TECHNICAL INFORMATION

Telegram Listing

Dx1000

SICK
Sensor Intelligence.

Table Of Contents

1 Preface

1.1 About this document

Please read this document carefully before beginning to use the telegram listing. This document is an addendum to the operating instructions of the Dx1000 long range distance sensor. It describes the SICK protocol CoLa A (ASCII values) that is used to communicate with the long range distance sensor Dx1000.

Please note that the naming convention of parameters and variables in this document differs from the naming convention that is used in the sensor's operating manual, in SOPAS and in the sensor display (e.g., "acquisition time" vs. "measurement cycle time"). To facilitate navigation in this document, the chapter headings and the table of contents also contain the names of the parameters according to the sensor's operating manual in square brackets [ ].

1.2 General

The sensor’s Ethernet interface allows setting sensor parameters as well as monitoring and controlling the sensor. Measured data such as distance or combined distance/speed values and operating data such as the internal temperature are transferred upon request or as an event-driven cyclical data stream, see also “2.4 Events“on page **Fehler! Textmarke nicht definiert.**.

1.3 IP configuration

The devices generally support automatic IP address discovery. Default IP configuration:

- Static IP address
- IP address: 192.168.100.236
- IP subnet mask: 255.255.255.0
- Gateway address: 0.0.0.0
- TCP port: 2112

All variables and parameters that are available in the sensor display can be accessed through the Ethernet interface. The sensor can be remote controlled using the functions described herein.

1.4 Minimum firmware revision

This telegram listing is based on the following firmware revision: 1.10

1.5 Communication protocol CoLa A (ASCII telegram)

The ASCII telegram has the advantage that commands can be written in plaintext. However, the string lengths of ASCII telegrams vary. The string consists only of two parts: the framing and the data part. The framing indicates with <STX> and <ETX> the start and stop of each telegram. The data part comprises the actual command with characters (plaintext), parameter values either in decimal or in hexadecimal and fixed hexadecimal values with a specific, intrinsic meaning. As leading zeros are being deleted, there is always a blank required between all command parts and parameter parts.

The length of the transmitted process data depends on their value. The process data are not complemented by leading zeros. Please refer to the syntax description in section 3. The maximum length is given by the datatype as indicated in the column “Type” and the column ”Length [Byte]“.

As further alternative within CoLa A, depending on the preferences of the user, all values can be written directly in Hex. This means however a 1:1 conversion of all characters and fixed hexadecimal values via the ASCII chart.

Negative values are represented in Hex by leading “F”s. Booleans are represented in HEX as 1 = TRUE and 0 = FALSE (please refer to the given examples below).

NOTE
The device will confirm parameter values always in hexadecimal code, regardless of the code sent.

1.6 Required user level

If device parameters need to be changed, the user must activate the access mode (“log in”). Changes become active when the access mode is set back to “Run” (“log out”). It is mandatory to perform a log in/log out sequence for each parameter change. I.e., after log in, only one parameter is to be amended, immediately followed by log out. The examples listed in section 1.8 describe the log in using the default password “81BE23AA”. This is the hash value of the password at the time of delivery (“servicelevel”) for the user level “Service”. If the password has been changed through SOPAS ET, the respective hash value must be entered there.

1.7 Permanent saving of parameters

Permanent saving of changed parameters requires executing a special command; see "Special functions" in the operating instructions of the Dx1000 and in this document.

1.8 Examples

This chapter provides frequently used examples how to read out variables from the sensor and how to set parameters.

Example 1: Log in at user level "Service"

Log in: <STX>sMN SetAccessMode 4 81BE23AA<ETX>
Response: <STX>sAN SetAccessMode 1<ETX>

Syntax of "Log in" request in greater detail:

ASCII		<STX>	sMN{SPC}SetAccessMode{SPC}4{SPC}81BE23AA	<ETX>
Hex		02	73 4D 4E 20 53 65 74 41 63 63 65 73 73 4D 6F 64 65 20 34 20 38 31 42 45 32 33 41 41	03

- Framing = <STX> = telegram start
- Data:
  - sMN = start of SOPAS command (and blank)
  - SetAccessMode = the actual command for setting the user level (and blank)
  - 4 = value meaning user level "Service" (and blank)
  - 81BE23AA = Hash value of the password at the time of delivery ("servicelevel") for the user level "Service". If the password has been changed through SOPAS ET, the respective hash value must be entered here.
- Framing = <ETX> = telegram stop

See also "3.4.1.1 Method: SetAccessMode"on page 84.

Example 2: Read out the distance value (here 1489mm)

Request: <STX>sRN Distance<ETX>
Response: <STX>sRA Distance 5D1<ETX>

See also "3.2.1 Variable: Distance"on page 65.

Example 3: Read out the measured object speed (here 510mm/s)

Request: <STX>sRN Velocity<ETX>
Response: <STX>sRA Velocity 1FE<ETX>

See also "3.2.3 Variable: Velocity"on page 66.

Example 4: Read out the (negative) distance value and the object speed (here -3276mm and 291mm/s, respectively)

Request: <STX>sRN Distance<ETX>
Response: <STX>sRA Distance FFFFF334<ETX>

Request: <STX>sRN Velocity<ETX>
Response: <STX>sRA Velocity 123<ETX>

See also "3.2.1 Variable: Distance" on page 65 and "3.2.3 Variable: Velocity [measured object speed]" on page 66.

Example 5: Read out the device temperature (here -1 °C)

Request: <STX>sRN deviceTemperature<ETX>
Response: <STX>sRA deviceTemperature FF<ETX>

See also "3.2.5 Variable: deviceTemperature" on page 67.

Example 6: Read out state of measurement laser (1 = measurement laser is on)

Request: <STX>sRN laserState<ETX>
Response: <STX>sRA laserState 1<ETX>

See also "3.3.1.3 Variable: laserState" on page 70.

Example 7: Read out the deviceStatusWord

Request: <STX>sRN deviceStatusWord<ETX>
Response: <STX>sRA deviceStatusWord 0<ETX>

See also "3.3.1.16 Variable: deviceStatusWord" on page 78.

Example 8: Read out laserError (1 = Error)

Request: <STX>sRN laserError<ETX>
Response: <STX>sRA laserError 1<ETX>

See also “3.3.2.1 Variable: laserError“ on page 78.

Example 9: Defining the echo selection: Last echo

Log in: <STX>sMN SetAccessMode 4 81BE23AA<ETX>
Response: <STX>sAN SetAccessMode 1<ETX>

Request: <STX>sWN echoSeletionMode 1<ETX>
Response: <STX>sWA echoSeletionMode<ETX>

Log out: <STX>sMN Run<ETX>
Response: <STX>sAN Run 1<ETX>

See also “3.1.1.2.3 Variable: echoSeletionMode [echo selection: first echo or last echo]” on page 20, “3.4.1.1 Method: SetAccessMode“ on page 84 and “3.4.1.2 Method: Run” on page 85.

Example 10: Configuring the distance range: Set upper measuring range limit to 30 m

Log in: <STX>sMN SetAccessMode 4 81BE23AA<ETX>
Response: <STX>sAN SetAccessMode 1<ETX>

Request: <STX>sWN roiEnd 30000<ETX>
Response: <STX>sWA roiEnd<ETX>

Log out: <STX>sMN Run<ETX>
Response: <STX>sAN Run 1<ETX>

See also “3.1.1.2.5 Variable: roiEnd [distance range: measuring range limit facing away from the device]” on page 22, “3.4.1.1 Method: SetAccessMode“ on page 84 and “3.4.1.2 Method: Run” on page 85.

2 General

2.1 Introduction

This document describes the functional interfaces of the Dx1000 device, 1.5.0.0R. The Dx1000 device is a SOPAS device. SOPAS devices have Variables, Methods and Events. Variables can always be read and in some cases be written by user.

2.2 User Level

Whether a Variable can be written by user depends on the least user level. Defined user levels are:

ID	Name
0	Always (Run)
1	Operator
2	Maintenance
3	Authorised Client
4	Service

2.3 Methods

Methods can be invoked by using certain parameters. The method will return with a structure of one or more return values. If a Method can be invoked depends as well on the least user level (see above).

2.4 Events

Events can be registered and will then be fired by the device to the registered client. Most Events have parameters which are the data coming with the Event.

Measured data such as distance or combined distance/speed values and operating data such as the internal temperature are transferred upon request or as an event-driven cyclical data stream.
The firmware allows to subscribe to an event for the following SOPAS variables:

- CombinedMeasData (Struct of DistanceF, Velocity, RSSI and deviceStatusWord)
- Distance
- DistanceF
- Velocity
- RSSI
- deviceTemperature
- echosInRoi
- deviceStatusWord
- OpHoursDevice

With the event, the variables are output via ethernet with every change (measurement all 1 ms) as COLA-A frame. For activation (start) and deactivation (stop) of a specific cyclical data stream please refer to the tables below.

Example: sEN CombinedMeasData

CoLa A	ASCII	<STX>73 45 4E{SPC}CombinedMeasData{SPC}1<ETX>
	Hex	02 73 45 4E 20 43 6F 6D 62 69 6E 65 64 4D 65 61 73 44 61 74 61 20 31 03

Variable Telegram Syntax

Set Event:				
sEN CombinedMeasData				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sEN	String	3	
Command	CombinedMeasData	String	16	(Struct of DistanceF, Velocity, RSSI and deviceStatusWord)
Variable Data	0, 1	String	1	Start: 1, Stop: 0

Set Event:				
sEN Distance				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sEN	String	3	
Command	Distance	String	8	
Variable Data	0, 1	String	1	Start: 1, Stop: 0

Set Event:				
sEN DistanceF				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sEN	String	3	
Command	DistanceF	String	9	
Variable Data	0, 1	String	1	Start: 1, Stop: 0

Set Event:				
sEN Velocity				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sEN	String	3	
Command	Velocity	String	8	
Variable Data	0, 1	String	1	Start: 1, Stop: 0

Set Event:				
sEN RSSI				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sEN	String	3	
Command	RSSI	String	4	Signal level
Variable Data	0, 1	String	1	Start: 1, Stop: 0

Set Event:				
sEN deviceTemperature				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sEN	String	3	
Command	deviceTemperature	String	17	
Variable Data	0, 1	String	1	Start: 1, Stop: 0

Set Event:				
sEN echosInRoi				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sEN	String	3	
Command	echosInRoi	String	10	
Variable Data	0, 1	String	1	Start: 1, Stop: 0

Set Event:				
sEN deviceStatusWord				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sEN	String	3	
Command	deviceStatusWord	String	16	
Variable Data	0, 1	String	1	Start: 1, Stop: 0

Set Event:				
sEN OpHoursDevice				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sEN	String	3	
Command	OpHoursDevice	String	13	
Variable Data	0, 1	String	1	Start: 1, Stop: 0

2.5 Datatypes

All items of the interface have certain data elements. These are the Variables itself, the parameters of Methods and Events and the return values of the Methods.

The structure of the data elements can be one of the following BasicType(s), Structures or Arrays.

Basic Type

Name	Description	Range of values
Bool	boolean	True(1), False(0)
USInt	unsigned short (8 bit)	(0..255)
UInt	unsigned int (16 bit)	(0..65535)
UDInt	unsigned double int (32 bit)	(0..4294967295)
ULInt	unsigned long int (64 bit)	(0..18446744073709551616)
SInt	signed short (8 bit)	(-128..127)
Int	signed int (16 bit)	(-32768..32767)
DInt	signed double int (32 bit)	(-2147483648..2147483647)
LInt	signed long int (64 bit)	(-9223372036854775808..9223372036854775807)
Real	IEEE-754 single precision (32 bit) (float)	See specification in IEEE-754
LReal	IEEE-754 single precision (64 bit) (double)	See specification in IEEE-754
Enum8	short enumeration (8 bit)	certain values defined in a list of choises (0-255)
Enum16	short enumeration (16 bit)	certain values defined in a list of choises (0-65535)
String	array of visible characters (array of 8 bit)	a character = an USInt with values between 0x20..0xFF
FlexString	array of visible characters with preeding current length (UInt lenght) (array of 8 bit)	See description of String and FlexArray
Byte	bitset definition (8 bit). Detailed specification of bits UInt1..UInt16 = UInt (1..16 bit) Int1..Int16 = Int (1..16 bit) Enum1..Enum16 = Enum16 (1..16 bit) Bool = Bool (1 bit)	value is transfered as an array of USInt. See "XByte Serialisation" document for further details on bit ordering
Word	bitset definition (16 bit), see description of Byte	value is transfered as an array of USInt see "XByte Serialisation" document for further details on bit ordering.
DWord	bitset definition (32 bit), see description of Byte	value is transfered as an array of USInt see "XByte Serialisation" document for further details on bit ordering.
LWord	bitset definition (64 bit), see description of Byte	value is transfered as an array of USInt see "XByte Serialisation" document for further details on bit ordering.
XByte	bitset definition (8,16,24,32,... bit) see description of Byte	value is transfered as an array of USInt see "XByte Serialisation" document for further details on bit ordering.
SCont	bitset definition (8 bit). Detailed specification of bits UInt1..UInt16 = UInt (1..16 bit) Int1..Int16 = Int (1..16 bit) Enum1..Enum16 = Enum16 (1..16 bit) Bool = Bool (1 bit)	value is transfered as USInt.
Cont	bitset definition (16 bit), see description of SCont	value is transfered as UInt.
DCont	bitset definition (32 bit), see description of SCont	value is transfered as UDInt.
LCont	bitset definition (64 bit), see description of SCont	value is transfered as ULInt.

Struct

A structure is a sequence of further types. These types can be of a BasicType, Structs again or an Array.

Array

An Array is a repetition of a type. The length of the array is defined with each Array. The types can be of a BasicType, a Struct or an Array again (n- dimensional).

Flex Array

A FlexArray is a repetition of a type with a variable length. The maximum length of the array is defined with each FlexArray. The current length of the FlexArray is transferred as a UInt preceeding the Array itself. The types can be of a BasicType, a Struct or an Array again (n- dimensional).

3 Interfaces

3.1 Device Setup

3.1.1 Measurement

3.1.1.1 Basic Settings

3.1.1.1.1 Variable: acquisitionTime [measurement cycle time]

The following section contains a detailed description of the variable acquisitionTime.

