

Telegram Listing

Ranging sensors LMS1xx, LMS5xx, TiM2xx,
TiM5xx, TiM7xx, LMS1000, MRS1000,
MRS6000, NAV310, LD-OEM15xx, LD-LRS36xx,
LMS4000, LRS4000



Described product

LMS1xx, LMS5xx, TiM2xx, TiM5xx, TiM7xx, LMS1000, MRS1000, MRS6000, NAV310, LD-OEM15xx, LD-LRS36xx, LMS4000, LRS4000

Manufacturer

SICK AG
Erwin-Sick-Str. 1
79183 Waldkirch

Germany

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Original document

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1 About this document

Please read this chapter carefully before beginning to use the telegram listing.

The document shows how to send telegrams via a terminal program using the SICK protocol CoLa A (ASCII and hexadecimal values, with TCP port 2111 or 2112) or CoLa B (binary/hexadecimal values, with TCP port 2112 only) to the laserscanners LMS1xx, LMS5xx, TiM2xx, TiM5xx (TiM55x, TiM56x, TiM57x), TiM7xx, LMS1000, MRS1000, MRS6000, NAV310, LD-OEM15xx, LD-LRS36xx, LMS4000 and LRS4000. This comprises the query of the current device state or certain parameter values, how to modify parameter values and the way in which the device confirms or responds to commands/telegrams.

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

- LMSxxx: 192.168.0.1
- TiMxxx: 192.168.0.1
- MRSxxxx: 192.168.0.1
- NAV310: 192.168.1.10
- LD-XXXXXX: 192.168.1.10
- LMS4000: 192.168.0.1
- LRS4000: 192.168.0.1

Subnet mask is 255.255.255.0.

IP ports:

- 2111: CoLa A (fixed) (for LMS4000 fixed CoLa B)
- 2112: CoLa A (can be switched to CoLa B)
- 2213: UDP

The document does not or only in a few exceptional cases differentiate between individual device versions or sub product families such as LMS5xx Lite and LMS5xx PRO. Most parameter changes also require certain user levels. Additionally, commands may change during the product lifecycle and development process with a new firmware.

This telegram listing is based on the following firmware statuses (or newer):

- LMS1xx: V1.80 (V1.21 for LMS12x/13x)
- LMS5xx: V2.10 (V2.10 for LMS531)
- TiM2xx: V1.00
- TiM5xx: V2.51
- TiM7xx: V2.51
- MRS1000: 1.0.0 (1.0.0.0R)
- LMS1000: 1.4.0 (1.4.0.0R)
- NAV310: V1.03
- LD-OEM15xx: V1.12 (V1.32 for OEM1500)
- LD-LRS36xx: V1.12 (V1.32 for LRS3600)
- LMS4000: V1.5 (1.5.0.0R)
- LRS4000: V1.1.0 (1.1.0.120C)

If commands do not seem to work, please verify that your device version supports this functionality, that the minimum required user level has been selected and check on updates of this documentation.



NOTE

In case you prefer to use complete drivers instead of single telegrams, the following options are available:

C++ drivers: https://github.com/SICKAG/sick_scan_xd

ROS drivers: https://github.com/SICKAG/sick_scan_xd

ROS2 drivers: https://github.com/SICKAG/sick_scan_xd

2 Communication format

2.1 Binary telegram (CoLa B)

The binary telegram is the basic protocol of the scanner (CoLa B). All values are in hexadecimal code and grouped into pairs of two digits (= 1 byte). The string consists of four parts: header, data length, data and checksum (CS).

The header indicates with $4 \times \text{STX}$ (02 02 02 02) the start of the telegram.

The data length defines the size of the data part (command part) by indicating the number of digit pairs in the third part. The size of the data length itself is 4 bytes, which means that the data part might have a maximum of $16^8 = 4,294,967,295$ digit pairs.

The data part comprises the actual command with letters and characters converted to Hex (according to the ASCII chart) and the parameters of either decimal numbers converted to Hex or fixed Hex values with a specific, intrinsic meaning (no conversion). There is always a blank (20) between the command and the parameters, but not between the different parameter values.

The checksum finally serves to verify that the telegram has been transferred correctly. The length of the checksum is 1 byte, CRC8. It is calculated with XOR.

Example: Binary telegram

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 F4 72 47 44	B3
Header	Length	Data	CS

Table 1: Example: Binary telegram

This is an example telegram for setting the user level “Authorized Client”:

- Header = 02 02 02 02
- Length = 23 digit pairs (17h)
- Data:
 - 73 4D 4E 20 = sMN = start of Sopas command (and blank)
 - 53 65 74 41 63 63 65 73 73 4D 6F 64 65 20 = Set Access Mode = the actual command for setting the user level (and blank)
 - 03 = fixed Hex value meaning user level “Authorized Client”
 - F4 72 47 44 = fixed Hex value, serving as password for the selected user level “Authorized Client”
- Checksum = B3 from XOR calculation

2.2 ASCII telegram (CoLa A)

The ASCII telegram is an alternative to the binary telegram. Due to the variable string length of ASCII telegrams, the Binary telegram is recommended when using scanners with a PLC.

The ASCII telegram has the advantage that commands can be written in plaintext. The string consists only of two parts: the framing and the data part.

The framing indicates with <STX> and <ETX> the start and stop of each telegram.

The data part comprises the actual command with letters and characters (plaintext), parameter values either in decimal (special indicator required) or in hexadecimal (example: a frequency of 25 Hz = +2500 (decimal) = 09C4 (Hex)) and fixed hexadecimal values with a specific, intrinsic meaning. As leading zeros are being deleted, there is always a blank required between all command parts and parameter parts.



NOTE

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

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

Example: ASCII telegram

ASCII	<STX>	sMN{SPC}SetAccessMode{SPC}03{SPC}F4724744	<ETX>
Hex	02	73 4D 4E 20 53 65 74 41 63 63 65 73 73 4D 6F 64 65 20 30 33 20 46 34 37 32 34 37 34 34	03
	Start	Data	Stop

Table 2: Example: ASCII telegram

This is again an example telegram for setting the user level “Authorized Client”. As only fixed hexadecimal parameter values are needed, the option to use parameter values in decimal code with special indicator cannot be applied here:

- Framing = <STX> = telegram start = 02 (Hex)
- Data:
 - sMN = start of Sopas command (and blank) = 73 4D 4E 20 (Hex)
 - SetAccessMode = the actual command for setting the user level (and blank) = 53 65 74 41 63 63 65 73 73 4D 6F 64 65 20 (Hex)
 - 03 = fixed Hex value meaning user level “Authorized Client” (and blank) = 30 33 20 (Hex)
 - F4 72 47 44 = fixed Hex value, serving as password for the selected user level “Authorized Client” = 46 34 37 32 34 37 34 34 (Hex)
- Framing = <ETX> = telegram stop = 03 (Hex)

2.3 Variable types

Variable type	Length (byte)	Value range	Sign
Bool_1	1	0 or 1	No
Uint_8	1	0 ... 255	No
Int_8	1	-128 ... +127	Yes
Uint_16	2	0 ... 65,535	No
Int_16	2	-32,768 ... +32,767	Yes
Uint_32	4	0 ... 4,294,967,295	No
Int_32	4	-2,147,483,648 ... +2,147,483,647	Yes
Enum_8	1	Certain values defined in a list of Choices (0 ... 255)	No
Enum_16	2	Certain values defined in a list of Choices (0 ... 65535)	No
String	Context-dependent	Strings are not terminated in zeroes	
Real		Float nach IEEE754 (see www.h-schmidt.net/FloatConverter/IEEE754de.html)	

Data length is always given in Bytes!

2.4 Command basics

Description	Value ASCII	Value Hex	Value Binary
Start of text	<STX>	02	02 02 02 02 + given length
End of text	<ETX>	03	Calculated checksum
Read	sRN	73 52 4E	
Write	sWN	73 57 4E	
Method	sMN	73 4D 4E	
Event	sEN	73 45 4E	
Answer	sRA	73 52 41	
	sWA	73 57 41	
	sAN	73 41 4E	
	sEA	73 45 41	
	sSN	73 53 4E	
Space	{SPC}	20	20

If values are divided into two parts (e.g. measurement data), they are documented according to LSB 0 (e.g. 00 07), output however is according to MSB (e.g. 07 00).

2.5 Log in: Required user level

Task	Required user level
Change sensor parameters	Authorized Client
Requests or queries (e.g. for measurement data or device state)	None
Manage password	Service

In general, every sWN command for changing parameters requires to log in to the device first (see chapter 4.1). When being logged in, any desired parameter valid for this user level can be changed. All changes become active only after having logged off again from the device via the sMN Run command (see chapter 4.2.26).

In this document, a required, specific user level is indicated in the telegram structure head line.

3 Workflows

3.1 Parameterize the scan

- 1 Log in: sMN SetAccessMode (see 4.1, page 14)
- 2 Set frequency and resolution: sMN mLMPsetscancfg (see 4.2.1, page 17)
- 3 Configure scandata content: sWN LMDscandatacfg (see 4.3.1, page 77)
- 4 Configure scandata output: sWN LMPoutputRange (see 4.3.2 page 81)
- 5 Store parameters: sMN mEEwriteall (see 0, page 72)
- 6 Log out: sMN Run (see 4.2.26, page 75)
- 7 Request scan:
sRN LMDscandata (see 4.3.4, page 87)
sEN LMDscandata (see 4.3.7, page 92)
(Device output ...)

More detailed command descriptions can be found in the course of this document.

Example: Sequence for LD-OEM1501, NAV310, LD-LR3601, LD-LR3611 to configure 2 sectors and get measurement scans

Sector configuration: Resolution: 10Hz; 0,125°;
Sector 1: 0° ... 44°(0h ... 6B6C0h);
Sector 2: 45° ... 180° (6DDD6h ... 1B7740h)

- 1 Stop measurement: sMN LMCstopmeas
sAN LMCstopmeas 0
- 2 Log in: sMN SetAccessMode (see 4.1, page 14)
- 3 Set Sectors : LCMstate001B7740 04E2 000000 0000000 04E2 000000 000000
sAN mLMPsetscancfg 0 3E8 2 4E2 0 6B6C0 4E2 6DDD6 1B7740 4E2 0 0 4E2 0 0
- 4 Store parameters: sMN mEEwriteall (see 0, page 72)
- 5 Log out: sMN Run (see 4.2.26, page 75)
- 6 Start Measurement: sMN LMCstartmeas
sAN LMCstartmeas 0
- 7 Request scan:
sRN LMDscandata (see 4.3.4, page 87)
sEN LMDscandata (see 4.3.7, page 92)
(Device output ...)

3.2 Set timestamp/data angle

- 1 Log in: sMN SetAccessMode (see 4.1, page 14)
- 2 Sopas command: sMN LSPsetdatetime (see 4.4.1, page 112)
- 3 Log out: sMN Run (see 4.2.26, page 75)

3.3 Telegrams that are valid for all sensors

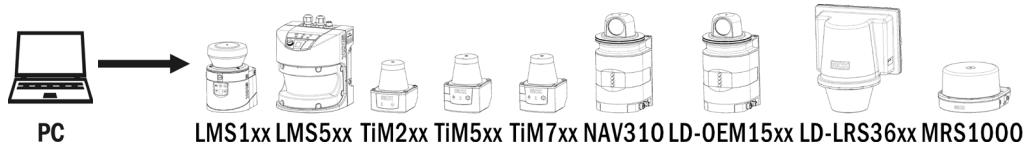
Here you find list of telegrams that can be used with every of the above mentioned LiDAR sensor families. Entries marked with a asterisk (*) are valid for almost all sensors. For a detailed description, please refer directly to chapter 4.

4.1	Log in
4.2.2	Read for frequency and angular resolution
4.2.6	Start measurement*
4.2.7	Stop measurement*

4.2.13	Load factory defaults*
4.2.14	Load application defaults*
4.2.16	Check password*
4.2.17	Reboot device*
4.2.25	Save parameters permanently
4.2.26	Set to run
4.3.1	Configure the data content for the scan
4.3.2	Configure measurement angle of the scandata for output*
4.3.3	Read for actual output range*
4.3.6	Poll one telegram
4.3.7	Send data permanently
4.5.1	Set particle filter*
4.7.3	Read state of the inputs
4.7.4	Read state of the outputs
4.7.5	Receive outputstate by event
4.7.6	Set output state*
4.8.2	Read firmware version
4.8.3	Read the device state
4.8.5	Read device order number
4.8.6	Read device type
4.8.7	Read operating hours*
4.8.8	Read power on counter*
4.8.10	Set device name*
4.8.11	Read device name*
4.8.13	Reset output counter*
4.9.1	Set IP address
4.9.2	Read IP address
4.9.3	Set Ethernet gateway
4.9.4	Read Ethernet gateway
4.9.5	Set IP mask
4.9.6	Read IP mask
4.9.11	Set Host port number*
4.9.12	Set Host port Command Language (CoLa dialect)*

4 Telegrams

4.1 Log in



NOTES

- ▶ Please note that for TiMxxx and LMS4000 the laser is shut off after a successful log in and no measurement data is created any more. The laser is turned on again after log out (sMN Run).
- ▶ An automated hash-value calculator can be found in SOPAS ET under menu “password”. Required userlevel “Service”.

Telegram structure: sMN SetAccessMode						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	73 4D 4E
Command	User level	String	13	All	SetAccessMode	53 65 74 41 63 63 65 73 73 4D 6F 64 65
User level	Select user level	Int_8	1	All	Maintenance: 02 Authorized client: 03 Service: 04	Maintenance: 02 Authorized client: 03 Service: 04
Password	Hash value for the selected user level	Uint_32	4	All	Maintenance: B21ACE26 Authorized client: F4724744 Service: 81BE23AA	Maintenance: B2 1A CE 26 Authorized client: F4 72 47 44 Service: 81 BE 23 AA

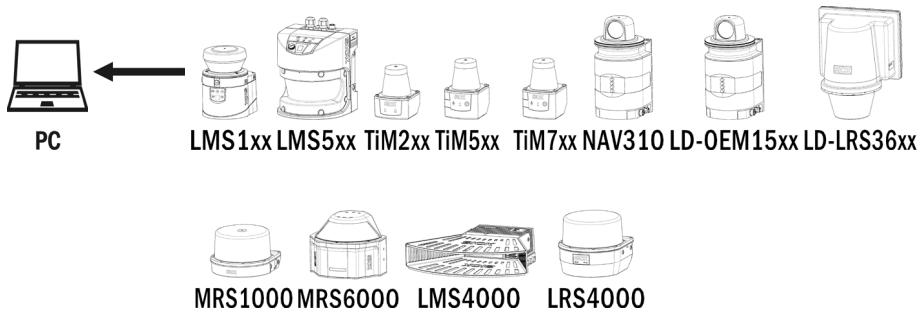
Table 3: Telegram structure: sMN SetAccessMode

Example: sMN SetAccessMode

Log in as “Authorized client” with password “F4724744”.

CoLa A	ASCII	<STX>sMN{SPC}SetAccessMode{SPC}03{SPC}F4724744<ETX>
CoLa B	Hex	02 73 4D 4E 20 53 65 74 41 63 63 65 73 73 4D 6F 64 65 20 30 33 20 46 34 37 32 34 37 34 34 03
CoLa B	Binary	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 F4 72 47 44 B3

Table 4: Example: sMN SetAccessMode



Telegram structure: sAN SetAccessMode						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	73 41 4E
Command	User level	String	13	All	SetAccessMode	53 65 74 41 63 63 65 73 73 4D 6F 64 65
Change user level	Changed level	Bool_1	1	All	Error: 0 Success: 1	Error: 00 Success: 01

Table 5: Telegram structure: sAN SetAccessMode

Example for LMS100: sAN SetAccessMode

CoLa A	ASCII	<STX>sAN{SPC}SetAccessMode{SPC}1<ETX>
	Hex	02 73 41 4E 20 53 65 74 41 63 63 65 73 73 4D 6F 64 65 20 31 03
CoLa B	Binary	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

Table 6: Example for LMS100: sAN SetAccessMode

4.2 Basic Settings

Telegram validity overview

		LMS1xx	LMS5xx	TiM2xx	TiM5xx	TiM7xx	NAV310	LD-OEM15xx	LD-LRS36xx	MRS1000	LMS1000	MRS6000	LMS4000	LRS4000
4.2.1	Set frequency and angular resolution/measurement sectors	X	X				X	X	X					
4.2.2	Read for frequency and angular resolution	X	X	X	X	X	X	X	X	X	X	X	X	X
4.2.3	Alignment mode (one layer activation for adjustment)									X				
4.2.4	Set scan configuration		X				X	X	X					X
4.2.5	Activate standby mode	X	X							X	X		X	X
4.2.6	Start measurement	X	X		X	X				X	X	X	X	X
4.2.7	Stop measurement	X	X		X	X				X	X	X	X	X
4.2.8	Autostart measurement	X	X					X	X			X		
4.2.9	Laser Control													X
4.2.10	Activate/deactivate field application						X	X						
4.2.11	Application selection and switching									X	X			
4.2.12	Read Application selection and switching									X	X			
4.2.13	Load factory defaults	X	X	X	X	X				X	X	X	X	X
4.2.14	Load application defaults	X	X		X	X				X	X	X	X	X
4.2.15	Change password	X	X									X	X	X
4.2.16	Check password	X	X	X	X	X						X	X	X
4.2.17	Reboot device	X	X	X	X	X				X	X	X	X	X
4.2.18	Set contamination measurement settings	X	X											
4.2.19	Set contamination indication settings	X	X							X	X			
4.2.20	Read contamination measurement settings	X	X											
4.2.21	Read contamination indication settings									X	X			
4.2.22	Read contamination measurement detailed values	X	X											
4.2.23	Read contamination indication data									X	X			
4.2.24	Read contamination indication result									X	X			
4.2.25	Save parameters permanently	X	X	X	X	X	X	X	X	X	X	X	X	X
4.2.26	Set to run	X	X	X	X	X	X	X	X	X	X	X	X	X

4.2.1 Set frequency and angular resolution/measurement sectors

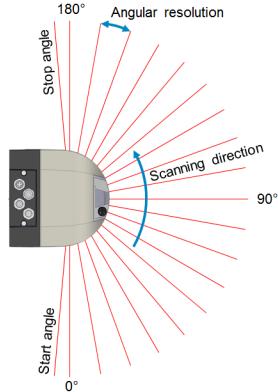


NOTES

- Please note that the new values will be activated only after log out (from the user level), when re-entering the Run mode (see Table 124 on page 75).

Coordination system of:

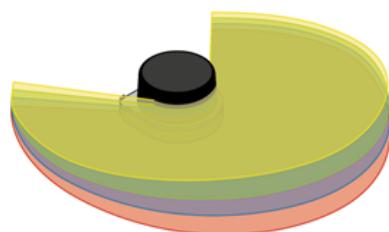
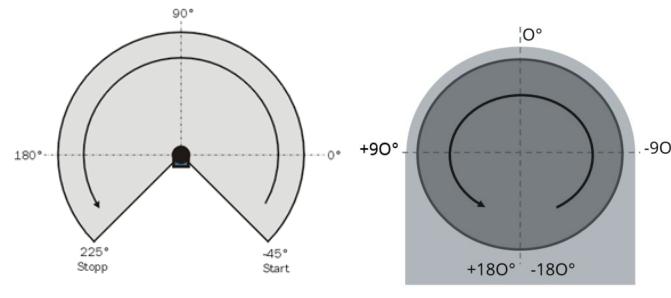
LMS5xx (-5° to 185°) → Start angle and stop angle are fixed values and not changeable for LMS5xx, only in the data output! This also applies for LMS1xx series.



LMS1xx and TiMxxx (-45° to 225°)

MRS1000 (-47,5° to 227,5°) and LMS1000 (-48° to 228°)

LRS4000 (+180° to -180°)



Layer4

Layer3

Layer2

Layer1

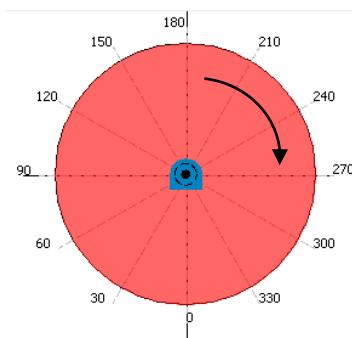
Sequence of the Layers In the Telegram

(Output sequence (DIN70000): 0, -250, 250, -500)

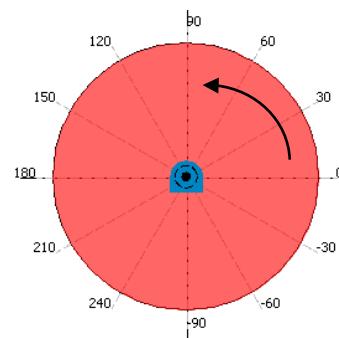
0	→ 0	Layer2
FF06	→ -250	Layer3
FA	→ 250	Layer1
FE0C	→ -500	Layer4

The LD series is available in two versions having a different rotation direction and coordinate system:

LD-OEM1501, NAV310, LD-LR36X1
(0° to 360°)



LD-OEM1500 and LD-LR36X0
(-90° to +270°)



For sending the sector configuration there follow these rules:

- ▶ Send the sectors in their ascending sequence.
- ▶ For LD and NAV products: Send always the definition for all sectors (unused sector as “{SPC}0{SPC}0”.)
- ▶ For LMS products: They have only one measurement sector, send only the first one and leave the rest away.

For more details on sector configuration see examples below.

For complete workflow see example in section 3, page 12.



Telegram structure: sMN mLMPsetscancfg (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	73 4D 4E
Command	Configuration of scan frequency and angular resolution	String	14	All	mLMPsetscancfg	6D 4C 4D 50 73 65 74 73 63 61 6E 63 66 67
Scan frequency	[1/100 Hz]	Uint_32	4	LMS1xx	25 Hz: +2500d (9C4h) 50 Hz: +5000d (1388h)	25 Hz: 00 00 09 C4 50 Hz: 00 00 13 88
				LMS5xx	25 Hz: +2500d (9C4h) 35 Hz: +3500d (D4Ch) 50 Hz: +5000d (1388h) 75 Hz: +7500d (1A0Bh) 100 Hz: +10000d (2710h)	25 Hz: 00 00 09 C4 35 Hz: 00 00 0D AC 50 Hz: 00 00 13 88 75 Hz: 00 00 1A 0B 100 Hz: 00 00 27 10
				MRS1000	50 Hz: +5000d (1388h) 25 Hz: +2500d (9C4h) 12,5 Hz: +1250d (4E2h)	50 Hz: 00 00 13 88 25 Hz: 00 00 09 C4 12,5Hz: 00 00 04 E2

Telegram structure: sMN mLMPsetsancfg (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
				LMS1000	150 Hz: +15000d (3A98h) 75 Hz: +7500d (1D4Ch) 37,5 Hz: +3750d (0EA6h)	150 Hz: 00 00 3A 98 75 Hz: 00 00 1D 4C 37,5 Hz: 00 00 0E A6
				NAV310 LD-OEM15xx	5 Hz ... 20 Hz: 500d ... 2000d (1F4h ... 7D0h)	5 Hz ... 20 Hz: 00 00 01 F4 ... 00 00 07 D0
				LD-LRS36xx	5 Hz ... 15 Hz: +500d ... +1500d (1F4h ... 5DCh)	5 Hz ... 15 Hz: 00 00 01 F4 ... 00 00 05 DC
Number of active sectors	Indicates the number of active sectors (e.g. NAV310 with 2 active sectors out of available 4)	Int_16	2	LMS1xx LMS5xx LMS1000 MRS1000	+1 (0001h)	0001
				NAV310 LD-OEM15xx LD-LRS36xx	+1 ... +4 (0001 ... 0004h)	0001 ... 0100 (binary)

Telegram structure: sMN mLMPsetscancfg (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Angular resolution	[1/10000°] Same value for each sector required.	Uint_32 4		LMS1xx	0.25°: +2500d (9C4h) 0.5°: +5000d (1388h)	0.25°: 00 00 09 C4 0.5°: 00 00 13 88
				LMS5xx	0.042°: +0417 d (01A1h) 0.083°: +0833 d (0341h) 0.1667°: +1667d (683h) 0.25°: +2500d (9C4h) 0.333°: +3333d (D05h) 0.5°: +5000d (1388h) 0.667°: +6667d (1A0Bh) 1°: +10000d (2710h)	0.042°: 00 00 01 A1 0.083°: 00 00 03 41 0.1667°: 00 00 06 83 0.25°: 00 00 09 C4 0.333°: 00 00 0D 05 0.5°: 00 00 13 88 0.667°: 00 00 1A 0B 1°: 00 00 27 10
				MRS1000	0.25°: +2500d (9C4h) 0.125°: +1250d (4E2h) 0.0625°: +0625d (271h)	0.25°: 00 00 09 C4 0.125°: 00 00 04 E2 0.0625°: 00 00 02 71
				LMS1000	0.75°: +7500d (1D4Ch) 0.375°: +3750d (0EA6h) 0.1875°: +1875d (0753h)	0.75°: 00 00 1D 4C 0.375°: 00 00 0E A6 0.1875°: 00 00 07 53
				NAV310 LD-OEM15xx LD-LRS36xx	0.125° ... 1°: +1250d° ... +10000d (4E2h° ... 2710h)	0.125° ... 1°: 00 00 04 E2 ... 00 00 27 10
				LMS1xx	-450000d (FFF92230h)	FF F9 22 30
				LMS5xx	-50000d (FFFF3CB0h)	FF FF 3C B0
				MRS1000	-475000d (FFF8C088h)	FF F8 C0 88
				LMS1000	-480000d (FFF8AD00h)	FF F8 AD 00
				NAV310 LD-OEM15x1 LD-LRS36x1	0° ... +3600000d (0h ... 36EE80h)	00 00 00 00 ... 00 36 EE 80
Start angle	[1/10000°] Value for start angle must always be greater than Stop angle of previous sector. Set to 0 if sector is inactive (not used). Values for LMSxxx are fixed.	Int_32 4		LD-OEM15x0 LD-LRS36x0	-900000d ... +2700000d (FFF24460h ... 41EB0h)	FF F2 44 60 ... 00 04 1E B0
				LMS1xx	+2250000d (225510h)	00 22 55 10
				LMS5xx	+1850000d (1C3A90h)	00 1C 3A 90
				MRS1000	+2275000d (22B6B8h)	00 22 B6 B8
				LMS1000	+2280000d (22CA40h)	00 22 CA 40
				NAV310 LD-OEM15x1 LD-LRS36x1	0 ... +3600000d (0h ... 36EE80h)	00 00 00 00 ... 00 36 EE 80
				LD-OEM15x0 LD-LRS36x0	-900000d ... +2700000d (FFF24460h ... 41EB0h)	FF F2 44 60 ... 00 04 1E B0
				LMS1xx	+2250000d (225510h)	00 22 55 10
				LMS5xx	+1850000d (1C3A90h)	00 1C 3A 90
				MRS1000	+2275000d (22B6B8h)	00 22 B6 B8
Stop angle	[1/10000°] Value for stop angle must always be greater than start angle of previous sector. Set to 0 if sector is inactive (not used). Values for LMSxxx are fixed.	Int_32 4		LMS1000	+2280000d (22CA40h)	00 22 CA 40
				NAV310 LD-OEM15x1 LD-LRS36x1	0 ... +3600000d (0h ... 36EE80h)	00 00 00 00 ... 00 36 EE 80
				LD-OEM15x0 LD-LRS36x0	-900000d ... +2700000d (FFF24460h ... 41EB0h)	FF F2 44 60 ... 00 04 1E B0
				LMS1xx	+2250000d (225510h)	00 22 55 10
				LMS5xx	+1850000d (1C3A90h)	00 1C 3A 90
				MRS1000	+2275000d (22B6B8h)	00 22 B6 B8
				LMS1000	+2280000d (22CA40h)	00 22 CA 40
				NAV310 LD-OEM15x1 LD-LRS36x1	0 ... +3600000d (0h ... 36EE80h)	00 00 00 00 ... 00 36 EE 80
				LD-OEM15x0 LD-LRS36x0	-900000d ... +2700000d (FFF24460h ... 41EB0h)	FF F2 44 60 ... 00 04 1E B0

Table 7: Telegram structure: sMN mLMPsetscancfg

Remark for measurement data output with LMS5xx at 0,083° and 0,042°:

With angular resolution of 0,083° or 0,042°, it is recommended to compensate the systematic error of the angular position. To calibrate the LMS5 in the system a correction table should be established in the customer's system software.

This table ensures the mapping of an indicated angle in the scan data telegram on an angle in the real system environment.

The calibration could be done, e.g. with a test object or with a reference scan on the system structure with known geometry. The table should comprise the complete field of view which is relevant for the application.

Example for LMS1xx
**Example for
LMS1xx with
1 measurement sector
of 270°**

ATTENTION: Scan angle can not be changed here, only in the data output! This applies for LMS1xx and LMS5xx series.

