCycleMinimum	719	Frequency Dosing Cycle Minimum	Set source minimum for frequency dosing cycle

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Enum Name	Value	Name	Description
FrequencyDosingCycleMaximum	720	Frequency Dosing Cycle Maximum	Set source maximum for frequency dosing cycle
FrequencyDosingCycleThreshold	721	Frequency Dosing Cycle Threshold	Set source input threshold for frequency dosing cycle, is the value under this level, the default value will taken
FrequencyDosingCycleInput	722	Frequency Dosing Cycle Input	Frequency for a dosing cycle from an external input
SourceRatioSuction	723	Source Ratio Suction	Suction Ratio Source
SourceRatioSuction-Cia301	724	Source Ratio Suction	Converted source for suction ratio
RatioSuctionScaling	725	Ratio Suction Scaling	Set Source Scaling for suction ratio
RatioSuctionOffset	726	Ratio Suction Offset	Set Source Offset for suction ratio
RatioSuctionMinimum	727	Ratio Suction Minimum	Set minimum for suction ratio
RatioSuctionMaximum	728	Ratio Suction Maximum	Set max for suction ratio
RatioSuctionThreshold	729	Ratio Suction Threshold	Set threshold for suction ratio, is the value under this level, the default value will taken
RatioSuctionInput	730	Ratio Suction Input	Ratio between pressure stroke and cycle time value from an external input
EventOutputDigital1	731	Event Output Digital 1	State of the event handler, is mapped to digital output 1
EventOutputDigital2	732	Event Output Digital 2	State of the event handler, is mapped to digital output 2
WarningRegister	733	Warning Register	This object provides warning information.
WarningEntryCount	734	Warning Entry Count	Read: returns the number of warnings in the warning log. Write 0: clears the warning buffer. Write otherwise: has no effects.
WarningEntry1MostRecent	735	Warning Entry 1 Most Recent	This object provides warning information.
WarningEntry2	736	Warning Entry 2	This object provides warning information.
WarningEntry3	737	Warning Entry 3	This object provides warning information.
WarningEntry4	738	Warning Entry 4	This object provides warning information.
WarningEntry5	739	Warning Entry 5	This object provides warning information.
FlowRateTargetSource	740	Flow Rate Target Source	Flow rate target source
FlowRateTargetSource-Cia301	741	Flow Rate Target Source	Flow rate target source CiA301
FlowRateTargetFix	742	Flow Rate Target Fix	Flow rate target fix
FlowRateTargetOffset	743	Flow Rate Target Offset	Flow rate target offset
FlowRateTargetScaling	744	Flow Rate Target Scaling	Flow rate target scale
FlowRateTargetMinimum	745	Flow Rate Target Minimum	Minimum target flow rate

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Enum Name	Value	Name	Description
FlowRateTargetHysteresis	746	Flow Rate Target Hysteresis	Hysteresis target flow rate
ResistanceThermalMotor	747	Resistance Thermal Motor	Thermal resistance of motor winding to ambient
TimeConstantThermalMotor	748	Time Constant Thermal Motor	Thermal time constant of motor winding
TemperatureRiseMotorWindingEstimated	749	Temperature Rise Motor Winding Estimated	Estimated rise of winding temperature
Subsystem1FirmwareVersion	750	Subsystem 1 Firmware Version	Subsystem 1 Firmware Version
CommandAuthenticationUserConfiguration	751	Command Authentication User Configuration	Command to configure the user access rights
CommandAuthenticationUserSelection	752	Command Authentication User Selection	Selected user for the user access rights configuration
CommandAuthenticationUserAccessRight	753	Command Authentication User Access Right	User access right consisting of index subindex and access flags
VolumePumpHeadCalibrated	754	Volume Pump Head Calibrated	Calibrated volume of the pump head
FlowControllerEnable	755	Flow Controller Enable	Command to enable/disable Flow Control.
FlowControllerInterval	756	Flow Controller Interval	Defines the interval of the flow controller. Every interval a new reference value is calculated.
FlowControllerActualValueSource	757	Flow Controller Actual Value Source	Data Source for Flow Controller (Parameter Unique Id)
FlowControllerActualValueSourceCia301	758	Flow Controller Actual Value Source	Data Source for Flow Controller (0xIIISS00 - III: Index / SS: Subindex)
FlowControllerActualValueFilterTimeConstant	759	Flow Controller Actual Value Filter Time Constant	Filter Constant for Flow Controller in [s]
FlowControllerActualValueFiltered	760	Flow Controller Actual Value Filtered	Actual Filtered Value Flow Controller
FlowControllerActualValueRipple	761	Flow Controller Actual Value Ripple	Process Value Peak-Peak Ripple Flow Control
FlowValueFilterTimeConstant	762	Flow Value Filter Time Constant	Filter Constant for Flow Value.
FlowRate	763	Flow Rate	Flow Rate (filtered Value)
FactorFlowRateReferenceMinimumStarting	764	Factor Flow Rate Reference Minimum Starting	Factor for calculating the minimum flow rate reference at starting.
FactorVoltageControlMinimumStarting	765	Factor Voltage Control Minimum Starting	Factor for calculating the minimum control voltage at starting
TimeSignalDosingCycleCompleteOn	766	Time Signal Dosing Cycle Complete On	High time for the cycle complete signal
CompleteDosingCycle	767	Complete Dosing Cycle	Short time-controlled signal to signalize a complete dosing cycle
TimeFlowControllerErrorMonitor	768	Time Flow Controller Error Monitor	Flow Controller Error Monitor Time

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Enum Name	Value	Name	Description
TimeFlowControllerErrorMonitorStarting	769	Time Flow Controller Error Monitor Starting	Starting Delay Time of Error Monitor after Controller was started
FactorFlowControllerErrorMonitor	770	Factor Flow Controller Error Monitor	Factor (from Setpoint) for Error Monitor
SourceSpeedPrime	771	Source Speed Prime	Speed Prime Source
SourceSpeedPrimeCia301	772	Source Speed Prime	Converted Source for speed prime
SpeedPrimeScaling	773	Speed Prime Scaling	Set Source Scaling for speed prime
SpeedPrimeOffset	774	Speed Prime Offset	Set Source Offset for speed prime
SpeedPrimeMinimum	775	Speed Prime Minimum	Set minimum for speed prime
SpeedPrimeMaximum	776	Speed Prime Maximum	Set max for speed prime
CommandAuthenticationUserAuthenticationState	777	Command Authentication User Authentication State	Command / State of the user authentication.
CommandAuthenticationUserConfigurationState	778	Command Authentication User Configuration State	Command / State of the user access configuration.
CommunicationSpeedI2c	779	Communication Speed I2c	Set speed for I2C communication
DirectionFlowAnalogDigitalInterface	780	Direction Flow Analog Digital Interface	Describes the flow direction from the analog digital interface, true == forward, false = reverse. Value from analog digital Interface overrule the direction from the can interface
SpeedPrimeInput	781	Speed Prime Input	Speed prime target value from an external input
SpeedPrimeThreshold	782	Speed Prime Threshold	Set threshold for prime speed, is the value under this level, the default value from the CANopen interface will taken
PositionInputAmplitude	783	Position Input Amplitude	Calculated amplitude from the position sensor
NumberCompleteDosingCycle	784	Number Complete Dosing Cycle	Counter for completed dosing cycles for checking the number of performed dosing cycle. Only increments the counter if the parameter NumbersDosingCycle is greater than one. Resets to zero upon receiving a new dosing command.
VolumeTargetHysteresis	785	Volume Target Hysteresis	Hysteresis for volume target threshold
FrequencyDosingCycleHysteresis	786	Frequency Dosing Cycle Hysteresis	Hysteresis for frequency dosing cycle threshold
RatioSuctionHysteresis	787	Ratio Suction Hysteresis	Hysteresis for ratio suction threshold
SpeedPrimeHysteresis	788	Speed Prime Hysteresis	Hysteresis for speed prime threshold
OverpressureCoefficientKmp	789	Overpressure Coefficient Km Prime Mode	Overpressure detection Coefficient to weight torque building current in prime mode
OverpressureCoefficientKvp	790	Overpressure Coefficient Kv Prime Mode	Overpressure detection Coefficient to weight rotor speed in prime mode

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Enum Name	Value	Name	Description
OverpressureCoefficientMrp	791	Overpressure Coefficient Mr Prime Mode	Overpressure detection Coefficient to weight the offset of torque in prime mode
OverpressureCoefficienttKmd	792	Overpressure Coefficient Km Dosing Mode	Overpressure detection Coefficient to weight torque building current in dosing mode
OverpressureCoefficienttKvd	793	Overpressure Coefficient Kv Dosing Mode	Overpressure detection Coefficient to weight rotor speed in dosing mode
OverpressureCoefficientMrd	794	Overpressure Coefficient Mr Dosing Mode	Overpressure detection Coefficient to weight the offset of torque in dosing mode
OverpressureCoefficienttART	795	Overpressure Coefficient a Mm for RT diaphragm	Overpressure detection Coefficient to weight the quadratic term of RT diaphragm polynomial
OverpressureCoefficientBRT	796	Overpressure Coefficient b of Mm for RT diaphragm	Overpressure detection Coefficient to weight the linear term of RT diaphragm polynomial
OverpressureCoefficientCRT	797	Overpressure Coefficient c of Mm for RT diaphragm	Overpressure detection Coefficient to weight the absolute term of RT diaphragm polynomial
OverpressureCoefficienttARP	798	Overpressure Coefficient a Mm for RP diaphragm	Overpressure detection Coefficient to weight the quadratic term of RP diaphragm polynomial
OverpressureCoefficientBRP	799	Overpressure Coefficient b Mm for RP diaphragm	Overpressure detection Coefficient to weight the linear term of RP diaphragm polynomial
OverpressureCoefficientCRP	800	Overpressure Coefficient c Mm for RP diaphragm	Overpressure detection Coefficient to weight the absolute term of RP diaphragm polynomial
OverpressureCoefficienttAPML	801	Overpressure Coefficient a Mm for PML diaphragm	Overpressure detection Coefficient to weight the quadratic term of PML diaphragm polynomial
OverpressureCoefficientBPML	802	Overpressure Coefficient b Mm for PML diaphragm	Overpressure detection Coefficient to weight the linear term of PML diaphragm polynomial
OverpressureCoefficientCPML	803	Overpressure Coefficient c of Mm for PML diaphragm	Overpressure detection Coefficient to weight the absolute term of PML diaphragm polynomial
OverpressureTypeDiaphragm	804	Overpressure Type Diaphragm	Overpressure type of diaphragm to distinct the influence of material
OverpressurePressureEstimated	805	Overpressure Pressure Estimated	The estimated pressure at the outlet of the pump
OverpressureAreaDiaphragm	806	Overpressure Area Diaphragm	The area of the diaphragm that is involved in the active stroke
OverpressureTorqueDiaphragm	807	Overpressure Torque Diaphragm	The estimated torque Mm generated from the diaphragm force only while discharging
OverpressurePressureLimit	808	Overpressure Pressure Limit	The pressure limit which is permitted at the outlet of the pump
OverpressureCurrentTorqueAveraged	809	Overpressure Current Torque Averaged	The averaged value of the torque building current iQ within the discharge interval
OverpressureSpeedAveraged	810	Overpressure Speed Averaged	The averaged value of the pump speed within the discharge interval