Variable Overview

Variable Name	Description
acquisitionTime	Acquisition Time

Read-Access	AuthorizedClient, Service
Write-Access	AuthorizedClient, Service

Enum8			
Default Value		s4_MS	
	Value	Name	Description
	0	s1_MS	
	1	s4_MS	
	2	s16_MS	
	3	s64_MS	
	4	s128_MS	

Variable Telegram Syntax

Read Variable:

```
sRN acquisitionTime
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	acquisitionTime	String	15	Acquisition Time

Read Variable Response:

```
sRA acquisitionTime <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	acquisitionTime	String	15	Acquisition Time
Variable Data	data	Enum8	1	

Write Variable:

```
sWN acquisitionTime <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	acquisitionTime	String	15	Acquisition Time
Variable Data	data	Enum8	1	

Write Variable Response:

```
sWA acquisitionTime
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	acquisitionTime	String	15	Acquisition Time

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN acquisitionTime[ETX]
Read Variable Response:	[STX]sRA acquisitionTime 1[ETX]
Write Variable:	[STX]sWN acquisitionTime 1[ETX]
Write Variable Response:	[STX]sWA acquisitionTime[ETX]

3.1.1.1.2 Variable: offset [distance offset]

The following section contains a detailed description of the variable offset.

Variable Overview

Variable Name	Description
offset	Offset in mm

Read-Access	Always
Write-Access	AuthorizedClient, Service

DInt	
Value Range	-4500000..4500000
Initialisation	0

Variable Telegram Syntax

Read Variable:				
sRN offset				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	offset	String	6	Offset in mm

Read Variable Response:				
sRA offset <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	offset	String	6	Offset in mm
Variable Data	data	DInt	4	

Write Variable:				
sWN offset <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	offset	String	6	Offset in mm
Variable Data	data	DInt	4	

Write Variable Response:				
sWA offset				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	offset	String	6	Offset in mm

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN offset[ETX]
Read Variable Response:	[STX]sRA offset 0[ETX]
Write Variable:	[STX]sWN offset 0[ETX]
Write Variable Response:	[STX]sWA offset[ETX]

3.1.1.1.3 Variable: countingDirection [measuring direction]

The following section contains a detailed description of the variable countingDirection.

Variable Overview

Variable Name	Description
countingDirection	Counting Direction can be either positive or negative

Read-Access	Always
Write-Access	AuthorizedClient, Service

Enum8			
Default Value		POSITIVE	
	Value	Name	Description
	0	POSITIVE	
	1	NEGATIVE	

Variable Telegram Syntax

Read Variable:

```
sRN countingDirection
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	countingDirection	String	17	Counting Direction can be either positive or negative

Read Variable Response:

```
sRA countingDirection <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	countingDirection	String	17	Counting Direction can be either positive or negative
Variable Data	data	Enum8	1	

Write Variable:

```
sWN countingDirection <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	countingDirection	String	17	Counting Direction can be either positive or negative
Variable Data	data	Enum8	1	

Write Variable Response:

```
sWA countingDirection
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	countingDirection	String	17	Counting Direction can be either positive or negative

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	`[STX]sRN countingDirection[ETX]`
Read Variable Response:	`[STX]sRA countingDirection 0[ETX]`
Write Variable:	`[STX]sWN countingDirection 0[ETX]`
Write Variable Response:	`[STX]sWA countingDirection[ETX]`

3.1.1.1.4 Variable: rainSnowFilterSetting [rain and snow filter]

The following section contains a detailed description of the variable rainSnowFilterSetting.

Variable Overview

Variable Name	Description
rainSnowFilterSetting	Rain Snow Median (how often has an echo to occure before it is accepted)

Read-Access	Always
Write-Access	AuthorizedClient, Service

Enum8			
Default Value		s9_of_16	
	Value	Name	Description
	0	s1_of_1	
	1	s5_of_8	
	2	s9_of_16	
	3	s13_of_23	
	4	s17_of_32	

Variable Telegram Syntax

Read Variable:

```
sRN rainSnowFilterSetting
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	rainSnowFilterSetting	String	21	Rain Snow Median (how often has an echo to occure before it is accepted)

Read Variable Response:

```
sRA rainSnowFilterSetting <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	rainSnowFilterSetting	String	21	Rain Snow Median (how often has an echo to occure before it is accepted)
Variable Data	data	Enum8	1	

Write Variable:

```
sWN rainSnowFilterSetting <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	rainSnowFilterSetting	String	21	Rain Snow Median (how often has an echo to occure before it is accepted)
Variable Data	data	Enum8	1	

Write Variable Response:

```
sWA rainSnowFilterSetting
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge

Write Variable Response:

```
sWA rainSnowFilterSetting
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	rainSnowFilterSetting	String	21	Rain Snow Median (how often has an echo to occure before it is accepted)

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	`[STX]sRN rainSnowFilterSetting[ETX]`
Read Variable Response:	`[STX]sRA rainSnowFilterSetting 2[ETX]`
Write Variable:	`[STX]sWN rainSnowFilterSetting 2[ETX]`
Write Variable Response:	`[STX]sWA rainSnowFilterSetting[ETX]`

3.1.1.1.5 Variable: fogFilter [fog filter]

The following section contains a detailed description of the variable fogFilter.

Variable Overview

Variable Name	Description
fogFilter	Fog Filter

Read-Access	Always
Write-Access	AuthorizedClient, Service

Enum8			
Default Value		ON	
	Value	Name	Description
	0	OFF	
	1	ON	

Variable Telegram Syntax

Read Variable:				
`sRN fogFilter`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	fogFilter	String	9	Fog Filter

Read Variable Response:				
`sRA fogFilter <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	fogFilter	String	9	Fog Filter
Variable Data	data	Enum8	1	

Write Variable:				
`sWN fogFilter <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	fogFilter	String	9	Fog Filter
Variable Data	data	Enum8	1	

Write Variable Response:				
`sWA fogFilter`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	fogFilter	String	9	Fog Filter

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	`[STX]sRN fogFilter[ETX]`
Read Variable Response:	`[STX]sRA fogFilter 1[ETX]`
Write Variable:	`[STX]sWN fogFilter 1[ETX]`
Write Variable Response:	`[STX]sWA fogFilter[ETX]`

3.1.1.2 Advanced Settings

3.1.1.2.1 Variable: filterSelection [distance filter]

The following section contains a detailed description of the variable filterSelection.

Variable Overview

Variable Name	Description
filterSelection	Suppress sporadic echos that overlapp the true echo

Read-Access	Always
Write-Access	AuthorizedClient, Service

Enum8			
Default Value		KALMAN	
	Value	Name	Description
	0	MEAN	Apply moving average filter
	1	KALMAN	Apply Kalman filter

Variable Telegram Syntax

Read Variable:

```
sRN filterSelection
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	filterSelection	String	15	Suppress sporadic echos that overlapp the true echo

Read Variable Response:

```
sRA filterSelection <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	filterSelection	String	15	Suppress sporadic echos that overlapp the true echo
Variable Data	data	Enum8	1	

Write Variable:

```
sWN filterSelection <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	filterSelection	String	15	Suppress sporadic echos that overlapp the true echo
Variable Data	data	Enum8	1	

Write Variable Response:

```
sWA filterSelection
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge

Write Variable Response:

```
sWA filterSelection
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	filterSelection	String	15	Suppress sporadic echos that overlapp the true echo

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	`[STX]sRN filterSelection[ETX]`
Read Variable Response:	`[STX]sRA filterSelection 1[ETX]`
Write Variable:	`[STX]sWN filterSelection 1[ETX]`
Write Variable Response:	`[STX]sWA filterSelection[ETX]`

3.1.1.2.2 Variable: filterDepth [Distance filter depth (of averaging filter)]

The following section contains a detailed description of the variable filterDepth.

Variable Overview

Variable Name	Description
filterDepth	Filter depth in steps

Read-Access	Always
Write-Access	AuthorizedClient, Service

UDInt	
Value Range	1..1023
Initialisation	1

Variable Telegram Syntax

Read Variable:

```
sRN filterDepth
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	filterDepth	String	11	Filter depth in steps

Read Variable Response:

```
sRA filterDepth <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	filterDepth	String	11	Filter depth in steps
Variable Data	data	UDInt	4	

Write Variable:

```
sWN filterDepth <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	filterDepth	String	11	Filter depth in steps
Variable Data	data	UDInt	4	

Write Variable Response:

```
sWA filterDepth
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	filterDepth	String	11	Filter depth in steps

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	`[STX]sRN filterDepth[ETX]`
Read Variable Response:	`[STX]sRA filterDepth 1[ETX]`
Write Variable:	`[STX]sWN filterDepth 1[ETX]`
Write Variable Response:	`[STX]sWA filterDepth[ETX]`

3.1.1.2.3 Variable: echoSeletionMode [echo selection: first echo or last echo]

The following section contains a detailed description of the variable echoSeletionMode.

Variable Overview

Variable Name	Description
echoSeletionMode	Echo Selection Mode

Read-Access	Always
Write-Access	AuthorizedClient, Service

Enum8			
Default Value		FIRST_ECHO	
	Value	Name	Description
	0	FIRST_ECHO	Select first echo
	1	LAST_ECHO	Select last echo

Variable Telegram Syntax

Read Variable:

```
sRN echoSeletionMode
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	echoSeletionMode	String	16	Echo Selection Mode

Read Variable Response:

```
sRA echoSeletionMode <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	echoSeletionMode	String	16	Echo Selection Mode
Variable Data	data	Enum8	1	

Write Variable:

```
sWN echoSeletionMode <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	echoSeletionMode	String	16	Echo Selection Mode
Variable Data	data	Enum8	1	

Write Variable Response:

```
sWA echoSeletionMode
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	echoSeletionMode	String	16	Echo Selection Mode

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	`[STX]sRN echoSeletionMode[ETX]`
Read Variable Response:	`[STX]sRA echoSeletionMode 0[ETX]`
Write Variable:	`[STX]sWN echoSeletionMode 0[ETX]`
Write Variable Response:	`[STX]sWA echoSeletionMode[ETX]`

3.1.1.2.4 Variable: roiStart [distance range: measuring range limit facing the device]

The following section contains a detailed description of the variable roiStart.

Variable Overview

Variable Name	Description
roiStart	Start of ROI in mm

Read-Access	Always
Write-Access	AuthorizedClient, Service

DInt	
Value Range	100..1500000
Initialisation	500
Physical Unit	mm

Variable Telegram Syntax

Read Variable:

```
sRN roiStart
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	roiStart	String	8	Start of ROI in mm

Read Variable Response:

```
sRA roiStart <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	roiStart	String	8	Start of ROI in mm
Variable Data	data	DInt	4	

Write Variable:

```
sWN roiStart <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	roiStart	String	8	Start of ROI in mm
Variable Data	data	DInt	4	

Write Variable Response:

```
sWA roiStart
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	roiStart	String	8	Start of ROI in mm

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	`[STX]sRN roiStart[ETX]`
Read Variable Response:	`[STX]sRA roiStart 1F4[ETX]`
Write Variable:	`[STX]sWN roiStart 1F4[ETX]`
Write Variable Response:	`[STX]sWA roiStart[ETX]`

3.1.1.2.5 Variable: roiEnd [distance range: measuring range limit facing away from the device]

The following section contains a detailed description of the variable roiEnd.

Variable Overview

Variable Name	Description
roiEnd	End of ROI in mm

Read-Access	Always
Write-Access	AuthorizedClient, Service

DInt	
Value Range	100..1500000
Initialisation	1500000
Physical Unit	mm

Variable Telegram Syntax

Read Variable:

```
sRN roiEnd
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	roiEnd	String	6	End of ROI in mm

Read Variable Response:

```
sRA roiEnd <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	roiEnd	String	6	End of ROI in mm
Variable Data	data	DInt	4	

Write Variable:

```
sWN roiEnd <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	roiEnd	String	6	End of ROI in mm

Write Variable:

```
sWN roiEnd <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Variable Data	data	DInt	4	

Write Variable Response:

```
sWA roiEnd
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	roiEnd	String	6	End of ROI in mm

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	`[STX]sRN roiEnd[ETX]`
Read Variable Response:	`[STX]sRA roiEnd 16E360[ETX]`
Write Variable:	`[STX]sWN roiEnd 16E360[ETX]`
Write Variable Response:	`[STX]sWA roiEnd[ETX]`

3.1.1.2.6 Variable: roiMinLevel [signal level range: lower signal level limit]

The following section contains a detailed description of the variable roiMinLevel.

Variable Overview

Variable Name	Description
roiMinLevel	Min level for echos in ROI

Read-Access	Always
Write-Access	AuthorizedClient, Service

DInt	
Value Range	0..16383
Initialisation	0

Variable Telegram Syntax

Read Variable:

```
sRN roiMinLevel
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	roiMinLevel	String	11	Min level for echos in ROI

Read Variable Response:

```
sRA roiMinLevel <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	roiMinLevel	String	11	Min level for echos in ROI
Variable Data	data	DInt	4	

Write Variable:

```
sWN roiMinLevel <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	roiMinLevel	String	11	Min level for echos in ROI
Variable Data	data	DInt	4	

Write Variable Response:

```
sWA roiMinLevel
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	roiMinLevel	String	11	Min level for echos in ROI

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	`[STX]sRN roiMinLevel[ETX]`
Read Variable Response:	`[STX]sRA roiMinLevel 0[ETX]`
Write Variable:	`[STX]sWN roiMinLevel 0[ETX]`
Write Variable Response:	`[STX]sWA roiMinLevel[ETX]`

3.1.1.2.7 Variable: roiMaxLevel [signal level range: upper signal level limit]

The following section contains a detailed description of the variable roiMaxLevel.

Variable Overview

Variable Name	Description
roiMaxLevel	Min level for echos in ROI

Read-Access	Always
Write-Access	AuthorizedClient, Service

DInt	
Value Range	0..16383
Initialisation	16383

Variable Telegram Syntax

Read Variable:

```
sRN roiMaxLevel
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	roiMaxLevel	String	11	Min level for echos in ROI

Read Variable Response:

```
sRA roiMaxLevel <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	roiMaxLevel	String	11	Min level for echos in ROI
Variable Data	data	DInt	4	

Write Variable:

```
sWN roiMaxLevel <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	roiMaxLevel	String	11	Min level for echos in ROI
Variable Data	data	DInt	4	

Write Variable Response:

```
sWA roiMaxLevel
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	roiMaxLevel	String	11	Min level for echos in ROI

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	`[STX]sRN roiMaxLevel[ETX]`
Read Variable Response:	`[STX]sRA roiMaxLevel 3FFF[ETX]`
Write Variable:	`[STX]sWN roiMaxLevel 3FFF[ETX]`
Write Variable Response:	`[STX]sWA roiMaxLevel[ETX]`

3.1.1.2.8 Variable: noEchoOutputMode [substitute values for "no echo"]

The following section contains a detailed description of the variable noEchoOutputMode.

Variable Overview

Variable Name	Description
noEchoOutputMode	Defines the sensor behaviour after max bridging time exceeded

Read-Access	Always
Write-Access	AuthorizedClient, Service

Enum8			
Default Value		REPLACEMENT	
	Value	Name	Description
	0	HOLD	Keep the last valid distance and velocity value
	1	REPLACEMENT	Replace distance and velocity with the NoEchoOutput values

Variable Telegram Syntax

Read Variable:

```
sRN noEchoOutputMode
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	noEchoOutputMode	String	16	Defines the sensor behaviour after max bridging time exceeded