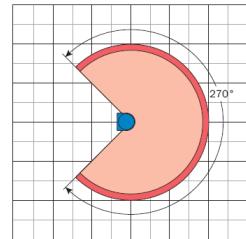
Scan frequency = 50 Hz

Sectors = 1 sector (This value is always 1 for these devices)

Angular resolution = 0, 5°

Start angle of sector = -45° (Fix values, angle not changeable)

Stop angle of sector = 225° (Fix values, angle not changeable)



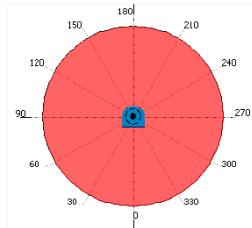
CoLa A	ASCII	<STX>sMN{SPC}mLMPsetscancfg{SPC}+5000{SPC}+1{SPC}+5000{SPC}-450000{SPC}+2250000<ETX> Alternatively: <STX>sMN{SPC}mLMPsetscancfg{SPC}1388{SPC}1{SPC}1388{SPC}FFF92230{SPC}225510<ETX>
	Hex	02 73 4D 4E 20 6D 4C 4D 50 73 65 74 73 63 61 6E 63 66 67 20 2B 35 30 30 30 20 2B 31 20 2B 35 30 30 30 20 2D 34 35 30 30 30 20 2B 32 32 35 30 30 30 30 03 Alternatively: 02 73 4D 4E 20 6D 4C 4D 50 73 65 74 73 63 61 6E 63 66 67 20 31 33 38 38 20 31 20 31 33 38 38 20 46 46 4639 32 32 33 30 20 32 32 35 35 31 30 03
CoLa B	Binary	02 02 02 02 00 00 00 25 73 4D 4E 20 6D 4C 4D 50 73 65 74 73 63 61 6E 63 66 67 20 00 00 13 88 00 01 00 00 13 88 FF F9 22 30 00 22 55 10 21

Table 8: Example: sMN mLMPsetscancfg for LMS1xx with 1 measurement sector of 270°

Examples for LD-OEM1501, NAV310, LD-LR36X1

Example for LD-xxx####1 with 1 measurement sector of 360°

Scan frequency = 8 Hz
Sectors = 1 sector
Angular resolution = 0,25°
Start angle of sector = 0°
Stop angle of sector = 360°



Col A	ASCII	<STX>sMN[SPC]mLMPsetscancfg[SPC]0320[SPC]01[SPC]09C4[SPC]0[SPC]0036EE80[SPC]09C4[SPC]0[SPC]0[SPC]09C4[SPC]0[SPC]09C4[SPC]0[SPC]09C4[SPC]0[SPC]09C4[SPC]0[SPC]09C4[SPC]0[SPC]<ETX>
	Hex	02 73 4D 4E 20 6D 4C 4D 50 73 65 74 73 63 61 6E 63 66 67 20 30 33 32 30 20 30 31 20 30 39 43 34 20 30 20 33 36 45 45 38 30 20 30 39 43 34 20 30 20 30 20 30 39 43 34 20 30 20 30 03
Col B	Binary	02 02 02 02 00 00 00 55 73 4D 4E 20 6D 4C 4D 50 73 65 74 73 63 61 6E 63 66 67 20 00 00 03 20 00 01 00 00 09 C4 00 00 00 00 00 36 EE 80 00 00 09 C4 00 00 00 00 00 00 00 00 00 09 C4 00 00 00 00 00 00 00 00 00 00 00 09 C4 00 00 00 00 00 00 00 00 00 00 00 00 E4

Table 9: Example: sMN mLMPsetscancfg for LD-XXX###1 with 1 measurement sector of 360°

Example for LD-XXX####1 with 1 measurement sector of 270°

Scan frequency = 10 Hz
Sectors = 1 sector
Angular resolution = 0,50°
Start angle of sector = +45°
Stop angle of sector = +315°

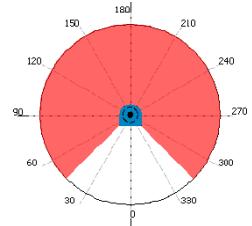


Table 10: Example: sMN mLMPsetscancfg for LD-XXX###1 with 1 measurement sector of 270°

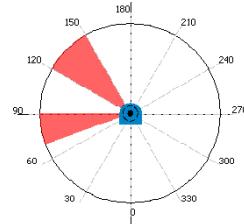
Example for LD-xxx###1 with 2 measurement sectors

Scan frequency = 8 Hz

Sectors = 2 sectors

Sector 1 = $+70^\circ \dots +90^\circ$
Sector 2 = $+120^\circ \dots +150^\circ$

Angular resolution = 0,25 °



ColA A	ASCII	<STX>sMN[SPC]mLMPsetscancfg[SPC]0320[SPC]02[SPC]09C4[SPC]+700000[SPC]+900000[SPC]09C4[SPC]+1200000[SPC]+1500000[SPC]09C4[SPC]0[SPC]0[SPC]09C4[SPC]0[SPC]0<ETX>
	Hex	02 73 4D 4E 20 6D 4C 4D 50 73 65 74 73 63 61 6E 63 66 67 20 30 33 32 30 20 30 32 20 30 39 43 34 20 2B 37 30 30 30 30 20 2B 39 30 30 30 30 30 20 30 39 43 34 20 2B 31 32 30 30 30 30 20 2B 31 35 30 30 30 30 20 30 39 43 34 20 30 20 30 20 30 39 43 34 20 30 20 30 03
ColA B	Binary	02 02 02 02 00 00 00 49 73 4D 4E 20 6D 4C 4D 50 73 65 74 73 63 61 6E 63 66 67 20 00 00 03 20 00 02 00 00 09 C4 00 0A AE 60 00 0D BB A0 00 00 09 C4 00 12 4F 80 00 16 E3 60 00 00 09 C4 00 00 00 00 00 00 00 09 C4 00 00 00 00 00 00 00 00 E8

Table 11: Example: sMN mLMPsetscancfg for LD-XXX###1 with 2 measurement sectors

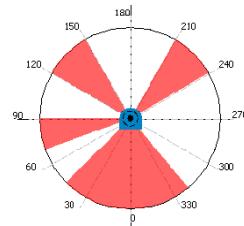
Example for LD-xxx###1 with 4 measurement sectors

Scan frequency = 8 Hz

Sectors = 4 sectors

Sector 1 = $+320^\circ$... $+45^\circ$
Sector 2 = $+70^\circ$... $+90^\circ$
Sector 3 = $+120^\circ$... $+150^\circ$
Sector 4 = $+210^\circ$... $+240^\circ$

Angular resolution = 0.25°



ColA A	ASCII	<STX>sMN[SPC]mLMPsetsancfg[SPC]0320[SPC]04[SPC]09C4[SPC]+3200000[SPC]+450000[SPC]09C4[SPC]+700000[SPC]+900000[SPC]09C4[SPC]+1200000[SPC]+1500000[SPC]09C4[SPC]+2100000[SPC]+240000<ETX>
	Hex	02 73 4D 4E 20 6D 4C 4D 50 73 65 74 73 63 61 6E 63 66 67 20 30 33 32 30 20 30 34 20 30 39 43 34 20 2B 33 32 30 30 30 30 20 2B 34 35 30 30 30 30 20 30 39 43 34 20 2B 37 30 30 30 30 20 2B 39 30 30 30 30 20 30 39 43 34 20 2B 31 32 30 30 30 30 20 2B 31 35 30 30 30 30 20 30 39 43 34 20 2B 32 31 30 30 30 20 2B 32 34 30 30 30 30 03
Col B	Binary	02 02 02 02 00 00 00 49 73 4D 4E 20 6D 4C 4D 50 73 65 74 73 63 61 6E 63 66 67 20 00 00 03 20 00 04 00 00 09 C4 00 30 D4 00 00 06 DD D0 00 00 09 C4 00 0A AE 60 00 0D BB A0 00 00 09 C4 00 12 4F 80 00 16 E3 60 00 00 09 C4 00 20 0B 20 00 24 9F 00 B1

Table 12: Example: sMN mLMPsetscancfg for LD-XXX####1 with 4 measurement sectors

Examples for LD-OEM1500 and LD-LR36X0

Example for
LD-xxx####0 with
1 measurement sector
of 360°

Scan frequency = 8 Hz

Sectors = 1 sector

Angular resolution = 0.25°

Start angle of sector = -90°

Stop angle of sector = +270°

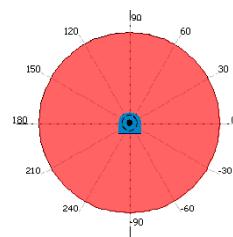


Table 13: Example: sMN mLMPsetscancfg for LD-XXX###O with 1 measurement sector of 360°

Example for
LD-xxx####0 with
1 measurement sector
of 270°

Scan frequency = 10 Hz

Sectors = 1 sector

Angular resolution = 0.50°

Start angle of sector = -45°

Stop angle of sector $\equiv \pm 225^\circ$

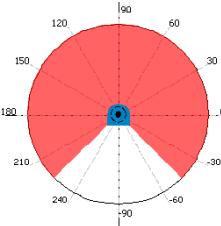


Table 14: Example: $sMN\ mlMPsetscancfg$ for LD-XXX###0 with 1 measurement sector of 270°

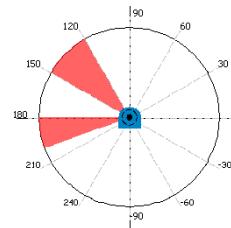
Example for LD-xxx###0 with 2 measurement sectors

Scan frequency = 8 Hz

Sectors = 2 sectors

Sector 1 = +120° ... +150°
Sector 2 = +180° ... +200°

Angular resolution = 0,25°



ColA A	ASCII	<STX>sMN[SPC]mLMPsetsancfg[SPC]320[SPC]2[SPC]9C4[SPC]+1200000[SPC]+1500000[SPC]9C4[SPC]+1800000[SPC]+2000000[SPC]9C4[SPC]0[SPC]0[SPC]9C4[SPC]0[SPC]0<ETX>
	Hex	02 73 4D 4E 20 6D 4C 4D 50 73 65 74 73 63 61 6E 63 66 67 20 33 32 30 20 32 20 39 43 34 20 2B 31 32 30 30 30 30 20 2B 31 35 30 30 30 30 30 20 39 43 34 20 2B 31 38 30 30 30 30 30 20 2B 32 30 30 30 30 30 20 39 43 34 20 30 20 39 43 34 20 30 20 30 03
ColA B	Binary	02 02 02 02 00 00 00 49 73 4D 4E 20 6D 4C 4D 50 73 65 74 73 63 61 6E 63 66 67 20 00 00 03 20 00 02 00 00 09 C4 00 12 4F 80 00 16 E3 60 00 00 09 C4 00 1B 77 40 00 1E 84 80 00 00 09 C4 00 00 00 00 00 00 00 09 C4 00 00 00 00 00 00 00 00 00 00 0C

Table 15: Example: sMN mLMPsetscancfg for LD-XXX###0 with 2 measurement sectors

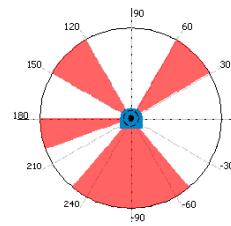
Example for LD-xxx###0 with 4 measurement sectors

Scan frequency = 8 Hz

Sectors = 4 sectors

Sector 1 = +230° ... -50°
Sector 2 = +30° ... +60°
Sector 3 = +120° ... +150°
Sector 4 = +210° ... +200°

Angular resolution = 0,25°



ColA A	ASCII	<STX>sMN[SPC]mLMPsetsancfg[SPC]320[SPC]4[SPC]9C4[SPC]+2300000[SPC]-500000[SPC]9C4[SPC]+300000[SPC]+600000[SPC]9C4[SPC]+1200000[SPC]+1500000[SPC]9C4[SPC]+1800000[SPC]+2000000<ETX>
	Hex	02 73 4D 4E 20 6D 4C 4D 50 73 65 74 73 63 61 6E 63 66 67 20 33 32 30 20 34 20 39 43 34 20 2B 32 33 30 30 30 30 20 2D 35 30 30 30 30 20 39 43 34 20 2B 33 30 30 30 30 30 20 2B 36 30 30 30 30 30 20 39 43 34 20 2B 31 32 30 30 30 20 2B 31 35 30 30 30 30 30 20 39 43 34 20 2B 31 38 30 30 30 30 30 20 2B 32 30 30 30 30 30 03
ColA B	Binary	02 02 02 02 00 00 00 49 73 4D 4E 20 6D 4C 4D 50 73 65 74 73 63 61 6E 63 66 67 20 00 00 03 20 00 04 00 00 09 C4 00 23 18 60 FF F8 5E E0 00 00 09 C4 00 04 93 E0 00 09 27 C0 00 00 09 C4 00 12 4F 80 00 16 E3 60 00 00 09 C4 00 1B 77 40 00 1E 84 80 71

Table 16: Example: sMN mLMPsetscancfg for LD-XXX###0 with 4 measurement sectors



Telegram structure: sAN mLMPsetscancfg						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	73 41 4E
Command	Info of scan frequency and angular resolution	String	14	All	mLMPsetscancfg	6D 4C 4D 50 73 65 74 73 63 61 6E 63 66 67
Status code	Accepted when value is 0	Enum_8	1	All	No error: 0 Frequency error: 1 Resolution error: 2 Resolution and scanarea error: 3 Scanarea error: 4 Other errors: 5	No error: 00 Frequency error: 01 Resolution error: 02 Resolution and scan area error: 03 Scanarea error: 04 Other errors: 05
Scan frequency	[1/100 Hz]	Uint_32	4	LMS1xx	25 Hz: +2500d (9C4h) 50 Hz: +5000d (1388h)	25 Hz: 00 00 09 C4 50 Hz: 00 00 13 88
				LMS5xx	25 Hz: +2500d (9C4h) 35 Hz: +3500d (D4Ch) 50 Hz: +5000d (1388h) 75 Hz: +7500d (1A0Bh) 100 Hz: +10000d (2710h)	25 Hz: 00 00 09 C4 35 Hz: 00 00 0D AC 50 Hz: 00 00 13 88 75 Hz: 00 00 1A 0B 100 Hz: 00 00 27 10
				NAV310 LD-OEM 15xx	5 Hz ... 20 Hz: +500d ... +2000d (1F4h ... 7D0h)	5 Hz ... 20 Hz: 00 00 01 F4 ... 00 00 07 D0
				LD-LRS 36xx	5 Hz ... 15 Hz: +500d ... +1500d (1F4h ... 5DCh)	5 Hz ... 15 Hz: 00 00 01 F4 ... 00 00 05 DC
				LMS1xx LMS5xx	1 (0001h)	0001
Number of active sectors	Indicates the number of active sectors	Int_16	2	NAV310 LD-OEM 15xx LD-LRS 36xx	1 ... 4 (0001h ... 0004h)	0001 ... 0100 (binary)

Telegram structure: sAN mLMPsetscancfg						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Per sector (active and inactive sectors)	Angular resolution [1/10000°]	Uint_32	4	LMS1xx	0.25°: +2500d (9C4h) 0.5°: +5000d (1388h)	0.25°: 00 00 09 C4 0.5°: 00 00 13 88
				LMS5xx	0.042°: +0417d (1A1h) 0.083°: +0833d (341h) 0.1667°: +1667d (683h) 0.25°: +2500d (9C4h) 0.333°: +3333d (D05h) 0.5°: +5000d (1388h) 0.667°: +6667d (1A0Bh) 1°: +10000d (2710h)	0.042°: 00 00 01 A1 0.083°: 00 00 03 41 0.1667°: 00 00 06 83 0.25°: 00 00 09 C4 0.333°: 00 00 0D 05 0.5°: 00 00 13 88 0.667°: 00 00 1A 0B 1°: 00 00 27 10
				NAV310 LD-OEM 15xx LD-LRS 36xx	0.125° ... 1°: +1250d° ... +10000d (4E2h° ... 2710h)	0.125° ... 1: 00 00 04 E2 ... 00 00 27 10
				LMS1xx	-450000d (FFF92230h)	FF F9 22 30
				LMS5xx	-50000d (FFFF3CB0h)	FF FF 3C B0
				NAV310 LD-OEM 15x1 LD-LRS 36x1	0° ... +3600000d (0h ... 36EE80h)	00 00 00 00 ... 00 36 EE 80
				LD-OEM 15x0 LD-LRS 36x0	-900000d ... +2700000d (FFF24460h ... 41EB0h)	FF F2 44 60 ... 00 04 1E B0
				LMS1xx	+2250000d (225510h)	00 22 55 10
				LMS5xx	+1850000d (1C3A90h)	00 1C 3A 90
				NAV310 LD-OEM 15x1 LD-LRS 36x1	0 ... +3600000d (0h ... 36EE80h)	00 00 00 00 ... 00 36 EE 80
Start angle	[1/10000°]	Int_32	4	LD-OEM 15x0 LD-LRS 36x0	-900000d ... +2700000d (FFF24460h ... 41EB0h)	FF F2 44 60 ... 00 04 1E B0
				LMS1xx	+2250000d (225510h)	00 22 55 10
				LMS5xx	+1850000d (1C3A90h)	00 1C 3A 90
				NAV310 LD-OEM 15x1 LD-LRS 36x1	0 ... +3600000d (0h ... 36EE80h)	00 00 00 00 ... 00 36 EE 80
Stop angle	[1/10000°]	Int_32	4	LD-OEM 15x0 LD-LRS 36x0	-900000d ... +2700000d (FFF24460h ... 41EB0h)	FF F2 44 60 ... 00 04 1E B0

Table 17: Telegram structure: sAN mLMPsetscancfg

Example: sAN mLMPsetscancfg

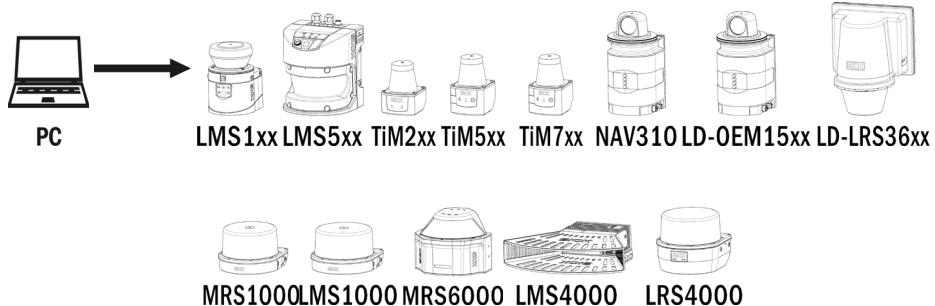
CoLa A	ASCII	<STX>sAN{SPC}mLMPsetscancfg{SPC}0{SPC}1388{SPC}1{SPC}1388{SPC}FFF92230{SPC}225510<ETX>
	Hex	02 73 41 4E 20 6D 4C 4D 50 73 65 74 73 63 61 6E 63 66 67 20 30 20 31 33 38 38 20 31 20 31 33 38 38 20 46 46 46 39 32 32 33 30 20 32 32 35 35 31 30 03

4 TELEGRAMS

CoLa B	Binary	02 02 02 02 00 00 00 26 73 41 4E 20 6D 4C 4D 50 73 65 74 73 63 61 6E 63 66 67 20 00 00 00 13 88 00 01 00 00 13 88 FF F9 22 30 00 22 55 10 2D
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Table 18: Example: sAN mLMPsetscancfg

4.2.2 Read for frequency and angular resolution



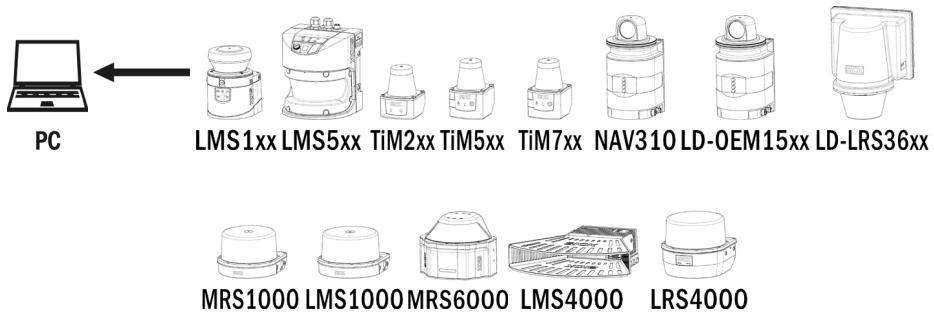
Telegram structure: sRN LMPscancfg						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Info of scan frequency and angular resolution	String	10	All	LMPscancfg	4C 4D 50 73 63 61 6E 63 66 67

Table 19: Telegram structure: sRN LMPscancfg

Example for LMS100: sRN LMPscancfg

CoLa A	ASCII	<STX>sRN{SPC}LMPscancfg<ETX>
	Hex	02 73 52 4E 20 4C 4D 50 73 63 61 6E 63 66 67 03
CoLa B	Binary	02 02 02 02 00 00 00 0E 73 52 4E 20 4C 4D 50 73 63 61 6E 63 66 67 63

Table 20: Example for LMS100: sRN LMPscancfg



Telegram structure: sRA LMPscancfg						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Info of scan frequency and angular resolution	String	10	All	LMPscancfg	4C 4D 50 73 63 61 6E 63 66 67
Scan frequency	[1/100 Hz]	Uint_32	4	LMS1xx	25 Hz: +2500d (9C4h) 50 Hz: +5000d (1388h)	25 Hz: 00 00 09 C4 50 Hz: 00 00 13 88
				LMS5xx	25 Hz: +2500d (9C4h) 35 Hz: +3500d (D4Ch) 50 Hz: +5000d (1388h) 75 Hz: +7500d (1A0Bh) 100 Hz: +10000d (2710h)	25 Hz: 00 00 09 C4 35 Hz: 00 00 0D AC 50 Hz: 00 00 13 88 75 Hz: 00 00 1A 0B 100 Hz: 00 00 27 10
				TiM24x	14.5 Hz: +1450d (5AAh)	14.5 Hz: 00 00 05 AA
				TiMxxx	15 Hz: +1500d (5DCh)	15 Hz: 00 00 05 DC
				NAV310 LD-OEM 15xx	5 Hz ... 20 Hz: +500d ... +2000d (1F4h ... 7D0h)	5 Hz ... 20 Hz: 00 00 01 F4 ... 00 00 07 D0
				LD-LRS 36xx	5 Hz ... 15 Hz: +500d ... +1500d (1F4h ... 5DCh)	5 Hz ... 15 Hz: 00 00 01 F4 ... 00 00 05 DC
				MRS1000	50 Hz: +5000d (1388h) 25 Hz: +2500d (9C4h) 12,5 Hz: +1250d (4E2h)	50 Hz: 00 00 13 88 25 Hz: 00 00 09 C4 12,5Hz: 00 00 04 E2
				LMS1000	150 Hz: +15000d (3A98h) 75 Hz: +7500d (1D4Ch) 37,5 Hz: +3750d (0EA6h)	150 Hz: 00 00 3A 98 75 Hz: 00 00 1D 4C 37,5 Hz: 00 00 0E A6
				MRS6000	10 Hz: +1000d (3E8h)	10 Hz: 00 00 03 E8
				LRS4000	12,5 Hz: + 1250d (4B0) 25 Hz: +2500d (9C4)	12,5 Hz: 00 00 04 B0 25 Hz: 00 00 09 C4

Telegram structure: sRA LMPscancfg						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Number of sectors	Indicates the number of sectors. The subsequent values will be transmitted 1 ... 4 accordingly.	Int_16	2	LMS1xx	Sector 1: 0001h	Sector 1: 0001
				LMS5xx TiMxxx MRS1000 LMS1000 MRS6000 LRS4000		
Angular resolution	[1/10000 °]	Uint_32	4	NAV310	Sector 1: 0001h	Sector 1: 0001
				LD-OEM	Sector 2: 0002h	Sector 2: 0010
				15xx	Sector 3: 0003h	Sector 3: 0011
				LD-LRS	Sector 4: 0004h	Sector 4: 0100
				36xx		
				LMS1xx	0.25°: +2500d (9C4h) 0.5°: +5000d (1388h)	0.25°: 00 00 09 C4 0.5°: 00 00 13 88
				LMS5xx	0.042°: +0417d (1A1h) 0.083°: +0833d (341h) 0.1667°: +1667d (683h) 0.25°: +2500d (9C4h) 0.333°: +3333d (D05h) 0.5°: +5000d (1388h) 0.667°: +6667d (1A0Bh) 1°: +10000d (2710h)	0.1667°: 00 00 06 83 0.25°: 00 00 09 C4 0.333°: 00 00 0D 05 0.5°: 00 00 13 88 0.667°: 00 00 1A 0B 1°: 00 00 27 10
				TiMxxx	0.333°: +3333d (D05h) 1°: +10000d (2710h)	0.333°: 00 00 0D 05 1°: 00 00 27 10
				NAV310	0.125° ... 1°: +1250d° ... +10000d (4E2h ... 2710h)	0.125° ... 1: 00 00 04 E2 ... 00 00 27 10
Angular resolution	[1/10000 °]	Uint_32	4	LD-OEM		
				15xx		
				LD-LRS		
Angular resolution	[1/10000 °]	Uint_32	4	36xx		
				MRS1000	0.25°: +2500d (9C4h) 0.125°: +1250d (4E2h) 0.0625°: +0625d (271h)	0.25°: 00 00 09 C4 0.125°: 00 00 04 E2 0.0625°: 00 00 02 71
				LMS1000	0.75°: +7500d (1D4Ch) 0.375°: +3750d (0EA6h) 0.1875°: +1875d (0753h)	0.75°: 00 00 1D 4C 0.375°: 00 00 0E A6 0.1875°: 00 00 07 53
Angular resolution	[1/10000 °]	Uint_32	4	MRS6000	0.13°: +1300d (515h)	0.13°: 00 00 05 15

Telegram structure: sRA LMPscancfg						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
				LRS4000	<p>@ 12.5 Hz: 0.0200° :+200d (C8h) 0.0400°: +400d (190h) 0.0600°: +600d (258h) 0.1000°: +1000d (3E8h) 0.1200°: +1200d (4B0h)</p> <hr/> <p>@ 25 Hz: 0.0400° :+400d (190h) 0.0800° :+800d (320h) 0.1200°: +1200d (4B0h) 0.2000°: +2000d (7D0h) 0.2400°: +2400d (960h)</p>	<p>@ 12.5 Hz: 0.0200°: 00 00 00 C8 0.0400°: 00 00 01 90 0.0600°: 00 00 02 58 0.1000°: 00 00 03 E8 0.1200°: 00 00 04 B0</p> <hr/> <p>@ 25 Hz: 0.0400°: 00 00 01 90 0.0800°: 00 00 03 20 0.1200°: 00 00 04 B0 0.2000°: 00 00 07 D0 0.2400°: 00 00 09 60</p>
Start angle [1/10000°]	Int_32	4		TiM24x	-1200000d ... +1200000d (FFEDB080h ... 1D4C0h)	FF ED B0 80... 00 01 D4 C0
				LMS1xx TiMxxx	-450000d ... +2250000d (FFF92230h ... 225510h)	FF F9 22 30 ... 00 22 55 10
				LMS5xx	-50000d ... +1850000d (FFFF3CB0h ... 1C3A90h)	FF FF 3C B0 ... 00 1C 3A 90
				NAV310 LD-OEM 15x1 LD-LRS 36x1	0° ... +3600000d (0h ... 36EE80h)	00 00 00 00 ... 00 36 EE 80
				LD-OEM 15x0 LD-LRS 36x0	-900000d ... +2700000d (FFF24460h ... 41EB0h)	FF F2 44 60 ... 00 04 1E B0
				MRS1000	-475000d (FFF8C088h)	FF F8 C0 88
				LMS1000	-480000d (FFF8AD00h)	FF F8 AD 00
				MRS6000	+300000d (493E0h)	00 04 93 E0
				LRS4000	-1800000d (FFE488C0h)	FF E4 88 C0

Telegram structure: sRA LMPscancfg						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Stop angle [1/10000 °]	Int_32	4	TiM24x LMS1xx TiMxxx LMS5xx NAV310 LD-OEM 15x1 LD-LRS 36x1 LD-OEM 15x0 LD-LRS 36x0 MRS1000 LMS1000 MRS6000 LRS4000	TiM24x	-1200000d ... +1200000d (FFEDB080h ... 1D4C0h)	FF ED B0 80... 00 01 D4 C0
				LMS1xx TiMxxx	-450000d ... +2250000d (FFF92230h ... 225510h)	FF F9 22 30 ... 00 22 55 10
				LMS5xx	-50000d ... +1850000d (FFFF3CB0h ... 1C3A90h)	FF FF 3C B0 ... 00 1C 3A 90
				NAV310 LD-OEM 15x1 LD-LRS 36x1	0 ... +3600000d (0h ... 36EE80h)	00 00 00 00 ... 00 36 EE 80
				LD-OEM 15x0 LD-LRS 36x0	-900000d ... +2700000d (FFF24460h ... 41EB0h)	FF F2 44 60 ... 00 04 1E B0
				MRS1000	+2275000d (22B6B8h)	00 22 B6 B8
				LMS1000	+2280000d (22CA40h)	00 22 CA 40
				MRS6000	+1500000d (16E360h)	00 16 E3 60
				LRS4000	+1800000d (1B7740h)	00 1B 77 40

Table 21: Telegram structure: sRA LMPscancfg

Example: sRA LMPscancfg

CoLa A	ASCII	<STX>sRA{SPC}LMPscancfg{SPC}1388{SPC}1{SPC}1388{SPC}FFF92230{SPC}225510<ETX>
	Hex	02 73 52 41 20 4C 4D 50 73 63 61 6E 63 66 67 20 31 33 38 38 20 31 20 31 33 38 38 20 46 46 46 39 32 32 33 30 20 32 32 35 35 31 30 03
CoLa B	Binary	02 02 02 02 00 00 00 21 73 52 41 20 4C 4D 50 73 63 61 6E 63 66 67 20 00 00 13 88 00 01 00 00 13 88 FF F9 22 30 00 22 55 10 3E

Table 22: Example: sRA LMPscancfg

4.2.3 Alignment mode (one layer activation for adjustment)



Telegram structure: sWN MMAAlignmentMode (Service) (sMN SetAccessMode 04 81BE23AA)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set device to alignment mode	String	15	All	MMAAlignmentMode	4D 4D 41 6C 69 67 6E 6D 65 6E 74 4D 6F 64 65
Layer activation					all Layer: 0 red Layer -2.5°: 1 blue Layer 0°: 2 green Layer +2.5°: 3 yellow Layer +5: 4	00 01 02 03 04

Table 23: Telegram structure: sWN MMAAlignmentMode

Example: sWN MMAAlignmentMode 2

CoLa A	ASCII	<STX>sWN{SPC}MMAAlignmentMode{SPC}2<ETX>
	Hex	02 73 57 4E 20 4D 4D 41 6C 69 67 6E 6D 65 6E 74 4D 6F 64 65 20 32 03
CoLa B	Binary	02 02 02 02 00 00 00 15 73 57 4E 20 4D 4D 41 6C 69 67 6E 6D 65 6E 74 4D 6F 64 65 20 02 14

Table 24: Example: sWN MMAAlignmentMode



Telegram structure: sWA MMAAlignmentMode						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set device to alignment mode	String	15	All	MMAAlignmentMode	4D 4D 41 6C 69 67 6E 6D 65 6E 74 4D 6F 64 65

Table 25: Telegram structure: sWA MMAAlignmentMode

Example: sWA MMAAlignmentMode

CoLa A	ASCII	<STX>sWA[SPC]MMAAlignmentMode<ETX>
	Hex	02 73 57 41 20 4D 4D 41 6C 69 67 6E 6D 65 6E 74 4D 6F 64 65 03
CoLa B	Binary	02 02 02 02 00 00 00 14 73 57 41 20 4D 4D 41 6C 69 67 6E 6D 65 6E 74 4D 6F 64 65 20 19

Table 26: Example: sWA MMAAlignmentMode

4.2.4 Set scan configuration

Sets the device to an defined scan configuration, consisting of scan frequency, angular resolution, sector definition and interlace mode.



Telegram structure: sMN mCLsetsancfglist						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	73 4D 4E
Command	Set scan configuration	String	17	All	mCLsetsancfglist	6D 43 4C 73 65 74 73 63 61 6E 63 66 67 6C 69 73 74
Mode	Interlace mode (see table below)	Enum_8	1	All	+1d, +2d, +3d ... (01h, 02h, 03h ...)	01, 02, 03 ...

Table 27: Telegram structure: sMN mCLsetsancfglist

Interlace mode

The interlace mode allows to achieve a higher angular resolution by combining scans with lower resolution. The individual scans are shifted to each other.

The command *mCLsetsancfglist* selects combinations of scan resolution, scan frequency and resolution. If the scan area will not match to the application then an adjustment is possible by the command “*mLMPsetsancfg*” (see section 4.2.1 “Set frequency and angular resolution/measurement sectors” on page 17).

LD Series switching table:

LD-OEM15xx, LD-LRS36xx, NAV310

Mode	Interlaced	Scan freq.	Result. scan freq.	Resolu-tion	Total Resol.	Field of view	Sector	LRS 3601 3611	OEM 1501	NAV 310	LRS 3600 3610	OEM 1500
1	0x	8 Hz	8 Hz	0.25°	0.25°	360°	0 ... 360°	x	x	x	(x)	(x)
2	0x	15 Hz	15 Hz	0.5°	0.5°	360°	0 ... 360°	x	x	x	(x)	(x)
3	0x	10 Hz	10 Hz	0.25°	0.25°	300°	30 ... 330°	x	x	x	x	x
4	0x	5 Hz	5 Hz	0.125°	0.125°	300°	30 ... 330°	x	x	x	x	x
5	0x	6 Hz	6 Hz	0.1875°	0.1875°	360°	0 ... 360°	x	x	x	(x)	(x)
6	0x	8Hz	8 Hz	0.25°	0.25°	359.5°	0.25° ...359.25°				x	X
8	0x	15 Hz	15 Hz	0.375°	0,375°	300°	30...330°	x	X	x	x	x
9	0x	15 Hz	15 Hz	0.5°	0.5°	359°	0.5 359.5°				x	x
21	0x	20 Hz	20 Hz	0.5°	0.5°	300°	30 ... 330°		X	x		x
22	0x	20 Hz	20 Hz	0.75°	0.75°	360°	0 ... 360°		x	x		(x)
44	4x	10 Hz	2.5 Hz	0.25°	0.0625°	300°	30 ... 330°	x	x		(x)	(x)
46	4x	16 Hz	4 Hz	0.5°	0.125°	300°	30 ... 330°		x			(x)

Table 28: Interlace mode for sMN mCLsetsancfglist for LD series

(x): Only at raw data scan (field application)

LMS5xx Variant switching table:

Default is 190° field of view from -5 to 185°. Filtering have to be set via data transmission output.