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Enum Name	Value	Name	Description
OverpressureLeverAveraged	811	Overpressure Lever Averaged	The averaged value of the active lever within the discharge interval
VoltageDcLinkMinimalForStartUp	812	Voltage Dc Link Minimal For Start Up	Defines the minimum DC-link voltage threshold. If the voltage falls below this threshold, the device will neither start up nor perform a shutdown sequence
CurrentDriveTarget	813	Current Drive Target	Current target of the drive
CurrentDriveReference	814	Current Drive Reference	Current reference of the drive
CurrentDriveScaling	815	Current Drive Scaling	Scaling factor of drive current
CurrentDriveOffset	816	Current Drive Offset	Offset of drive current
CurrentDriveRaw	817	Current Drive Raw	Raw value of drive current
CurrentDrive	818	Current Drive	Current of the drive
VoltageMotorPhaseA	819	Voltage Motor Phase A	Voltage motor phase A
VoltageMotorPhaseB	820	Voltage Motor Phase B	Voltage motor phase B
OverpressureCoefficientKtP	821	Overpressure influence of board temperature on over pressure while priming	Overpressure Coefficient that considers the influence of the board temperature during prime activities
OverpressureCoefficientKtD	822	Overpressure influence of board temperature on over pressure while dosing	Overpressure Coefficient that considers the influence of the board temperature during dosing activities
CommandWriteIdent-NumberAssemblyState	823	Command Write Ident Number Assembly State	Command to Write the Assembly Ident number if there is not already one given
CommandWriteIdent-NumberAssembly	824	Command Write Ident Number Assembly	Ident Number to be written if command is set
IdentNumberAssembly	825	Ident Number Assembly	The indent number of the assembly.
OverpressurePressureWarningLevel	826	Overpressure Pressure Warning Level	Overpressure level of warning relative to the maximum pressure limit for the outlet pressure
StateIndicationEventIdSeverity	827	State Indication Event Id Severity	State Indication Event Id and Severity
StateIndicationDeviceState	828	State Indication Device State	State Indication Device State
StateIndicationTimeStamp	829	State Indication Time Stamp	State Indication Time Stamp
PositionMechanicalMultiTurn	830	Position Mechanical Multi Turn	Position mechanical multi turn
PositionMechanicalAbsolute	831	Position Mechanical Absolute	Position mechanical absolute
VoltageAdc1Reference	832	Voltage Adc 1 Reference	The voltage of the ADC reference system.
VoltageAdc1ReferenceRaw	833	Voltage Adc 1 Reference Raw	The raw value representing the voltage of the ADC reference system.
VoltageAdc3Reference	834	Voltage Adc 3 Reference	The voltage of the ADC reference system.
VoltageAdc3ReferenceRaw	835	Voltage Adc 3 Reference Raw	The raw value of the voltage of the ADC reference system.
FactorEFlowRateCompensation	836	Factor E Flow Rate Compensation	Factor E for the Flowrate Calculation
DurationTestSection	837	Duration Test Section	Duration Test Section

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Enum Name	Value	Name	Description
DurationTestSection-Average	838	Duration Test Section Average	Duration Test Section Average
DurationTestSection-Minimum	839	Duration Test Section Minimum	Duration Test Section Minimum
DurationTestSection-Maximum	840	Duration Test Section Maximum	Duration Test Section Maximum
Pressure	841	Pressure	Pressure
PressureTarget	842	Pressure Target	Pressure target
PressureReference	843	Pressure Reference	Pressure reference
PressureControllerProportionalGain	844	Pressure Controller Proportional Gain	Pressure controller proportional gain
PressureControllerIntegralGain	845	Pressure Controller Integral Gain	Pressure controller integral gain
PressureControllerDifferentialGain	846	Pressure Controller Differential Gain	Pressure controller differential gain
PressureScaling	847	Pressure Scaling	Pressure scaling
PressureOffset	848	Pressure Offset	Pressure offset
PressureReferenceSlope	849	Pressure Reference Slope	Pressure reference slope
PressureReferenceMinimum	850	Pressure Reference Minimum	Pressure reference minimum
PressureReferenceMaximum	851	Pressure Reference Maximum	Pressure reference maximum
GenericPidControllerActualValueMonitorEnable	852	Generic Pid Controller Actual Value Monitor Enable	Enable to activate monitoring. When activated, the actual value is monitored. If the actual value limits are exceeded, an event is triggered.
GenericPidControllerActualValueMonitorReferenceSource	853	Generic Pid Controller Actual Value Monitor Reference Source	Defines the reference source (the parameter unique ID) for the actual value monitor. If set to zero, then min/max values are taken directly as limits. If set to a parameter (e.g. the generic PID controller reference), then the min/max values are relative to the value of that parameter.
GenericPidControllerActualValueMonitorReferenceSourceCia301	854	Generic Pid Controller Actual Value Monitor Reference Source	Defines the reference source (0xIIISS00 - IIII: Index / SS: Subindex) for the actual value monitor. If set to zero, then min/max values are taken as hard limits. If set to a parameter (e.g. the generic PID controller reference), then the min/max values are relative to the value of that parameter.
GenericPidControllerActualValueMonitorStartupDelay	855	Generic Pid Controller Actual Value Monitor Startup Delay	Delay in seconds before the monitor is activated after PID control is enabled.
GenericPidControllerActualValueMonitorDelay	856	Generic Pid Controller Actual Value Monitor Delay	Delay in seconds after which an event is generated if the monitored limits are exceeded.
GenericPidControllerActualValueMonitorMaximum	857	Generic Pid Controller Actual Value Monitor Maximum	Defines the upper limit for the actual value monitor.

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Enum Name	Value	Name	Description
GenericPidController-ActualValueMonitorMinimum	858	Generic Pid Controller Actual Value Monitor Minimum	Defines the lower limit for the actual value monitor.
CurrentDriveReferenceMaximum	859	Current Drive Reference Maximum	Current drive reference maximum
CommandParameterEditingSessionState	860	Command Parameter Editing Session State	State of the command to start and stop parameter editing session.
CommandParameterEditingSession	861	Command Parameter Editing Session	Command for parameter editing session.

Chapter 5

Interfaces

5.1 CANopen

5.1.1 CiA 301

5.1.1.1 Device Type

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x1000-0x00	Device Type	DeviceType , see section 3.4 on page 89	0

5.1.1.2 Error Register

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x1001-0x00	Error Register	ErrorRegister , see section 2.5.7.7 on page 50	0

5.1.1.3 Pre-defined Error Field

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x1003-0x00	Error Entry Count	ErrorEntryCount , see section 2.5.7.6 on page 50	0
0x1003-0x01	Error Entry 1 Most Recent	ErrorEntry1MostRecent , see section 2.5.7.1 on page 47	0
0x1003-0x02	Error Entry 2	ErrorEntry2 , see section 2.5.7.2 on page 48	0
0x1003-0x03	Error Entry 3	ErrorEntry3 , see section 2.5.7.3 on page 48	0
0x1003-0x04	Error Entry 4	ErrorEntry4 , see section 2.5.7.4 on page 49	0
0x1003-0x05	Error Entry 5	ErrorEntry5 , see section 2.5.7.5 on page 49	0

5.1.1.4 Manufacturer Device Name

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x1008-0x00	Device Name	DeviceName , see section 3.3 on page 89	0

5.1.1.5 Identity Object

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x1018-0x01	Vendor Id	VendorId , see section 3.9 on page 92	0
0x1018-0x04	Serial Number	SerialNumber , see section 2.5.6.1 on page 45	0

5.1.2 CiA General Manufacturer Specific Objects

5.1.2.1 Firmware Information

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x4000-0x05	Firmware Sap Id	FirmwareSapId , see section 3.8 on page 91	0

5.1.2.2 Hardware Information

Index-SubIndex	Sub-Object Name	Key	Map Permission
1 0x4001-0x01	Device Name	DeviceName , see section 3.3 on page 89	0
0x4001-0x03	Serial Number	SerialNumber , see section 2.5.6.1 on page 45	0