Read Variable Response:

```
sRA noEchoOutputMode <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	noEchoOutputMode	String	16	Defines the sensor behaviour after max bridging time exceeded
Variable Data	data	Enum8	1	

Write Variable:

```
sWN noEchoOutputMode <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	noEchoOutputMode	String	16	Defines the sensor behaviour after max bridging time exceeded
Variable Data	data	Enum8	1	

Write Variable Response:

```
sWA noEchoOutputMode
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	noEchoOutputMode	String	16	Defines the sensor behaviour after max bridging time exceeded

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	`[STX]sRN noEchoOutputMode[ETX]`
Read Variable Response:	`[STX]sRA noEchoOutputMode 1[ETX]`
Write Variable:	`[STX]sWN noEchoOutputMode 1[ETX]`
Write Variable Response:	`[STX]sWA noEchoOutputMode[ETX]`

3.1.1.2.9 Variable: noEchoOutputDistance [user-defined substitute values: distance]

The following section contains a detailed description of the variable noEchoOutputDistance.

Variable Overview

Variable Name	Description
noEchoOutputDistance	Distance in mm that shall be set it no echo is found

Read-Access	Always
Write-Access	AuthorizedClient, Service

DInt	
Value Range	-6096000..6096000
Initialisation	6096000
Physical Unit	mm

Variable Telegram Syntax

Read Variable:

```
sRN noEchoOutputDistance
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	noEchoOutputDistance	String	20	Distance in mm that shall be set it no echo is found

Read Variable Response:

```
sRA noEchoOutputDistance <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	noEchoOutputDistance	String	20	Distance in mm that shall be set it no echo is found
Variable Data	data	DInt	4	

Write Variable:

```
sWN noEchoOutputDistance <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	noEchoOutputDistance	String	20	Distance in mm that shall be set it no echo is found
Variable Data	data	DInt	4	

Write Variable Response:

```
sWA noEchoOutputDistance
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	noEchoOutputDistance	String	20	Distance in mm that shall be set it no echo is found

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	`[STX]sRN noEchoOutputDistance[ETX]`
Read Variable Response:	`[STX]sRA noEchoOutputDistance 5D0480[ETX]`
Write Variable:	`[STX]sWN noEchoOutputDistance 5D0480[ETX]`
Write Variable Response:	`[STX]sWA noEchoOutputDistance[ETX]`

3.1.1.2.10 Variable: noEchoOutputVelocity [user-defined substitute values: speed]

The following section contains a detailed description of the variable noEchoOutputVelocity.

Variable Overview

Variable Name	Description
noEchoOutputVelocity	Velocity in mm/s that shall be set it no echo is found

Read-Access	Always
Write-Access	AuthorizedClient, Service

DInt	
Value Range	-20000..20000
Initialisation	0
Physical Unit	mm/s

Variable Telegram Syntax

Read Variable:

```
sRN noEchoOutputVelocity
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	noEchoOutputVelocity	String	20	Velocity in mm/s that shall be set it no echo is found

Read Variable Response:

```
sRA noEchoOutputVelocity <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	noEchoOutputVelocity	String	20	Velocity in mm/s that shall be set it no echo is found
Variable Data	data	DInt	4	

Write Variable:

```
sWN noEchoOutputVelocity <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	noEchoOutputVelocity	String	20	Velocity in mm/s that shall be set it no echo is found
Variable Data	data	DInt	4	

Write Variable Response:

```
sWA noEchoOutputVelocity
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	noEchoOutputVelocity	String	20	Velocity in mm/s that shall be set it no echo is found

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	`[STX]sRN noEchoOutputVelocity[ETX]`
Read Variable Response:	`[STX]sRA noEchoOutputVelocity 0[ETX]`
Write Variable:	`[STX]sWN noEchoOutputVelocity 0[ETX]`
Write Variable Response:	`[STX]sWA noEchoOutputVelocity[ETX]`

3.1.1.2.11 Variable: errorOutputDistance [behaviour on error: user-defined substitute values: distance]

The following section contains a detailed description of the variable errorOutputDistance.

Variable Overview

Variable Name	Description
errorOutputDistance	Distance in mm that shall be set if error is present

Read-Access	Always
Write-Access	AuthorizedClient, Service

DInt	
Value Range	-6096000..6096000
Initialisation	0
Physical Unit	mm

Variable Telegram Syntax

Read Variable:

```
sRN errorOutputDistance
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	errorOutputDistance	String	19	Distance in mm that shall be set if error is present

Read Variable Response:

```
sRA errorOutputDistance <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	errorOutputDistance	String	19	Distance in mm that shall be set if error is present
Variable Data	data	DInt	4	

Write Variable:

```
sWN errorOutputDistance <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	errorOutputDistance	String	19	Distance in mm that shall be set if error is present

Write Variable:

```
sWN errorOutputDistance <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Variable Data	data	DInt	4	

Write Variable Response:

```
sWA errorOutputDistance
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	errorOutputDistance	String	19	Distance in mm that shall be set if error is present

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	`[STX]sRN errorOutputDistance[ETX]`
Read Variable Response:	`[STX]sRA errorOutputDistance 0[ETX]`
Write Variable:	`[STX]sWN errorOutputDistance 0[ETX]`
Write Variable Response:	`[STX]sWA errorOutputDistance[ETX]`

3.1.1.2.12 Variable: errorOutputVelocity [behaviour on error: user-defined substitute values: speed]

The following section contains a detailed description of the variable errorOutputVelocity.

Variable Overview

Variable Name	Description
errorOutputVelocity	Velocity in mm/s that shall be set if error is present

Read-Access	Always
Write-Access	AuthorizedClient, Service

DInt	
Value Range	-20000..20000
Initialisation	0
Physical Unit	mm/s

Variable Telegram Syntax

Read Variable:

```
sRN errorOutputVelocity
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	errorOutputVelocity	String	19	Velocity in mm/s that shall be set if error is present

Read Variable Response:

```
sRA errorOutputVelocity <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	errorOutputVelocity	String	19	Velocity in mm/s that shall be set if error is present
Variable Data	data	DInt	4	

Write Variable:

```
sWN errorOutputVelocity <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	errorOutputVelocity	String	19	Velocity in mm/s that shall be set if error is present
Variable Data	data	DInt	4	

Write Variable Response:

```
sWA errorOutputVelocity
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	errorOutputVelocity	String	19	Velocity in mm/s that shall be set if error is present

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	`[STX]sRN errorOutputVelocity[ETX]`
Read Variable Response:	`[STX]sRA errorOutputVelocity 0[ETX]`
Write Variable:	`[STX]sWN errorOutputVelocity 0[ETX]`
Write Variable Response:	`[STX]sWA errorOutputVelocity[ETX]`

3.1.2 Interface

3.1.2.1 Variable: preset [switching input: preset value]

The following section contains a detailed description of the variable preset.

Variable Overview

Variable Name	Description
preset	Preset in mm

Read-Access	Always
Write-Access	AuthorizedClient, Service

DInt	
Value Range	-1500000..1500000
Initialisation	0

Variable Telegram Syntax

Read Variable:

```
sRN preset
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	preset	String	6	Preset in mm

Read Variable Response:

```
sRA preset <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	preset	String	6	Preset in mm
Variable Data	data	DInt	4	

Write Variable:

```
sWN preset <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	preset	String	6	Preset in mm
Variable Data	data	DInt	4	

Write Variable Response:

```
sWA preset
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	preset	String	6	Preset in mm

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	`[STX]sRN preset[ETX]`
Read Variable Response:	`[STX]sRA preset 0[ETX]`
Write Variable:	`[STX]sWN preset 0[ETX]`
Write Variable Response:	`[STX]sWA preset[ETX]`

3.1.2.2 Variable: configIo1 [selection: In/Q1 as digital input or output]

The following section contains a detailed description of the variable configIo1.

Variable Overview

Variable Name	Description
configIo1	Configuration of IO1

Read-Access	AuthorizedClient, Service
Write-Access	AuthorizedClient, Service

Struct				
Dir				
	Enum8			
	Default Value		OUTPUT	
		Value	Name	Description
		0	INPUT	
		1	OUTPUT	
Type				
	Enum8			
	Default Value		DIGITAL	
		Value	Name	Description
		0	DIGITAL	
Cfg				
	UserType			
	ioConfiguration_t		See the chapter "User Types" for details.	

Variable Telegram Syntax

Read Variable:

```
sRN configIo1
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	configIo1	String	9	Configuration of IO1

Read Variable Response:

```
sRA configIo1 <Dir> <Type> <Cfg>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	configIo1	String	9	Configuration of IO1
Variable Data 1	Dir	Enum8	1	
Variable Data 2	Type	Enum8	1	
Variable Data 3	Cfg	ioConfiguration_t	0	

Write Variable:

```
sWN configIo1 <Dir> <Type> <Cfg>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	configIo1	String	9	Configuration of IO1
Variable Data 1	Dir	Enum8	1	
Variable Data 2	Type	Enum8	1	
Variable Data 3	Cfg	ioConfiguration_t	0	

Write Variable Response:

```
sWA configIo1
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	configIo1	String	9	Configuration of IO1

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	`[STX]sRN configIo1[ETX]`
Read Variable Response:	`[STX]sRA configIo1 1 0 0 0 2 3 2710 4E20 64 1388 32 1 1 1 1 1 1 0 0 0 0 0 0 1[ETX]`
Write Variable:	`[STX]sWN configIo1 1 0 0 0 2 3 2710 4E20 64 1388 32 1 1 1 1 1 1 0 0 0 0 0 0 1[ETX]`
Write Variable Response:	`[STX]sWA configIo1[ETX]`

3.1.2.3 Variable: configIo2 [selection: QA/Q2 as analog input or digital output]

The following section contains a detailed description of the variable configIo2.

Variable Overview

Variable Name	**Description**
configIo2	Configuration of IO2

Read-Access	AuthorizedClient, Service
Write-Access	AuthorizedClient, Service

Struct			
Dir			
	Enum8		
	Default Value	OUTPUT	
	Value	Name	Description
	1	OUTPUT	
Type			
	Enum8		
	Default Value	DIGITAL	
	Value	Name	Description
	0	DIGITAL	
	1	ANALOG	
Cfg			
	UserType		
	ioConfiguration_t	See the chapter "User Types" for details.	

Variable Telegram Syntax

Read Variable:				
`sRN configIo2`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	configIo2	String	9	Configuration of IO2

Read Variable Response:				
`sRA configIo2 <Dir> <Type> <Cfg>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	configIo2	String	9	Configuration of IO2
Variable Data 1	Dir	Enum8	1	
Variable Data 2	Type	Enum8	1	
Variable Data 3	Cfg	ioConfiguration_t	0	

Write Variable:				
sWN configIo2 <Dir> <Type> <Cfg>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	configIo2	String	9	Configuration of IO2
Variable Data 1	Dir	Enum8	1	
Variable Data 2	Type	Enum8	1	
Variable Data 3	Cfg	ioConfiguration_t	0	

Write Variable Response:				
sWA configIo2				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	configIo2	String	9	Configuration of IO2

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN configIo2[ETX]
Read Variable Response:	[STX]sRA configIo2 1 0 0 0 2 3 2710 4E20 64 1388 32 1 1 1 1 1 1 0 0 0 0 0 0 1[ETX]
Write Variable:	[STX]sWN configIo2 1 0 0 0 2 3 2710 4E20 64 1388 32 1 1 1 1 1 1 0 0 0 0 0 0 1[ETX]
Write Variable Response:	[STX]sWA configIo2[ETX]

3.1.2.4 Variable: configIo3 [selection: Q3 as digital output]

The following section contains a detailed description of the variable configIo3.

Variable Overview

Variable Name	Description
configIo3	Configuration of IO3

Read-Access	AuthorizedClient, Service
Write-Access	AuthorizedClient, Service

Struct				
Dir				
	Enum8			
	Default Value		OUTPUT	
		Value	Name	Description
		1	OUTPUT	

Struct				
Type				
	Enum8			
	Default Value		DIGITAL	
		Value	Name	Description
		0	DIGITAL	
Cfg				
	UserType			
	ioConfiguration_t		See the chapter "User Types" for details.	

Variable Telegram Syntax

Read Variable:				
sRN configIo3				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	configIo3	String	9	Configuration of IO3

Read Variable Response:				
sRA configIo3 <Dir> <Type> <Cfg>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	configIo3	String	9	Configuration of IO3
Variable Data 1	Dir	Enum8	1	
Variable Data 2	Type	Enum8	1	
Variable Data 3	Cfg	ioConfiguration_t	0	

Write Variable:				
sWN configIo3 <Dir> <Type> <Cfg>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	configIo3	String	9	Configuration of IO3
Variable Data 1	Dir	Enum8	1	
Variable Data 2	Type	Enum8	1	
Variable Data 3	Cfg	ioConfiguration_t	0	

Write Variable Response:				
sWA configIo3				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	configIo3	String	9	Configuration of IO3

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN configIo3[ETX]
Read Variable Response:	[STX]sRA configIo3 1 0 0 0 2 3 2710 4E20 64 1388 32 1 1 1 1 1 1 0 0 0 0 0 0 1[ETX]
Write Variable:	[STX]sWN configIo3 1 0 0 0 2 3 2710 4E20 64 1388 32 1 1 1 1 1 1 0 0 0 0 0 0 1[ETX]
Write Variable Response:	[STX]sWA configIo3[ETX]

3.1.2.5 Variable: configIo4 [selection: Q4 as digital output]

The following section contains a detailed description of the variable configIo4.

Variable Overview

Variable Name	Description
configIo4	Configuration of IO4

Read-Access	AuthorizedClient, Service
Write-Access	AuthorizedClient, Service

Struct			
Dir			
	Enum8		
	Default Value	OUTPUT	
	Value	Name	Description
	1	OUTPUT	
Type			
	Enum8		
	Default Value	DIGITAL	
	Value	Name	Description
	0	DIGITAL	
Cfg			
	UserType		
	ioConfiguration_t	See the chapter "User Types" for details.	

Variable Telegram Syntax

Read Variable:				
sRN configIo4				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	configIo4	String	9	Configuration of IO4

Read Variable Response:				
sRA configIo4 <Dir> <Type> <Cfg>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	configIo4	String	9	Configuration of IO4
Variable Data 1	Dir	Enum8	1	
Variable Data 2	Type	Enum8	1	
Variable Data 3	Cfg	ioConfiguration_t	0	

Write Variable:				
sWN configIo4 <Dir> <Type> <Cfg>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	configIo4	String	9	Configuration of IO4
Variable Data 1	Dir	Enum8	1	
Variable Data 2	Type	Enum8	1	
Variable Data 3	Cfg	ioConfiguration_t	0	

Write Variable Response:				
sWA configIo4				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	configIo4	String	9	Configuration of IO4

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN configIo4[ETX]
Read Variable Response:	[STX]sRA configIo4 1 0 0 0 2 3 2710 4E20 64 1388 32 1 1 1 1 1 1 0 0 0 0 0 0 1[ETX]
Write Variable:	[STX]sWN configIo4 1 0 0 0 2 3 2710 4E20 64 1388 32 1 1 1 1 1 1 0 0 0 0 0 0 1[ETX]
Write Variable Response:	[STX]sWA configIo4[ETX]

3.1.2.6 Variable: configIo5 [selection: In2 as digital input]

The following section contains a detailed description of the variable configIo5.