Mode in Hex	Mode in Dec	Interlaced	Scan freq.	Resolution
0	0	0x	25Hz	0,167°
1	1	0x	25Hz	0,25°
2	2	0x	35Hz	0,25°
3	3	0x	35Hz	0,5°
4	4	0x	50Hz	0,333°
5	5	0x	50Hz	0,5°
6	6	0x	75Hz	0,5°
7	7	0x	75Hz	1°
8	8	0x	100Hz	0,667°
9	9	0x	100Hz	1°
A	10	2x	50Hz	0,167°
B	11	2x	75Hz	0,25°
C	12	2x	100Hz	0,167°
D	13	2x	100Hz	0,333°
E	14	2x	100Hz	0,5°
F	15	4x	25Hz	0,083°
10	16	4x	25Hz	0,042°

Table 29: Interlace mode for sMN mCLsetsancfglist for LMS5xx

Remark for measurement data output with LMS5xx at 0,083° and 0,042°:

With angular resolution of 0,083° or 0,042°, it is recommended to compensate the systematic error of the angular position. To calibrate the LMS5 in the system a correction table should be established in the customer's system software.

This table ensures the mapping of an indicated angle in the scan data telegram on an angle in the real system environment.

The calibration could be done, e.g. with a test object or with a reference scan on the system structure with known geometry. The table should comprise the complete field of view which is relevant for the application.

LRS4000 switching table:

Default is 360° field of view from -180 to +180°

Mode	Mode Name	Inter-laced	Scan freq.	Result. scan freq.	Resolu-tion	Total Resol.	Field of view
11	12.5Hz & 0.020°	0x	12.5 Hz	12.5 Hz	0.040°	0.020°	288°
1	12.5Hz & 0.040°	0x	12.5 Hz	12.5 Hz	0.040°	0.040°	360°
2	12.5Hz & 0.060°	0x	12.5 Hz	12.5 Hz	0.060°	0.060°	360°
4	12.5Hz & 0.100°	0x	12.5 Hz	12.5 Hz	0.100°	0.100°	360°
5	12.5Hz & 0.120°	0x	12.5 Hz	12.5 Hz	0.120°	0.120°	360°
71	25Hz & 0.040°	0x	25Hz	25 Hz	0.080°	0.040°	288°
61	25Hz & 0.080°	0x	25 Hz	25 Hz	0.080°	0.080°	360°
62	25Hz & 0.120°	0x	25 Hz	25 Hz	0.120°	0.120°	360°
64	25Hz & 0.200°	0x	25 Hz	25 Hz	0.200°	0.200°	360°
65	25Hz & 0.240°	0x	25 Hz	25 Hz	0.240°	0.240°	360°

Table 30: Interlace mode for sMN mCLsetsancfglist for LRS4000

Example: Set scan configuration 1: sMN mCLsetsancfglist 1

Col A	ASCII	<STX>sMN{SPC}mCLsetsancfglist{SPC}1<ETX>
	Hex	02 73 4D 4E 20 6D 43 4C 73 65 74 73 63 61 6E 63 66 67 6C 69 73 74 20 31 03
Col B	Binary	02 02 02 02 00 00 00 17 20 73 4D 4E 20 6D 43 4C 73 65 74 73 63 61 6E 63 66 67 6C 69 73 74 20 01 0F

Table 31: Example: Set scan configuration 1: sMN mCLsetsancfglist 1



Telegram structure: sAN mCLsetsancfglist						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	73 41 4E
Command	Confirm scan configuration	String	17	All	mCLsetsancfglist	6D 43 4C 73 65 74 73 63 61 6E 63 66 67 6C 69 73 74
Status code	Wrong setting	Enum_8	1	All	Ok: 0 Error frequency: 1 Error resolution: 2 Err. res. and freq.: 3 Err. scan field: 4 Error: 5	Ok: 00 Error frequency: 01 Error resolution: 02 Err. res. and freq.: 03 Err. scan field: 04 Error: 05

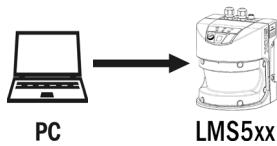
Table 32: Telegram structure: sAN mCLsetsancfglist

Example: sAN mCLsetsancfglist Ok

CoLa A	ASCII	<STX>sAN{SPC}mCLsetsancfglist{SPC}O<ETX>
	Hex	02 73 41 4E 20 6D 43 4C 73 65 74 73 63 61 6E 63 66 67 6C 69 73 74 20 30 03
CoLa B	Binary	02 02 02 02 00 00 00 17 73 41 4E 20 6D 43 4C 73 65 74 73 63 61 6E 63 66 67 6C 69 73 74 20 00 10

Table 33: Example: sAN mCLsetsancfglist Ok

Example LMS5xx



Note



After sending this telegram, it will take 30 seconds to process the new configuration in the sensor.

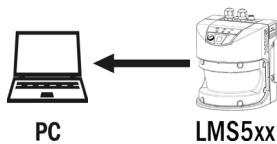
Telegram structure: sMN mCLsetsancfglist (user level 'authorized client' required)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sMN	73 4D 4E
Command	Set scan configuration	String	17	All	mCLsetsancfglist	6D 43 4C 73 65 74 73 63 61 6E 63 66 67 6C 69 73 74
Mode	Scan configuration	Enum_8	1	All	0d = 25Hz, 0.167° 1d = 25Hz, 0.25° 2d = 35Hz, 0.25° 3d = 35Hz, 0.5° 4d = 50Hz, 0.333° 5d = 50Hz, 0.5° 6d = 75Hz, 0.5° 7d = 75Hz, 1.0° 8d = 100Hz, 0.667° 9d = 100Hz, 1.0° 10d = 50Hz, 0.167° interl. 11d = 75Hz, 0.25° interl. 12d = 100Hz, 0.167° interl. 13d = 100Hz, 0.333° interl. 14d = 100Hz, 0.5° interl. 15d = 25Hz, 0.083° interl. 16d = 100Hz, 0.042° interl.	00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 10

Table 34: Telegram structure: sMN mCLsetsancfglist

LMS5xxx Example: sMN mCLsetsancfglist 5

CoLa A	ASCII	<STX>sMN[SPC]mCLsetsancfglist[SPC]5<ETX>
	Hex	02 73 4D 4E 20 6D 43 4C 73 65 74 73 63 61 6E 63 66 67 6C 69 73 74 20 35 03
CoLa B	Binary	02 02 02 02 00 00 00 17 73 4D 4E 20 6D 43 4C 73 65 74 73 63 61 6E 63 66 67 6C 69 73 74 20 05 0A

Table 35: Example: sMN mCLsetsancfglist 5



Telegram structure: sAN mCLsetsancfglist (user level 'authorized client' required)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	73 41 4E
Command	Confirm scan configuration	String	17	All	mCLsetsancfglist	4F 50 68 65 61 74 73 74 61 74 65 65 78 74
Status code	Result	Enum_8	1	All	0d = Ok 1d = Frequency error 2d = Resolution error 3d = Frequency and resolution combination error 4d = Range error 5d = General error	00 01 02 03 04 05

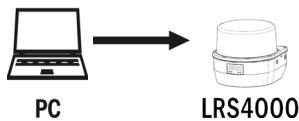
Table 36: Telegram structure: sAN mCLsetsancfglist

Example: sAN mCLsetsancfglist 0

CoLa A	ASCII	<STX>sAN{SPC}mCLsetsancfglist{SPC}J<ETX>
	Hex	02 73 41 4E 20 4F 50 68 65 61 74 73 74 61 74 65 65 78 74 20 30 03
CoLa B	Binary	02 02 02 02 00 00 00 14 73 41 4E 20 4F 50 68 65 61 74 73 74 61 74 65 65 78 74 20 00 03

Table 37: Example: sAN mCLsetsancfglist 0

Example LRS4000



Note



After sending this telegram, it will take 30 seconds to process the new configuration in the sensor.

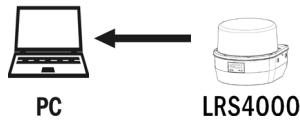
Telegram structure: sMN mCLsetsancfglist (user level 'authorized client' required)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	73 4D 4E
Command	Set scan configuration	String	17	All	mCLsetsancfglist	6D 43 4C 73 65 74 73 63 61 6E 63 66 67 6C 69 73 74
Mode	Scan configuration (see table below)	Enum_8	1	All	11d = 12.5Hz & 0.020° 1d= 12.5Hz & 0.040° 2d = 12.5Hz & 0.060° 4d = 12.5Hz & 0.100° 5d = 12.5Hz & 0.120° 71d = 25Hz & 0.040° 61d = 25Hz & 0.080° 62d = 25Hz & 0.120° 64d = 25Hz & 0.200° 65d = 25Hz & 0.240°	0B 01 02 04 05 47 3D 3E 40 41

Table 38: Telegram structure: sMN mCLsetsancfglist

Example: Set scan configuration 1: sMN mCLsetsancfglist 1

CoLa A	ASCII	<STX>sMN{SPC}mCLsetsancfglist{SPC}1<ETX>
	Hex	02 73 4D 4E 20 6D 43 4C 73 65 74 73 63 61 6E 63 66 67 6C 69 73 74 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 17 20 73 4D 4E 20 6D 43 4C 73 65 74 73 63 61 6E 63 66 67 6C 69 73 74 20 01 0F

Table 39: Example: Set scan configuration 1: sMN mCLsetsancfglist 1



Telegram structure: sAN mCLsetscancfglist						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	73 41 4E
Command	Confirm scan configuration	String	17	All	mCLsetscancfglist	6D 43 4C 73 65 74 73 63 61 6E 63 66 67 6C 69 73 74
Status code	Wrong setting	Enum_8	1	All	Ok: 0 Error frequency: 1 Error resolution: 2 Err. res. and freq.: 3 Err. Range error: 4 General Error: 5	Ok: 00 Error frequency: 01 Error resolution: 02 Err. res. and freq.: 03 Err. scan field: 04 Error: 05

Table 40: Telegram structure: sAN mCLsetscancfglist

Example: sAN mCLsetscancfglist Ok

Cola A	ASCII	<STX>sAN{SPC}mCLsetscancfglist{SPC}0<ETX>
	Hex	02 73 41 4E 20 6D 43 4C 73 65 74 73 63 61 6E 63 66 67 6C 69 73 74 20 30 03
Cola B	Binary	02 02 02 02 00 00 00 17 73 41 4E 20 6D 43 4C 73 65 74 73 63 61 6E 63 66 67 6C 69 73 74 20 00 10

Table 41: Example: sAN mCLsetscancfglist Ok

4.2.5 Activate standby mode

Shut off the laser in order to extend the lifetime of laser diode.

LMS1xx, MR1000, LMS1000 and LMS4000: The motor keeps on turning.

LMS5xx: Reduce motor speed to 25 Hz



Telegram structure: sMN LMCstandby (All = Authorized client; LMS4000 = Operator)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	73 4D 4E
Command	Set device to standby	String	10	All	LMCstandby	4C 4D 43 73 74 61 6E 64 62 79

Table 42: Telegram structure: sMN LMCstandby

Example: sMN LMCstandby

CoLa A	ASCII	<STX>sMN{SPC}LMCstandby<ETX>
	Hex	02 73 4D 4E 20 4C 4D 43 73 74 61 6E 64 62 79 03
CoLa B	Binary	02 02 02 02 00 00 00 0E 73 4D 4E 20 4C 4D 43 73 74 61 6E 64 62 79 65

Table 43: Example: sMN LMCstandby



Telegram structure: sAN LMCstandby						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	73 41 4E
Command	Set device to standby	String	10	All	LMCstandby	4C 4D 43 73 74 61 6E 64 62 79
Status code	Accepted when value is 0	Enum_8	1	All	No error: 0	No error: 00

Table 44: Telegram structure: sAN LMCstandby

Example: sAN LMCstandby

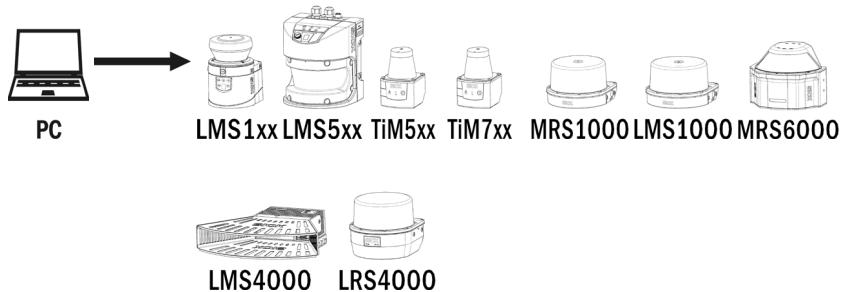
CoLa A	ASCII	<STX>sAN{SPC}LMCstandby{SPC}0<ETX>
	Hex	02 73 41 4E 20 4C 4D 43 73 74 61 6E 64 62 79 20 30 03

Cola B	Binary	02 02 02 02 00 00 00 10 73 41 4E 20 4C 4D 43 73 74 61 6E 64 62 79 20 00 49
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Table 45: Example: sAN LMCstandby

4.2.6 Start measurement

Start the laser and (unless in Standby mode) the motor of the device



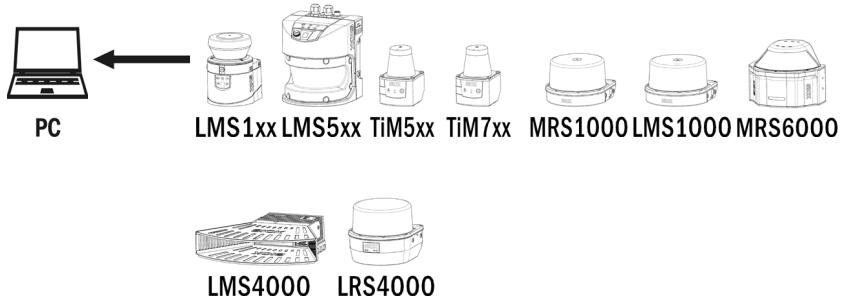
Telegram structure: sMN LMCstartmeas (All = Authorized client; LMS4000 = Operator)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	73 4D 4E
Command	Start measurement	String	12	All	LMCstartmeas	4C 4D 43 73 74 61 72 74 6D 65 61 73

Table 46: Telegram structure: sMN LMCstartmeas

Example: sMN LMCstartmeas

CoLa A	ASCII	<STX>sMN[SPC]LMCstartmeas<ETX>
	Hex	02 73 4D 4E 20 4C 4D 43 73 74 61 72 74 6D 65 61 73 03
CoLa B	Binary	02 02 02 02 00 00 00 10 73 4D 4E 20 4C 4D 43 73 74 61 72 74 6D 65 61 73 68

Table 47: Example: sMN LMCstartmeas



Telegram structure: sAN LMCstartmeas						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	73 41 4E
Command	Start measurement	String	12	All	LMCstartmeas	4C 4D 43 73 74 61 72 74 6D 65 61 73
Status code	Accepted when value is 0	Enum_8	1	All	No error: 0 Not allowed: 1	No error: 00 Not allowed: 01

Table 48: Telegram structure: sAN LMCstartmeas

Example: sAN LMCstartmeas

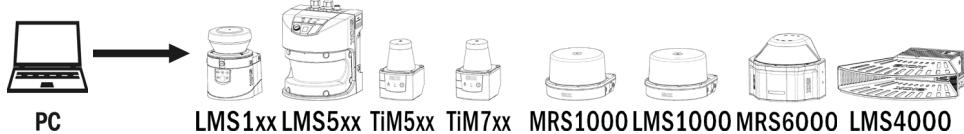
CoLa A	ASCII	<STX>sAN{SPC}LMCstartmeas{SPC}0<ETX>
	Hex	02 73 41 4E 20 4C 4D 43 73 74 61 72 74 6D 65 61 73 20 30 03
CoLa B	Binary	02 02 02 02 00 00 00 12 73 41 4E 20 4C 4D 43 73 74 61 72 74 6D 65 61 73 20 00 44

Table 49: Example: sAN LMCstartmeas

4.2.7 Stop measurement

LMS1xx/MRS1000/LMS1000/TiM5xx/TiM7xx/LMS4000: Shut off the laser and stop the motor.

LMS5xx: Shut off the laser and the motor is running at the set up frequency.



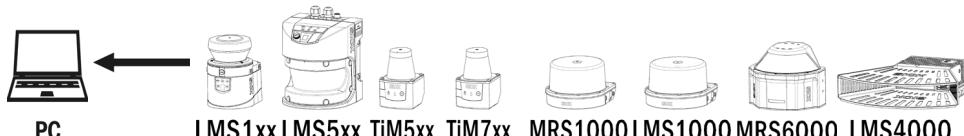
Telegram structure: sMN LMCstopmeas (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	73 4D 4E
Command	Stop measurement	String	11	All	LMCstopmeas	4C 4D 43 73 74 6F 70 6D 65 61 73

Table 50: Telegram structure: sMN LMCstopmeas

Example: sMN LMCstopmeas

CoLa A	ASCII	<STX>sMN{SPC}LMCstopmeas<ETX>
	Hex	02 73 4D 4E 20 4C 4D 43 73 74 6F 70 6D 65 61 73 03
CoLa B	Binary	02 02 02 02 00 00 00 0F 73 4D 4E 20 4C 4D 43 73 74 6F 70 6D 65 61 73 10

Table 51: Example: sMN LMCstopmeas



Telegram structure: sAN LMCstopmeas						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	73 41 4E
Command	Stop measurement	String	11	All	LMCstopmeas	4C 4D 43 73 74 6F 70 6D 65 61 73
Status code	Accepted when value is 0	Enum_8	1	All	No error: 0 Not allowed: 1	No error: 00 Not allowed: 01

Table 52: Telegram structure: sAN LMCstopmeas

Example: sAN LMCstopmeas

CoLa A	ASCII	<STX>sAN{SPC}LMCstopmeas{SPC}0<ETX>
	Hex	02 73 41 4E 20 4C 4D 43 73 74 6F 70 6D 65 61 73 20 30 03
CoLa B	Binary	02 02 02 02 00 00 00 11 73 41 4E 20 4C 4D 43 73 74 6F 70 6D 65 61 73 20 00 3C

Table 53: Example: sAN LMCstopmeas

4.2.8 Autostart measurement

Telegram structure: sWN LMPautostartmeas (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Autostart measurement	String	16	All	LMPautostartmeas	4C 4D 50 61 75 74 6F 73 74 61 72 74 6D 65 61 73
Status code	Activate / Deactivate Autostart	Bool_1	1	All	Autostart off: 0 Autostart on: 1	00 01

Table 54: Telegram structure: sWN LMPautostartmeas

Example: sWN LMPautostartmeas 1

CoLa A	ASCII	<STX>sWN{SPC}LMPautostartmeas{SPC}1<ETX>
	Hex	02 73 57 4E 20 4C 4D 50 61 75 74 6F 73 74 61 72 74 6D 65 61 73 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 16 73 57 4E 20 4C 4D 50 61 75 74 6F 73 74 61 72 74 6D 65 61 73 20 01 4F

Table 55: Example: sWN LMPautostartmeas 1

This parameter defines whether the scanner will start directly rotate and measure when powering up or remain in idle mode. The changed setting (saved with the command sMN mEEWriteall) will be then be active with the next power-up cycle.

In case autostart is deactivated the sensor will remain in idle mode as follows:

- LMS1xx: Laser: off / motor speed: stop
- LMS5xx : Laser: off / motor speed: 25 Hz
- LD-OEM15XX : Laser: off / motor speed: stop
- LD-LRS36XX: Laser: off / motor speed: stop
- MRS6000: Laser off / motor speed : stop



Telegram structure: sWA LMPautostartmeas						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Autostart measurement	String	14	All	LMPautostartmeas	4C 4D 43 73 74 61 72 74 6D 65 61 73

Table 56: Telegram structure: sWA LMDautostartmeas

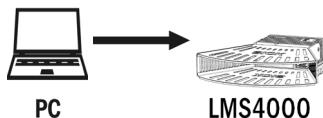
Example: sWA LMPautostartmeas

CoLa A	ASCII	<STX>sWA{SPC}LMPautostartmeas<ETX>
	Hex	02 73 57 41 20 4C 4D 43 73 74 61 72 74 6D 65 61 73 03
CoLa B	Binary	02 02 02 02 00 00 00 15 73 57 41 20 4C 4D 50 61 75 74 6F 73 74 61 72 74 6D 65 61 73 20 41

Table 57: Example: sWA LMPautostartmeas

4.2.9 Laser Control

Define if laser is always on or rather switched on and off by specific trigger signal. Also select delay times and timeout.



Telegram structure: sWN IOlasc (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Autostart measurement	String	6	All	IOlasc	49 4F 6C 61 73 63
Trigger Source	Select Trigger Source	Uint_8	1	All	Free running: 0 Software: 1 Input 1: 2 Input 2: 3 Input 1 or 2: 4	00 01 02 03 04
Delay on Start	Delay on Start in ms	Uint_16	2	All	0 ... +65535d (0 ... FFFFh)	00 00 ... FF FF
Delay on Stop	Delay on Stop in ms	Uint_16	2	All	0 ... +65535d (0 ... FFFFh)	00 00 ... FF FF

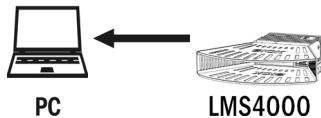
Telegram structure: sWN IOlasc (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Laser Timeout	Laser shuts down after defined time in s, if trigger signal does not disappear	Uint_16	2	All	0 = inactive 1 ... +65535d (0 ... FFFFh)	00 00 00 01 ... FF FF
Delay settings	Reserved	Uint_8	1	All	Always: 0	00

Table 58: Telegram structure: sWN IOlasc

Example: sWN IOlasc 1 +500 0 0 0

CoLa A	ASCII	<STX>sMN{SPC}IOlasc{SPC}1{SPC}+500{SPC}0{SPC}0{SPC}0<ETX>
	Hex	02 73 57 4E 20 49 4F 6C 61 73 63 20 31 20 2B 35 30 30 20 30 20 30 20 30 03
CoLa B	Binary	02 02 02 02 00 00 00 16 73 57 4E 20 49 4F 6C 61 73 63 20 01 01 F4 00 00 00 00 00 00 00 20 A5

Table 59: Example: sWN IOlasc with Software Trigger and 0.5 s delay on start.



Telegram structure: sWA IOlasc						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Autostart measurement	String	14	All	IOlasc	49 4F 6C 61 73 63

Table 60: Telegram structure: sWA IOlasc

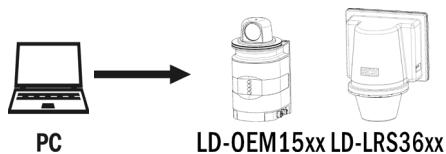
Example: sWA IOlasc

CoLa A	ASCII	<STX>sWA{SPC}IOlasc<ETX>
	Hex	02 73 57 41 20 49 4F 6C 61 73 63 03
CoLa B	Binary	02 02 02 02 00 00 00 0B 73 57 41 20 49 4F 6C 61 73 63 20 7E

Table 61: Example: sWA IOlasc

4.2.10 Activate/deactivate field application

With the aid of the integrated field application, the LD-OEM1500/LD-LRS3600 evaluates up to four evaluation fields within its scan area.



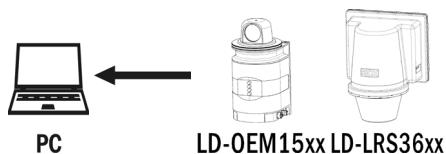
Telegram structure: sWN CLApplication (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Activate/deactivate field application	String	13	All	CLApplication	43 4C 41 70 70 6C 69 63 61 74 69 6F 6E
Mode	Application	Enum_16	2	All	Scan only: 00 Field application: 11	Scan only: 00 00 Field application: 00 11

Table 62: Telegram structure: sWN CLApplication

Example: Activate the field application: sWN CLApplication 11

CoLa A	ASCII	<STX>sWN[SPC]CLApplication[SPC]11<ETX>
	Hex	02 73 57 4E 20 43 4C 41 70 70 6C 69 63 61 74 69 6F 6E 20 31 31 03
CoLa B	Binary	02 02 02 02 00 00 00 00 17 73 57 4E 20 43 4C 41 70 70 6C 69 63 61 74 69 6F 6E 20 00 11 1F

Table 63: Example: Activate the field application: sWN CLApplication 11



Telegram structure: sWA CLApplication						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Activate/deactivate field application	String	13	All	CLApplication	43 4C 41 70 70 6C 69 63 61 74 69 6F 6E

Table 64: Telegram structure: sWA CLApplication

Example: sWA CLApplication correct and accepted

CoLa A	ASCII	<STX>sWA{SPC}CLApplication<ETX>
	Hex	02 73 57 41 20 43 4C 41 70 70 6C 69 63 61 74 69 6F 6E 03
CoLa B	Binary	02 02 02 02 00 00 00 11 73 57 41 20 43 4C 41 70 70 6C 69 63 61 74 69 6F 6E 1A

Table 65: Example: sWA CLApplication correct and accepted

4.2.11 Application selection and switching

Selection between the field application (default) and the ranging application in the device.



Telegram structure: sWN SetActiveApplications (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Selects all currently active applications of the scanner	String	13	All	SetActiveApplications	43 4C 41 70 70 6C 69 63 61 74 69 6F 6E
Array lenght				All	0..1	00...01
Identifier	Application	String			FEVL (Field Application) RANG (Ranging)	46 45 56 4C 52 41 4E 47
Active		Bool_1			False = 0 True = 1	False = 00 True = 01

Table 66: Telegram structure: sWN SetActiveApplications

Example: Activate the field application: sWN CLApplication 11

CoLa A	ASCII	<STX>sWN{SPC}SetActiveApplications{SPC}1{SPC}FEVL{SPC}1<ETX>
	Hex	73 57 4E 20 53 65 74 41 63 74 69 76 65 41 70 70 6C 69 63 61 74 69 6F 6E 73 20 31 20 46 45 56 4C 20 31
CoLa B	Binary	02 02 02 02 00 00 00 22 73 57 4E 20 53 65 74 41 63 74 69 76 65 41 70 70 6C 69 63 61 74 69 6F 6E 73 20 31 20 46 45 56 4C 20 31 34

Table 67: Example: Activate the field application: : sWN SetActiveApplications 1 FEVL 1



Telegram structure: sWA SetActiveApplications						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Selects all currently active applications of the scanner	String		All	SetActiveApplications	53 65 74 41 63 74 69 76 65 41 70 70 6C 69 63 61 74 69 6F 6E 73

Table 68: Telegram structure: sWA SetActiveApplications

Example: sWA CLApplication correct and accepted

CoLa A	ASCII	<STX>sWA{SPC}SetActiveApplications<ETX>
	Hex	73 57 41 20 53 65 74 41 63 74 69 76 65 41 70 70 6C 69 63 61 74 69 6F 6E 73
CoLa B	Binary	02 02 02 02 00 00 00 19 73 57 41 20 53 65 74 41 63 74 69 76 65 41 70 70 6C 69 63 61 74 69 6F 6E 73 02

Table 69: Example: sWA SetActiveApplications correct and accepted

4.2.12 Read Application selection and switching



Telegram structure: sRN SetActiveApplications						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Info of scan frequency and angular resolution	String	10	All	SetActiveApplications	53 65 74 41 63 74 69 76 65 41 70 70 6C 69 63 61 74 69 6F 6E 73

Table 70: Telegram structure: sRN SetActiveApplications

Example for MRS1000: sRN SetActiveApplications

CoLa A	ASCII	<STX>sRN{SPC}SetActiveApplications<ETX>
	Hex	73 52 4E 20 53 65 74 41 63 74 69 76 65 41 70 70 6C 69 63 61 74 69 6F 6E 73
CoLa B	Binary	02 02 02 02 00 00 00 19 73 52 4E 20 53 65 74 41 63 74 69 76 65 41 70 70 6C 69 63 61 74 69 6F 6E 73 08

Table 71: Example for MRS1000: sRN SetActiveApplications

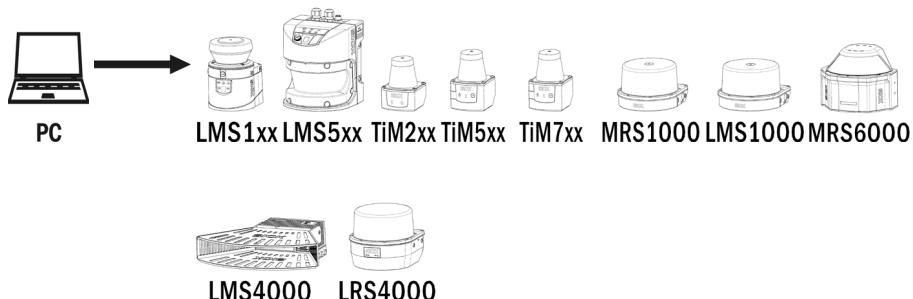


Telegram structure: sRA SetActiveApplications						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Info of scan frequency and angular resolution	String	10	All	SetActiveApplications	73 52 4E 20 53 65 74 41 63 74 69 76 65 41 70 70 6C 69 63 61 74 69 6F 6E 73

4.2.13 Load factory defaults


NOTE

The Factory-Reset (Load factory defaults) deletes the entire parametrization of the device. All parameters, settings and system applications will be set to default.



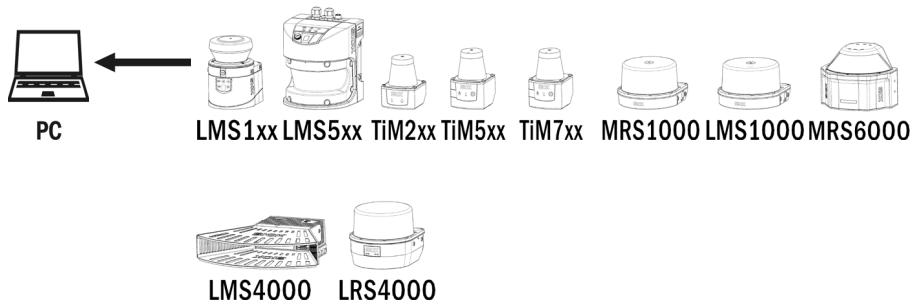
Telegram structure: sMN mSCloadfacdef (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	Not possible
Command	Load factory defaults	String	13	All	mSCloadfacdef	Not possible

Table 72: Telegram structure: sMN mSCloadfacdef

Example: sMN mSCloadfacdef

CoLa A	ASCII	<STX>sMN{SPC}mSCloadfacdef<ETX>
	Hex	02 73 4D 4E 20 6D 53 43 6C 6F 61 64 66 61 63 64 65 66 03
CoLa B	Binary	Not possible

Table 73: Example: sMN mSCloadfacdef



Telegram structure: sAN mSCloadfacdef						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	Not possible
Command	Load factory defaults	String	13	All	mSCloadfacdef	Not possible

Table 74: Telegram structure: sAN mSCloadfacdef

Example: sAN mSCloadfacdef

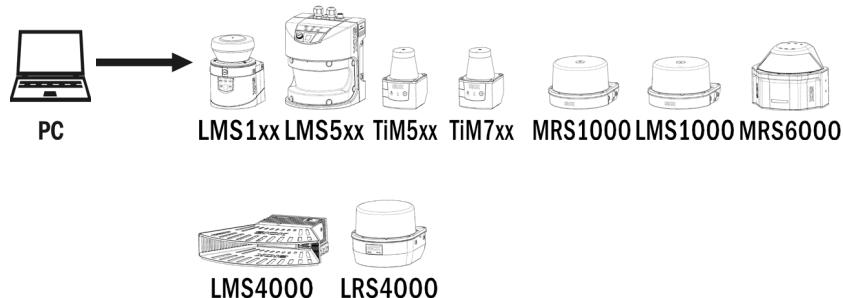
CoLa A	ASCII	<STX>sAN{SPC}mSCloadfacdef<ETX>
	Hex	02 73 41 4E 20 6D 53 43 6C 6F 61 64 66 61 63 64 65 66 03
CoLa B	Binary	Not possible

Table 75: Example: sAN mSCloadfacdef

4.2.14 Load application defaults

**NOTE**

The Application-Reset (Load application defaults) deletes only the user parametrization of the Fields, Evaluation cases (EVC) and parameters under the header “Application”. Other parameters like Interface settings, Echo Filter, etc. remain unaffected.