5.1.2.3 Tracer

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x4002-0x01	Tracer Record 1 Source	TracerRecord1SourceCia301 , see section 2.5.9.5 on page 55	1
0x4002-0x02	Tracer Record 2 Source	TracerRecord2SourceCia301 , see section 2.5.9.6 on page 56	1
0x4002-0x03	Tracer Record 3 Source	TracerRecord3SourceCia301 , see section 2.5.9.7 on page 56	1
0x4002-0x04	Tracer Record 4 Source	TracerRecord4SourceCia301 , see section 2.5.9.8 on page 57	1
0x4002-0x05	Tracer Trigger Source	TracerTriggerSourceCia301 , see section 2.5.9.15 on page 60	1
0x4002-0x06	Tracer Trigger Mode	TracerTriggerMode , see section 2.5.9.14 on page 60	1
0x4002-0x07	Tracer Trigger Threshold	TracerTriggerThreshold , see section 2.5.9.16 on page 61	1
0x4002-0x08	Tracer Trigger Delay	TracerTriggerDelay , see section 2.5.9.13 on page 59	1
0x4002-0x09	Tracer Start	TracerStart , see section 2.5.9.10 on page 58	1
0x4002-0x0a	Tracer Stop	TracerStop , see section 2.5.9.12 on page 59	1
0x4002-0x0b	Tracer Sampling Rate	TracerSamplingRate , see section 2.5.9.9 on page 57	1
0x4002-0x0c	Tracer Output 1	TracerOutput1 , see section 2.5.9.1 on page 53	1
0x4002-0x0d	Tracer Output 2	TracerOutput2 , see section 2.5.9.2 on page 54	1
0x4002-0x0e	Tracer Output 3	TracerOutput3 , see section 2.5.9.3 on page 54	1
0x4002-0x0f	Tracer Output 4	TracerOutput4 , see section 2.5.9.4 on page 55	1
0x4002-0x10	Tracer State	TracerState , see section 2.5.9.11 on page 58	1

5.1.2.4 Logger

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x4004-0x01	Logger Entry	LoggerEntry , see section 2.5.8.1 on page 51	1
0x4004-0x02	Logger Module Id	LoggerModuleId , see section 2.5.8.3 on page 52	1
0x4004-0x03	Logger Transaction Id	LoggerTransactionId , see section 2.5.8.4 on page 52	1
0x4004-0x04	Logger Value	LoggerValue , see section 2.5.8.5 on page 53	1
0x4004-0x05	Logger Level Filter	LoggerLevelFilter , see section 2.5.8.2 on page 51	1

5.1.2.5 Time Statistics

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x400a-0x01	Time Since Boot	TimeSinceBoot , see section 2.5.6.4 on page 47	1
0x400a-0x02	Time Powered	TimePowered , see section 2.5.6.3 on page 46	1
0x400a-0x03	Time Operation	TimeOperation , see section 2.5.6.2 on page 46	1

5.1.2.6 Event Handler Output Digital

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x400e-0x01	Event Output Digital 1	EventOutputDigital1 , see section 2.5.1 on page 43	1
0x400e-0x02	Event Output Digital 2	EventOutputDigital2 , see section 2.5.2 on page 43	1

5.1.2.7 Warning Register

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x4010-0x00	Warning Register	WarningRegister , see section 2.5.10.7 on page 64	0

5.1.2.8 Pre-defined Warning Field

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x4011-0x00	Warning Entry Count	WarningEntryCount , see section 2.5.10.6 on page 64	0
0x4011-0x01	Warning Entry 1 Most Recent	WarningEntry1MostRecent , see section 2.5.10.1 on page 61	0
0x4011-0x02	Warning Entry 2	WarningEntry2 , see section 2.5.10.2 on page 62	0
0x4011-0x03	Warning Entry 3	WarningEntry3 , see section 2.5.10.3 on page 62	0

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Index-SubIndex	Sub-Object Name	Key	Map Permission
0x4011-0x04	Warning Entry 4	WarningEntry4 , see section 2.5.10.4 on page 63	0
0x4011-0x05	Warning Entry 5	WarningEntry5 , see section 2.5.10.5 on page 63	0

5.1.2.9 Device States

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x4013-0x01	State Indication Event Id Severity	StateIndicationEventIdSeverity , see section 2.5.4 on page 44	1
0x4013-0x02	State Indication Device State	StateIndicationDeviceState , see section 2.5.3 on page 44	1
0x4013-0x03	State Indication Time Stamp	StateIndicationTimeStamp , see section 2.5.5 on page 45	1

5.1.2.10 Move Planner

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x5efc-0x04	Time Move Planner Sequence	TimeMovePlannerSequence , see section 2.6.3.1 on page 81	0

5.1.3 CiA 401 I/O Devices

5.1.3.1 Mpio 1 Settings

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x2005-0x01	Mpio 1 Level	Mpio1Level , see section 2.4.1.5 on page 35	0
0x2005-0x02	Mpio 1 Input Mode	Mpio1InputMode , see section 2.4.1.1 on page 33	0

5.1.3.2 Mpio 2 Settings

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x2006-0x01	Mpio 2 Level	Mpio2Level , see section 2.4.2.5 on page 37	0
0x2006-0x02	Mpio 2 Input Mode	Mpio2InputMode , see section 2.4.2.1 on page 35	0

5.1.3.3 Mpio 3 Settings

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x2007-0x01	Mpio 3 Level	Mpio3Level , see section 2.4.3.5 on page 40	0
0x2007-0x02	Mpio 3 Input Mode	Mpio3InputMode , see section 2.4.3.1 on page 38	0

5.1.3.4 Mpio 4 Settings

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x2008-0x01	Mpio 4 Level	Mpio4Level , see section 2.4.4.5 on page 42	0
0x2008-0x02	Mpio 4 Input Mode	Mpio4InputMode , see section 2.4.4.1 on page 40	0

5.1.3.5 Analog Input 16-bit Value

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x6401-0x13	Position Electrical	PositionElectrical , see section 2.7.2.1 on page 83	0
0x6401-0x23	Voltage Adc 3 Reference Raw	VoltageAdc3ReferenceRaw , see section 2.7.3.2 on page 84	0

5.1.3.6 Analog Input Value Float

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x6403-0x02	Voltage Dc Link	VoltageDcLink , see section 2.7.1.1 on page 82	1
0x6403-0x04	Temperature Board	TemperatureBoard , see section 2.7.4.1 on page 85	1
0x6403-0x05	Temperature Cpu	TemperatureCpu , see section 2.7.4.2 on page 85	1
0x6403-0x15	Mpio 1 Input Value	Mpio1InputValue , see section 2.4.1.2 on page 33	1
0x6403-0x16	Mpio 2 Input Value	Mpio2InputValue , see section 2.4.2.2 on page 36	1
0x6403-0x17	Mpio 3 Input Value	Mpio3InputValue , see section 2.4.3.2 on page 38	1
0x6403-0x18	Mpio 4 Input Value	Mpio4InputValue , see section 2.4.4.2 on page 41	1
0x6403-0x23	Voltage Adc 3 Reference	VoltageAdc3Reference , see section 2.7.3.1 on page 84	1

5.1.3.7 Analog Input Offset Float

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x642e-0x15	Mpio 1 Input Value Offset	Mpio1InputValueOffset , see section 2.4.1.3 on page 34	0
0x642e-0x16	Mpio 2 Input Value Offset	Mpio2InputValueOffset , see section 2.4.2.3 on page 36	0
0x642e-0x17	Mpio 3 Input Value Offset	Mpio3InputValueOffset , see section 2.4.3.3 on page 39	0
0x642e-0x18	Mpio 4 Input Value Offset	Mpio4InputValueOffset , see section 2.4.4.3 on page 41	0

5.1.3.8 Analog Input Scaling Float

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x642f-0x15	Mpio 1 Input Value Scaling	Mpio1InputValueScaling , see section 2.4.1.4 on page 34	0
0x642f-0x16	Mpio 2 Input Value Scaling	Mpio2InputValueScaling , see section 2.4.2.4 on page 37	0
0x642f-0x17	Mpio 3 Input Value Scaling	Mpio3InputValueScaling , see section 2.4.3.4 on page 39	0
0x642f-0x18	Mpio 4 Input Value Scaling	Mpio4InputValueScaling , see section 2.4.4.4 on page 42	0

5.1.3.9 Device Type

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x67ff-0x00	Device Type 401	DeviceType401 , see section 3.5 on page 90	0

5.1.4 CiA 402 Drives and Motion Control

5.1.4.1 Speed Controller

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x2800-0x08	Speed Controller Integral Gain	SpeedControllerIntegralGain , see section 2.3.4.5 on page 31	0
0x2800-0x0b	Speed Actual	SpeedActual , see section 2.3.4.3 on page 29	1
0x2800-0x10	Current Motor Feed Forward	CurrentMotorFeedForward , see section 2.3.4.2 on page 29	0

5.1.4.2 Current Controller

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x2801-0x06	Current Motor DAxis Reference	CurrentMotorDAxisReference , see section 2.3.1.3 on page 23	1

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Index-SubIndex	Sub-Object Name	Key	Map Permission
0x2801-0x07	Current Motor QAxis Reference	CurrentMotorQAxisReference , see section 2.3.1.5 on page 24	1
0x2801-0x08	Current Motor DAxis Actual	CurrentMotorDAxisActual , see section 2.3.1.2 on page 22	1
0x2801-0x09	Current Motor QAxis Actual	CurrentMotorQAxisActual , see section 2.3.1.4 on page 23	1
0x2801-0x0a	Voltage DAxis Reference	VoltageDAxisReference , see section 2.3.1.6 on page 24	1
0x2801-0x0b	Voltage QAxis Reference	VoltageQAxisReference , see section 2.3.1.7 on page 25	1

5.1.4.3 Angular Measurement

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x2803-0x01	Source Position	SourcePosition , see section 2.7.2.2 on page 83	0

