TECHNICAL INFORMATION

Telegram Listing

Visionary-S CX

SICK
Sensor Intelligence.

Described product

Visionary-S CX

Manufacturer

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Legal information

Original document

This document is an original document of SICK AG.

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1. Disclaimer

This document contains detailed information about single telegrams which can be used to communicate with the device and configure it. Sending telegrams with malformed data or in unproper order can harm the device. So it is highly recommended to use the provided API for unexperienced users!

The telegrams are not guaranteed to remain unchanged in other/newer firmware versions. This means, that if you are using the telegrams you take the responsibilty to take care of changes introduced by firmware updates.

The CoLa protocol specifications allows referencing variables and methods by index - however, only access/invocation by name is recommended for this device!

When reading the CoLa specifications keep in mind that the device uses CoLa-B. For the calculation of the telegram checksum please refer to the provided python example.

The below linked repository contains a set of programming examples implemented in both C++ and Python. These examples are designed to illustrate the practical application of the methods and variables detailed in this document. They provide a comprehensive guide on how to perform read/write operations on these variables and how to effectively invoke the associated methods.

Programming samples: https://github.com/SICKAG/sick_visionary_samples.

2. General

2.1. Introduction

This document describes the functional interfaces of the Visionary-S CX V3S102-1x device, 6.0.0.0R. The Visionary-S CX V3S102-1x device is a SOPAS device. SOPAS devices may have Variables, Methods and Events.

2.2. User Level

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

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

Table 1: User Levels

2.3. Variables

Variables can always be read and can only be written by a user with sufficient user level.

2.4. 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 on the least user level.

2.5. 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.

2.6. 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)

Name	Description	Range of values
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.

Table 2: Basic Datatypes

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. Measurement data

This chapter gathers all information about the used formats and issues with the data streaming.

3.1. Introduction

There are two types of data connections:

Streaming

The device sends out cyclic data; so called *blobs* (**b**inary **l**arge **o**bject **s**).

Control

Channel for acyclic control messages (read variables from device, invoke methods on the device, …).

Figure 1. Connections with the device

The device provides a separation of the streaming into two channels via different ports.

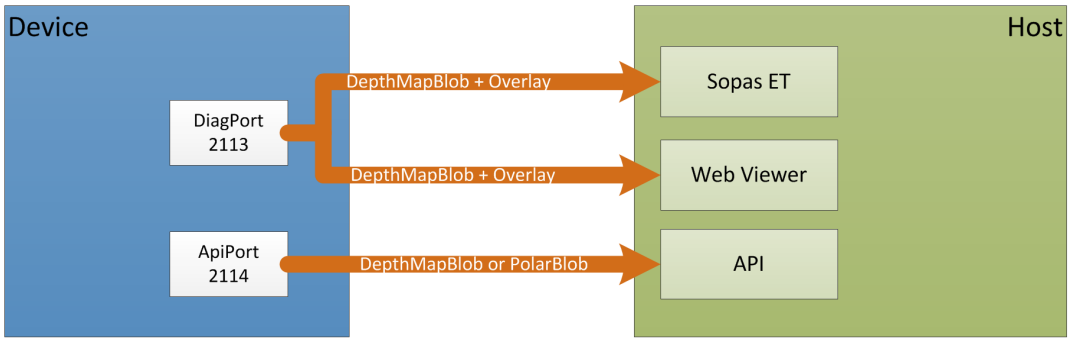

Figure 2. Streaming capabilities of the device

The diagnosis channel sends *depth map* frames containing local Z and rgb intensity maps. Those are complemented with visual overlays that support the diagnosis.
The API channel can be configured to send the intended data channels. Currently, only *depth map* data are supported.
The diagnostics data channel is used by Sopas ET and the Web Interface - hence those do not work in parallel. The ApiPort for the pure data transfer can be configured in the variable called BlobTcpPortAPI.

3.2. Blob format

A blob is formatted in a specific way that gathers all the needed information – see figure below:

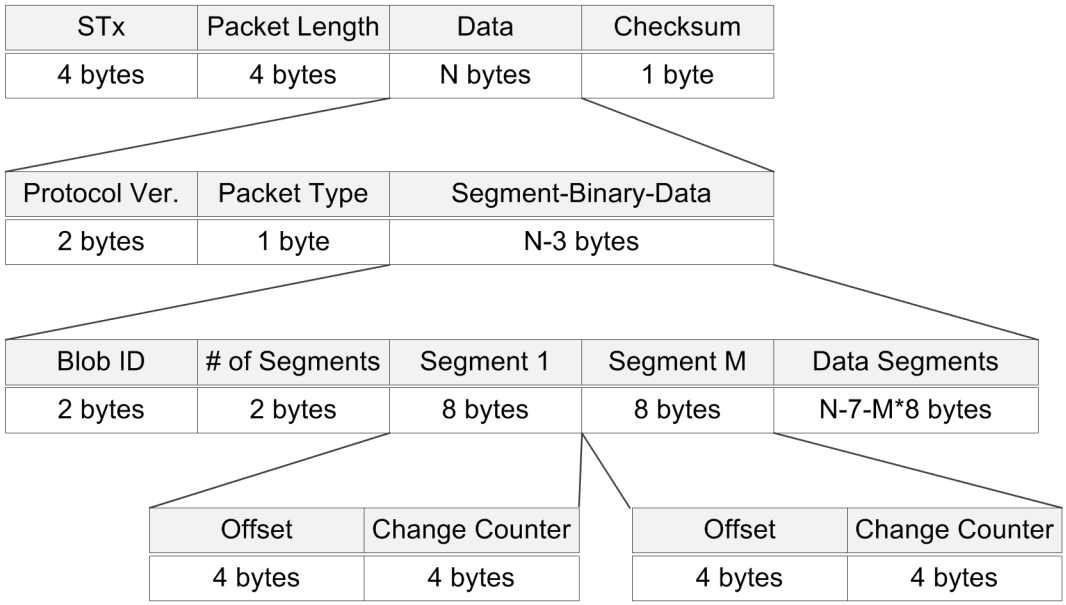

Figure 3. Blob structure overview

The following table describes the blob format items in detail:

Item Name	Description
STx	The framing header, always <0x02> <0x02> <0x02> <0x02>
Packet Length	The total number of bytes contained inside of Data
Data	Blob data without framing
Checksum	Not in use - Always <0x45>
Protocol Ver.	Always <0x00> <0x01>
Packet Type	Always <0x62>
Segment-Binary-Data	Blob data without Protocol Ver. and Packet Type
Blob ID	3D Data identification, always <0x00> <0x01>
# of Segments	The number of segments contained in this blob, M in this example
Segment 1..M	Each segment has its own 8 byte long description
Data Segments	Data Segments content (XML Metadata, Binary data and XML Overlays)
Offset	Defines where the segment data starts, counting begins after Packet Type
Change Counter	A counter value which will change if the segment content has changed

Figure 4. Items and description

3.3. Data Segments

We use the Blob ID = 1 and there are always the following three segments (in the given order):
1) XML metadata
2) Binary data
3) XML overlays

3.3.1. XML metadata

For how to extract the XML Metadata segment from the received data please refer to the Python example in *Data.py* and take a look inside the *Data.read()* method.

logging.debug("The whole XML segment:")
logging.debug(xmlSegment)

3.3.2. Binary data

This segment contains the binary measurement data as captured or computed by the device. For how to extract the measurement values from the binary data segment of the received data please refer to the Python example in *Data.py* and take a look inside the *Data.read()* method. For parsing the binary data itself please refer to the class *BinaryParser* in the same file. There you will also find how to extract the other data like version, frame number, data quality, device status, and so on.
The binary data is structured in several data sets (as specified in the XML metadata part) like shown in the next figures:

Dataset 1				**Dataset 2**			
Length = J	Data	CRC of Data	Length = J	Length = K	Data	CRC of Data	Length = K
4 Bytes	J – 8 Bytes	4 Bytes	4 Bytes	4 Bytes	K – 8 Bytes	4 Bytes	4 Bytes
	J Bytes				K Bytes		

Figure 5. Binary format: scans

Data							
Timestamp	Version	Frame #	Data Quality	Device Status	Distance	RGB	State
8 Bytes	2 Bytes	4 Bytes	1 Byte	1 Byte	640*512*2 bytes	640*512*4 bytes	640*512*2 bytes

Figure 6. Structure of the Data part.

Pitfalls

The timestamp is 64bit in an internal SICK format. See the code in the Python examples (in file Data.py method BinaryParser.logTimeStamp) how to extract date and time. Note that the devices do not contain a real time clock and hence the timestamp can only be used for relative comparisons.

Contrary to all other parts, the binary data (*Depthmap*) is delivered in little-endian.

Please note that for Visionary-S devices the wording distance is sometimes used in place of Z value.

3.3.3. XML overlays

The XML overlays are visualized in Sopas ET and the web interface in order to support the device configuration. Hence, the XML overlay segment always contains an empty overlay for the *ApiPort*.

4. Interfaces

4.1. General Access

4.1.1. LegacyAuth

4.1.1.1. Method: GetAccessMode

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

Method Overview

Method Name	Description
GetAccessMode	This method is used to query the current operation mode. The operation mode corresponds to the User Level ID of an active login. If this value differs from User Level RUN (ID = 0) then the device is in configuration mode.

Invocation Access	Always

Return Values	
opmode	
SInt	
Value Range	-128..127

Method Telegram Syntax

Method Invocation:

```
sMN GetAccessMode
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sMN	String	3	Request (SOPAS Method by Name)
Method	GetAccessMode	String	13	returns actual operation mode

Method Return Value:

```
sAN GetAccessMode <opmode>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sAN	String	3	Result (SOPAS Method Result)
Method	GetAccessMode	String	13	returns actual operation mode
Return Value 1	opmode	SInt	1	

Method Telegram Examples

Example: Default Values

Method telegram examples with parameter data and return value data set to default values.

Method Invocation:	02 02 02 02 00 00 00 12 73 4D 4E 20 47 65 74 41 63 63 65 73 73 4D 6F 64 65 20 21	····sMN GetA ccessMode !
Method Return Value:	02 02 02 02 00 00 00 13 73 41 4E 20 47 65 74 41 63 63 65 73 73 4D 6F 64 65 20 00 2D	····sAN GetA ccessMode ·-

4.1.1.2. Method: SetAccessMode

Calculation of the Password parameter:

```
hash = md5('plaintext password')
```

md5 is 128bit in total interpreted as array of 4x 32bit on the client with **little-endian** byteorder

```
Password = hash[0] ^ hash[1] ^ hash[2] ^ hash[3]
```

reduced 32bit value by XORing all elements of the hash array

Method Overview

Method Name	Description
SetAccessMode	This method is used to login to the device. NewMode corresponds to the desired User Level ID. Logging in with a User Level different from RUN (ID = 0) switches the device to configuration mode. Password is a 32bit value calculated from the MD5 hash of the plaintext password. (see above)

Invocation Access	Always

Parameters	
NewMode	
SInt	
Value Range	-128..127
Password	
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	sMN	String	3	Request (SOPAS Method by Name)
Method	SetAccessMode	String	13	
Parameter 1	NewMode	SInt	1	
Parameter 2	Password	UDInt	4	

Method Return Value:				
sAN SetAccessMode <success>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sAN	String	3	Result (SOPAS Method Result)
Method	SetAccessMode	String	13	
Return Value 1	success	Bool	1	

Method Telegram Examples

Set MAINTENANCE user level, with password hash for password MAIN		
Method Invocation:	02 02 02 02 00 00 00 17 73 4D 4E 20 53 65 74 41 63 63 65 73 73 4D 6F 64 65 20 02 55 77 00 E6 F3	····sMN SetA ccessMode ·Uw·
Method Return Value:	02 02 02 02 00 00 00 13 73 41 4E 20 53 65 74 41 63 63 65 73 73 4D 6F 64 65 20 01 38	····sAN SetA ccessMode ·8

Set AUTHORIZEDCLIENT user level, with password hash for password CLIENT		
Method Invocation:	02 02 02 02 00 00 00 17 73 4D 4E 20 53 65 74 41 63 63 65 73 73 4D 6F 64 65 20 03 FB 35 6C DE 4A	····sMN SetA ccessMode ·5lJ
Method Return Value:	02 02 02 02 00 00 00 13 73 41 4E 20 53 65 74 41 63 63 65 73 73 4D 6F 64 65 20 01 38	····sAN SetA ccessMode ·8

Set SERVICE user level, with password hash for password CUST_SERV		
Method Invocation:	02 02 02 02 00 00 00 17 73 4D 4E 20 53 65 74 41 63 63 65 73 73 4D 6F 64 65 20 04 ED 78 4B AA 45	····sMN SetA ccessMode ·xKE
Method Return Value:	02 02 02 02 00 00 00 13 73 41 4E 20 53 65 74 41 63 63 65 73 73 4D 6F 64 65 20 01 38	····sAN SetA ccessMode ·8

4.1.1.3. Method: Run

NOTE

The method needs to be used in order to be able to trigger snapshots (see Method: SingleStep).

Method Overview

Method Name	Description
Run	This method is used to logout from the device. It switches the device back to running mode if it's currently in configuration mode due to an active login.

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	sMN	String	3	Request (SOPAS Method by Name)
Method	Run	String	3	Change operation mode to "Run"

Method Return Value:

```
sAN Run <success>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sAN	String	3	Result (SOPAS Method Result)
Method	Run	String	3	Change operation mode to "Run"
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:	02 02 02 02 00 00 00 08 73 4D 4E 20 52 75 6E 20 39	····sMN Run 9
Method Return Value:	02 02 02 02 00 00 00 09 73 41 4E 20 52 75 6E 20 00 35	····sAN Run ·5

4.1.1.4. Method: SetPassword

NOTE

When changing the password hash also update the secure hash with ChangePassword based on the same plaintext password to prevent problems using SICK tools relying on both.

Be aware that you need to login via SetAccessMode before invoking this method.
For the calculation of the udiNewPassword see Password under SetAccessMode.

Method Overview

Method Name	Description
SetPassword	This method allows to set a new password hash for a UserLevel ID <= currently logged in UserLevel ID.

Invocation Access	Always

Parameters	
siUserLevel	
SInt	
Value Range	-128..127
udiNewPassword	
UDInt	
Value Range	0..4294967295

Return Values	
bSuccess	
Bool	
Value Range	False, True
Initialisation	False

Method Telegram Syntax

Method Invocation:

```
sMN SetPassword <siUserLevel> <udiNewPassword>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sMN	String	3	Request (SOPAS Method by Name)
Method	SetPassword	String	11	
Parameter 1	siUserLevel	SInt	1	
Parameter 2	udiNewPassword	UDInt	4	

Method Return Value:

```
sAN SetPassword <bSuccess>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sAN	String	3	Result (SOPAS Method Result)
Method	SetPassword	String	11	
Return Value 1	bSuccess	Bool	1	

Method Telegram Examples

Example: Default Values		
Method telegram examples with parameter data and return value data set to default values.		
Method Invocation:	02 02 02 02 00 00 00 15 73 4D 4E 20 53 65 74 50 61 73 73 77 6F 72 64 20 00 00 00 00 00 0D	····sMN SetP assword ·····
Method Return Value:	02 02 02 02 00 00 00 11 73 41 4E 20 53 65 74 50 61 73 73 77 6F 72 64 20 00 01	····sAN SetP assword ··

4.1.2. SecureAuth

4.1.2.1. Method: GetAccessMode

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

Method Overview

Method Name	Description
GetAccessMode	This method is used to query the current operation mode. The operation mode corresponds to the user level of an active login (see chapter: User Level). If this value differs from user level RUN (value = 0) then the device is in configuration mode.

Invocation Access	Always

Return Values	
opmode	
SInt	
Value Range	-128..127

Method Telegram Syntax

Method Invocation:				
`sMN GetAccessMode`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sMN	String	3	Request (SOPAS Method by Name)
Method	GetAccessMode	String	13	returns actual operation mode

Method Return Value:				
`sAN GetAccessMode <opmode>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sAN	String	3	Result (SOPAS Method Result)
Method	GetAccessMode	String	13	returns actual operation mode
Return Value 1	opmode	SInt	1	

Method Telegram Examples

Example: Default Values		
Method telegram examples with parameter data and return value data set to default values.		
Method Invocation:	`02 02 02 02 00 00 00 12  73 4D 4E 20 47 65 74 41` `63 63 65 73 73 4D 6F 64  65 20 21`	`·····sMN GetA` `ccessMode !`
Method Return Value:	`02 02 02 02 00 00 00 13  73 41 4E 20 47 65 74 41` `63 63 65 73 73 4D 6F 64  65 20 00 2D`	`·····sAN GetA` `ccessMode ·-`

4.1.2.2. Method: SetUserLevel

Calculation of the challengeResponse parameter:

`message = UserLevelName + ':SICK Sensor:' + PlaintextPassword`
UserLevelName is the string of the Name of the desired UserLevel e.g. 'AuthorizedClient'

`hash = sha256(message)`
hash is a 32x 8bit byte array

`challengeResponse = sha256(hash + Challenge)`
hash and Challenge are treated as bytes and hence binary data.
Challenge is 16x 8bit byte array returned by GetChallenge and challengeResponse is finally also a 32x 8bit byte array

Method Overview

Method Name	**Description**
SetUserLevel	This method is used to login to the device. NewMode corresponds to the desired User Level ID. Logging in with a User Level different from RUN (ID = 0) switches the device to configuration mode. For challengeResponse calculation see above.

Invocation Access	Always

Parameters			
challengeResponse			
	Array		
	Length	32	
		USInt	
		Value Range	0..255
userLevel			
	UserType		
	E_USER_LEVEL_TYPE	See the chapter "User Types" for details.	

Return Values				
result				
	Enum8			
		Value	Name	Description
		0	SUCCESS	
		1	INVALID_CLIENT	
		2	NOT_ACCEPTED	
		3	UNKNOWN_CHALLENGE	

Method Telegram Syntax

Method Invocation:
`sMN SetUserLevel <challengeResponse> <userLevel>`

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sMN	String	3	Request (SOPAS Method by Name)
Method	SetUserLevel	String	12	
Parameter 1	challengeResponse	Array	32	
Parameter 2	userLevel	E_USER_LEVEL_TYPE	0	

Method Return Value:
`sAN SetUserLevel <result>`

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sAN	String	3	Result (SOPAS Method Result)
Method	SetUserLevel	String	12	
Return Value 1	result	Enum8	1	

Method Telegram Examples

Example: Default Values		
Method telegram examples with parameter data and return value data set to default values.		
Method Invocation:	02 02 02 02 00 00 00 32 73 4D 4E 20 53 65 74 55 73 65 72 4C 65 76 65 6C 20 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 55	·······2sMN SetU serLevel ······· ················ ··········U
Method Return Value:	02 02 02 02 00 00 00 12 73 41 4E 20 53 65 74 55 73 65 72 4C 65 76 65 6C 20 00 59	········sAN SetU serLevel ·Y

4.1.2.3. Method: Run

NOTE

The method needs to be used in order to be able to trigger snapshots (see Method: SingleStep).

Method Overview

Method Name	Description
Run	This method is used to logout from the device. It switches the devive back to running mode if it's currently in configuration mode due to an active login.

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	sMN	String	3	Request (SOPAS Method by Name)
Method	Run	String	3	Change operation mode to "Run"

Method Return Value:				
`sAN Run <success>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sAN	String	3	Result (SOPAS Method Result)
Method	Run	String	3	Change operation mode to "Run"
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:	`02 02 02 02 00 00 00 08  73 4D 4E 20 52 75 6E 20 39`	`·····sMN Run 9`
Method Return Value:	`02 02 02 02 00 00 00 09  73 41 4E 20 52 75 6E 20 00 35`	`·····sAN Run ·5`

4.1.2.4. Method: GetChallenge

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

Method Overview

Method Name	**Description**
GetChallenge	This method is used to get the challenge bytes for the secure authentication methods.

Invocation Access	Always

Return Values			
result			
	Enum8		
	Value	Name	Description
	0	SUCCESS	
	1	INVALID_CLIENT	
	2	NOT_ACCEPTED	
challenge			
	Array		
	Length	16	
	USInt		
	Value Range	0..255	

Method Telegram Syntax

Method Invocation:				
`sMN GetChallenge`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sMN	String	3	Request (SOPAS Method by Name)
Method	GetChallenge	String	12	

Method Return Value:				
`sAN GetChallenge <result> <challenge>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sAN	String	3	Result (SOPAS Method Result)
Method	GetChallenge	String	12	
Return Value 1	result	Enum8	1	
Return Value 2	challenge	Array	16	

Method Telegram Examples

Example: Default Values		
Method telegram examples with parameter data and return value data set to default values.		
Method Invocation:	`02 02 02 02 00 00 00 11  73 4D 4E 20 47 65 74 43` `68 61 6C 6C 65 6E 67 65  20 65`	`........sMN GetC` `hallenge e`

Method Return Value:	`02 02 02 02 00 00 00 22  73 41 4E 20 47 65 74 43`
	`68 61 6C 6C 65 6E 67 65  20 00 00 00 00 00 00 00`
	`00 00 00 00 00 00 00 00  00 00 69`
		`........"sAN GetC`
		`hallenge ........`
		`..........i`

4.1.2.5. Method: ChangePassword

NOTE

When changing the secure hash also update the password hash with SetPassword based on the same plaintext password to prevent problems using SICK tools relying on both.

Be aware that you need to login via SetAccessMode before invoking this method.
Calculation of the encryptedMessage parameter:

```
oldPwStr = UserLevelName + ':SICK Sensor:' + oldPassword
newPwStr = UserLevelName + ':SICK Sensor:' + newPassword
```

UserLevelName is the string of the Name of the desired UserLevel e.g. 'AuthorizedClient'

```
oldPwHash = sha256(oldPsStr)
newPwHash = sha256(newPwStr)
```

oldPwHash, newPwHash are a 32x 8bit byte array

```
key = slice(oldPwdHash, 0, 16)
```
key is the first 16bytes of the oldPwHash
```
iv = randombytes(16)
```
iv is 16bytes of random data
```
newPwHashPKCS7padded = newPwHash + 16 * "\x10"
```
16 * "\x10" means 16 times the 0x10 byte thus the newPwHashPKCS7padded has a length of 48 bytes in total
```
encryptedNewPwdHash = AES128CBC(key, iv, newPwHashPKCS7padded )

hmacData = iv + encryptedNewPwdHash
generatedHMAC = HMACsha256(oldPwdHash, hmacData)
```
oldPwdHash ist the key for the HMAC
```
encryptedMessage = iv + encryptedNewPwdHash + generatedHMAC
```

Method Overview

Method Name	**Description**
ChangePassword	This method allows to change the secure hash for a UserLevel with known password.

Invocation Access	Always

Parameters			
encryptedMessage			
	Array		
	Length	0..1024	
		USInt	
		Value Range	0..255
userLevel			
	UserType		
	E_USER_LEVEL_TYPE	See the chapter "User Types" for details.	

Return Values				
result				
	Enum8			
		Value	Name	Description
		0	SUCCESS	
		1	INVALID_CLIENT	
		2	NOT_ACCEPTED	
		4	PWD_NOT_CHANGABLE	

Method Telegram Syntax

Method Invocation:				
`sMN ChangePassword <encryptedMessage> <userLevel>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sMN	String	3	Request (SOPAS Method by Name)
Method	ChangePassword	String	14	
Parameter 1	encryptedMessage	Array	1024	
Parameter 2	userLevel	E_USER_LEVEL_TYPE	0	

Method Return Value:				
`sAN ChangePassword <result>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sAN	String	3	Result (SOPAS Method Result)
Method	ChangePassword	String	14	
Return Value 1	result	Enum8	1	

Method Telegram Examples

Example: Default Values		
Method telegram examples with parameter data and return value data set to default values.		
Method Invocation:	`02 02 02 02 00 00 00 16  73 4D 4E 20 43 68 61 6E` `67 65 50 61 73 73 77 6F  72 64 20 00 00 00 69`	`·····sMN Chan` `gePassword ···i`
Method Return Value:	`02 02 02 02 00 00 00 14  73 41 4E 20 43 68 61 6E` `67 65 50 61 73 73 77 6F  72 64 20 00 65`	`·····sAN Chan` `gePassword ·e`

4.1.3. Ethernet Settings

4.1.3.1. Variable: EtherAddressingMode

NOTE

When no DHCP server is running (and device is in TX_RETRY mode, see EtherDHCPFallback) it is no longer accessible. Use AutoIP discovery to recover the device using its MAC Address.

Variable Overview

Variable Name	Description
EtherAddressingMode	Mode for ethernet address assignement

Communication Name	EIAddrMode
Read-Access	Always
Write-Access	Service

Enum8			
Default Value		TX_IP_STATIC	
	Value	Name	Description
	0	TX_IP_STATIC	
	1	TX_IP_DHCP	

Variable Telegram Syntax

Read Variable:

```
sRN EIAddrMode
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	EIAddrMode	String	10	Which mode to use for Ethernet address assignement

Read Variable Response:

```
sRA EIAddrMode <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	EIAddrMode	String	10	Which mode to use for Ethernet address assignement
Variable Data	data	Enum8	1	

Write Variable:

```
sWN EIAddrMode <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	EIAddrMode	String	10	Which mode to use for Ethernet address assignement
Variable Data	data	Enum8	1	

Write Variable Response:				
sWA EIAddrMode				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	EIAddrMode	String	10	Which mode to use for Ethernet address assignement

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 0F 73 52 4E 20 45 49 41 64 64 72 4D 6F 64 65 20 73	........sRN EIAd drMode s
Read Variable Response:	02 02 02 02 00 00 00 10 73 52 41 20 45 49 41 64 64 72 4D 6F 64 65 20 00 7C	........sRA EIAd drMode .|
Write Variable:	02 02 02 02 00 00 00 10 73 57 4E 20 45 49 41 64 64 72 4D 6F 64 65 20 00 76	........sWN EIAd drMode .v
Write Variable Response:	02 02 02 02 00 00 00 0F 73 57 41 20 45 49 41 64 64 72 4D 6F 64 65 20 79	........sWA EIAd drMode y

4.1.3.2. Method: EthernetUpdate

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

Method Overview

Method Name	Description
EthernetUpdate	This method applies the changed ethernet parameters.

Communication Name	mEthUpdt
Invocation Access	AuthorizedClient, Service

Method Telegram Syntax

Method Invocation:				
sMN mEthUpdt				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sMN	String	3	Request (SOPAS Method by Name)
Method	mEthUpdt	String	8	updates the ethernet connection

Method Return Value:				
sAN mEthUpdt				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sAN	String	3	Result (SOPAS Method Result)
Method	mEthUpdt	String	8	updates the ethernet connection

Method Telegram Examples

Example: Default Values		
Method telegram examples with parameter data and return value data set to default values.		
Method Invocation:	02 02 02 02 00 00 00 0D 73 4D 4E 20 6D 45 74 68 55 70 64 74 20 71	........sMN mEth Updt q
Method Return Value:	02 02 02 02 00 00 00 0D 73 41 4E 20 6D 45 74 68 55 70 64 74 20 7D	........sAN mEth Updt }

4.1.3.3. Variable: EtherLinkState

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

Variable Overview

Variable Name	Description
EtherLinkState	Link state of the ethernet connection, up or down

Communication Name	EILinkState
Read-Access	Always
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
`sRN EILinkState`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	EILinkState	String	11	Linkstate of the Cable, up or down

Read Variable Response:				
`sRA EILinkState <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	EILinkState	String	11	Linkstate of the Cable, up or down
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 10 73 52 4E 20 45 49 4C 69 6E 6B 53 74 61 74 65 20 14	........sRN EILi nkState ·
Read Variable Response:	02 02 02 02 00 00 00 11 73 52 41 20 45 49 4C 69 6E 6B 53 74 61 74 65 20 00 1B	........sRA EILi nkState ··

4.1.3.4. Variable: EtherMACAddress

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

Variable Overview

Variable Name	Description
EtherMACAddress	MAC address of the device

Communication Name	EIMacAdr
Read-Access	Always
Write-Access	No! (readonly)

Array	
Length	6
Default Value	{0,0x06,0x77,0xFF,0x12,0x03}
USInt	
Value Range	0..255

Variable Telegram Syntax

Read Variable:				
`sRN EIMacAdr`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	EIMacAdr	String	8	MAC-Address of the Device

Read Variable Response:				
`sRA EIMacAdr <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	EIMacAdr	String	8	MAC-Address of the Device
Variable Data	data	Array	6	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 0D 73 52 4E 20 45 49 4D 61 63 41 64 72 20 7B	........sRN EIMa cAdr {
Read Variable Response:	02 02 02 02 00 00 00 13 73 52 41 20 45 49 4D 61 63 41 64 72 20 00 06 77 FF 12 03 EB	........sRA EIMa cAdr ..w..

4.1.3.5. Variable: EtherIPAddress

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

Variable Overview

Variable Name	Description
EtherIPAddress	IP address of the device. Changes take effect after method EthernetUpdate gets called.

Communication Name	EIIpAddr
Read-Access	Always
Write-Access	AuthorizedClient, Service

Array	
Length	4
Default Value	{192,168,1,10}
USInt	
Value Range	0..255

Variable Telegram Syntax

Read Variable:				
sRN EIIpAddr				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	EIIpAddr	String	8	IP-Address of the device. Please note that changes in this variable won't be applied until the parameters are saved persistently and the device is rebooted.

Read Variable Response:				
sRA EIIpAddr <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	EIIpAddr	String	8	IP-Address of the device. Please note that changes in this variable won't be applied until the parameters are saved persistently and the device is rebooted.
Variable Data	data	Array	4	

Write Variable:				
sWN EIIpAddr <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	EIIpAddr	String	8	IP-Address of the device. Please note that changes in this variable won't be applied until the parameters are saved persistently and the device is rebooted.
Variable Data	data	Array	4	

Write Variable Response:				
sWA EIIpAddr				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	EIIpAddr	String	8	IP-Address of the device. Please note that changes in this variable won't be applied until the parameters are saved persistently and the device is rebooted.

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 0D 73 52 4E 20 45 49 49 70 41 64 64 72 20 69	........sRN EIIp Addr i
Read Variable Response:	02 02 02 02 00 00 00 11 73 52 41 20 45 49 49 70 41 64 64 72 20 C0 A8 01 0A 05	........sRA EIIp Addr ...
Write Variable:	02 02 02 02 00 00 00 11 73 57 4E 20 45 49 49 70 41 64 64 72 20 C0 A8 01 0A 0F	........sWN EIIp Addr ...
Write Variable Response:	02 02 02 02 00 00 00 0D 73 57 41 20 45 49 49 70 41 64 64 72 20 63	........sWA EIIp Addr c

4.1.3.6. Variable: EtherIPMask

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

Variable Overview

Variable Name	Description
EtherIPMask	Network mask of the device. Changes take effect after method EthernetUpdate gets called.