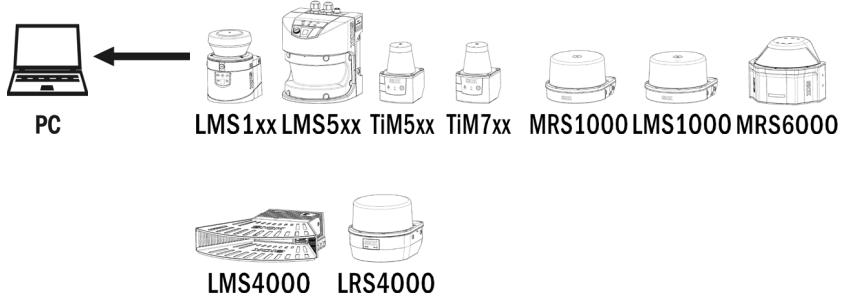
Telegram structure: sMN mSCloadappdef (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	Not possible
Command	Load application defaults	String	13	All	mSCloadappdef	Not possible

Table 76: Telegram structure: sMN mSCloadappdef

Example: sMN mSCloadappdef

CoLa A	ASCII	<STX>sMN{SPC}mSCloadappdef<ETX>
	Hex	02 73 4D 4E 20 6D 53 43 6C 6F 61 64 61 70 70 64 65 66 03
CoLa B	Binary	Not possible

Table 77: Example: sMN mSCloadappdef



Telegram structure: sAN mSCloadappdef						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	Not possible
Command	Load application defaults	String	13	All	mSCloadappdef	Not possible

Table 78: Telegram structure: sAN mSCloadappdef

Example: sAN mSCloadappdef

CoLa A	ASCII	<STX>sAN{SPC}mSCloadappdef<ETX>
	Hex	02 73 41 4E 20 6D 53 43 6C 6F 61 64 61 70 70 64 65 66 03
CoLa B	Binary	Not possible

Table 79: Example: sAN mSCloadappdef

4.2.15 Change password

**NOTE**

If logged in with a higher level you may set the password for lower levels as well.



Telegram structure: sMN SetPassword (the same User level or higher)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	73 4D 4E
Command	Set password request	String	13	All	SetPassword	53 65 74 50 61 73 73 77 6F 72 64
User level	User level that the password will be applied to	Int_8	1	All	Maintenance: 02 Authorized client: 03 Service: 04	Maintenance: 02 Authorized client: 03 Service: 04
Password	Hash value of the new password	Uint_32	4	All	<Hash value>	<Hash value>

Table 80: Telegram structure: sMN SetPassword

Example: sMN SetPassword

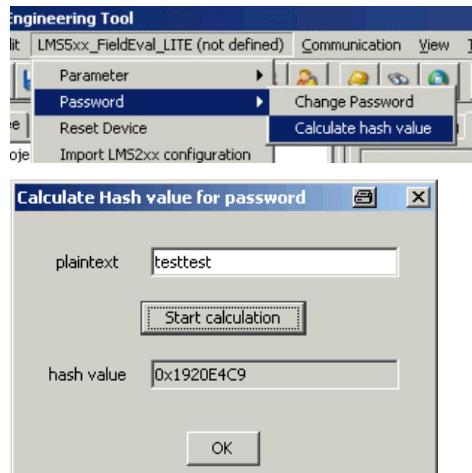
Set password for Authorized user to “testtest”.

CoLa A	ASCII	<STX>sMN[SPC]SetPassword[SPC]03[SPC]19 20 E4 C9<ETX>
	Hex	02 73 4D 4E 20 53 65 74 50 61 73 73 77 6F 72 64 20 30 33 20 19 20 E4 C9 03
CoLa B	Binary	02 02 02 02 00 00 00 17 73 4D 4E 20 53 65 74 50 61 73 73 77 6F 72 64 20 30 33 20 19 20 E4 C9 3A

Table 81: Example: sMN SetPassword

Calculating the hash value of the password

- ▶ Login SOPAS with user level “Service”.
- ▶ Select [Device] > Password > Calculate Hash value.



Telegram structure: sAN SetPassword						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	Not possible
Command	Set password requested	String	13	All	SetPassword	53 65 74 50 61 73 73 77 6F 72 64
Success	Confirmation	Int_8	1	All	0: Failed 1: Success	0: Failed 1: Success

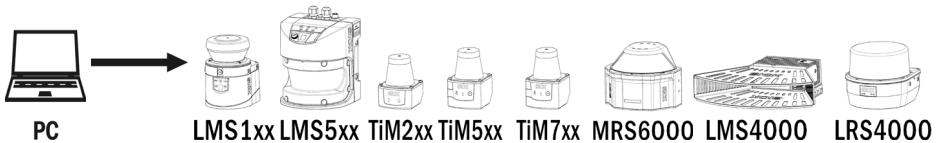
Table 82: Telegram structure: sAN SetPassword

Example: sAN SetPassword

CoLa A	ASCII	<STX>sAN{SPC}SetPassword[SPC]1<ETX>
	Hex	02 73 4D 4E 20 53 65 74 50 61 73 73 77 6F 72 64 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 11 73 41 4E 20 53 65 74 50 61 73 73 77 6F 72 64 20 31 30

Table 83: Example: sAN SetPassword

4.2.16 Check password



Telegram structure: sMN CheckPassword (the same User level or higher)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	73 4D 4E
Command	Check password request	String	13	All	CheckPassword	43 68 65 63 6B 50 61 73 73 77 6F 72 64
User level	User level to check the password for	Int_8	1	All	Maintenance: 02 Authorized client: 03 Service: 04	Maintenance: 02 Authorized client: 03 Service: 04
Password	Hash value of the password to be checked	Uint_32	4	All	<Hash value>	<Hash value>

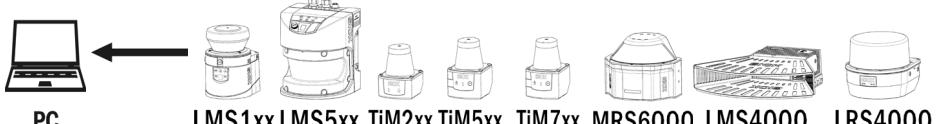
Table 84: Telegram structure: sMN CheckPassword

Example: sMN CheckPassword

Check password “testtest” for Authorized user.

CoLa A	ASCII	<STX>sMN{SPC}CheckPassword{SPC}03{SPC}19 20 E4 C9<ETX>
	Hex	02 73 4D 4E 20 43 68 65 63 6B 50 61 73 73 77 6F 72 64 20 30 33 20 19 20 E4 C9 03
CoLa B	Binary	02 02 02 02 00 00 00 19 73 4D 4E 20 43 68 65 63 6B 50 61 73 73 77 6F 72 64 20 30 33 20 19 20 E4 C9 0E

Table 85: Example: sMN CheckPassword



Telegram structure: sAN CheckPassword						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	Not possible
Command	Check password requested	String	13	All	CheckPassword	43 68 65 63 6B 50 61 73 73 77 6F 72 64
Success	Confirmation	Int_8	1	All	0: Failed 1: Success	0: Failed 1: Success

Table 86: Telegram structure: sAN CheckPassword

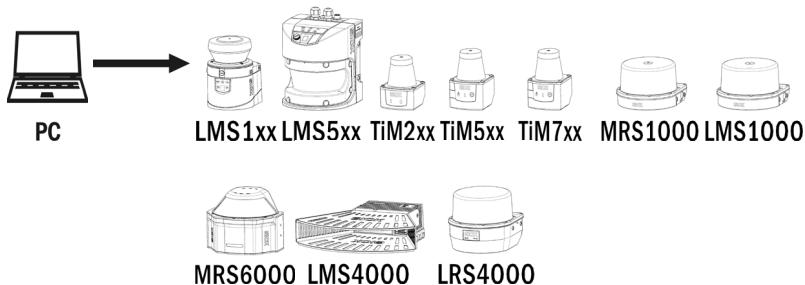
Example: sAN CheckPassword

CoLa A	ASCII	<STX>sAN{SPC}CheckPassword{SPC}1<ETX>
	Hex	02 73 41 4E 20 43 68 65 63 6B 50 61 73 73 77 6F 72 64 20 30 31 03
CoLa B	Binary	02 73 41 4E 20 43 68 65 63 6B 50 61 73 73 77 6F 72 64 20 31 03

Table 87: Example: sAN CheckPassword

4.2.17 Reboot device

This command includes saving all parameters.



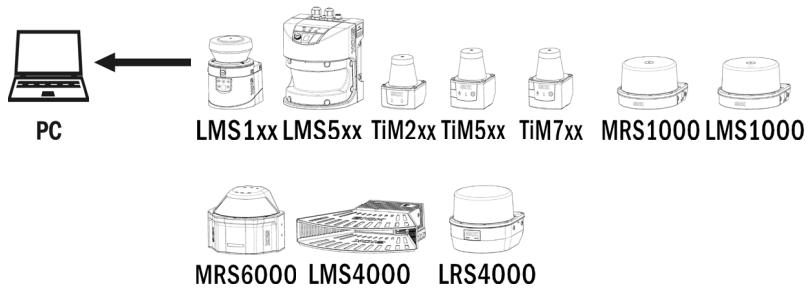
Telegram structure: sMN mSCreboot (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	73 4D 4E
Command	Reboot device	String	9	All	mSCreboot	6D 53 43 72 65 62 6F 6F 74

Table 88: Telegram structure: sMN mSCreboot

Example: sMN mSCreboot

CoLa A	ASCII	<STX>sMN{SPC}mSCreboot<ETX>
	Hex	02 73 4D 4E 20 6D 53 43 72 65 62 6F 6F 74 03
CoLa B	Binary	02 02 02 02 00 00 00 0D 73 4D 4E 20 6D 53 43 72 65 62 6F 6F 74 2C

Table 89: Example: sMN mSCreboot



Telegram structure: sAN mSCreboot						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	73 41 4E
Command	Reboot device	String	9	All	mSCreboot	6D 53 43 72 65 62 6F 6F 74

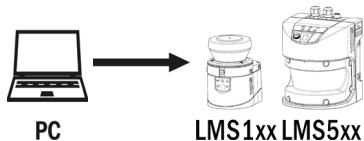
Table 90: Telegram structure: sAN mSCreboot

Example: sAN mSCreboot

CoLa A	ASCII	<STX>sAN{SPC}mSCreboot<ETX>
	Hex	02 73 41 4E 20 6D 53 43 72 65 62 6F 6F 74 03
CoLa B	Binary	02 02 02 02 00 00 00 00 0E 73 41 4E 20 6D 53 43 72 65 62 6F 6F 74 00

Table 91: Example: sAN mSCreboot

4.2.18 Set contamination measurement settings



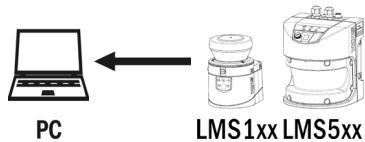
Telegram structure: sWN LCMcfg (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command		String	6	All	LCMcfg	4C 43 4D 63 66 67
Strategy	Strategy code	Enum_8	1	All	Inactive: 0 High available: 1 Available: 2 Sensitive: 3 Semi-sensitive: 4	Inactive: 00 High available: 01 Available: 02 Sensitive: 03 Semi-sensitive: 04
Response time	Time lapse	Uint_16	4	All	+1d ... +60d (01h ... 3Ch)	00 01 ... 00 3C
Threshold warning	Threshold value	Uint_16	4	All	0d ... +100d (00h ... 64h)	00 00 ... 00 64
Threshold error	Threshold value	Uint_16	4	All	0d ... +100d (00h ... 64h)	00 00 ... 00 64

Table 92: Telegram structure: sWN LCMcfg

Example: sWN LCMcfg

CoLa A	ASCII	<STX>sWN{SPC}LCMcfg{SPC}1{SPC}+30{SPC}+65{SPC}+45<ETX>
	Hex	02 73 57 4E 20 4C 43 4D 63 66 67 20 31 20 2B 33 30 20 2B 36 35 20 2B 34 35 03
CoLa B	Binary	02 02 02 02 00 00 00 18 73 57 4E 20 4C 43 4D 63 66 67 20 01 00 1E 00 41 00 2D 39

Table 93: Example: sWN LCMcfg



Telegram structure: sWA LCMcfg						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command		String	6	All	LCMcfg	4C 43 4D 63 66 67

Table 94: Telegram structure: sWA LCMcfg

Example: sWA LCMcfg

CoLa A	ASCII	<STX>sWA{SPC}LCMcfg<ETX>
	Hex	02 73 57 41 20 4C 43 4D 63 66 67 03
CoLa B	Binary	02 02 02 02 00 00 00 0B 73 57 41 20 4C 43 4D 63 66 67 45

Table 95: Example: sWA LCMcfg

4.2.19 Set contamination indication settings



Telegram structure: sWN ContaminationConfig (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command		String	19	All	ContaminationConfig	43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 43 6F 6E 66 69 67
Strategy	Strategy code	Enum_8	1	All	Inactive: 0 High available: 1 Available: 2 Semi-sensitive: 3 Sensitive: 4	Inactive: 00 High available: 01 Available: 02 Semi-sensitive: 03 Sensitive: 04
Response time	Time lapse	Uint_16	2	All	+1d ... +60d (01h ... 3Ch)	00 01 ... 00 3C
Threshold warning	Threshold value	Enum_8	1	All	LOW: 0 MID: 1 HIGH: 2	LOW: 00 MID: 01 HIGH 02
Cover	Weatherhood constalation	Enum_8	1	All	No Weatherhood: 0 Weatherh. 210 no Flaps: 1 Weatherh. 210 Flap left: 2 Weatherh. 210 Flap right: 3 Weatherh. 210 both Flaps: 4 Weatherhood 275: 5	No Weatherhood: 00 Weatherh. 210 no Flaps: 01 Weatherh. 210 Flap left: 02 Weatherh. 210 Flap ri: 03 Weatherh. 210 b. Flaps: 04 Weatherhood 275: 05
Enable Warning	Warning monitoring	Bool_1			Off: 0 On: 1	OFF (False): 00 ON (True): 01
Enable Error	Error monitoring	Bool_1			Off: 0 On: 1	OFF (False): 00 ON (True): 01

Table 96: Telegram structure: sWN ContaminationConfig

Example: sWN ContaminationConfig

CoLa A	ASCII	<STX>sWN[SPC]ContaminationConfig[SPC]1[SPC]3[SPC]2[SPC]0[SPC]1[SPC]1<ETX>
	Hex	02 73 57 4E 20 43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 43 6F 6E 66 69 67 20 31 20 33 20 32 20 30 20 31 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 1F 73 57 4E 20 43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 43 6F 6E 66 69 67 20 01 00 03 02 00 01 01 00

Table 97: Example: sWN ContaminationConfig



Telegram structure: sWA ContaminationConfig						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command		String	19	All	ContaminationConfig	43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 43 6F 6E 66 69 67

Table 98: Telegram structure: sWA ContaminationConfig

Example: sWA ContaminationConfig

CoLa A	ASCII	<STX>sWA[SPC]ContaminationConfig<ETX>
	Hex	02 73 57 41 20 43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 43 6F 6E 66 69 67 03
CoLa B	Binary	02 02 02 02 00 00 00 18 73 57 41 20 43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 43 6F 6E 66 69 67 20

Table 99: Example: sWA ContaminationConfig

4.2.20 Read contamination measurement settings

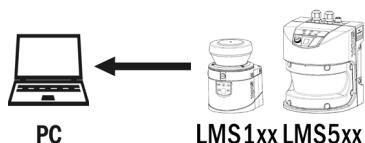
Telegram structure: sRN LCMcfg						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command		String	6	All	LCMcfg	4C 43 4D 63 66 67

Table 100: Telegram structure: sRN LCMcfg

Example: sRN ContaminationConfig

CoLa A	ASCII	<STX>sRN{SPC}LCMcfg<ETX>
	Hex	02 73 52 4E 20 4C 43 4D 63 66 67 03
CoLa B	Binary	02 02 02 02 00 00 00 0A 73 52 4E 20 4C 43 4D 63 66 67 6F

Table 101: Example: sRN LCMcfg



Telegram structure: sRA LCMcfg

Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Read for settings	String	6	All	LCMcfg	4C 43 4D 63 66 67
Strategy	Strategy code	Enum_8	1	All	Inactive: 0 High available: 1 Available: 2 Sensitive: 3 Semi-sensitive: 4	Inactive: 00 High available: 01 Available: 02 Sensitive: 03 Semi-sensitive: 04
Response time	Time lapse	Uint_16	2	All	+1d ... +60d (00h ... 3Ch)	00 00 ... 00 3C
Threshold warning	Threshold value	Uint_16	2	All	0d ... +100d (00h ... 64h)	00 00 ... 00 64
Threshold error	Threshold value	Uint_16	2	All	0d ... +100d (00h ... 64h)	00 00 ... 00 64

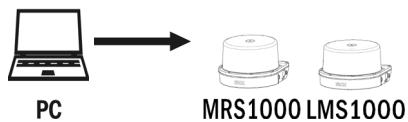
Table 102: Telegram structure: sRA LCMcfg

Example: sRA LCMcfg

CoLa A	ASCII	<STX>sRA{SPC}LCMcfg{SPC}1{SPC}1{SPC}46{SPC}1E<ETX>
	Hex	02 73 57 41 20 4C 43 4D 63 66 67 20 31 20 31 20 34 36 20 31 45 03
CoLa B	Binary	02 02 02 02 00 00 00 12 73 52 41 20 4C 43 4D 63 66 67 20 01 00 01 00 46 00 1E 18

Table 103: Example: sRA LCMcfg

4.2.21 Read contamination indication settings



Telegram structure: sRN ContaminationConfig						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command		String	19	All	ContaminationConfig	43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 43 6F 6E 66 69 67

Table 104: Telegram structure: sRN ContaminationConfig

Example: sRN ContaminationConfig

CoLa A	ASCII	<STX>sRN{SPC}ContaminationConfig<ETX>
	Hex	02 73 52 4E 20 43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 43 6F 6E 66 69 67 03
CoLa B	Binary	02 02 02 02 00 00 00 17 73 52 4E 20 43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 43 6F 6E 66 69 67 25

Table 105: Example: sRN ContaminationConfig



Telegram structure: sRA ContaminationConfig						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command		String	19	All	ContaminationConfig	43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 43 6F 6E 66 69 67
Strategy	Strategy code	Enum_8	1	All	Inactive: 0 High available: 1 Available: 2 Semi-sensitive: 3 Sensitive: 4	Inactive: 00 High available: 01 Available: 02 Semi-sensitive: 03 Sensitive: 04
Response time	Time lapse	Uint_16	4	All	+1d ... +60d (01h ... 3Ch)	00 01 ... 00 3C
Threshold warning	Threshold value	Enum_8	1	All	LOW: 0 MID: 1 HIGH: 2	LOW: 00 MID: 01 HIGH 02
Cover	Weatherhood constalation	Enum_8	1	All	No Weatherhood: 0 Weatherh. 210 no Flaps: 1 Weatherh. 210 Flap left: 2 Weatherh. 210 Flap right: 3 Weatherh. 210 both Flaps: 4 Weatherhood 275: 5	No Weatherhood: 00 Weatherh. 210 no Flaps: 01 Weatherh. 210 Flap left: 02 Weatherh. 210 Flap ri: 03 Weatherh. 210 b. Flaps: 04 Weatherhood 275: 05
Enable Warning	Warning monitoring	Bool_1			Off: 0 On: 1	OFF (False): 00 ON (True): 01
Enable Error	Error monitoring	Bool_1			Off: 0 On: 1	OFF (False): 00 ON (True): 01

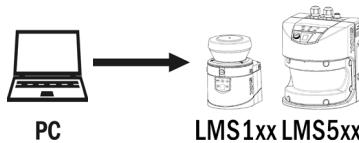
Table 106: Telegram structure: sRA ContaminationConfig

Example: sRA ContaminationConfig

CoLa A	ASCII	<STX>sRA{SPC}ContaminationConfig{SPC}1{SPC}3{SPC}2{SPC}0{SPC}1{SPC}1<ETX>
CoLa A	Hex	02 73 52 41 20 43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 43 6F 6E 66 69 67 20 31 20 33 20 32 20 30 20 31 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 1F 73 52 41 20 43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 43 6F 6E 66 69 67 20 01 00 03 02 00 01 01 OA

Table 107: Example: sRA ContaminationConfig

4.2.22 Read contamination measurement detailed values



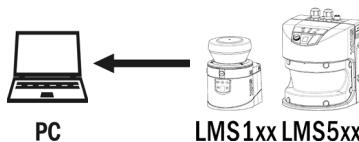
Telegram structure: sRN CMContLvIM						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command		String	10	All	CMContLvIM	43 4D 43 6F 6E 74 4C 76 6C 4D

Table 108: Telegram structure: sRN CMContLvIM

Example: sRN CMContLvIM

CoLa A	ASCII	<STX>sRN{SPC}CMContLvIM<ETX>
	Hex	02 73 52 4E 20 43 4D 43 6F 6E 74 4C 76 6C 4D 03
CoLa B	Binary	02 02 02 02 00 00 00 00 0E 73 52 4E 20 43 4D 43 6F 6E 74 4C 76 6C 4D 6C

Table 109: Example: sRN CMContLvIM



Telegram structure: sRA CMContLvIM						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command		String	10	All	CMContLvIM	43 4D 43 6F 6E 74 4C 76 6C 4D
Contamination data for different channels	[% of transparency] in order of the different channels	Uint_8	1	LMS1xx	Order of 7 channels: -25.8°/12.8°/51.4°/90°/ 128.6°/167.2°/205.8° 0d ... +100d (00h ... 64h)	Order of 7 channels: -25.8°/12.8°/51.4°/90°/ 128.6°/167.2°/205.8° 00 ... 64
				LMS5xx NAV310 LD-OEM 15xx LD-LRS 36xx	Order of 6 channels: 5°/35°/70°/110°/145°/ 175° 0d ... +100d (00h ... 64h)	Order of 6 channels: 5°/35°/70°/110°/145°/ 175° 00 ... 64

Table 110: Telegram structure: sRA CMContLvIM

Example for LMS5xx: sRA CMContLvIM

5°- to 110°-channel: 100 %, 145°- and 175°-channel only 84 % availability:

CoLa A	ASCII	<STX>sRA{SPC}CMContLvIM{SPC}64{SPC}64{SPC}64{SPC}54{SPC}54{SPC}<ETX>
	Hex	02 73 52 41 20 43 4D 43 6F 6E 74 4C 76 6C 4D 20 64 64 64 64 54 54 03
CoLa B	Binary	02 02 02 02 00 00 00 15 73 52 41 20 43 4D 43 6F 6E 74 4C 76 6C 4D 20 64 64 64 64 54 54 43

Table 111: Example for LMS5xx: sRA CMContLvIM

4.2.23 Read contamination indication data



Telegram structure: sRN ContaminationData						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command		String	17	All	ContaminationData	43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 44 61 74 61

Table 112: Telegram structure: sRN ContaminationData

Example: sRN ContaminationData

CoLa A	ASCII	<STX>sRN{SPC}ContaminationData<ETX>
	Hex	02 73 52 4E 20 43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 44 61 74 61 03
CoLa B	Binary	02 02 02 02 00 00 00 15 73 52 4E 20 43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 44 61 74 61 3F

Table 113: Example: sRN ContaminationData



Telegram structure: sRA ContaminationData						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command		String	17	All	ContaminationData	43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 44 61 74 61
Contamination data for different channels	[Status of contamination] in order of the different channels	Enum_8	1	MRS 1000 LMS 1000	Order of 6 channels: (1 / 2 / 3 / 4 / 5 / 6) CM channel: x CM NONE: 0 CM WARN: 1 CM ERROR: 2	Order of 6 channels: (1 / 2 / 3 / 4 / 5 / 6) CM channel: x CM NONE: 00 CM WARN: 01 CM ERROR: 02

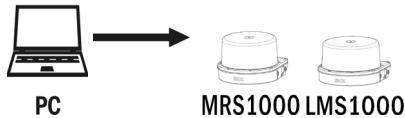
Table 114: Telegram structure: sRA ContaminationData

Example: sRA ContaminationData

CoLa A	ASCII	<STX>sRA{SPC}ContaminationData{SPC}0{SPC}0{SPC}0{SPC}0{SPC}0{SPC}<ETX>
	Hex	02 73 52 41 20 43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 44 61 74 61 20 30 20 30 20 30 20 30 20 30 20 30 03
CoLa B	Binary	02 02 02 02 00 00 00 00 1C 73 52 41 20 43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 44 61 74 20 00 00 00 00 00 00 10

Table 115: Example: sRA ContaminationData

4.2.24 Read contamination indication result



Telegram structure: sRN ContaminationResult						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command		String	19	All	ContaminationResult	43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 52 65 73 75 6C 74

Table 116: Telegram structure: sRN ContaminationResult

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Example: sRN ContaminationResult

CoLa A	ASCII	<STX>sRN{SPC}ContaminationResult<ETX>
	Hex	02 73 52 4E 20 43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 52 65 73 75 6C 74 03
CoLa B	Binary	02 02 02 02 00 00 00 17 73 52 4E 20 43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 52 65 73 75 6C 74 26

Table 117: Example: sRN ContaminationResult



Telegram structure: sRA ContaminationResult						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command		String	19	All	ContaminationResult	43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 52 65 73 75 6C 74
Contamination Result	Result of contamination indication	Enum_8	1	MRS 1000 LMS 1000	Order of 2 results: (Warning / Error) Result: Warning / Error False: 0 True: 1	Order of 2 results: (Warning / Error) Result: Warning / Error False: 00 True: 01

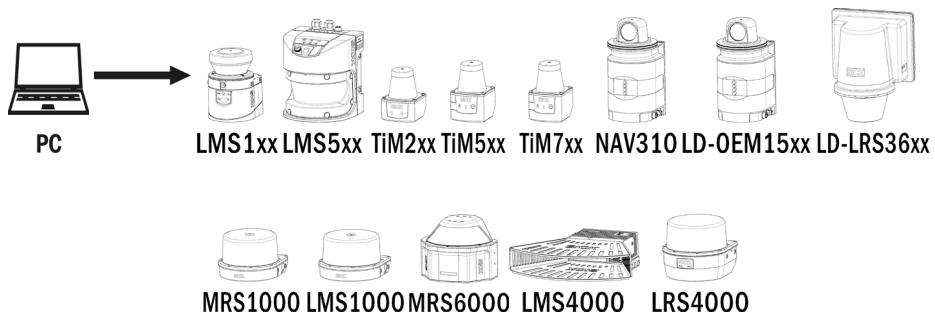
Table 118: Telegram structure: sRA ContaminationResult

Example: sRA ContaminationResult

CoLa A	ASCII	<STX>sRA{SPC}ContaminationResult{SPC}0{SPC}0<ETX>
	Hex	02 73 52 41 20 43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 52 65 73 75 6C 74 20 30 20 30 03
CoLa B	Binary	02 02 02 02 00 00 00 1A 73 52 41 20 43 6F 6E 74 61 6D 69 6E 61 74 69 6F 6E 52 65 73 75 6C 74 20 00 00 09

Table 119: Example: sRA ContaminationResult

4.2.25 Save parameters permanently



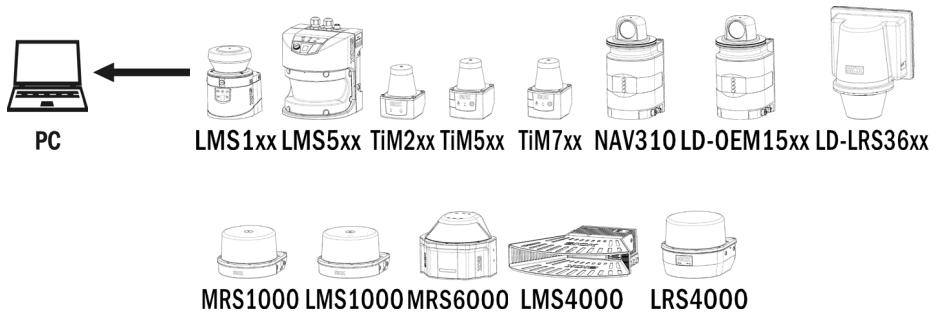
Telegram structure: sMN mEEwriteall (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	73 4D 4E
Command	Store parameters permanently	String	11	All	mEEwriteall	6D 45 45 77 72 69 74 65 61 6C 6C

Table 120: Telegram structure: sMN mEEwriteall

Example: sMN mEEwriteall

CoLa A	ASCII	<STX>sMN[SPC]mEEwriteall<ETX>
	Hex	02 73 4D 4E 20 6D 45 45 77 72 69 74 65 61 6C 6C 03
CoLa B	Binary	02 02 02 02 00 00 00 0F 73 4D 4E 20 6D 45 45 77 72 69 74 65 61 6C 6C 21

Table 121: Example: sMN mEEwriteall



Telegram structure: sAN mEEwriteall						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	73 41 4E
Command	Store parameters permanently	String	11	All	mEEwriteall	6D 45 45 77 72 69 74 65 61 6C 6C
Status code	Accepted when value is 1	Bool_1	1	All	Error: 0 Success: 1	Error: 00 Success: 01

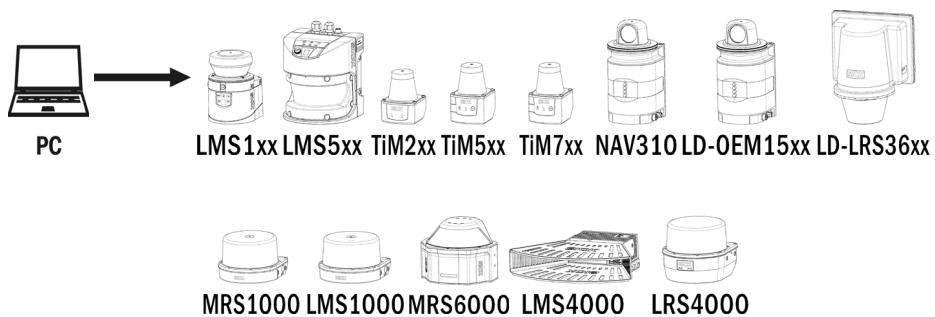
Table 122: Telegram structure: sAN mEEwriteall

Example: sAN mEEwriteall

CoLa A	ASCII	<STX>sAN{SPC}mEEwriteall{SPC}1<ETX>
	Hex	02 73 41 4E 20 6D 45 45 77 72 69 74 65 61 6C 6C 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 11 73 41 4E 20 6D 45 45 77 72 69 74 65 61 6C 6C 20 01 0C

Table 123: Example: sAN mEEwriteall

4.2.26 Set to run



Log out from device and activate all parameter changes.