5.1.4.4 State

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x2804-0x01	Motor Control State	MotorControlState , see section 2.6.4.1 on page 81	0
0x2804-0x04	State Dosing Pump	StateDosingPump , see section 2.6.2.24 on page 77	0

5.1.4.5 Position demand value

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x6862-0x00	Position Demand	PositionDemandCia402 , see section 2.3.3.1 on page 26	1

5.1.4.6 Speed actual value

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x686c-0x00	Speed Actual	SpeedActualCia402 , see section 2.3.4.4 on page 30	1

5.1.4.7 Torque demand

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x6874-0x00	Torque Demand	TorqueDemandCia402 , see section 2.3.2.2 on page 26	1

5.1.4.8 Torque actual value

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x6877-0x00	Torque Actual	TorqueActualCia402 , see section 2.3.2.1 on page 25	1

5.1.4.9 Current actual value

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x6878-0x00	Current Motor Actual	CurrentMotorActualCia402 , see section 2.3.1.1 on page 22	1

5.1.4.10 Profile acceleration

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x6883-0x00	Acceleration Profile	AccelerationProfileCia402 , see section 2.3.4.1 on page 28	0

5.1.4.11 Control effort

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x68fa-0x00	Speed Control Effort Position Controller	SpeedControlEffortPositionControllerCia402 , see section 2.3.3.2 on page 27	1

5.1.4.12 Target speed

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x68ff-0x00	Speed Target	SpeedTargetCia402 , see section 2.3.4.7 on page 32	1

5.1.4.13 Device Type

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x6fff-0x00	Device Type 402	DeviceType402 , see section 3.6 on page 90	0

5.1.5 CiA 434 Laboratory Automation Systems

5.1.5.1 Overpressure Limiter Data

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x3015-0x07	Overpressure Pressure Warning Level	OverpressurePressureWarningLevel , see section 2.6.1.1 on page 65	0

5.1.5.2 Dosing Cycles Time Segments

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x3016-0x10	Time Between Dosing Cycle	TimeBetweenDosingCycle , see section 2.6.2.25 on page 78	0

5.1.5.3 Volume Target

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x3017-0x01	Volume Target	VolumeTarget , see section 2.6.2.26 on page 78	0
0x3017-0x02	Source Volume Target	SourceVolumeTargetCia301 , see section 2.6.2.19 on page 75	0
0x3017-0x03	Volume Target Scaling	VolumeTargetScaling , see section 2.6.2.30 on page 80	0
0x3017-0x04	Volume Target Offset	VolumeTargetOffset , see section 2.6.2.29 on page 80	0
0x3017-0x05	Volume Target Minimum	VolumeTargetMinimum , see section 2.6.2.28 on page 79	0
0x3017-0x06	Volume Target Maximum	VolumeTargetMaximum , see section 2.6.2.27 on page 79	0

5.1.5.4 Frequency Dosing Cycle

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x3018-0x01	Frequency Dosing Cycle	FrequencyDosingCycle , see section 2.6.2.4 on page 67	0
0x3018-0x02	Source Frequency Dosing Cycle	SourceFrequencyDosingCycleCia301 , see section 2.6.2.16 on page 73	0
0x3018-0x03	Frequency Dosing Cycle Scaling	FrequencyDosingCycleScaling , see section 2.6.2.8 on page 69	0
0x3018-0x04	Frequency Dosing Cycle Offset	FrequencyDosingCycleOffset , see section 2.6.2.7 on page 69	0
0x3018-0x05	Frequency Dosing Cycle Minimum	FrequencyDosingCycleMinimum , see section 2.6.2.6 on page 68	0
0x3018-0x06	Frequency Dosing Cycle Maximum	FrequencyDosingCycleMaximum , see section 2.6.2.5 on page 68	0

5.1.5.5 Suction Ratio

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x3019-0x01	Ratio Suction Dosing Cycle	RatioSuctionDosingCycle , see section 2.6.2.11 on page 71	0
0x3019-0x02	Source Ratio Suction	SourceRatioSuctionCia301 , see section 2.6.2.17 on page 74	0
0x3019-0x03	Ratio Suction Scaling	RatioSuctionScaling , see section 2.6.2.15 on page 73	0
0x3019-0x04	Ratio Suction Offset	RatioSuctionOffset , see section 2.6.2.14 on page 72	0
0x3019-0x05	Ratio Suction Minimum	RatioSuctionMinimum , see section 2.6.2.13 on page 72	0
0x3019-0x06	Ratio Suction Maximum	RatioSuctionMaximum , see section 2.6.2.12 on page 71	0

5.1.5.6 Speed Prime

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x301a-0x01	Speed Prime	SpeedPrime , see section 2.3.4.6 on page 31	0
0x301a-0x02	Source Speed Prime	SourceSpeedPrimeCia301 , see section 2.6.2.18 on page 74	0
0x301a-0x03	Speed Prime Scaling	SpeedPrimeScaling , see section 2.6.2.23 on page 77	0
0x301a-0x04	Speed Prime Offset	SpeedPrimeOffset , see section 2.6.2.22 on page 76	0
0x301a-0x05	Speed Prime Minimum	SpeedPrimeMinimum , see section 2.6.2.21 on page 76	0
0x301a-0x06	Speed Prime Maximum	SpeedPrimeMaximum , see section 2.6.2.20 on page 75	0

5.1.5.7 Numbers Of Dosing Cycles

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x301b-0x01	Numbers Dosing Cycle	NumbersDosingCycle , see section 2.6.2.10 on page 70	0
0x301b-0x02	Number Complete Dosing Cycle	NumberCompleteDosingCycle , see section 2.6.2.9 on page 70	0
0x301b-0x03	Complete Dosing Cycle	CompleteDosingCycle , see section 2.6.2.1 on page 66	0

5.1.5.8 Flow Direction

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x301c-0x01	Direction Flow	DirectionFlow , see section 2.6.2.2 on page 66	0
0x301c-0x02	Direction Flow Analog Digital Interface	DirectionFlowAnalogDigitalInterface , see section 2.6.2.3 on page 67	0

5.1.5.9 Device Type

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x77ff-0x00	Device Type 434	DeviceType434 , see section 3.7 on page 91	0

5.1.6 KNF Commands

5.1.6.1 Reset Command Interface

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x5f02-0x01	Command Reset State	CommandResetState , see section 2.2.2.1 on page 20	0

5.1.6.2 Dosing State Command Interface

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x5f08-0x01	Command Dosing Task State	CommandDosingTaskState , see section 2.2.1.2 on page 20	0
0x5f08-0x03	Command Dosing Task	CommandDosingTask , see section 2.2.1.1 on page 19	0

5.1.6.3 Interface for Authentication

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x5f0b-0x01	Authentication Device Version	AuthenticationDeviceVersion , see section 3.1 on page 88	0
0x5f0b-0x02	Authentication Device Challenge 0	AuthenticationDeviceChallenge0 , see section 2.1.1.1 on page 10	0
0x5f0b-0x03	Authentication Device Challenge 1	AuthenticationDeviceChallenge1 , see section 2.1.1.2 on page 10	0
0x5f0b-0x04	Authentication Device Challenge 2	AuthenticationDeviceChallenge2 , see section 2.1.1.3 on page 11	0
0x5f0b-0x05	Authentication Device Challenge 3	AuthenticationDeviceChallenge3 , see section 2.1.1.4 on page 11	0
0x5f0b-0x06	Authentication Device Cypher Text 0	AuthenticationDeviceCypherText0 , see section 2.1.1.5 on page 12	0
0x5f0b-0x07	Authentication Device Cypher Text 1	AuthenticationDeviceCypherText1 , see section 2.1.1.6 on page 12	0
0x5f0b-0x08	Authentication Device Cypher Text 2	AuthenticationDeviceCypherText2 , see section 2.1.1.7 on page 13	0
0x5f0b-0x09	Authentication Device Cypher Text 3	AuthenticationDeviceCypherText3 , see section 2.1.1.8 on page 13	0

5.1.6.4 Authentication User

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x5f0f-0x01	Command Authentication User Authentication State	CommandAuthenticationUserAuthenticationState , see section 2.1.2.2 on page 14	0
0x5f0f-0x02	Command Authentication User Version	CommandAuthenticationUserVersion , see section 3.2 on page 88	0
0x5f0f-0x03	Command Authentication User Challenge 0	CommandAuthenticationUserChallenge0 , see section 2.1.2.3 on page 15	0
0x5f0f-0x04	Command Authentication User Challenge 1	CommandAuthenticationUserChallenge1 , see section 2.1.2.4 on page 15	0
0x5f0f-0x05	Command Authentication User Challenge 2	CommandAuthenticationUserChallenge2 , see section 2.1.2.5 on page 16	0
0x5f0f-0x06	Command Authentication User Challenge 3	CommandAuthenticationUserChallenge3 , see section 2.1.2.6 on page 16	0
0x5f0f-0x07	Command Authentication User Cypher Text 0	CommandAuthenticationUserCypherText0 , see section 2.1.2.7 on page 17	0
0x5f0f-0x08	Command Authentication User Cypher Text 1	CommandAuthenticationUserCypherText1 , see section 2.1.2.8 on page 17	0
0x5f0f-0x09	Command Authentication User Cypher Text 2	CommandAuthenticationUserCypherText2 , see section 2.1.2.9 on page 18	0
0x5f0f-0x0a	Command Authentication User Cypher Text 3	CommandAuthenticationUserCypherText3 , see section 2.1.2.10 on page 18	0
0x5f0f-0x0b	Command Authentication User Authenticated	CommandAuthenticationUserAuthenticated , see section 2.1.2.1 on page 14	0
0x5f0f-0x0c	Command Authentication User Selection	CommandAuthenticationUserSelection , see section 2.1.2.11 on page 19	0