Communication Name	EImask
Read-Access	Always
Write-Access	AuthorizedClient, Service

Array	
Length	4
Default Value	{255,255,255,0}
USInt	
Value Range	0..255

Variable Telegram Syntax

Read Variable:				
`sRN EImask`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	EImask	String	6	Netmask. Please note that changes in this variable won't be applied until the parameters are saved persistently and the device is rebooted.

Read Variable Response:				
`sRA EImask <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	EImask	String	6	Netmask. Please note that changes in this variable won't be applied until the parameters are saved persistently and the device is rebooted.
Variable Data	data	Array	4	

Write Variable:				
`sWN EImask <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	EImask	String	6	Netmask. Please note that changes in this variable won't be applied until the parameters are saved persistently and the device is rebooted.
Variable Data	data	Array	4	

Write Variable Response:				
`sWA EImask`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	EImask	String	6	Netmask. Please note that changes in this variable won't be applied until the parameters are saved persistently and the device is rebooted.

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	`02 02 02 02 00 00 00 0B  73 52 4E 20 45 49 6D 61 73 6B 20 77`	`·····sRN EImask w`
Read Variable Response:	`02 02 02 02 00 00 00 0F  73 52 41 20 45 49 6D 61 73 6B 20 FF FF FF 00 87`	`·····sRA EImask ·`
Write Variable:	`02 02 02 02 00 00 00 0F  73 57 4E 20 45 49 6D 61 73 6B 20 FF FF FF 00 8D`	`·····sWN EImask ·`
Write Variable Response:	`02 02 02 02 00 00 00 0B  73 57 41 20 45 49 6D 61 73 6B 20 7D`	`·····sWA EImask }`

4.1.3.7. Variable: EtherIPGateAddress

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

Variable Overview

Variable Name	Description
EtherIPGateAddress	Gateway IP address of the device. Changes take effect after method EthernetUpdate gets called.

Communication Name	EIgate
Read-Access	Always
Write-Access	AuthorizedClient, Service

Array	
Length	4
Default Value	{0,0,0,0}
USInt	
Value Range	0..255

Variable Telegram Syntax

Read Variable:

```
sRN EIgate
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	EIgate	String	6	IP-Address of the Ethernet Gateway. Please note that changes in this variable won't be applied until the parameters are saved persistently and the device is rebooted.

Read Variable Response:

```
sRA EIgate <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	EIgate	String	6	IP-Address of the Ethernet Gateway. Please note that changes in this variable won't be applied until the parameters are saved persistently and the device is rebooted.
Variable Data	data	Array	4	

Write Variable:

```
sWN EIgate <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	EIgate	String	6	IP-Address of the Ethernet Gateway. Please note that changes in this variable won't be applied until the parameters are saved persistently and the device is rebooted.
Variable Data	data	Array	4	

Write Variable Response:				
sWA EIgate				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	EIgate	String	6	IP-Address of the Ethernet Gateway. Please note that changes in this variable won't be applied until the parameters are saved persistently and the device is rebooted.

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 0B 73 52 4E 20 45 49 67 61 74 65 20 74	····sRN EIgate t
Read Variable Response:	02 02 02 02 00 00 00 0F 73 52 41 20 45 49 67 61 74 65 20 00 00 00 00 7B	····sRA EIgate ····{
Write Variable:	02 02 02 02 00 00 00 0F 73 57 4E 20 45 49 67 61 74 65 20 00 00 00 00 71	····sWN EIgate ····q
Write Variable Response:	02 02 02 02 00 00 00 0B 73 57 41 20 45 49 67 61 74 65 20 7E	····sWA EIgate ~

4.1.3.8. Variable: EtherIPAddressDHCP

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

Variable Overview

Variable Name	Description
EtherIPAddressDHCP	IP address of the device assigned by DHCP (if active)

Communication Name	EIIpAddrDHCP
Read-Access	Always
Write-Access	No! (readonly)

Array	
Length	4
Default Value	{192,168,0,1}
USInt	
Value Range	0..255

Variable Telegram Syntax

Read Variable:				
sRN EIIpAddrDHCP				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	EIIpAddrDHCP	String	12	IP-Address of the Device assigned by DHCP if active

Read Variable Response:				
sRA EIIpAddrDHCP <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	EIIpAddrDHCP	String	12	IP-Address of the Device assigned by DHCP if active
Variable Data	data	Array	4	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 11 73 52 4E 20 45 49 49 70 41 64 64 72 44 48 43 50 20 76	........sRN EIIp AddrDHCP v
Read Variable Response:	02 02 02 02 00 00 00 15 73 52 41 20 45 49 49 70 41 64 64 72 44 48 43 50 20 C0 A8 00 01 10	........sRA EIIp AddrDHCP ...

4.1.3.9. Variable: EtherIPMaskDHCP

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

Variable Overview

Variable Name	Description
EtherIPMaskDHCP	Netmask assigned by DHCP (if active)

Communication Name	EImaskDHCP
Read-Access	Always
Write-Access	No! (readonly)

Array		
Length		4
Default Value		{255,255,255,0}
	USInt	
	Value Range	0..255

Variable Telegram Syntax

Read Variable:				
sRN EImaskDHCP				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	EImaskDHCP	String	10	Netmask assigned by DHCP if active

Read Variable Response:				
sRA EImaskDHCP <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	EImaskDHCP	String	10	Netmask assigned by DHCP if active
Variable Data	data	Array	4	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 0F 73 52 4E 20 45 49 6D 61 73 6B 44 48 43 50 20 68	........sRN EIma skDHCP h
Read Variable Response:	02 02 02 02 00 00 00 13 73 52 41 20 45 49 6D 61 73 6B 44 48 43 50 20 FF FF FF 00 98	........sRA EIma skDHCP ·

4.1.3.10. Variable: EtherIPGateAddressDHCP

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

Variable Overview

Variable Name	Description
EtherIPGateAddressDHCP	IP address of the ethernet gateway assigned by DHCP (if active)

Communication Name	EIgateDHCP
Read-Access	Always
Write-Access	No! (readonly)

Array	
Length	4
Default Value	{0,0,0,0}
USInt	
Value Range	0..255

Variable Telegram Syntax

Read Variable:				
sRN EIgateDHCP				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	EIgateDHCP	String	10	IP-Address of the Ethernet Gateway assigned by DHCP if active

Read Variable Response:				
sRA EIgateDHCP <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	EIgateDHCP	String	10	IP-Address of the Ethernet Gateway assigned by DHCP if active
Variable Data	data	Array	4	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 0F 73 52 4E 20 45 49 67 61 74 65 44 48 43 50 20 6B	····sRN EIga teDHCP k
Read Variable Response:	02 02 02 02 00 00 00 13 73 52 41 20 45 49 67 61 74 65 44 48 43 50 20 00 00 00 00 64	····sRA EIga teDHCP ···d

4.1.3.11. Variable: EtherDHCPFallback

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

Variable Overview

Variable Name	Description
EtherDHCPFallback	Action if DHCP was unsuccessfull: retry or fallback. EtherIPAddress, EtherIPMask, EtherIPGateAddress will be used as fallback as configured for static case.

Communication Name	EIDHCPFallback
Read-Access	Always
Write-Access	Service

Enum8			
Default Value		TX_RETRY_DHCP	
	Value	Name	Description
	0	TX_USE_STATIC_IP	
	1	TX_RETRY_DHCP	

Variable Telegram Syntax

Read Variable:				
`sRN EIDHCPFallback`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	EIDHCPFallback	String	14	Fallback if DHCP not successfull

Read Variable Response:				
`sRA EIDHCPFallback <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	EIDHCPFallback	String	14	Fallback if DHCP not successfull
Variable Data	data	Enum8	1	

Write Variable:				
`sWN EIDHCPFallback <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	EIDHCPFallback	String	14	Fallback if DHCP not successfull
Variable Data	data	Enum8	1	

Write Variable Response:				
`sWA EIDHCPFallback`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	EIDHCPFallback	String	14	Fallback if DHCP not successfull

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	`02 02 02 02 00 00 00 13  73 52 4E 20 45 49 44 48` `43 50 46 61 6C 6C 62 61  63 6B 20 50`	`........sRN EIDH` `CPFallback P`
Read Variable Response:	`02 02 02 02 00 00 00 14  73 52 41 20 45 49 44 48` `43 50 46 61 6C 6C 62 61  63 6B 20 01 5E`	`........sRA EIDH` `CPFallback .^`
Write Variable:	`02 02 02 02 00 00 00 14  73 57 4E 20 45 49 44 48` `43 50 46 61 6C 6C 62 61  63 6B 20 01 54`	`........sWN EIDH` `CPFallback .T`
Write Variable Response:	`02 02 02 02 00 00 00 13  73 57 41 20 45 49 44 48` `43 50 46 61 6C 6C 62 61  63 6B 20 5A`	`........sWA EIDH` `CPFallback Z`

4.1.3.12. Variable: EtherIPSpeedDuplex

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

Variable Overview

Variable Name	Description
EtherIPSpeedDuplex	Ethernet speed and duplex settings

Communication Name	EISpdDpx
Read-Access	Always
Write-Access	Service

Enum8			
Default Value		TX_AUTO	
	Value	Name	Description
	0	TX_AUTO	
	1	TX_10MB_HALF	
	2	TX_10MB_FULL	
	3	TX_100MB_HALF	
	4	TX_100MB_FULL	
	5	TX_1000MB_HALF	
	6	TX_1000MB_FULL	

Variable Telegram Syntax

Read Variable:

```
sRN EISpdDpx
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	EISpdDpx	String	8	Speed and Duplex settings

Read Variable Response:

```
sRA EISpdDpx <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	EISpdDpx	String	8	Speed and Duplex settings
Variable Data	data	Enum8	1	

Write Variable:

```
sWN EISpdDpx <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	EISpdDpx	String	8	Speed and Duplex settings
Variable Data	data	Enum8	1	

Write Variable Response:				
sWA EISpdDpx				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	EISpdDpx	String	8	Speed and Duplex settings

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 0D 73 52 4E 20 45 49 53 70 64 44 70 78 20 68	........sRN EISp dDpx h
Read Variable Response:	02 02 02 02 00 00 00 0E 73 52 41 20 45 49 53 70 64 44 70 78 20 00 67	........sRA EISp dDpx ·g
Write Variable:	02 02 02 02 00 00 00 0E 73 57 4E 20 45 49 53 70 64 44 70 78 20 00 6D	........sWN EISp dDpx ·m
Write Variable Response:	02 02 02 02 00 00 00 0D 73 57 41 20 45 49 53 70 64 44 70 78 20 62	........sWA EISp dDpx b

4.1.3.13. Variable: EtherIPSpeedDuplexNegotiated

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

Variable Overview

Variable Name	Description
EtherIPSpeedDuplexNegotiated	Speed and duplex settings as negotiated when EtherIPSpeedDuplex is set to AUTO

Communication Name	EISpdDpxNet
Read-Access	Always
Write-Access	No! (readonly)

Enum8			
Default Value		TX_UNKNOWN_DUPLEX_SPEED	
	Value	Name	Description
	0	TX_UNKNOWN_DUPLEX_SPEED	
	1	TX_10MB_HALF	
	2	TX_10MB_FULL	
	3	TX_100MB_HALF	
	4	TX_100MB_FULL	
	5	TX_1000MB_HALF	
	6	TX_1000MB_FULL	

Variable Telegram Syntax

Read Variable:				
`sRN EISpdDpxNet`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	EISpdDpxNet	String	11	Speed and Duplex settings as negotiated when set to AUTO

Read Variable Response:				
`sRA EISpdDpxNet <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	EISpdDpxNet	String	11	Speed and Duplex settings as negotiated when set to AUTO
Variable Data	data	Enum8	1	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	`02 02 02 02 00 00 00 10  73 52 4E 20 45 49 53 70` `64 44 70 78 4E 65 74 20  37`	`········sRN EISp` `dDpxNet 7`
Read Variable Response:	`02 02 02 02 00 00 00 11  73 52 41 20 45 49 53 70` `64 44 70 78 4E 65 74 20  00 38`	`········sRA EISp` `dDpxNet ·8`

4.1.4. Ethernet Protocol Settings

4.1.4.1. Variable: BlobTransportProtocolAPI

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

Variable Overview

Variable Name	Description
BlobTransportProtocolAPI	Protocol which should be used for blob transport.

Read-Access	Always
Write-Access	AuthorizedClient, Service

Enum8			
Default Value		TCP	
	Value	Name	Description
	0	TCP	TCP Protocol
	1	UDP	UDP Protocol

Variable Telegram Syntax

Read Variable:

```
sRN BlobTransportProtocolAPI
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	BlobTransportProtocolAPI	String	24	

Read Variable Response:

```
sRA BlobTransportProtocolAPI <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	BlobTransportProtocolAPI	String	24	
Variable Data	data	Enum8	1	

Write Variable:

```
sWN BlobTransportProtocolAPI <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	BlobTransportProtocolAPI	String	24	
Variable Data	data	Enum8	1	

Write Variable Response:

```
sWA BlobTransportProtocolAPI
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	BlobTransportProtocolAPI	String	24	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 1D 73 52 4E 20 42 6C 6F 62 54 72 61 6E 73 70 6F 72 74 50 72 6F 74 6F 63 6F 6C 41 50 49 20 61	........sRN Blob TransportProtoco lAPI a
Read Variable Response:	02 02 02 02 00 00 00 1E 73 52 41 20 42 6C 6F 62 54 72 61 6E 73 70 6F 72 74 50 72 6F 74 6F 63 6F 6C 41 50 49 20 00 6E	........sRA Blob TransportProtoco lAPI ·n
Write Variable:	02 02 02 02 00 00 00 1E 73 57 4E 20 42 6C 6F 62 54 72 61 6E 73 70 6F 72 74 50 72 6F 74 6F 63 6F 6C 41 50 49 20 00 64	........sWN Blob TransportProtoco lAPI ·d
Write Variable Response:	02 02 02 02 00 00 00 1D 73 57 41 20 42 6C 6F 62 54 72 61 6E 73 70 6F 72 74 50 72 6F 74 6F 63 6F 6C 41 50 49 20 6B	........sWA Blob TransportProtoco lAPI k

4.1.4.2. Variable: BlobTcpPortAPI

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

Variable Overview

Variable Name	Description
BlobTcpPortAPI	Port number which should be used for blob transmission.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UInt	
Value Range	1025..65535
Initialisation	2114

Variable Telegram Syntax

Read Variable:

```
sRN BlobTcpPortAPI
```

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

Read Variable Response:

```
sRA BlobTcpPortAPI <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	BlobTcpPortAPI	String	14	
Variable Data	data	UInt	2	

Write Variable:				
sWN BlobTcpPortAPI <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	BlobTcpPortAPI	String	14	
Variable Data	data	UInt	2	

Write Variable Response:				
sWA BlobTcpPortAPI				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	BlobTcpPortAPI	String	14	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 13 73 52 4E 20 42 6C 6F 62 54 63 70 50 6F 72 74 41 50 49 20 6A	........sRN Blob TcpPortAPI j
Read Variable Response:	02 02 02 02 00 00 00 15 73 52 41 20 42 6C 6F 62 54 63 70 50 6F 72 74 41 50 49 20 08 42 2F	........sRA Blob TcpPortAPI ·B/
Write Variable:	02 02 02 02 00 00 00 15 73 57 4E 20 42 6C 6F 62 54 63 70 50 6F 72 74 41 50 49 20 08 42 25	........sWN Blob TcpPortAPI ·B%
Write Variable Response:	02 02 02 02 00 00 00 13 73 57 41 20 42 6C 6F 62 54 63 70 50 6F 72 74 41 50 49 20 60	........sWA Blob TcpPortAPI `

4.1.4.3. Variable: BlobUdpAutoTransmit

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

Variable Overview

Variable Name	Description
BlobUdpAutoTransmit	Enables automatic UDP transmission to specified client.

Read-Access	Always
Write-Access	AuthorizedClient, Service

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
`sRN BlobUdpAutoTransmit`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	BlobUdpAutoTransmit	String	19	Enables Auto transmit to specified Client

Read Variable Response:				
`sRA BlobUdpAutoTransmit <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	BlobUdpAutoTransmit	String	19	Enables Auto transmit to specified Client
Variable Data	data	Bool	1	

Write Variable:				
`sWN BlobUdpAutoTransmit <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	BlobUdpAutoTransmit	String	19	Enables Auto transmit to specified Client
Variable Data	data	Bool	1	

Write Variable Response:				
`sWA BlobUdpAutoTransmit`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	BlobUdpAutoTransmit	String	19	Enables Auto transmit to specified Client

Variable Telegram Examples

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

Read Variable:	`02 02 02 02 00 00 00 18  73 52 4E 20 42 6C 6F 62`
	`55 64 70 41 75 74 6F 54  72 61 6E 73 6D 69 74 20`
	`08`
		`........sRN Blob`
		`UdpAutoTransmit`
		`.`

Read Variable Response:	`02 02 02 02 00 00 00 19  73 52 41 20 42 6C 6F 62`
	`55 64 70 41 75 74 6F 54  72 61 6E 73 6D 69 74 20`
	`00 07`
		`........sRA Blob`
		`UdpAutoTransmit`
		`..`

Write Variable:	`02 02 02 02 00 00 00 19  73 57 4E 20 42 6C 6F 62`
	`55 64 70 41 75 74 6F 54  72 61 6E 73 6D 69 74 20`
	`00 0D`
		`........sWN Blob`
		`UdpAutoTransmit`
		`..`

Write Variable Response:	`02 02 02 02 00 00 00 18  73 57 41 20 42 6C 6F 62`
	`55 64 70 41 75 74 6F 54  72 61 6E 73 6D 69 74 20`
	`02`
		`........sWA Blob`
		`UdpAutoTransmit`
		`.`

4.1.4.4. Variable: BlobUdpReceiverIPAPI

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

Variable Overview

Variable Name	Description
BlobUdpReceiverIPAPI	The receiver IP address to which the blob data will be sent.

Read-Access	Always
Write-Access	AuthorizedClient, Service

FlexString	
Length	0..45

Variable Telegram Syntax

Read Variable:

```
sRN BlobUdpReceiverIPAPI
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	BlobUdpReceiverIPAPI	String	20	The IP Address where the blob data will be send to.

Read Variable Response:

```
sRA BlobUdpReceiverIPAPI <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	BlobUdpReceiverIPAPI	String	20	The IP Address where the blob data will be send to.
Variable Data	data	FlexString	45	

Write Variable:

```
sWN BlobUdpReceiverIPAPI <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	BlobUdpReceiverIPAPI	String	20	The IP Address where the blob data will be send to.
Variable Data	data	FlexString	45	

Write Variable Response:

```
sWA BlobUdpReceiverIPAPI
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	BlobUdpReceiverIPAPI	String	20	The IP Address where the blob data will be send to.

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 19 73 52 4E 20 42 6C 6F 62 55 64 70 52 65 63 65 69 76 65 72 49 50 41 50 49 20 75	····sRN Blob UdpReceiverIPAPI u
Read Variable Response:	02 02 02 02 00 00 00 1B 73 52 41 20 42 6C 6F 62 55 64 70 52 65 63 65 69 76 65 72 49 50 41 50 49 20 00 00 7A	····sRA Blob UdpReceiverIPAPI ··z
Write Variable:	02 02 02 02 00 00 00 1B 73 57 4E 20 42 6C 6F 62 55 64 70 52 65 63 65 69 76 65 72 49 50 41 50 49 20 00 00 70	····sWN Blob UdpReceiverIPAPI ··p
Write Variable Response:	02 02 02 02 00 00 00 19 73 57 41 20 42 6C 6F 62 55 64 70 52 65 63 65 69 76 65 72 49 50 41 50 49 20 7F	····sWA Blob UdpReceiverIPAPI ·

4.1.4.5. Variable: BlobUdpReceiverPortAPI

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

Variable Overview

Variable Name	Description
BlobUdpReceiverPortAPI	The receiver port for the UDP blob transmission.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UInt	
Value Range	1025..65535
Initialisation	2114

Variable Telegram Syntax

Read Variable:

```
sRN BlobUdpReceiverPortAPI
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	BlobUdpReceiverPortAPI	String	22	

Read Variable Response:

```
sRA BlobUdpReceiverPortAPI <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	BlobUdpReceiverPortAPI	String	22	
Variable Data	data	UInt	2	

Write Variable:				
sWN BlobUdpReceiverPortAPI <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	BlobUdpReceiverPortAPI	String	22	
Variable Data	data	UInt	2	

Write Variable Response:				
sWA BlobUdpReceiverPortAPI				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	BlobUdpReceiverPortAPI	String	22	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 1B 73 52 4E 20 42 6C 6F 62 55 64 70 52 65 63 65 69 76 65 72 50 6F 72 74 41 50 49 20 55	····sRN Blob UdpReceiverPortA PI U
Read Variable Response:	02 02 02 02 00 00 00 1D 73 52 41 20 42 6C 6F 62 55 64 70 52 65 63 65 69 76 65 72 50 6F 72 74 41 50 49 20 08 42 10	····sRA Blob UdpReceiverPortA PI ·B·
Write Variable:	02 02 02 02 00 00 00 1D 73 57 4E 20 42 6C 6F 62 55 64 70 52 65 63 65 69 76 65 72 50 6F 72 74 41 50 49 20 08 42 1A	····sWN Blob UdpReceiverPortA PI ·B·
Write Variable Response:	02 02 02 02 00 00 00 1B 73 57 41 20 42 6C 6F 62 55 64 70 52 65 63 65 69 76 65 72 50 6F 72 74 41 50 49 20 5F	····sWA Blob UdpReceiverPortA PI _

4.1.4.6. Variable: BlobUdpControlPortAPI

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

Variable Overview

Variable Name	Description
BlobUdpControlPortAPI	The control port for the UDP blob transmission.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UInt	
Value Range	1025..65535
Initialisation	2114

Variable Telegram Syntax

Read Variable:				
`sRN BlobUdpControlPortAPI`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	BlobUdpControlPortAPI	String	21	

Read Variable Response:				
`sRA BlobUdpControlPortAPI <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	BlobUdpControlPortAPI	String	21	
Variable Data	data	UInt	2	

Write Variable:				
`sWN BlobUdpControlPortAPI <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	BlobUdpControlPortAPI	String	21	
Variable Data	data	UInt	2	

Write Variable Response:				
`sWA BlobUdpControlPortAPI`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	BlobUdpControlPortAPI	String	21	

Variable Telegram Examples

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

Read Variable:	`02 02 02 02 00 00 00 1A 73 52 4E 20 42 6C 6F 62`
	`55 64 70 43 6F 6E 74 72 6F 6C 50 6F 72 74 41 50`
	`49 20 2B`
		`........sRN Blob`
		`UdpControlPortAP`
		`I +`

Read Variable Response:	`02 02 02 02 00 00 00 1C 73 52 41 20 42 6C 6F 62`
	`55 64 70 43 6F 6E 74 72 6F 6C 50 6F 72 74 41 50`
	`49 20 08 42 6E`
		`........sRA Blob`
		`UdpControlPortAP`
		`I ·Bn`

Write Variable:	`02 02 02 02 00 00 00 1C 73 57 4E 20 42 6C 6F 62`
	`55 64 70 43 6F 6E 74 72 6F 6C 50 6F 72 74 41 50`
	`49 20 08 42 64`
		`........sWN Blob`
		`UdpControlPortAP`
		`I ·Bd`

Write Variable Response:	`02 02 02 02 00 00 00 1A 73 57 41 20 42 6C 6F 62`
	`55 64 70 43 6F 6E 74 72 6F 6C 50 6F 72 74 41 50`
	`49 20 21`
		`........sWA Blob`
		`UdpControlPortAP`
		`I !`

4.1.4.7. Variable: BlobUdpHeaderEnabled

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

Variable Overview

Variable Name	Description
BlobUdpHeaderEnabled	Enable header in UDP packets.

Read-Access	Always
Write-Access	AuthorizedClient, Service

Bool	
Value Range	False, True
Initialisation	True

Variable Telegram Syntax

Read Variable:

```
sRN BlobUdpHeaderEnabled
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	BlobUdpHeaderEnabled	String	20	Enable Header in UDP Packets

Read Variable Response:

```
sRA BlobUdpHeaderEnabled <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	BlobUdpHeaderEnabled	String	20	Enable Header in UDP Packets
Variable Data	data	Bool	1	

Write Variable:

```
sWN BlobUdpHeaderEnabled <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	BlobUdpHeaderEnabled	String	20	Enable Header in UDP Packets
Variable Data	data	Bool	1	

Write Variable Response:

```
sWA BlobUdpHeaderEnabled
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	BlobUdpHeaderEnabled	String	20	Enable Header in UDP Packets

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 19 73 52 4E 20 42 6C 6F 62 55 64 70 48 65 61 64 65 72 45 6E 61 62 6C 65 64 20 77	........sRN Blob UdpHeaderEnabled w
Read Variable Response:	02 02 02 02 00 00 00 1A 73 52 41 20 42 6C 6F 62 55 64 70 48 65 61 64 65 72 45 6E 61 62 6C 65 64 20 01 79	........sRA Blob UdpHeaderEnabled ·y
Write Variable:	02 02 02 02 00 00 00 1A 73 57 4E 20 42 6C 6F 62 55 64 70 48 65 61 64 65 72 45 6E 61 62 6C 65 64 20 01 73	........sWN Blob UdpHeaderEnabled ·s
Write Variable Response:	02 02 02 02 00 00 00 19 73 57 41 20 42 6C 6F 62 55 64 70 48 65 61 64 65 72 45 6E 61 62 6C 65 64 20 7D	........sWA Blob UdpHeaderEnabled }

4.1.4.8. Variable: BlobUdpHeartbeatInterval

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

Variable Overview

Variable Name	Description
BlobUdpHeartbeatInterval	The maximal interval between two heartbeats in ms (0 = disabled).

Read-Access	Always
Write-Access	AuthorizedClient, Service

UDInt	
Value Range	0..10000000
Initialisation	0
Physical Unit	ms

Variable Telegram Syntax

Read Variable:

```
sRN BlobUdpHeartbeatInterval
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	BlobUdpHeartbeatInterval	String	24	The maximum Interval between two heartbeats in ms (0 = disabled)

Read Variable Response:

```
sRA BlobUdpHeartbeatInterval <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	BlobUdpHeartbeatInterval	String	24	The maximum Interval between two heartbeats in ms (0 = disabled)
Variable Data	data	UDInt	4	

Write Variable:				
sWN BlobUdpHeartbeatInterval <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	BlobUdpHeartbeatInterval	String	24	The maximum Interval between two heartbeats in ms (0 = disabled)
Variable Data	data	UDInt	4	

Write Variable Response:				
sWA BlobUdpHeartbeatInterval				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	BlobUdpHeartbeatInterval	String	24	The maximum Interval between two heartbeats in ms (0 = disabled)

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 1D 73 52 4E 20 42 6C 6F 62 55 64 70 48 65 61 72 74 62 65 61 74 49 6E 74 65 72 76 61 6C 20 6A	........sRN Blob UdpHeartbeatInte rval j
Read Variable Response:	02 02 02 02 00 00 00 21 73 52 41 20 42 6C 6F 62 55 64 70 48 65 61 72 74 62 65 61 74 49 6E 74 65 72 76 61 6C 20 00 00 00 00 65	........!sRA Blob UdpHeartbeatInte rval ....e
Write Variable:	02 02 02 02 00 00 00 21 73 57 4E 20 42 6C 6F 62 55 64 70 48 65 61 72 74 62 65 61 74 49 6E 74 65 72 76 61 6C 20 00 00 00 00 6F	.......!sWN Blob UdpHeartbeatInte rval ....o
Write Variable Response:	02 02 02 02 00 00 00 1D 73 57 41 20 42 6C 6F 62 55 64 70 48 65 61 72 74 62 65 61 74 49 6E 74 65 72 76 61 6C 20 60	........sWA Blob UdpHeartbeatInte rval `

4.1.4.9. Variable: BlobUdpMaxPacketSizeAPI

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

Variable Overview

Variable Name	Description
BlobUdpMaxPacketSizeAPI	The maximum size of a single UDP packet.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UInt	
Value Range	100..65535
Initialisation	1024

Variable Telegram Syntax

Read Variable:				
`sRN BlobUdpMaxPacketSizeAPI`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	BlobUdpMaxPacketSizeAPI	String	23	The maximum size of a single UDP Packet

Read Variable Response:				
`sRA BlobUdpMaxPacketSizeAPI <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	BlobUdpMaxPacketSizeAPI	String	23	The maximum size of a single UDP Packet
Variable Data	data	UInt	2	

Write Variable:				
`sWN BlobUdpMaxPacketSizeAPI <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	BlobUdpMaxPacketSizeAPI	String	23	The maximum size of a single UDP Packet
Variable Data	data	UInt	2	

Write Variable Response:				
`sWA BlobUdpMaxPacketSizeAPI`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	BlobUdpMaxPacketSizeAPI	String	23	The maximum size of a single UDP Packet

Variable Telegram Examples

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

Read Variable:	`02 02 02 02 00 00 00 1C  73 52 4E 20 42 6C 6F 62`
	`55 64 70 4D 61 78 50 61  63 6B 65 74 53 69 7A 65`
	`41 50 49 20 0C`
		`........sRN Blob`
		`UdpMaxPacketSize`
		`API ·`

Read Variable Response:	`02 02 02 02 00 00 00 1E  73 52 41 20 42 6C 6F 62`
	`55 64 70 4D 61 78 50 61  63 6B 65 74 53 69 7A 65`
	`41 50 49 20 04 00 07`
		`........sRA Blob`
		`UdpMaxPacketSize`
		`API ···`

Write Variable:	`02 02 02 02 00 00 00 1E  73 57 4E 20 42 6C 6F 62`
	`55 64 70 4D 61 78 50 61  63 6B 65 74 53 69 7A 65`
	`41 50 49 20 04 00 0D`
		`........sWN Blob`
		`UdpMaxPacketSize`
		`API ···`

Write Variable Response:	`02 02 02 02 00 00 00 1C  73 57 41 20 42 6C 6F 62`
	`55 64 70 4D 61 78 50 61  63 6B 65 74 53 69 7A 65`
	`41 50 49 20 06`
		`........sWA Blob`
		`UdpMaxPacketSize`
		`API ·`

4.1.4.10. Variable: BlobUdpIdleTimeBetweenPacketsAPI

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

Variable Overview

Variable Name	Description
BlobUdpIdleTimeBetweenPacketsAPI	Waiting time in microseconds before a new packet is sent.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UInt	
Value Range	0..10000
Initialisation	0
Physical Unit	µs

Variable Telegram Syntax

Read Variable:

```
sRN BlobUdpIdleTimeBetweenPacketsAPI
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	BlobUdpIdleTimeBetweenPacketsAPI	String	32	The time in uS the device waits before sending a new Packet

Read Variable Response:

```
sRA BlobUdpIdleTimeBetweenPacketsAPI <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	BlobUdpIdleTimeBetweenPacketsAPI	String	32	The time in uS the device waits before sending a new Packet
Variable Data	data	UInt	2	

Write Variable:

```
sWN BlobUdpIdleTimeBetweenPacketsAPI <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	BlobUdpIdleTimeBetweenPacketsAPI	String	32	The time in uS the device waits before sending a new Packet
Variable Data	data	UInt	2	

Write Variable Response:

```
sWA BlobUdpIdleTimeBetweenPacketsAPI
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	BlobUdpIdleTimeBetweenPacketsAPI	String	32	The time in uS the device waits before sending a new Packet

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 25 73 52 4E 20 42 6C 6F 62 55 64 70 49 64 6C 65 54 69 6D 65 42 65 74 77 65 65 6E 50 61 63 6B 65 74 73 41 50 49 20 55	·····%sRN Blob UdpIdleTimeBetwe enPacketsAPI U
Read Variable Response:	02 02 02 02 00 00 00 27 73 52 41 20 42 6C 6F 62 55 64 70 49 64 6C 65 54 69 6D 65 42 65 74 77 65 65 6E 50 61 63 6B 65 74 73 41 50 49 20 00 00 5A	·····'sRA Blob UdpIdleTimeBetwe enPacketsAPI ··Z
Write Variable:	02 02 02 02 00 00 00 27 73 57 4E 20 42 6C 6F 62 55 64 70 49 64 6C 65 54 69 6D 65 42 65 74 77 65 65 6E 50 61 63 6B 65 74 73 41 50 49 20 00 00 50	·····'sWN Blob UdpIdleTimeBetwe enPacketsAPI ··P
Write Variable Response:	02 02 02 02 00 00 00 25 73 57 41 20 42 6C 6F 62 55 64 70 49 64 6C 65 54 69 6D 65 42 65 74 77 65 65 6E 50 61 63 6B 65 74 73 41 50 49 20 5F	·····%sWA Blob UdpIdleTimeBetwe enPacketsAPI _

4.1.4.11. Variable: BlobUdpHeaderEnabled

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

Variable Overview

Variable Name	Description
BlobUdpHeaderEnabled	Enable header in UDP packets.

Read-Access	Always
Write-Access	AuthorizedClient, Service

Bool	
Value Range	False, True
Initialisation	True

Variable Telegram Syntax

Read Variable:

```
sRN BlobUdpHeaderEnabled
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	BlobUdpHeaderEnabled	String	20	Enable Header in UDP Packets

Read Variable Response:

```
sRA BlobUdpHeaderEnabled <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	BlobUdpHeaderEnabled	String	20	Enable Header in UDP Packets
Variable Data	data	Bool	1	

Write Variable:				
sWN BlobUdpHeaderEnabled <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	BlobUdpHeaderEnabled	String	20	Enable Header in UDP Packets
Variable Data	data	Bool	1	

Write Variable Response:				
sWA BlobUdpHeaderEnabled				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	BlobUdpHeaderEnabled	String	20	Enable Header in UDP Packets

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 19 73 52 4E 20 42 6C 6F 62 55 64 70 48 65 61 64 65 72 45 6E 61 62 6C 65 64 20 77	····sRN Blob UdpHeaderEnabled w
Read Variable Response:	02 02 02 02 00 00 00 1A 73 52 41 20 42 6C 6F 62 55 64 70 48 65 61 64 65 72 45 6E 61 62 6C 65 64 20 01 79	····sRA Blob UdpHeaderEnabled ·y
Write Variable:	02 02 02 02 00 00 00 1A 73 57 4E 20 42 6C 6F 62 55 64 70 48 65 61 64 65 72 45 6E 61 62 6C 65 64 20 01 73	····sWN Blob UdpHeaderEnabled ·s
Write Variable Response:	02 02 02 02 00 00 00 19 73 57 41 20 42 6C 6F 62 55 64 70 48 65 61 64 65 72 45 6E 61 62 6C 65 64 20 7D	····sWA Blob UdpHeaderEnabled }

4.1.4.12. Variable: BlobUdpFECEnabled

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

Variable Overview

Variable Name	Description
BlobUdpFECEnabled	Enable Forward Error Correction for UDP packets.

Read-Access	Always
Write-Access	AuthorizedClient, Service

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
`sRN BlobUdpFECEnabled`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	BlobUdpFECEnabled	String	17	Enable Forward Error Correction for UDP Packets

Read Variable Response:				
`sRA BlobUdpFECEnabled <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	BlobUdpFECEnabled	String	17	Enable Forward Error Correction for UDP Packets
Variable Data	data	Bool	1	

Write Variable:				
`sWN BlobUdpFECEnabled <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	BlobUdpFECEnabled	String	17	Enable Forward Error Correction for UDP Packets
Variable Data	data	Bool	1	

Write Variable Response:				
`sWA BlobUdpFECEnabled`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	BlobUdpFECEnabled	String	17	Enable Forward Error Correction for UDP Packets

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	`02 02 02 02 00 00 00 16  73 52 4E 20 42 6C 6F 62` `55 64 70 46 45 43 45 6E  61 62 6C 65 64 20 08`	`·····sRN Blob` `UdpFECEnabled ·`
Read Variable Response:	`02 02 02 02 00 00 00 17  73 52 41 20 42 6C 6F 62` `55 64 70 46 45 43 45 6E  61 62 6C 65 64 20 00 07`	`·····sRA Blob` `UdpFECEnabled ··`
Write Variable:	`02 02 02 02 00 00 00 17  73 57 4E 20 42 6C 6F 62` `55 64 70 46 45 43 45 6E  61 62 6C 65 64 20 00 0D`	`·····sWN Blob` `UdpFECEnabled ··`
Write Variable Response:	`02 02 02 02 00 00 00 16  73 57 41 20 42 6C 6F 62` `55 64 70 46 45 43 45 6E  61 62 6C 65 64 20 02`	`·····sWA Blob` `UdpFECEnabled ·`

4.1.4.13. Method: BlobServerGetStatistics

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

Method Overview

Method Name	Description
BlobServerGetStatistics	Returns the following values: Decoding: NumImages, NumErrors. Sending: NumImages, NumErrors, NumInactive. ScalingTime: MinTime_ms, AvgTime_ms, MaxTime_ms. SendingTime: MinTime_ms, AvgTime_ms, MaxTime_ms.

Invocation Access	Always

Return Values	
Levels	
Array	
Length	2
Struct	
Decoding	
Struct	
NumImages	
UDInt	Return Values[Levels].Array.Struct[Decoding].Struct[NumImages].UDInt
NumErrors	
UDInt	Return Values[Levels].Array.Struct[Decoding].Struct[NumErrors].UDInt
Sending	
Struct	
NumImages	
UDInt	Return Values[Levels].Array.Struct[Sending].Struct[NumImages].UDInt
NumErrors	
UDInt	Return Values[Levels].Array.Struct[Sending].Struct[NumErrors].UDInt
NumInactive	
UDInt	Return Values[Levels].Array.Struct[Sending].Struct[NumInactive].UDInt
ScalingTime	
Struct	
MinTime_ms	
Real	Return Values[Levels].Array.Struct[ScalingTime].Struct[MinTime_ms].Real
AvgTime_ms	
Real	Return Values[Levels].Array.Struct[ScalingTime].Struct[AvgTime_ms].Real
MaxTime_ms	
Real	Return Values[Levels].Array.Struct[ScalingTime].Struct[MaxTime_ms].Real
SendingTime	
Struct	
MinTime_ms	
Real	Return Values[Levels].Array.Struct[SendingTime].Struct[MinTime_ms].Real
AvgTime_ms	
Real	Return Values[Levels].Array.Struct[SendingTime].Struct[AvgTime_ms].Real
MaxTime_ms	
Real	Return Values[Levels].Array.Struct[SendingTime].Struct[MaxTime_ms].Real

UDInt	Return Values[Levels].Array.Struct[Decoding].Struct[NumImages].UDInt
Value Range	0..4294967295

UDInt	Return Values[Levels].Array.Struct[Decoding].Struct[NumErrors].UDInt
Value Range	0..4294967295

UDInt	Return Values[Levels].Array.Struct[Sending].Struct[NumImages].UDInt
Value Range	0..4294967295

UDInt	Return Values[Levels].Array.Struct[Sending].Struct[NumErrors].UDInt
Value Range	0..4294967295

UDInt	Return Values[Levels].Array.Struct[Sending].Struct[NumInactive].UDInt
Value Range	0..4294967295

Real	Return Values[Levels].Array.Struct[ScalingTime].Struct[MinTime_ms].Real
Value Range	See specification IEEE 754

Real	Return Values[Levels].Array.Struct[ScalingTime].Struct[AvgTime_ms].Real
Value Range	See specification IEEE 754

Real	Return Values[Levels].Array.Struct[ScalingTime].Struct[MaxTime_ms].Real
Value Range	See specification IEEE 754

Real	Return Values[Levels].Array.Struct[SendingTime].Struct[MinTime_ms].Real
Value Range	See specification IEEE 754

Real	Return Values[Levels].Array.Struct[SendingTime].Struct[AvgTime_ms].Real
Value Range	See specification IEEE 754

Real	Return Values[Levels].Array.Struct[SendingTime].Struct[MaxTime_ms].Real
Value Range	See specification IEEE 754

Method Telegram Syntax

Method Invocation:

```
sMN BlobServerGetStatistics
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sMN	String	3	Request (SOPAS Method by Name)
Method	BlobServerGetStatistics	String	23	

Method Return Value:

```
sAN BlobServerGetStatistics <Levels>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sAN	String	3	Result (SOPAS Method Result)
Method	BlobServerGetStatistics	String	23	
Return Value 1	Levels	Array	88	

Method Telegram Examples

Example: Default Values

Method telegram examples with parameter data and return value data set to default values.

Method Invocation:

```
02 02 02 02 00 00 00 1C   73 4D 4E 20 42 6C 6F 62   ........sMN Blob
53 65 72 76 65 72 47 65   74 53 74 61 74 69 73 74   ServerGetStatist
69 63 73 20 05                                      ics .
```

Method Return Value:	02 02 02 02 00 00 00 74 73 41 4E 20 42 6C 6F 62 53 65 72 76 65 72 47 65 74 53 74 61 74 69 73 74 69 63 73 20 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 09	.......tsAN Blob ServerGetStatist ics ···· ···· ···· ···· ···· ···· ····

4.1.5. Method: mjSelectJob

Multiple job handling: select job by job id.

Method Overview

Method Name	Description
mjSelectJob	Trigger a switch to the job with the specified id

Invocation Access	AuthorizedClient, Service

Parameters		
id		
	Int	
	Value Range	0..255
	Initialisation	0

Return Values			
message			
	Enum8		
	Default Value	OK	
	Value	Name	Description
	0	OK	
	1	UNKNOWN_ID	

Method Telegram Syntax

Method Invocation:				
`sMN mjSelectJob <id>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sMN	String	3	Request (SOPAS Method by Name)
Method	mjSelectJob	String	11	Trigger a switch to the job with the specified id
Parameter 1	id	Int	2	

Method Return Value:				
`sAN mjSelectJob <message>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sAN	String	3	Result (SOPAS Method Result)
Method	mjSelectJob	String	11	Trigger a switch to the job with the specified id
Return Value 1	message	Enum8	1	

Method Telegram Examples

Custom Example 1		
run function mjSelectJob(1)		
Method Invocation:	02 02 02 02 00 00 00 12 73 4D 4E 20 6D 6A 53 65 6C 65 63 74 4A 6F 62 20 00 01 19	........sMN mjSe lectJob ···
Method Return Value:	02 02 02 02 00 00 00 11 73 41 4E 20 6D 6A 53 65 6C 65 63 74 4A 6F 62 20 00 14	........sAN mjSe lectJob ··

4.1.6. Variable: SCParamsChanged

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

Variable Overview

Variable Name	Description
SCParamsChanged	Flag is set if parameters may have been changed but are not saved permanently

Communication Name	SCParmChngd
Read-Access	Always
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
`sRN SCParmChngd`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	SCParmChngd	String	11	Flag is set if parameters may have been changed but are not saved permanently

Read Variable Response:				
`sRA SCParmChngd <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	SCParmChngd	String	11	Flag is set if parameters may have been changed but are not saved permanently
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 10 73 52 4E 20 53 43 50 61 72 6D 43 68 6E 67 64 20 17	·····sRN SCPa rmChngd ·
Read Variable Response:	02 02 02 02 00 00 00 11 73 52 41 20 53 43 50 61 72 6D 43 68 6E 67 64 20 00 18	·····sRA SCPa rmChngd ··

4.1.7. Method: WriteEeprom

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

Method Overview

Method Name	Description
WriteEeprom	Method writes all permanent parameters from the SOPAS mirror to the device memory.

Communication Name	mEEwriteall
Invocation Access	AuthorizedClient, Service

Return Values	
Success	
Bool	
Value Range	False, True
Initialisation	False

Method Telegram Syntax

Method Invocation:

```
sMN mEEwriteall
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sMN	String	3	Request (SOPAS Method by Name)
Method	mEEwriteall	String	11	Method writes all permanent parameters from the SOPAS mirror to the ParamEEprom

Method Return Value:

```
sAN mEEwriteall <Success>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sAN	String	3	Result (SOPAS Method Result)
Method	mEEwriteall	String	11	Method writes all permanent parameters from the SOPAS mirror to the ParamEEprom
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:	02 02 02 02 00 00 00 10 73 4D 4E 20 6D 45 45 77 72 69 74 65 61 6C 6C 20 01	........sMN mEEw riteall ·
Method Return Value:	02 02 02 02 00 00 00 11 73 41 4E 20 6D 45 45 77 72 69 74 65 61 6C 6C 20 00 0D	........sAN mEEw riteall ··

4.1.8. Method: RebootDevice

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

Method Overview

Method Name	Description
RebootDevice	Method reboots the device an saves the parameters 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	sMN	String	3	Request (SOPAS Method by Name)
Method	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	sAN	String	3	Result (SOPAS Method Result)
Method	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:	02 02 02 02 00 00 00 0E 73 4D 4E 20 6D 53 43 72 65 62 6F 6F 74 20 0C	........sMN mSCr eboot ·
Method Return Value:	02 02 02 02 00 00 00 0E 73 41 4E 20 6D 53 43 72 65 62 6F 6F 74 20 00	........sAN mSCr eboot ·

4.1.9. Method: LoadApplicationDefaults

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

Method Overview

Method Name	Description
LoadApplicationDefaults	Resets all application variables to their default value.

Communication Name	mSCloadappdef
Invocation Access	AuthorizedClient, Service

Method Telegram Syntax

Method Invocation:				
`sMN mSCloadappdef`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sMN	String	3	Request (SOPAS Method by Name)
Method	mSCloadappdef	String	13	The method resets all application relevant variables to their default value

Method Return Value:				
`sAN mSCloadappdef`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sAN	String	3	Result (SOPAS Method Result)
Method	mSCloadappdef	String	13	The method resets all application relevant variables to their default value

Method Telegram Examples

Example: Default Values		
Method telegram examples with parameter data and return value data set to default values.		
Method Invocation:	`02 02 02 02 00 00 00 12  73 4D 4E 20 6D 53 43 6C` `6F 61 64 61 70 70 64 65  66 20 0D`	`·····sMN mSCl` `oadappdef ·`
Method Return Value:	`02 02 02 02 00 00 00 12  73 41 4E 20 6D 53 43 6C` `6F 61 64 61 70 70 64 65  66 20 01`	`·····sAN mSCl` `oadappdef ·`

4.1.10. Method: LoadFactoryDefaults

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

Method Overview

Method Name	Description
LoadFactoryDefaults	Resets all variables to their default value.

Communication Name	mSCloadfacdef
Invocation Access	Service

Method Telegram Syntax

Method Invocation:

```
sMN mSCloadfacdef
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sMN	String	3	Request (SOPAS Method by Name)
Method	mSCloadfacdef	String	13	The method resets all variables to their default value.

Method Return Value:

```
sAN mSCloadfacdef
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sAN	String	3	Result (SOPAS Method Result)
Method	mSCloadfacdef	String	13	The method resets all variables to their default value.

Method Telegram Examples

Example: Default Values

Method telegram examples with parameter data and return value data set to default values.

Method Invocation:	02 02 02 02 00 00 00 12 73 4D 4E 20 6D 53 43 6C 6F 61 64 66 61 63 64 65 66 20 08	........sMN mSCl oadfacdef ·
Method Return Value:	02 02 02 02 00 00 00 12 73 41 4E 20 6D 53 43 6C 6F 61 64 66 61 63 64 65 66 20 04	........sAN mSCl oadfacdef ·

4.2. System Health (Diagnostics)

4.2.1. Electrical

4.2.1.1. Variable: ElectricalMonitoring

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

Variable Overview

Variable Name	Description
ElectricalMonitoring	Returns the following values: LEDsCurrent [A], OperationVoltage [V], MinimalVoltage [V], MaximalVoltage [V].

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

UserType	
V3SElectricalMonitoring	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:

```
sRN ElectricalMonitoring
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	ElectricalMonitoring	String	20	All available electrical value.

Read Variable Response:

```
sRA ElectricalMonitoring <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	ElectricalMonitoring	String	20	All available electrical value.
Variable Data	data	V3SElectricalMonitoring	16	

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	02 02 02 02 00 00 00 19 73 52 4E 20 45 6C 65 63 74 72 69 63 61 6C 4D 6F 6E 69 74 6F 72 69 6E 67 20 6D	........sRN Elec tricalMonitoring m
Read Variable Response:	02 02 02 02 00 00 00 29 73 52 41 20 45 6C 65 63 74 72 69 63 61 6C 4D 6F 6E 69 74 6F 72 69 6E 67 20 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 62	.......)sRA Elec tricalMonitoring ····· ·b

4.2.1.2. Variable: ElectricalLimits

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

Variable Overview

Variable Name	Description
ElectricalLimits	Returns the following values: MinAllowedLEDsCurrent [A], MaxAllowedLEDsCurrent [A], MinAllowedOpVoltage [V], MaxAllowedOpVoltage [V].

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

UserType	
V3SElectricalLimits	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:

```
sRN ElectricalLimits
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	ElectricalLimits	String	16	The electrical limit values.

Read Variable Response:

```
sRA ElectricalLimits <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	ElectricalLimits	String	16	The electrical limit values.
Variable Data	data	V3SElectricalLimits	16	

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	02 02 02 02 00 00 00 15 73 52 4E 20 45 6C 65 63 74 72 69 63 61 6C 4C 69 6D 69 74 73 20 67	........sRN Elec tricalLimits g
Read Variable Response:	02 02 02 02 00 00 00 25 73 52 41 20 45 6C 65 63 74 72 69 63 61 6C 4C 69 6D 69 74 73 20 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 68	.......%sRA Elec tricalLimits ... .h

4.2.2. Variable: OpVoltageStatus

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

Variable Overview

Variable Name	Description
OpVoltageStatus	Shows the current OpVoltageStatus as either INVALID, ERROR, WARNING or GOOD.

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

UserType	
ThreeLevels	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:

```
sRN OpVoltageStatus
```

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

Read Variable Response:

```
sRA OpVoltageStatus <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	OpVoltageStatus	String	15	
Variable Data	data	ThreeLevels	0	

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	02 02 02 02 00 00 00 14 73 52 4E 20 4F 70 56 6F 6C 74 61 67 65 53 74 61 74 75 73 20 26	........sRN OpVo ltageStatus &
Read Variable Response:	02 02 02 02 00 00 00 15 73 52 41 20 4F 70 56 6F 6C 74 61 67 65 53 74 61 74 75 73 20 00 29	........sRA OpVo ltageStatus ·)

4.2.3. Variable: illuminationActive

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

Variable Overview

Variable Name	Description
illuminationActive	Shows whether illumination is active.

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

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:

```
sRN illuminationActive
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	illuminationActive	String	18	Shows whether illumination is active.

Read Variable Response:

```
sRA illuminationActive <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	illuminationActive	String	18	Shows whether illumination is active.
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	02 02 02 02 00 00 00 17 73 52 4E 20 69 6C 6C 75 6D 69 6E 61 74 69 6F 6E 41 63 74 69 76 65 20 48	........sRN illu minationActive H
Read Variable Response:	02 02 02 02 00 00 00 18 73 52 41 20 69 6C 6C 75 6D 69 6E 61 74 69 6F 6E 41 63 74 69 76 65 20 00 47	........sRA illu minationActive · G

4.2.4. Variable: DeviceTime

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

Variable Overview

Variable Name	Description
DeviceTime	Device time in milliseconds. Returns the 32 LSBs of the device time which can be used to synchronize with the time stamp of a frame.

Read-Access	Always
Write-Access	Always

UDInt	
Value Range	0..4294967295
Initialisation	0

Variable Telegram Syntax

Read Variable:

```
sRN DeviceTime
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	DeviceTime	String	10	Timestamp of the device in milliseconds. Must be updated in real time by the device itself

Read Variable Response:

```
sRA DeviceTime <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	DeviceTime	String	10	Timestamp of the device in milliseconds. Must be updated in real time by the device itself
Variable Data	data	UDInt	4	

Write Variable:

```
sWN DeviceTime <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	DeviceTime	String	10	Timestamp of the device in milliseconds. Must be updated in real time by the device itself
Variable Data	data	UDInt	4	

Write Variable Response:

```
sWA DeviceTime
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	DeviceTime	String	10	Timestamp of the device in milliseconds. Must be updated in real time by the device itself

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 0F 73 52 4E 20 44 65 76 69 63 65 54 69 6D 65 20 62	........sRN Devi ceTime b
Read Variable Response:	02 02 02 02 00 00 00 13 73 52 41 20 44 65 76 69 63 65 54 69 6D 65 20 00 00 00 00 6D	........sRA Devi ceTime ····m
Write Variable:	02 02 02 02 00 00 00 13 73 57 4E 20 44 65 76 69 63 65 54 69 6D 65 20 00 00 00 00 67	........sWN Devi ceTime ····g
Write Variable Response:	02 02 02 02 00 00 00 0F 73 57 41 20 44 65 76 69 63 65 54 69 6D 65 20 68	........sWA Devi ceTime h

4.2.5. System Log

4.2.5.1. Variable: EMsgInfo

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

Variable Overview

Variable Name	Description
EMsgInfo	Error messages on logging level INFO, which are stored in volatile memory.

Communication Name	MSinfo
Read-Access	Always
Write-Access	No! (readonly)

Array		
Length		25
	UserType	
	ErrStructType	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:

```
sRN MSinfo
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	MSinfo	String	6	Info messages which are stored in volatile memory. They are informations and do not indicate an error condition.

Read Variable Response:

```
sRA MSinfo <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	MSinfo	String	6	Info messages which are stored in volatile memory. They are informations and do not indicate an error condition.
Variable Data	data	Array	2050	

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:

```
02 02 02 02 00 00 00 0B   73 52 4E 20 4D 53 69 6E  ........sRN MSin
66 6F 20 7F                                       fo ·
```

Read Variable Response:	02 02 02 02 00 00 03 5D 73 52 41 20 4D 53 69 6E 66 6F 20 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 70	·······]sRA MSin fo ············· ·····p

4.2.5.2. Variable: EMsgWarning

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

Variable Overview

Variable Name	Description
EMsgWarning	Error messages on logging level WARNING, which are stored in non-volatile memory (EEPROM).

Communication Name	MSwarn
Read-Access	Always
Write-Access	No! (readonly)

Array		
Length		25
	UserType	
	ErrStructType	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:

```
sRN MSwarn
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	MSwarn	String	6	Error message on level WARNING which is stored in non volatile memory

Read Variable Response:

```
sRA MSwarn <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	MSwarn	String	6	Error message on level WARNING which is stored in non volatile memory
Variable Data	data	Array	2050	

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	02 02 02 02 00 00 00 0B 73 52 4E 20 4D 53 77 61 72 6E 20 7B	........sRN MSwarn {

Read Variable Response:	02 02 02 02 00 00 03 5D 73 52 41 20 4D 53 77 61	·······]sRA MSwa
	72 6E 20 00 00 00 00 00 00 00 00 00 00 00 00 00	rn ·············
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
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	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
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	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	················
	00 00 00 00 00 74	·····t

4.2.5.3. Variable: EMsgError

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

Variable Overview

Variable Name	Description
EMsgError	Error messages on logging level ERROR, which are stored in non-volatile memory (EEPROM).

Communication Name	MSerr
Read-Access	Always
Write-Access	No! (readonly)

Array	
Length	10
UserType	
ErrStructType	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:

```
sRN MSerr
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	MSerr	String	5	Error message on level ERROR which is stored in non volatile memory

Read Variable Response:

```
sRA MSerr <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	MSerr	String	5	Error message on level ERROR which is stored in non volatile memory
Variable Data	data	Array	820	

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	02 02 02 02 00 00 00 0A 73 52 4E 20 4D 53 65 72 72 20 14	........sRN MSerr .

Read Variable Response:	02 02 02 02 00 00 01 5E 73 52 41 20 4D 53 65 72 72 20 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 1B	.......^sRA MSer r ....

4.2.5.4. Variable: EMsgFatal

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

Variable Overview

Variable Name	Description
EMsgFatal	Error messages on logging level FATAL, which are stored in non-volatile memory (EEPROM).

Communication Name	MSfat
Read-Access	Always
Write-Access	No! (readonly)

Array		
Length	10	
	UserType	
	ErrStructType	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:				
`sRN MSfat`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	MSfat	String	5	Error message on level FATAL which is stored in non volatile memory

Read Variable Response:				
`sRA MSfat <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	MSfat	String	5	Error message on level FATAL which is stored in non volatile memory
Variable Data	data	Array	820	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	`02 02 02 02 00 00 00 0A  73 52 4E 20 4D 53 66 61` `74 20 02`	`········sRN MSfa` `t ·`
Read Variable Response:	`02 02 02 02 00 00 01 5E  73 52 41 20 4D 53 66 61` `74 20 00 00 00 00 00 00  00 00 00 00 00 00 00 00` `00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00` `00 00 00 00 00 00 0D`	`·······^sRA MSfa` `t ··············` `················` `·······`

4.2.5.5. Variable: PowerOnCnt

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

Variable Overview

Variable Name	Description
PowerOnCnt	The number of power on cycles.

Communication Name	ODpwrc
Read-Access	Always
Write-Access	No! (readonly)

UDInt	
Value Range	0..4294967295
Initialisation	0

Variable Telegram Syntax

Read Variable:

```
sRN ODpwrc
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	ODpwrc	String	6	The number of power on cycles

Read Variable Response:

```
sRA ODpwrc <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	ODpwrc	String	6	The number of power on cycles
Variable Data	data	UDInt	4	

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	02 02 02 02 00 00 00 0B 73 52 4E 20 4F 44 70 77 72 63 20 72	........sRN ODpwrc r
Read Variable Response:	02 02 02 02 00 00 00 0F 73 52 41 20 4F 44 70 77 72 63 20 00 00 00 00 7D	........sRA ODpwrc ....}

4.2.5.6. Variable: OpHours

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

Variable Overview

Variable Name	Description
OpHours	The total number of operating hours since last service reset. Can only be reset by SICK service.

Communication Name	ODoprh
Read-Access	Always
Write-Access	No! (readonly)

Real	
Value Range	See specification IEEE 754
Initialisation	0.0
Physical Unit	h

Variable Telegram Syntax

Read Variable:

```
sRN ODoprh
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	ODoprh	String	6	The total number of operating hours since last service reset. Can be reset by the service

Read Variable Response:

```
sRA ODoprh <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	ODoprh	String	6	The total number of operating hours since last service reset. Can be reset by the service
Variable Data	data	Real	4	

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	02 02 02 02 00 00 00 0B 73 52 4E 20 4F 44 6F 70 72 68 20 61	........sRN ODoprh a
Read Variable Response:	02 02 02 02 00 00 00 0F 73 52 41 20 4F 44 6F 70 72 68 20 00 00 00 00 6E	........sRA ODoprh ....n

4.2.5.7. Variable: DailyOpHours

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

Variable Overview

Variable Name	Description
DailyOpHours	Runtime of the device since last power-on. Non-persistent variable.

Communication Name	ODopdaily
Read-Access	Always
Write-Access	No! (readonly)

Real	
Value Range	See specification IEEE 754
Initialisation	0.0
Physical Unit	h

Variable Telegram Syntax

Read Variable:

```
sRN ODopdaily
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	ODopdaily	String	9	The runtime duration since last power on. Non persistant !

Read Variable Response:

```
sRA ODopdaily <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	ODopdaily	String	9	The runtime duration since last power on. Non persistant !
Variable Data	data	Real	4	

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	02 02 02 02 00 00 00 0E 73 52 4E 20 4F 44 6F 70 64 61 69 6C 79 20 02	........sRN ODop daily .
Read Variable Response:	02 02 02 02 00 00 00 12 73 52 41 20 4F 44 6F 70 64 61 69 6C 79 20 00 00 00 00 0D	........sRA ODop daily .....

4.2.6. Temperature

4.2.6.1. Variable: TempLevel

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

Variable Overview

Variable Name	Description
TempLevel	The current temperature level of the device (Good, Warning, Error).

Communication Name	TmpLvl
Read-Access	Always
Write-Access	No! (readonly)

UserType	
ThreeLevels	See the chapter "User Types" for details.

Variable Telegram Syntax

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

Read Variable Response:				
`sRA TmpLvl <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	TmpLvl	String	6	Temperature level
Variable Data	data	ThreeLevels	0	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	`02 02 02 02 00 00 00 0B  73 52 4E 20 54 6D 70 4C 76 6C 20 70`	`·····sRN TmpLvl p`
Read Variable Response:	`02 02 02 02 00 00 00 0C  73 52 41 20 54 6D 70 4C 76 6C 20 00 7F`	`·····sRA TmpLvl ··`

4.2.6.2. Variable: SysTemperatureCurrentValue

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

Variable Overview

Variable Name	Description
SysTemperatureCurrentValue	Current system temperature of the device.

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

Int	
Value Range	-32768..32767
Physical Unit	°C
Physical Unit Factor	10.0

Variable Telegram Syntax

Read Variable:

```
sRN SysTemperatureCurrentValue
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	SysTemperatureCurrentValue	String	26	Current temperature of the device.

Read Variable Response:

```
sRA SysTemperatureCurrentValue <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	SysTemperatureCurrentValue	String	26	Current temperature of the device.
Variable Data	data	Int	2	

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	02 02 02 02 00 00 00 1F 73 52 4E 20 53 79 73 54 65 6D 70 65 72 61 74 75 72 65 43 75 72 72 65 6E 74 56 61 6C 75 65 20 78	........sRN SysT emperatureCurren tValue x
Read Variable Response:	02 02 02 02 00 00 00 21 73 52 41 20 53 79 73 54 65 6D 70 65 72 61 74 75 72 65 43 75 72 72 65 6E 74 56 61 6C 75 65 20 00 00 77	.......!sRA SysT emperatureCurren tValue ..w

4.2.6.3. Variable: SysTemperatureWarningMargin

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

Variable Overview

Variable Name	Description
SysTemperatureWarningMargin	Adjustable warning range for the sytem temperature. Margin relative to the system temperature error limit.