Variable Overview

Variable Name	Description
configIo5	Configuration of IO5

Read-Access	AuthorizedClient, Service
Write-Access	AuthorizedClient, Service

Struct				
Dir				
	Enum8			
	Default Value	INPUT		
	Value	Name	Description	
	0	INPUT		
Type				
	Enum8			
	Default Value	DIGITAL		
	Value	Name	Description	
	0	DIGITAL		
Cfg				
	UserType			
	ioConfiguration_t	See the chapter "User Types" for details.		

Variable Telegram Syntax

Read Variable:

```
sRN configIo5
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	configIo5	String	9	Configuration of IO5

Read Variable Response:

```
sRA configIo5 <Dir> <Type> <Cfg>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	configIo5	String	9	Configuration of IO5
Variable Data 1	Dir	Enum8	1	
Variable Data 2	Type	Enum8	1	
Variable Data 3	Cfg	ioConfiguration_t	0	

Write Variable:

```
sWN configIo5 <Dir> <Type> <Cfg>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWN	String	3	Write SOPAS Variable by Name

Write Variable:

```
sWN configIo5 <Dir> <Type> <Cfg>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	configIo5	String	9	Configuration of IO5
Variable Data 1	Dir	Enum8	1	
Variable Data 2	Type	Enum8	1	
Variable Data 3	Cfg	ioConfiguration_t	0	

Write Variable Response:				
sWA configIo5				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	configIo5	String	9	Configuration of IO5

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN configIo5[ETX]
Read Variable Response:	[STX]sRA configIo5 0 0 0 0 2 3 2710 4E20 64 1388 32 1 1 1 1 1 1 0 0 0 0 0 0 1[ETX]
Write Variable:	[STX]sWN configIo5 0 0 0 0 2 3 2710 4E20 64 1388 32 1 1 1 1 1 1 0 0 0 0 0 0 1[ETX]
Write Variable Response:	[STX]sWA configIo5[ETX]

3.1.3 Device

3.1.3.1 Laser

3.1.3.1.1 Method: enableMeasurementLaser [switching the measurement laser on/off: on]

The following section contains a detailed description of the method enableMeasurementLaser.

Method Overview

Method Name	Description
enableMeasurementLaser	Enable Measurement Laser

Invocation Access	AuthorizedClient, Service

Return Values		
success		
	Bool	
	Value Range	False, True
	Initialisation	False

Method Telegram Syntax

Method Invocation:				
sMN enableMeasurementLaser				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sMN	String	3	Request (SOPAS Method by Name)
Command	enableMeasurementLaser	String	22	Enable Measurement Laser

Method Return Value:				
sAN enableMeasurementLaser <success>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sAN	String	3	Result (SOPAS Method Result)
Command	enableMeasurementLaser	String	22	Enable Measurement Laser
Return Value 1	success	Bool	1	

Method Telegram Examples

Example: Default Values	
Method telegram examples with parameter data and return value data set to default values.	
Method Invocation:	[STX]sMN enableMeasurementLaser[ETX]
Method Return Value:	[STX]sAN enableMeasurementLaser 0[ETX]

3.1.3.1.2 Method: disableMeasurementLaser [Switching the measurement laser on/off: off]

The following section contains a detailed description of the method disableMeasurementLaser.

Method Overview

Method Name	Description
disableMeasurementLaser	Disable Measurement Laser

Invocation Access	AuthorizedClient, Service

Return Values	
success	
Bool	
Value Range	False, True
Initialisation	False

Method Telegram Syntax

Method Invocation:				
`sMN disableMeasurementLaser`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sMN	String	3	Request (SOPAS Method by Name)
Command	disableMeasurementLaser	String	23	Disable Measurement Laser

Method Return Value:				
`sAN disableMeasurementLaser <success>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sAN	String	3	Result (SOPAS Method Result)
Command	disableMeasurementLaser	String	23	Disable Measurement Laser
Return Value 1	success	Bool	1	

Method Telegram Examples

Example: Default Values	
Method telegram examples with parameter data and return value data set to default values.	
Method Invocation:	`[STX]sMN disableMeasurementLaser[ETX]`
Method Return Value:	`[STX]sAN disableMeasurementLaser 0[ETX]`

3.1.3.1.3 Method: enablePilotLaser [switching the alignmentt laser on/off: on]

The following section contains a detailed description of the method enablePilotLaser.

Method Overview

Method Name	Description
enablePilotLaser	Enable Pilot Laser

Invocation Access	AuthorizedClient, Service

Return Values	
success	
Bool	
Value Range	False, True
Initialisation	False

Method Telegram Syntax

Method Invocation:				
`sMN enablePilotLaser`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sMN	String	3	Request (SOPAS Method by Name)
Command	enablePilotLaser	String	16	Enable Pilot Laser

Method Return Value:				
sAN enablePilotLaser <success>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sAN	String	3	Result (SOPAS Method Result)
Command	enablePilotLaser	String	16	Enable Pilot Laser
Return Value 1	success	Bool	1	

Method Telegram Examples

Example: Default Values	
Method telegram examples with parameter data and return value data set to default values.	
Method Invocation:	[STX]sMN enablePilotLaser[ETX]
Method Return Value:	[STX]sAN enablePilotLaser 0[ETX]

3.1.3.1.4 Method: disablePilotLaser [switching the alignment laser on/off: off]

The following section contains a detailed description of the method disablePilotLaser.

Method Overview

Method Name	Description
disablePilotLaser	Disable Pilot Laser

Invocation Access	AuthorizedClient, Service

Return Values		
success		
	Bool	
	Value Range	False, True
	Initialisation	False

Method Telegram Syntax

Method Invocation:				
sMN disablePilotLaser				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sMN	String	3	Request (SOPAS Method by Name)
Command	disablePilotLaser	String	17	Disable Pilot Laser

Method Return Value:				
sAN disablePilotLaser <success>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sAN	String	3	Result (SOPAS Method Result)
Command	disablePilotLaser	String	17	Disable Pilot Laser
Return Value 1	success	Bool	1	

Method Telegram Examples

Example: Default Values	
Method telegram examples with parameter data and return value data set to default values.	
Method Invocation:	[STX]sMN disablePilotLaser[ETX]
Method Return Value:	[STX]sAN disablePilotLaser 0[ETX]

3.1.3.2 Heater

3.1.3.2.1 Variable: heaterSwitchingThreshold [switch-on temperature]

The following section contains a detailed description of the variable heaterSwitchingThreshold.

Variable Overview

Variable Name	Description
heaterSwitchingThreshold	If temperature falls below this level the heater will be switched on

Read-Access	Always
Write-Access	AuthorizedClient, Service

SInt	
Value Range	-20..20
Initialisation	-10
Physical Unit	°C

Variable Telegram Syntax

Read Variable:

```
sRN heaterSwitchingThreshold
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	heaterSwitchingThreshold	String	24	If temperature falls below this level the heater will be switched on

Read Variable Response:

```
sRA heaterSwitchingThreshold <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	heaterSwitchingThreshold	String	24	If temperature falls below this level the heater will be switched on
Variable Data	data	SInt	1	

Write Variable:

```
sWN heaterSwitchingThreshold <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	heaterSwitchingThreshold	String	24	If temperature falls below this level the heater will be switched on
Variable Data	data	SInt	1	

Write Variable Response:

```
sWA heaterSwitchingThreshold
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	heaterSwitchingThreshold	String	24	If temperature falls below this level the heater will be switched on

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	`[STX]sRN heaterSwitchingThreshold[ETX]`
Read Variable Response:	`[STX]sRA heaterSwitchingThreshold F6[ETX]`
Write Variable:	`[STX]sWN heaterSwitchingThreshold F6[ETX]`
Write Variable Response:	`[STX]sWA heaterSwitchingThreshold[ETX]`

3.1.3.2.2 Method: switchHeaterOn [heating on]

The following section contains a detailed description of the method switchHeaterOn.

Method Overview

Method Name	Description
switchHeaterOn	Switch Heater on

Invocation Access	AuthorizedClient, Service

Method Telegram Syntax

Method Invocation:				
sMN switchHeaterOn				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sMN	String	3	Request (SOPAS Method by Name)
Command	switchHeaterOn	String	14	Switch Heater on

Method Return Value:				
sAN switchHeaterOn				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sAN	String	3	Result (SOPAS Method Result)
Command	switchHeaterOn	String	14	Switch Heater on

Method Telegram Examples

Example: Default Values	
Method telegram examples with parameter data and return value data set to default values.	
Method Invocation:	[STX]sMN switchHeaterOn[ETX]
Method Return Value:	[STX]sAN switchHeaterOn[ETX]

3.1.3.2.3 Method: switchHeaterOff [heating off]

The following section contains a detailed description of the method switchHeaterOff.

Method Overview

Method Name	Description
switchHeaterOff	Switch Heater off

Invocation Access	AuthorizedClient, Service

Method Telegram Syntax

Method Invocation:				
sMN switchHeaterOff				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sMN	String	3	Request (SOPAS Method by Name)
Command	switchHeaterOff	String	15	Switch Heater off

Method Return Value:				
sAN switchHeaterOff				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sAN	String	3	Result (SOPAS Method Result)
Command	switchHeaterOff	String	15	Switch Heater off

Method Telegram Examples

Example: Default Values	
Method telegram examples with parameter data and return value data set to default values.	
Method Invocation:	[STX]sMN switchHeaterOff[ETX]
Method Return Value:	[STX]sAN switchHeaterOff[ETX]

3.1.3.2.4 Method: switchHeaterAuto [auto: heating is activated if the measured temperature is below the defined switch-on temperature]

The following section contains a detailed description of the method switchHeaterAuto.

Method Overview

Method Name	Description
switchHeaterAuto	Switch Heater to auto control

Invocation Access	AuthorizedClient, Service

Method Telegram Syntax

Method Invocation:				
`sMN switchHeaterAuto`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sMN	String	3	Request (SOPAS Method by Name)
Command	switchHeaterAuto	String	16	Switch Heater to auto control

Method Return Value:				
`sAN switchHeaterAuto`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sAN	String	3	Result (SOPAS Method Result)
Command	switchHeaterAuto	String	16	Switch Heater to auto control

Method Telegram Examples

Example: Default Values	
Method telegram examples with parameter data and return value data set to default values.	
Method Invocation:	`[STX]sMN switchHeaterAuto[ETX]`
Method Return Value:	`[STX]sAN switchHeaterAuto[ETX]`

3.1.3.3 Display

3.1.3.3.1 Variable: displayContrast [display contrast]

The following section contains a detailed description of the variable displayContrast.

Variable Overview

Variable Name	Description
displayContrast	display contrast

Read-Access	Always
Write-Access	AuthorizedClient, Service

USInt	
Value Range	0..100
Initialisation	50

Variable Telegram Syntax

Read Variable:				
`sRN displayContrast`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	displayContrast	String	15	display contrast

Read Variable Response:				
`sRA displayContrast <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	displayContrast	String	15	display contrast
Variable Data	data	USInt	1	

Write Variable:				
sWN displayContrast <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	displayContrast	String	15	display contrast
Variable Data	data	USInt	1	

Write Variable Response:				
sWA displayContrast				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	displayContrast	String	15	display contrast

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN displayContrast[ETX]
Read Variable Response:	[STX]sRA displayContrast 32[ETX]
Write Variable:	[STX]sWN displayContrast 32[ETX]
Write Variable Response:	[STX]sWA displayContrast[ETX]

3.1.3.3.2 Variable: displayBrightness [display brightness]

The following section contains a detailed description of the variable displayBrightness.

Variable Overview

Variable Name	Description
displayBrightness	display brightness

Read-Access	Always
Write-Access	AuthorizedClient, Service

USInt	
Value Range	0..100
Initialisation	50

Variable Telegram Syntax

Read Variable:				
sRN displayBrightness				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	displayBrightness	String	17	display brightness

Read Variable Response:				
sRA displayBrightness <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	displayBrightness	String	17	display brightness
Variable Data	data	USInt	1	

Write Variable:				
sWN displayBrightness <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	displayBrightness	String	17	display brightness
Variable Data	data	USInt	1	

Write Variable Response:				
sWA displayBrightness				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	displayBrightness	String	17	display brightness

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN displayBrightness[ETX]
Read Variable Response:	[STX]sRA displayBrightness 32[ETX]
Write Variable:	[STX]sWN displayBrightness 32[ETX]
Write Variable Response:	[STX]sWA displayBrightness[ETX]

3.1.3.3.3 Variable: displayRotation [display orientation: 0° or 180°]

The following section contains a detailed description of the variable displayRotation.

Variable Overview

Variable Name	Description
displayRotation	Rotation can be enabled or disabled

Read-Access	Always
Write-Access	AuthorizedClient, Service

Enum8			
Default Value		DISABLED	
	Value	Name	Description
	0	DISABLED	
	1	ENABLED	

Variable Telegram Syntax

Read Variable:				
sRN displayRotation				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	displayRotation	String	15	Rotation can be enabled or disabled

Read Variable Response:				
sRA displayRotation <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	displayRotation	String	15	Rotation can be enabled or disabled
Variable Data	data	Enum8	1	

Write Variable:				
sWN displayRotation <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	displayRotation	String	15	Rotation can be enabled or disabled
Variable Data	data	Enum8	1	

Write Variable Response:				
sWA displayRotation				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	displayRotation	String	15	Rotation can be enabled or disabled

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	`[STX]sRN displayRotation[ETX]`
Read Variable Response:	`[STX]sRA displayRotation 0[ETX]`
Write Variable:	`[STX]sWN displayRotation 0[ETX]`
Write Variable Response:	`[STX]sWA displayRotation[ETX]`

3.1.3.3.4 Variable: displayLanguage [language: English or German]

The following section contains a detailed description of the variable displayLanguage.