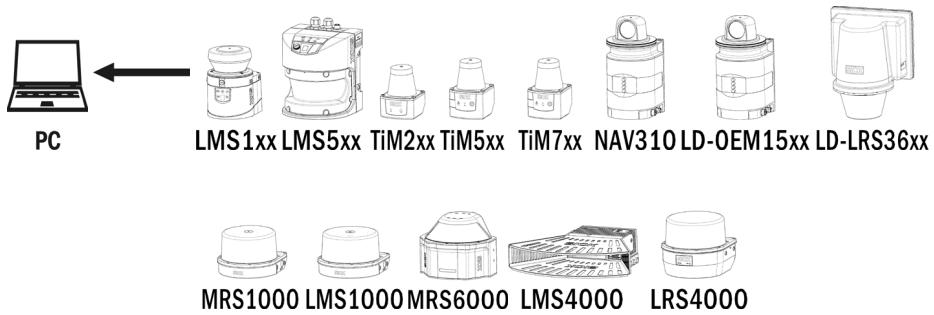
Telegram structure: sMN Run						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	73 4D 4E
Command	Start the device	String	3	All	Run	52 75 6E

Table 124: Telegram structure: sMN Run

Example: sMN Run

CoLa A	ASCII	<STX>sMN[SPC]Run<ETX>
	Hex	02 73 4D 4E 20 52 75 6E 03
CoLa B	Binary	02 02 02 02 00 00 00 07 73 4D 4E 20 52 75 6E 19

Table 125: Example: sMN Run



Telegram structure: sAN Run						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	73 41 4E
Command	Start the device	String	3	All	Run	52 75 6E
Status code	Accepted when value is 1	Bool_1	1	All	Error: 0 Success: 1	Error: 00 Success: 01

Table 126: Telegram structure: sAN Run

Example: sAN Run

CoLa A	ASCII	<STX>sAN{SPC}Run{SPC}1<ETX>
	Hex	02 73 41 4E 20 52 75 6E 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 09 73 41 4E 20 52 75 6E 20 01 34

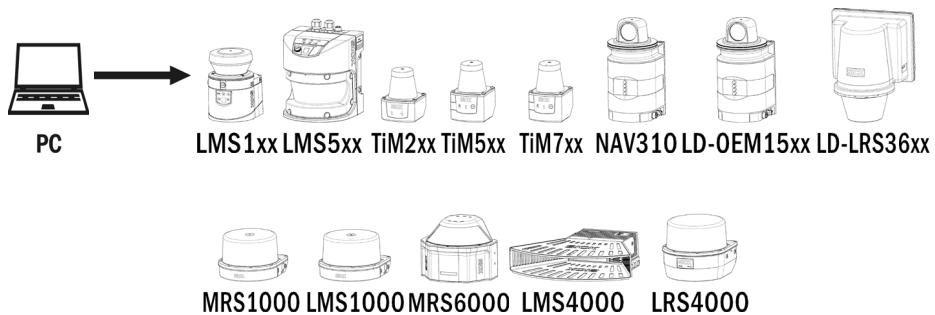
Table 127: Example: sAN Run

4.3 Measurement output telegram

Telegram validity overview

		LMS1xx	LMS5xx	TiM2xx	TiM5xx	TiM7xx	NAV310	LD-OEM15xx	LD-LRS36xx	MRS1000	LMS1000	MRS6000	LMS4000	LRS4000
4.3.1	Configure the data content for the scan	X	X	X	X	X	X	X	X	X	X	X	X	X
4.3.2	Configure measurement angle of the scandata for output	X	X	X	X	X				X	X	X	X	X
4.3.3	Read for actual output range	X	X	X	X	X				X	X	X	X	X
4.3.4	Configure the distance scaling of the scandata for the output													X
4.3.5	Read the distance scaling for the distance values of the scandata													X
4.3.6	Poll one telegram	X	X	X	X	X	X	X	X	X	X	X	X	X
4.3.7	Send data permanently	X	X	X	X	X	X	X	X	X	X	X	X	X

4.3.1 Configure the data content for the scan



Telegram structure: sWN LMDscandatacfg (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Configure scandata	String	14	All	LMDscandatacfg	4C 4D 44 73 63 61 6E 64 61 74 61 63 66 67
Data channel	Defines the telegram content (DIST)	Uint_8	2	LMS1xx	Output channel 1: 1 0 Output channel 2: 2 0 Output channel 1+2: 3 0	01 00 02 00 03 00
				LMS5xx	Set via Echo Filter, therefore: 0 Other values than 0 will be ignored.	00 00
				TiMxxx NAV310 LD-OEM 15xx LD-LRS 36xx	Output channel 1: 1 0	01 00
				MRS1000 LMS1000 MRS6000 LRS4000	Set via Echo Filter, therefore: 0 Other values than 0 will be ignored.	00 00
				LMS 4000	No distance values: 0 0 Distance values: 1 0	00 00 01 00
Further data channels	Remission, Angle offset, Ambient light & Quality data output	Uint_8	1	All	No values: 0 RSSI: 1	00 01
				MRS1000 LMS1000	No values: 0 RSSI: 1 AINF: 8 RSSI & AINF: 9	00 01 08 09

4 TELEGRAMS

Telegram structure: sWN LMDscandatacfg (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
				LMS4000	No values: 0 Remission only: 1 Angle only: 2 Remission & Angle: 3 Quality only: 4 Remission & Quality: 5 Angle & Quality: 6 Remission & Angle & Quality: 7	00 01 02 03 04 05 06 07
Resolution	Resolution of remission data ¹⁾	Enum_8	1	All	8 Bit: 0 16 Bit: 1	00 01
				LMS4000	Always: 1	01
Unit	Unit of remission data	Enum_8	1	All	Digits: 0	00
				LMS4000	Digits (RSSI): 0 Percent (REFL): 1	00 01
Encoder	Encoder data	Uint_8	2	LMS1xx LMS5xx LMS4000 LRS4000	No encoder: 0 0 Channel 1: 1 0	00 00 01 00
				NAV310 LD-OEM 15xx LD-LRS 36xx TiMxxx MRS1000 LMS1000 MRS6000	No encoder: 0 0	No encoder: 00 00
Position	Position values	Bool_1	1	All	No: 0 Yes: 1	00 01
Device name	Sends the device name	Bool_1	1	All	No: 0 Yes: 1	00 01
Comment	Saved comment	Bool_1	1	All	No: 0 Yes: 1	00 01
Time	Sends time information	Bool_1	1	All	No: 0 Yes: 1	00 01
				TiM24x	No: 0	00

¹⁾ LMS5xx since V1.10, 8 bit only.; MRS1000/LMS1000 8bit only

Telegram structure: SWN LMDscandatacfg (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Output rate	Sends the output rate	Uint_16	2	LMS1xx LMS5xx TiMxxx LMS4000 MRS1000 LMS1000 MRS6000 TIM240 LRS4000 NAV310 LD-OEM 15xx LD-LRS 36xx	All scans: +1d (1h) Each 2 nd scan: +2d (2h) Each 50000 th scan: +50000d (C350h) All scans: +1d (1h) All scans: +1d (1h) Each 2 nd scan: +2d (2h) ... Max: Each 100 th Scan: +100d (64h) All scans: +1d (1h) Each 2 nd scan: +2d (2h) Each 200 th scan: +200d (C8h)	00 01 00 02 C3 50 00 01 00 01 00 02 ... 00 64 00 01 00 02 00 C8

Table 128: Telegram structure: sWN LMDscandatacfg

Example 1: output channel 1, remission, resolution 16Bit, no encoder and all scans

CoLa A	ASCII	<STX>sWN[SPC]LMDscandatacfg[SPC]01[SPC]00[SPC]1[SPC]1[SPC]0[SPC]00[SPC]00[SPC]0[SPC]0 [SPC]0[SPC]0[SPC]+1<ETX>
	Hex	02 73 57 4E 20 4C 4D 44 73 63 61 6E 64 61 74 61 63 66 67 20 30 31 20 30 30 20 31 20 31 20 30 20 30 30 20 30 30 20 30 20 30 20 30 20 30 20 30 20 3B 31 03
CoLa B	Binary	02 02 02 02 00 00 00 20 73 57 4E 20 4C 4D 44 73 63 61 6E 64 61 74 61 63 66 67 20 01 00 01 01 00 00 00 00 00 00 00 00 01 43

Table 129: Example 1: sWN LMDscandatacfg

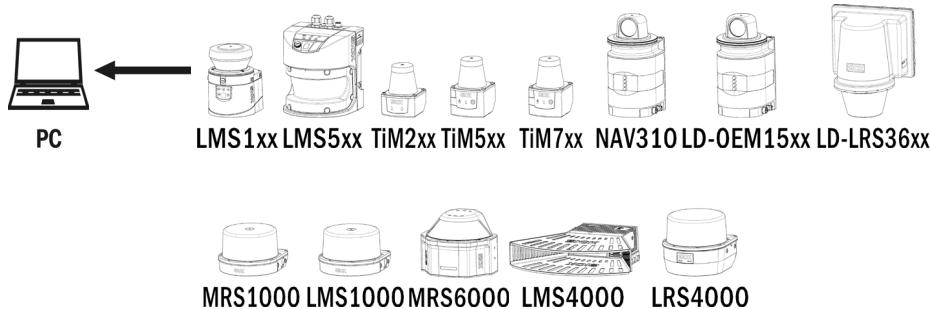
Example 2: output channel 1, remission, resolution 16Bit, no encoder, each 10th scan

CoLa A	ASCII	<STX>sWN[SPC]LMDscandatacfg[SPC]01[SPC]00[SPC]1[SPC]1[SPC]0[SPC]00[SPC]00[SPC]0[SPC]0 [SPC]0[SPC]0[SPC]+10<ETX>
	Hex	02 73 57 4E 20 4C 4D 44 73 63 61 6E 64 61 74 61 63 66 67 20 30 31 20 30 30 20 30 20 30 20 31 20 30 20 30 30 20 30 30 20 30 20 30 20 30 20 30 20 30 20 30 20 2B 31 30 03
CoLa B	Binary	02 02 02 02 00 00 00 20 73 57 4E 20 4C 4D 44 73 63 61 6E 64 61 74 61 63 66 67 20 01 00 00 01 00 00 00 00 00 00 00 00 10 52

Table 130: Example 2: sWN LMDscandatacfg

Example 3: output channel 2, resolution 16Bit, encoder active, each 10th scan

Table 131: Example3: sWN LMDscandatacfg



Telegram structure: sWA LMDscandatacfg						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Configure scandata	String	14	All	LMDscandatacfg	4C 4D 44 73 63 61 6E 64 61 74 61 63 66 67

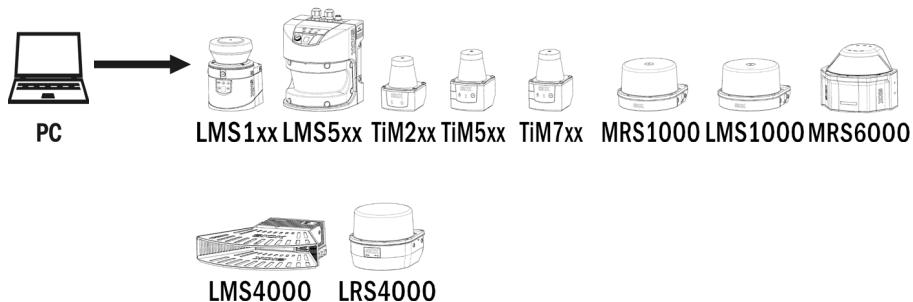
Table 132: Telegram structure: sWA LMDscandatacfg

Example: sWA LMDscandatacfg

CoLa A	ASCII	<STX>sWA{SPC}LMDscandatacfg<ETX>
	Hex	02 73 57 41 20 4C 4D 44 73 63 61 6E 64 61 74 61 63 66 67 03
CoLa B	Binary	02 02 02 02 00 00 00 13 73 57 41 20 4C 4D 44 73 63 61 6E 64 61 74 61 63 66 67 20 4D

Table 133: Example: sWA LMDscandatacfg

4.3.2 Configure measurement angle of the scandata for output



Telegram structure: sWN LMPoutputRange (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Change output angle range	String	14	All	LMPoutputRange	4C 4D 50 6F 75 74 70 75 74 52 61 6E 67 65
Status code	Length	Int_16	2	All	1	00 01
Angular resolution ²⁾	[1/10000°]	Uint_32	4	LMS1xx	0.25°: +2500d (9C4h) 0.5°: +5000d (1388h)	0.25°: 00 00 09 C4 0.5°: 00 00 13 88
				LMS5xx	0.1667°: +1667d (683h) 0.25°: +2500d (9C4h) 0.333°: +3333d (D05h) 0.5°: +5000d (1388h) 0.667°: +6667d (1A0Bh) 1°: +10000d (2710h)	0.1667°: 00 00 06 83 0.25°: 00 00 09 C4 0.333°: 00 00 0D 05 0.5°: 00 00 13 88 0.667°: 00 00 1A 0B 1°: 00 00 27 10
				TiMxxx	0.333°: +3333d (D05h) 1°: +10000d (2710h)	0.333°: 00 00 0D 05 1°: 00 00 27 10
				TiM24x	1°: +10000d (2710h)	1°: 00 00 27 10
				MRS1000	0.25°: +2500d (9C4h)	0.25°: 00 00 09 C4
				LMS1000	0.75°: +7500d (1D4Ch)	
				MRS 6000	0.13°: +1300d (515h)	0.13°: 00 00 05 15
				LMS 4000	0.0833°: +833 (341h)	0.0833°: 00 00 03 41
				LRS4000	@ 12.5 Hz: 0.0200° :+200d (C8h) 0.0400°: +400d (190h) 0.0600°: +600d (258h)	@ 12.5 Hz: 0.0200°: 00 00 00 C8 0.0400°: 00 00 01 90 0.0600°: 00 00 02 58

²⁾ Note: Angular resolution can not be changed here, it is taken automatically from the basic scan settings! The angular resolution is not exactly 0.1667 degree, and this value should not be used for calculations. The result is an angular resolution of 0,16 or 1/6 of a degree (six measurements per degree). When used for calculations a customer should recover the real value, e.g. by double AngRes = 2.0 / round(2.0 / GivenAngRes).

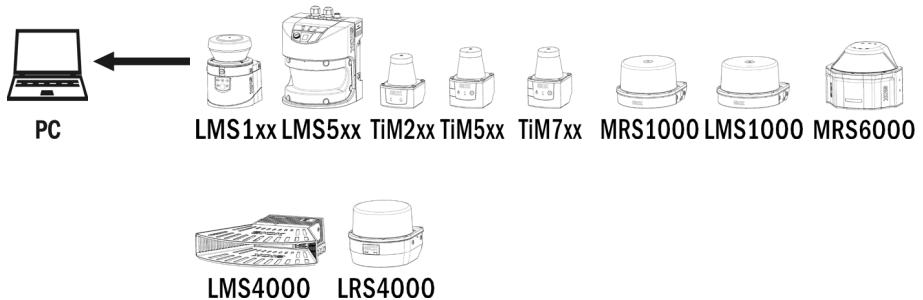
Telegram structure: sWN LMPoutputRange (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
					0.1000°: +1000d (3E8h) 0.1200°: +1200d (4B0h)	0.1000°: 00 00 03 E8 0.1200°: 00 00 04 B0
Start angle	[1/10000°]	Int_32	4	LMS1xx	-450000d ... +2250000d (FFF92230h ... 225510h)	FF F9 22 30 ... 00 22 55 10
				TiM24x	-1200000d ... +1200000d (FFEDB080h ... 124F80h)	FF ED B0 80 ... 00 12 4F 80
				LMS5xx	-50000d ... +1850000d (FFFF3CB0h ... 1C3A90h)	FF FF 3C B0 ... 00 1C 3A 90
				MRS1000	-475000d ... +2275000d (FFF8C088h ... 22B6B8h)	FF F8 C0 88 ... 00 22 B6 B8
				LMS1000	-480000d (FFF8AD00h)	
				MRS 6000	30000d...1500000d (493E0h ... 16E360h)	00 04 93 E0 ... 00 16 E3 60
				LMS 4000	+550000d... +1250000d (86470h ... 1312D0h)	00 08 64 70 ... 00 13 12 D0
				LRS4000	-1800000d (- FFE488C0h)	FF E4 88 C0
Stop angle	[1/10000°]	Int_32	4	LMS1xx	-450000d ... +2250000d (FFF92230h ... 225510h)	FF F9 22 30 ... 00 22 55 10
				TiM24x	-1200000d ... +1200000d (FFEDB080h ... 124F80h)	FF ED B0 80 ... 00 12 4F 80
				LMS5xx	-50000d ... +1850000d (FFFF3CB0h ... 1C3A90h)	FF FF 3C B0 ... 00 1C 3A 90
				MRS1000	-475000d ... +2275000d (FFF8C088h ... 22B6B8h)	FF F8 C0 88 ... 00 22 B6 B8
				LMS1000	+2280000d (22CA40h)	
				MRS 6000	30000d...1500000d (493E0h ... 16E360h)	00 04 93 E0h ... 00 16 E3 60h
				LMS 4000	+550000d... +1250000d (86470h ... 1312D0h)	00 08 64 70 ... 00 13 12 D0
				LRS4000	+1800000d (1B7740h)	00 1B 7740

Table 134: Telegram structure: sWN LMPoutputRange

Example: sWN LMPoutputRange 0,50° resolution, 0°-90°

CoLa A	ASCII	<STX>sWN[SPC]LMPoutputRange[SPC]1[SPC]1388[SPC]0[SPC]DBBA0<ETX>
	Hex	02 73 57 4E 20 4C 4D 50 6F 75 74 70 75 74 52 61 6E 67 65 20 31 20 31 33 38 38 20 30 20 44 42 42 41 30 03
CoLa B	Binary	02 02 02 02 00 00 00 21 73 57 4E 20 4C 4D 50 6F 75 74 70 75 74 52 61 6E 67 65 20 00 01 00 00 13 88 00 00 00 00 00 0D BB A0 F7

Table 135: Example: sWN LMPoutputRange 0,50° resolution, 0°-90°



Telegram structure: sWA LMPOutputRange						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Store parameters	String	14	All	LMPOutputRange	4C 4D 50 6F 75 74 70 75 74 52 61 6E 67 65

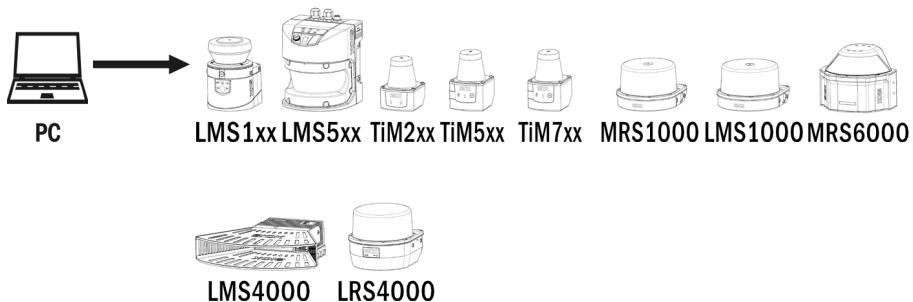
Table 136: Telegram structure: sWA LMPOutputRange

Example: sWA LMPOutputRange

CoLa A	ASCII	<STX>sWA{SPC}LMPOutputRange<ETX>
	Hex	02 73 57 41 20 4C 4D 50 6F 75 74 70 75 74 52 61 6E 67 65 03
CoLa B	Binary	02 02 02 02 00 00 00 13 73 57 41 20 4C 4D 50 6F 75 74 70 75 74 52 61 6E 67 65 20 74

Table 137: Example: sWA LMPOutputRange

4.3.3 Read for actual output range



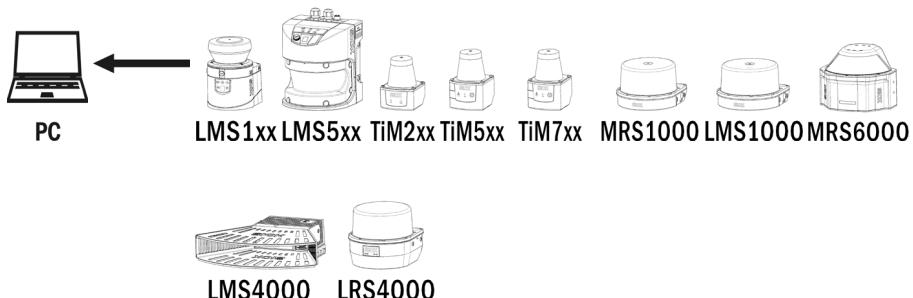
Telegram structure: sRN LMPoutputRange						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Output range	String	14	All	LMPoutputRange	4C 4D 50 6F 75 74 70 75 74 52 61 6E 67 65

Table 138: Telegram structure: sRN LMPoutputRange

Example: sRN LMPoutputRange

CoLa A	ASCII	<STX>sRN{SPC}LMPoutputRange<ETX>
	Hex	02 73 52 4E 20 4C 4D 50 6F 75 74 70 75 74 52 61 6E 67 65 03
CoLa B	Binary	02 02 02 02 00 00 00 12 73 52 4E 20 4C 4D 50 6F 75 74 70 75 74 52 61 6E 67 65 5E

Table 139: Example: sRN LMPoutputRange



Telegram structure: sRA LMPoutputRange						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Output range	String	14	All	LMPoutputRange	4C 4D 50 6F 75 74 70 75 74 52 61 6E 67 65

Telegram structure: sRA LMPoutputRange						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Number of sectors	Indicates the number of sectors. The subsequent values will be transmitted 1 ... 4 accordingly.	Int_16	2	All	Sector 1: 0001h	Sector 1: 0001
Angular resolution	[1/10000°]	Uint_32	4	LMS1xx	0.25°: +2500d (9C4h) 0.5°: +5000d (1388h)	0.25°: 00 00 09 C4 0.5°: 00 00 13 88
				LMS5xx	0.1667°: +1667d (683h) 0.25°: +2500d (9C4h) 0.333°: +3333d (D05h) 0.5°: +5000d (1388h) 0.667°: +6667d (1A0Bh) 1°: +10000d (2710h)	0.1667°: 00 00 06 83 0.25°: 00 00 09 C4 0.333°: 00 00 0D 05 0.5°: 00 00 13 88 0.667°: 00 00 1A 0B 1°: 00 00 27 10
				TiMxxx	0.333°: +3333d (D05h) 1°: +10000d (2710h)	0.333°: 00 00 0D 05 1°: 00 00 27 10
				TiM24x	1°: +10000d (2710h)	1°: 00 00 27 10
				MRS1000	0.25°: +2500d (9C4h)	0.25°: 00 00 09 C4
				LMS1000	0.75°: +7500d (1D4Ch)	
				MRS 6000	0.13°: +1300d (515h)	0.13°: 00 00 05 15
				LMS 4000	0.0833°: +833 (341h)	0.0833°: 00 00 03 41
				LRS4000	@ 12.5 Hz: 0.0200° :+200d (C8h) 0.0400°: +400d (190h) 0.0600°: +600d (258h) 0.1000°: +1000d (3E8h) 0.1200°: +1200d (4B0h) @ 25 Hz: 0.0400° :+400d (190h) 0.0800° :+800d (320h) 0.1200°: +1200d (4B0h) 0.2000°: +2000d (7D0h) 0.2400°: +2400d (960h)	@ 12,5 Hz: 0.0200°: 00 00 00 C8 0.0400°: 00 00 01 90 0.0600°: 00 00 02 58 0.1000°: 00 00 03 E8 0.1200°: 00 00 04 B0 @ 25 Hz: 0.0400°: 00 00 01 90 0.0800°: 00 00 03 20 0.1200°: 00 00 04 B0 0.2000°: 00 00 07 D0 0.2400°: 00 00 09 60

Telegram structure: sRA LMPoutputRange						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Start angle	[1/10000°]	Int_32	4	LMS1xx	-450000d ... +2250000d (FFF92230h ... 225510h)	FF F9 22 30 ... 00 22 55 10
				TiM24x	-1200000d ... +1200000d (FFEDB080h ... 124F80h)	FF ED B0 80 ... 00 12 4F 80
				LMS5xx	-50000d ... +1850000d (FFFF3CB0h ... 1C3A90h)	FF FF 3C B0 ... 00 1C 3A 90
				MRS1000	-475000d ... +2275000d (FFF8C088h ... 22B6B8h)	FF F8 C0 88 ... 00 22 B6 B8
				LMS1000	-480000d ... +2280000d (FFF8AD00h ... 22CA40h)	
				MRS 6000	30000d...1500000d (493E0h ... 16E360h)	00 04 93 E0h ... 00 16 E3 60h
				LMS 4000	+550000d... +1250000d (86470h ... 1312D0h)	00 08 64 70 ... 00 13 12 D0
				LRS4000	-1800000d (FFE488C0h)	FF E4 88 C0
Stop angle	[1/10000°]	Int_32	4	LMS1xx	-450000d ... +2250000d (FFF92230h ... 225510h)	FF F9 22 30 ... 00 22 55 10
				TiM24x	-1200000d ... +1200000d (FFEDB080h ... 124F80h)	FF ED B0 80 ... 00 12 4F 80
				LMS5xx	-50000d ... +1850000d (FFFF3CB0h ... 1C3A90h)	FF FF 3C B0 ... 00 1C 3A 90
				MRS1000	-475000d ... +2275000d (FFF8C088h ... 22B6B8h)	FF F8 C0 88 ... 00 22 B6 B8
				LMS1000	-480000d ... +2280000d (FFF8AD00h ... 22CA40h)	
				MRS 6000	30000d...1500000d (493E0h ... 16E360h)	00 04 93 E0h ... 00 16 E3 60h
				LMS 4000	+550000d... +1250000d (86470h ... 1312D0h)	00 08 64 70 ... 00 13 12 D0
				LRS4000	+1800000d (1B7740h)	00 1B 7740

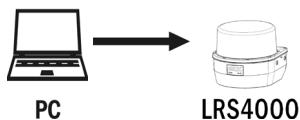
Table 140: Telegram structure: sRA LMPoutputRange

Example: sRA LMPoutputRange

CoLa A	ASCII	<STX>sRA{SPC}LMPoutputRange{SPC}1{SPC}1388{SPC}FFF92230{SPC}225510<ETX>
	Hex	02 73 52 41 20 4C 4D 50 6F 75 74 70 75 74 52 61 6E 67 65 20 31 20 31 33 38 38 20 46 46 46 39 32 32 33 30 20 32 32 35 35 31 30 03
CoLa B	Binary	02 02 02 02 00 00 00 21 73 52 41 20 4C 4D 50 6F 75 74 70 75 74 52 61 6E 67 65 20 00 01 00 00 13 88 FF F9 22 30 00 22 55 10 98

Table 141: Example: sRA LMPoutputRange

4.3.4 Configure the distance scaling of the scandata for the output



Telegram structure: sWN LMDscandatascalefactor (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Change distance scale factor	String	14	All	LMDscandatascalefactor	4C 4D 44 73 63 61 6E 64 61 74 61 73 63 61 6C 65 66 61 63 74 6F 72
ScaleFactor	[mm/digit]	Real as float according to IEEE754	4	LRS4000	Factor × 1: 3F800000h Factor × 2 (values have to be scaled by factor two): 4000000h (Default) MinValue="0.1" MaxValue="16.0" Default "2.0" PhysicalUnit="mm/digit"	3F 80 00 00 40 00 00 00

Table 142: Telegram structure: sWN LMDscandatascalefactor

Example :

ScaleFactor=1 : Distance value represented [16bit] 1mm per digit ; Maximum value $2^{16} = 65535$ mm.

ScaleFactor=2: Distance value represented [16bit] : 2 mm per digit ; Maximum value / range = 131072 mm.

Example: sWN LMDscandatascalefactor 1.0°

CoLa A	ASCII	<STX>sWN{SPC} LMDscandatascalefactor {SPC}3F800000<ETX>
	Hex	02 73 57 4E 20 4C 4D 44 73 63 61 6E 64 61 74 61 73 63 61 6C 65 66 61 63 74 6F 72 20 3F800000 03
CoLa B	Binary	02 02 73 02 00 00 00 23 73 57 4E 20 4C 4D 44 73 63 61 6E 64 61 74 61 73 63 61 6C 65 66 61 63 74 6F 72 20 3F 80 00 00 28

Table 143: Example: sWN LMDscandatascalefactor 1,0



Telegram structure: sWA LMDscandatascalefactor						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Change distance scale factor	String	14	All	LMDscandatascalefactor	4C 4D 44 73 63 61 6E 64 61 74 61 73 63 61 6C 65 66 61 63 74 6F 72

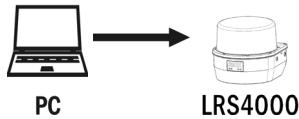
Table 144: Telegram structure: sWA LMDscandatascalefactor

Example: sWA LMDscandatascalefactor

CoLa A	ASCII	<STX>sWA[SPC]LMDscandatascalefactor<ETX>
	Hex	02 73 57 41 20 4C 4D 44 73 63 61 6E 64 61 74 61 73 63 61 6C 65 66 61 63 74 6F 72 03
CoLa B	Binary	02 02 02 02 00 00 00 1A 73 57 41 20 4C 4D 44 73 63 61 6E 64 61 74 61 73 63 61 6C 65 66 61 63 74 6F 72 7A

Table 145: Example: sWA LMDscandatascalefactor

4.3.5 Read the distance scaling for the distance values of the scandata



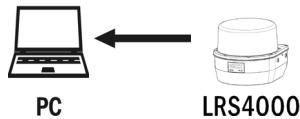
Telegram structure: sRN LMDscandatascalefactor						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Change distance scale factor	String	14	All	LMDscandatascalefactor	4C 4D 44 73 63 61 6E 64 61 74 61 73 63 61 6C 65 66 61 63 74 6F 72

Table 146: Telegram structure: sRN LMDscandatascalefactor

Example: sRN LMDscandatascalefactor

CoLa A	ASCII	<STX>sRN[SPC] LMDscandatascalefactor ETX>
	Hex	02 73 52 4E 20 4C 4D 44 73 63 61 6E 64 61 74 61 73 63 61 6C 65 66 61 63 74 6F 72 03
CoLa B	Binary	02 02 02 02 00 00 00 1A 73 52 4E 20 4C 4D 44 73 63 61 6E 64 61 74 61 73 63 61 6C 65 66 61 63 74 6F 72 70

Table 147: Example: sRN LMPOutputRange



Telegram structure: sRA LMDscandatascalefactor						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Distance Scale Factor	String	14	All	LMDscandatascalefactor	4C 4D 50 6F 75 74 70 75 74 52 61 6E 67 65
ScaleFactor	[mm/digit]	Real as float according to IEEE754	4	All	Factor × 1: 3F800000h Factor × 2 (values have to be scaled by factor two): 40000000h (Default) MinValue="0.1" MaxValue="16.0" Default "1.0" PhysicalUnit="mm/digit"	3F 80 00 00 40 00 00 00

Table 148: Telegram structure: sRA LMDscandatascalefactor

Example: sRA LMDscandatascalefactor

CoLa A	ASCII	<STX>sRA{SPC}LMDscandatascalefactor{SPC}3F800000<ETX>
	Hex	02 73 52 41 20 4C 4D 44 73 63 61 6E 64 61 74 61 73 63 61 6C 65 66 61 63 74 6F 72 20 3F 80 00 00 03
CoLa B	Binary	02 02 02 02 00 00 00 23 73 52 41 20 4C 4D 44 73 63 61 6E 64 61 74 61 73 63 61 6C 65 66 61 63 74 6F 72 20 3F 80 00 00 03 22

Table 149: Example: sRA LMDscandatascalefactor

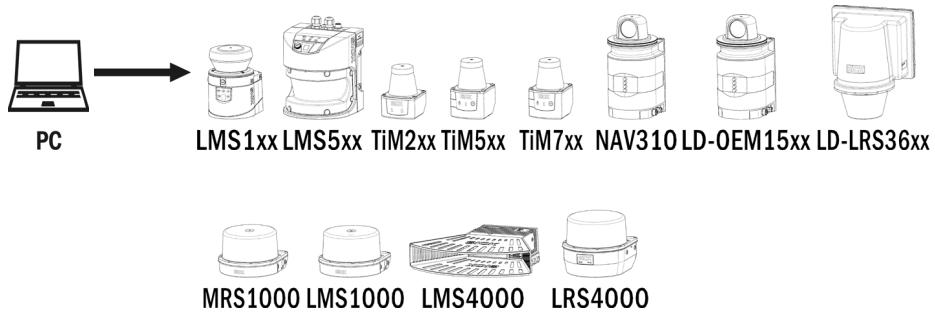
4.3.6 Poll one telegram

Output of values from last scan.