Read-Access	Always
Write-Access	Service

Int	
Value Range	-32768..32767
Initialisation	50
Physical Unit	°C
Physical Unit Factor	10.0

Variable Telegram Syntax

Read Variable:

```
sRN SysTemperatureWarningMargin
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	SysTemperatureWarningMargin	String	27	The margin to systems error limit. If temeprature raises above the margin, the device will change into warning state.

Read Variable Response:

```
sRA SysTemperatureWarningMargin <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	SysTemperatureWarningMargin	String	27	The margin to systems error limit. If temeprature raises above the margin, the device will change into warning state.
Variable Data	data	Int	2	

Write Variable:

```
sWN SysTemperatureWarningMargin <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	SysTemperatureWarningMargin	String	27	The margin to systems error limit. If temeprature raises above the margin, the device will change into warning state.
Variable Data	data	Int	2	

Write Variable Response:

```
sWA SysTemperatureWarningMargin
```

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

Write Variable Response:				
sWA SysTemperatureWarningMargin				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Variable	SysTemperatureWarningMargin	String	27	The margin to systems error limit. If temeprature raises above the margin, the device will change into warning state.

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 20 73 52 4E 20 53 79 73 54 65 6D 70 65 72 61 74 75 72 65 57 61 72 6E 69 6E 67 4D 61 72 67 69 6E 20 0E	····· sRN SysT emperatureWarnin gMargin ·
Read Variable Response:	02 02 02 02 00 00 00 22 73 52 41 20 53 79 73 54 65 6D 70 65 72 61 74 75 72 65 57 61 72 6E 69 6E 67 4D 61 72 67 69 6E 20 00 32 33	·····"sRA SysT emperatureWarnin gMargin ·23
Write Variable:	02 02 02 02 00 00 00 22 73 57 4E 20 53 79 73 54 65 6D 70 65 72 61 74 75 72 65 57 61 72 6E 69 6E 67 4D 61 72 67 69 6E 20 00 32 39	·····"sWN SysT emperatureWarnin gMargin ·29
Write Variable Response:	02 02 02 02 00 00 00 20 73 57 41 20 53 79 73 54 65 6D 70 65 72 61 74 75 72 65 57 61 72 6E 69 6E 67 4D 61 72 67 69 6E 20 04	····· sWA SysT emperatureWarnin gMargin ·

4.2.6.4. Variable: SysTemperatureErrorLimit

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

Variable Overview

Variable Name	Description
SysTemperatureErrorLimit	Maximum system temperature. Exceeding this temperature will result in a device error and shutdown. May depend on configuration.

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

Int	
Value Range	-32768..32767
Initialisation	750
Physical Unit	°C
Physical Unit Factor	10.0

Variable Telegram Syntax

Read Variable:				
sRN SysTemperatureErrorLimit				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	SysTemperatureErrorLimit	String	24	Systems highest allowed temperature. May depend on configuration.

Read Variable Response:				
sRA SysTemperatureErrorLimit <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	SysTemperatureErrorLimit	String	24	Systems highest allowed temperature. May depend on configuration.
Variable Data	data	Int	2	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 1D 73 52 4E 20 53 79 73 54 65 6D 70 65 72 61 74 75 72 65 45 72 72 6F 72 4C 69 6D 69 74 20 77	····sRN SysT emperatureErrorL imit w
Read Variable Response:	02 02 02 02 00 00 00 1F 73 52 41 20 53 79 73 54 65 6D 70 65 72 61 74 75 72 65 45 72 72 6F 72 4C 69 6D 69 74 20 02 EE 94	····sRA SysT emperatureErrorL imit ·

4.2.6.5. Variable: TemperatureNames

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

Variable Overview

Variable Name	Description
TemperatureNames	List of all names for the available temperatures listed by TemperatureValues.

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

Array		
Length		0..128
	FlexString	
	Length	0..128

Variable Telegram Syntax

Read Variable:				
sRN TemperatureNames				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	TemperatureNames	String	16	List of all names for variable TemperatureValues

Read Variable Response:				
sRA TemperatureNames <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	TemperatureNames	String	16	List of all names for variable TemperatureValues
Variable Data	data	Array	16384	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 15 73 52 4E 20 54 65 6D 70 65 72 61 74 75 72 65 4E 61 6D 65 73 20 77	····sRN Temp eratureNames w
Read Variable Response:	02 02 02 02 00 00 00 17 73 52 41 20 54 65 6D 70 65 72 61 74 75 72 65 4E 61 6D 65 73 20 00 00 78	····sRA Temp eratureNames ··x

4.2.6.6. Variable: TemperatureValues

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

Variable Overview

Variable Name	Description
TemperatureValues	List of all available temperatures. See also TemperatureNames.

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

Array		
Length		0..128
	Int	
	Value Range	-32768..32767
	Physical Unit	°C
	Physical Unit Factor	10.0

Variable Telegram Syntax

Read Variable:				
`sRN TemperatureValues`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	TemperatureValues	String	17	List of all available temperatures. Ordered by significance in terms of calibration.

Read Variable Response:				
`sRA TemperatureValues <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	TemperatureValues	String	17	List of all available temperatures. Ordered by significance in terms of calibration.
Variable Data	data	Array	256	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	`02 02 02 02 00 00 00 16  73 52 4E 20 54 65 6D 70` `65 72 61 74 75 72 65 56  61 6C 75 65 73 20 1B`	`·····sRN Temp` `eratureValues ·`

Read Variable Response:	`02 02 02 02 00 00 00 18  73 52 41 20 54 65 6D 70`
	`65 72 61 74 75 72 65 56  61 6C 75 65 73 20 00 00`
	`14`
		`·····sRA Temp`
		`eratureValues ··`
		`·`

4.2.7. Digital IO

4.2.7.1. Variable: digitalIOStatus

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

Variable Overview

Variable Name	Description
digitalIOStatus	Status of the digital outputs. True if neither overload nor any pin error are true.

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

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:

```
sRN digitalIOStatus
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	digitalIOStatus	String	15	Digital output status, true if neither overload nor any pin error.

Read Variable Response:

```
sRA digitalIOStatus <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	digitalIOStatus	String	15	Digital output status, true if neither overload nor any pin error.
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	02 02 02 02 00 00 00 14 73 52 4E 20 64 69 67 69 74 61 6C 49 4F 53 74 61 74 75 73 20 27	····sRN digi talIOStatus '
Read Variable Response:	02 02 02 02 00 00 00 15 73 52 41 20 64 69 67 69 74 61 6C 49 4F 53 74 61 74 75 73 20 00 28	····sRA digi talIOStatus ·(

4.2.7.2. Variable: doutOverload

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

Variable Overview

Variable Name	Description
doutOverload	Digital output overheated, e.g. due to an overload.

Communication Name	DoOvrld
Read-Access	Always
Write-Access	No! (readonly)

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
`sRN DoOvrld`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	DoOvrld	String	7	Digital output overheated, i.e. due to a overload

Read Variable Response:				
`sRA DoOvrld <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	DoOvrld	String	7	Digital output overheated, i.e. due to a overload
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	`02 02 02 02 00 00 00 0C 73 52 4E 20 44 6F 4F 76 72 6C 64 20 07`	`........sRN DoOvrld .`
Read Variable Response:	`02 02 02 02 00 00 00 0D 73 52 41 20 44 6F 4F 76 72 6C 64 20 00 08`	`........sRA DoOvrld ..`

4.2.7.3. Variable: doutPinError

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

Variable Overview

Variable Name	Description
doutPinError	Digital output error due to a short circuit.

Communication Name	DoPinErr
Read-Access	Always
Write-Access	No! (readonly)

DCont		
Bit Length		32
out1		
0.0	**Bool**	
	Value Range	False, True
	Initialisation	False
out2		
0.1	**Bool**	
	Value Range	False, True
	Initialisation	False
out3		
0.2	**Bool**	
	Value Range	False, True
	Initialisation	False
out4		
0.3	**Bool**	
	Value Range	False, True
	Initialisation	False
out5		
0.4	**Bool**	
	Value Range	False, True
	Initialisation	False
out6		
0.5	**Bool**	
	Value Range	False, True
	Initialisation	False
out7		
0.6	**Bool**	
	Value Range	False, True
	Initialisation	False
out8		
0.7	**Bool**	
	Value Range	False, True
	Initialisation	False

Variable Telegram Syntax

Read Variable:				
sRN DoPinErr				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	DoPinErr	String	8	Digital output health, if set, a short circuit occured

Read Variable Response:				
sRA DoPinErr <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	DoPinErr	String	8	Digital output health, if set, a short circuit occured
Variable Data	data	DCont	4	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 0D 73 52 4E 20 44 6F 50 69 6E 45 72 72 20 56	····sRN DoPi nErr V
Read Variable Response:	02 02 02 02 00 00 00 11 73 52 41 20 44 6F 50 69 6E 45 72 72 20 00 00 00 00 59	····sRA DoPi nErr ···Y

4.2.8. Service Information

4.2.8.1. Variable: DeviceIdent

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

Variable Overview

Variable Name	Description
DeviceIdent	Identification of the device via product name and firmware version (=CID version).

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

Struct		
Name		
	FlexString	
	Length	0..32
	Initialisation	Visionary-S CX V3S102-1x
Version		
	FlexString	
	Length	0..50
	Initialisation	6.0.0.0R

Variable Telegram Syntax

Read Variable:

```
sRN DeviceIdent
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	DeviceIdent	String	11	Unique Identification of device

Read Variable Response:

```
sRA DeviceIdent <Name> <Version>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	DeviceIdent	String	11	Unique Identification of device
Variable Data 1	Name	FlexString	32	
Variable Data 2	Version	FlexString	50	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 10 73 52 4E 20 44 65 76 69 63 65 49 64 65 6E 74 20 05	····sRN Devi ceIdent ·
Read Variable Response:	02 02 02 02 00 00 00 34 73 52 41 20 44 65 76 69 63 65 49 64 65 6E 74 20 00 18 56 69 73 69 6F 6E 61 72 79 2D 53 20 43 58 20 56 33 53 31 30 32 2D 31 78 00 08 36 2E 30 2E 30 2E 30 52 2A	····4sRA Devi ceIdent ··Vision ary-S CX V3S102- 1x··6.0.0.0R*

4.2.8.2. Variable: LocationName

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

Variable Overview

Variable Name	Description
LocationName	Location of the device (as set by user).

Read-Access	Always
Write-Access	Always

FlexString	
Length	0..16
Initialisation	NoName

Variable Telegram Syntax

Read Variable:

```
sRN LocationName
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	LocationName	String	12	Location of Device (set by user)

Read Variable Response:

```
sRA LocationName <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	LocationName	String	12	Location of Device (set by user)
Variable Data	data	FlexString	16	

Write Variable:

```
sWN LocationName <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	LocationName	String	12	Location of Device (set by user)
Variable Data	data	FlexString	16	

Write Variable Response:				
sWA LocationName				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	LocationName	String	12	Location of Device (set by user)

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 11 73 52 4E 20 4C 6F 63 61 74 69 6F 6E 4E 61 6D 65 20 75	........sRN Loca tionName u
Read Variable Response:	02 02 02 02 00 00 00 19 73 52 41 20 4C 6F 63 61 74 69 6F 6E 4E 61 6D 65 20 00 06 4E 6F 4E 61 6D 65 7A	........sRA Loca tionName ··NoNam ez
Write Variable:	02 02 02 02 00 00 00 19 73 57 4E 20 4C 6F 63 61 74 69 6F 6E 4E 61 6D 65 20 00 06 4E 6F 4E 61 6D 65 70	........sWN Loca tionName ··NoNam ep
Write Variable Response:	02 02 02 02 00 00 00 11 73 57 41 20 4C 6F 63 61 74 69 6F 6E 4E 61 6D 65 20 7F	........sWA Loca tionName ·

4.2.8.3. Variable: Manufacturer

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

Variable Overview

Variable Name	Description
Manufacturer	Manufacturer

Communication Name	DImanf
Read-Access	Always
Write-Access	No! (readonly)

FlexString	
Length	0..18
Initialisation	SICK AG

Variable Telegram Syntax

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

Read Variable Response:				
sRA DImanf <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	DImanf	String	6	Manufacturer
Variable Data	data	FlexString	18	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 0B 73 52 4E 20 44 49 6D 61 6E 66 20 66	····sRN DIma nf f
Read Variable Response:	02 02 02 02 00 00 00 14 73 52 41 20 44 49 6D 61 6E 66 20 00 07 53 49 43 4B 20 41 47 5A	····sRA DIma nf ··SICK AGZ

4.2.8.4. Variable: FirmwareVersion

NOTE

Be aware that the firmware version mentioned at official SICK sources will refer to the CID version rather than this variable.

Variable Overview

Variable Name	Description
FirmwareVersion	Firmware version of the device.

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

FlexString	
Length	0..30
Initialisation	XXXXXXXXXX

Variable Telegram Syntax

Read Variable:				
sRN FirmwareVersion				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	FirmwareVersion	String	15	Version of the application software

Read Variable Response:				
sRA FirmwareVersion <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	FirmwareVersion	String	15	Version of the application software
Variable Data	data	FlexString	30	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 14 73 52 4E 20 46 69 72 6D 77 61 72 65 56 65 72 73 69 6F 6E 20 04	····sRN Firm wareVersion ·
Read Variable Response:	02 02 02 02 00 00 00 20 73 52 41 20 46 69 72 6D 77 61 72 65 56 65 72 73 69 6F 6E 20 00 0A 58 58 58 58 58 58 58 58 58 58 01	···· sRA Firm wareVersion ··XX XXXXXXXX·

4.2.8.5. Variable: DeviceType

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

Variable Overview

Variable Name	Description
DeviceType	Specific product name within the product family.

Communication Name	DItype
Read-Access	Always
Write-Access	No! (readonly)

FlexString	
Length	0..18

Variable Telegram Syntax

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

Read Variable Response:				
sRA DItype <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	DItype	String	6	DeviceType
Variable Data	data	FlexString	18	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 0B 73 52 4E 20 44 49 74 79 70 65 20 7A	····sRN DIty pe z
Read Variable Response:	02 02 02 02 00 00 00 0D 73 52 41 20 44 49 74 79 70 65 20 00 00 75	····sRA DIty pe ··u

4.2.8.6. Variable: CidVersion

NOTE

This variable is referenced as SDD version in the SOPAS ET GUI. Official SICK sources will refer to this variable as firmware version rather than the variable FirmwareVersion.

Variable Overview

Variable Name	Description
CidVersion	Version of communication interface description

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

UserType	
CidVersion	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:				
`sRN CidVersion`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	CidVersion	String	10	Version of communication interface description

Read Variable Response:				
`sRA CidVersion <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	CidVersion	String	10	Version of communication interface description
Variable Data	data	CidVersion	11	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	`02 02 02 02 00 00 00 0F  73 52 4E 20 43 69 64 56` `65 72 73 69 6F 6E 20 7B`	`·····sRN CidV` `ersion {`

Read Variable Response:	`02 02 02 02 00 00 00 1A  73 52 41 20 43 69 64 56`
	`65 72 73 69 6F 6E 20 00  06 00 00 00 00 00 00 00`
	`00 03 71`
		`·····sRA CidV`
		`ersion ·····`
		`··q`

4.2.8.7. Variable: OrderNumber

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

Variable Overview

Variable Name	Description
OrderNumber	The value of this variable matches the SICK part number (order number) of the device.

Communication Name	DIornr
Read-Access	Always
Write-Access	No! (readonly)

String	
Length	7

Variable Telegram Syntax

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

Read Variable Response:				
sRA DIornr <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	DIornr	String	6	Order number
Variable Data	data	String	7	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 0B 73 52 4E 20 44 49 6F 72 6E 72 20 63	····sRN DIornr c
Read Variable Response:	02 02 02 02 00 00 00 12 73 52 41 20 44 49 6F 72 6E 72 20 00 00 00 00 00 00 00 6C	····sRA DIornr ····l

4.2.8.8. Variable: SerialNumber

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

Variable Overview

Variable Name	Description
SerialNumber	Serial number of the device.

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

FlexString	
Length	0..8

Variable Telegram Syntax

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

Read Variable Response:				
`sRA SerialNumber <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	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:	`02 02 02 02 00 00 00 11  73 52 4E 20 53 65 72 69` `61 6C 4E 75 6D 62 65 72  20 6C`	`·····sRN Seri` `alNumber l`
Read Variable Response:	`02 02 02 02 00 00 00 13  73 52 41 20 53 65 72 69` `61 6C 4E 75 6D 62 65 72  20 00 00 63`	`·····sRA Seri` `alNumber ··c`

4.2.8.9. Variable: KernelVersion

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

Variable Overview

Variable Name	Description
KernelVersion	This variable contains the version of the Linux kernel.

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

FlexString	
Length	0..80

Variable Telegram Syntax

Read Variable:				
`sRN KernelVersion`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	KernelVersion	String	13	Returns the version of the Linux Kernel.

Read Variable Response:				
`sRA KernelVersion <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	KernelVersion	String	13	Returns the version of the Linux Kernel.
Variable Data	data	FlexString	80	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	`02 02 02 02 00 00 00 12  73 52 4E 20 4B 65 72 6E` `65 6C 56 65 72 73 69 6F  6E 20 0E`	`·····sRN Kern` `elVersion ·`
Read Variable Response:	`02 02 02 02 00 00 00 14  73 52 41 20 4B 65 72 6E` `65 6C 56 65 72 73 69 6F  6E 20 00 00 01`	`·····sRA Kern` `elVersion ···`

4.2.8.10. Variable: BootloaderIdentification

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

Variable Overview

Variable Name	Description
BootloaderIdentification	This variable contains the version of the bootloader.

Communication Name	FIBootloaderIdent
Read-Access	Always
Write-Access	No! (readonly)

FlexString	
Length	0..80

Variable Telegram Syntax

Read Variable:				
sRN FIBootloaderIdent				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	FIBootloaderIdent	String	17	Shows the identification string of the current bootloader.

Read Variable Response:				
sRA FIBootloaderIdent <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	FIBootloaderIdent	String	17	Shows the identification string of the current bootloader.
Variable Data	data	FlexString	80	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 16 73 52 4E 20 46 49 42 6F 6F 74 6C 6F 61 64 65 72 49 64 65 6E 74 20 15	····sRN FIBo otloaderIdent ·
Read Variable Response:	02 02 02 02 00 00 00 18 73 52 41 20 46 49 42 6F 6F 74 6C 6F 61 64 65 72 49 64 65 6E 74 20 00 00 1A	····sRA FIBo otloaderIdent ·· ·

4.2.8.11. Variable: FpgaBitstreamVersion

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

Variable Overview

Variable Name	Description
FpgaBitstreamVersion	This variable contains the version of the FPGA bitstream.

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

FlexString	
Length	0..20
Initialisation	255.255

Variable Telegram Syntax

Read Variable:				
sRN FpgaBitstreamVersion				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	FpgaBitstreamVersion	String	20	Returns the version of the FPGA bitstream: Will return 0.0 or 255.255 if FPGA bitstream is corrupted.

Read Variable Response:				
sRA FpgaBitstreamVersion <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	FpgaBitstreamVersion	String	20	Returns the version of the FPGA bitstream: Will return 0.0 or 255.255 if FPGA bitstream is corrupted.
Variable Data	data	FlexString	20	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 19 73 52 4E 20 46 70 67 61 42 69 74 73 74 72 65 61 6D 56 65 72 73 69 6F 6E 20 46	........sRN Fpga BitstreamVersion F
Read Variable Response:	02 02 02 02 00 00 00 22 73 52 41 20 46 70 67 61 42 69 74 73 74 72 65 61 6D 56 65 72 73 69 6F 6E 20 00 07 32 35 35 2E 32 35 35 60	.......\"sRA Fpga BitstreamVersion ..255.255`

4.2.8.12. Variable: IoControllerVersion

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

Variable Overview

Variable Name	Description
IoControllerVersion	This variable contains the version of the IO controller firmware.

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

FlexString	
Length	0..10

Variable Telegram Syntax

Read Variable:				
sRN IoControllerVersion				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	IoControllerVersion	String	19	Returns the version of the IO Controller firmware.

Read Variable Response:				
sRA IoControllerVersion <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	IoControllerVersion	String	19	Returns the version of the IO Controller firmware.
Variable Data	data	FlexString	10	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 18 73 52 4E 20 49 6F 43 6F 6E 74 72 6F 6C 6C 65 72 56 65 72 73 69 6F 6E 20 2F	····sRN IoCo ntrollerVersion /
Read Variable Response:	02 02 02 02 00 00 00 1A 73 52 41 20 49 6F 43 6F 6E 74 72 6F 6C 6C 65 72 56 65 72 73 69 6F 6E 20 00 00 20	····sRA IoCo ntrollerVersion ··

4.2.8.13. Variable: LmControllerVersion

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

Variable Overview

Variable Name	Description
LmControllerVersion	This variable contains the version of the LM controller firmware.

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

FlexString	
Length	0..10

Variable Telegram Syntax

Read Variable:				
sRN LmControllerVersion				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	LmControllerVersion	String	19	Returns the version of the LM Controller firmware.

Read Variable Response:				
sRA LmControllerVersion <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	LmControllerVersion	String	19	Returns the version of the LM Controller firmware.
Variable Data	data	FlexString	10	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 18 73 52 4E 20 4C 6D 43 6F 6E 74 72 6F 6C 6C 65 72 56 65 72 73 69 6F 6E 20 28	····sRN LmCo ntrollerVersion (
Read Variable Response:	02 02 02 02 00 00 00 1A 73 52 41 20 4C 6D 43 6F 6E 74 72 6F 6C 6C 65 72 56 65 72 73 69 6F 6E 20 00 00 27	····sRA LmCo ntrollerVersion ··'

4.3. Frontend Settings

4.3.1. Camera Controls

4.3.1.1. Variable: frontendMode

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

Variable Overview

Variable Name	Description
frontendMode	(Persistent) state that specifies the frontend mode of the device (continuous, stop or external hardware trigger).

Read-Access	Always
Write-Access	AuthorizedClient, Service

Enum8			
Default Value		CONTINUOUS	
	Value	Name	Description
	0	CONTINUOUS	
	1	STOP	
	2	EXTERNALTRIGGER	

Variable Telegram Syntax

Read Variable:				
`sRN frontendMode`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	frontendMode	String	12	(Persistent) state that specifies the mode of the device (continuous, stop, external trigger)

Read Variable Response:				
`sRA frontendMode <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	frontendMode	String	12	(Persistent) state that specifies the mode of the device (continuous, stop, external trigger)
Variable Data	data	Enum8	1	

Write Variable:				
`sWN frontendMode <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	frontendMode	String	12	(Persistent) state that specifies the mode of the device (continuous, stop, external trigger)
Variable Data	data	Enum8	1	

Write Variable Response:				
sWA frontendMode				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	frontendMode	String	12	(Persistent) state that specifies the mode of the device (continuous, stop, external trigger)

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 11 73 52 4E 20 66 72 6F 6E 74 65 6E 64 4D 6F 64 65 20 42	····sRN fron tendMode B
Read Variable Response:	02 02 02 02 00 00 00 12 73 52 41 20 66 72 6F 6E 74 65 6E 64 4D 6F 64 65 20 00 4D	····sRA fron tendMode ·M
Write Variable:	02 02 02 02 00 00 00 12 73 57 4E 20 66 72 6F 6E 74 65 6E 64 4D 6F 64 65 20 00 47	····sWN fron tendMode ·G
Write Variable Response:	02 02 02 02 00 00 00 11 73 57 41 20 66 72 6F 6E 74 65 6E 64 4D 6F 64 65 20 48	····sWA fron tendMode H

4.3.1.2. Method: PlayStart

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

Method Overview

Method Name	Description
PlayStart	Starts the continuous image acquistion and streaming of camera data.

Communication Name	PLAYSTART
Invocation Access	Always

Method Telegram Syntax

Method Invocation:				
sMN PLAYSTART				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sMN	String	3	Request (SOPAS Method by Name)
Method	PLAYSTART	String	9	Activates playback.

Method Return Value:				
sAN PLAYSTART				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sAN	String	3	Result (SOPAS Method Result)
Method	PLAYSTART	String	9	Activates playback.

Method Telegram Examples

Example: Default Values		
Method telegram examples with parameter data and return value data set to default values.		
Method Invocation:	02 02 02 02 00 00 00 0E 73 4D 4E 20 50 4C 41 59 53 54 41 52 54 20 34	........sMN PLAY START 4
Method Return Value:	02 02 02 02 00 00 00 0E 73 41 4E 20 50 4C 41 59 53 54 41 52 54 20 38	........sAN PLAY START 8

4.3.1.3. Method: SingleStep

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

Method Overview

Method Name	Description
SingleStep	Software trigger to acquire a single frame after the frontend has been stopped (single frame acquisition).

Communication Name	PLAYNEXT
Invocation Access	Always

Method Telegram Syntax

Method Invocation:				
sMN PLAYNEXT				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sMN	String	3	Request (SOPAS Method by Name)
Method	PLAYNEXT	String	8	Request single image from device.

Method Return Value:				
sAN PLAYNEXT				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sAN	String	3	Result (SOPAS Method Result)
Method	PLAYNEXT	String	8	Request single image from device.

Method Telegram Examples

Example: Default Values		
Method telegram examples with parameter data and return value data set to default values.		
Method Invocation:	02 02 02 02 00 00 00 0D 73 4D 4E 20 50 4C 41 59 4E 45 58 54 20 73	........sMN PLAY NEXT s
Method Return Value:	02 02 02 02 00 00 00 0D 73 41 4E 20 50 4C 41 59 4E 45 58 54 20 7F	........sAN PLAY NEXT ·

4.3.1.4. Method: PlayStop

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

Method Overview

Method Name	Description
PlayStop	Stops the continuous image acquistion and streaming of the camera data.

Communication Name	PLAYSTOP
Invocation Access	Always

Method Telegram Syntax

Method Invocation:				
sMN PLAYSTOP				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sMN	String	3	Request (SOPAS Method by Name)
Method	PLAYSTOP	String	8	Stops playback.

Method Return Value:				
sAN PLAYSTOP				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sAN	String	3	Result (SOPAS Method Result)
Method	PLAYSTOP	String	8	Stops playback.

Method Telegram Examples

Example: Default Values		
Method telegram examples with parameter data and return value data set to default values.		
Method Invocation:	02 02 02 02 00 00 00 0D 73 4D 4E 20 50 4C 41 59 53 54 4F 50 20 6C	........sMN PLAY STOP l
Method Return Value:	02 02 02 02 00 00 00 0D 73 41 4E 20 50 4C 41 59 53 54 4F 50 20 60	........sAN PLAY STOP `

4.3.2. Mounting Settings

4.3.2.1. Variable: sensorPosition

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

Variable Overview

Variable Name	Description
sensorPosition	Sensor position in 3D Cartesian coordinates relative to a reference point (0,0,0) in world coordinates.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UserType	
Vector3	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:

```
sRN sensorPosition
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	sensorPosition	String	14	Sensor position in 3D Cartesian coordinates.

Read Variable Response:

```
sRA sensorPosition <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	sensorPosition	String	14	Sensor position in 3D Cartesian coordinates.
Variable Data	data	Vector3	12	

Write Variable:

```
sWN sensorPosition <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	sensorPosition	String	14	Sensor position in 3D Cartesian coordinates.
Variable Data	data	Vector3	12	

Write Variable Response:

```
sWA sensorPosition
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	sensorPosition	String	14	Sensor position in 3D Cartesian coordinates.

Variable Telegram Examples

Custom Value 1		
read/write variable sensorPosition with value of <X=0mm, Y=0mm, Z=3000mm> (TOP-DOWN)		
Read Variable:	02 02 02 02 00 00 00 13 73 52 4E 20 73 65 6E 73 6F 72 50 6F 73 69 74 69 6F 6E 20 40	····sRN sens orPosition @
Read Variable Response:	02 02 02 02 00 00 00 1F 73 52 41 20 73 65 6E 73 6F 72 50 6F 73 69 74 69 6F 6E 20 00 00 00 00 00 00 00 00 45 3B 80 00 B1	····sRA sens orPosition ····· ···E;·
Write Variable:	02 02 02 02 00 00 00 1F 73 57 4E 20 73 65 6E 73 6F 72 50 6F 73 69 74 69 6F 6E 20 00 00 00 00 00 00 00 00 45 3B 80 00 BB	····sWN sens orPosition ····· ···E;·
Write Variable Response:	02 02 02 02 00 00 00 13 73 57 41 20 73 65 6E 73 6F 72 50 6F 73 69 74 69 6F 6E 20 4A	····sWA sens orPosition J

4.3.2.2. Variable: sensorOrientation

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

Variable Overview

Variable Name	Description
sensorOrientation	Sensor orientation in Euler angles. The rotation is applied in the order X, Y, Z.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UserType	
RotationVector3f	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:				
`sRN sensorOrientation`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	sensorOrientation	String	17	Sensor orientation in Euler angles.

Read Variable Response:				
`sRA sensorOrientation <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	sensorOrientation	String	17	Sensor orientation in Euler angles.
Variable Data	data	RotationVector3f	12	

Write Variable:				
sWN sensorOrientation <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	sensorOrientation	String	17	Sensor orientation in Euler angles.
Variable Data	data	RotationVector3f	12	

Write Variable Response:				
sWA sensorOrientation				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	sensorOrientation	String	17	Sensor orientation in Euler angles.

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 16 73 52 4E 20 73 65 6E 73 6F 72 4F 72 69 65 6E 74 61 74 69 6F 6E 20 2F	····sRN sens orOrientation /
Read Variable Response:	02 02 02 02 00 00 00 22 73 52 41 20 73 65 6E 73 6F 72 4F 72 69 65 6E 74 61 74 69 6F 6E 20 00 00 00 00 00 00 00 00 00 00 00 00 20	····"sRA sens orOrientation ·· ··
Write Variable:	02 02 02 02 00 00 00 22 73 57 4E 20 73 65 6E 73 6F 72 4F 72 69 65 6E 74 61 74 69 6F 6E 20 00 00 00 00 00 00 00 00 00 00 00 00 2A	····"sWN sens orOrientation ·· ··*
Write Variable Response:	02 02 02 02 00 00 00 16 73 57 41 20 73 65 6E 73 6F 72 4F 72 69 65 6E 74 61 74 69 6F 6E 20 25	····sWA sens orOrientation %

4.3.2.3. Variable: cameraModel

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

Variable Overview

Variable Name	Description
cameraModel	Information about the camera model, which contains: CameraID, ImageWidth, ImageHeight, FocalDistance, FocalDistanceUnit, IntrinsicK-Matrix, WorldToSensorDistortion-Matrix, SensorToWorldDistortion-Matrix, Transform-Matrix

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

UserType	
CameraModel	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:				
`sRN cameraModel`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	cameraModel	String	11	Information about the camera model, which contains: CameraID, ImageWidth, ImageHeight, FocalDistance, FocalDistanceUnit, IntrinsicK-Matrix, WorldToSensorDistortion-Matrix, SensorToWorldDistortion-Matrix, Transform-Matrix

Read Variable Response:				
`sRA cameraModel <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	cameraModel	String	11	Information about the camera model, which contains: CameraID, ImageWidth, ImageHeight, FocalDistance, FocalDistanceUnit, IntrinsicK-Matrix, WorldToSensorDistortion-Matrix, SensorToWorldDistortion-Matrix, Transform-Matrix
Variable Data	data	CameraModel	368	

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:

```
02 02 02 02 00 00 00 10   73 52 4E 20 63 61 6D 65  ........sRN came
72 61 4D 6F 64 65 6C 20   39                        raModel 9
```

Read Variable Response:

```
02 02 02 02 00 00 01 3C   73 52 41 20 63 61 6D 65  .......<sRA came
72 61 4D 6F 64 65 6C 20   00 00 00 00 00 00 00 00  raModel ........
00 00 00 00 00 00 00 00   00 00 00 00 3F F0 00 00  ............?...
00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00  ................
00 00 00 00 00 00 00 00   00 00 00 00 3F F0 00 00  ............?...
00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00  ................
00 00 00 00 00 00 00 00   00 00 00 00 3F F0 00 00  ............?...
00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00  ................
00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00  ................
00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00  ................
00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00  ................
00 00 00 00 3F F0 00 00   00 00 00 00 00 00 00 00  ....?...........
00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00  ................
00 00 00 00 00 00 00 00   00 00 00 00 3F F0 00 00  ............?...
00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00  ................
00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00  ................
00 00 00 00 3F F0 00 00   00 00 00 00 00 00 00 00  ....?...........
00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00  ................
00 00 00 00 00 00 00 00   00 00 00 00 3F F0 00 00  ............?...
00 00 00 00 F9                                     ....
```

4.3.2.4. Variable: cameraToWorldMatrix

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

Variable Overview

Variable Name	Description
cameraToWorldMatrix	Camera to world transformation matrix, contains sensor position and orientation as 4 by 4 matrix.