Variable Overview

Variable Name	Description
displayLanguage	Display Language can be either german or english

Read-Access	Always
Write-Access	AuthorizedClient, Service

Enum8			
Default Value		ENGLISH	
	Value	Name	Description
	0	GERMAN	
	1	ENGLISH	

Variable Telegram Syntax

Read Variable:				
`sRN displayLanguage`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	displayLanguage	String	15	Display Language can be either german or english

Read Variable Response:				
`sRA displayLanguage <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	displayLanguage	String	15	Display Language can be either german or english
Variable Data	data	Enum8	1	

Write Variable:				
`sWN displayLanguage <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	displayLanguage	String	15	Display Language can be either german or english
Variable Data	data	Enum8	1	

Write Variable Response:				
`sWA displayLanguage`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	displayLanguage	String	15	Display Language can be either german or english

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	`[STX]sRN displayLanguage[ETX]`
Read Variable Response:	`[STX]sRA displayLanguage 1[ETX]`
Write Variable:	`[STX]sWN displayLanguage 1[ETX]`
Write Variable Response:	`[STX]sWA displayLanguage[ETX]`

3.1.3.4 General

3.1.3.4.1 Method: resetParamAndReboot [factory settings: reset and reboot]

The following section contains a detailed description of the method resetParamAndReboot.

Method Overview

Method Name	Description
resetParamAndReboot	reset the parametrization and reboot

Invocation Access	AuthorizedClient, Service

Return Values		
Successful		
	Bool	
	Value Range	False, True
	Initialisation	False

Method Telegram Syntax

Method Invocation:				
`sMN resetParamAndReboot`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sMN	String	3	Request (SOPAS Method by Name)
Command	resetParamAndReboot	String	19	reset the parametrization and reboot

Method Return Value:				
`sAN resetParamAndReboot <Successful>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sAN	String	3	Result (SOPAS Method Result)
Command	resetParamAndReboot	String	19	reset the parametrization and reboot
Return Value 1	Successful	Bool	1	

Method Telegram Examples

Example: Default Values	
Method telegram examples with parameter data and return value data set to default values.	
Method Invocation:	`[STX]sMN resetParamAndReboot[ETX]`
Method Return Value:	`[STX]sAN resetParamAndReboot 0[ETX]`

3.1.4 Communication

3.1.4.1 SSI

3.1.4.1.1 Variable: spdOutputMode [serial interface: select RS-422 or SSI]

The following section contains a detailed description of the variable spdOutputMode.

Variable Overview

Variable Name
spdOutputMode

Read-Access	Always
Write-Access	AuthorizedClient, Service

Enum8			
Default Value		RS422	
	Value	Name	Description
	0	SSI	
	1	RS422	

Variable Telegram Syntax

Read Variable:				
sRN spdOutputMode				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	spdOutputMode	String	13	

Read Variable Response:				
sRA spdOutputMode <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	spdOutputMode	String	13	
Variable Data	data	Enum8	1	

Write Variable:				
sWN spdOutputMode <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	spdOutputMode	String	13	
Variable Data	data	Enum8	1	

Write Variable Response:				
sWA spdOutputMode				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	spdOutputMode	String	13	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN spdOutputMode[ETX]
Read Variable Response:	[STX]sRA spdOutputMode 1[ETX]
Write Variable:	[STX]sWN spdOutputMode 1[ETX]
Write Variable Response:	[STX]sWA spdOutputMode[ETX]

3.1.4.1.2 Variable: serialOutputDistanceScale [distance value resolution for SSI data transfer: free input]

The following section contains a detailed description of the variable serialOutputDistanceScale.

Variable Overview

Variable Name	Description
serialOutputDistanceScale	Distance scale in um

Read-Access	Always
Write-Access	AuthorizedClient, Service

UDInt	
Value Range	1..1000000
Initialisation	1000

Variable Telegram Syntax

Read Variable:				
sRN serialOutputDistanceScale				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	serialOutputDistanceScale	String	25	Distance scale in um

Read Variable Response:				
sRA serialOutputDistanceScale <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	serialOutputDistanceScale	String	25	Distance scale in um
Variable Data	data	UDInt	4	

Write Variable:				
sWN serialOutputDistanceScale <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	serialOutputDistanceScale	String	25	Distance scale in um
Variable Data	data	UDInt	4	

Write Variable Response:				
sWA serialOutputDistanceScale				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	serialOutputDistanceScale	String	25	Distance scale in um

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN serialOutputDistanceScale[ETX]
Read Variable Response:	[STX]sRA serialOutputDistanceScale 3E8[ETX]
Write Variable:	[STX]sWN serialOutputDistanceScale 3E8[ETX]
Write Variable Response:	[STX]sWA serialOutputDistanceScale[ETX]

3.1.4.1.3 Variable: ssiProtocol [SSI coding]

The following section contains a detailed description of the variable ssiProtocol.

Variable Overview

Variable Name	Description
ssiProtocol	selects SSI protocol

Read-Access	Always
Write-Access	AuthorizedClient, Service

Enum8			
Default Value		D24G_E	
	Value	Name	Description
	0	D24D	Distance 24 bit dual, no error bit
	1	D25D	Distance 25 bit dual, no error bit
	2	D24D_E	Distance 24 bit dual, with error bit
	3	S7_D24D_E	Status 7 Bit, Distance 24 bit dual, with error bit
	4	D24G	Distance 24 bit gray, no error bit
	5	D25G	Distance 25 bit gray, no error bit
	6	D24G_E	Distance 24 bit gray, with error bit
	7	S7_D24G_E	Status 7 Bit, Distance 24 bit gray, with error bit

Variable Telegram Syntax

Read Variable:				
sRN ssiProtocol				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	ssiProtocol	String	11	selects SSI protocol

Read Variable Response:				
sRA ssiProtocol <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	ssiProtocol	String	11	selects SSI protocol
Variable Data	data	Enum8	1	

Write Variable:				
sWN ssiProtocol <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	ssiProtocol	String	11	selects SSI protocol
Variable Data	data	Enum8	1	

Write Variable Response:				
sWA ssiProtocol				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	ssiProtocol	String	11	selects SSI protocol

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN ssiProtocol[ETX]
Read Variable Response:	[STX]sRA ssiProtocol 6[ETX]
Write Variable:	[STX]sWN ssiProtocol 6[ETX]
Write Variable Response:	[STX]sWA ssiProtocol[ETX]

3.1.4.2 RS422

3.1.4.2.1 Variable: spdOutputMode [serial interface: select RS-422 or SSI]

The following section contains a detailed description of the variable spdOutputMode.

Variable Overview

Variable Name
spdOutputMode

Read-Access	Always
Write-Access	AuthorizedClient, Service

Enum8			
Default Value		RS422	
	Value	Name	Description
	0	SSI	
	1	RS422	

Variable Telegram Syntax

Read Variable:				
sRN spdOutputMode				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	spdOutputMode	String	13	

Read Variable Response:				
sRA spdOutputMode <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	spdOutputMode	String	13	
Variable Data	data	Enum8	1	

Write Variable:				
sWN spdOutputMode <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	spdOutputMode	String	13	
Variable Data	data	Enum8	1	

Write Variable Response:				
sWA spdOutputMode				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	spdOutputMode	String	13	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN spdOutputMode[ETX]
Read Variable Response:	[STX]sRA spdOutputMode 1[ETX]
Write Variable:	[STX]sWN spdOutputMode 1[ETX]
Write Variable Response:	[STX]sWA spdOutputMode[ETX]

3.1.4.2.2 Variable: serialOutputDistanceScale [distance value resolution for RS-422 data transfer: free input]]

The following section contains a detailed description of the variable serialOutputDistanceScale.

Variable Overview

Variable Name	Description
serialOutputDistanceScale	Distance scale in um

Read-Access	Always
Write-Access	AuthorizedClient, Service

UDInt	
Value Range	1..1000000
Initialisation	1000

Variable Telegram Syntax

Read Variable:				
sRN serialOutputDistanceScale				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	serialOutputDistanceScale	String	25	Distance scale in um

Read Variable Response:				
sRA serialOutputDistanceScale <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	serialOutputDistanceScale	String	25	Distance scale in um
Variable Data	data	UDInt	4	

Write Variable:				
sWN serialOutputDistanceScale <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	serialOutputDistanceScale	String	25	Distance scale in um
Variable Data	data	UDInt	4	

Write Variable Response:				
sWA serialOutputDistanceScale				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	serialOutputDistanceScale	String	25	Distance scale in um

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN serialOutputDistanceScale[ETX]
Read Variable Response:	[STX]sRA serialOutputDistanceScale 3E8[ETX]
Write Variable:	[STX]sWN serialOutputDistanceScale 3E8[ETX]
Write Variable Response:	[STX]sWA serialOutputDistanceScale[ETX]

3.1.4.2.3 Variable: serialOutputVelocityScale [speed value resolution for RS-422 data transfer: free input]

The following section contains a detailed description of the variable serialOutputVelocityScale.

Variable Overview

Variable Name	Description
serialOutputVelocityScale	Velocity scale in um/s

Read-Access	Always
Write-Access	AuthorizedClient, Service

UDInt	
Value Range	1..1000000
Initialisation	1000

Variable Telegram Syntax

Read Variable:				
sRN serialOutputVelocityScale				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	serialOutputVelocityScale	String	25	Velocity scale in um/s

Read Variable Response:				
sRA serialOutputVelocityScale <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	serialOutputVelocityScale	String	25	Velocity scale in um/s
Variable Data	data	UDInt	4	

Write Variable:				
sWN serialOutputVelocityScale <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	serialOutputVelocityScale	String	25	Velocity scale in um/s
Variable Data	data	UDInt	4	

Write Variable Response:				
sWA serialOutputVelocityScale				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	serialOutputVelocityScale	String	25	Velocity scale in um/s

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN serialOutputVelocityScale[ETX]
Read Variable Response:	[STX]sRA serialOutputVelocityScale 3E8[ETX]
Write Variable:	[STX]sWN serialOutputVelocityScale 3E8[ETX]
Write Variable Response:	[STX]sWA serialOutputVelocityScale[ETX]

3.1.4.2.4 Variable: rs422PeriodicOutputContent [continuous RS-422 output]

The following section contains a detailed description of the variable rs422PeriodicOutputContent.

Variable Overview

Variable Name	Description
rs422PeriodicOutputContent	Select what to output periodically; nothing (periodic output disabled), only distance, distance and velocity or distance and status.

Read-Access	Always
Write-Access	AuthorizedClient, Service

Enum8			
Default Value		OFF	
	Value	Name	Description
	0	OFF	
	1	DISTANCE	
	2	DISTANCE_VELOCITY	
	3	DISTANCE_STATUS	
	4	DISTANCE_RSSI	

Variable Telegram Syntax

Read Variable:				
sRN rs422PeriodicOutputContent				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	rs422PeriodicOutputContent	String	26	Select what to output periodically; nothing (periodic output disabled), only distance, distance and velocity or distance and status.

Read Variable Response:				
sRA rs422PeriodicOutputContent <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	rs422PeriodicOutputContent	String	26	Select what to output periodically; nothing (periodic output disabled), only distance, distance and velocity or distance and status.
Variable Data	data	Enum8	1	

Write Variable:				
sWN rs422PeriodicOutputContent <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	rs422PeriodicOutputContent	String	26	Select what to output periodically; nothing (periodic output disabled), only distance, distance and velocity or distance and status.
Variable Data	data	Enum8	1	

Write Variable Response:				
sWA rs422PeriodicOutputContent				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	rs422PeriodicOutputContent	String	26	Select what to output periodically; nothing (periodic output disabled), only distance, distance and velocity or distance and status.

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN rs422PeriodicOutputContent[ETX]
Read Variable Response:	[STX]sRA rs422PeriodicOutputContent 0[ETX]
Write Variable:	[STX]sWN rs422PeriodicOutputContent 0[ETX]
Write Variable Response:	[STX]sWA rs422PeriodicOutputContent[ETX]

3.1.4.2.5 Variable: rs422PeriodicOutputFormat [RS-422 data protocol]

The following section contains a detailed description of the variable rs422PeriodicOutputFormat.

Variable Overview

Variable Name	Description
rs422PeriodicOutputFormat	Select format/framing used for periodic output; SerialLink or CR/LF protocol.

Read-Access	Always
Write-Access	AuthorizedClient, Service

Enum8			
Default Value		CRLF	
	Value	Name	Description
	0	SERIAL_LINK	
	1	CRLF	

Variable Telegram Syntax

Read Variable:				
sRN rs422PeriodicOutputFormat				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	rs422PeriodicOutputFormat	String	25	Select format/framing used for periodic output; SerialLink or CR/LF protocol.

Read Variable Response:				
sRA rs422PeriodicOutputFormat <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	rs422PeriodicOutputFormat	String	25	Select format/framing used for periodic output; SerialLink or CR/LF protocol.
Variable Data	data	Enum8	1	

Write Variable:				
sWN rs422PeriodicOutputFormat <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	rs422PeriodicOutputFormat	String	25	Select format/framing used for periodic output; SerialLink or CR/LF protocol.
Variable Data	data	Enum8	1	

Write Variable Response:				
sWA rs422PeriodicOutputFormat				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	rs422PeriodicOutputFormat	String	25	Select format/framing used for periodic output; SerialLink or CR/LF protocol.

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN rs422PeriodicOutputFormat[ETX]
Read Variable Response:	[STX]sRA rs422PeriodicOutputFormat 1[ETX]
Write Variable:	[STX]sWN rs422PeriodicOutputFormat 1[ETX]
Write Variable Response:	[STX]sWA rs422PeriodicOutputFormat[ETX]

3.1.4.2.6 Variable: rs422PeriodicDuration [RS-422 output cycle time]

The following section contains a detailed description of the variable rs422PeriodicDuration.

Variable Overview

Variable Name	Description
rs422PeriodicDuration	Cycle duration of periodic output in ms; set to 0 to output as fast as possible.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UDInt	
Value Range	0..1000
Initialisation	1

Variable Telegram Syntax

Read Variable:				
sRN rs422PeriodicDuration				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	rs422PeriodicDuration	String	21	Cycle duration of periodic output in ms; set to 0 to output as fast as possible.

Read Variable Response:				
sRA rs422PeriodicDuration <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	rs422PeriodicDuration	String	21	Cycle duration of periodic output in ms; set to 0 to output as fast as possible.
Variable Data	data	UDInt	4	

Write Variable:				
sWN rs422PeriodicDuration <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWN	String	3	Write SOPAS Variable by Name

Write Variable:				
sWN rs422PeriodicDuration <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	rs422PeriodicDuration	String	21	Cycle duration of periodic output in ms; set to 0 to output as fast as possible.
Variable Data	data	UDInt	4	

Write Variable Response:				
sWA rs422PeriodicDuration				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	rs422PeriodicDuration	String	21	Cycle duration of periodic output in ms; set to 0 to output as fast as possible.

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN rs422PeriodicDuration[ETX]
Read Variable Response:	[STX]sRA rs422PeriodicDuration 1[ETX]
Write Variable:	[STX]sWN rs422PeriodicDuration 1[ETX]
Write Variable Response:	[STX]sWA rs422PeriodicDuration[ETX]

3.1.4.2.7 Variable: rs422BaudRate [RS-422 data transmission rate]

The following section contains a detailed description of the variable rs422BaudRate.