Asking the device for the measurement values of the last valid scan. The device will respond, even if it is not running at the moment.

NOTE

After changing the scanning frequency, there will be no data telegram or answer from the devices LMS1xx, LMS5xx and TiMxxx for up to 30 seconds. The same applies when the device is powering up or rebooting.



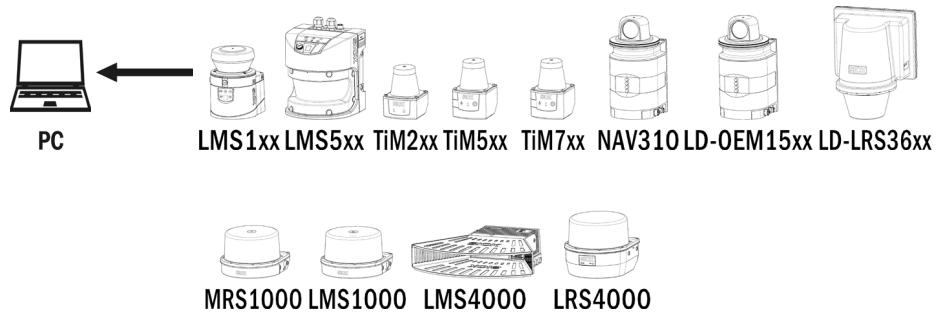
Telegram structure: sRN LMDscandata						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Only one telegram	String	11	All	LMDscandata	4C 4D 44 73 63 61 6E 64 61 74 61

Table 150: Telegram structure: sRN LMDscandata

Example: sRN LMDscandata

CoLa A	ASCII	<STX>sRN{SPC}LMDscandata<ETX>
	Hex	02 73 52 4E 20 4C 4D 44 73 63 61 6E 64 61 74 61 03
CoLa B	Binary	02 02 02 02 00 00 00 0F 73 52 4E 20 4C 4D 44 73 63 61 6E 64 61 74 61 05

Table 151: Example: sRN LMDscandata



Telegram structure: sRA LMDscandata						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Find complete telegram structure of the answer in section 4.3.7 „Send data permanent“ on page 92.						

Table 152: Telegram structure: sRA LMDscandata

Example: sRA LMDscandata

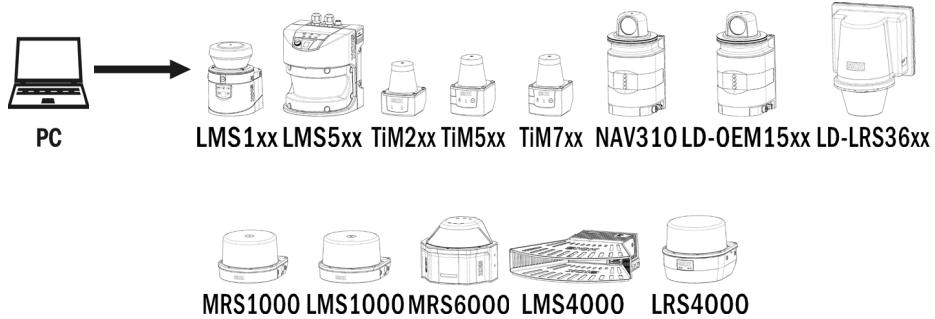
CoLa A	ASCII	No ASCII answer possible.
	Hex	02 73 52 41 20 4C 4D 44 73 63 61 6E 64 61 74 61 20 01 20 01 20 89 C9 97 20 00 20 00 20 1A AE 1A B1 20 58 1C BC 15 20 58 1D 15 3D 20 00 20 00 20 07 20 00 20 00 20 13 88 20 15 20 F6 20 F9 20 F5 20 EF 20 F6 20 F2 20 EF 20 ED 20 F5 20 E9 20 F2 20 FA 20 FC 20 FF 20 F1 20 F2 20 01 07 20 FC 20 FC 20 01 02 20 FF 20 00 20 00 20 00 20 00 20 00 20 00 03
CoLa B	Binary	Find complete telegram structure of the answer in section 4.3.7 „Send data permanent“ on page 92.

Table 153: Example: sRA LMDscandata

4.3.7 Send data permanently


NOTE

After changing the scanning frequency, there will be no data telegram or answer from the devices LMS1xx, LMS5xx and TiMxxx for up to 30 seconds. The same applies when the device is powering up or rebooting.



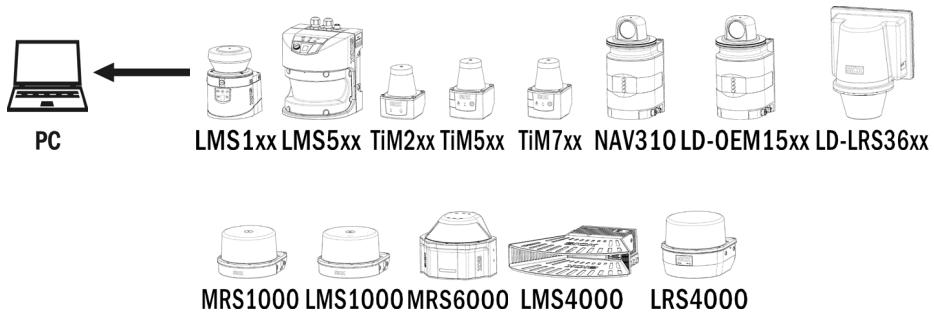
Telegram structure: sEN LMDscandata						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Event	String	3	All	sEN	73 45 4E
Command	Data telegram	String	11	All	LMDscandata	4C 4D 44 73 63 61 6E 64 61 74 61
Measurement	Start/stop	Enum_8	1	All	Stop: 0 Start: 1	Stop: 00 Start: 01

Table 154: Telegram structure: sEN LMDscandata

Example: sEN LMDscandata

CoLa A	ASCII	<STX>sEN{SPC}LMDscandata{SPC}1<ETX>
	Hex	02 73 45 4E 20 4C 4D 44 73 63 61 6E 64 61 74 61 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 11 73 45 4E 20 4C 4D 44 73 63 61 6E 64 61 74 61 20 01 33

Table 155: Example: sEN LMDscandata



Telegram structure: sEA LMDscandata						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sEA	73 45 41
Command	Data telegram	String	11	All	LMDscandata	4C 4D 44 73 63 61 6E 64 61 74 61
Measurement	Start/stop	Enum_8	1	All	Stop: 0 Start: 1	Stop: 00 Start: 01

Table 156: Telegram structure: sEA LMDscandata

Example: Confirmation of sEA LMDscandata

CoLa A	ASCII	<STX>sEA{SPC} LMDscandata{SPC}1<ETX>
	Hex	02 73 45 41 20 4C 4D 44 73 63 61 6E 64 61 74 61 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 11 73 45 41 20 4C 4D 44 73 63 61 6E 64 61 74 61 20 01 33

Table 157: Example: Confirmation of sEA LMDscandata

Telegram stream

The answer to the telegram will be followed by the scandata:

NOTE

Leading zeros of a value will not be displayed in ASCII.

Telegram structure: sRA LMDscandata/sSN LMDscandata						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRA sSN	73 52 41 73 53 4E
Command	Data telegram	String	11	All	LMDscandata	4C 4D 44 73 63 61 6E 64 61 74 61
Version number	For detecting format changes by the version. Version is always 0 or 1 up to now.	Uint_16	2	All	1h ... FFFFh	00 01 ... FF FF

4 TELEGRAMS

Telegram structure: sRA LMDscandata/sSN LMDscandata						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Device	Device number	Defined with SOPAS	Uint_16	2	All	0h ... FFFFh 00 00 ... FF FF
	Serial number	Defined in factory	Uint_32	4	All	0h ... FFFFFFFFh 00 00 00 00 ... FF FF FF FF
	Device status	(See values column)	Uint_8	2 × 1	All	Ok: 0 0 Error: 0 1 00 00 (0000 0000) 00 01 (0000 0001)
					LMS1xx	Pollution warning: 0 2 Pollution error with no device error: 0 4 00 02 (0000 0010)
					LMS5xx	Pollution error with device error: 0 5 00 04 (0000 0100)
					LMS4000	Data output during laser off: 1 0 00 05 (0000 0101)
Status info	Telegram counter	Number of measurement telegrams finished in the scanner and given to the interface. ³⁾	Uint_16	2	All	0h ... FFFFh 00 00 ... FF FF
	Scan counter	Number of scans which were created in the device; counts how many scans were really done.	Uint_16	2	All	0h ... FFFFh 00 00 ... FF FF
	Time since start up in µs	Counting the time since power up the device; starting with 0. In the output telegram this is the time at the zero index before the measurement itself starts.	Uint_32	4	All	0h ... FFFFFFFFh 00 00 00 00 ... FF FF FF FF
	Time of transmission in µs	Time in µs when the complete scan is transmitted to the buffer for data output; starting with 0 at scanner bootup.	Uint_32	4	All	0h ... FFFFFFFFh 00 00 00 00 ... FF FF FF FF
	Status of digital inputs	Low byte represents input 1.	Uint_8	2 × 1	LMS1xx	All inputs low: 0 0 All inputs high: 3 0 00 00 03 00
					LMS4000	All inputs low: 0 0 IN1 high: 1 0 IN2 high: 2 0 IN1+2 high: 3 0 00 00 01 00 02 00 03 00

³⁾ Does not count how many telegrams were really given out; is relevant if not all scans are delivered from the scan core.

Telegram structure: sRA LMDscandata/sSN LMDscandata						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
				TiM24x MRS 1000 LMS1000 MRS6000 LRS4000	0 0	00 00
Status of digital outputs	Low byte represents output 1.	Uint_8	2 × 1	All	All outputs low: 0 0	00 00
				TiM5xx, TiM7xx	All outputs high: F 0	0F 00
				TiM24x	All outputs high: 2 0	02 00
				LMS1xx	All internal outputs high: 7 0 All outputs high (inkl. Ext. Out): 07 FF	07 00 07 FF
				LMS5xx	All internal outputs high: 3F 0 All outputs high (inkl. Ext. Out): 3F FF	3F 00 3F FF
				LDxxx	All outputs high: F 0	0F 00
				LMS4000	OUT1 high: 1 0 OUT2 high: 2 0 OUT1+2 high: 3 0 OUT4 high: 8 0 OUT1+4 high: 9 0 OUT2+4 high: A 0 OUT1+2+4 high: B 0	01 00 02 00 03 00 08 00 09 00 0A 00 0B 00
				LMS1000, MRS1000, MRS6000 LRS4000	Always: 0	00 00
				All	0	0
				MRS1000	0 → 0 Layer2 FF06 → -250Layer3 FA → 250 Layer1 FE0C → -500Layer4 (value 1/100)	00 00 00 00 46 46 30 36 00 00 46 41 46 45 30 43
former Reserved now Layer angle.	-	Uint_16	2	MRS6000	Angle = value / 200 Example: F5B2h → -2638/200= -13.19° → Layer 24 EDh → 237/200= 1.185° → Layer 1 Range: -13.19° ~ 1.185° (each layer is 0.625°)	Angle = value / 200 Example: F5 B2 → Layer 24 00 ED → Layer 1
				Int_16		

Telegram structure: sRA LMDscandata/sSN LMDscandata							
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)	
Frequencies	Scan frequency [1/100 Hz]	Uint_32	4	LMS1xx	25 Hz: +2500d (9C4h) 50 Hz: +5000d (1388h)	09 C4 13 88	
				LMS5xx	25 Hz: +2500d (9C4h) 35 Hz: +3500d (DACH) 50 Hz: +5000d (1388h) 75 Hz: +7500d (1A0Bh) 100 Hz: +10000d (2710h)	09 C4 0D AC 13 88 1A 0B 27 10	
				TiMxxx	15 Hz: +1500d (5DCh)	05 DC	
				TiM24x	14.5 Hz: +1450d (5AAh)	05 AA	
				NAV310 LD-OEM 15xx	5 Hz ... 20 Hz: +500d ... +2000d (1F4h ... 7D0h)	01 F4 ... 07 D0	
				LD-LRS 36xx	5 Hz ... 15 Hz: +500d ... +1500 (1F4h ... 5DCh))	01 F4 ... 05 DC	
				MRS1000	50 Hz: +5000d (1388h)	50 Hz: 13 88	
				LMS1000	150 Hz: +15000d (3A98h)		
				MRS6000	10 Hz: +1000d (3E8h)	10 Hz: 03 E8	
				LMS4000	600 Hz: +60000d (EA60h)	600 Hz: EA 60	
Measurement frequency	Inverse of the time between two measurement shots (in 100 Hz), Example: 50 Hz, 0.5° resolution → 720 shots/20 ms → 36 kHz	Uint_32	4	All	00000000h ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF	
				LMS4000	21C0h	00 00 21 C0	
Amount of encoder	If 0, then next two values are missing.	Enum_16	2	TiMxxx MRS1000 LMS1000 MRS6000	Always: 0	Always: 00 00	
				LMS1xx LMS5xx	0 ... 3	00 00 ... 00 03	
				LMS4000 LRS4000	0 External encoder: 1	00 00 00 01	
Values	Encoder position	Info in ticks	Uint_32	4	LMS1xx LMS5xx LMS4000 LRS4000	0h ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF

Telegram structure: sRA LMDscandata/sSN LMDscandata						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Encoder speed	Ticks/mm	Uint_16	2	LMS1xx LMS5xx LRS4000	0h ... FFFFh	00 00 ... FF FF
				LMS4000	Always: 0	Always: 00 00
Amount of 16 bit channels	Number of 16 bit channels that provide measured data	Uint_16	2	TiMxxx	Output channel: 1	Output channel: 01
				LMS1xx	Output channels: 1, 2 or 4	Output channels: 01, 02 or 04
				LMS5xx	Output channels: 1 or 5	Output channels: 01 or 05
				MRS1000 LMS1000	Output channels: 1 or 3	Output channels: 01 or 03
				MRS6000	Output channels:1..9	Output channels:01..09
				LMS4000	Output channels: 0...3	Output channels: 00...03
				NAV310 LD-OEM 15xx LD-LRS 36xx	Depending on amount of sectors and selection of output of distance or distance and remission RSSI Example (2 sectors): If 2 channels: sectors 1 + 2 contain Dist1 If 4 channels: sectors 1 + 2 contain Dist + RSSI1	Depending on amount of sectors and selection of output of distance or distance and remission RSSI Example (2 sectors): If 2 channels: sectors 1 + 2 contain Dist1 If 4 channels: sectors 1 + 2 contain Dist + RSSI1
				LRS4000	Output Channels: 1,2,3,6 (1 or 3, with or without RSSI)	Output channel: 01

Telegram structure: sRA LMDscandata/sSN LMDscandata						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Output channel I (16 bit)	Content Defines the content of the output channel Unit of radial distance values (DIST) is mm	String	5	LMS1xx	DIST1: Distance values of first pulse DIST2: Distance values of second pulse RSSI1: Energy values of first pulse RSSI2: Energy values of second pulse	44 49 53 54 31 44 49 53 54 32 52 53 53 49 31 52 53 53 49 32
				LMS5xx (with Software ≥V1.10 only)	DIST1: Distance values of first pulse DIST2: Distance values of second pulse DIST3: Distance values of third pulse DIST4: Distance values of fourth pulse DIST5: Distance values of fifth pulse RSSI1: Energy values of first pulse RSSI2: Energy values of second pulse RSSI3: Energy values of third pulse RSSI4: Energy values of forth pulse RSSI5: Energy values of fifth pulse	44 49 53 54 31 44 49 53 54 32 44 49 53 54 33 44 49 53 54 34 44 49 53 54 35 52 53 53 49 31 52 53 53 49 32 52 53 53 49 33 52 53 53 49 34 52 53 53 49 35
				TiMxxx	DIST1: Distance values	44 49 53 54 31
				MRS1000	DIST1: Distance values	44 49 53 54 31
				LMS1000	DIST2: Distance values DIST3: Distance values RSSI1: Energy values RSSI2: Energy values RSSI3: Energy values	44 49 53 54 32 44 49 53 54 33 52 53 53 49 31 52 53 53 49 32 52 53 53 49 33

Telegram structure: sRA LMDscandata/sSN LMDscandata						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
				MRS6000	DIST1: Distance values DIST2: Distance values DIST3: Distance values DIST4: Distance values RSSI1: Energy values RSSI2: Energy values RSSI3: Energy values RSSI4: Energy values VANGL: Vertical Angle	44 49 53 54 31 44 49 53 54 32 44 49 53 54 33 44 49 53 54 34 52 53 53 49 31 52 53 53 49 32 52 53 53 49 33 52 53 53 49 34 56 41 4E 47 4C
				NAV310 LD-OEM 15xx LD-LRS 36xx	DIST1: Distance values RSSI1: Energy values	44 49 53 54 31 52 53 53 49 31
				LMS4000	DIST1: Distance values RSSI1: Energy values in digit REFL1: Calibrated energy values in percent ANGL1: Angle Offset values	44 49 53 54 31 52 53 53 49 31 52 45 46 4C 31 41 4E 47 4C 31
				LRS4000	DIST1: Distance values DIST2: Distance values DIST3: Distance values RSSI1: Energy values RSSI2: Energy values RSSI3: Energy values	
Scale factor	Scale factor or factor of the measurement values (for the LMS5xx this depends on the angular resolution)	Real as float according to IEEE754	4	LMS1xx LMS5xx TiMxxx MRS 1000 LMS 1000	Factor × 1: 3F800000h Factor × 2: 40000000h	3F 80 00 00 40 00 00 00
				MRS6000	Factor x 12.5: 41480000h Factor × 1: 3F800000h Factor x -0.00025: B983126Fh	41 48 00 00 3F 80 00 00 B9 83 12 6F
				NAV310 LD-OEM 15xx LD-LRS 36xx	Factor × 4: 40800000h	04 08 00 00

Telegram structure: sRA LMDscandata/sSN LMDscandata						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
				LMS4000	Factor x 0.1: 3DCCCDDh (DIST1) Factor × 1: 3F800000h (RSSI1) Factor × 1: 3F800000h (REFL1) Factor × 1: 3F800000h (ANGL1)	3D CC CC CD 3F 80 00 00 3F 80 00 00 3F 80 00 00
				LRS4000	Factor x 2 4000000h (0.1 .. 16.0 (Default 2.0))	40 00 00 00
Scale factor offset	Sets starting point of measurement	Real as float according to IEEE754	4	LMS1xx LMS5xx TiMxxx MRS 1000 LMS 1000	0	00 00 00 00
				MRS6000	Offset 0 : 0 Offset 1.5: 3FC00000 (1.5 offset for VANGL)	00 00 00 00 3F C0 00 00 (1.5 offset for VANGL)
				NAV310 LD-OEM 15xx LD-LRS 36xx	00000000h ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF
				LMS4000	DIST1: 0 RSSI1: 0 REFL1: 0 ANGL1: C7000000h (-32768 = 3.2768°)	00 00 00 00 00 00 00 00 00 00 00 00 C7 00 00 00
Start angle	[1/10000 °]	Uint_32	4	LMS1xx TiMxxx	-450000d ... +2250000d (FFF92230h ... 225510h)	FF F9 22 30 ... 00 22 55 10
				TiM24x	-1200000d ... +1200000d (FFEDB080h ... 124F80h)	FF ED B0 80 ... 00 12 4F 80
				LMS5xx	-50000d ... +1850000d (FFFF3CB0h ... 1C3A90h)	FF FF 3C B0 ... 00 1C 3A 90
				MRS 1000	-475000d ... +2275000d (FFF8C088h ... 22B6B8h)	FF F8 C0 88 ... 00 22 B6 B8
				LMS 1000	-480000d ... +2280000d (FFF8AD00h ... 22CA40h)	FF F8 AD 00 ... 00 22 CA 40
				MRS 6000	+30000d...+1500000d (493E0h ... 16E360h)	00 04 93 E0h ... 00 16 E3 60h
				NAV310 LD-OEM 15x1 LD-LRS 36x1	0d ... +3600000d (0h ... 36EE80h)	00 00 00 00 ... 00 36 EE 80

Telegram structure: sRA LMDscandata/sSN LMDscandata						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Size of single angular step	Output format in degree: 1/10000°	Uint_16	2	LD-OEM 15x0 LD-LRS 36x0	-900000d ... +2700000d (FFF24460h ... 41EB0h)	FF F2 44 60 ... 00 04 1E B0
				LMS4000	+550000d... +1250000d (86470h ... 1312D0h)	00 08 64 70 ... 00 13 12 D0
				LRS4000	1800000d .. + 1800000d (1B7740h ... FFE488C0h)	00 1B 77 40 FF E4 88 C0
				LMS1xx	+2500d ... +5000d (9C4h ... 1388h)	09 C4 ... 13 88
				LMS5xx	+1667d ... +10000d (683h ... 2710h)	06 83 ... 27 10
				TiMxxx	+333d ... +10000d (D05h ... 2710h)	0D 05 ... 27 10
				TiM24x	+10000d (2710h)	27 10
				MRS1000	+2500d (9C4h)	09 C4
				LMS1000	+7500d (1D4Ch)	1D 4C
				MRS6000	+1300d (= 0.13°) (515h)	05 15
Amount of data	Defines the number of items on measured output	Uint_16	2	NAV310 LD-OEM 15xx LD-LRS 36xx	0.125° ... 1° def. 0.25° +1250d ... +10000d (4E2h ... 2710h) (Default: 09C4h = 0.25°)	04 E2 ... 27 10 (Default: 09 C4)
				LMS4000	0.0833°: +833 (341h)	0.0833°: 03 41
				LRS4000	@ 12.5 Hz: 0.0200°: +200d (C8h) 0.0400°: +400d (190h) 0.0600°: +600d (258h) 0.1000°: +1000d (3E8h) 0.1200°: +1200d (4B0h) @ 25 Hz: 0.0400°: +400d (190h) 0.0800°: +800d (320h) 0.1200°: +1200d (4B0h) 0.2000°: +2000d (7D0h) 0.2400°: +2400d (960h)	@ 12.5 Hz: 0.0200°: 00 00 00 C8 0.0400°: 00 00 01 90 0.0600°: 00 00 02 58 0.1000°: 00 00 03 E8 0.1200°: 00 00 04 B0 @ 25 Hz: 0.0400°: 00 00 01 90 0.0800°: 00 00 03 20 0.1200°: 00 00 04 B0 0.2000°: 00 00 07 D0 0.2400°: 00 00 09 60
				All	0h ... FFFFh	00 00 ... FF FF
				LMS100	0h ... 4E20h	00 00 00 00 ... 00 00 4E 20
				LMS150	0h ... C350h	00 00 00 00 ... 00 00 C3 50
				LMS5xx	0h ... FDE8h	00 00 00 00 ... 00 00 FD E8
				Data_1 Data_n	Data stream starting Data_1 to Data_n ⁴⁾	

⁴⁾ LMS1xx without limit.

Telegram structure: sRA LMDscandata/sSN LMDscandata						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
				TiMxxx	0h ... 61A8h	00 00 00 00 ... 00 00 61 A8
				MRS 1000	0h ... FA00h	00 00 00 00 .. 00 00 FA 00
				LMS 1000		
				MRS 6000	0h...8CA0h(DIST) 0h...FFFFh(RSSI) EDh...F5B2h(VANGL)	00 00...8C A0 (DIST) 00 00...FF FF(RSSI) 00 ED...F5 B2 (VANGL)
				LMS 4000	0h...FFFFh (DIST1) 0h...FFFFh (RSSI1) 0h...FFFFh (REFL1) 0h...FFFFh (ANGL1)	00 00 ... FF FF 00 00 ... FF FF 00 00 ... FF FF 00 00 ... FF FF
				NAV310 LD-OEM 15xx LD-LRS 36xx	0h ... 0992h	00 00 00 00 ... 00 00 09 92
				LRS4000	0000h ... FFFFh	00 00 ... FF FF

For NAV310/LD-OEM15xx/LRS:

The array “Output channel 16 bit ” has various dimensions “Amount of 16 Bit Channels”, depending on the amount of sectors and if RSSI (output of remission values) is selected as on or off:

- If RSSI was not selected (by LMDscandatacfg); there are 2 channels with the contents
 - Channel 1: First sector (Test target), content: DIST1
 - Channel 2: Second sector (Main profile data), content: DIST1
- If RSSI was selected (by LMDscandatacfg); there are 4 channels with the contents
 - Channel 1: First sector (Test target), content: DIST1
 - Channel 2: First sector (Test target), content: RSSI1
 - Channel 3: Second sector (Main profile data), content: DIST1
 - Channel 4: Second sector (Main profile data), content: RSSI1

The number behind DIST and RSSI is the order number of the pulse. As the NAV310/LD-OEM15xx/LD-LRS36xx scanner are working with a single pulse measurement, it is always “1”.

Amount of 8 bit channels	Amount of 8 bit channels, giving out the measured data	Enum_16	2	LMS1xx	Output channels: 1 or 2	01 or 02
				LMS5xx	Output channels: 1 or 5	01 or 05
				MRS1000 LMS1000	Output channels: 1 or 3	01 or 03
				LMS4000	Output channels: 0 or 1	00 or 01
				TiMxxx NAV310 LD-OEM 15xx LD-LRS 36xx MRS6000 LRS4000	Output channels: 0	00

Telegram structure: sRA LMDscandata/sSN LMDscandata							
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)	
Output channel (8 bit)	Content Defines the content of the output channel	String	5	LMS1xx	DIST1 DIST2 RSSI1 RSSI2	44 49 53 54 31 44 49 53 54 32 52 53 53 49 31 52 53 53 49 32	
				5	LMS5xx (with Software ≥V1.10 only)	DIST1 DIST2 DIST3 DIST4 DIST5 RSSI1 RSSI2 RSSI3 RSSI4 RSSI5	44 49 53 54 31 44 49 53 54 32 44 49 53 54 33 44 49 53 54 34 44 49 53 54 35 52 53 53 49 31 52 53 53 49 32 52 53 53 49 33 52 53 53 49 34 52 53 53 49 35
				5	TiMxxx	DIST1 RSSI1	44 49 53 54 31 52 53 53 49 31
				MRS1000 LMS1000	DIST1 DIST2 DIST3 RSSI1 RSSI2 RSSI3 AINF1 (Ambient light)	44 49 53 54 31 44 49 53 54 32 44 49 53 54 33 52 53 53 49 31 52 53 53 49 32 52 53 53 49 33 41 49 4E 46 31	
				LMS 4000	QLTY1	51 4C 54 59 31	
Scale factor	Scale factor or of the measurement values (in LMS5xx depends on the angular resolution)	Real as float according to IEEE754	4	All	Factor × 1: 3F800000h Factor × 2 (values have to be scaled by factor two): 40000000h	3F 80 00 00 40 00 00 00	
Scale factor offset	Sets starting point of measurement	Real as float according to IEEE754	4	All	0h	00 00 00 00	
Start angle	Output format: 1/10000 °	Int_32	4	LMS1xx	-450000d ... +225000d	FF F9 22 30 ... 00 22 55 10	
				LMS5xx	-50000d ... 1850000d	FF FF 3C B0 ... 00 1C 3A 90	
				LMS1000	-480000d ... +2280000d (FFF8AD00h ... 22CA40h)	FF F8 AD 00 ... 00 22 CA 40	
				MRS1000	-475000d ... +2275000d (FFF8C088h ... 22B6B8h)	FF F8 C0 88 ... 00 22 B6 B8	
				LMS4000	+550000d... +1250000d (86470h ... 1312D0h)	00 08 64 70 ... 00 13 12 D0	

Telegram structure: sRA LMDscandata/sSN LMDscandata						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Size of single angular step	Output format: 1/10000 °	Uint_16	2	LMS1xx	+1000d ... +10000d	03 E8 ... 27 10
				LMS5xx	+1667d ... +10000d	06 83 ... 27 10
				LMS 1000	+7500d (1D4Ch)	1D 4C
				MRS 1000	+2500d (9C4h)	09 C4
				LMS 4000	0.0833°: +833 (341h)	0.0833°: 03 41
Amount of data	Amount	Uint_16	2	All	0000h ... FFFFh	00 00 ... FF FF
Data_1 Data_n	Data stream starting Data_1 to Data_n	Uint_8	1	All	00h ... FFh	00 ... FF
				MRS 1000 LMS 1000	DIST & RSSI: 0h ... FFh AINF (Intensity): 0: 00 1: 04 2: 08 3: 0C 4: 10 5: 14 6: 18 7: 1C	00 ... FF
				LMS 4000	8-Bit Quality Channel Bit 0 (below lower signal threshold): e.g. 1h (0000 0001d) Bit 1 (above upper signal threshold): e.g. 2h (0000 0010d) Bit 2 (below lower distance threshold): e.g. 4h (0000 0100d) Bit 3 (above upper distance threshold): e.g. 8h (0000 1000d) Bit 4 (normal hit): e.g. 10h (0001 0000d) Bit 4+5 (edge hit likelihood): e.g. likely 20h (0010 0000d) or very likely (30h (0011 0000d)) Bit 6 (possible outlier): e.g. 40h (0100 0000d) Bit 7 (partial gloss): e.g. 80h (1000 0000d)	00 ... FF e.g. 01 e.g. 02 e.g. 04 e.g. 08 e.g. 10 e.g. 20 or 30 e.g. 40 e.g. 80
Position	Output of position data	Enum_16	2	All	No position data: 0	No position data: 00 00
Name	Device name	Uint_16	2	All	No name: 0 Name: 1	No name: 00 00 Name: 00 01
Name information	Length	Length of name	Uint_16	2	All	0h ... Fh
	Name	Device name in characters	String	16	All	20h ... 7Ah
Comment	Comment	Uint_16	2	All	No comment: 0 Comment: 1	No comment: 00 00 Comment: 00 01

Telegram structure: sRA LMDscandata/sSN LMDscandata						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Comment information	Length	Length of comment	Uint_8	1	All	0h ... Fh 00 ... 0F
	Comment	Transmits a comment in characters	String	16	All	20h ... 7Ah 20 ... 7A
Time	Transmits a time stamp	Uint_16	2	All	No time: 0	No time: 00 00
				LMS1xx, LMS5xx, NAV310, LD-OEM 15xx LD-LRS 36xx LMS 4000 LRS4000	Time: 1	Time: 00 01
Time info	Year	1970 to 2037	Uint_16	2	All	7B2h ... 07F5h 07 B2 ... 07 F5
	Month	1 to 12	Uint_8	1	All	0h ... Ch 00 ... 0C
	Day	Day of month 1 to 31	Uint_8	1	All	0h ... 1Fh 00 ... 1F
	Hour	0 to 23	Uint_8	1	All	0h ... 17h 00 ... 17
	Minute	0 to 59	Uint_8	1	All	0h ... 3Bh 00 ... 3B
	Second	0 to 59	Uint_8	1	All	0h ... 3Bh 00 ... 3B
	Micro-second	0 to 999999	Uint_32	4	All	0h ... F423Fh 00 00 00 00 ... 00 0F 42 3F
Event info		Display event info	Uint_16	2	All	No info: 0 Transmit info: 1 No info: 00 00 Transmit info: 00 01
Event Information	Type	Fast digital input	String	4	All	FDIN FDIN
	Encoder position	Position of encoder when event happened	Uint_32	4	All	00000000h ... FFFFFFFFh 00 00 00 00 ... FF FF FF FF
	Time of event	Time (μ s) of encoder when event happened	Uint_32	4	All	00000000h ... FFFFFFFFh 00 00 00 00 ... FF FF FF FF
	Angle of event	Angle of encoder when event happened	Int_32	4	All	0 ... 3600000 00 00 00 00 ... 00 36 EE 80

Table 158: Telegram structure: Datastream of sRA LMDscandata/sSN LMDscandata

**NOTE**

- The grey written parts are not given out by the sensor.
- The event information is not available with the LMS1xx and with the LMS5xx only with firmware V1.20 or higher.
- The order of events within the data structure is “newest” first.