Communication Name	CWMat
Read-Access	Always
Write-Access	No! (readonly)

UserType	
Matrix4x4	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:

```
sRN CWMat
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	CWMat	String	5	Camera to world transformation matrix, contains sensor position and orientation as 4 by 4 matrix. This variable is read-only.

Read Variable Response:

```
sRA CWMat <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	CWMat	String	5	Camera to world transformation matrix, contains sensor position and orientation as 4 by 4 matrix. This variable is read-only.
Variable Data	data	Matrix4x4	64	

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:

```
02 02 02 02 00 00 00 0A   73 52 4E 20 43 57 4D 61   ........sRN CWMa
74 20 23                                            t #
```

Read Variable Response:

```
02 02 02 02 00 00 00 4A   73 52 41 20 43 57 4D 61   .......JsRA CWMa
74 20 3F 80 00 00 00 00   00 00 00 00 00 00 00 00   t ?............
00 00 00 00 00 00 3F 80   00 00 00 00 00 00 00 00   ......?.........
00 00 00 00 00 00 00 00   00 00 3F 80 00 00 00 00   ..........?.....
00 00 00 00 00 00 00 00   00 00 00 00 00 00 3F 80   ..............?
00 00 2C                                            ..,
```

4.3.3. Stereo Settings

4.3.3.1. Variable: acquisitionModeStereo

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

Variable Overview

Variable Name	Description
acquisitionModeStereo	The acquisition mode of the stereo front end. Three modes are available. - Normal: This mode is the standard acquisition mode. - HDR: This mode is recommended when both dark and shiny objects are present in the scene. Two different integration times can be defined by the user to handle scenes of such high dynamic range. - HQM: The high quality mode (HQM) will increase the repeatability of your depth values but may reduce the frame rate.

Read-Access	Always
Write-Access	AuthorizedClient, Service

Enum8			
Default Value		NORMAL	
	Value	Name	Description
	0	NORMAL	normal mode
	1	HDR	high dynamic range mode
	2	HQM	high quality mode

Variable Telegram Syntax

Read Variable:

```
sRN acquisitionModeStereo
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	acquisitionModeStereo	String	21	Change acquisition mode. (NORMAL, HDR, HQM)

Read Variable Response:

```
sRA acquisitionModeStereo <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	acquisitionModeStereo	String	21	Change acquisition mode. (NORMAL, HDR, HQM)
Variable Data	data	Enum8	1	

Write Variable:

```
sWN acquisitionModeStereo <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	acquisitionModeStereo	String	21	Change acquisition mode. (NORMAL, HDR, HQM)
Variable Data	data	Enum8	1	

Write Variable Response:				
sWA acquisitionModeStereo				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	acquisitionModeStereo	String	21	Change acquisition mode. (NORMAL, HDR, HQM)

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 1A 73 52 4E 20 61 63 71 75 69 73 69 74 69 6F 6E 4D 6F 64 65 53 74 65 72 65 6F 20 1F	····sRN acqu isitionModeStere o ·
Read Variable Response:	02 02 02 02 00 00 00 1B 73 52 41 20 61 63 71 75 69 73 69 74 69 6F 6E 4D 6F 64 65 53 74 65 72 65 6F 20 00 10	····sRA acqu isitionModeStere o ··
Write Variable:	02 02 02 02 00 00 00 1B 73 57 4E 20 61 63 71 75 69 73 69 74 69 6F 6E 4D 6F 64 65 53 74 65 72 65 6F 20 00 1A	····sWN acqu isitionModeStere o ··
Write Variable Response:	02 02 02 02 00 00 00 1A 73 57 41 20 61 63 71 75 69 73 69 74 69 6F 6E 4D 6F 64 65 53 74 65 72 65 6F 20 15	····sWA acqu isitionModeStere o ·

4.3.3.2. Variable: framePeriodTime

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

Variable Overview

Variable Name	Description
framePeriodTime	This variable sets the desired duration of a complete image acquisition for 'Acquisition mode' 'Normal' . The frame rate (FPS) is based on the acquisition time. Some settings ("Exposure time RGB", "Minimum idle time") can lead to a mismatch between this setting and the total acquisition time. Please also refer to 'imagerTimings' and its graphical representation in SOPAS ET.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UDInt	
Value Range	33000..30000000
Initialisation	100000
Physical Unit	µs

Variable Telegram Syntax

Read Variable:				
`sRN framePeriodTime`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	framePeriodTime	String	15	Sets the time within a complete image has to been captured. This results in higher or lower frames per second. Must be significant greater than all integration times in total. Min and max are based on frontend limits.

Read Variable Response:				
`sRA framePeriodTime <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	framePeriodTime	String	15	Sets the time within a complete image has to been captured. This results in higher or lower frames per second. Must be significant greater than all integration times in total. Min and max are based on frontend limits.
Variable Data	data	UDInt	4	

Write Variable:				
`sWN framePeriodTime <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	framePeriodTime	String	15	Sets the time within a complete image has to been captured. This results in higher or lower frames per second. Must be significant greater than all integration times in total. Min and max are based on frontend limits.
Variable Data	data	UDInt	4	

Write Variable Response:				
`sWA framePeriodTime`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	framePeriodTime	String	15	Sets the time within a complete image has to been captured. This results in higher or lower frames per second. Must be significant greater than all integration times in total. Min and max are based on frontend limits.

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	`02 02 02 02 00 00 00 14  73 52 4E 20 66 72 61 6D` `65 50 65 72 69 6F 64 54  69 6D 65 20 02`	`····sRN fram` `ePeriodTime ·`

Read Variable Response:	`02 02 02 02 00 00 00 18  73 52 41 20 66 72 61 6D`
	`65 50 65 72 69 6F 64 54  69 6D 65 20 00 01 86 A0`
	`2A`
		`····sRA fram`
		`ePeriodTime ··`
		`*`

Write Variable:	`02 02 02 02 00 00 00 18  73 57 4E 20 66 72 61 6D`
	`65 50 65 72 69 6F 64 54  69 6D 65 20 00 01 86 A0`
	`20`
		`····sWN fram`
		`ePeriodTime ··`

Write Variable Response:	02 02 02 02 00 00 00 14 73 57 41 20 66 72 61 6D 65 50 65 72 69 6F 64 54 69 6D 65 20 08	........sWA fram ePeriodTime ·

4.3.3.3. Variable: framePeriodTimeHQM

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

Variable Overview

Variable Name	Description
framePeriodTimeHQM	This variable sets the desired duration of a complete image acquisition for 'Acquisition mode' 'HQM' . The frame rate (FPS) is based on the acquisition time. Some settings ("Exposure time RGB", "Minimum idle time") can lead to a mismatch between this setting and the total acquisition time. Please also refer to 'imagerTimings' and its graphical representation in SOPAS ET.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UDInt	
Value Range	40000..30000000
Initialisation	100000
Physical Unit	µs

Variable Telegram Syntax

Read Variable:				
sRN framePeriodTimeHQM				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	framePeriodTimeHQM	String	18	Sets the time within a complete image has to been captured. This results in higer or lower frames per second. Must be significant greater than all integration times in total. Min and max are based on frontend limits. (HQM)

Read Variable Response:				
sRA framePeriodTimeHQM <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	framePeriodTimeHQM	String	18	Sets the time within a complete image has to been captured. This results in higer or lower frames per second. Must be significant greater than all integration times in total. Min and max are based on frontend limits. (HQM)
Variable Data	data	UDInt	4	

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

Write Variable:				
sWN framePeriodTimeHQM <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Variable	framePeriodTimeHQM	String	18	Sets the time within a complete image has to been captured. This results in higer or lower frames per second. Must be significant greater than all integration times in total. Min and max are based on frontend limits. (HQM)
Variable Data	data	UDInt	4	

Write Variable Response:				
sWA framePeriodTimeHQM				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	framePeriodTimeHQM	String	18	Sets the time within a complete image has to been captured. This results in higer or lower frames per second. Must be significant greater than all integration times in total. Min and max are based on frontend limits. (HQM)

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 17 73 52 4E 20 66 72 61 6D 65 50 65 72 69 6F 64 54 69 6D 65 48 51 4D 20 56	····sRN fram ePeriodTimeHQM V
Read Variable Response:	02 02 02 02 00 00 00 1B 73 52 41 20 66 72 61 6D 65 50 65 72 69 6F 64 54 69 6D 65 48 51 4D 20 00 01 86 A0 7E	····sRA fram ePeriodTimeHQM · ·~
Write Variable:	02 02 02 02 00 00 00 1B 73 57 4E 20 66 72 61 6D 65 50 65 72 69 6F 64 54 69 6D 65 48 51 4D 20 00 01 86 A0 74	····sWN fram ePeriodTimeHQM · ·t
Write Variable Response:	02 02 02 02 00 00 00 17 73 57 41 20 66 72 61 6D 65 50 65 72 69 6F 64 54 69 6D 65 48 51 4D 20 5C	····sWA fram ePeriodTimeHQM \

4.3.3.4. Variable: framePeriodTimeHDR

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

Variable Overview

Variable Name	Description
framePeriodTimeHDR	This variable sets the desired duration of a complete image acquisition for 'Acquisition mode' 'HDR' . The frame rate (FPS) is based on the acquisition time. Some settings ("Exposure time RGB", "Minimum idle time") can lead to a mismatch between this setting and the total acquisition time. Please also refer to 'imagerTimings' and its graphical representation in SOPAS ET.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UDInt	
Value Range	40000..30000000
Initialisation	100000
Physical Unit	µs

Variable Telegram Syntax

Read Variable:

```
sRN framePeriodTimeHDR
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	framePeriodTimeHDR	String	18	Sets the time within a complete image has to been captured. This results in higer or lower frames per second. Must be significant greater than all integration times in total. Min and max are based on frontend limits. (HDR)

Read Variable Response:

```
sRA framePeriodTimeHDR <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	framePeriodTimeHDR	String	18	Sets the time within a complete image has to been captured. This results in higer or lower frames per second. Must be significant greater than all integration times in total. Min and max are based on frontend limits. (HDR)
Variable Data	data	UDInt	4	

Write Variable:

```
sWN framePeriodTimeHDR <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	framePeriodTimeHDR	String	18	Sets the time within a complete image has to been captured. This results in higer or lower frames per second. Must be significant greater than all integration times in total. Min and max are based on frontend limits. (HDR)
Variable Data	data	UDInt	4	

Write Variable Response:

```
sWA framePeriodTimeHDR
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	framePeriodTimeHDR	String	18	Sets the time within a complete image has to been captured. This results in higer or lower frames per second. Must be significant greater than all integration times in total. Min and max are based on frontend limits. (HDR)

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 17 73 52 4E 20 66 72 61 6D 65 50 65 72 69 6F 64 54 69 6D 65 48 44 52 20 5C	····sRN fram ePeriodTimeHDR \
Read Variable Response:	02 02 02 02 00 00 00 1B 73 52 41 20 66 72 61 6D 65 50 65 72 69 6F 64 54 69 6D 65 48 44 52 20 00 01 86 A0 74	····sRA fram ePeriodTimeHDR · ·t
Write Variable:	02 02 02 02 00 00 00 1B 73 57 4E 20 66 72 61 6D 65 50 65 72 69 6F 64 54 69 6D 65 48 44 52 20 00 01 86 A0 7E	····sWN fram ePeriodTimeHDR · ·~
Write Variable Response:	02 02 02 02 00 00 00 17 73 57 41 20 66 72 61 6D 65 50 65 72 69 6F 64 54 69 6D 65 48 44 52 20 56	····sWA fram ePeriodTimeHDR V

4.3.3.5. Variable: integrationTimeUs

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

Variable Overview

Variable Name	Description
integrationTimeUs	Exposure time 3D Normal - Higher values are advantageous if darker objects are of main interest. Be aware that setting higher values can also lead to more saturated values of shiny objects and/or to stronger motion blur effects.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UDInt	
Value Range	1..9300
Initialisation	1000
Physical Unit	µs

Variable Telegram Syntax

Read Variable:

```
sRN integrationTimeUs
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	integrationTimeUs	String	17	The integration time of the 3D frontend.

Read Variable Response:

```
sRA integrationTimeUs <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	integrationTimeUs	String	17	The integration time of the 3D frontend.
Variable Data	data	UDInt	4	

Write Variable:				
sWN integrationTimeUs <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	integrationTimeUs	String	17	The integration time of the 3D frontend.
Variable Data	data	UDInt	4	

Write Variable Response:				
sWA integrationTimeUs				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	integrationTimeUs	String	17	The integration time of the 3D frontend.

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 16 73 52 4E 20 69 6E 74 65 67 72 61 74 69 6F 6E 54 69 6D 65 55 73 20 02	····sRN inte grationTimeUs ·
Read Variable Response:	02 02 02 02 00 00 00 1A 73 52 41 20 69 6E 74 65 67 72 61 74 69 6F 6E 54 69 6D 65 55 73 20 00 00 03 E8 E6	····sRA inte grationTimeUs ·· ·
Write Variable:	02 02 02 02 00 00 00 1A 73 57 4E 20 69 6E 74 65 67 72 61 74 69 6F 6E 54 69 6D 65 55 73 20 00 00 03 E8 EC	····sWN inte grationTimeUs ·· ·
Write Variable Response:	02 02 02 02 00 00 00 16 73 57 41 20 69 6E 74 65 67 72 61 74 69 6F 6E 54 69 6D 65 55 73 20 08	····sWA inte grationTimeUs ·

4.3.3.6. Variable: integrationTimeHQMUs

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

Variable Overview

Variable Name	Description
integrationTimeHQMUs	Exposure time 3D HQM - An exposure time in the range of 1500 - 9500 µs can be set.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UDInt	
Value Range	1..9300
Initialisation	4000
Physical Unit	µs

Variable Telegram Syntax

Read Variable:				
`sRN integrationTimeHQMUs`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	integrationTimeHQMUs	String	20	The integration time of the 3D frontend used while acquisitionMode HQM is active.

Read Variable Response:				
`sRA integrationTimeHQMUs <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	integrationTimeHQMUs	String	20	The integration time of the 3D frontend used while acquisitionMode HQM is active.
Variable Data	data	UDInt	4	

Write Variable:				
`sWN integrationTimeHQMUs <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	integrationTimeHQMUs	String	20	The integration time of the 3D frontend used while acquisitionMode HQM is active.
Variable Data	data	UDInt	4	

Write Variable Response:				
`sWA integrationTimeHQMUs`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	integrationTimeHQMUs	String	20	The integration time of the 3D frontend used while acquisitionMode HQM is active.

Variable Telegram Examples

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

Read Variable:	`02 02 02 02 00 00 00 19  73 52 4E 20 69 6E 74 65`
	`67 72 61 74 69 6F 6E 54  69 6D 65 48 51 4D 55 73`
	`20 56`
		`·····sRN inte`
		`grationTimeHQMUs`
		` V`

Read Variable Response:	`02 02 02 02 00 00 00 1D  73 52 41 20 69 6E 74 65`
	`67 72 61 74 69 6F 6E 54  69 6D 65 48 51 4D 55 73`
	`20 00 00 0F A0 F6`
		`·····sRA inte`
		`grationTimeHQMUs`
		` ···`

Write Variable:	`02 02 02 02 00 00 00 1D  73 57 4E 20 69 6E 74 65`
	`67 72 61 74 69 6F 6E 54  69 6D 65 48 51 4D 55 73`
	`20 00 00 0F A0 FC`
		`·····sWN inte`
		`grationTimeHQMUs`
		` ···`

Write Variable Response:	`02 02 02 02 00 00 00 19  73 57 41 20 69 6E 74 65`
	`67 72 61 74 69 6F 6E 54  69 6D 65 48 51 4D 55 73`
	`20 5C`
		`·····sWA inte`
		`grationTimeHQMUs`
		` \`

4.3.3.7. Variable: integrationTimeHdrStereoUs

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

Variable Overview

Variable Name	Description
integrationTimeHdrStereoUs	Exposure time 3D HDR - Two different integration times can be set. Both integration times are used to generate a single frame with an enhanced dynamic range. The first value has to be smaller than the second value. The second value cannot be smaller than 1500µs.

Read-Access	Always
Write-Access	AuthorizedClient, Service

Struct		
first		
	UDInt	
	Value Range	1..9300
	Initialisation	1000
	Physical Unit	µs
second		
	UDInt	
	Value Range	1..9300
	Initialisation	3000
	Physical Unit	µs

Variable Telegram Syntax

Read Variable:

```
sRN integrationTimeHdrStereoUs
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	integrationTimeHdrStereoUs	String	26	The integration times of the 3D frontend used while acquisitionMode HDR is active.

Read Variable Response:

```
sRA integrationTimeHdrStereoUs <first> <second>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	integrationTimeHdrStereoUs	String	26	The integration times of the 3D frontend used while acquisitionMode HDR is active.
Variable Data 1	first	UDInt	4	
Variable Data 2	second	UDInt	4	

Write Variable:

```
sWN integrationTimeHdrStereoUs <first> <second>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	integrationTimeHdrStereoUs	String	26	The integration times of the 3D frontend used while acquisitionMode HDR is active.
Variable Data 1	first	UDInt	4	

Write Variable:				
sWN integrationTimeHdrStereoUs <first> <second>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Variable Data 2	second	UDInt	4	

Write Variable Response:				
sWA integrationTimeHdrStereoUs				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	integrationTimeHdrStereoUs	String	26	The integration times of the 3D frontend used while acquisitionMode HDR is active.

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 1F 73 52 4E 20 69 6E 74 65 67 72 61 74 69 6F 6E 54 69 6D 65 48 64 72 53 74 65 72 65 6F 55 73 20 66	····sRN inte grationTimeHdrSt ereoUs f
Read Variable Response:	02 02 02 02 00 00 00 27 73 52 41 20 69 6E 74 65 67 72 61 74 69 6F 6E 54 69 6D 65 48 64 72 53 74 65 72 65 6F 55 73 20 00 00 03 E8 00 00 0B B8 31	····'sRA inte grationTimeHdrSt ereoUs ····1
Write Variable:	02 02 02 02 00 00 00 27 73 57 4E 20 69 6E 74 65 67 72 61 74 69 6F 6E 54 69 6D 65 48 64 72 53 74 65 72 65 6F 55 73 20 00 00 03 E8 00 00 0B B8 3B	····'sWN inte grationTimeHdrSt ereoUs ····;
Write Variable Response:	02 02 02 02 00 00 00 1F 73 57 41 20 69 6E 74 65 67 72 61 74 69 6F 6E 54 69 6D 65 48 64 72 53 74 65 72 65 6F 55 73 20 6C	····sWA inte grationTimeHdrSt ereoUs l

4.3.3.8. Variable: integrationTimeUsColor

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

Variable Overview

Variable Name	Description
integrationTimeUsColor	Exposure time RGB (color) in microseconds. Set the exposure time RGB to optimize the brightness of the RGB image according to the ambient light. This might influence the total acquisition time.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UDInt	
Value Range	1..100000
Initialisation	1000
Physical Unit	µs

Variable Telegram Syntax

Read Variable:				
`sRN integrationTimeUsColor`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	integrationTimeUsColor	String	22	The integration time of the color frontend.

Read Variable Response:				
`sRA integrationTimeUsColor <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	integrationTimeUsColor	String	22	The integration time of the color frontend.
Variable Data	data	UDInt	4	

Write Variable:				
`sWN integrationTimeUsColor <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	integrationTimeUsColor	String	22	The integration time of the color frontend.
Variable Data	data	UDInt	4	

Write Variable Response:				
`sWA integrationTimeUsColor`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	integrationTimeUsColor	String	22	The integration time of the color frontend.

Variable Telegram Examples

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

Read Variable:	`02 02 02 02 00 00 00 1B 73 52 4E 20 69 6E 74 65`
	`67 72 61 74 69 6F 6E 54 69 6D 65 55 73 43 6F 6C`
	`6F 72 20 5F`
		`·····sRN inte`
		`grationTimeUsCol`
		`or _`

Read Variable Response:	`02 02 02 02 00 00 00 1F 73 52 41 20 69 6E 74 65`
	`67 72 61 74 69 6F 6E 54 69 6D 65 55 73 43 6F 6C`
	`6F 72 20 00 00 03 E8 BB`
		`·····sRA inte`
		`grationTimeUsCol`
		`or ···`

Write Variable:	`02 02 02 02 00 00 00 1F 73 57 4E 20 69 6E 74 65`
	`67 72 61 74 69 6F 6E 54 69 6D 65 55 73 43 6F 6C`
	`6F 72 20 00 00 03 E8 B1`
		`·····sWN inte`
		`grationTimeUsCol`
		`or ···`

Write Variable Response:	`02 02 02 02 00 00 00 1B 73 57 41 20 69 6E 74 65`
	`67 72 61 74 69 6F 6E 54 69 6D 65 55 73 43 6F 6C`
	`6F 72 20 55`
		`·····sWA inte`
		`grationTimeUsCol`
		`or U`

4.3.3.9. Variable: minimumIdleTime

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

Variable Overview

Variable Name	Description
minimumIdleTime	Minimum idle time - The time in between two consecutive frames during continuous acquisition mode. Actions which occur in the field of view during this idle time are not captured. Increasing this value results in a lower frame rate (fps).

Read-Access	Always
Write-Access	AuthorizedClient, Service

UDInt	
Value Range	0..30000000
Initialisation	0
Physical Unit	µs

Variable Telegram Syntax

Read Variable:

```
sRN minimumIdleTime
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	minimumIdleTime	String	15	Sets the minimum idle time after an image has been captured.

Read Variable Response:

```
sRA minimumIdleTime <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	minimumIdleTime	String	15	Sets the minimum idle time after an image has been captured.
Variable Data	data	UDInt	4	

Write Variable:

```
sWN minimumIdleTime <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	minimumIdleTime	String	15	Sets the minimum idle time after an image has been captured.
Variable Data	data	UDInt	4	

Write Variable Response:

```
sWA minimumIdleTime
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	minimumIdleTime	String	15	Sets the minimum idle time after an image has been captured.

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 14 73 52 4E 20 6D 69 6E 69 6D 75 6D 49 64 6C 65 54 69 6D 65 20 08	····sRN mini mumIdleTime ·
Read Variable Response:	02 02 02 02 00 00 00 18 73 52 41 20 6D 69 6E 69 6D 75 6D 49 64 6C 65 54 69 6D 65 20 00 00 00 00 07	····sRA mini mumIdleTime ···· ·
Write Variable:	02 02 02 02 00 00 00 18 73 57 4E 20 6D 69 6E 69 6D 75 6D 49 64 6C 65 54 69 6D 65 20 00 00 00 00 0D	····sWN mini mumIdleTime ···· ·
Write Variable Response:	02 02 02 02 00 00 00 14 73 57 41 20 6D 69 6E 69 6D 75 6D 49 64 6C 65 54 69 6D 65 20 02	····sWA mini mumIdleTime ·

4.3.3.10. Variable: imagerTimings

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

Variable Overview

Variable Name	Description
imagerTimings	This variable shows all current timings in place for the imaging sequence.

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

Array			
Length			0..32
Default Value			{8, {{{0, ""}, 0}, {{0, ""}, 0}, {{0, ""}, 0}, {{0, ""}, 0}, {{0, ""}, 0}, {{0, ""}, 0}, {{0, ""}, 0}, {{0, ""}, 0}}}
	Struct		
	name		
		FlexString	
		Length	0..32
	value		
		UDInt	
		Value Range	0..4294967295
		Initialisation	0
		Physical Unit	µs

Variable Telegram Syntax

Read Variable:				
sRN imagerTimings				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	imagerTimings	String	13	Read all available Timings of the Imagers.

Read Variable Response:				
sRA imagerTimings <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	imagerTimings	String	13	Read all available Timings of the Imagers.
Variable Data	data	Array	1152	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 12 73 52 4E 20 69 6D 61 67 65 72 54 69 6D 69 6E 67 73 20 39	·····sRN imag erTimings 9
Read Variable Response:	02 02 02 02 00 00 00 44 73 52 41 20 69 6D 61 67 65 72 54 69 6D 69 6E 67 73 20 00 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 3E	·····DsRA imag erTimings ····· ····· ····· ·····>

4.3.3.11. Variable: colorTemperature

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

Variable Overview

Variable Name	Description
colorTemperature	Color temperature used for the RGB (color) image in order to adjust white-balance.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UDInt	
Value Range	0..12000
Initialisation	5400
Physical Unit	K

Variable Telegram Syntax

Read Variable:				
`sRN colorTemperature`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	colorTemperature	String	16	Adjust the color temperature to suite actual white balance

Read Variable Response:				
`sRA colorTemperature <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	colorTemperature	String	16	Adjust the color temperature to suite actual white balance
Variable Data	data	UDInt	4	

Write Variable:				
`sWN colorTemperature <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	colorTemperature	String	16	Adjust the color temperature to suite actual white balance
Variable Data	data	UDInt	4	

Write Variable Response:				
`sWA colorTemperature`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	colorTemperature	String	16	Adjust the color temperature to suite actual white balance

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	`02 02 02 02 00 00 00 15  73 52 4E 20 63 6F 6C 6F` `72 54 65 6D 70 65 72 61  74 75 72 65 20 5E`	`·····sRN colo` `rTemperature ^`

Read Variable Response:	`02 02 02 02 00 00 00 19  73 52 41 20 63 6F 6C 6F`
	`72 54 65 6D 70 65 72 61  74 75 72 65 20 00 00 15`
	`18 5C`
		`·····sRA colo`
		`rTemperature ···`
		`·\`

Write Variable:	`02 02 02 02 00 00 00 19  73 57 4E 20 63 6F 6C 6F`
	`72 54 65 6D 70 65 72 61  74 75 72 65 20 00 00 15`
	`18 56`
		`·····sWN colo`
		`rTemperature ···`
		`·V`

Write Variable Response:	`02 02 02 02 00 00 00 15  73 57 41 20 63 6F 6C 6F` `72 54 65 6D 70 65 72 61  74 75 72 65 20 54`	`·····sWA colo` `rTemperature T`

4.3.3.12. Variable: rgbMapping

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

Variable Overview

Variable Name	Description
rgbMapping	Priority RGB / 3D - Defines whether forward mapping (color to depth) or backward mapping (depth to RGB) is used.

Read-Access	Always
Write-Access	AuthorizedClient, Service

Enum8			
Default Value		RGB_TO_Z	
	Value	Name	Description
	0	DISABLED	disabled
	1	RGB_TO_Z	depth accuracy
	2	Z_TO_RGB	RGB image quality

Variable Telegram Syntax

Read Variable:

```
sRN rgbMapping
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	rgbMapping	String	10	Priority RGB / 3D Defines whether forward mapping (color to depth) or backward mapping (depth to color) is used.

Read Variable Response:

```
sRA rgbMapping <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	rgbMapping	String	10	Priority RGB / 3D Defines whether forward mapping (color to depth) or backward mapping (depth to color) is used.
Variable Data	data	Enum8	1	

Write Variable:

```
sWN rgbMapping <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	rgbMapping	String	10	Priority RGB / 3D Defines whether forward mapping (color to depth) or backward mapping (depth to color) is used.
Variable Data	data	Enum8	1	

Write Variable Response:				
sWA rgbMapping				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	rgbMapping	String	10	Priority RGB / 3D Defines whether forward mapping (color to depth) or backward mapping (depth to color) is used.

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 0F 73 52 4E 20 72 67 62 4D 61 70 70 69 6E 67 20 54	........sRN rgbM apping T
Read Variable Response:	02 02 02 02 00 00 00 10 73 52 41 20 72 67 62 4D 61 70 70 69 6E 67 20 01 5A	........sRA rgbM apping .Z
Write Variable:	02 02 02 02 00 00 00 10 73 57 4E 20 72 67 62 4D 61 70 70 69 6E 67 20 01 50	........sWN rgbM apping .P
Write Variable Response:	02 02 02 02 00 00 00 0F 73 57 41 20 72 67 62 4D 61 70 70 69 6E 67 20 5E	........sWA rgbM apping ^

4.3.3.13. Variable: distanceMode

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

Variable Overview

Variable Name	Description
distanceMode	Switch between short and long distance mode.

Read-Access	Always
Write-Access	AuthorizedClient, Service

Enum8			
Default Value		SHORT_RANGE	
	Value	Name	Description
	0	SHORT_RANGE	Recommended operating mode for short range applications. The depth range is limited to 0.5 ... 6.5m and provides sub mm precision.
	1	LONG_RANGE	Recommended for applications with working distances above 6.5m. The working range is increased to 0.5m ... 65m and provides mm precision.

Variable Telegram Syntax

Read Variable:				
`sRN distanceMode`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	distanceMode	String	12	Switch between short and long distance mode.

Read Variable Response:				
`sRA distanceMode <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	distanceMode	String	12	Switch between short and long distance mode.
Variable Data	data	Enum8	1	

Write Variable:				
`sWN distanceMode <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	distanceMode	String	12	Switch between short and long distance mode.
Variable Data	data	Enum8	1	

Write Variable Response:				
`sWA distanceMode`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	distanceMode	String	12	Switch between short and long distance mode.

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	`02 02 02 02 00 00 00 11  73 52 4E 20 64 69 73 74` `61 6E 63 65 4D 6F 64 65  20 4F`	`·····sRN dist` `anceMode O`
Read Variable Response:	`02 02 02 02 00 00 00 12  73 52 41 20 64 69 73 74` `61 6E 63 65 4D 6F 64 65  20 00 40`	`·····sRA dist` `anceMode ·@`
Write Variable:	`02 02 02 02 00 00 00 12  73 57 4E 20 64 69 73 74` `61 6E 63 65 4D 6F 64 65  20 00 4A`	`·····sWN dist` `anceMode ·J`
Write Variable Response:	`02 02 02 02 00 00 00 11  73 57 41 20 64 69 73 74` `61 6E 63 65 4D 6F 64 65  20 45`	`·····sWA dist` `anceMode E`

4.3.3.14. Variable: enableDepthValidationStereo

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

Variable Overview

Variable Name	Description
enableDepthValidationStereo	Enable 3D reliability filter - The reliability of each 3D value is assessed and pixels in the 3D data are filtered according to the 3D reliability filter settings.

Read-Access	Always
Write-Access	AuthorizedClient, Service

Bool	
Value Range	False, True
Initialisation	True

Variable Telegram Syntax

Read Variable:

```
sRN enableDepthValidationStereo
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	enableDepthValidationStereo	String	27	Enable stereo depth validation.