Variable Overview

Variable Name
rs422BaudRate

Read-Access	Always
Write-Access	AuthorizedClient, Service

Enum8			
	Value	Name	Description
	4	4800	
	5	9600	
	6	19200	
	7	38400	
	8	57600	
	9	115200	
	12	230400	

Variable Telegram Syntax

Read Variable:				
sRN rs422BaudRate				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	rs422BaudRate	String	13	

Read Variable Response:				
sRA rs422BaudRate <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	rs422BaudRate	String	13	
Variable Data	data	Enum8	1	

Write Variable:				
sWN rs422BaudRate <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	rs422BaudRate	String	13	
Variable Data	data	Enum8	1	

Write Variable Response:				
sWA rs422BaudRate				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	rs422BaudRate	String	13	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN rs422BaudRate[ETX]
Read Variable Response:	[STX]sRA rs422BaudRate[ETX]
Write Variable:	[STX]sWN rs422BaudRate[ETX]
Write Variable Response:	[STX]sWA rs422BaudRate[ETX]

3.1.4.2.8 Variable: rs422ByteFormat [RS-422 data format]

The following section contains a detailed description of the variable rs422ByteFormat.

Variable Overview

Variable Name
rs422ByteFormat

Read-Access	Always
Write-Access	AuthorizedClient, Service

Enum8			
	Value	Name	Description
	0	7N1	
	1	7O1	
	2	7E1	
	3	8N1	
	4	8O1	
	5	8E1	

Variable Telegram Syntax

Read Variable:				
sRN rs422ByteFormat				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	rs422ByteFormat	String	15	

Read Variable Response:				
sRA rs422ByteFormat <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	rs422ByteFormat	String	15	
Variable Data	data	Enum8	1	

Write Variable:				
sWN rs422ByteFormat <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWN	String	3	Write SOPAS Variable by Name
Command	rs422ByteFormat	String	15	
Variable Data	data	Enum8	1	

Write Variable Response:				
sWA rs422ByteFormat				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sWA	String	3	SOPAS Variable Write Acknowledge
Command	rs422ByteFormat	String	15	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN rs422ByteFormat[ETX]
Read Variable Response:	[STX]sRA rs422ByteFormat 0[ETX]
Write Variable:	[STX]sWN rs422ByteFormat 0[ETX]
Write Variable Response:	[STX]sWA rs422ByteFormat[ETX]

3.1.5 Info

3.1.5.1 Device

3.1.5.1.1 Variable: hwUpdateNumber [hardware revision of sensor]

The following section contains a detailed description of the variable hwUpdateNumber.

Variable Overview

Variable Name	Description
hwUpdateNumber	Hardware Update Number

Read-Access	Always
Write-Access	No! (readonly)

FlexString	
Length	0..8
Initialisation	00000000

Variable Telegram Syntax

Read Variable:				
sRN hwUpdateNumber				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	hwUpdateNumber	String	14	Hardware Update Number

Read Variable Response:				
sRA hwUpdateNumber <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	hwUpdateNumber	String	14	Hardware Update Number
Variable Data	data	FlexString	8	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN hwUpdateNumber[ETX]
Read Variable Response:	[STX]sRA hwUpdateNumber 8 00000000[ETX]

3.1.5.1.2 Variable: productPartNo [part number of sensor]

The following section contains a detailed description of the variable productPartNo.

Variable Overview

Variable Name	Description
productPartNo	Product Part Number

Read-Access	No! (writeonly)
Write-Access	No! (readonly)

FlexString	
Length	0..7
Initialisation	0000000

Variable Telegram Examples

Example: Default Values
Variable telegram examples with data set to default values.

3.1.5.1.3 Variable: SerialNumber [serial number of sensor]

The following section contains a detailed description of the variable SerialNumber.

Variable Overview

Variable Name	Description
SerialNumber	serial number of device

Read-Access	Always
Write-Access	No! (readonly)

FlexString	
Length	0..8
Initialisation	12345678

Read Variable:				
`sRN SerialNumber`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	SerialNumber	String	12	serial number of device

Read Variable Response:				
`sRA SerialNumber <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	SerialNumber	String	12	serial number of device
Variable Data	data	FlexString	8	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	`[STX]sRN SerialNumber[ETX]`
Read Variable Response:	`[STX]sRA SerialNumber 8 12345678[ETX]`

3.1.5.1.4 Variable: productCode [product code/type of sensor]

The following section contains a detailed description of the variable productCode.

Variable Overview

Variable Name	Description
productCode	Product Code

Read-Access	Always
Write-Access	No! (readonly)

FlexString	
Length	0..18
Initialisation	Dx1000-S11101

Read Variable:

```
sRN productCode
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	productCode	String	11	Product Code

Read Variable Response:

```
sRA productCode <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	productCode	String	11	Product Code
Variable Data	data	FlexString	18	

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	`[STX]sRN productCode[ETX]`
Read Variable Response:	`[STX]sRA productCode D Dx1000-S11101[ETX]`

3.1.5.1.5 Variable: interfaceVersion [interface revision]

The following section contains a detailed description of the variable interfaceVersion.

Variable Overview

Variable Name	Description
interfaceVersion	Interface Version of application controller: version.subversion.revison.build

Read-Access	Always
Write-Access	No! (readonly)

FlexString	
Length	0..11
Initialisation	000.000.000

Read Variable:

```
sRN interfaceVersion
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	interfaceVersion	String	16	Interface Version of application controller: version.subversion.revison.build

Read Variable Response:				
sRA interfaceVersion <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	interfaceVersion	String	16	Interface Version of application controller: version.subversion.revison.build
Variable Data	data	FlexString	11	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN interfaceVersion[ETX]
Read Variable Response:	[STX]sRA interfaceVersion B 000.000.000[ETX]

3.1.5.1.6 Variable: firmwareBuildTime [Firmware: created on]

The following section contains a detailed description of the variable firmwareBuildTime.

Variable Overview

Variable Name	Description
firmwareBuildTime	Firmware Build Time

Read-Access	Always
Write-Access	No! (readonly)

FlexString	
Length	0..21
Initialisation	2015/01/01 00:00:00

Read Variable:				
sRN firmwareBuildTime				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	firmwareBuildTime	String	17	Firmware Build Time

Read Variable Response:				
sRA firmwareBuildTime <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	firmwareBuildTime	String	17	Firmware Build Time
Variable Data	data	FlexString	21	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN firmwareBuildTime[ETX]
Read Variable Response:	[STX]sRA firmwareBuildTime 13 2015/01/01 00:00:00[ETX]

3.1.5.1.7 Variable: firmwareVerification [firmware verification]

The following section contains a detailed description of the variable firmwareVerification.

Variable Overview

Variable Name	Description
firmwareVerification	Hash value computed over all firmware vectors

Read-Access	Always
Write-Access	No! (readonly)

FlexString	
Length	0..19
Initialisation	0000-0000-0000-0000

Read Variable:

```
sRN firmwareVerification
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	firmwareVerification	String	20	Hash value computed over all firmware vectors

Read Variable Response:

```
sRA firmwareVerification <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	firmwareVerification	String	20	Hash value computed over all firmware vectors
Variable Data	data	FlexString	19	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	`[STX]sRN firmwareVerification[ETX]`
Read Variable Response:	`[STX]sRA firmwareVerification 13 0000-0000-0000-0000[ETX]`

3.1.5.2 IOs

3.1.5.2.1 Variable: eventCntIo1 [IO counter: In1/Q1]

The following section contains a detailed description of the variable eventCntIo1.

Variable Overview

Variable Name	Description
eventCntIo1	Event counter of IO 1

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

UDInt	
Value Range	0..4294967295
Initialisation	0

Variable Telegram Syntax

Read Variable:

```
sRN eventCntIo1
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	eventCntIo1	String	11	Event counter of IO 1

Read Variable Response:

```
sRA eventCntIo1 <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	eventCntIo1	String	11	Event counter of IO 1
Variable Data	data	UDInt	4	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	`[STX]sRN eventCntIo1[ETX]`
Read Variable Response:	`[STX]sRA eventCntIo1 0[ETX]`

3.1.5.2.2 Variable: eventCntIo2 [IO counter: Q2]

The following section contains a detailed description of the variable eventCntIo2.

Variable Overview

Variable Name	Description
eventCntIo2	Event counter of IO 2

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

UDInt	
Value Range	0..4294967295
Initialisation	0

Variable Telegram Syntax

Read Variable:

```
sRN eventCntIo2
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	eventCntIo2	String	11	Event counter of IO 2

Read Variable Response:

```
sRA eventCntIo2 <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	eventCntIo2	String	11	Event counter of IO 2
Variable Data	data	UDInt	4	

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	`[STX]sRN eventCntIo2[ETX]`
Read Variable Response:	`[STX]sRA eventCntIo2 0[ETX]`

3.1.5.2.3 Variable: eventCntIo3 [IO counter: Q3]

The following section contains a detailed description of the variable eventCntIo3.

Variable Overview

Variable Name	Description
eventCntIo3	Event counter of IO 3

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

UDInt	
Value Range	0..4294967295
Initialisation	0

Variable Telegram Syntax

Read Variable:

```
sRN eventCntIo3
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	eventCntIo3	String	11	Event counter of IO 3

Read Variable Response:				
sRA eventCntIo3 <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	eventCntIo3	String	11	Event counter of IO 3
Variable Data	data	UDInt	4	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN eventCntIo3[ETX]
Read Variable Response:	[STX]sRA eventCntIo3 0[ETX]

3.1.5.2.4 Variable: eventCntIo4 [IO counter: Q4]

The following section contains a detailed description of the variable eventCntIo4.

Variable Overview

Variable Name	Description
eventCntIo4	Event counter of IO 4

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

UDInt	
Value Range	0..4294967295
Initialisation	0

Variable Telegram Syntax

Read Variable:				
sRN eventCntIo4				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	eventCntIo4	String	11	Event counter of IO 4

Read Variable Response:				
sRA eventCntIo4 <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	eventCntIo4	String	11	Event counter of IO 4
Variable Data	data	UDInt	4	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN eventCntIo4[ETX]
Read Variable Response:	[STX]sRA eventCntIo4 0[ETX]

3.1.5.2.5 Variable: eventCntIo5 [IO counter: In2]

The following section contains a detailed description of the variable eventCntIo5.

Variable Overview

Variable Name	Description
eventCntIo5	Event counter of IO 5

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

UDInt	
Value Range	0..4294967295
Initialisation	0

Variable Telegram Syntax

Read Variable:				
sRN eventCntIo5				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	eventCntIo5	String	11	Event counter of IO 5

Read Variable Response:				
sRA eventCntIo5 <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	eventCntIo5	String	11	Event counter of IO 5
Variable Data	data	UDInt	4	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN eventCntIo5[ETX]
Read Variable Response:	[STX]sRA eventCntIo5 0[ETX]

3.1.5.2.6 Method: resetEventCounters [deleting the counter readings of switching events/reset]

The following section contains a detailed description of the method resetEventCounters.

Method Overview

Method Name	Description
resetEventCounters	Reset the IO event counters

Invocation Access	Always

Method Telegram Syntax

Method Invocation:				
sMN resetEventCounters				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sMN	String	3	Request (SOPAS Method by Name)
Command	resetEventCounters	String	18	Reset the IO event counters

Method Return Value:				
sAN resetEventCounters				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sAN	String	3	Result (SOPAS Method Result)
Command	resetEventCounters	String	18	Reset the IO event counters

Method Telegram Examples

Example: Default Values	
Method telegram examples with parameter data and return value data set to default values.	
Method Invocation:	[STX]sMN resetEventCounters[ETX]
Method Return Value:	[STX]sAN resetEventCounters[ETX]

3.2 Measurement

3.2.1 Variable: Distance [measured distance to object]

The following section contains a detailed description of the variable Distance.

Variable Overview

Variable Name	Description
Distance	Distance in mm

Read-Access	Always
Write-Access	No! (readonly)

DInt	
Value Range	-2147483648..2147483647
Initialisation	0
Physical Unit	mm

Variable Telegram Syntax

Read Variable:				
`sRN Distance`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	Distance	String	8	Distance in mm

Read Variable Response:				
`sRA Distance <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	Distance	String	8	Distance in mm
Variable Data	data	DInt	4	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	`[STX]sRN Distance[ETX]`
Read Variable Response:	`[STX]sRA Distance 0[ETX]`

3.2.2 Variable: DistanceF [measured distance to object]

The following section contains a detailed description of the variable DistanceF.

Variable Overview

Variable Name	Description
DistanceF	Distance in mm (float)

Read-Access	Always
Write-Access	No! (readonly)

Real	
Value Range	See specification IEEE 754
Initialisation	0
Physical Unit	mm

Variable Telegram Syntax

Read Variable:				
`sRN DistanceF`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	DistanceF	String	9	Distance in mm (float)

Read Variable Response:				
sRA DistanceF <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	DistanceF	String	9	Distance in mm (float)
Variable Data	data	Real	4	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN DistanceF[ETX]
Read Variable Response:	[STX]sRA DistanceF 00000000[ETX]

3.2.3 Variable: Velocity [measured object speed]

The following section contains a detailed description of the variable Velocity.

Variable Overview

Variable Name	Description
Velocity	Velocity in mm / s

Read-Access	Always
Write-Access	No! (readonly)

DInt	
Value Range	-2147483648..2147483647
Initialisation	0
Physical Unit	mm/s

Variable Telegram Syntax

Read Variable:				
sRN Velocity				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	Velocity	String	8	Velocity in mm / s

Read Variable Response:				
sRA Velocity <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	Velocity	String	8	Velocity in mm / s
Variable Data	data	DInt	4	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN Velocity[ETX]
Read Variable Response:	[STX]sRA Velocity 0[ETX]

3.2.4 Variable: RSSI [measured signal level]

The following section contains a detailed description of the variable RSSI.

Variable Overview

Variable Name	Description
RSSI	Rx Level

Read-Access	Always
Write-Access	No! (readonly)

DInt	
Value Range	-2147483648..2147483647
Initialisation	0

Variable Telegram Syntax

Read Variable:				
sRN RSSI				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	RSSI	String	4	Rx Level

Read Variable Response:				
sRA RSSI <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	RSSI	String	4	Rx Level
Variable Data	data	DInt	4	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN RSSI[ETX]
Read Variable Response:	[STX]sRA RSSI 0[ETX]

3.2.5 Variable: deviceTemperature [measured operating temperature of the device]

The following section contains a detailed description of the variable deviceTemperature.

Variable Overview

Variable Name	Description
deviceTemperature	Device temperature

Read-Access	Always
Write-Access	No! (readonly)

SInt	
Value Range	-128..127
Initialisation	0
Physical Unit	°C

Variable Telegram Syntax

Read Variable:				
sRN deviceTemperature				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	deviceTemperature	String	17	Device temperature

Read Variable Response:				
sRA deviceTemperature <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	deviceTemperature	String	17	Device temperature
Variable Data	data	SInt	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	`[STX]sRN deviceTemperature[ETX]`
Read Variable Response:	`[STX]sRA deviceTemperature 0[ETX]`

3.2.6 Variable: OpHoursDevice [operating time display]

The following section contains a detailed description of the variable OpHoursDevice.