LMDscandata - reserved values

Valid distance measurement values are values starting from 16d upwards; everything below has the following meaning:

DIST	RSSI	Description
0d	0h	Invalid measurement value; caused by very low remission (extremely dark object), object distance not within measurement range (too close or too far away) or selected filter settings at device
1d	FFFFh (16Bit output) FFh (8Bit output)	Invalid measurement value, device was dazzled or blinded, e.g. by measuring into the sun
2d	0h	Implausible measurement values (not used for LMS5xx)
3d	0h	Value was set to invalid by a filter (Echo Filter, Particle Filter) or GRE (ground reference evaluation, MRS1000) (not used for LMS5xx, TiM)
4d – 15d	0h	Reserved, currently not in use
≥16d	>0h	Valid measurement values

max. measurement value LMS4000: Dez: 3 150 mm --> Hex: 7B0C (scale factor 0.1)

max. measurement value TiM5xx: Dez: 10 000 mm --> Hex: 2710

max. measurement value TiM57x: Dez: 25 000 mm --> Hex: 61A8

max. measurement value LMS1xx: Dez: 20 000 mm --> Hex: 4E20

max. measurement value LMS15x: Dez: 50 000 mm --> Hex: C350

max. measurement value LMS5xx: Dez: 65 000 mm --> Hex: FDE8

max. measurement value LMS5xx: Dez: 80 000 mm --> Hex: 9C40 with scale factor 2 --> 13880

Higher measurement values will be given out with a zero, that means no measurement value detected.

Calculation and amount of data for LMS5xx

Example how to calculate the amount of data for a measurement telegram.

Sizes of values and telegram parts:

- one measurement value: 5 byte (4 byte value itself, 1 byte blank after the value)
- one RSSI value: 3 byte (2 byte value itself, 1 byte blank after the value)
- telegram header: 81 byte
- telegram end: 12 byte

Calculation of number of Measurement values depends always on the resolution:

$0.5^\circ = 2$ measurements per degree

$0.25^\circ = 4$ measurements per degree

Always one additional measurement for the last measurement

Number of measurement values =

Number of degrees × measurements per degree + 1

Example for measurement of 56° in 0.5° resolution (without RSSI data):

$56 \times 2 + 1 = 113$ Measurement values

Amount of Data for this measurement values:

$113 \times 5 \text{ Byte} = \underline{565 \text{ Byte}}$

Calculation of amount of data per telegram:

Data of one Telegram = Header + Measurements + end of telegram

81 Byte + 113 Measurements + 12 Byte

$81 \text{ Byte} + (113 \times 5 \text{ Byte}) + 12 \text{ Byte} =$

658 Byte per Telegram (= $5264 \text{ Bit} (658 \times 8 \text{ Bit})$)

Possible amount for delivery with special Speed:

Number of telegrams per second = Speed ÷ telegram size

Speed Example:

$115200 \text{ Bit/s} = 11520 \text{ Byte/s} = 11,52 \text{ Byte/s}$

$11520 \text{ (Byte/s)} \div 658 \text{ Byte} = \underline{17,5 \text{ Telegrams/s}}$

Telegram size with **0,25°** resolution:

Degrees: 270°

Resolution: 0.25°

→ Measurement Values = $270 \times 4 + 1 = 1081$

Data per Telegram =

$$81 \text{ Byte} + (1081 \times 5 \text{ Byte}) + 12 \text{ Byte} = \underline{\underline{5498 \text{ Byte}}} \quad (= 43984 \text{ Bit})$$

Telegram size with **0,5°** resolution:

Degrees: 270°

Resolution: 0.5°

→ Measurement Values = $270 \times 2 + 1 = 541$

Data per Telegram =

$$81 \text{ Byte} + (541 \times 5 \text{ Byte}) + 12 \text{ Byte} = \underline{\underline{2798 \text{ Byte}}} \quad (= 22384 \text{ Bit})$$

As a result in that configuration a 10 Mbit connection will not be enough. With a 100 Mbit Hub, 3-4 scanner can be used, with a 1 Gbit Hub accordingly more.

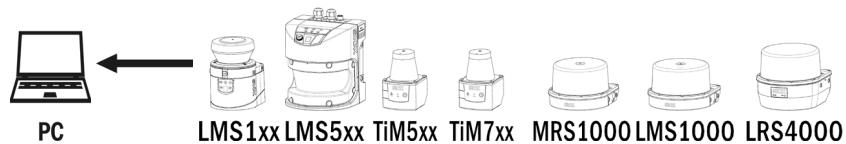
Example of a telegram stream

Example: telegram LMS1xx, LMS5xx similar with corresponding values (10°-20° data range)

ASCII

<STX>sRA[SPC]LMDscandata[SPC]1[SPC]1[SPC]89A27F[SPC]0[SPC]0[SPC]343[SPC]347[SPC]2747
7BA9[SPC]2747813B[SPC]0[SPC]0[SPC]7[SPC]0[SPC]0[SPC]1388[SPC]168[SPC]0[SPC]1[SPC]DIST
1[SPC]3F800000[SPC]00000000[SPC]186A0[SPC]1388[SPC]15[SPC]8A1[SPC]8A5[SPC]8AB[SPC]
8AC[SPC]8A6[SPC]8AC[SPC]8B6[SPC]8C8[SPC]8C2[SPC]8C9[SPC]8CB[SPC]8C4[SPC]8E4[SPC]8E1{
[SPC]8EB[SPC]8E0[SPC]8F5[SPC]908[SPC]8FC[SPC]907[SPC]906[SPC]0[SPC]0[SPC]0[SPC]0[SPC]0
{[SPC]0<ETX>

BINARY



Telegram structure: sRA LMDscandata (Example)				
Telegram part	Variable	Length	Values CoLa A (ASCII)	Values CoLa B (Binary)
Frame/header			02 <STX>	02 02 02 02
Length				00 00 00 83
Command type	String	3	sRA[SPC]	73 52 41 20
Command	String	11	LMDscandata[SPC]	4C 4D 44 73 63 61 6E 64 61 74 61 20
Version number	Uint_16	2	1[SPC]	00 01
'> c d Device number	Uint_16	2	1[SPC]	00 01

Telegram structure: sRA LMDscandata (Example)					
Telegram part		Variable	Length	Values CoLa A (ASCII)	Values CoLa B (Binary)
	Serial number	Uint_32	4	89A27F{SPC} Dec: 9020031	00 89 A2 7F
	Device status	Uint_8	2 × 1	0{SPC}0{SPC}	00 00
Status information	Telegram counter	Uint_16	2	343{SPC} Dec: 835	03 43
	Scan counter	Uint_16	2	347{SPC} Dec: 839	03 47
	Time since start up [μs]	Uint_32	4	27477BA9{SPC} Dec: 658996137	27 47 7B A9
	Time of transmission [μs]	Uint_32	4	2747813B{SPC} Dec: 568997563	27 47 81 3B
	Status of digital inputs	Uint_8	2 × 1	0{SPC}0{SPC}	00 00
	Status of digital outputs	Uint_8	2 × 1	7{SPC}0{SPC} Corresponds to status 0111	07 00
	Reserved	Uint_16	2	0{SPC}	00 00
Frequencies	Scan frequency	Uint_32	4	1388{SPC} Dec: 5000/100 = 50 Hz	00 00 13 88
	Measurement frequency	Uint_32	4	168{SPC}	00 00 01 68
Amount of encoder		Enum_16	2	0{SPC} No encoder data	00 00
Position information	Encoder position	Uint_16	2	Not generated, not existing because amount is 0	Not generated, not existing because amount is 0
	Encoder speed	Uint_16	2	Not generated, not existing because amount is 0	Not generated, not existing because amount is 0
Amount of 16 bit channels		Enum_16	2	1{SPC}	00 01
Output channel (16 bit)	Content	String	5	DIST1{SPC}	44 49 53 54 31
	Scale factor according to IEEE754	Real	4	3F800000{SPC} Floating Point: Value = 1	3F 80 00 00
	Scale factor offset acco. to IEEE754	Real	4	0{SPC} Floating Point: Value = 0	00 00 00 00
	Start angle	Int_32	4	186A0{SPC} Dec: 100000/10000 = 10°	00 01 86 A0
	Size of single angular step	Uint_16	2	1388{SPC} Dec: 5000/10000 = 0.5°	13 88
	Amount of data	Uint_16	2	15{SPC} Dec: 21 measurement points	00 15
	Data_1 ... Data_21	Uint_16	2	8A1{SPC}8A5{SPC}8AB{SPC}8AC{SPC}8A6{SPC}8AC{SPC}8B6{SPC}8C8{SPC}8C2{SPC}8C9{SPC}8CB{SPC}8C4{SPC}8E4{SPC}8E1{SPC}8EB{SPC}8E0{SPC}8F5{SPC}908{SPC}8FC{SPC}907{SPC}906{SPC} Measurement data Min. 22 mm: 16h Max. 20000 mm: 4E20h	08 A1 08 A5 08 AB 08 AC 08 A6 08 AC 08 B6 08 C8 08 C2 08 C9 08 CB 08 C4 08 E4 08 E1 08 EB 08 E0 08 F5 09 08 08 FC 09 07 09 06

Telegram structure: sRA LMDscandata (Example)				
Telegram part	Variable	Length	Values CoLa A (ASCII)	Values CoLa B (Binary)
Amount of 8 bit channels	Enum_16	2	0{SPC} No 8 bit data	00 00 No 8 bit data
Output channel (8 bit)	Content	String	5	-
	Scale factor	Real	4	-
	Scale factor offset	Real	4	-
	Start angle	Int_32	4	-
	Size of single angular step	Uint_16	2	-
	Amount of data	Uint_16	2	-
	Data_1 Data_n	Uint_8	1	-
Position	Enum_16	2	0{SPC} No position data	00 00 No position data
Position information	X position	Real	4	-
	Y position	Real	4	-
	Z position	Real	4	-
	X rotation	Real	4	-
	Y rotation	Real	4	-
	Z rotation	Real	4	-
	Rotations type	Enum_8	1	-
Name	Enum_16	2	No device name: 0	00 00
Comment	Enum_16	2	No comment: 0	00 00

Telegram structure: sRA LMDscandata (Example)				
Telegram part		Variable	Length	Values CoLa A (ASCII)
Time		Enum_16	2	0{SPC} No time transmitted
Time info	Year	Uint_16	2	-
	Month	Uint_8	1	-
	Day	Uint_8	1	-
	Hour	Uint_8	1	-
	Minute	Uint_8	1	-
	Second	Uint_8	1	-
	Microsecond	Uint_32	4	-
Event info		Enum_16	2	0{SPC} No event info available
Event information	Type	String	4	-
	Encoder position	Uint_32	4	-
	Time of event	Uint_32	4	-
	Angle of event	Int_32	4	-
Frame				03 <ETX>
				2B Checksum

Table 159: Example of one telegram stream

4.4 Time stamp

Telegram validity overview

		LMS1xx	LMS5xx	TiM2xx	TiM5xx	TiM7xx	NAV310	LD-OEM15xx	LD-LRS36xx	MRS1000	LMS1000	MRS6000	LMS4000	LRS4000
4.4.1	Set time stamp	x	x				x	x	x			x	x	
4.4.2	Read time stamp and status of the measurement function	x	x											
4.4.3	Read device time						x	x	x			x	x	x
4.4.4	Set NTP (Network Time Protocol) parameters	x	x									x	x	

4.4.1 Set time stamp

The data format in the telegram is:

+2009{SPC}+7{SPC}+22{SPC}+12{SPC}+0{SPC}+0{SPC}+0.

The numbers represent year, month, day, hour, minute, second, microsecond).

If plus is used up-front the data is interpreted as an integer decimal number, without the plus it's the scanner reads the data as hex format.

The answer is always in ASCII format.

Attention: There is no real time clock inside the device. When the scanner is switched off and after a reboot, the time has to be set again.

However, it is possible to analyze the Off-time in order to evade this issue.



Telegram structure: sMN LSPsetdatetime (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	73 4D 4E
Command	Set time stamp	String	14	All	LSPsetdatetime	4C 53 50 73 65 74 64 61 74 65 74 69 6D 65
Year		Uint_16	2	All	1970d ... +2099d (07B2h ... 0833h)	07 b2 ... 08 33
Month		Uint_8	1	All	01d ... +12d (01h ... 0Ch)	01 ... 0C
Day		Uint_8	1	All	01d ... +31d (01h ... 1Fh)	00 ... 1F
Hour		Uint_8	1	All	00d ... +23d	00 ... 17

Telegram structure: sMN LSPsetdatetime (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
					(00h ... 17h)	
Minute		Uint_8	1	All	00d ... +59d (00h ... 3Bh)	00 ... 3B
Second		Uint_8	1	All	00d ... +59d (00h ... 3Bh)	00 ... 3B
Micro-second		Uint_32	4	All	00000000d ... +00999999d (00000000h ... 000F423Fh)	00 00 00 00 ... 00 0F 42 3F

Table 160: Telegram structure: sMN LSPsetdatetime

Example 1: sMN LSPsetdatetime

CoLa A	ASCII	<STX>sMN{SPC}LSPsetdatetime{SPC}7D9{SPC}2{SPC}11{SPC}10{SPC}22{SPC}0{SPC}0<ETX>
	Hex	02 73 4D 4E 20 4C 53 50 73 65 74 64 61 74 65 74 69 6D 65 20 37 44 39 20 32 20 31 31 20 31 30 20 32 32 20 30 20 30 03
CoLa B	Binary	02 02 02 02 00 00 00 1E 73 4D 4E 20 4C 53 50 73 65 74 64 61 74 65 74 69 6D 65 20 07 D9 02 11 10 22 00 00 00 00 A3

Table 161: Example 1: sMN LSPsetdatetime

Example 2: sMN LSPsetdatetime

CoLa A	ASCII	<STX>sMN{SPC}LSPsetdatetime{SPC}+2010{SPC}+01{SPC}+26{SPC}+10{SPC}+35{SPC}0{SPC}0<ETX>
	Hex	02 73 4D 4E 20 4C 53 50 73 65 74 64 61 74 65 74 69 6D 65 20 2B 32 30 31 30 20 2B 30 31 20 2B 32 36 20 2B 31 30 20 2B 33 35 20 2B 30 30 20 2B 30 30 30 30 03
CoLa B	Binary	02 02 02 02 00 00 00 1E 73 4D 4E 20 4C 53 50 73 65 74 64 61 74 65 74 69 6D 65 20 07 DA 01 1A 0A 23 00 00 00 00 A3

Table 162: Example 2: sMN LSPsetdatetime



Telegram structure: sAN LSPsetdatetime						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	73 41 4E
Command	Set time stamp	String	14	All	LSPsetdatetime	4C 53 50 73 65 74 64 61 74 65 74 69 6D 65
Status code	Code number	Enum_8	1	All	Success: 1	Success: 01

Table 163: Telegram structure: sAN LSPsetdatetime

Example 1, 2: sAN LSPsetdatetime

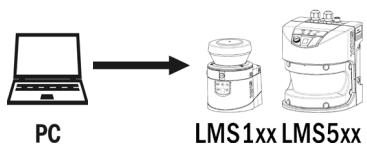
CoLa A	ASCII	<STX>sAN{SPC}LSPsetdatetime{SPC}1<ETX>
	Hex	02 73 41 4E 20 4C 53 50 73 65 74 64 61 74 65 74 69 6D 65 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 14 73 41 4E 20 4C 53 50 73 65 74 64 61 74 65 74 69 6D 65 20 01 51

Table 164: Example 1, 2: sAN LSPsetdatetime

Activate time stamp in the output string format or on SOPAS page “data processing”.

4.4.2 Read time stamp and status of the measurement function

Command: sRN STlms



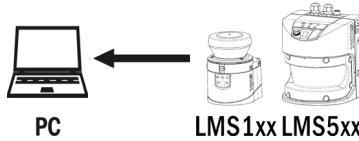
Telegram structure: sRN STlms						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Status and time	String	5	All	STlms	53 54 6C 6D 73

Table 165: Telegram structure: sRN STlms

Example: sRN STlms

CoLa A	ASCII	<STX>sRN{SPC}STlms<ETX>
	Hex	02 73 52 4E 20 53 54 6C 6D 73 03
CoLa B	Binary	02 02 02 02 00 00 00 09 73 52 4E 20 53 54 6C 6D 73 3A

Table 166: Example: sRN STlms

Answer: sRA STlms

Telegram structure: sRA STlms						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Status and time	String	5	All	STlms	53 54 6C 6D 73
Status code	Status of the measurement function.	Enum_16	2	All	Boot cycle: 0 ... 5 Ready: 6 Measurement active: 7 FW Update: 8 Error: 10	Boot cycle: 00 00 ... 00 05 Ready: 00 06 Measurement active: 00 07 FW Update: 00 08 Error: 00 0A
Temp. out of range	Device running in temp. range or not	Uint_8	1	All	False (in range) = 0 True (out of range) = 1	False (in range) = 00 True (out of range) = 01
Length of time parameter		Uint_16	2	All	0d ... +65535d (00h ... FFFFh)	00 00 ... FF FF
Time	HH HH	Uint_16	2	All	0d ... 99d	00 00 ... 00 63
	:	Uint_8	1	All	:	3A
	MM MM	Uint_16	2	All	0d ... 99d	00 00 ... 00 63
	:	Uint_8	1	All	:	3A
	SS SS	Uint_16	2	All	0d ... 99d	00 00 ... 00 63
Length of date parameter		Uint_16	2	All	0d ... +65535d (00h ... FFFFh)	00 00 ... FF FF
Date	DD DD	Uint_16	2	All	0d ... 99d	00 00 ... 00 63
	.	Uint_8	1	All	.	2E
	MM MM	Uint_16	2	All	0d ... 99d	00 00 ... 00 63
	.	Uint_8	1	All	.	2E
	YY YY YY YY	Uint_32	4	All	0d ... 9999d	00 00 00 00 ... 00 00 27 0F
LED1		Uint_16	2	All	Inactive: 0 Active: 1	Inactive: 00 00 Active: 00 01
LED2		Uint_16	2	All	Inactive: 0 Active: 1	Inactive: 00 00 Active: 00 01
LED3		Uint_16	2	All	Inactive: 0 Active: 1	Inactive: 00 00 Active: 00 01
Reserved		Uint_16	3 × 2	All	0 0 0	00 00 00 00 00 00

Table 167: Telegram structure: sRA STlms

Example: sRA STIms

ColA A	ASCII	<STX>sRA{SPC}STIms{SPC}7{SPC}0{SPC}8{SPC}16:36:54{SPC}10{SPC}17.03.2030{SPC}0{SPC}0{SPC}0<ETX>
	Hex	Not available
ColA B	Binary	02 02 02 02 00 00 00 2F 73 52 41 20 53 54 6C 6D 73 20 00 07 00 00 08 00 10 3A 00 24 3A 00 36 00 0A 00 11 2E 00 03 2E 00 00 07 EE 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 17

Table 168: Example: sRA STIms

4.4.3 Read device time

Command to read the actual time of the internal clock (ms).

The timer is 32 counter with a resolution of 1 ms.

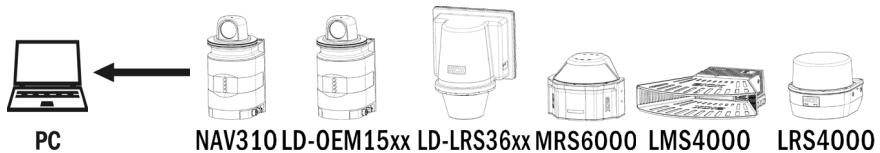


Table 169: Telegram structure: sRN DeviceTime

Example: sRN DeviceTime

CoLa A	ASCII	<STX>sRN{SPC}DeviceTime<ETX>
	Hex	02 73 52 4E 20 44 65 76 69 63 65 54 69 6D 65 03
CoLa B	Binary	02 02 02 02 00 00 00 0E 73 52 4E 20 44 65 76 69 63 65 54 69 6D 65 42

Table 170: Example: sRN DeviceTime



Telegram structure: sRA DeviceTime						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command		String	10	All	DeviceTime	44 65 76 69 63 65 54 69 6D 65
Device time	Time	Uint_32	4	All	0d ... +9999d (0h ... 270Fh)	00 00 00 00 ... 00 00 27 0F

Table 171: Telegram structure: sRA DeviceTime

Example: sRA DeviceTime 0

CoLa A	ASCII	<STX>sRA{SPC}DeviceTime{SPC}0<ETX>
	Hex	0273 52 41 20 44 65 76 69 63 65 54 69 6D 65 20 00 03
CoLa B	Binary	02 02 02 02 00 00 00 10 73 52 41 20 44 65 76 69 63 65 54 69 6D 65 00 00 00 00 6D

Table 172: Example: sRA DeviceTime 0

4.4.4 Set NTP (Network Time Protocol) parameters

Set time synchronization



Telegram structure: sWN TSCRole (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set NTP role	String	7	All	TSCRole	54 53 43 52 6F 6C 65
Variable data	NTP role	Uint_8	1	All	None: 0 Client: 1 Server: 2	None: 00 Client: 01 Server: 02

Table 173: Telegram structure: sWN TSCRole

Example: sWN TSCRole

CoLa A	ASCII	<STX>sWN{SPC}TSCRole{SPC}1<ETX>
	Hex	02 73 57 4E 20 54 53 43 52 6F 6C 65 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 0D 73 57 4E 20 54 53 43 52 6F 6C 65 20 01 1B

Table 174: Example: sWN TSCRole



Telegram structure: sWA TSCRole						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set NTP role	String	7	All	TSCRole	54 53 43 52 6F 6C 65

Table 175: Telegram structure: sWA TSCRole

Example: sWA TSCRole

CoLa A	ASCII	<STX>sWA{SPC}TSCRole<ETX>
	Hex	02 73 57 41 20 54 53 43 52 6F 6C 65 03
CoLa B	Binary	02 02 02 02 00 00 00 0C 73 57 41 20 54 53 43 52 6F 6C 65 20 15

Table 176: Example: sWA TSCRole

Set time synchronization interface



Telegram structure: sWN TSCTInterface (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set time synchronization interface	String	14	All	TSCTInterface	54 53 43 54 43 49 6E 74 65 72 66 61 63 65
Variable data	Time synchronization interface data	Uint_8	1	All	Ethernet: 0 CAN: 1	Ethernet: 00 CAN: 01

Table 177: Telegram structure: sWN TSCTInterface

Example: sWN TSCTInterface

CoLa A	ASCII	<STX>sWN{SPC}TSCTInterface{SPC}0<ETX>
	Hex	02 73 57 4E 20 54 53 43 54 43 49 6E 74 65 72 66 61 63 65 20 30 03
CoLa B	Binary	02 02 02 02 00 00 00 14 73 57 4E 20 54 53 43 54 43 49 6E 74 65 72 66 61 63 65 20 00 7C

Table 178: Example: sWN TSCTInterface



Telegram structure: sWA TSCTInterface						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set time synchronization	String	14	All	TSCTInterface	54 53 43 54 43 49 6E 74 65 72 66 61 63 65

Table 179: Telegram structure: sWA TSCTInterface

Example: sWA TSCTCInterface

CoLa A	ASCII	<STX>sWA{SPC}TSCTCInterface<ETX>
	Hex	02 73 57 41 20 54 53 43 54 43 49 6E 74 65 72 66 61 63 65 03
CoLa B	Binary	02 02 02 02 00 00 00 13 73 57 41 20 54 53 43 54 43 49 6E 74 65 72 66 61 63 65 20 73

Table 180: Example: sWA TSCTCInterface

Set time server IP address



Telegram structure: sWN TSCTCSrvAddr (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set time server IP address	String	12	All	TSCTCSrvAddr	54 53 43 54 43 53 72 76 41 64 64 72
IP address data	Set values in hex	Uint_32	4	All	00 00 00 00h ... FF FF FF FFh (decimal values unwieldy)	00 00 00 00 ... FF FF FF FF

Table 181: Telegram structure: sWN TSCTCSrvAddr

Example: sWN TSCTCSrvAddr 192.168.0.11

CoLa A	ASCII	<STX>sWN{SPC}TSCTCSrvAddr{SPC}C0{SPC}A8{SPC}00{SPC}0B<ETX>
	Hex	02 73 57 4E 20 54 53 43 54 43 53 72 76 41 64 64 72 20 C0 A8 00 0B 03
CoLa B	Binary	02 02 02 02 00 00 00 15 73 57 4E 20 54 53 43 54 43 53 72 76 41 64 64 72 20 C0 A8 00 0B 3E

Table 182: Example: sWN TSCTCSrvAddr 192.168.0.11



Telegram structure: sWA TSCTCSrvAddr						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set time server IP address	String	12	All	TSCTCSrvAddr	54 53 43 54 43 53 72 76 41 64 64 72

Table 183: Telegram structure: sWA TSCTCSrvAddr

Example: sWA TSCTCSrvAddr

CoLa A	ASCII	<STX>sWA[SPC]TSCTCSrvAddr<ETX>
	Hex	02 73 57 41 20 54 53 43 54 43 53 72 76 41 64 64 72 03
CoLa B	Binary	02 02 02 02 00 00 00 11 73 57 41 20 54 53 43 54 43 53 72 76 41 64 64 72 20 52

Table 184: Example: sWA TSCTCSrvAddr

Set time zone

Telegram structure: sWN TSCTCtimezone (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set time zone	String	13	All	TSCTCtimezone	54 53 43 54 43 74 69 6D 65 7A 6F 6E 65
Time zone data	Set values in number of hours relative to GMT, hex specially coded	Int_8	1	All	[GMT + ...] -12d ... +12d (00h ... 18h)	[GMT + ...] 00 ... 18

Table 185: Telegram structure: sWN TSCTCtimezone

Example: sWN TSCTCtimezone GMT + 1 hour

CoLa A	ASCII	<STX>sWN{SPC}TSCTCtimezone{SPC}+1<ETX>
	Hex	02 73 57 4E 20 54 53 43 54 43 74 69 6D 65 7A 6F 6E 65 20 0D 03
CoLa B	Binary	02 02 02 02 00 00 00 13 73 57 4E 20 54 53 43 54 43 74 69 6D 65 7A 6F 6E 65 20 0D 3F

Table 186: Example: sWN TSCTCtimezone GMT + 1 hour



Telegram structure: sWA TSCTCtimezone						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set time zone	String	13	All	TSCTCtimezone	54 53 43 54 43 74 69 6D 65 7A 6F 6E 65

Table 187: Telegram structure: sWA TSCTCtimezone

Example: sWA TSCTCtimezone

CoLa A	ASCII	<STX>sWA{SPC}TSCTCtimezone<ETX>
	Hex	02 73 57 41 20 54 53 43 54 43 74 69 6D 65 7A 6F 6E 65 03
CoLa B	Binary	02 02 02 02 00 00 00 12 73 57 41 20 54 53 43 54 43 74 69 6D 65 7A 6F 6E 65 20 3D

Table 188: Example: sWA TSCTCtimezone

Set update time

Telegram structure: sWN TSCTCupdatetime (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set update time of synchronization	String	15	All	TSCTCupdatetime	54 53 43 54 43 75 70 64 61 74 65 74 69 6D 65
Update time of synchronization	Set values in seconds	Uint_32	4	All	+1d ... +3600d (01h ... 0E10h)	00 00 00 00 ... 00 00 0E 10

Table 189: Telegram structure: sWN TSCTCupdatetime

Example: sWN TSCTCupdatetime 600 s

CoLa A	ASCII	<STX>sWN{SPC}TSCTCupdatetime{SPC}+600<ETX>
	Hex	02 73 57 4E 20 54 53 43 54 43 75 70 64 61 74 65 74 69 6D 65 20 02 58 03
CoLa B	Binary	02 02 02 02 00 00 00 18 73 57 4E 20 54 53 43 54 43 75 70 64 61 74 65 74 69 6D 65 20 00 00 02 58 67

Table 190: Example: sWN TSCTCupdatetime 600 s



Telegram structure: sWA TSCTCupdatetime						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set update time of synchronization	String	15	All	TSCTCupdatetime	54 53 43 54 43 75 70 64 61 74 65 74 69 6D 65

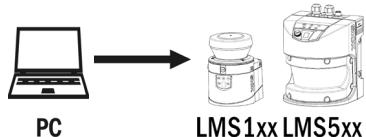
Table 191: Telegram structure: sWA TSCTCupdatetime

Example: sWA TSCTCupdatetime

CoLa A	ASCII	<STX>sWA{SPC}TSCTCupdatetime<ETX>
	Hex	02 73 57 41 20 54 53 43 54 43 75 70 64 61 74 65 74 69 6D 65 03
CoLa B	Binary	02 02 02 02 00 00 00 14 73 57 41 20 54 53 43 54 43 75 70 64 61 74 65 74 69 6D 65 20 32

Table 192: Example: sWA TSCTCupdatetime

Read for maximum offset time



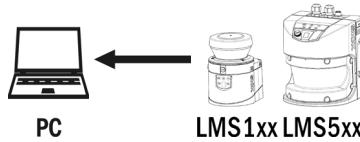
Telegram structure: sRN TSCTCmaxoffset (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Read maximum offset time	String	14	All	TSCTCmaxoffset	54 53 43 54 43 6D 61 78 6F 66 66 73 65 74

Table 193: Telegram structure: sRN TSCTCmaxoffset

Example: sRN TSCTCmaxoffset

CoLa A	ASCII	<STX>sRN{SPC}TSCTCmaxoffset<ETX>
	Hex	02 73 52 4E 20 54 53 43 54 43 6D 61 78 6F 66 66 73 65 74 03
CoLa B	Binary	02 02 02 02 00 00 00 12 73 52 4E 20 54 53 43 54 43 6D 61 78 6F 66 66 73 65 74 65

Table 194: Example: sRN TSCTCmaxoffset



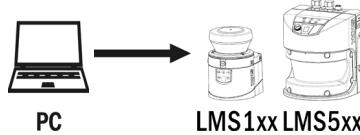
Telegram structure: sRA TSCTCmaxoffset						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Read maximum offset time	String	14	All	TSCTCmaxoffset	54 53 43 54 43 6D 61 78 6F 66 66 73 65 74
Max. offset time	[Seconds as float according to IEEE754]	Real	4	All	0h ... FFFFFFFFh Min Value ~ -3.403*10^38 s Max Value ~+3.403*10^38 s	00 00 00 00 ... FF FF FF FF

Table 195: Telegram structure: sRA TSCTCmaxoffset

Example: sRA TSCTCmaxoffset (18000 s)

CoLa A	ASCII	<STX>sRA{SPC}TSCTCmaxoffset{SPC}468CA000<ETX>
	Hex	02 73 52 41 20 54 53 43 54 43 6D 61 78 6F 66 66 73 65 74 20 34 36 38 43 41 30 30 30 03
CoLa B	Binary	02 02 02 02 00 00 00 17 73 52 41 20 54 53 43 54 43 6D 61 78 6F 66 66 73 65 74 20 46 8C A0 00 20

Table 196: Example: sRA TSCTCmaxoffset 18000 s

Read for delay time

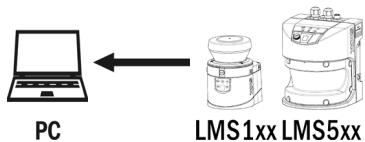
Telegram structure: sRN TSCTCdely (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Read delay time	String	10	All	TSCTCdely	54 53 43 54 43 64 65 6C 61 79

Table 197: Telegram structure: sRN TSCTCdely

Example: sRN TSCTCdelay

CoLa A	ASCII	<STX>sRN{SPC}TSCTCdelay<ETX>
	Hex	02 73 52 4E 20 54 53 43 54 43 64 65 6C 61 79 03
CoLa B	Binary	02 02 02 02 00 00 00 0E 73 52 4E 20 54 53 43 54 43 64 65 6C 61 79 69

Table 198: Example: sRN TSCTCdelay



Telegram structure: sRA TSCTCdelay						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Read for delay time	String	10	All	TSCTCdelay	54 53 43 54 43 64 65 6C 61 79
Max. offset time	[Seconds as float according to IEEE754]	Real	4	All	0h ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF

Table 199: Telegram structure: sRA TSCTCdelay

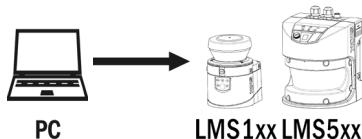
Example: sRA TSCTCdelay (0.003 s)

CoLa A	ASCII	<STX>sRA{SPC}TSCTCdelay{SPC}3B435B02<ETX>
	Hex	02 73 52 41 20 54 53 43 54 43 64 65 6C 61 79 20 33 42 34 33 35 42 30 32 03
CoLa B	Binary	02 02 02 02 00 00 00 13 73 52 41 20 54 53 43 54 43 64 65 6C 61 79 20 3B 43 5B 02 67

Table 200: Example: sRA TSCTCdelay 0.003 s

Reset maximum offset time

This command resets the maximum offset time, i.e. sets it to zero (0).