Read Variable Response:

```
sRA enableDepthValidationStereo <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	enableDepthValidationStereo	String	27	Enable stereo depth validation.
Variable Data	data	Bool	1	

Write Variable:

```
sWN enableDepthValidationStereo <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	enableDepthValidationStereo	String	27	Enable stereo depth validation.
Variable Data	data	Bool	1	

Write Variable Response:

```
sWA enableDepthValidationStereo
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	enableDepthValidationStereo	String	27	Enable stereo depth validation.

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 20 73 52 4E 20 65 6E 61 62 6C 65 44 65 70 74 68 56 61 6C 69 64 61 74 69 6F 6E 53 74 65 72 65 6F 20 32	····· sRN enab leDepthValidatio nStereo 2
Read Variable Response:	02 02 02 02 00 00 00 21 73 52 41 20 65 6E 61 62 6C 65 44 65 70 74 68 56 61 6C 69 64 61 74 69 6F 6E 53 74 65 72 65 6F 20 01 3C	·····!sRA enab leDepthValidatio nStereo ·<
Write Variable:	02 02 02 02 00 00 00 21 73 57 4E 20 65 6E 61 62 6C 65 44 65 70 74 68 56 61 6C 69 64 61 74 69 6F 6E 53 74 65 72 65 6F 20 01 36	·····!sWN enab leDepthValidatio nStereo ·6
Write Variable Response:	02 02 02 02 00 00 00 20 73 57 41 20 65 6E 61 62 6C 65 44 65 70 74 68 56 61 6C 69 64 61 74 69 6F 6E 53 74 65 72 65 6F 20 38	····· sWA enab leDepthValidatio nStereo 8

4.3.3.15. Variable: depthValidationStereo

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

Variable Overview

Variable Name	Description
depthValidationStereo	This variable controls the 3D reliability filter strength (weak = -9, moderate = 0, strong = 9).

Read-Access	Always
Write-Access	AuthorizedClient, Service

Int	
Value Range	-9..9
Initialisation	5

Variable Telegram Syntax

Read Variable:

```
sRN depthValidationStereo
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	depthValidationStereo	String	21	3D reliability filter The reliability of each 3D value is assessed and pixels are hidden in the visualization accordingly. This setting allows to fine tune the filter strength. (-8 = weakest, 1 = weak, 5 = moderate, 9 = strong)

Read Variable Response:

```
sRA depthValidationStereo <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge

Read Variable Response:				
`sRA depthValidationStereo <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Variable	depthValidationStereo	String	21	3D reliability filter The reliability of each 3D value is assessed and pixels are hidden in the visualization accordingly. This setting allows to fine tune the filter strength. (-8 = weakest, 1 = weak, 5 = moderate, 9 = strong)
Variable Data	data	Int	2	

Write Variable:				
`sWN depthValidationStereo <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	depthValidationStereo	String	21	3D reliability filter The reliability of each 3D value is assessed and pixels are hidden in the visualization accordingly. This setting allows to fine tune the filter strength. (-8 = weakest, 1 = weak, 5 = moderate, 9 = strong)
Variable Data	data	Int	2	

Write Variable Response:				
`sWA depthValidationStereo`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	depthValidationStereo	String	21	3D reliability filter The reliability of each 3D value is assessed and pixels are hidden in the visualization accordingly. This setting allows to fine tune the filter strength. (-8 = weakest, 1 = weak, 5 = moderate, 9 = strong)

Variable Telegram Examples

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

Read Variable:	`02 02 02 02 00 00 00 1A  73 52 4E 20 64 65 70 74`
	`68 56 61 6C 69 64 61 74  69 6F 6E 53 74 65 72 65`
	`6F 20 13`
		`·····sRN dept`
		`hValidationStere`
		`o ·`

Read Variable Response:	`02 02 02 02 00 00 00 1C  73 52 41 20 64 65 70 74`
	`68 56 61 6C 69 64 61 74  69 6F 6E 53 74 65 72 65`
	`6F 20 00 05 19`
		`·····sRA dept`
		`hValidationStere`
		`o ···`

Write Variable:	`02 02 02 02 00 00 00 1C  73 57 4E 20 64 65 70 74`
	`68 56 61 6C 69 64 61 74  69 6F 6E 53 74 65 72 65`
	`6F 20 00 05 13`
		`·····sWN dept`
		`hValidationStere`
		`o ···`

Write Variable Response:	`02 02 02 02 00 00 00 1A  73 57 41 20 64 65 70 74`
	`68 56 61 6C 69 64 61 74  69 6F 6E 53 74 65 72 65`
	`6F 20 19`
		`·····sWA dept`
		`hValidationStere`
		`o ·`

4.3.3.16. Variable: autoExposureROI

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

Variable Overview

Variable Name	Description
autoExposureROI	Region-of-interest (ROI) used for the auto exposure algorithm. ROI is defined by two corners at the top-left and the bottom-right in sensor coordinates.

Read-Access	Always
Write-Access	AuthorizedClient, Service

Struct	
left	
UDInt	
Value Range	0..639
Initialisation	0
right	
UDInt	
Value Range	0..639
Initialisation	639
top	
UDInt	
Value Range	0..511
Initialisation	0
bottom	
UDInt	
Value Range	0..511
Initialisation	511

Variable Telegram Syntax

Read Variable:

```
sRN autoExposureROI
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	autoExposureROI	String	15	ROI of auto exposure algorithm.

Read Variable Response:

```
sRA autoExposureROI <left> <right> <top> <bottom>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	autoExposureROI	String	15	ROI of auto exposure algorithm.
Variable Data 1	left	UDInt	4	
Variable Data 2	right	UDInt	4	
Variable Data 3	top	UDInt	4	
Variable Data 4	bottom	UDInt	4	

Write Variable:				
sWN autoExposureROI <left> <right> <top> <bottom>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	autoExposureROI	String	15	ROI of auto exposure algorithm.
Variable Data 1	left	UDInt	4	
Variable Data 2	right	UDInt	4	
Variable Data 3	top	UDInt	4	
Variable Data 4	bottom	UDInt	4	

Write Variable Response:				
sWA autoExposureROI				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	autoExposureROI	String	15	ROI of auto exposure algorithm.

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 14 73 52 4E 20 61 75 74 6F 45 78 70 6F 73 75 72 65 52 4F 49 20 07	····????sRN auto ExposureROI ·
Read Variable Response:	02 02 02 02 00 00 00 24 73 52 41 20 61 75 74 6F 45 78 70 6F 73 75 72 65 52 4F 49 20 00 00 00 00 00 00 02 7F 00 00 00 00 00 00 01 FF 8B	····????$sRA auto ExposureROI ···· ···????····
Write Variable:	02 02 02 02 00 00 00 24 73 57 4E 20 61 75 74 6F 45 78 70 6F 73 75 72 65 52 4F 49 20 00 00 00 00 00 00 02 7F 00 00 00 00 00 00 01 FF 81	····????$sWN auto ExposureROI ···· ···????····
Write Variable Response:	02 02 02 02 00 00 00 14 73 57 41 20 61 75 74 6F 45 78 70 6F 73 75 72 65 52 4F 49 20 0D	····????sWA auto ExposureROI ·

4.3.3.17. Variable: autoExposureHDRROI

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

Variable Overview

Variable Name	Description
autoExposureHDRROI	(Second) Region-of-interest (ROI) used for the HDR auto exposure algorithm. ROI is defined by two corners at the top-left and the bottom-right in sensor coordinates.

Read-Access	Always
Write-Access	AuthorizedClient, Service

Struct		
left		
	UDInt	
	Value Range	0..639
	Initialisation	0

Struct	
right	
UDInt	
Value Range	0..639
Initialisation	639
top	
UDInt	
Value Range	0..511
Initialisation	0
bottom	
UDInt	
Value Range	0..511
Initialisation	511

Variable Telegram Syntax

Read Variable:

```
sRN autoExposureHDRROI
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	autoExposureHDRROI	String	18	ROI of auto exposure algorithm.

Read Variable Response:

```
sRA autoExposureHDRROI <left> <right> <top> <bottom>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	autoExposureHDRROI	String	18	ROI of auto exposure algorithm.
Variable Data 1	left	UDInt	4	
Variable Data 2	right	UDInt	4	
Variable Data 3	top	UDInt	4	
Variable Data 4	bottom	UDInt	4	

Write Variable:

```
sWN autoExposureHDRROI <left> <right> <top> <bottom>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	autoExposureHDRROI	String	18	ROI of auto exposure algorithm.
Variable Data 1	left	UDInt	4	
Variable Data 2	right	UDInt	4	
Variable Data 3	top	UDInt	4	
Variable Data 4	bottom	UDInt	4	

Write Variable Response:

```
sWA autoExposureHDRROI
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	autoExposureHDRROI	String	18	ROI of auto exposure algorithm.

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 17 73 52 4E 20 61 75 74 6F 45 78 70 6F 73 75 72 65 48 44 52 52 4F 49 20 59	........sRN auto ExposureHDRROI Y
Read Variable Response:	02 02 02 02 00 00 00 27 73 52 41 20 61 75 74 6F 45 78 70 6F 73 75 72 65 48 44 52 52 4F 49 20 00 00 00 00 00 00 02 7F 00 00 00 00 00 00 01 FF D5	.......'sRA auto ExposureHDRROI · ·····'·····
Write Variable:	02 02 02 02 00 00 00 27 73 57 4E 20 61 75 74 6F 45 78 70 6F 73 75 72 65 48 44 52 52 4F 49 20 00 00 00 00 00 00 02 7F 00 00 00 00 00 00 01 FF DF	.......'sWN auto ExposureHDRROI · ·····'·····
Write Variable Response:	02 02 02 02 00 00 00 17 73 57 41 20 61 75 74 6F 45 78 70 6F 73 75 72 65 48 44 52 52 4F 49 20 53	........sWA auto ExposureHDRROI S

4.3.3.18. Variable: autoExposureColorROI

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

Variable Overview

Variable Name	Description
autoExposureColorROI	ROI of auto exposure Color algorithm. ROI defined by two corners at top-left and bottom-right.

Read-Access	Always
Write-Access	AuthorizedClient, Service

Struct		
left		
	UDInt	
	Value Range	0..639
	Initialisation	0
right		
	UDInt	
	Value Range	0..639
	Initialisation	639
top		
	UDInt	
	Value Range	0..511
	Initialisation	0
bottom		
	UDInt	
	Value Range	0..511
	Initialisation	511

Variable Telegram Syntax

Read Variable:				
`sRN autoExposureColorROI`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	autoExposureColorROI	String	20	ROI of auto exposure Color algorithm.

Read Variable Response:				
`sRA autoExposureColorROI <left> <right> <top> <bottom>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	autoExposureColorROI	String	20	ROI of auto exposure Color algorithm.
Variable Data 1	left	UDInt	4	
Variable Data 2	right	UDInt	4	
Variable Data 3	top	UDInt	4	
Variable Data 4	bottom	UDInt	4	

Write Variable:				
`sWN autoExposureColorROI <left> <right> <top> <bottom>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	autoExposureColorROI	String	20	ROI of auto exposure Color algorithm.
Variable Data 1	left	UDInt	4	
Variable Data 2	right	UDInt	4	
Variable Data 3	top	UDInt	4	
Variable Data 4	bottom	UDInt	4	

Write Variable Response:				
`sWA autoExposureColorROI`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	autoExposureColorROI	String	20	ROI of auto exposure Color algorithm.

Variable Telegram Examples

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

Read Variable:	`02 02 02 02 00 00 00 19  73 52 4E 20 61 75 74 6F`
	`45 78 70 6F 73 75 72 65  43 6F 6C 6F 72 52 4F 49`
	`20 5A`
		`·····sRN auto`
		`ExposureColorROI`
		` Z`

Read Variable Response:	`02 02 02 02 00 00 00 29  73 52 41 20 61 75 74 6F`
	`45 78 70 6F 73 75 72 65  43 6F 6C 6F 72 52 4F 49`
	`20 00 00 00 00 00 00 02  7F 00 00 00 00 00 00 01`
	`FF D6`
		`·····)sRA auto`
		`ExposureColorROI`
		` ·····`

Write Variable:	`02 02 02 02 00 00 00 29  73 57 4E 20 61 75 74 6F`
	`45 78 70 6F 73 75 72 65  43 6F 6C 6F 72 52 4F 49`
	`20 00 00 00 00 00 00 02  7F 00 00 00 00 00 00 01`
	`FF DC`
		`·····)sWN auto`
		`ExposureColorROI`
		` ·····`

Write Variable Response:	`02 02 02 02 00 00 00 19  73 57 41 20 61 75 74 6F`
	`45 78 70 6F 73 75 72 65  43 6F 6C 6F 72 52 4F 49`
	`20 50`
		`·····sWA auto`
		`ExposureColorROI`
		` P`

4.3.3.19. Variable: autoWhiteBalanceROI

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

Variable Overview

Variable Name	Description
autoWhiteBalanceROI	ROI of auto white balance algorithm. ROI defined by two corners at top-left and bottom-right.

Read-Access	Always
Write-Access	AuthorizedClient, Service

Struct		
left		
	UDInt	
	Value Range	0..639
	Initialisation	0
right		
	UDInt	
	Value Range	0..639
	Initialisation	639
top		
	UDInt	
	Value Range	0..511
	Initialisation	0
bottom		
	UDInt	
	Value Range	0..511
	Initialisation	511

Variable Telegram Syntax

Read Variable:				
`sRN autoWhiteBalanceROI`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	autoWhiteBalanceROI	String	19	ROI of auto white balance algorithm.

Read Variable Response:				
`sRA autoWhiteBalanceROI <left> <right> <top> <bottom>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	autoWhiteBalanceROI	String	19	ROI of auto white balance algorithm.
Variable Data 1	left	UDInt	4	
Variable Data 2	right	UDInt	4	
Variable Data 3	top	UDInt	4	
Variable Data 4	bottom	UDInt	4	

Write Variable:				
sWN autoWhiteBalanceROI <left> <right> <top> <bottom>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	autoWhiteBalanceROI	String	19	ROI of auto white balance algorithm.
Variable Data 1	left	UDInt	4	
Variable Data 2	right	UDInt	4	
Variable Data 3	top	UDInt	4	
Variable Data 4	bottom	UDInt	4	

Write Variable Response:				
sWA autoWhiteBalanceROI				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	autoWhiteBalanceROI	String	19	ROI of auto white balance algorithm.

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 18 73 52 4E 20 61 75 74 6F 57 68 69 74 65 42 61 6C 61 6E 63 65 52 4F 49 20 35	····sRN auto WhiteBalanceROI 5
Read Variable Response:	02 02 02 02 00 00 00 28 73 52 41 20 61 75 74 6F 57 68 69 74 65 42 61 6C 61 6E 63 65 52 4F 49 20 00 00 00 00 00 00 02 7F 00 00 00 00 00 00 01 FF B9	····(sRA auto WhiteBalanceROI ····
Write Variable:	02 02 02 02 00 00 00 28 73 57 4E 20 61 75 74 6F 57 68 69 74 65 42 61 6C 61 6E 63 65 52 4F 49 20 00 00 00 00 00 00 02 7F 00 00 00 00 00 00 01 FF B3	····(sWN auto WhiteBalanceROI ····
Write Variable Response:	02 02 02 02 00 00 00 18 73 57 41 20 61 75 74 6F 57 68 69 74 65 42 61 6C 61 6E 63 65 52 4F 49 20 3F	····sWA auto WhiteBalanceROI ?

4.3.3.20. Variable: autoExposureParameterizedRunning

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

Variable Overview

Variable Name	Description
autoExposureParameterizedRunning	Checks if any of the auto exposure algorithms are currently running.

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

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
sRN autoExposureParameterizedRunning				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	autoExposureParameterizedRunning	String	32	Checks if any of the auto exposure algorithms is actually running

Read Variable Response:				
sRA autoExposureParameterizedRunning <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	autoExposureParameterizedRunning	String	32	Checks if any of the auto exposure algorithms is actually running
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 25 73 52 4E 20 61 75 74 6F 45 78 70 6F 73 75 72 65 50 61 72 61 6D 65 74 65 72 69 7A 65 64 52 75 6E 6E 69 6E 67 20 4F	·····%sRN auto ExposureParame te rizedRunning O
Read Variable Response:	02 02 02 02 00 00 00 26 73 52 41 20 61 75 74 6F 45 78 70 6F 73 75 72 65 50 61 72 61 6D 65 74 65 72 69 7A 65 64 52 75 6E 6E 69 6E 67 20 00 40	·····&sRA auto ExposureParame te rizedRunning ·@

4.3.3.21. Method: TriggerAutoExposure

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

Method Overview

Method Name	Description
TriggerAutoExposure	Triggers the auto exposure algorithm for the depth map (3D data).

Invocation Access	AuthorizedClient, Service

Return Values	
success	
Bool	
Value Range	False, True
Initialisation	False

Method Telegram Syntax

Method Invocation:				
sMN TriggerAutoExposure				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sMN	String	3	Request (SOPAS Method by Name)
Method	TriggerAutoExposure	String	19	Trigger auto exposure algorithm for Depthmap

Method Return Value:				
sAN TriggerAutoExposure <success>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sAN	String	3	Result (SOPAS Method Result)
Method	TriggerAutoExposure	String	19	Trigger auto exposure algorithm for Depthmap
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:	02 02 02 02 00 00 00 18 73 4D 4E 20 54 72 69 67 67 65 72 41 75 74 6F 45 78 70 6F 73 75 72 65 20 34	........sMN Trig gerAutoExposure 4
Method Return Value:	02 02 02 02 00 00 00 19 73 41 4E 20 54 72 69 67 67 65 72 41 75 74 6F 45 78 70 6F 73 75 72 65 20 00 38	........sAN Trig gerAutoExposure ·8

4.3.3.22. Method: TriggerAutoExposureParameterized

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

Method Overview

Method Name	Description
TriggerAutoExposureParameterized	Vector to trigger the different auto exposure algorithms (depth, RGB, white balance) simultaneously.

Invocation Access	AuthorizedClient, Service

Parameters				
exposureAlgorithms			Vector of all Exposure Algorithms which should be run (e.g. integration time or color)	
	Array			
	Length		0..16	
		Enum8		
		Default Value	INTEGRATION_TIME	
		Value	Name	Description
		0	INTEGRATION_TIME	
		1	INTEGRATION_TIME_COLOR	
		2	WHITE_BALANCE	

Return Values	
success	
Bool	
Value Range	False, True
Initialisation	False

Method Telegram Syntax

Method Invocation:

```
sMN TriggerAutoExposureParameterized <exposureAlgorithms>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sMN	String	3	Request (SOPAS Method by Name)
Method	TriggerAutoExposureParameterized	String	32	Trigger auto exposure algorithm for Depthmap
Parameter 1	exposureAlgorithms	Array	16	Vector of all Exposure Algorithms which should be run (e.g. integration time or color)

Method Return Value:

```
sAN TriggerAutoExposureParameterized <success>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sAN	String	3	Result (SOPAS Method Result)
Method	TriggerAutoExposureParameterized	String	32	Trigger auto exposure algorithm for Depthmap
Return Value 1	success	Bool	1	

Method Telegram Examples

Custom Example 1

How to trigger white balance

Method Invocation:	02 02 02 02 00 00 00 28 73 4D 4E 20 54 72 69 67 67 65 72 41 75 74 6F 45 78 70 6F 73 75 72 65 50 61 72 61 6D 65 74 65 72 69 7A 65 64 20 00 01 02 6C	·····(sMN Trig gerAutoExposureP arameterized ··· l
Method Return Value:	02 02 02 02 00 00 00 26 73 41 4E 20 54 72 69 67 67 65 72 41 75 74 6F 45 78 70 6F 73 75 72 65 50 61 72 61 6D 65 74 65 72 69 7A 65 64 20 01 62	·····&sAN Trig gerAutoExposureP arameterized ·b

4.3.3.23. Variable: handlingTriggerSignal

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

Variable Overview

Variable Name	Description
handlingTriggerSignal	Device is busy processing a trigger signal if True. No new trigger signals can be reiceived if True.

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

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:

```
sRN handlingTriggerSignal
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	handlingTriggerSignal	String	21	Busy handling trigger signal if True

Read Variable Response:

```
sRA handlingTriggerSignal <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	handlingTriggerSignal	String	21	Busy handling trigger signal if True
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	02 02 02 02 00 00 00 1A 73 52 4E 20 68 61 6E 64 6C 69 6E 67 54 72 69 67 67 65 72 53 69 67 6E 61 6C 20 06	........sRN hand lingTriggerSigna l ·
Read Variable Response:	02 02 02 02 00 00 00 1B 73 52 41 20 68 61 6E 64 6C 69 6E 67 54 72 69 67 67 65 72 53 69 67 6E 61 6C 20 00 09	........sRA hand lingTriggerSigna l ··

4.3.3.24. Variable: AutoAdoptionChangeThrottle

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

Variable Overview

Variable Name	Description
AutoAdoptionChangeThrottle	Defines a minimum pause time [ms] for the continuous automatic exposure algortihms, so that frequency of config changes can be throttled.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UDInt	
Value Range	0..2000
Initialisation	500

Variable Telegram Syntax

Read Variable:

```
sRN AutoAdoptionChangeThrottle
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	AutoAdoptionChangeThrottle	String	26	Defines a minimum pause time [ms] for continuous automatic adjustment, so frequency of coonfig changes can be throttled

Read Variable Response:

```
sRA AutoAdoptionChangeThrottle <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	AutoAdoptionChangeThrottle	String	26	Defines a minimum pause time [ms] for continuous automatic adjustment, so frequency of coonfig changes can be throttled
Variable Data	data	UDInt	4	

Write Variable:

```
sWN AutoAdoptionChangeThrottle <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	AutoAdoptionChangeThrottle	String	26	Defines a minimum pause time [ms] for continuous automatic adjustment, so frequency of coonfig changes can be throttled
Variable Data	data	UDInt	4	

Write Variable Response:

```
sWA AutoAdoptionChangeThrottle
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	AutoAdoptionChangeThrottle	String	26	Defines a minimum pause time [ms] for continuous automatic adjustment, so frequency of coonfig changes can be throttled

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 1F 73 52 4E 20 41 75 74 6F 41 64 6F 70 74 69 6F 6E 43 68 61 6E 67 65 54 68 72 6F 74 74 6C 65 20 68	····sRN Auto AdoptionChangeTh rottle h
Read Variable Response:	02 02 02 02 00 00 00 23 73 52 41 20 41 75 74 6F 41 64 6F 70 74 69 6F 6E 43 68 61 6E 67 65 54 68 72 6F 74 74 6C 65 20 00 00 01 F4 92	····#sRA Auto AdoptionChangeTh rottle ···
Write Variable:	02 02 02 02 00 00 00 23 73 57 4E 20 41 75 74 6F 41 64 6F 70 74 69 6F 6E 43 68 61 6E 67 65 54 68 72 6F 74 74 6C 65 20 00 00 01 F4 98	····#sWN Auto AdoptionChangeTh rottle ···
Write Variable Response:	02 02 02 02 00 00 00 1F 73 57 41 20 41 75 74 6F 41 64 6F 70 74 69 6F 6E 43 68 61 6E 67 65 54 68 72 6F 74 74 6C 65 20 62	····sWA Auto AdoptionChangeTh rottle b

4.3.3.25. Variable: RGBContAutoExposureEnabled

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

Variable Overview

Variable Name	Description
RGBContAutoExposureEnabled	Enable/Disable the continuous auto exposure algorithm for color map (RGB data).

Read-Access	Always
Write-Access	AuthorizedClient, Service

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:

```
sRN RGBContAutoExposureEnabled
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	RGBContAutoExposureEnabled	String	26	Enable/Disable continuous auto exposure algorithm for color map

Read Variable Response:

```
sRA RGBContAutoExposureEnabled <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	RGBContAutoExposureEnabled	String	26	Enable/Disable continuous auto exposure algorithm for color map
Variable Data	data	Bool	1	

Write Variable:				
sWN RGBContAutoExposureEnabled <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	RGBContAutoExposureEnabled	String	26	Enable/Disable continuous auto exposure algorithm for color map
Variable Data	data	Bool	1	

Write Variable Response:				
sWA RGBContAutoExposureEnabled				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	RGBContAutoExposureEnabled	String	26	Enable/Disable continuous auto exposure algorithm for color map

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 1F 73 52 4E 20 52 47 42 43 6F 6E 74 41 75 74 6F 45 78 70 6F 73 75 72 65 45 6E 61 62 6C 65 64 20 57	····sRN RGBC ontAutoExposureE nabled W
Read Variable Response:	02 02 02 02 00 00 00 20 73 52 41 20 52 47 42 43 6F 6E 74 41 75 74 6F 45 78 70 6F 73 75 72 65 45 6E 61 62 6C 65 64 20 00 58	···· sRA RGBC ontAutoExposureE nabled ·X
Write Variable:	02 02 02 02 00 00 00 20 73 57 4E 20 52 47 42 43 6F 6E 74 41 75 74 6F 45 78 70 6F 73 75 72 65 45 6E 61 62 6C 65 64 20 00 52	···· sWN RGBC ontAutoExposureE nabled ·R
Write Variable Response:	02 02 02 02 00 00 00 1F 73 57 41 20 52 47 42 43 6F 6E 74 41 75 74 6F 45 78 70 6F 73 75 72 65 45 6E 61 62 6C 65 64 20 5D	····sWA RGBC ontAutoExposureE nabled]

4.3.3.26. Variable: RGBContAutoExposureIntTimeLimitUs

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

Variable Overview

Variable Name	Description
RGBContAutoExposureIntTimeLimitUs	Set an upper limit for the exposure time color during continuous autoexposure. This maximum will not be exceeded.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UDInt	
Value Range	0..4294967295
Initialisation	100000

Variable Telegram Syntax

Read Variable:				
`sRN RGBContAutoExposureIntTimeLimitUs`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	RGBContAutoExposureIntTimeLimitUs	String	33	Set a limit for auto adoption. This maximum will not be exceeded by the device.

Read Variable Response:				
`sRA RGBContAutoExposureIntTimeLimitUs <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	RGBContAutoExposureIntTimeLimitUs	String	33	Set a limit for auto adoption. This maximum will not be exceeded by the device.
Variable Data	data	UDInt	4	

Write Variable:				
`sWN RGBContAutoExposureIntTimeLimitUs <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	RGBContAutoExposureIntTimeLimitUs	String	33	Set a limit for auto adoption. This maximum will not be exceeded by the device.
Variable Data	data	UDInt	4	

Write Variable Response:				
`sWA RGBContAutoExposureIntTimeLimitUs`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	RGBContAutoExposureIntTimeLimitUs	String	33	Set a limit for auto adoption. This maximum will not be exceeded by the device.

Variable Telegram Examples

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

Read Variable:	`02 02 02 02 00 00 00 26 73 52 4E 20 52 47 42 43`
	`6F 6E 74 41 75 74 6F 45 78 70 6F 73 75 72 65 49`
	`6E 74 54 69 6D 65 4C 69 6D 69 74 55 73 20 07`
		`·····&sRN RGBC`
		`ontAutoExposureI`
		`ntTimeLimitUs ·`

Read Variable Response:	`02 02 02 02 00 00 00 2A 73 52 41 20 52 47 42 43`
	`6F 6E 74 41 75 74 6F 45 78 70 6F 73 75 72 65 49`
	`6E 74 54 69 6D 65 4C 69 6D 69 74 55 73 20 00 01`
	`86 A0 2F`
		`·····*sRA RGBC`
		`ontAutoExposureI`
		`ntTimeLimitUs ··`
		`/`

Write Variable:	`02 02 02 02 00 00 00 2A 73 57 4E 20 52 47 42 43`
	`6F 6E 74 41 75 74 6F 45 78 70 6F 73 75 72 65 49`
	`6E 74 54 69 6D 65 4C 69 6D 69 74 55 73 20 00 01`
	`86 A0 25`
		`·····*sWN RGBC`
		`ontAutoExposureI`
		`ntTimeLimitUs ··`
		`%`

Write Variable Response:	`02 02 02 02 00 00 00 26 73 57 41 20 52 47 42 43`
	`6F 6E 74 41 75 74 6F 45 78 70 6F 73 75 72 65 49`
	`6E 74 54 69 6D 65 4C 69 6D 69 74 55 73 20 0D`
		`·····&sWA RGBC`
		`ontAutoExposureI`
		`ntTimeLimitUs ·`

4.3.3.27. Variable: RGBContAutoExposureSensitivity

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

Variable Overview

Variable Name	Description
RGBContAutoExposureSensitivity	A lower sensitivity results in less continuous, automatic changes, a higher sensitivity results in more frequent changes.

Read-Access	Always
Write-Access	AuthorizedClient, Service

Real	
Value Range	See specification IEEE 754 0.1..0.9
Initialisation	0.5

Variable Telegram Syntax

Read Variable:

```
sRN RGBContAutoExposureSensitivity
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	RGBContAutoExposureSensitivity	String	30	Lower senitivity for less continuous automatic changes - higher sensitivity for frequent changes

Read Variable Response:

```
sRA RGBContAutoExposureSensitivity <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	RGBContAutoExposureSensitivity	String	30	Lower senitivity for less continuous automatic changes - higher sensitivity for frequent changes
Variable Data	data	Real	4	

Write Variable:

```
sWN RGBContAutoExposureSensitivity <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	RGBContAutoExposureSensitivity	String	30	Lower senitivity for less continuous automatic changes - higher sensitivity for frequent changes
Variable Data	data	Real	4	