5.1.6.5 Parameter Storage

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x5f11-0x01	Command Storage Parameter State	CommandStorageParameterState , see section 2.2.3.2 on page 21	0
0x5f11-0x03	Command Storage Parameter	CommandStorageParameter , see section 2.2.3.1 on page 21	0

5.1.6.6 Authentication User Configuration

Index-SubIndex	Sub-Object Name	Key	Map Permission
0x5f14-0x03	Command Authentication User Cypher Text 0	CommandAuthenticationUserCypherText0 , see section 2.1.2.7 on page 17	0
0x5f14-0x04	Command Authentication User Cypher Text 1	CommandAuthenticationUserCypherText1 , see section 2.1.2.8 on page 17	0
0x5f14-0x05	Command Authentication User Cypher Text 2	CommandAuthenticationUserCypherText2 , see section 2.1.2.9 on page 18	0
0x5f14-0x06	Command Authentication User Cypher Text 3	CommandAuthenticationUserCypherText3 , see section 2.1.2.10 on page 18	0
0x5f14-0x07	Command Authentication User Selection	CommandAuthenticationUserSelection , see section 2.1.2.11 on page 19	0

5.1.7 CiA Events

5.1.7.1 NoEvent

Key	NoEvent
Register Flag	EventRegisterFlags::NoEvent
Event Code	EventCodes::NoEvent

5.1.7.2 ShutDown

Key	ShutDown
Register Flag	EventRegisterFlags::DeviceProfileSpecific
Event Code	EventCodes::CiA402DcLinkUnderVoltage

5.1.7.3 FirmwareAssert

Key	FirmwareAssert
Register Flag	EventRegisterFlags::Generic
Event Code	EventCodes::DeviceSoftwareAssert

5.1.7.4 WindowWatchdog

Key	WindowWatchdog
Register Flag	EventRegisterFlags::Generic
Event Code	EventCodes::DeviceSoftwareWindowWatchdog

5.1.7.5 IndependentWatchdog

Key	IndependentWatchdog
Register Flag	EventRegisterFlags::Generic
Event Code	EventCodes::DeviceSoftwareIndependentWatchdog

5.1.7.6 LowPower

Key	LowPower
Register Flag	EventRegisterFlags::Generic
Event Code	EventCodes::DeviceSoftwareLowPowerReset

5.1.7.7 OptionByte

Key	OptionByte
Register Flag	EventRegisterFlags::Generic
Event Code	EventCodes::DeviceSoftwareOptionByteReset

5.1.7.8 UnexpectedReset

Key	UnexpectedReset
Register Flag	EventRegisterFlags::Generic
Event Code	EventCodes::DeviceSoftwareUnexpectedReset

5.1.7.9 TemperatureHigh

Key	TemperatureHigh
Register Flag	EventRegisterFlags::Temperature
Event Code	EventCodes::TemperatureTooHigh

5.1.7.10 TemperatureOutOfRange

Key	TemperatureOutOfRange
Register Flag	EventRegisterFlags::Temperature
Event Code	EventCodes::TemperaturesOutOfRange

5.1.7.11 PDOLengthExceeded

Key	PDOLengthExceeded
Register Flag	EventRegisterFlags::Generic
Event Code	EventCodes::PDOLengthExceeded

5.1.7.12 CommunicationLayerGeneralError

Key	CommunicationLayerGeneralError
Register Flag	EventRegisterFlags::Communication
Event Code	EventCodes::MonitoringCommunication

5.1.7.13 CommunicationLayerInvalidData

Key	CommunicationLayerInvalidData
Register Flag	EventRegisterFlags::Communication
Event Code	EventCodes::Generic

5.1.7.14 CommunicationLayerRemoteDetectedInvalidData

Key	CommunicationLayerRemoteDetectedInvalidData
Register Flag	EventRegisterFlags::Communication
Event Code	EventCodes::Generic

5.1.7.15 ShutdownFileWritingFailed

Key	ShutdownFileWritingFailed
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	EventCodes::DeviceSoftwareDataSetShutdownFileWritingFailed

5.1.7.16 ShutdownFileReadingFailed

Key	ShutdownFileReadingFailed
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	EventCodes::DeviceSoftwareDataSetShutdownFileReadingFailed

5.1.7.17 ShutdownFileLengthInvalid

Key	ShutdownFileLengthInvalid
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSetShutdownFileLengthInvalid

5.1.7.18 ShutdownFileFormatVersionInvalid

Key	ShutdownFileFormatVersionInvalid
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSetShutdownFileFormatVersionInvalid

5.1.7.19 ShutdownFileFormatHashInvalid

Key	ShutdownFileFormatHashInvalid
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSetShutdownFileFormatVersionInvalid

5.1.7.20 ShutdownFileRemovingFailed

Key	ShutdownFileRemovingFailed
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSetShutdownFileRemoveFailed

5.1.7.21 ParameterFileWritingFailed

Key	ParameterFileWritingFailed
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSetParameterFileWritingFailed

5.1.7.22 ParameterFileReadingFailed

Key	ParameterFileReadingFailed
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSetParameterFileReadingFailed

5.1.7.23 ParameterFileLengthInvalid

Key	ParameterFileLengthInvalid
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSetParameterFileLengthInvalid

5.1.7.24 ParameterFileFormatVersionInvalid

Key	ParameterFileFormatVersionInvalid
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSetParameterFileFormatVersionInvalid

5.1.7.25 ParameterFileFormatHashInvalid

Key	ParameterFileFormatHashInvalid
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSetParameterFileFormatVersionInvalid

5.1.7.26 ParameterFileRemovingFailed

Key	ParameterFileRemovingFailed
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSetParameterFileRemoveFailed

5.1.7.27 CalibrationFileWritingFailed

Key	CalibrationFileWritingFailed
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSetCalibrationFileWritingFailed

5.1.7.28 CalibrationFileReadingFailed

Key	CalibrationFileReadingFailed
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSetCalibrationFileReadingFailed

5.1.7.29 CalibrationFileLengthInvalid

Key	CalibrationFileLengthInvalid
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSet CalibrationFileLengthInvalid

5.1.7.30 CalibrationFileFormatVersionInvalid

Key	CalibrationFileFormatVersionInvalid
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSet CalibrationFileFormat VersionInvalid

5.1.7.31 CalibrationFileFormatHashInvalid

Key	CalibrationFileFormatHashInvalid
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSet CalibrationFileFormat VersionInvalid

5.1.7.32 CalibrationFileRemovingFailed

Key	CalibrationFileRemovingFailed
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSet CalibrationFileRemoveFailed

5.1.7.33 EventConfigurationFileWritingFailed

Key	Event ConfigurationFileWritingFailed
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSet Event ConfigurationFileWritingFailed

5.1.7.34 EventConfigurationFileReadingFailed

Key	Event ConfigurationFileReadingFailed
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSet Event ConfigurationFileReadingFailed

5.1.7.35 EventConfigurationFileLengthInvalid

Key	Event ConfigurationFileLengthInvalid
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSet Event ConfigurationFileLengthInvalid

5.1.7.36 EventConfigurationFileFormatVersionInvalid

Key	Event ConfigurationFileFormat VersionInvalid
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSet Event ConfigurationFileFormat VersionInvalid

5.1.7.37 EventConfigurationFileFormatHashInvalid

Key	Event ConfigurationFileFormatHashInvalid
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSet Event ConfigurationFileFormat VersionInvalid

5.1.7.38 EventConfigurationFileRemovingFailed

Key	Event ConfigurationFileRemovingFailed
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSet Event ConfigurationFileRemoveFailed

5.1.7.39 UserAccessConfigurationWritingFailed

Key	User AccessConfigurationWritingFailed
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSet User AccessConfigurationWritingFailed

5.1.7.40 UserAccessConfigurationReadingFailed

Key	User AccessConfigurationReadingFailed
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSet User AccessConfigurationReadingFailed

5.1.7.41 UserAccessConfigurationLengthInvalid

Key	UserAccessConfigurationLengthInvalid
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSet UserAccessConfigurationLengthInvalid

5.1.7.42 UserAccessConfigurationFormatVersionInvalid

Key	UserAccessConfigurationFormatVersionInvalid
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSet UserAccessConfigurationFormatVersionInvalid

5.1.7.43 UserAccessConfigurationFormatHashInvalid

Key	UserAccessConfigurationFormatHashInvalid
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSet UserAccessConfigurationFormatVersionInvalid

5.1.7.44 UserAccessConfigurationRemovingFailed

Key	UserAccessConfigurationRemovingFailed
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSet UserAccessConfigurationRemoveFailed

5.1.7.45 FileSystemSetupFailed

Key	FileSystemSetupFailed
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSet FileSystemSetupFailed

5.1.7.46 FileSystemCleanupFailed

Key	FileSystemCleanupFailed
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::DeviceSoftwareDataSet FileSystemCleanupFailed

5.1.7.47 RotorPositionNoEdgeDetected

Key	RotorPositionNoEdgeDetected
Register Flag	EventRegisterFlags::DeviceProfileSpecific
Event Code	Event Codes::CiA402Position

5.1.7.48 RotorPositionUnexpectedEdge

Key	RotorPositionUnexpectedEdge
Register Flag	EventRegisterFlags::DeviceProfileSpecific
Event Code	Event Codes::CiA402Position

5.1.7.49 IncorrectCalibrationDetected

Key	IncorrectCalibrationDetected
Register Flag	EventRegisterFlags::DeviceProfileSpecific
Event Code	Event Codes::CiA402Position

5.1.7.50 PositionSensorDisturbed

Key	PositionSensorDisturbed
Register Flag	EventRegisterFlags::DeviceProfileSpecific
Event Code	Event Codes::CiA402Position

5.1.7.51 SupplyCurrentHigh

Key	SupplyCurrentHigh
Register Flag	EventRegisterFlags::Current
Event Code	Event Codes::CiA402CurrentDeviceInput