Variable Overview

Variable Name	Description
OpHoursDevice	The total number of operating hours during the lifetime of the device. Resolution is a 1 hour

Read-Access	Always
Write-Access	No! (readonly)

UDInt	
Value Range	0..4294967295
Initialisation	0
Physical Unit	h

Variable Telegram Syntax

Read Variable:

```
sRN OpHoursDevice
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	OpHoursDevice	String	13	The total number of operating hours during the lifetime of the device. Resolution is a 1 hour

Read Variable Response:

```
sRA OpHoursDevice <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	OpHoursDevice	String	13	The total number of operating hours during the lifetime of the device. Resolution is a 1 hour
Variable Data	data	UDInt	4	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	`[STX]sRN OpHoursDevice[ETX]`
Read Variable Response:	`[STX]sRA OpHoursDevice 0[ETX]`

3.3 Device Status Flags

3.3.1 Info

3.3.1.1 Variable: noEcho [bit 11 of status word: no echo]

The following section contains a detailed description of the variable noEcho.

Variable Overview

Variable Name
noEcho

Read-Access	Always
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
sRN noEcho				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	noEcho	String	6	

Read Variable Response:				
sRA noEcho <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	noEcho	String	6	
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN noEcho[ETX]
Read Variable Response:	[STX]sRA noEcho 0[ETX]

3.3.1.2 Variable: BridgingActive [bit 12 of status word: no echo: delay time active]

The following section contains a detailed description of the variable BridgingActive.

Variable Overview

Variable Name
BridgingActive

Read-Access	Always
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
sRN BridgingActive				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	BridgingActive	String	14	

Read Variable Response:				
sRA BridgingActive <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	BridgingActive	String	14	
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN BridgingActive[ETX]
Read Variable Response:	[STX]sRA BridgingActive 0[ETX]

3.3.1.3 Variable: laserState [bit 14 of status word: measurement laser active]

The following section contains a detailed description of the variable laserState.

Variable Overview

Variable Name	Description
laserState	signals if measurement laser is on or off

Read-Access	Always
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:

```
sRN laserState
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	laserState	String	10	signals if measurement laser is on or off

Read Variable Response:

```
sRA laserState <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	laserState	String	10	signals if measurement laser is on or off
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	`[STX]sRN laserState[ETX]`
Read Variable Response:	`[STX]sRA laserState 0[ETX]`

3.3.1.4 Variable: pilotState [bit 15 of status word: alignment laser active]

The following section contains a detailed description of the variable pilotState.

Variable Overview

Variable Name	Description
pilotState	signals if pilot laser is on or off

Read-Access	Always
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:

```
sRN pilotState
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	pilotState	String	10	signals if pilot laser is on or off

Read Variable Response:				
sRA pilotState <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	pilotState	String	10	signals if pilot laser is on or off
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN pilotState[ETX]
Read Variable Response:	[STX]sRA pilotState 0[ETX]

3.3.1.5 Variable: heaterStatus [bit 13 of status word: heating active]

The following section contains a detailed description of the variable heaterStatus.

Variable Overview

Variable Name	Description
heaterStatus	Signals if heater is on (1) or off (0)

Read-Access	Always
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
sRN heaterStatus				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	heaterStatus	String	12	Signals if heater is on (1) or off (0)

Read Variable Response:				
sRA heaterStatus <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	heaterStatus	String	12	Signals if heater is on (1) or off (0)
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN heaterStatus[ETX]
Read Variable Response:	[STX]sRA heaterStatus 0[ETX]

3.3.1.6 Variable: io1state [bit 6 of status word: status (=switching state or input state) of Q1/In1]

The following section contains a detailed description of the variable io1state.

Variable Overview

Variable Name	Description
io1state	State of IO 1

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
sRN io1state				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	io1state	String	8	State of IO 1

Read Variable Response:				
sRA io1state <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	io1state	String	8	State of IO 1
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN io1state[ETX]
Read Variable Response:	[STX]sRA io1state 0[ETX]

3.3.1.7 Variable: io2state [bit 7 of status word: status (=switching state) of Q2]

The following section contains a detailed description of the variable io2state.

Variable Overview

Variable Name	Description
io2state	State of IO 2

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
sRN io2state				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	io2state	String	8	State of IO 2

Read Variable Response:				
sRA io2state <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	io2state	String	8	State of IO 2
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN io2state[ETX]
Read Variable Response:	[STX]sRA io2state 0[ETX]

3.3.1.8 Variable: io3state [bit 8 of status word: status (=switching state) of Q3]

The following section contains a detailed description of the variable io3state.

Variable Overview

Variable Name	Description
io3state	State of IO 3

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
sRN io3state				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	io3state	String	8	State of IO 3

Read Variable Response:				
sRA io3state <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	io3state	String	8	State of IO 3
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN io3state[ETX]
Read Variable Response:	[STX]sRA io3state 0[ETX]

3.3.1.9 Variable: io4state [bit 9 of status word: status (=switching state) of Q4]

The following section contains a detailed description of the variable io4state.

Variable Overview

Variable Name	Description
io4state	State of IO 4

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
sRN io4state				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	io4state	String	8	State of IO 4

Read Variable Response:				
sRA io4state <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	io4state	String	8	State of IO 4
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN io4state[ETX]
Read Variable Response:	[STX]sRA io4state 0[ETX]

3.3.1.10 Variable: io5state [bit 10 of status word: status (= input state) of In2]

The following section contains a detailed description of the variable io5state.

Variable Overview

Variable Name	Description
io5state	State of IO 5

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
sRN io5state				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	io5state	String	8	State of IO 5

Read Variable Response:				
sRA io5state <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	io5state	String	8	State of IO 5
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN io5state[ETX]
Read Variable Response:	[STX]sRA io5state 0[ETX]

3.3.1.11 Variable: io1level [bit 1 of status word: level (= output or input potential) of Q1/In1]

The following section contains a detailed description of the variable io1level.

Variable Overview

Variable Name	Description
io1level	State of IO 1

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:

```
sRN io1level
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	io1level	String	8	State of IO 1

Read Variable Response:

```
sRA io1level <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	io1level	String	8	State of IO 1
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	`[STX]sRN io1level[ETX]`
Read Variable Response:	`[STX]sRA io1level 0[ETX]`

3.3.1.12 Variable: io2level [bit 2 of status word: level (= output potential) of Q2]

The following section contains a detailed description of the variable io2level.

Variable Overview

Variable Name	Description
io2level	Level of IO 2

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:

```
sRN io2level
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	io2level	String	8	Level of IO 2

Read Variable Response:				
sRA io2level <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	io2level	String	8	Level of IO 2
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN io2level[ETX]
Read Variable Response:	[STX]sRA io2level 0[ETX]

3.3.1.13 Variable: io3level [bit 3 of status word: level (= output potential) of Q3]

The following section contains a detailed description of the variable io3level.

Variable Overview

Variable Name	Description
io3level	Level of IO 3

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
sRN io3level				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	io3level	String	8	Level of IO 3

Read Variable Response:				
sRA io3level <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	io3level	String	8	Level of IO 3
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN io3level[ETX]
Read Variable Response:	[STX]sRA io3level 0[ETX]

3.3.1.14 Variable: io4level [bit 4 of status word: level (= output potential) of Q4]

The following section contains a detailed description of the variable io4level.

Variable Overview

Variable Name	Description
io4level	Level of IO 4

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
sRN io4level				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	io4level	String	8	Level of IO 4

Read Variable Response:				
sRA io4level <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	io4level	String	8	Level of IO 4
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN io4level[ETX]
Read Variable Response:	[STX]sRA io4level 0[ETX]

3.3.1.15 Variable: io5level [bit 5 of status word: level (= input potential) of In2]

The following section contains a detailed description of the variable io5level.

Variable Overview

Variable Name	Description
io5level	Level of IO 5

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
sRN io5level				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	io5level	String	8	Level of IO 5

Read Variable Response:				
sRA io5level <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	io5level	String	8	Level of IO 5
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN io5level[ETX]
Read Variable Response:	[STX]sRA io5level 0[ETX]

3.3.1.16 Variable: deviceStatusWord [device status word definition]

The following section contains a detailed description of the variable deviceStatusWord.

Variable Overview

Variable Name	Description
deviceStatusWord	Device Status Word

Read-Access	Always
Write-Access	No! (readonly)

UDInt	
Value Range	0..4294967295

Variable Telegram Syntax

Read Variable:				
`sRN deviceStatusWord`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	deviceStatusWord	String	16	Device Status Word

Read Variable Response:				
`sRA deviceStatusWord <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	deviceStatusWord	String	16	Device Status Word
Variable Data	data	UDInt	4	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	`[STX]sRN deviceStatusWord[ETX]`
Read Variable Response:	`[STX]sRA deviceStatusWord 0[ETX]`

3.3.2 Error and Warning

3.3.2.1 Variable: laserError [bit 31 of status word: laser error]

The following section contains a detailed description of the variable laserError.

Variable Overview

Variable Name	Description
laserError	Laser Error

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
`sRN laserError`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	laserError	String	10	Laser Error

Read Variable Response:				
sRA laserError <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	laserError	String	10	Laser Error
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN laserError[ETX]
Read Variable Response:	[STX]sRA laserError 0[ETX]

3.3.2.2 Variable: hardwareFailure [bit 30 of status word: hardware error]

The following section contains a detailed description of the variable hardwareFailure.

Variable Overview

Variable Name	Description
hardwareFailure	Hardware Failure

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
sRN hardwareFailure				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	hardwareFailure	String	15	Hardware Failure

Read Variable Response:				
sRA hardwareFailure <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	hardwareFailure	String	15	Hardware Failure
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN hardwareFailure[ETX]
Read Variable Response:	[STX]sRA hardwareFailure 0[ETX]

3.3.2.3 Variable: measurementError [bit 29 of status word: measurement error]

The following section contains a detailed description of the variable measurementError.

Variable Overview

Variable Name	Description
measurementError	Measurement Error

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
sRN measurementError				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	measurementError	String	16	Measurement Error

Read Variable Response:				
sRA measurementError <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	measurementError	String	16	Measurement Error
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN measurementError[ETX]
Read Variable Response:	[STX]sRA measurementError 0[ETX]

3.3.2.4 Variable: ambientLightError [bit 27 of status word: ambient light error]

The following section contains a detailed description of the variable ambientLightError.

Variable Overview

Variable Name	Description
ambientLightError	Ambient Light Error

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
sRN ambientLightError				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	ambientLightError	String	17	Ambient Light Error

Read Variable Response:				
sRA ambientLightError <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	ambientLightError	String	17	Ambient Light Error
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN ambientLightError[ETX]
Read Variable Response:	[STX]sRA ambientLightError 0[ETX]

3.3.2.5 Variable: temperatureError [bit 28 of status word: temperature error]

The following section contains a detailed description of the variable temperatureError.

Variable Overview

Variable Name	Description
temperatureError	Laser Error

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:

```
sRN temperatureError
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	temperatureError	String	16	Laser Error

Read Variable Response:

```
sRA temperatureError <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	temperatureError	String	16	Laser Error
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	`[STX]sRN temperatureError[ETX]`
Read Variable Response:	`[STX]sRA temperatureError 0[ETX]`

3.3.2.6 Variable: laserWarning [bit 23 of status word: warning: Laser]

The following section contains a detailed description of the variable laserWarning.