Write Variable Response:

```
sWA RGBContAutoExposureSensitivity
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	RGBContAutoExposureSensitivity	String	30	Lower senitivity for less continuous automatic changes - higher sensitivity for frequent changes

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 23 73 52 4E 20 52 47 42 43 6F 6E 74 41 75 74 6F 45 78 70 6F 73 75 72 65 53 65 6E 73 69 74 69 76 69 74 79 20 5F	·····#sRN RGBC ontAutoExposureS ensitivity _
Read Variable Response:	02 02 02 02 00 00 00 27 73 52 41 20 52 47 42 43 6F 6E 74 41 75 74 6F 45 78 70 6F 73 75 72 65 53 65 6E 73 69 74 69 76 69 74 79 20 3F 00 00 00 6F	·····'sRA RGBC ontAutoExposureS ensitivity ?···o
Write Variable:	02 02 02 02 00 00 00 27 73 57 4E 20 52 47 42 43 6F 6E 74 41 75 74 6F 45 78 70 6F 73 75 72 65 53 65 6E 73 69 74 69 76 69 74 79 20 3F 00 00 00 65	·····'sWN RGBC ontAutoExposureS ensitivity ?···e
Write Variable Response:	02 02 02 02 00 00 00 23 73 57 41 20 52 47 42 43 6F 6E 74 41 75 74 6F 45 78 70 6F 73 75 72 65 53 65 6E 73 69 74 69 76 69 74 79 20 55	·····#sWA RGBC ontAutoExposureS ensitivity U

4.3.3.28. Variable: RGBContAutoExposureBrightness

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

Variable Overview

Variable Name	Description
RGBContAutoExposureBrightness	Lower value for darker images - higher value for brighter images

Read-Access	Always
Write-Access	AuthorizedClient, Service

Real	
Value Range	See specification IEEE 754 0.1..0.9
Initialisation	0.6

Variable Telegram Syntax

Read Variable:

```
sRN RGBContAutoExposureBrightness
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	RGBContAutoExposureBrightness	String	29	Lower value for darker images - higher value for brighter images

Read Variable Response:

```
sRA RGBContAutoExposureBrightness <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	RGBContAutoExposureBrightness	String	29	Lower value for darker images - higher value for brighter images
Variable Data	data	Real	4	

Write Variable:				
sWN RGBContAutoExposureBrightness <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	RGBContAutoExposureBrightness	String	29	Lower value for darker images - higher value for brighter images
Variable Data	data	Real	4	

Write Variable Response:				
sWA RGBContAutoExposureBrightness				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	RGBContAutoExposureBrightness	String	29	Lower value for darker images - higher value for brighter images

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 22 73 52 4E 20 52 47 42 43 6F 6E 74 41 75 74 6F 45 78 70 6F 73 75 72 65 42 72 69 67 68 74 6E 65 73 73 20 3B	·······"sRN RGBC ontAutoExposureB rightness ;
Read Variable Response:	02 02 02 02 00 00 00 26 73 52 41 20 52 47 42 43 6F 6E 74 41 75 74 6F 45 78 70 6F 73 75 72 65 42 72 69 67 68 74 6E 65 73 73 20 3F 19 99 9A 11	·······&sRA RGBC ontAutoExposureB rightness ?··
Write Variable:	02 02 02 02 00 00 00 26 73 57 4E 20 52 47 42 43 6F 6E 74 41 75 74 6F 45 78 70 6F 73 75 72 65 42 72 69 67 68 74 6E 65 73 73 20 3F 19 99 9A 1B	·······&sWN RGBC ontAutoExposureB rightness ?··
Write Variable Response:	02 02 02 02 00 00 00 22 73 57 41 20 52 47 42 43 6F 6E 74 41 75 74 6F 45 78 70 6F 73 75 72 65 42 72 69 67 68 74 6E 65 73 73 20 31	·······"sWA RGBC ontAutoExposureB rightness 1

4.3.3.29. Variable: checkingIntegrationTime

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

Variable Overview

Variable Name	Description
checkingIntegrationTime	States if the auto exposure algorithm for the exposure time 3D is currently running.

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

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
sRN checkingIntegrationTime				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	checkingIntegrationTime	String	23	Busy checking current integration time for auto exposure if True

Read Variable Response:				
sRA checkingIntegrationTime <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	checkingIntegrationTime	String	23	Busy checking current integration time for auto exposure if True
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 1C 73 52 4E 20 63 68 65 63 6B 69 6E 67 49 6E 74 65 67 72 61 74 69 6F 6E 54 69 6D 65 20 02	........sRN chec kingIntegrationT ime ·
Read Variable Response:	02 02 02 02 00 00 00 1D 73 52 41 20 63 68 65 63 6B 69 6E 67 49 6E 74 65 67 72 61 74 69 6F 6E 54 69 6D 65 20 00 0D	........sRA chec kingIntegrationT ime ··

4.3.3.30. Variable: checkingIntegrationTimeColor

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

Variable Overview

Variable Name	Description
checkingIntegrationTimeColor	States if the auto exposure algorithm for the exposure time RGB is currently running.

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

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
sRN checkingIntegrationTimeColor				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	checkingIntegrationTimeColor	String	28	Busy checking current integration time for auto exposure if True

Read Variable Response:				
sRA checkingIntegrationTimeColor <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	checkingIntegrationTimeColor	String	28	Busy checking current integration time for auto exposure if True
Variable Data	data	Bool	1	

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 21 73 52 4E 20 63 68 65 63 6B 69 6E 67 49 6E 74 65 67 72 61 74 69 6F 6E 54 69 6D 65 43 6F 6C 6F 72 20 5F	·····!sRN chec kingIntegrationT imeColor _
Read Variable Response:	02 02 02 02 00 00 00 22 73 52 41 20 63 68 65 63 6B 69 6E 67 49 6E 74 65 67 72 61 74 69 6F 6E 54 69 6D 65 43 6F 6C 6F 72 20 00 50	·····"sRA chec kingIntegrationT imeColor ·P

4.3.3.31. Variable: checkingWhiteBalance

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

Variable Overview

Variable Name	Description
checkingWhiteBalance	States if the auto white balance algorithm is currently running.

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

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
`sRN checkingWhiteBalance`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	checkingWhiteBalance	String	20	Busy checking current white balance for auto white balance if True

Read Variable Response:				
`sRA checkingWhiteBalance <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	checkingWhiteBalance	String	20	Busy checking current white balance for auto white balance if True
Variable Data	data	Bool	1	

Variable Telegram Examples

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

Read Variable:	`02 02 02 02 00 00 00 19  73 52 4E 20 63 68 65 63`
	`6B 69 6E 67 57 68 69 74  65 42 61 6C 61 6E 63 65`
	`20 68`
		`····sRN chec`
		`kingWhiteBalance`
		` h`

Read Variable Response:	`02 02 02 02 00 00 00 1A  73 52 41 20 63 68 65 63`
	`6B 69 6E 67 57 68 69 74  65 42 61 6C 61 6E 63 65`
	`20 00 67`
		`····sRA chec`
		`kingWhiteBalance`
		` ·g`

4.3.4. Filter Settings

4.3.4.1. Variable: enCartFilter

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

Variable Overview

Variable Name	Description
enCartFilter	Enable Cartesian coordinates based filter.

Read-Access	Always
Write-Access	AuthorizedClient, Service

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:

```
sRN enCartFilter
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	enCartFilter	String	12	Flag whether the cartesian volume filter is enabled

Read Variable Response:

```
sRA enCartFilter <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	enCartFilter	String	12	Flag whether the cartesian volume filter is enabled
Variable Data	data	Bool	1	

Write Variable:

```
sWN enCartFilter <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	enCartFilter	String	12	Flag whether the cartesian volume filter is enabled
Variable Data	data	Bool	1	

Write Variable Response:

```
sWA enCartFilter
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	enCartFilter	String	12	Flag whether the cartesian volume filter is enabled

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 11 73 52 4E 20 65 6E 43 61 72 74 46 69 6C 74 65 72 20 60	····sRN enCa rtFilter `
Read Variable Response:	02 02 02 02 00 00 00 12 73 52 41 20 65 6E 43 61 72 74 46 69 6C 74 65 72 20 00 6F	····sRA enCa rtFilter ·o
Write Variable:	02 02 02 02 00 00 00 12 73 57 4E 20 65 6E 43 61 72 74 46 69 6C 74 65 72 20 00 65	····sWN enCa rtFilter ·e
Write Variable Response:	02 02 02 02 00 00 00 11 73 57 41 20 65 6E 43 61 72 74 46 69 6C 74 65 72 20 6A	····sWA enCa rtFilter j

4.3.4.2. Variable: cartFilterBounds

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

Variable Overview

Variable Name	Description
cartFilterBounds	Bounds of the volume used for Cartesian based filter.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UserType	
BoundingBoxLReal	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:

```
sRN cartFilterBounds
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	cartFilterBounds	String	16	The bounds of the cartesian volume filter (this variable will also be the persistent store for the cartesian bounds)

Read Variable Response:

```
sRA cartFilterBounds <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	cartFilterBounds	String	16	The bounds of the cartesian volume filter (this variable will also be the persistent store for the cartesian bounds)
Variable Data	data	BoundingBoxLReal	48	

Write Variable:				
sWN cartFilterBounds <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	cartFilterBounds	String	16	The bounds of the cartesian volume filter (this variable will also be the persistent store for the cartesian bounds)
Variable Data	data	BoundingBoxLReal	48	

Write Variable Response:				
sWA cartFilterBounds				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	cartFilterBounds	String	16	The bounds of the cartesian volume filter (this variable will also be the persistent store for the cartesian bounds)

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 15 73 52 4E 20 63 61 72 74 46 69 6C 74 65 72 42 6F 75 6E 64 73 20 6A	····· sRN cart FilterBounds j
Read Variable Response:	02 02 02 02 00 00 00 45 73 52 41 20 63 61 72 74 46 69 6C 74 65 72 42 6F 75 6E 64 73 20 C0 93 88 00 00 00 00 00 40 93 88 00 00 00 00 00 C0 93 88 00 00 00 00 00 40 93 88 00 00 00 00 00 C0 93 88 00 00 00 00 00 40 93 88 00 00 00 00 00 E5	····· EsRA cart FilterBounds ·····@····· ·····@····· ·····@·····
Write Variable:	02 02 02 02 00 00 00 45 73 57 4E 20 63 61 72 74 46 69 6C 74 65 72 42 6F 75 6E 64 73 20 C0 93 88 00 00 00 00 00 40 93 88 00 00 00 00 00 C0 93 88 00 00 00 00 00 40 93 88 00 00 00 00 00 C0 93 88 00 00 00 00 00 40 93 88 00 00 00 00 00 EF	····· EsWN cart FilterBounds ·····@····· ·····@····· ·····@·····
Write Variable Response:	02 02 02 02 00 00 00 15 73 57 41 20 63 61 72 74 46 69 6C 74 65 72 42 6F 75 6E 64 73 20 60	····· sWA cart FilterBounds `

4.3.4.3. Method: setCartFilterBounds

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

Method Overview

Method Name	Description
setCartFilterBounds	Method to set the lower and upper limit for each dimension of the Cartesian based filter volume.

Invocation Access	Service

UserType	
BoundingBoxLReal	See the chapter "User Types" for details.

Return Values	
success	
Bool	
Value Range	False, True
Initialisation	False

Method Telegram Syntax

Method Invocation:				
`sMN setCartFilterBounds <x> <y> <z>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sMN	String	3	Request (SOPAS Method by Name)
Method	setCartFilterBounds	String	19	Set the bounding values for the x, y and z dimension of the cartesian filter volume.
Parameter 1	x	RangeMm	16	
Parameter 2	y	RangeMm	16	
Parameter 3	z	RangeMm	16	

Method Return Value:				
`sAN setCartFilterBounds <success>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sAN	String	3	Result (SOPAS Method Result)
Method	setCartFilterBounds	String	19	Set the bounding values for the x, y and z dimension of the cartesian filter volume.
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:	`02 02 02 02 00 00 00 48  73 4D 4E 20 73 65 74 43`
	`61 72 74 46 69 6C 74 65  72 42 6F 75 6E 64 73 20`
	`C0 93 88 00 00 00 00 00  40 93 88 00 00 00 00 00`
	`C0 93 88 00 00 00 00 00  40 93 88 00 00 00 00 00`
	`C0 93 88 00 00 00 00 00  40 93 88 00 00 00 00 00`
	`B7`
		`·······HsMN setC`
		`artFilterBounds`
		`·····@·····`
		`·····@·····`
		`·····@·····`

Method Return Value:	`02 02 02 02 00 00 00 19  73 41 4E 20 73 65 74 43`
	`61 72 74 46 69 6C 74 65  72 42 6F 75 6E 64 73 20`
	`00 3B`
		`········sAN setC`
		`artFilterBounds`
		`·;`

4.3.4.4. Variable: enableDynamicDistanceFilter

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

Variable Overview

Variable Name	Description
enableDynamicDistanceFilter	Enable dynamic distance filter - This filter identifies and removes artifacts in highly dynamic scenes. Reducing the threshold increases the sensitivity. Measurement values above the threshold are set to zero. Be aware of the increased reaction time of the device when using this filter.

Communication Name	enDynDistFilter
Read-Access	Always
Write-Access	AuthorizedClient, Service

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:

```
sRN enDynDistFilter
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	enDynDistFilter	String	15	Switching the dynamic distance filtering on and off

Read Variable Response:

```
sRA enDynDistFilter <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	enDynDistFilter	String	15	Switching the dynamic distance filtering on and off
Variable Data	data	Bool	1	

Write Variable:

```
sWN enDynDistFilter <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	enDynDistFilter	String	15	Switching the dynamic distance filtering on and off
Variable Data	data	Bool	1	

Write Variable Response:

```
sWA enDynDistFilter
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	enDynDistFilter	String	15	Switching the dynamic distance filtering on and off

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 14 73 52 4E 20 65 6E 44 79 6E 44 69 73 74 46 69 6C 74 65 72 20 3D	····sRN enDy nDistFilter =
Read Variable Response:	02 02 02 02 00 00 00 15 73 52 41 20 65 6E 44 79 6E 44 69 73 74 46 69 6C 74 65 72 20 00 32	····sRA enDy nDistFilter ·2
Write Variable:	02 02 02 02 00 00 00 15 73 57 4E 20 65 6E 44 79 6E 44 69 73 74 46 69 6C 74 65 72 20 00 38	····sWN enDy nDistFilter ·8
Write Variable Response:	02 02 02 02 00 00 00 14 73 57 41 20 65 6E 44 79 6E 44 69 73 74 46 69 6C 74 65 72 20 37	····sWA enDy nDistFilter 7

4.3.4.5. Variable: dynamicDistanceThres

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

Variable Overview

Variable Name	Description
dynamicDistanceThres	Threshold for the dynamic distance filter. (attention the unit is mm/10 e.g. 1 = 0.1mm | 10 = 1.0mm)

Communication Name	dynDistThres
Read-Access	Always
Write-Access	AuthorizedClient, Service

UInt	
Value Range	0..10000
Initialisation	300

Variable Telegram Syntax

Read Variable:

```
sRN dynDistThres
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	dynDistThres	String	12	The dynamic distance threshold. If the difference between the distance value of a pixel in the previous and in the current frame is greater than this threshold, the pixel is considered invalid and its distance is set to zero.

Read Variable Response:

```
sRA dynDistThres <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	dynDistThres	String	12	The dynamic distance threshold. If the difference between the distance value of a pixel in the previous and in the current frame is greater than this threshold, the pixel is considered invalid and its distance is set to zero.

Read Variable Response:				
sRA dynDistThres <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Variable Data	data	UInt	2	

Write Variable:				
sWN dynDistThres <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	dynDistThres	String	12	The dynamic distance threshold. If the difference between the distance value of a pixel in the previous and in the current frame is greater than this threshold, the pixel is considered invalid and its distance is set to zero.
Variable Data	data	UInt	2	

Write Variable Response:				
sWA dynDistThres				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	dynDistThres	String	12	The dynamic distance threshold. If the difference between the distance value of a pixel in the previous and in the current frame is greater than this threshold, the pixel is considered invalid and its distance is set to zero.

Variable Telegram Examples

Custom Value 1		
read/write variable dynamicDistanceThres with value of <10mm>		
Read Variable:	02 02 02 02 00 00 00 11 73 52 4E 20 64 79 6E 44 69 73 74 54 68 72 65 73 20 6E	........sRN dynD istThres n
Read Variable Response:	02 02 02 02 00 00 00 13 73 52 41 20 64 79 6E 44 69 73 74 54 68 72 65 73 20 00 0A 6B	........sRA dynD istThres ··k
Write Variable:	02 02 02 02 00 00 00 13 73 57 4E 20 64 79 6E 44 69 73 74 54 68 72 65 73 20 00 0A 61	........sWN dynD istThres ··a
Write Variable Response:	02 02 02 02 00 00 00 11 73 57 41 20 64 79 6E 44 69 73 74 54 68 72 65 73 20 64	........sWA dynD istThres d

4.3.4.6. Variable: enableDistanceFilter

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

Variable Overview

Variable Name	Description
enableDistanceFilter	Enable Z based filter - This filter sets the z values for all pixels outside the given range to zero.

Communication Name	enDistFilter
Read-Access	Always
Write-Access	AuthorizedClient, Service

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:

```
sRN enDistFilter
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	enDistFilter	String	12	Switching the distance based filtering on and off

Read Variable Response:

```
sRA enDistFilter <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	enDistFilter	String	12	Switching the distance based filtering on and off
Variable Data	data	Bool	1	

Write Variable:

```
sWN enDistFilter <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	enDistFilter	String	12	Switching the distance based filtering on and off
Variable Data	data	Bool	1	

Write Variable Response:

```
sWA enDistFilter
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	enDistFilter	String	12	Switching the distance based filtering on and off

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 11 73 52 4E 20 65 6E 44 69 73 74 46 69 6C 74 65 72 20 6E	····sRN enDi stFilter n
Read Variable Response:	02 02 02 02 00 00 00 12 73 52 41 20 65 6E 44 69 73 74 46 69 6C 74 65 72 20 00 61	····sRA enDi stFilter ·a
Write Variable:	02 02 02 02 00 00 00 12 73 57 4E 20 65 6E 44 69 73 74 46 69 6C 74 65 72 20 00 6B	····sWN enDi stFilter ·k
Write Variable Response:	02 02 02 02 00 00 00 11 73 57 41 20 65 6E 44 69 73 74 46 69 6C 74 65 72 20 64	····sWA enDi stFilter d

4.3.4.7. Variable: maxDistanceThreshold

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

Variable Overview

Variable Name	Description
maxDistanceThreshold	The maximal distance threshold. All values above are set to zero if the distance based filter is active.

Communication Name	maxDistThresh
Read-Access	Always
Write-Access	AuthorizedClient, Service

UInt	
Value Range	0..6500
Initialisation	6500
Physical Unit	mm

Variable Telegram Syntax

Read Variable:

```
sRN maxDistThresh
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	maxDistThresh	String	13	The maximal distance threshold. All values above are set to zero if the distance based filter is active.

Read Variable Response:

```
sRA maxDistThresh <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	maxDistThresh	String	13	The maximal distance threshold. All values above are set to zero if the distance based filter is active.
Variable Data	data	UInt	2	

Write Variable:				
sWN maxDistThresh <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	maxDistThresh	String	13	The maximal distance threshold. All values above are set to zero if the distance based filter is active.
Variable Data	data	UInt	2	

Write Variable Response:				
sWA maxDistThresh				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	maxDistThresh	String	13	The maximal distance threshold. All values above are set to zero if the distance based filter is active.

Variable Telegram Examples

Custom Value 1

read/write variable maxDistanceThreshold with value of <2500mm>

Read Variable:	02 02 02 02 00 00 00 12 73 52 4E 20 6D 61 78 44 69 73 74 54 68 72 65 73 68 20 01	····sRN maxD istThresh ·
Read Variable Response:	02 02 02 02 00 00 00 14 73 52 41 20 6D 61 78 44 69 73 74 54 68 72 65 73 68 20 09 C4 C3	····sRA maxD istThresh ·
Write Variable:	02 02 02 02 00 00 00 14 73 57 4E 20 6D 61 78 44 69 73 74 54 68 72 65 73 68 20 09 C4 C9	····sWN maxD istThresh ·
Write Variable Response:	02 02 02 02 00 00 00 12 73 57 41 20 6D 61 78 44 69 73 74 54 68 72 65 73 68 20 0B	····sWA maxD istThresh ·

Custom Value 2

read/write variable maxDistanceThreshold with value of <15000mm>

Read Variable:	02 02 02 02 00 00 00 12 73 52 4E 20 6D 61 78 44 69 73 74 54 68 72 65 73 68 20 01	····sRN maxD istThresh ·
Read Variable Response:	02 02 02 02 00 00 00 14 73 52 41 20 6D 61 78 44 69 73 74 54 68 72 65 73 68 20 19 64 73	····sRA maxD istThresh ·ds
Write Variable:	02 02 02 02 00 00 00 14 73 57 4E 20 6D 61 78 44 69 73 74 54 68 72 65 73 68 20 19 64 79	····sWN maxD istThresh ·dy
Write Variable Response:	02 02 02 02 00 00 00 12 73 57 41 20 6D 61 78 44 69 73 74 54 68 72 65 73 68 20 0B	····sWA maxD istThresh ·

4.3.4.8. Variable: minDistanceThreshold

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

Variable Overview

Variable Name	Description
minDistanceThreshold	The minimal distance threshold. All values below are set to zero if the distance based filter is active.

Communication Name	minDistThresh
Read-Access	Always
Write-Access	AuthorizedClient, Service

UInt	
Value Range	0..6500
Initialisation	0
Physical Unit	mm

Variable Telegram Syntax

Read Variable:

```
sRN minDistThresh
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	minDistThresh	String	13	The minimal distance threshold. All values below are set to zero if the distance based filter is active.

Read Variable Response:

```
sRA minDistThresh <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	minDistThresh	String	13	The minimal distance threshold. All values below are set to zero if the distance based filter is active.
Variable Data	data	UInt	2	

Write Variable:

```
sWN minDistThresh <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	minDistThresh	String	13	The minimal distance threshold. All values below are set to zero if the distance based filter is active.
Variable Data	data	UInt	2	

Write Variable Response:

```
sWA minDistThresh
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	minDistThresh	String	13	The minimal distance threshold. All values below are set to zero if the distance based filter is active.

Variable Telegram Examples

Custom Value 1		
read/write variable minDistanceThreshold with value of <500mm>		
Read Variable:	02 02 02 02 00 00 00 12 73 52 4E 20 6D 69 6E 44 69 73 74 54 68 72 65 73 68 20 1F	····sRN minD istThresh ·
Read Variable Response:	02 02 02 02 00 00 00 14 73 52 41 20 6D 69 6E 44 69 73 74 54 68 72 65 73 68 20 01 F4 E5	····sRA minD istThresh ·
Write Variable:	02 02 02 02 00 00 00 14 73 57 4E 20 6D 69 6E 44 69 73 74 54 68 72 65 73 68 20 01 F4 EF	····sWN minD istThresh ·
Write Variable Response:	02 02 02 02 00 00 00 12 73 57 41 20 6D 69 6E 44 69 73 74 54 68 72 65 73 68 20 15	····sWA minD istThresh ·

4.3.4.9. Variable: enableIsolatedPixelFilter

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

Variable Overview

Variable Name	Description
enableIsolatedPixelFilter	Enable isolated pixel filter - This filter identifies single distance outlier pixels within a scene.

Communication Name	enIsoPixFilter
Read-Access	Always
Write-Access	AuthorizedClient, Service

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:

```
sRN enIsoPixFilter
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	enIsoPixFilter	String	14	Switching the isolated pixel filtering on and off

Read Variable Response:

```
sRA enIsoPixFilter <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	enIsoPixFilter	String	14	Switching the isolated pixel filtering on and off
Variable Data	data	Bool	1	

Write Variable:				
sWN enIsoPixFilter <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	enIsoPixFilter	String	14	Switching the isolated pixel filtering on and off
Variable Data	data	Bool	1	

Write Variable Response:				
sWA enIsoPixFilter				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	enIsoPixFilter	String	14	Switching the isolated pixel filtering on and off

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 13 73 52 4E 20 65 6E 49 73 6F 50 69 78 46 69 6C 74 65 72 20 50	........sRN enIs oPixFilter P
Read Variable Response:	02 02 02 02 00 00 00 14 73 52 41 20 65 6E 49 73 6F 50 69 78 46 69 6C 74 65 72 20 00 5F	........sRA enIs oPixFilter ·_
Write Variable:	02 02 02 02 00 00 00 14 73 57 4E 20 65 6E 49 73 6F 50 69 78 46 69 6C 74 65 72 20 00 55	........sWN enIs oPixFilter ·U
Write Variable Response:	02 02 02 02 00 00 00 13 73 57 41 20 65 6E 49 73 6F 50 69 78 46 69 6C 74 65 72 20 5A	........sWA enIs oPixFilter Z

4.3.4.10. Variable: enableMedianFilter

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

Variable Overview

Variable Name	Description
enableMedianFilter	Enable median filter - Returns the median for each pixel over the selected median level of frames. In single frame and triggered acquisition, the number of image capture commands must be the same as the median level (e.g., three single acquisition commands at a selected median of 3). In continuous mode, the frame rate is reduced according to the median level.

Read-Access	Always
Write-Access	AuthorizedClient, Service

Bool	
Value Range	False, True
Initialisation	False

Variable Telegram Syntax

Read Variable:				
`sRN enableMedianFilter`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	enableMedianFilter	String	18	Switching the median filter on and off.

Read Variable Response:				
`sRA enableMedianFilter <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	enableMedianFilter	String	18	Switching the median filter on and off.
Variable Data	data	Bool	1	

Write Variable:				
`sWN enableMedianFilter <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	enableMedianFilter	String	18	Switching the median filter on and off.
Variable Data	data	Bool	1	

Write Variable Response:				
`sWA enableMedianFilter`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	enableMedianFilter	String	18	Switching the median filter on and off.

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 17 73 52 4E 20 65 6E 61 62 6C 65 4D 65 64 69 61 6E 46 69 6C 74 65 72 20 64	····sRN enab leMedianFilter d
Read Variable Response:	02 02 02 02 00 00 00 18 73 52 41 20 65 6E 61 62 6C 65 4D 65 64 69 61 6E 46 69 6C 74 65 72 20 00 6B	····sRA enab leMedianFilter · k
Write Variable:	02 02 02 02 00 00 00 18 73 57 4E 20 65 6E 61 62 6C 65 4D 65 64 69 61 6E 46 69 6C 74 65 72 20 00 61	····sWN enab leMedianFilter · a
Write Variable Response:	02 02 02 02 00 00 00 17 73 57 41 20 65 6E 61 62 6C 65 4D 65 64 69 61 6E 46 69 6C 74 65 72 20 6E	····sWA enab leMedianFilter n

4.3.4.11. Variable: medianFramePeriod

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

Variable Overview

Variable Name	Description
medianFramePeriod	Level, i.e. number of frames used to calculate the median if the median filter is enabled.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UInt	
Value Range	3..29
Initialisation	3

Variable Telegram Syntax

Read Variable:

```
sRN medianFramePeriod
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	medianFramePeriod	String	17	Frame period. e.g., if set to 3, then the output image will be the median of the previous three images.