5.1.7.52 VoltageDcLinkHigh

Key	VoltageDcLinkHigh
Register Flag	EventRegisterFlags::Voltage
Event Code	Event Codes::CiA402DcLinkOverVoltage

5.1.7.53 VoltageDcLinkLow

Key	VoltageDcLinkLow
Register Flag	EventRegisterFlags::Voltage
Event Code	EventCodes::CiA402DcLinkUnderVoltage

5.1.7.54 Test

Key	Test
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	EventCodes::Generic

5.1.7.55 TimeDosingCycleCalculationFailed

Key	TimeDosingCycleCalculationFailed
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	EventCodes::GenericErrorPumpApplication

5.1.7.56 PositioningControllerFollowingError

Key	PositioningControllerFollowingError
Register Flag	EventRegisterFlags::DeviceProfileSpecific
Event Code	EventCodes::CiA402FollowingError

5.1.7.57 MpioInputModeNotSupported

Key	MpioInputModeNotSupported
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	EventCodes::DeviceHardwareMpioInputModeNotSupported

5.1.7.58 MpioOutputModeNotSupported

Key	MpioOutputModeNotSupported
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	EventCodes::DeviceHardwareMpioOutputModeNotSupported

5.1.7.59 CommandAuthenticationConfigurationFailedNoFreeEntries

Key	CommandAuthenticationConfigurationFailedNoFreeEntries
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	EventCodes::CommandAuthenticationConfigurationFailedNoFreeEntries

5.1.7.60 CommandAuthenticationConfigurationFailedRequestedEntryNotFound

Key	CommandAuthenticationConfigurationFailedRequestedEntryNotFound
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	EventCodes::CommandAuthenticationConfigurationFailedRequestedEntryNotFound

5.1.7.61 CommandAuthenticationConfigurationFailedRequestedConfigurationNotFound

Key	CommandAuthenticationConfigurationFailedRequestedConfigurationNotFound
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	EventCodes::CommandAuthenticationConfigurationFailedRequestedConfigurationNotFound

5.1.7.62 CommandAuthenticationUserWrongPassword

Key	CommandAuthenticationUserWrongPassword
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	EventCodes::CommandAuthenticationUserWrongPassword

5.1.7.63 CommandAuthenticationUserNoFileHandler

Key	CommandAuthenticationUserNoFileHandler
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	EventCodes::CommandAuthenticationUserNoFileHandler

5.1.7.64 CommandAuthenticationUserNoUserAccessConfiguration

Key	CommandAuthenticationUserNoUserAccessConfiguration
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	EventCodes::CommandAuthenticationUserNoUserAccessConfiguration

5.1.7.65 CommandAuthenticationUserReadingUserAccessConfigurationFailed

Key	CommandAuthenticationUserReadingUserAccessConfigurationFailed
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::CommandAuthenticationUserReadingUserAccessConfigurationFailed

5.1.7.66 RatioSuctionAutomaticallyAdjusted

Key	RatioSuctionAutomaticallyAdjusted
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::RatioSuctionAutomaticallyAdjusted

5.1.7.67 TargetSpeedNotReached

Key	TargetSpeedNotReached
Register Flag	EventRegisterFlags::DeviceProfileSpecific
Event Code	Event Codes::CiA402Speed

5.1.7.68 EstimatedPressureAboveLimit

Key	EstimatedPressureAboveLimit
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::EstimatedPressureAboveLimit

5.1.7.69 EstimatedPressureAboveWarningLevel

Key	EstimatedPressureAboveWarningLevel
Register Flag	EventRegisterFlags::ManufacturerSpecific
Event Code	Event Codes::EstimatedPressureAboveWarningLevel

5.2 Persistent Storage**5.2.1 Shutdown**

File Name	Shutdown
Version	0x00000000

5.2.2 Parameter

File Name	Parameter
Version	0x0000002b

5.2.3 Calibration

File Name	Calibration
Version	0x00000005

5.3 Logger

5.3.1 No Log

Key	NoLog
Value	0
Level	Info
Name	No Log
Text	No Log

5.3.2 Time Stamp

Key	TimeStamp
Value	1
Level	TimeStamp
Name	Time Stamp
Text	Time Stamp
Type	Uint32
Unit	[ms]

5.3.3 Time Stamp Overflow

Key	TimeStampOverflow
Value	2
Level	TimeStamp
Name	Time Stamp Overflow
Text	Time Stamp overflow after 49.7 days

5.3.4 Hdlc Read Failed

Key	HdlcReadFailed
Value	3
Level	Warning
Name	Hdlc Read Failed
Text	Reading of a HDLC frame with given sequence failed
Type	Uint8
Unit	[-]

5.3.5 Motor Control State Transition

Key	MotorControlStateTransition
Value	4
Level	Info
Name	Motor Control State Transition
Text	New motor state (1 idle, 2 running)
Type	Uint32
Unit	[-]

5.3.6 Rotor Position Measurement State Transition

Key	RotorPositionMeasurementStateTransition
Value	5
Level	Info
Name	Rotor Position Measurement State Transition
Text	New rotor position state
Type	Uint32
Unit	[-]

5.3.7 I2C State

Key	I2CState
Value	6
Level	Info
Name	I2C State
Text	I2C state (0 disabled, 1 enabled)
Type	Uint32
Unit	[-]

5.3.8 Sensor Failure

Key	SensorFailure
Value	7
Level	Info
Name	Sensor Failure
Text	Sensor Failure (number)
Type	Uint32
Unit	[-]

5.3.9 Sensor Board Reading

Key	SensorBoardReading
Value	8
Level	Info
Name	Sensor Board Reading
Text	Reading Sensor Board (number)
Type	Uin32
Unit	[-]

5.3.10 Sensor Creation

Key	SensorCreation
Value	9
Level	Info
Name	Sensor Creation
Text	Sensor created (number)
Type	Uin32
Unit	[-]

5.3.11 Setup Started

Key	SetupStarted
Value	10
Level	Info
Name	Setup Started
Text	Setup Started

5.3.12 Setup Finished

Key	SetupFinished
Value	11
Level	Info
Name	Setup Finished
Text	Setup Finished (free blocks)
Type	Uint32
Unit	[-]

5.3.13 Cleanup Started

Key	CleanupStarted
Value	12
Level	Info
Name	Cleanup Started
Text	Cleanup Started

5.3.14 Cleanup Finished

Key	CleanupFinished
Value	13
Level	Info
Name	Cleanup Finished
Text	Cleanup Finished

5.3.15 Block Not Erased

Key	BlockNotErased
Value	14
Level	Info
Name	Block Not Erased
Text	Not Erased Block found (block number)
Type	Uint32
Unit	[-]

5.3.16 Block Corrupt

Key	BlockCorrupt
Value	15
Level	Info
Name	Block Corrupt
Text	Corrupt Block found (block number)
Type	Uint32
Unit	[-]

5.3.17 File Moved

Key	FileMoved
Value	16
Level	Info
Name	File Moved
Text	File Moved (file ID)
Type	Uint32
Unit	[-]

5.3.18 File Duplicated

Key	FileDuplicated
Value	17
Level	Info
Name	File Duplicated
Text	Duplicated File found (file ID)
Type	Uint32
Unit	[-]

5.3.19 Cpu Temperature Too High

Key	CpuTemperatureTooHigh
Value	18
Level	Info
Name	Cpu Temperature Too High
Text	Measured CPU temperature is above tolerated value
Type	Float32
Unit	[-]

5.3.20 Hotspot Temperature Too High

Key	HotspotTemperatureTooHigh
Value	19
Level	Info
Name	Hotspot Temperature Too High
Text	Measured Hotspot temperature is above tolerated value
Type	Float32
Unit	[-]

5.3.21 File Incomplete

Key	FileIncomplete
Value	20
Level	Info
Name	File Incomplete
Text	Incomplete File found (file ID)
Type	Uint32
Unit	[-]

5.3.22 File Stored

Key	FileStored
Value	21
Level	Info
Name	File Stored
Text	File stored (file ID)
Type	Uint32
Unit	[-]

5.3.23 File Removed

Key	FileRemoved
Value	22
Level	Info
Name	File Removed
Text	File removed (file ID)
Type	Uint32
Unit	[-]

5.3.24 File Read

Key	FileRead
Value	23
Level	Info
Name	File Read
Text	File has been read (file ID)
Type	Uint32
Unit	[-]

5.3.25 Event Handler Warning

Key	EventHandlerWarning
Value	24
Level	Warning
Name	Event Handler Warning
Text	Warning occurred
Type	Uint16
Unit	[-]

5.3.26 Event Handler Error

Key	EventHandlerError
Value	25
Level	Error
Name	Event Handler Error
Text	Error occurred
Type	Uint16
Unit	[-]

5.3.27 Flow Rate Reference State Transition

Key	FlowRateReferenceStateTransition
Value	26
Level	Info
Name	Flow Rate Reference State Transition
Text	New flow rate reference state
Type	Uint8
Unit	[-]

5.3.28 Speed Controller Voltage Output State Transition

Key	SpeedControllerVoltageOutputStateTransition
Value	27
Level	Info
Name	Speed Controller Voltage Output State Transition
Text	New state of speed controller
Type	UInt8
Unit	[-]

5.3.29 Pid Controller State Transition

Key	PidControllerStateTransition
Value	28
Level	Info
Name	Pid Controller State Transition
Text	New state of Pid Controller
Type	UInt8
Unit	[-]

5.3.30 Tracer Remaining Samples

Key	TracerRemainingSamples
Value	29
Level	Info
Name	Tracer Remaining Samples
Text	Remaining samples to transmit
Type	UInt32
Unit	[-]

5.3.31 Pos Value

Key	PosValue
Value	0xfffc
Level	Info
Name	Pos Value
Text	Pos measurement value
Type	Float32
Unit	[-]