Variable Overview

Variable Name	Description
laserWarning	Laser Warning

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:

```
sRN laserWarning
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	laserWarning	String	12	Laser Warning

Read Variable Response:				
sRA laserWarning <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	laserWarning	String	12	Laser Warning
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN laserWarning[ETX]
Read Variable Response:	[STX]sRA laserWarning 0[ETX]

3.3.2.7 Variable: firmwareWarning [bit 22 of status word: firmware warning]

The following section contains a detailed description of the variable firmwareWarning.

Variable Overview

Variable Name	Description
firmwareWarning	Firmware Warning

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
sRN firmwareWarning				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	firmwareWarning	String	15	Firmware Warning

Read Variable Response:				
sRA firmwareWarning <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	firmwareWarning	String	15	Firmware Warning
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN firmwareWarning[ETX]
Read Variable Response:	[STX]sRA firmwareWarning 0[ETX]

3.3.2.8 Variable: ambientLightWarning [bit 19 of status word: warning: ambient light]

The following section contains a detailed description of the variable ambientLightWarning.

Variable Overview

Variable Name	Description
ambientLightWarning	Ambient Light Warning

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
sRN ambientLightWarning				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	ambientLightWarning	String	19	Ambient Light Warning

Read Variable Response:				
sRA ambientLightWarning <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	ambientLightWarning	String	19	Ambient Light Warning
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN ambientLightWarning[ETX]
Read Variable Response:	[STX]sRA ambientLightWarning 0[ETX]

3.3.2.9 Variable: temperatureWarning [bit 20 of status word: warning: temperature]

The following section contains a detailed description of the variable temperatureWarning.

Variable Overview

Variable Name	Description
temperatureWarning	Laser Warning

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
sRN temperatureWarning				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	temperatureWarning	String	18	Laser Warning

Read Variable Response:				
sRA temperatureWarning <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	temperatureWarning	String	18	Laser Warning
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	[STX]sRN temperatureWarning[ETX]
Read Variable Response:	[STX]sRA temperatureWarning 0[ETX]

3.3.2.10 Variable: doFault [bit 21 of status word: warning: shortcircuit at switching output]

The following section contains a detailed description of the variable doFault.

Variable Overview

Variable Name	Description
doFault	Fault at DO 1,2,3 or 4

Read-Access	AuthorizedClient, Service
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
`sRN doFault`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRN	String	3	Read SOPAS Variable by Name
Command	doFault	String	7	Fault at DO 1,2,3 or 4

Read Variable Response:				
`sRA doFault <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sRA	String	3	SOPAS Variable Read Acknowledge
Command	doFault	String	7	Fault at DO 1,2,3 or 4
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values	
Variable telegram examples with data set to default values.	
Read Variable:	`[STX]sRN doFault[ETX]`
Read Variable Response:	`[STX]sRA doFault 0[ETX]`

3.4 Methods

3.4.1 General

3.4.1.1 Method: SetAccessMode

The following section contains a detailed description of the method SetAccessMode.

Method Overview

Method Name	Description
SetAccessMode	Change operation mode returns True, if successful

Invocation Access	Always

Parameters		
NewMode		
	SInt	
	Value Range	-128..127
Password		hash value
	UDInt	
	Value Range	0..4294967295

Return Values	
success	
Bool	
Value Range	False, True
Initialisation	False

Method Telegram Syntax

Method Invocation:				
`sMN SetAccessMode <NewMode> <Password>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sMN	String	3	Request (SOPAS Method by Name)
Command	SetAccessMode	String	13	Change operation mode returns True, if successful
Parameter 1	NewMode	SInt	1	
Parameter 2	Password	UDInt	4	hash value

Method Return Value:				
`sAN SetAccessMode <success>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sAN	String	3	Result (SOPAS Method Result)
Command	SetAccessMode	String	13	Change operation mode returns True, if successful
Return Value 1	success	Bool	1	

Example: Default Values	
Method telegram examples with parameter data and return value data set to default values.	
Method Invocation:	`[STX]sMN SetAccessMode 0 0[ETX]`
Method Return Value:	`[STX]sAN SetAccessMode 0[ETX]`

3.4.1.2 Method: Run

The following section contains a detailed description of the method Run.

Method Overview

Method Name	Description
Run	Change operation mode to "Run"

Invocation Access	Always

Return Values	
success	
Bool	
Value Range	False, True
Initialisation	False

Method Telegram Syntax

Method Invocation:				
`sMN Run`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sMN	String	3	Request (SOPAS Method by Name)
Command	Run	String	3	Change operation mode to "Run"

Method Return Value:				
`sAN Run <success>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sAN	String	3	Result (SOPAS Method Result)
Command	Run	String	3	Change operation mode to "Run"
Return Value 1	success	Bool	1	

Example: Default Values	
Method telegram examples with parameter data and return value data set to default values.	
Method Invocation:	`[STX]sMN Run[ETX]`
Method Return Value:	`[STX]sAN Run 0[ETX]`

3.4.1.3 Method: resetParamAndReboot [reset and reboot]

The following section contains a detailed description of the method resetParamAndReboot.

Method Overview

Method Name	Description
resetParamAndReboot	reset the parametrization and reboot

Invocation Access	AuthorizedClient, Service

Return Values	
Successful	
Bool	
Value Range	False, True
Initialisation	False

Method Telegram Syntax

Method Invocation:				
`sMN resetParamAndReboot`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sMN	String	3	Request (SOPAS Method by Name)
Command	resetParamAndReboot	String	19	reset the parametrization and reboot

Method Return Value:				
`sAN resetParamAndReboot <Successful>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sAN	String	3	Result (SOPAS Method Result)
Command	resetParamAndReboot	String	19	reset the parametrization and reboot
Return Value 1	Successful	Bool	1	

Example: Default Values	
Method telegram examples with parameter data and return value data set to default values.	
Method Invocation:	`[STX]sMN resetParamAndReboot[ETX]`
Method Return Value:	`[STX]sAN resetParamAndReboot 0[ETX]`

3.4.1.4 Method: RebootDevice [reboot]

The following section contains a detailed description of the method RebootDevice.

Method Overview

Method Name	Description
RebootDevice	Method shuts the device down but saves the parameter before shutdown ist executed

Communication Name	mSCreboot
Invocation Access	AuthorizedClient, Service

Method Telegram Syntax

Method Invocation:				
`sMN mSCreboot`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sMN	String	3	Request (SOPAS Method by Name)
Command	mSCreboot	String	9	Method shuts the device down but saves the parameter before shutdown ist executed

Method Return Value:				
sAN mSCreboot				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sAN	String	3	Result (SOPAS Method Result)
Command	mSCreboot	String	9	Method shuts the device down but saves the parameter before shutdown ist executed

Method Telegram Examples

Example: Default Values	
Method telegram examples with parameter data and return value data set to default values.	
Method Invocation:	[STX]sMN mSCreboot[ETX]
Method Return Value:	[STX]sAN mSCreboot[ETX]

3.4.2 Preset

3.4.2.1 Method: autoZero [set output to 0]

The following section contains a detailed description of the method autoZero.

Method Overview

Method Name	Description
autoZero	Auto Zero

Invocation Access	AuthorizedClient, Service

Method Telegram Syntax

Method Invocation:				
sMN autoZero				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sMN	String	3	Request (SOPAS Method by Name)
Command	autoZero	String	8	Auto Zero

Method Return Value:				
sAN autoZero				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sAN	String	3	Result (SOPAS Method Result)
Command	autoZero	String	8	Auto Zero

Method Telegram Examples

Example: Default Values	
Method telegram examples with parameter data and return value data set to default values.	
Method Invocation:	[STX]sMN autoZero[ETX]
Method Return Value:	[STX]sAN autoZero[ETX]

3.4.2.2 Method: activatePreset [activate preset]

The following section contains a detailed description of the method activatePreset.

Method Overview

Method Name	Description
activatePreset	Activate preset

Invocation Access	AuthorizedClient, Service

Method Telegram Syntax

Method Invocation:				
sMN activatePreset				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sMN	String	3	Request (SOPAS Method by Name)
Command	activatePreset	String	14	Activate preset

Method Return Value:				
sAN activatePreset				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sAN	String	3	Result (SOPAS Method Result)
Command	activatePreset	String	14	Activate preset

Method Telegram Examples

Example: Default Values	
Method telegram examples with parameter data and return value data set to default values.	
Method Invocation:	[STX]sMN activatePreset[ETX]
Method Return Value:	[STX]sAN activatePreset[ETX]

3.4.2.3 Method: resetPreset [delete preset value]

The following section contains a detailed description of the method resetPreset.

Method Overview

Method Name	Description
resetPreset	Reset any pending preset

Invocation Access	AuthorizedClient, Service

Method Telegram Syntax

Method Invocation:				
sMN resetPreset				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sMN	String	3	Request (SOPAS Method by Name)
Command	resetPreset	String	11	Reset any pending preset

Method Return Value:				
sAN resetPreset				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command Type	sAN	String	3	Result (SOPAS Method Result)
Command	resetPreset	String	11	Reset any pending preset

Method Telegram Examples

Example: Default Values	
Method telegram examples with parameter data and return value data set to default values.	
Method Invocation:	[STX]sMN resetPreset[ETX]
Method Return Value:	[STX]sAN resetPreset[ETX]

4 User Types

4.1 IOs

4.1.1 Type: ioConfiguration_t

The following section contains a detailed description of the user type ioConfiguration_t.

Type	Description
ioConfiguration_t	Configuration options for an IO

Struct	
doFunction	
UserType	
doFunction_t	See the chapter "User Types" for details.
doDistFunction	
UserType	
distanceFunction_t	See the chapter "User Types" for details.
doVeloFunction	
UserType	
movementDirection_t	See the chapter "User Types" for details.
diFunction	
UserType	
diFunction_t	See the chapter "User Types" for details.
lowerPoint	
UserType	
lowerSwitchPoint_t	See the chapter "User Types" for details.
upperPoint	
UserType	
upperSwitchPoint_t	See the chapter "User Types" for details.
distHysteresis	
UserType	
distHysteresis_t	See the chapter "User Types" for details.
veloSwitchpoint	
UserType	
veloSwitchpoint_t	See the chapter "User Types" for details.
veloHysteresis	
UserType	
veloHysteresis_t	See the chapter "User Types" for details.
servFuncSelection	
UserType	
serviceFunction_t	See the chapter "User Types" for details.
activeState	
UserType	
activeState_t	See the chapter "User Types" for details.

4.1.2 Type: doFunction_t [assign monitoring function (distance, object speed or service) to digital output]

The following section contains a detailed description of the user type doFunction_t.

Type	Description
doFunction_t	DO Function

Enum8			
Default Value		DISTANCE	
	Value	Name	Description
	0	DISTANCE	
	1	VELOCITY	
	2	SERVICE	

4.1.3 Type: distanceFunction_t [define switching function]

The following section contains a detailed description of the user type distanceFunction_t.

Type	Description
distanceFunction_t	Distance Funtion

Enum8			
Default Value		DTO	
	Value	Name	Description
	0	DTO	
	1	WINDOW	
	2	OBSB	

4.1.4 Type: movementDirection_t [defining the monitoring direction for the object speed value: positive (+) or Nnegative (-) or positive and negative (+/-)]

The following section contains a detailed description of the user type movementDirection_t.

Type	Description
movementDirection_t	selects the movement directions which are controlled

Enum8			
Default Value		BOTH	
	Value	Name	Description
	0	POSITIVE_DIRECTION	distance value is increasing
	1	NEGATIVE_DIRECTION	distance values decreasing
	2	BOTH	both directions are controlled

4.1.5 Type: diFunction_t [configuring the switching input: preset, alignment laser on, measurement laser off, deactivated]

The following section contains a detailed description of the user type diFunction_t.

Type	Description
diFunction_t	DI Function

Enum8			
Default Value		NO_FUNCTION	
	Value	Name	Description
	0	PRESET_TRIGGER	
	1	PILOT_ON	
	2	LASER_OFF	
	3	NO_FUNCTION	

4.1.6 Type: lowerSwitchPoint_t [switching function "distance to object": defining the switching point SP for distance value. Switching function "window": switching pointSP1]

The following section contains a detailed description of the user type lowerSwitchPoint_t.

Type	Description
lowerSwitchPoint_t	Point 1 (Can be Switch Point or 4mA point)

DInt	
Value Range	-4500000..4500000
Initialisation	10000

4.1.7 Type: upperSwitchPoint_t [switching function "distance to object": NOT USED. Switching function "window": switching point SP2]

The following section contains a detailed description of the user type upperSwitchPoint_t.

Type	Description
upperSwitchPoint_t	Point 2 (Can be Switch Point or 20mA point)

DInt	
Value Range	-4500000..4500000
Initialisation	20000

4.1.8 Type: distHysteresis_t [switching hysteresis for the distance value]

The following section contains a detailed description of the user type distHysteresis_t.

Type	Description
distHysteresis_t	Hyteresis in mm

UDInt	
Value Range	0..1500000
Initialisation	100

4.1.9 Type: veloSwitchpoint_t [switching point for the object speed value]

The following section contains a detailed description of the user type veloSwitchpoint_t.

Type	Description
veloSwitchpoint_t	Velocity switch point in mm/s

UDInt	
Value Range	0..20000
Initialisation	5000

4.1.10 Type: veloHysteresis_t [switching point hysteresis for the object speed value]

The following section contains a detailed description of the user type veloHysteresis_t.

Type	Description
veloHysteresis_t	Velocity switch point in mm/s

UDInt	
Value Range	0..1000
Initialisation	50

4.1.11 Type: activeState_t [defining the active state]

The following section contains a detailed description of the user type activeState_t.

Type	Description
activeState_t	IO pin can be high or low active

Enum8			
Default Value		LOW_ACTIVE	
	Value	Name	Description
	0	HIGH_ACTIVE	
	1	LOW_ACTIVE	

4.1.12 Type: serviceFunctionState_t [Assigning a switching event to the service functions]

The following section contains a detailed description of the user type serviceFunctionState_t.

Type	Description
serviceFunctionState_t	Service function can be en- or disabled

Enum8			
Default Value		ENABLED	
	Value	Name	Description
	0	DISABLED	
	1	ENABLED	

5 Appendix

5.1 Telegram structure: sFA ErrorCode

Error code	Description	Dec.	Hex.
Sopas_Ok	No error	0	0
Sopas_Error_METHODIN_ACCESSDENIED	Wrong userlevel, access to method not allowed	1	1
Sopas_Error_METHODIN_UNKNOWNINDEX	Trying to access a method with an unknown Sopas index	2	2
Sopas_Error_VARIABLE_UNKNOWNINDEX	Trying to access a variable with an unknown Sopas index	3	3
Sopas_Error_LOCALCONDITIONFAILED	Local condition violated, e.g. giving a value that exceeds the minimum or maximum allowed value for this variable	4	4
Sopas_Error_INVALID _DATA	Invalid data given for variable, this errorcode is deprecated (is not used anymore).	5	5
Sopas_Error_UNKNOWN_ERROR	An error with unknown reason occurred, this errorcode is deprecated.	6	6
Sopas_Error_BUFFER_OVERFLOW	The communication buffer was too small for the amount of data that should be serialised.	7	7
Sopas_Error_BUFFER_UNDERFLOW	More data was expected, the allocated buffer could not be filled.	8	8
Sopas_Error_ERROR_UNKNOWN_TYPE	The variable that shall be serialised has an unknown type. This can only happen when there are variables in the firmware of the device that do not exist in the released description of the device. This should never happen.	9	9
Sopas_Error_VARIABLE_WRITE_ACCESSDEN IED	It is not allowed to write values to this variable. Probably the variable is defined as read-only.	10	A
Sopas_Error_UNKNOWN_CMD_FOR_NAMESE RVER	When using names instead of indices, a command was issued that the nameserver does not understand.	11	B
Sopas_Error_UNKNOWN_COLA_COMMAND	The CoLa protocol specification does not define the given command, command is unknown.	12	C
Sopas_Error_METHODIN_SERVER_BUSY	It is not possible to issue more than one command at a time to an SRT device.	13	D
Sopas_Error_FLEX_OUT_OF_BOUNDS	An array was accessed over its maximum length.	14	E
Sopas_Error_EVENTREG_UNKNOWNINDEX	The event you wanted to register for does not exist, the index is unknown.	15	F
Sopas_Error_COLA_A_VALUE_OVERFLOW	The value does not fit into the value field, it is too large.	16	10
Sopas_Error_COLA_A_INVALID_CHARACTER	Character is unknown, probably not alphanumeric.	17	11

Error code	Description	Dec.	Hex.
Sopas_Error_OSAI_NO_MESSAGE	Only when using SRTOS in the firmware and distributed variables this error can occur. It is an indication that no operating system message could be created. This happens when trying to GET a variable.	18	12
Sopas_Error_OSAI_NO_ANSWER_MESSAGE	This is the same as Sopas_Error_OSAI_NO_MESSAGE with the difference that it is thrown when trying to PUT a variable.	19	13
Sopas_Error_INTERNAL	Internal error in the firmware, problably a pointer to a parameter was null.	20	14
Sopas_Error_HubAddressCorrupted	The Sopas Hubaddress is either too short or too long.	21	15
Sopas_Error_HubAddressDecoding	The Sopas Hubaddress is invalid, it can not be decoded (Syntax).	22	16
Sopas_Error_HubAddressAddressExceeded	Too many hubs in the address	23	17
Sopas_Error_HubAddressBlankExpected	When parsing a HubAddress an expected blank was not found. The HubAddress is not valid.	24	18
Sopas_Error_AsyncMethodsAreSuppressed	An asynchronous method call was made although the device was built with “AsyncMethodsSuppressed”. This is an internal error that should never happen in a released device.	25	19
Sopas_Error_ComplexArraysNotSupported	Device was built with „ComplexArraysSuppressed“ because the compiler does not allow recursions. But now a complex array was found. This is an internal error that should never happen in a released device.	26	20

Example: sFA ErrorCode Wrong userlevel

CoLa A	ASCII	<STX>sFA{SPC}1<ETX>
	Hex	02 73 46 41 20 31 03

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