Read Variable Response:

```
sRA medianFramePeriod <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	medianFramePeriod	String	17	Frame period. e.g., if set to 3, then the output image will be the median of the previous three images.
Variable Data	data	UInt	2	

Write Variable:

```
sWN medianFramePeriod <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	medianFramePeriod	String	17	Frame period. e.g., if set to 3, then the output image will be the median of the previous three images.
Variable Data	data	UInt	2	

Write Variable Response:

```
sWA medianFramePeriod
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	medianFramePeriod	String	17	Frame period. e.g., if set to 3, then the output image will be the median of the previous three images.

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 16 73 52 4E 20 6D 65 64 69 61 6E 46 72 61 6D 65 50 65 72 69 6F 64 20 1D	····sRN medi anFramePeriod ·
Read Variable Response:	02 02 02 02 00 00 00 18 73 52 41 20 6D 65 64 69 61 6E 46 72 61 6D 65 50 65 72 69 6F 64 20 00 03 11	····sRA medi anFramePeriod ·· ·
Write Variable:	02 02 02 02 00 00 00 18 73 57 4E 20 6D 65 64 69 61 6E 46 72 61 6D 65 50 65 72 69 6F 64 20 00 03 1B	····sWN medi anFramePeriod ·· ·
Write Variable Response:	02 02 02 02 00 00 00 16 73 57 41 20 6D 65 64 69 61 6E 46 72 61 6D 65 50 65 72 69 6F 64 20 17	····sWA medi anFramePeriod ·

4.4. Digital IOs

4.4.1. Variable: IOValue

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

Variable Overview

Variable Name	Description
IOValue	This variable returns the logical state of all six I/Os which can either be 0 or 1.

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

UserType	
V3SIOsState	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:

```
sRN IOValue
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	IOValue	String	7	All available IOs Values

Read Variable Response:

```
sRA IOValue <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	IOValue	String	7	All available IOs Values
Variable Data	data	V3SIOsState	6	

Variable Telegram Examples

Example: Default Values

Variable telegram examples with data set to default values.

Read Variable:	02 02 02 02 00 00 00 0C 73 52 4E 20 49 4F 56 61 6C 75 65 20 22	........sRN IOValue "
Read Variable Response:	02 02 02 02 00 00 00 12 73 52 41 20 49 4F 56 61 6C 75 65 20 00 00 00 00 00 00 2D	........sRA IOValue ....

4.4.2. Variable: SENS_IN1_Function

The following section contains a detailed description of the variable SENS_IN1_Function.

Variable Overview

Variable Name	Description
SENS_IN1_Function	This variable maps one of the defined input functions to SENS_IN1. Possible functions, i.e. enum items are: NoFunction, Trigger (only SENS_IN1), JobCycling and JobSwitching.

Communication Name	SENS_IN1Func
Read-Access	Always
Write-Access	AuthorizedClient, Service

UserType	
InputFunctionType	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:

```
sRN SENS_IN1Func
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	SENS_IN1Func	String	12	Functionality for SENS_IN1

Read Variable Response:

```
sRA SENS_IN1Func <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	SENS_IN1Func	String	12	Functionality for SENS_IN1
Variable Data	data	InputFunctionType	0	

Write Variable:

```
sWN SENS_IN1Func <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	SENS_IN1Func	String	12	Functionality for SENS_IN1
Variable Data	data	InputFunctionType	0	

Write Variable Response:

```
sWA SENS_IN1Func
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	SENS_IN1Func	String	12	Functionality for SENS_IN1

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 11 73 52 4E 20 53 45 4E 53 5F 49 4E 31 46 75 6E 63 20 33	····sRN SENS _IN1Func 3
Read Variable Response:	02 02 02 02 00 00 00 12 73 52 41 20 53 45 4E 53 5F 49 4E 31 46 75 6E 63 20 00 3C	····sRA SENS _IN1Func ·<
Write Variable:	02 02 02 02 00 00 00 12 73 57 4E 20 53 45 4E 53 5F 49 4E 31 46 75 6E 63 20 00 36	····sWN SENS _IN1Func ·6
Write Variable Response:	02 02 02 02 00 00 00 11 73 57 41 20 53 45 4E 53 5F 49 4E 31 46 75 6E 63 20 39	····sWA SENS _IN1Func 9

4.4.3. Variable: SENS_IN1_active

The following section contains a detailed description of the variable SENS_IN1_active.

Variable Overview

Variable Name	Description
SENS_IN1_active	Defines the input logic for SENS_IN1. Active-high (High) and active-low (Low) logic are available via the respective enum items 1 and 0.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UserType	
OutputActiveType	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:

```
sRN SENS_IN1_active
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	SENS_IN1_active	String	15	Select for input signal on SENS_IN1 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)

Read Variable Response:

```
sRA SENS_IN1_active <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	SENS_IN1_active	String	15	Select for input signal on SENS_IN1 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)
Variable Data	data	OutputActiveType	0	

Write Variable:				
sWN SENS_IN1_active <data>				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	SENS_IN1_active	String	15	Select for input signal on SENS_IN1 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)
Variable Data	data	OutputActiveType	0	

Write Variable Response:				
sWA SENS_IN1_active				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	SENS_IN1_active	String	15	Select for input signal on SENS_IN1 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 14 73 52 4E 20 53 45 4E 53 5F 49 4E 31 5F 61 63 74 69 76 65 20 5E	····sRN SENS _IN1_active ^
Read Variable Response:	02 02 02 02 00 00 00 15 73 52 41 20 53 45 4E 53 5F 49 4E 31 5F 61 63 74 69 76 65 20 01 50	····sRA SENS _IN1_active ·P
Write Variable:	02 02 02 02 00 00 00 15 73 57 4E 20 53 45 4E 53 5F 49 4E 31 5F 61 63 74 69 76 65 20 01 5A	····sWN SENS _IN1_active ·Z
Write Variable Response:	02 02 02 02 00 00 00 14 73 57 41 20 53 45 4E 53 5F 49 4E 31 5F 61 63 74 69 76 65 20 54	····sWA SENS _IN1_active T

4.4.4. Variable: SENS_IN2_Function

The following section contains a detailed description of the variable SENS_IN2_Function.

Variable Overview

Variable Name	Description
SENS_IN2_Function	This variable maps one of the defined input functions to SENS_IN2. Possible functions, i.e. enum items are: NoFunction, Trigger (only SENS_IN1), JobCycling and JobSwitching.

Communication Name	SENS_IN2Func
Read-Access	Always
Write-Access	AuthorizedClient, Service

UserType	
InputFunctionType	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:				
`sRN SENS_IN2Func`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	SENS_IN2Func	String	12	Functionality for SENS_IN2

Read Variable Response:				
`sRA SENS_IN2Func <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	SENS_IN2Func	String	12	Functionality for SENS_IN2
Variable Data	data	InputFunctionType	0	

Write Variable:				
`sWN SENS_IN2Func <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	SENS_IN2Func	String	12	Functionality for SENS_IN2
Variable Data	data	InputFunctionType	0	

Write Variable Response:				
`sWA SENS_IN2Func`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	SENS_IN2Func	String	12	Functionality for SENS_IN2

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	`02 02 02 02 00 00 00 11  73 52 4E 20 53 45 4E 53` `5F 49 4E 32 46 75 6E 63  20 30`	`·····sRN SENS` `_IN2Func 0`
Read Variable Response:	`02 02 02 02 00 00 00 12  73 52 41 20 53 45 4E 53` `5F 49 4E 32 46 75 6E 63  20 00 3F`	`·····sRA SENS` `_IN2Func ·?`
Write Variable:	`02 02 02 02 00 00 00 12  73 57 4E 20 53 45 4E 53` `5F 49 4E 32 46 75 6E 63  20 00 35`	`·····sWN SENS` `_IN2Func ·5`
Write Variable Response:	`02 02 02 02 00 00 00 11  73 57 41 20 53 45 4E 53` `5F 49 4E 32 46 75 6E 63  20 3A`	`·····sWA SENS` `_IN2Func :`

4.4.5. Variable: SENS_IN2_active

The following section contains a detailed description of the variable SENS_IN2_active.

Variable Overview

Variable Name	Description
SENS_IN2_active	Defines the input logic for SENS_IN2. Active-high (High) and active-low (Low) logic are available via the respective enum items 1 and 0.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UserType	
OutputActiveType	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:

```
sRN SENS_IN2_active
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	SENS_IN2_active	String	15	Select for input signal on SENS_IN2 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)

Read Variable Response:

```
sRA SENS_IN2_active <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	SENS_IN2_active	String	15	Select for input signal on SENS_IN2 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)
Variable Data	data	OutputActiveType	0	

Write Variable:

```
sWN SENS_IN2_active <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	SENS_IN2_active	String	15	Select for input signal on SENS_IN2 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)
Variable Data	data	OutputActiveType	0	

Write Variable Response:

```
sWA SENS_IN2_active
```

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

Write Variable Response:				
sWA SENS_IN2_active				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Variable	SENS_IN2_active	String	15	Select for input signal on SENS_IN2 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 14 73 52 4E 20 53 45 4E 53 5F 49 4E 32 5F 61 63 74 69 76 65 20 5D	····sRN SENS _IN2_active]
Read Variable Response:	02 02 02 02 00 00 00 15 73 52 41 20 53 45 4E 53 5F 49 4E 32 5F 61 63 74 69 76 65 20 01 53	····sRA SENS _IN2_active ·S
Write Variable:	02 02 02 02 00 00 00 15 73 57 4E 20 53 45 4E 53 5F 49 4E 32 5F 61 63 74 69 76 65 20 01 59	····sWN SENS _IN2_active ·Y
Write Variable Response:	02 02 02 02 00 00 00 14 73 57 41 20 53 45 4E 53 5F 49 4E 32 5F 61 63 74 69 76 65 20 57	····sWA SENS _IN2_active W

4.4.6. Variable: INOUT1_Function

The following section contains a detailed description of the variable INOUT1_Function.

Variable Overview

Variable Name	Description
INOUT1_Function	This variable maps one of the defined functions to INOUT1. Possible functions, i.e. enum items are: NoFunction (0) (Input), ON (2) (Output), OFF (1) (Output), TemperatureWarning (5) (Output), DeviceError (3) (Output), JobSwitching (25) (Input) and IlluminationTrigger (28) (Input, only INOUT4). IlluminationTrigger can be used for external RGB flash sync.

Communication Name	DIO1Fnc
Read-Access	Always
Write-Access	AuthorizedClient, Service

UserType	
IOFunctionType	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:				
`sRN DIO1Fnc`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	DIO1Fnc	String	7	Function of INOUT1

Read Variable Response:				
`sRA DIO1Fnc <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	DIO1Fnc	String	7	Function of INOUT1
Variable Data	data	IOFunctionType	0	

Write Variable:				
`sWN DIO1Fnc <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	DIO1Fnc	String	7	Function of INOUT1
Variable Data	data	IOFunctionType	0	

Write Variable Response:				
`sWA DIO1Fnc`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	DIO1Fnc	String	7	Function of INOUT1

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	`02 02 02 02 00 00 00 0C 73 52 4E 20 44 49 4F 31 46 6E 63 20 57`	`........sRN DIO1Fnc W`
Read Variable Response:	`02 02 02 02 00 00 00 0D 73 52 41 20 44 49 4F 31 46 6E 63 20 00 58`	`........sRA DIO1Fnc ·X`
Write Variable:	`02 02 02 02 00 00 00 0D 73 57 4E 20 44 49 4F 31 46 6E 63 20 00 52`	`........sWN DIO1Fnc ·R`
Write Variable Response:	`02 02 02 02 00 00 00 0C 73 57 41 20 44 49 4F 31 46 6E 63 20 5D`	`........sWA DIO1Fnc ]`

4.4.7. Variable: OUT1_active

The following section contains a detailed description of the variable OUT1_active.

Variable Overview

Variable Name	Description
OUT1_active	Defines the logic for INOUT1. Active-high (High) and active-low (Low) logic are available via the respective enum items 1 and 0.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UserType	
OutputActiveType	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:

```
sRN OUT1_active
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	OUT1_active	String	11	Select for output signal on pin 1 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)

Read Variable Response:

```
sRA OUT1_active <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	OUT1_active	String	11	Select for output signal on pin 1 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)
Variable Data	data	OutputActiveType	0	

Write Variable:

```
sWN OUT1_active <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	OUT1_active	String	11	Select for output signal on pin 1 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)
Variable Data	data	OutputActiveType	0	

Write Variable Response:

```
sWA OUT1_active
```

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

Write Variable Response:				
sWA OUT1_active				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Variable	OUT1_active	String	11	Select for output signal on pin 1 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 10 73 52 4E 20 4F 55 54 31 5F 61 63 74 69 76 65 20 43	····sRN OUT1 _active C
Read Variable Response:	02 02 02 02 00 00 00 11 73 52 41 20 4F 55 54 31 5F 61 63 74 69 76 65 20 01 4D	····sRA OUT1 _active ·M
Write Variable:	02 02 02 02 00 00 00 11 73 57 4E 20 4F 55 54 31 5F 61 63 74 69 76 65 20 01 47	····sWN OUT1 _active ·G
Write Variable Response:	02 02 02 02 00 00 00 10 73 57 41 20 4F 55 54 31 5F 61 63 74 69 76 65 20 49	····sWA OUT1 _active I

4.4.8. Variable: INOUT2_Function

The following section contains a detailed description of the variable INOUT2_Function.

Variable Overview

Variable Name	Description
INOUT2_Function	This variable maps one of the defined functions to INOUT2. Possible functions, i.e. enum items are: NoFunction (0) (Input), ON (2) (Output), OFF (1) (Output), TemperatureWarning (5) (Output), DeviceError (3) (Output), JobSwitching (25) (Input) and IlluminationTrigger (28) (Input, only INOUT4). IlluminationTrigger can be used for external RGB flash sync.

Communication Name	DIO2Fnc
Read-Access	Always
Write-Access	AuthorizedClient, Service

UserType	
IOFunctionType	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:				
`sRN DIO2Fnc`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	DIO2Fnc	String	7	Function of INOUT2

Read Variable Response:				
`sRA DIO2Fnc <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	DIO2Fnc	String	7	Function of INOUT2
Variable Data	data	IOFunctionType	0	

Write Variable:				
`sWN DIO2Fnc <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	DIO2Fnc	String	7	Function of INOUT2
Variable Data	data	IOFunctionType	0	

Write Variable Response:				
`sWA DIO2Fnc`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	DIO2Fnc	String	7	Function of INOUT2

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	`02 02 02 02 00 00 00 0C 73 52 4E 20 44 49 4F 32 46 6E 63 20 54`	`........sRN DIO2 Fnc T`
Read Variable Response:	`02 02 02 02 00 00 00 0D 73 52 41 20 44 49 4F 32 46 6E 63 20 00 5B`	`........sRA DIO2 Fnc .[`
Write Variable:	`02 02 02 02 00 00 00 0D 73 57 4E 20 44 49 4F 32 46 6E 63 20 00 51`	`........sWN DIO2 Fnc .Q`
Write Variable Response:	`02 02 02 02 00 00 00 0C 73 57 41 20 44 49 4F 32 46 6E 63 20 5E`	`........sWA DIO2 Fnc ^`

4.4.9. Variable: OUT2_active

The following section contains a detailed description of the variable OUT2_active.

Variable Overview

Variable Name	Description
OUT2_active	Defines the logic for INOUT2. Active-high (High) and active-low (Low) logic are available via the respective enum items 1 and 0.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UserType	
OutputActiveType	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:

```
sRN OUT2_active
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	OUT2_active	String	11	Select for output signal on pin 2 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)

Read Variable Response:

```
sRA OUT2_active <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	OUT2_active	String	11	Select for output signal on pin 2 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)
Variable Data	data	OutputActiveType	0	

Write Variable:

```
sWN OUT2_active <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	OUT2_active	String	11	Select for output signal on pin 2 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)
Variable Data	data	OutputActiveType	0	

Write Variable Response:

```
sWA OUT2_active
```

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

Write Variable Response:				
sWA OUT2_active				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Variable	OUT2_active	String	11	Select for output signal on pin 2 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 10 73 52 4E 20 4F 55 54 32 5F 61 63 74 69 76 65 20 40	····sRN OUT2 _active @
Read Variable Response:	02 02 02 02 00 00 00 11 73 52 41 20 4F 55 54 32 5F 61 63 74 69 76 65 20 01 4E	····sRA OUT2 _active ·N
Write Variable:	02 02 02 02 00 00 00 11 73 57 4E 20 4F 55 54 32 5F 61 63 74 69 76 65 20 01 44	····sWN OUT2 _active ·D
Write Variable Response:	02 02 02 02 00 00 00 10 73 57 41 20 4F 55 54 32 5F 61 63 74 69 76 65 20 4A	····sWA OUT2 _active J

4.4.10. Variable: INOUT3_Function

The following section contains a detailed description of the variable INOUT3_Function.

Variable Overview

Variable Name	Description
INOUT3_Function	This variable maps one of the defined functions to INOUT3. Possible functions, i.e. enum items are: NoFunction (0) (Input), ON (2) (Output), OFF (1) (Output), TemperatureWarning (5) (Output), DeviceError (3) (Output), JobSwitching (25) (Input) and IlluminationTrigger (28) (Input, only INOUT4). IlluminationTrigger can be used for external RGB flash sync.

Communication Name	DIO3Fnc
Read-Access	Always
Write-Access	AuthorizedClient, Service

UserType	
IOFunctionType	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:				
`sRN DIO3Fnc`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	DIO3Fnc	String	7	Function of INOUT3

Read Variable Response:				
`sRA DIO3Fnc <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	DIO3Fnc	String	7	Function of INOUT3
Variable Data	data	IOFunctionType	0	

Write Variable:				
`sWN DIO3Fnc <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	DIO3Fnc	String	7	Function of INOUT3
Variable Data	data	IOFunctionType	0	

Write Variable Response:				
`sWA DIO3Fnc`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	DIO3Fnc	String	7	Function of INOUT3

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	`02 02 02 02 00 00 00 0C 73 52 4E 20 44 49 4F 33 46 6E 63 20 55`	`........sRN DIO3Fnc U`
Read Variable Response:	`02 02 02 02 00 00 00 0D 73 52 41 20 44 49 4F 33 46 6E 63 20 00 5A`	`........sRA DIO3Fnc ·Z`
Write Variable:	`02 02 02 02 00 00 00 0D 73 57 4E 20 44 49 4F 33 46 6E 63 20 00 50`	`........sWN DIO3Fnc ·P`
Write Variable Response:	`02 02 02 02 00 00 00 0C 73 57 41 20 44 49 4F 33 46 6E 63 20 5F`	`........sWA DIO3Fnc _`

4.4.11. Variable: OUT3_active

The following section contains a detailed description of the variable OUT3_active.

Variable Overview

Variable Name	Description
OUT3_active	Defines the logic for INOUT3. Active-high (High) and active-low (Low) logic are available via the respective enum items 1 and 0.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UserType	
OutputActiveType	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:

```
sRN OUT3_active
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	OUT3_active	String	11	Select for output signal on pin 3 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)

Read Variable Response:

```
sRA OUT3_active <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	OUT3_active	String	11	Select for output signal on pin 3 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)
Variable Data	data	OutputActiveType	0	

Write Variable:

```
sWN OUT3_active <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	OUT3_active	String	11	Select for output signal on pin 3 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)
Variable Data	data	OutputActiveType	0	

Write Variable Response:

```
sWA OUT3_active
```

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

Write Variable Response:				
sWA OUT3_active				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Variable	OUT3_active	String	11	Select for output signal on pin 3 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 10 73 52 4E 20 4F 55 54 33 5F 61 63 74 69 76 65 20 41	····sRN OUT3 _active A
Read Variable Response:	02 02 02 02 00 00 00 11 73 52 41 20 4F 55 54 33 5F 61 63 74 69 76 65 20 01 4F	····sRA OUT3 _active ·O
Write Variable:	02 02 02 02 00 00 00 11 73 57 4E 20 4F 55 54 33 5F 61 63 74 69 76 65 20 01 45	····sWN OUT3 _active ·E
Write Variable Response:	02 02 02 02 00 00 00 10 73 57 41 20 4F 55 54 33 5F 61 63 74 69 76 65 20 4B	····sWA OUT3 _active K

4.4.12. Variable: INOUT4_Function

The following section contains a detailed description of the variable INOUT4_Function.

Variable Overview

Variable Name	Description
INOUT4_Function	This variable maps one of the defined functions to INOUT4. Possible functions, i.e. enum items are: NoFunction (0) (Input), ON (2) (Output), OFF (1) (Output), TemperatureWarning (5) (Output), DeviceError (3) (Output), JobSwitching (25) (Input) and IlluminationTrigger (28) (Input, only INOUT4). IlluminationTrigger can be used for external RGB flash sync.

Communication Name	DIO4Fnc
Read-Access	Always
Write-Access	AuthorizedClient, Service

UserType	
IOFunctionType	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:				
`sRN DIO4Fnc`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	DIO4Fnc	String	7	Function of INOUT4

Read Variable Response:				
`sRA DIO4Fnc <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	DIO4Fnc	String	7	Function of INOUT4
Variable Data	data	IOFunctionType	0	

Write Variable:				
`sWN DIO4Fnc <data>`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	DIO4Fnc	String	7	Function of INOUT4
Variable Data	data	IOFunctionType	0	

Write Variable Response:				
`sWA DIO4Fnc`				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Command	sWA	String	3	SOPAS Variable Write Acknowledge
Variable	DIO4Fnc	String	7	Function of INOUT4

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	`02 02 02 02 00 00 00 0C 73 52 4E 20 44 49 4F 34 46 6E 63 20 52`	`........sRN DIO4 Fnc R`
Read Variable Response:	`02 02 02 02 00 00 00 0D 73 52 41 20 44 49 4F 34 46 6E 63 20 00 5D`	`........sRA DIO4 Fnc .]`
Write Variable:	`02 02 02 02 00 00 00 0D 73 57 4E 20 44 49 4F 34 46 6E 63 20 00 57`	`........sWN DIO4 Fnc .W`
Write Variable Response:	`02 02 02 02 00 00 00 0C 73 57 41 20 44 49 4F 34 46 6E 63 20 58`	`........sWA DIO4 Fnc X`

4.4.13. Variable: OUT4_active

The following section contains a detailed description of the variable OUT4_active.

Variable Overview

Variable Name	Description
OUT4_active	Defines the logic for INOUT4. Active-high (High) and active-low (Low) logic are available via the respective enum items 1 and 0.

Read-Access	Always
Write-Access	AuthorizedClient, Service

UserType	
OutputActiveType	See the chapter "User Types" for details.

Variable Telegram Syntax

Read Variable:

```
sRN OUT4_active
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRN	String	3	Read SOPAS Variable by Name
Variable	OUT4_active	String	11	Select for output signal on pin 4 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)

Read Variable Response:

```
sRA OUT4_active <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sRA	String	3	SOPAS Variable Read Acknowledge
Variable	OUT4_active	String	11	Select for output signal on pin 4 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)
Variable Data	data	OutputActiveType	0	

Write Variable:

```
sWN OUT4_active <data>
```

Telegram Part	Telegram	Type	Length [Byte]	Description
Command	sWN	String	3	Write SOPAS Variable by Name
Variable	OUT4_active	String	11	Select for output signal on pin 4 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)
Variable Data	data	OutputActiveType	0	

Write Variable Response:

```
sWA OUT4_active
```

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

Write Variable Response:				
sWA OUT4_active				
Telegram Part	**Telegram**	**Type**	**Length [Byte]**	**Description**
Variable	OUT4_active	String	11	Select for output signal on pin 4 individually if it is active-high or active-low. States: LOW = active-low (0) / HIGH = active-high (1)

Variable Telegram Examples

Example: Default Values		
Variable telegram examples with data set to default values.		
Read Variable:	02 02 02 02 00 00 00 10 73 52 4E 20 4F 55 54 34 5F 61 63 74 69 76 65 20 46	····sRN OUT4 _active F
Read Variable Response:	02 02 02 02 00 00 00 11 73 52 41 20 4F 55 54 34 5F 61 63 74 69 76 65 20 01 48	····sRA OUT4 _active ·H
Write Variable:	02 02 02 02 00 00 00 11 73 57 4E 20 4F 55 54 34 5F 61 63 74 69 76 65 20 01 42	····sWN OUT4 _active ·B
Write Variable Response:	02 02 02 02 00 00 00 10 73 57 41 20 4F 55 54 34 5F 61 63 74 69 76 65 20 4C	····sWA OUT4 _active L

5. User Types

5.1. Type: BoundingBoxLReal

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

Type	Description
BoundingBoxLReal	Axis aligned bounding box, values are LReals, unit is millimeter

Struct	
x	
UserType	
RangeMm	See the chapter "User Types" for details.
y	
UserType	
RangeMm	See the chapter "User Types" for details.
z	
UserType	
RangeMm	See the chapter "User Types" for details.

5.2. Type: CameraModel

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

Type
CameraModel

Struct	
CameraID	Unique camera identifier
FlexString	
Length	0..64
ImageWidth	Image width for which the calibration is valid
DInt	
Value Range	-2147483648..2147483647
ImageHeight	Image height for which the calibration is valid
DInt	
Value Range	-2147483648..2147483647
FocalDistance	Distance from the camera to the plane of best image sharpness
LReal	
Value Range	See specification IEEE 754
FocalDistanceUnit	Focus distance unit (Default is mm)
FlexString	
Length	0..8

Struct		
IntrinsicK		3x3 matrix with the intrinsic camera parameters: K = [fx s cx, 0 fy cy, 0 0 1]
	UserType	
	Matrix3x3d	See the chapter "User Types" for details.
WorldToSensorDistortion		5x1 matrix with the world to sensor lens distortion coefficients [k1, k2, p1, p2, k3]
	UserType	
	Matrix5x1d	See the chapter "User Types" for details.
SensorToWorldDistortion		5x1 matrix with the sensor to world lens distortion coefficients [k1, k2, p1, p2, k3]
	UserType	
	Matrix5x1d	See the chapter "User Types" for details.
Transform3D		Rigid transformation from camera reference point to sensor coordinates [R,t]
	UserType	
	Matrix4x4d	See the chapter "User Types" for details.

5.3. Type: CidVersion

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

Type
CidVersion

Struct			
MajorVersion			
	UInt		
	Value Range	0..65535	
	Initialisation	6	
MinorVersion			
	UInt		
	Value Range	0..65535	
	Initialisation	0	
PatchVersion			
	UInt		
	Value Range	0..65535	
	Initialisation	0	
BuildNumber			
	UDInt		
	Value Range	0..4294967295	
	Initialisation	0	
VersionClassifier			
	Enum8		
	Default Value	R	
	Value	Name	Description
	0	C	Release Candidate
	1	A	Alpha
	2	B	Beta
	3	R	Release
	4	S	Special

5.4. Type: ErrStructType

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

Type	Description
ErrStructType	TODO

Struct	
ErrorId	
UDInt	
Value Range	0..4294967295
ErrorState	
UDInt	
Value Range	0..4294967295
FirstTime	
UserType	
ErrTimeType	See the chapter "User Types" for details.
LastTime	
UserType	
ErrTimeType	See the chapter "User Types" for details.
NumberOccurance	
UInt	
Value Range	0..65535
Initialisation	0
ErrReserved	
UInt	
Value Range	0..65535
Initialisation	0
ExtInfo	
FlexString	
Length	0..50

5.5. Type: ErrTimeType

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

Type	Description
ErrTimeType	TODO

Struct		
PwrOnCnt		
	UInt	
	Value Range	0..65535
	Initialisation	0
OpSecs		
	UDInt	
	Value Range	0..4294967295
	Initialisation	0
TimeOccur		
	UDInt	
	Value Range	0..4294967295
	Initialisation	0

5.6. Type: InputFunctionType

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

Type
InputFunctionType

Enum8			
Default Value		NoFunction	
	Value	Name	Description
	0	NoFunction	
	1	PowerSaveMode	
	2	Trigger	
	3	DONTUSE_Application	Was planned for an application specific trigger, now obsolete and unused. Allocated choice number might be re-used for other functions in future
	4	JobSwitching	
	5	JobCycling	
	6	TriggerTeach	

5.7. Type: IOFunctionType

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

Type
IOFunctionType

Enum8			
Default Value		NoFunction	
	Value	Name	Description
	0	NoFunction	
	1	SteadyLOW	
	2	SteadyHIGH	
	3	DeviceStatus	
	4	DataQualityCheck	
	5	TemperatureWarning	
	6	DONTUSE_PollutionWarning	Planned to signal a possible pollution of the optics. Not yet used, but might be available in future.
	7	Trigger	
	8	DONTUSE_UserStart	Only needed to convert old data sets, don't use.
	9	DONTUSE_User2	Only needed to convert old data sets, don't use.
	10	DONTUSE_User3	Only needed to convert old data sets, don't use.
	11	DONTUSE_User4	Only needed to convert old data sets, don't use.
	12	DONTUSE_User5	Only needed to convert old data sets, don't use.
	13	DONTUSE_User6	Only needed to convert old data sets, don't use.
	14	DONTUSE_User7	Only needed to convert old data sets, don't use.
	15	DONTUSE_User8	Only needed to convert old data sets, don't use.
	16	DONTUSE_User9	Only needed to convert old data sets, don't use.
	17	DONTUSE_User10	Only needed to convert old data sets, don't use.
	18	DONTUSE_User11	Only needed to convert old data sets, don't use.
	19	DONTUSE_User12	Only needed to convert old data sets, don't use.
	20	DONTUSE_User13	Only needed to convert old data sets, don't use.
	21	DONTUSE_User14	Only needed to convert old data sets, don't use.
	22	DONTUSE_UserEnd	Only needed to convert old data sets, don't use.
	23	TriggerBusy	
	24	PowerSaveMode	
	25	JobSwitching	
	26	JobOutput	
	27	TriggerTeach	
	28	IlluminationTrigger	Used to trigger an external illumination.
	29	HeartbeatOut	Used to output a device-alive heartbeat signal.
	30	DTResultValid	Indicates when the detection result is valid (e. g. after a jow switch).

5.8. Type: Matrix3x3d

The following section contains a detailed description of the user type Matrix3x3d.

Type
Matrix3x3d

Struct		
Values		
	Array	
	Length	9
	Default Value	{1.0,0.0,0.0,0.0,1.0,0.0,0.0,0.0,1.0}
		LReal
		Value Range	See specification IEEE 754

5.9. Type: Matrix4x4

The following section contains a detailed description of the user type Matrix4x4.

Type
Matrix4x4

Struct		
Values		
	Array	
	Length	16
	Default Value	{1.0f,0.0f,0.0f,0.0f,0.0f,1.0f,0.0f,0.0f,0.0f,0.0f,1.0f,0.0f,0.0f,0.0f,0.0f,1.0f}
		Real
		Value Range	See specification IEEE 754

5.10. Type: Matrix4x4d

The following section contains a detailed description of the user type Matrix4x4d.

Type
Matrix4x4d

Struct		
Values		
	Array	
	Length	16
	Default Value	{1.0,0.0,0.0,0.0,0.0,1.0,0.0,0.0,0.0,0.0,0.0,1.0,0.0,0.0,0.0,0.0,0.0,0.0,1.0}
		LReal
		Value Range	See specification IEEE 754

5.11. Type: Matrix5x1d

The following section contains a detailed description of the user type Matrix5x1d.

Type	Description
Matrix5x1d	Matrix of 5 columns and 1 row

Struct			
Values			
	Array		
	Length		5
	Default Value		{0.0,0.0,0.0,0.0,0.0}
		LReal	
		Value Range	See specification IEEE 754

5.12. Type: OutputActiveType

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

Type	Description
OutputActiveType	Select for each output signal individually if it should be active-high or active-low.

Enum8			
Default Value		High	
	Value	Name	Description
	0	Low	
	1	High	

5.13. Type: RangeMm

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

Type
RangeMm

Struct		
lower		
	LReal	
	Value Range	See specification IEEE 754
	Initialisation	-1250.0
	Physical Unit	mm
upper		
	LReal	
	Value Range	See specification IEEE 754
	Initialisation	1250.0
	Physical Unit	mm

5.14. Type: RotationVector3f

The following section contains a detailed description of the user type RotationVector3f.

Type
RotationVector3f

Struct		
X		
	Real	
	Value Range	See specification IEEE 754
	Initialisation	0.0
	Physical Unit	deg
Y		
	Real	
	Value Range	See specification IEEE 754
	Initialisation	0.0
	Physical Unit	deg
Z		
	Real	
	Value Range	See specification IEEE 754
	Initialisation	0.0
	Physical Unit	deg

5.15. Type: ThreeLevels

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

Type
ThreeLevels

Enum8			
	Value	Name	Description
	0	INVALID	Unspecified, uninitalized, unkown
	1	ERROR	An error was detected
	2	WARNING	Reliability is questionable
	3	GOOD	Anything is like expected

5.16. Type: V3SIOsState

The following section contains a detailed description of the user type V3SIOsState.

Type
V3SIOsState

Struct	
INOUT1	
SInt	
Value Range	-128..127
INOUT2	
SInt	
Value Range	-128..127
INOUT3	
SInt	
Value Range	-128..127
INOUT4	
SInt	
Value Range	-128..127
SENS_IN1	
SInt	
Value Range	-128..127
SENS_IN2	
SInt	
Value Range	-128..127

5.17. Type: Vector3

The following section contains a detailed description of the user type Vector3.

Type
Vector3

Struct	
X	
Real	
Value Range	See specification IEEE 754
Initialisation	0.0
Physical Unit	mm
Y	
Real	
Value Range	See specification IEEE 754
Initialisation	0.0
Physical Unit	mm

Struct	
Z	
Real	
Value Range	See specification IEEE 754
Initialisation	0.0
Physical Unit	mm

5.18. Type: V3SElectricalMonitoring

The following section contains a detailed description of the user type V3SElectricalMonitoring.

Type
V3SElectricalMonitoring

Struct	
LEDsCurrent	
Real	
Value Range	See specification IEEE 754
Initialisation	0.0
Physical Unit	A
OperationVoltage	
Real	
Value Range	See specification IEEE 754
Initialisation	0.0
Physical Unit	V
MinimalVoltage	
Real	
Value Range	See specification IEEE 754
Initialisation	0.0
Physical Unit	V
MaximalVoltage	
Real	
Value Range	See specification IEEE 754
Initialisation	0.0
Physical Unit	V

5.19. Type: V3SElectricalLimits

The following section contains a detailed description of the user type V3SElectricalLimits.

Type
V3SElectricalLimits

Struct	
MinAllowedLEDsCurrent	
Real	
Value Range	See specification IEEE 754
Initialisation	0.0
Physical Unit	A
MaxAllowedLEDsCurrent	
Real	
Value Range	See specification IEEE 754
Initialisation	0.0
Physical Unit	A
MinAllowedOpVoltage	
Real	
Value Range	See specification IEEE 754
Initialisation	0.0
Physical Unit	V
MaxAllowedOpVoltage	
Real	
Value Range	See specification IEEE 754
Initialisation	0.0
Physical Unit	V

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