5.3.32 Log Event Unknown

Key	LogEventUnknown
Value	0xfffd
Level	Error
Name	Log Event Unknown
Text	There is no translation available. Used in tests, should not be used otherwise.
Type	Uint32
Unit	[-]

5.3.33 Unit And Integration Test

Key	UnitAndIntegrationTest
Value	0xfffe
Level	Info
Name	Unit And Integration Test
Text	Reserved for unit and integration tests
Type	Uint32
Unit	[-]

5.3.34 Maximum

Key	Maximum
Value	0xffff
Level	Verbose
Name	Maximum
Text	Maximum

Chapter 6

Event Handler

Version of the event configuration file: 0x00000001

6.1 Events

6.1.1 No Event

Key	NoEvent
ID	0
Name	No Event
Description	No Event
Time Reset [s]	0

6.1.2 Shut Down

Key	ShutDown
ID	1
Name	Shut Down
Description	System has been shut-down due to an under voltage trigger.
Time Reset [s]	1
Action	Stop
Action	LedOff

6.1.3 Firmware Assert

Key	FirmwareAssert
ID	2
Name	Firmware Assert
Description	A firmware assert occurred.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	IndicateErrorState

6.1.4 Window Watchdog

Key	WindowWatchdog
ID	4
Name	Window Watchdog
Description	The MCU was reset due to the window watchdog.
Time Reset [s]	1
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	IndicateErrorState
Action	SelfReset

6.1.5 Independent Watchdog

Key	IndependentWatchdog
ID	5
Name	Independent Watchdog
Description	The MCU was reset due to the independent watchdog.
Time Reset [s]	1
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	IndicateErrorState
Action	SelfReset

6.1.6 Low Power

Key	LowPower
ID	6
Name	Low Power
Description	The MCU was reset due to low power.
Time Reset [s]	0
Action	HistoryLogError
Action	LoggerLogError
Action	IndicateErrorState

6.1.7 Option Byte

Key	OptionByte
ID	7
Name	Option Byte
Description	The MCU was reset due to option bytes.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	IndicateErrorState

6.1.8 Unexpected Reset

Key	UnexpectedReset
ID	8
Name	Unexpected Reset
Description	The MCU was reset due to unexpected reason.
Time Reset [s]	0
Action	HistoryLogError
Action	LoggerLogError
Action	IndicateErrorState

6.1.9 Temperature High

Key	TemperatureHigh
ID	9
Name	Temperature High
Description	Temperature is too high.
Time Reset [s]	2
Action	Stop
Action	HistoryLogError
Action	LedRedBlink
Action	SelfReset
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.10 Temperature Out of Range

Key	TemperatureOutOfRange
ID	10
Name	Temperature Out of Range
Description	Temperature is out of measurement range.
Time Reset [s]	2
Action	Stop
Action	HistoryLogError
Action	LedRedBlink
Action	SelfReset
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.11 PDO Length Exceeded

Key	PDOLengthExceeded
ID	11
Name	PDO Length Exceeded
Description	PDO length was exceeded.
Time Reset [s]	0
Action	HistoryLogError
Action	LoggerLogError
Action	IndicateErrorState

6.1.12 Communication Layer General Error

Key	CommunicationLayerGeneralError
ID	12
Name	Communication Layer General Error
Description	General error of communication layer.
Time Reset [s]	0
Action	HistoryLogError

6.1.13 Communication Layer Invalid Data

Key	CommunicationLayerInvalidData
ID	13
Name	Communication Layer Invalid Data
Description	Invalid data detected by communication layer
Time Reset [s]	0
Action	HistoryLogError

6.1.14 Communication Layer Remote Detected Invalid Data

Key	CommunicationLayerRemoteDetectedInvalidData
ID	14
Name	Communication Layer Remote Detected Invalid Data
Description	Invalid data detected by the communication layer of the remote node.
Time Reset [s]	0
Action	HistoryLogError

6.1.15 Shutdown File Writing Failed

Key	ShutdownFileWritingFailed
ID	15
Name	Shutdown File Writing Failed
Description	The writing of the shut-down file failed.
Time Reset [s]	0
Action	HistoryLogError

6.1.16 Shutdown File Reading Failed

Key	ShutdownFileReadingFailed
ID	16
Name	Shutdown File Reading Failed
Description	The reading of the shut-down file failed.
Time Reset [s]	0
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	IndicateErrorState

6.1.17 Shutdown File Length Invalid

Key	ShutdownFileLengthInvalid
ID	17
Name	Shutdown File Length Invalid
Description	The shut-down file has invalid length.
Time Reset [s]	0
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	IndicateErrorState

6.1.18 Shutdown File Format Version Invalid

Key	ShutdownFileFormatVersionInvalid
ID	18
Name	Shutdown File Format Version Invalid
Description	The shut-down file has invalid version.
Time Reset [s]	0
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	IndicateErrorState

6.1.19 Shutdown File Format Hash Invalid

Key	ShutdownFileFormatHashInvalid
ID	19
Name	Shutdown File Format Hash Invalid
Description	The shut-down file has invalid format hash.
Time Reset [s]	0
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	IndicateErrorState

6.1.20 Shutdown File Removing Failed

Key	ShutdownFileRemovingFailed
ID	20
Name	Shutdown File Removing Failed
Description	Removing the shut-down file failed.
Time Reset [s]	0
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	IndicateErrorState

6.1.21 Parameter File Writing Failed

Key	ParameterFileWritingFailed
ID	21
Name	Parameter File Writing Failed
Description	The writing of the parameter file failed.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.22 Parameter File Reading Failed

Key	ParameterFileReadingFailed
ID	22
Name	Parameter File Reading Failed
Description	The reading of the parameter file failed.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.23 Parameter File Length Invalid

Key	ParameterFileLengthInvalid
ID	23
Name	Parameter File Length Invalid
Description	The parameter file has invalid length.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.24 Parameter File Format Version Invalid

Key	ParameterFileFormatVersionInvalid
ID	24
Name	Parameter File Format Version Invalid
Description	The parameter file has invalid version.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.25 Parameter File Format Hash Invalid

Key	ParameterFileFormatHashInvalid
ID	25
Name	Parameter File Format Hash Invalid
Description	The parameter file has invalid format hash.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.26 Parameter File Removing Failed

Key	ParameterFileRemovingFailed
ID	26
Name	Parameter File Removing Failed
Description	Removing the parameter file failed.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.27 File System Setup Failed

Key	FileSystemSetupFailed
ID	27
Name	File System Setup Failed
Description	The setup of the file system failed.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	IndicateErrorState

6.1.28 File System Cleanup Failed

Key	FileSystemCleanupFailed
ID	28
Name	File System Cleanup Failed
Description	The cleanup of the file system failed.
Time Reset [s]	0
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	IndicateErrorState

6.1.29 Rotor Position No Edge Detected

Key	RotorPositionNoEdgeDetected
ID	29
Name	Rotor Position No Edge Detected
Description	No edge detected by rotor position measurement.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.30 Rotor Position Unexpected Edge

Key	RotorPositionUnexpectedEdge
ID	30
Name	Rotor Position Unexpected Edge
Description	Unexpected edge detected by rotor position measurement.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.31 Supply Current High

Key	SupplyCurrentHigh
ID	31
Name	Supply Current High
Description	The estimated supply current is too high.
Time Reset [s]	1
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	SelfReset
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.32 Voltage Dc Link High

Key	VoltageDcLinkHigh
ID	32
Name	Voltage Dc Link High
Description	The DC link voltage is too high.
Time Reset [s]	2
Action	Stop
Action	HistoryLogError
Action	LedRedBlink
Action	SelfReset
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.33 Voltage Dc Link Low

Key	VoltageDcLinkLow
ID	33
Name	Voltage Dc Link Low
Description	The DC link voltage is too low.
Time Reset [s]	2
Action	Stop
Action	HistoryLogError
Action	LedRedBlink
Action	SelfReset
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.34 Event Configuration File Writing Failed

Key	EventConfigurationFileWritingFailed
ID	43
Name	Event Configuration File Writing Failed
Description	Writing the event configuration file failed.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.35 Event Configuration File Reading Failed

Key	EventConfigurationFileReadingFailed
ID	44
Name	Event Configuration File Reading Failed
Description	Reading the event configuration file failed.
Time Reset [s]	0
Action	LoggerLogWarning
Action	SelfReset

6.1.36 Event Configuration File Length Invalid

Key	EventConfigurationFileLengthInvalid
ID	45
Name	Event Configuration File Length Invalid
Description	Event configuration file has invalid length.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.37 Event Configuration File Format Version Invalid

Key	EventConfigurationFileFormatVersionInvalid
ID	46
Name	Event Configuration File Format Version Invalid
Description	Event configuration file has invalid version.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.38 Event Configuration File Format Hash Invalid

Key	EventConfigurationFileFormatHashInvalid
ID	47
Name	Event Configuration File Format Hash Invalid
Description	Event configuration file has invalid format hash.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.39 Event Configuration File Removing Failed

Key	EventConfigurationFileRemovingFailed
ID	48
Name	Event Configuration File Removing Failed
Description	Removing event configuration file failed.
Time Reset [s]	0
Action	LoggerLogWarning
Action	IndicateWarningState
Action	SelfReset

6.1.40 Calibration File Writing Failed

Key	CalibrationFileWritingFailed
ID	49
Name	Calibration File Writing Failed
Description	Writing of the calibration file failed.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.41 Calibration File Reading Failed

Key	CalibrationFileReadingFailed
ID	50
Name	Calibration File Reading Failed
Description	Reading the calibration file failed.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.42 Calibration File Length Invalid

Key	CalibrationFileLengthInvalid
ID	51
Name	Calibration File Length Invalid
Description	The calibration file has invalid length.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.43 Calibration File Format Version Invalid

Key	CalibrationFileFormatVersionInvalid
ID	52
Name	Calibration File Format Version Invalid
Description	The calibration file has invalid version.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.44 Calibration File Format Hash Invalid

Key	CalibrationFileFormatHashInvalid
ID	53
Name	Calibration File Format Hash Invalid
Description	The calibration file has invalid format hash.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.45 Calibration File Removing Failed

Key	CalibrationFileRemovingFailed
ID	54
Name	Calibration File Removing Failed
Description	Removing the calibration file failed.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.46 Incorrect Calibration Detected

Key	IncorrectCalibrationDetected
ID	55
Name	Incorrect Calibration Detected
Description	Rotor position measurement detected incorrect calibration.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.47 Time Dosing Cycle Calculation Failed

Key	TimeDosingCycleCalculationFailed
ID	56
Name	Time Dosing Cycle Calculation Failed
Description	The calculation of the moving time failed.
Time Reset [s]	1
Action	HistoryLogError
Action	LedRedOn
Action	SelfReset
Action	LoggerLogError
Action	IndicateErrorState

6.1.48 Positioning Controller Following Error

Key	PositioningControllerFollowingError
ID	63
Name	Positioning Controller Following Error
Description	Position error of the position controller is too high.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.49 Mpio Input Mode Not Supported

Key	MpioInputModeNotSupported
ID	64
Name	Mpio Input Mode Not Supported
Description	The MPIO input mode is not supported.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.50 MPIO Output Mode Not Supported

Key	MpioOutputModeNotSupported
ID	65
Name	MPIO Output Mode Not Supported
Description	The MPIO output mode is not supported.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.51 User Access Configuration Writing Failed

Key	UserAccessConfigurationWritingFailed
ID	71
Name	User Access Configuration Writing Failed
Description	Writing the user access configuration file failed.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.52 User Access Configuration Reading Failed

Key	UserAccessConfigurationReadingFailed
ID	72
Name	User Access Configuration Reading Failed
Description	Reading the user access configuration file failed.
Time Reset [s]	0
Action	LoggerLogWarning
Action	SelfReset

6.1.53 User Access Configuration Length Invalid

Key	UserAccessConfigurationLengthInvalid
ID	73
Name	User Access Configuration Length Invalid
Description	The user access configuration file has invalid length.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.54 User Access Configuration Format Version Invalid

Key	UserAccessConfigurationFormatVersionInvalid
ID	74
Name	User Access Configuration Format Version Invalid
Description	The user access configuration file has invalid version
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.55 User Access Configuration Format Hash Invalid

Key	UserAccessConfigurationFormatHashInvalid
ID	75
Name	User Access Configuration Format Hash Invalid
Description	The user access configuration file has invalid format hash.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.56 User Access Configuration Removing Failed

Key	UserAccessConfigurationRemovingFailed
ID	76
Name	User Access Configuration Removing Failed
Description	Removing the user access configuration file failed.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.57 Command Authentication Configuration Failed No Free Entries

Key	CommandAuthenticationConfigurationFailedNoFreeEntries
ID	80
Name	Command Authentication Configuration Failed No Free Entries
Description	The command for authentication configuration failed because there was no entry left.
Time Reset [s]	2
Action	HistoryLogWarning
Action	LoggerLogWarning
Action	IndicateWarningState

6.1.58 Command Authentication Configuration Failed Requested Entry Not Found

Key	CommandAuthenticationConfigurationFailedRequestedEntryNotFound
ID	81
Name	Command Authentication Configuration Failed Requested Entry Not Found
Description	The command for authentication configuration failed because the requested entry was not found.
Time Reset [s]	2
Action	HistoryLogWarning
Action	LoggerLogWarning
Action	IndicateWarningState

6.1.59 Command Authentication Configuration Failed Requested Configuration Not Found

Key	CommandAuthenticationConfigurationFailedRequestedConfigurationNotFound
ID	82
Name	Command Authentication Configuration Failed Requested Configuration Not Found
Description	Command for authentication configuration failed because the requested configuration was not found.
Time Reset [s]	2
Action	HistoryLogWarning
Action	LoggerLogWarning
Action	IndicateWarningState

6.1.60 Position Sensor Disturbed

Key	PositionSensorDisturbed
ID	83
Name	Position Sensor Disturbed
Description	The position sensor is disturbed by an external influence.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital1
Action	IndicateErrorState

6.1.61 Command Authentication User Wrong Password

Key	CommandAuthenticationUserWrongPassword
ID	84
Name	Command Authentication User Wrong Password
Description	The user authentication command failed due to wrong password.
Time Reset [s]	0
Action	HistoryLogWarning
Action	LoggerLogWarning
Action	IndicateWarningState
Action	SelfReset

6.1.62 Command Authentication User No File Handler

Key	CommandAuthenticationUserNoFileHandler
ID	85
Name	Command Authentication User No File Handler
Description	The user authentication command failed due to missing file handler.
Time Reset [s]	0
Action	HistoryLogWarning
Action	LoggerLogWarning
Action	IndicateWarningState
Action	SelfReset

6.1.63 Command Authentication User No User Access Configuration

Key	CommandAuthenticationUserNoUserAccessConfiguration
ID	86
Name	Command Authentication User No User Access Configuration
Description	The user authentication command failed due to missing access configuration.
Time Reset [s]	0
Action	HistoryLogWarning
Action	LoggerLogWarning
Action	IndicateWarningState
Action	SelfReset

6.1.64 Command Authentication User Reading User Access Configuration Failed

Key	CommandAuthenticationUserReadingUserAccessConfigurationFailed
ID	87
Name	Command Authentication User Reading User Access Configuration Failed
Description	The user authentication command failed because the user access configuration file could not be read.
Time Reset [s]	0
Action	HistoryLogWarning
Action	LoggerLogWarning
Action	IndicateWarningState
Action	SelfReset

6.1.65 Ratio Suction Automatically Adjusted

Key	RatioSuctionAutomaticallyAdjusted
ID	88
Name	Ratio Suction Automatically Adjusted
Description	Calculated moving time from cycle time and suction ratio is too short. Suction ratio is adjusted automatically.
Time Reset [s]	1
Action	HistoryLogWarning
Action	LoggerLogWarning
Action	IndicateWarningState
Action	LedGreenBlink
Action	SelfReset

6.1.66 Target Speed Not Reached

Key	TargetSpeedNotReached
ID	89
Name	Target Speed Not Reached
Description	The target speed was not reached within the defined time.
Time Reset [s]	2
Action	HistoryLogWarning
Action	LoggerLogWarning
Action	IndicateWarningState
Action	LedGreenBlink
Action	SelfReset

6.1.67 Estimated Pressure Above Limit

Key	EstimatedPressureAboveLimit
ID	90
Name	Estimated Pressure Above Limit
Description	The estimated pressure is too high.
Time Reset [s]	0
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	SetOutputDigital2
Action	IndicateErrorState

6.1.68 Estimated Pressure Above Warning Level

Key	EstimatedPressureAboveWarningLevel
ID	91
Name	Estimated Pressure Above Warning Level
Description	The estimated pressure has reached the warning level.
Time Reset [s]	5
Action	LedGreenBlink
Action	HistoryLogWarning
Action	LoggerLogWarning
Action	SelfReset
Action	IndicateErrorState

6.1.69 Test Event

Key	Test
ID	0x7fff
Name	Test Event
Description	Event used for integration test.
Time Reset [s]	123
Action	Stop
Action	HistoryLogError
Action	LedRedOn
Action	LoggerLogError
Action	IndicateErrorState

6.2 Actions

6.2.1 Stop

Key	Stop
ID	0x00000001
Name	Stop
Description	Stops the operation of the pump.
Type	Immediate action

6.2.2 Logger Log Warning

Key	LoggerLogWarning
ID	0x00000004
Name	Logger Log Warning
Description	Sends the logger message "Warning occurred".
Type	Background action

6.2.3 Logger Log Error

Key	LoggerLogError
ID	0x00000008
Name	Logger Log Error
Description	Sends the logger message "Error occurred".
Type	Background action

6.2.4 History Log Warning

Key	HistoryLogWarning
ID	0x00000010
Name	History Log Warning
Description	Logs the warning in the warning history.
Type	Background action

6.2.5 History Log Error

Key	HistoryLogError
ID	0x00000020
Name	History Log Error
Description	Logs the error in the error history.
Type	Background action

6.2.6 Self Reset

Key	SelfReset
ID	0x00000080
Name	Self Reset
Description	The event is reset after reset time when no new event has received by event handler.
Type	Background action

6.2.7 Led Off

Key	LedOff
ID	0x00000100
Name	Led Off
Description	All LEDs are switched off.
Type	Immediate action

6.2.8 Led Red On

Key	LedRedOn
ID	0x00000200
Name	Led Red On
Description	Red LED is switched on, green LED is switched off.
Type	Background action

6.2.9 Led Red Blink

Key	LedRedBlink
ID	0x00000400
Name	Led Red Blink
Description	Red LED blinks.
Type	Background action

6.2.10 Led Green Blink

Key	LedGreenBlink
ID	0x00000800
Name	Led Green Blink
Description	Green LED blinks.
Type	Background action

6.2.11 Set Output Digital 1

Key	SetOutputDigital1
ID	0x00001000
Name	Set Output Digital 1
Description	Sets the digital output 1.
Type	Background action

6.2.12 Set Output Digital 2

Key	SetOutputDigital2
ID	0x00002000
Name	Set Output Digital 2
Description	Sets the digital output 2.
Type	Background action

6.2.13 Indicate Error State

Key	IndicateErrorState
ID	0x00004000
Name	Indicate Error State
Description	Indicate error state by state PDO
Type	Background action

6.2.14 Indicate Warning State

Key	IndicateWarningState
ID	0x00008000
Name	Indicate Warning State
Description	Indicate warning state by state PDO
Type	Background action