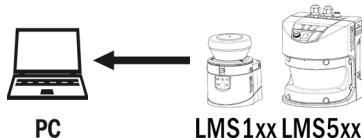
Telegram structure: sMN mResetMaxOff (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	73 4D 4E
Command	Reset maximum offset time	String	12	All	mResetMaxOff	6D 52 65 73 65 74 4D 61 78 4F 66 66

Table 201: Telegram structure: sMN mResetMaxOff

Example: sMN mResetMaxOff

Cola A	ASCII	<STX>sMN{SPC}mResetMaxOff<ETX>
	Hex	02 73 4D 4E 20 6D 52 65 73 65 74 4D 61 78 4F 66 66 03
Cola B	Binary	02 02 02 02 00 00 00 10 73 4D 4E 20 6D 52 65 73 65 74 4D 61 78 4F 66 66 73

Table 202: Example: sMN mResetMaxOff



Telegram structure: sAN mResetMaxOff						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	73 41 4E
Command	Read maximum offset time	String	12	All	mResetMaxOff	6D 52 65 73 65 74 4D 61 78 4F 66 66

Table 203: Telegram structure: sAN mResetMaxOff

Example: sAN mResetMaxOff

Cola A	ASCII	<STX>sAN{SPC}mResetMaxOff<ETX>
	Hex	02 73 41 4E 20 6D 52 65 73 65 74 4D 61 78 4F 66 66 03
Cola B	Binary	02 02 02 02 00 00 00 11 73 41 4E 20 6D 52 65 73 65 74 4D 61 78 4F 66 66 20 5F

Table 204: Example: sAN mResetMaxOff

4.5 Filter

Telegram validity overview

		LMS1xx	LMS5xx	TiM2xx	TiM5xx	TiM7xx	NAV310	LD-OEM15xx	LD-LRS36xx	MRS1000	LMS1000	MRS6000	LMS4000	LRS4000
4.5.1	Set particle filter	x	x	x	x	x				x	x			
4.5.2	Set mean filter	x	x							x	x		x	x
4.5.3	Set n-pulse to 1-pulse filter (Echo filter)	x												
4.5.4	Set echo filter		x							x	x	x		x
4.5.5	Set and read fog filter	x	x											
4.5.6	Set sensitivity fog filter (LMS5xx, LMS/MRS1000)		x							x	x			
4.5.7	Activate/deactivate "fog filter operating radius active"		x											
4.5.8	Execute the "Teach from 90° angle" button		x											
4.5.9	Setting of the value "Fog filter operating radius active up to"		x											
4.5.10	Enable/disable digital nearfield filter						x							
4.5.11	Set digital nearfield filter sector selection						x	x						
4.5.12	Activate Median filter								x	x		x	x	
4.5.13	Activate Edge filter											x		
4.5.14	Set Edge filter											x		
4.5.15	Set Cubic Area filter											x		
4.5.16	Activate Gloss compensation filter											x		
4.5.17	Activate long range mode										x			
4.5.18	Read status of long range mode										x			

4.5.1 Set particle filter



Telegram structure: sWN LFPparticle (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set particle filter	String	11	All	LFPparticle	4C 46 50 70 61 72 74 69 63 6C 65
Status code	Code number	Bool_1	1	All	Inactive: 0 Active: 1	Inactive: 00 Active: 01
Threshold ⁵⁾	Particle threshold in mm	Uint_16	2	All	+500d (must be taken) (1F4h)	01 F4 (must be taken)

Table 205: Telegram structure: sWN LFPparticle

Example: sWN LFPparticle

CoLa A	ASCII	<STX>sWN{SPC}LFPparticle{SPC}1{SPC}+500<ETX>
	Hex	02 73 57 4E 20 4C 46 50 70 61 72 74 69 63 6C 65 20 31 20 2B 35 30 30 03
CoLa B	Binary	02 02 02 02 00 00 00 13 73 57 4E 20 4C 46 50 70 61 72 74 69 63 6C 65 20 01 01 F4 D0

Table 206: Example: sWN LFPparticle



Telegram structure: sWA LFPparticle						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set particle filter	String	11	All	LFPparticle	4C 46 50 70 61 72 74 69 63 6C 65

Table 207: Telegram structure: sWA LFPparticle

⁵⁾ Never change the threshold here, it is taken by the device to handle the particles.

Example: sWA LFPparticle

CoLa A	ASCII	<STX>sWA{SPC}LFPparticle<ETX>
	Hex	02 73 57 41 20 4C 46 50 70 61 72 74 69 63 6C 65 03
CoLa B	Binary	02 02 02 02 00 00 00 10 73 57 41 20 4C 46 50 70 61 72 74 69 63 6C 65 20 2B

Table 208: Example: sWA LFPparticle

4.5.2 Set mean filter



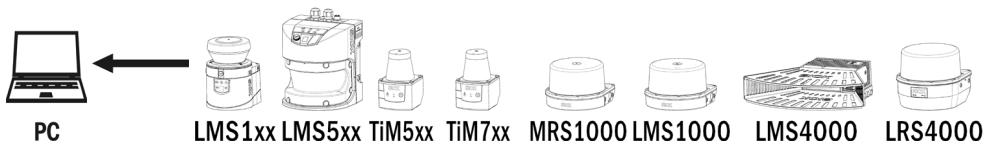
Telegram structure: sWN LFPmeanfilter (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set mean filter	String	13	All	LFPmeanfilter	4C 46 50 6D 65 61 6E 66 69 6C 74 65 72
Status code	Code number	Bool_1	1	All	Inactive: 0 Active: 1	Inactive: 00 Active: 01
Number of scans	Number	Uint_16	2	All	+2d ... +100d (00 02h ... 00 64h)	00 02 ... 00 64
Final part	Reserved	Enum_8	1	All	0	00

Table 209: Telegram structure: sWN LFPmeanfilter

Example: sWN LFPmeanfilter

CoLa A	ASCII	<STX>sWN{SPC}LFPmeanfilter{SPC}1{SPC}+10{SPC}0<ETX>
	Hex	02 73 57 4E 20 4C 46 50 6D 65 61 6E 66 69 6C 74 65 72 20 31 20 2B 31 30 20 30 03
CoLa B	Binary	02 02 02 02 00 00 00 16 73 57 4E 20 4C 46 50 6D 65 61 6E 66 69 6C 74 65 72 20 01 00 64 00 52

Table 210: Example: sWN LFPmeanfilter



Telegram structure: sWA LFPmeanfilter						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set mean filter	String	13	All	LFPmeanfilter	4C 46 50 6D 65 61 6E 66 69 6C 74 65 72

Table 211: Telegram structure: sWA LFPmeanfilter

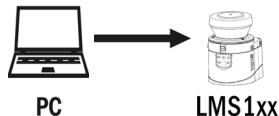
Example: sWA LFPmeanfilter

CoLa A	ASCII	<STX>sWA{SPC}LFPmeanfilter<ETX>
	Hex	02 73 57 41 20 4C 46 50 6D 65 61 6E 66 69 6C 74 65 72 03
CoLa B	Binary	02 02 02 02 00 00 00 12 73 57 41 20 4C 46 50 6D 65 61 6E 66 69 6C 74 65 72 38

Table 212: Example: sWA LFPmeanfilter

4.5.3 Set n-pulse to 1-pulse filter (Echo filter)

Only LMS1xx, for LMS5xx take the echo filter.



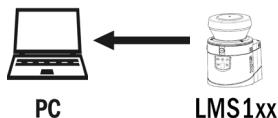
Telegram structure: sWN LFPnto1filter (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	LMS1xx	sWN	73 57 4E
Command	Set n-to-1 filter	String	13	LMS1xx	LFPnto1filter	4C 46 50 6E 74 6F 31 66 69 6C 74 65 72
Status code	Code number	Bool_1	1	LMS1xx	Inactive: 0 Active: 1	Inactive: 00 Active: 01

Table 213: Telegram structure: sWN LFPnto1filter

Example: sWN LFPnto1filter

CoLa A	ASCII	<STX>sWN[SPC]LFPnto1filter[SPC]1<ETX>
	Hex	02 73 57 4E 20 4C 46 50 6E 74 6F 31 66 69 6C 74 65 72 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 13 73 57 4E 20 4C 46 50 6E 74 6F 31 66 69 6C 74 65 72 20 01 75

Table 214: Example: sWN LFPnto1filter



Telegram structure: sWA LFPnto1filter						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	LMS1xx	sWA	73 57 41
Command	Set n-to-1 filter	String	13	LMS1xx	LFPnto1filter	4C 46 50 6E 74 6F 31 66 69 6C 74 65 72

Table 215: Telegram structure: sWA LFPnto1filter

Example: sWA LFPnto1filter

CoLa A	ASCII	<STX>sWA[SPC]LFPnto1filter<ETX>
	Hex	02 73 57 41 20 4C 46 50 6E 74 6F 31 66 69 6C 74 65 72 03
CoLa B	Binary	02 02 02 02 00 00 00 12 73 57 41 20 4C 46 50 6E 74 6F 31 66 69 6C 74 65 72 7B

Table 216: Example: sWA LFPnto1filter

4.5.4 Set echo filter

Only LMS5xx. For LMS1xx use the n-pulse to 1-pulse filter.



Telegram structure: sWN FREchoFilter (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set echo filter	String	12	All	FREchoFilter	46 52 45 63 68 6F 46 69

Telegram structure: sWN FREchoFilter (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
						6C 74 65 72
Status code	Code number	Enum_8	1	All	First echo: 0 All echos: 1 Last echo: 2	First echo: 00 All echos: 01 Last echo: 02

Table 217: Telegram structure: sWN FREchoFilter

Example: sWN FREchoFilter

CoLa A	ASCII	<STX>sWN{SPC}FREchoFilter{SPC}1<ETX>
	Hex	02 73 57 4E 20 46 52 45 63 68 6F 46 69 6C 74 65 72 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 12 73 57 4E 20 46 52 45 63 68 6F 46 69 6C 74 65 72 20 01 7E Only available with firmware versions > V1.10.

Table 218: Example: sWN FREchoFilter



Telegram structure: sWA FREchoFilter						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set echo filter	String	12	All	FREchoFilter	46 52 45 63 68 6F 46 69 6C 74 65 72

Table 219: Telegram structure: sWA FREchoFilter

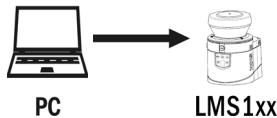
Example: sWa FREchoFilter

CoLa A	ASCII	<STX>sWA{SPC}FREchoFilter<ETX>
	Hex	02 73 57 41 20 46 52 45 63 68 6F 46 69 6C 74 65 72 03
CoLa B	Binary	02 02 02 02 00 00 00 11 73 57 41 20 46 52 45 63 68 6F 46 69 6C 74 65 72 20 70 Only available with firmware versions > V1.10 LMS5xx.

Table 220: Example: sWa FREchoFilter

4.5.5 Set and read fog filter

Set fog filter (LMS1xx)



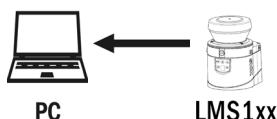
Telegram structure: sWN MSsupemode (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set fog filter	String	10	All	MSsupemode	4D 53 73 75 70 70 6D 6F 64 65
Status code	Code number	Bool_1	1	All	Glitch: 0 Fog: 1	Glitch: 00 Fog: 01

Table 221: Telegram structure: sWN MSsupemode

Example: sWN MSsupemode

CoLa A	ASCII	<STX>sWN[SPC]MSsupemode[SPC]1<ETX>
	Hex	02 73 57 4E 20 4D 53 73 75 70 70 6D 6F 64 65 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 10 73 57 4E 20 4D 53 73 75 70 70 6D 6F 64 65 20 01 70

Table 222: Example: sWN MSsupemode



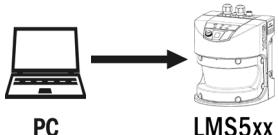
Telegram structure: sWA MSsupemode						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set fog filter	String	10	All	MSsupemode	4D 53 73 75 70 70 6D 6F 64 65

Table 223: Telegram structure: sWA MSsupemode

Example: sWA MSsuppmode

CoLa A	ASCII	<STX>sWA{SPC}MSsuppmode<ETX>
	Hex	02 73 57 41 20 4D 53 73 75 70 70 6D 6F 64 65 03
CoLa B	Binary	02 02 02 02 00 00 00 0F 73 57 41 20 4D 53 73 75 70 70 6D 6F 64 65 7E

Table 224: Example: sWA MSsuppmode

Set fog filter (LMS5xx)

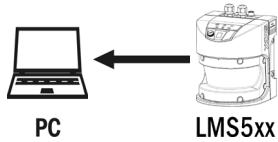
Telegram structure: sWN CLFogFilterEn (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Enable fog filter	String	13	All	CLFogFilterEn	43 4C 46 6F 67 46 69 6C 74 65 72 45 6E
Status code	Enable or disable fog filter	Bool_1	1	All	Disable: 0 Enable: 1	Disable: 00 Enable: 01

Table 225: Telegram structure: sWN CLFogFilterEn

Example: sWN CLFogFilterEn

CoLa A	ASCII	<STX>sWN{SPC}CLFogFilterEn{SPC}1<ETX>
	Hex	02 73 57 4E 20 43 4C 46 6F 67 46 69 6C 74 65 72 45 6E 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 00 13 73 57 4E 20 43 4C 46 6F 67 46 69 6C 74 65 72 45 6E 20 01 21

Table 226: Example: sWN CLFogFilterEn



Telegram structure: sWA CLFogFilterEn						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Enable fog filter	String	13	All	CLFogFilterEn	43 4C 46 6F 67 46 69 6C 74 65 72 45 6E

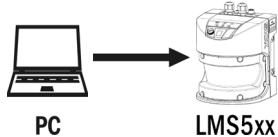
Table 227: Telegram structure: sWA CLFogFilterEn

Example: sWA CLFogFilterEn

CoLa A	ASCII	<STX>sWA{SPC}CLFogFilterEn<ETX>
	Hex	02 73 57 41 20 43 4C 46 6F 67 46 69 6C 74 65 72 45 6E 03
CoLa B	Binary	02 02 02 02 00 00 00 12 73 57 41 20 43 4C 46 6F 67 46 69 6C 74 65 72 45 6E 20 2F

Table 228: Example: sWA CLFogFilterEn

Read for enabled fog filter (LMS5xx)



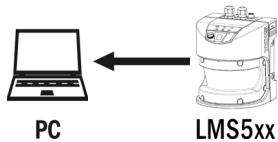
Telegram structure: sRN CLFogFilterEn						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Enabled fog filter	String	13	All	CLFogFilterEn	43 4C 46 6F 67 46 69 6C 74 65 72 45 6E

Table 229: Telegram structure: sRN CLFogFilterEn

Example: sRN CLFogFilterEn

CoLa A	ASCII	<STX>sRN{SPC}CLFogFilterEn<ETX>
	Hex	02 73 52 4E 20 43 4C 46 6F 67 46 69 6C 74 65 72 45 6E 03
CoLa B	Binary	02 02 02 02 00 00 00 11 73 52 4E 20 43 4C 46 6F 67 46 69 6C 74 65 72 45 6E 05

Table 230: Example: sRN CLFogFilterEn



Telegram structure: sRA CLFogFilterEn						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Enabled fog filter	String	13	All	CLFogFilterEn	43 4C 46 6F 67 46 69 6C 74 65 72 45 6E
Status code	Fog filter enabled or disabled	Bool_1	1	All	Disabled: 0 Enabled: 1	Disabled: 00 Enabled: 01

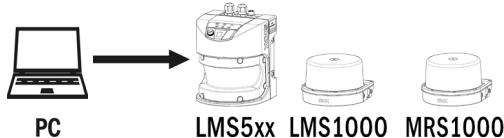
Table 231: Telegram structure: sRA CLFogFilterEn

Example: sRA CLFogFilterEn

CoLa A	ASCII	<STX>sRA{SPC}CLFogFilterEn{SPC}1<ETX>
	Hex	02 73 52 41 20 43 4C 46 6F 67 46 69 6C 74 65 72 45 6E 20 01 03
CoLa B	Binary	02 02 02 02 00 00 00 13 73 52 41 20 43 4C 46 6F 67 46 69 6C 74 65 72 45 6E 20 01 2B

Table 232: Example: sRA CLFogFilterEn

4.5.6 Set sensitivity fog filter (LMS5xx, LMS/MRS1000)



Telegram structure: sWN MCSenseLevel (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Sense level	String	12	All	MCSenseLevel	4D 43 53 65 6E 73 65 4C 65 76 65 6C
Sensitivity level	Enable or disable fog filter and Sense Level	Uint_8	1	LMS5xx	1 ... 6	01 ... 06
				LMS / MRS 1000	0 (Fog Filter off) 1 (Fog Filter on)	00 01

Table 233: Telegram structure: sWN MCSenseLevel

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Example: sWN MCSenseLevel

CoLa A	ASCII	<STX>sWN[SPC]MCSenseLevel[SPC]1<ETX>
	Hex	02 73 57 4E 20 4D 43 53 65 6E 73 65 4C 65 76 65 6C 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 10 73 57 4E 20 4D 43 53 65 6E 73 65 4C 65 76 65 6C 20 01 70

Table 234: Example: sWN MCSenseLevel



Telegram structure: sWA MCSenseLevel						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Sense level	String	12	All	MCSenseLevel	4D 43 53 65 6E 73 65 4C 65 76 65 6C

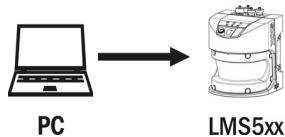
Table 235: Telegram structure: sWA MCSenseLevel

Example: sWA MCSenseLevel

CoLa A	ASCII	<STX>sWA[SPC]MCSenseLevel<ETX>
	Hex	02 73 57 41 20 4D 43 53 65 6E 73 65 4C 65 76 65 6C 20 03
CoLa B	Binary	02 02 02 02 00 00 00 0F 73 57 41 20 4D 43 53 65 6E 73 65 4C 65 76 65 6C 20 7E

Table 236: Example: sWA MCSenseLevel

4.5.7 Activate/deactivate “fog filter operating radius active”



Telegram structure: sWN FogFilterMaxRangeEnable (required user level: Authorized Client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Enable max. range restriction for fog filter	String	23	All	FogFilterMaxRangeEnable	46 6F 67 46 69 6C 74 65 72 4D 61 78 52 61 6E 67 65 45 6E 61 62 6C 65

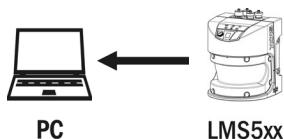
Telegram structure: sWN FogFilterMaxRangeEnable (required user level: Authorized Client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Enable/Disable		Bool_1	1	All	Activate : 1 Deactivate: 0	Activate : 01 Deactivate: 00

Table 237: Telegram structure: sWN FogFilterMaxRangeEnable

Example: sWN FogFilterMaxRangeEnable 1

CoLa A	ASCII	<STX>sWN{SPC}FogFilterMaxRangeEnable{SPC}1 <ETX>
	Hex	02 73 57 4E 20 46 6F 67 46 69 6C 74 65 72 4D 61 78 52 61 6E 67 65 45 6E 61 62 6C 65 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 01 73 57 4E 20 46 6F 67 46 69 6C 74 65 72 4D 61 78 52 61 6E 67 65 45 6E 61 62 6C 65 20 01 2F

Table 238: Example: sWN FogFilterMaxRangeEnable 1



Telegram structure: sWA FogFilterMaxRangeEnable (required user level: Authorized Client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Enable max. range restriction for fog filter	String	23	All	FogFilterMaxRangeEnable	46 6F 67 46 69 6C 74 65 72 4D 61 78 52 61 6E 67 65 45 6E 61 62 6C 65

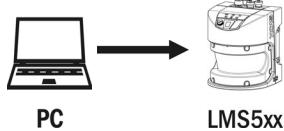
Table 239: Telegram structure: sWA FogFilterMaxRangeEnable

Example: sWA FogFilterMaxRangeEnable

CoLa A	ASCII	<STX>sWN{SPC} FogFilterMaxRangeEnable<ETX>
	Hex	02 73 57 41 20 46 6F 67 46 69 6C 74 65 72 4D 61 78 52 61 6E 67 65 45 6E 61 62 6C 65 03
CoLa B	Binary	02 02 02 02 00 00 00 01 73 57 41 20 46 6F 67 46 69 6C 74 65 72 4D 61 78 52 61 6E 67 65 45 6E 61 62 6C 65 20 21

Table 240: Example: sWA FogFilterMaxRangeEnable

4.5.8 Execute the “Teach from 90° angle” button



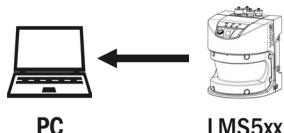
Telegram structure: sMN TeachFogFilterMaxRange (required user level: Authorized Client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	73 4D 4E
Command	Teach max. range restriction for fog filter	String	22	All	TeachFogFilterMaxRange	54 65 61 63 68 46 6F 67 46 69 6C 74 65 72 4D 61 78 52 61 6E 67 65

Table 241: Telegram structure: sMN TeachFogFilterMaxRange

Example: sMN TeachFogFilterMaxRange

CoLa A	ASCII	<STX>sMN{SPC}TeachFogFilterMaxRange<ETX>
	Hex	02 73 4D 4E 20 54 65 61 63 68 46 6F 67 46 69 6C 74 65 72 4D 61 78 52 61 6E 67 65 03
CoLa B	Binary	02 02 02 02 00 00 00 00 1A 73 4D 4E 20 54 65 61 63 68 46 6F 67 46 69 6C 74 65 72 4D 61 78 52 61 6E 67 65 6E

Table 242: Example: sMN TeachFogFilterMaxRange



Telegram structure: sAN TeachFogFilterMaxRange (required user level: Authorized Client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	73 41 4E
Command	Teach max. range restriction for fog filter	String	22	All	TeachFogFilterMaxRange	54 65 61 63 68 46 6F 67 46 69 6C 74 65 72 4D 61 78 52 61 6E 67 65

Table 243: Telegram structure: sAN TeachFogFilterMaxRange

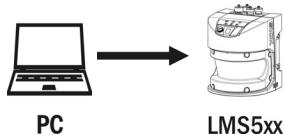
Example: sAN TeachFogFilterMaxRange

CoLa A	ASCII	<STX>sAN{SPC}TeachFogFilterMaxRange<ETX>
	Hex	02 73 41 4E 20 54 65 61 63 68 46 6F 67 46 69 6C 74 65 72 4D 61 78 52 61 6E 67 65 03

CoLa B	Binary	02 02 02 02 00 00 00 1B 73 41 4E 20 54 65 61 63 68 46 6F 67 46 69 6C 74 65 72 4D 61 78 52 61 6E 67 65 20 42
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Table 244: Example: sAN TeachFogFilterMaxRange

4.5.9 Setting of the value “Fog filter operating radius active up to”



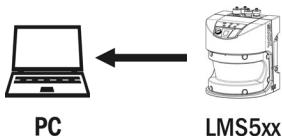
Telegram structure: sWN FogFilterMaxRange (required user level: Authorized Client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Max. range restriction for fog filter	String	17	All	FogFilterMaxRange	46 6F 67 46 69 6C 74 65 72 4D 61 78 52 61 6E 67 65
Distance of the radius	[1/1000m]	Real as float according to IEEE754	4	All	0.5m : 43FA0000 up to 16.0m: 467A0000	0.5m: 43 FA 00 00 up to 16.0m: 46 7A 00 00

Table 245: Telegram structure: sWN FogFilterMaxRange

Example: sWN FogFilterMaxRange 43FA0000 (0,5m)

CoLa A	ASCII	<STX>sWN{SPC}FogFilterMaxRange{SPC}43FA0000<ETX>
	Hex	02 73 57 4E 20 46 6F 67 46 69 6C 74 65 72 4D 61 78 52 61 6E 67 65 20 43 FA 00 00 03
CoLa B	Binary	02 02 02 02 00 00 00 1A 73 57 4E 20 46 6F 67 46 69 6C 74 65 72 4D 61 78 52 61 6E 67 65 20 43 FA 00 00 B6

Table 246: Example: sWN FogFilterMaxRange 43FA0000



Telegram structure: sWA FogFilterMaxRange (required user level: Authorized Client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Max. range restriction for fog filter	String	17	All	FogFilterMaxRange	46 6F 67 46 69 6C 74 65 72 4D 61 78 52 61 6E 67 65

Table 247: Telegram structure: sWA FogFilterMaxRange

Example: sWA FogFilterMaxRange

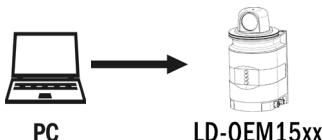
CoLa A	ASCII	<STX>sWA[SPC]FogFilterMaxRange<ETX>
	Hex	02 73 57 41 20 46 6F 67 46 69 6C 74 65 72 4D 61 78 52 61 6E 67 65 03
CoLa B	Binary	02 02 02 02 00 00 00 16 73 57 41 20 46 6F 67 46 69 6C 74 65 72 4D 61 78 52 61 6E 67 65 20 00

Table 248: Example: sWA FogFilterMaxRange

4.5.10 Enable/disable digital nearfield filter

Activates or deactivates the nearfield filter of the LD series.

Do not change the setting on LD-LRS XXXX !



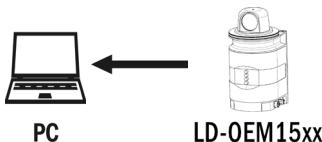
Telegram structure: sWN CLNFDigFilterEn (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Digital nearfield filter	String	15	All	CLNFDigFilterEn	43 4C 4E 46 44 69 67 46 69 6C 74 65 72 45 6E
Status code	Code number	Bool_1	1	All	Inactive: 0 Active: 1	Inactive: 00 Active: 01

Table 249: Telegram structure: sWN CLNFDigFilterEn

Example: sWN CLNFDigFilterEn

CoLa A	ASCII	<STX>sWN[SPC]CLNFDigFilterEn[SPC]1<ETX>
	Hex	02 73 57 4E 20 43 4C 4E 46 44 69 67 46 69 6C 74 65 72 45 6E 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 16 73 57 4E 20 43 4C 4E 46 44 69 67 46 69 6C 74 65 72 45 6E 20 01 51

Table 250: Example: sWN CLNFDigFilterEn



Telegram structure: sWA CLNFDigFilterEn						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Digital nearfield filter	String	15	All	CLNFDigFilterEn	43 4C 4E 46 44 69 67 46 69 6C 74 65 72 45 6E

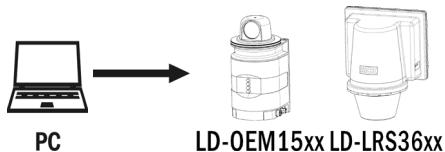
Table 251: Telegram structure: sWA CLNFDigFilterEn

Example: sWA CLNFDigFilterEn

CoLa A	ASCII	<STX>sWA[SPC]CLNFDigFilterEn<ETX>
	Hex	02 73 57 41 20 43 4C 4E 46 44 69 67 46 69 6C 74 65 72 45 6E 03
CoLa B	Binary	02 02 02 02 00 00 00 13 73 57 41 20 43 4C 4E 46 44 69 67 46 69 6C 74 65 72 45 6E 03

Table 252: Example: sWA CLNFDigFilterEn

4.5.11 Set digital nearfield filter sector selection



Do not change the setting on LD-LRS XXXX !

Telegram structure: sWN CLHWFilterSectEn (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Sector function	String	16	All	CLHWFilterSectEn	43 4C 48 57 46 69 6C 74 65 72 53 65 63 74 45 6E
Status code	Active sector vector	Bool_1	4 × 1	All	Active in none of the sectors: 0 0 0 0 Active in all sectors: 1 1 1 1	Active in none of the sectors: 00 00 00 00 Active in all sectors: 01 01 01 01

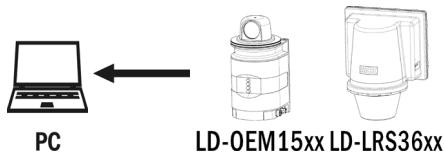
Table 253: Telegram structure: sWN CLHWFilterSectEn

Example: sWN CLHWFilterSectEn

Enable Nearfield Suppression for sector 1, disable for sectors 2, 3 and 4.

CoLa A	ASCII	<STX>sWN[SPC]CLHWFilterSectEn[SPC]1[SPC]0[SPC]0[SPC]0<ETX>
	Hex	02 73 57 4E 20 43 4C 48 57 46 69 6C 74 65 72 53 65 63 74 45 6E 20 31 20 30 20 30 20 30 03
CoLa B	Binary	02 02 02 02 00 00 00 19 73 57 4E 20 43 4C 48 57 46 69 6C 74 65 72 53 65 63 74 45 6E 20 31 30 30 30 51

Table 254: Example: sWN CLHWFilterSectEn 1 0 0 0



Telegram structure: sWA CLHWFilterSectEn						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Sector function	String	16	All	CLHWFilterSectEn	43 4C 48 57 46 69 6C 74 65 72 53 65 63 74 45 6E

Table 255: Telegram structure: sWA CLHWFilterSectEn

Example: sWA CLHWFilterSectEn

CoLa A	ASCII	<STX>sWA{SPC}CLHWFilterSectEn<ETX>
	Hex	02 73 57 41 20 43 4C 48 57 46 69 6C 74 65 72 53 65 63 74 45 6E 03
CoLa B	Binary	02 02 02 02 00 00 00 15 73 57 41 20 43 4C 48 57 46 69 6C 74 65 72 53 65 63 74 45 6E 20 5F

Table 256: Example: sWA CLHWFilterSectEn

4.5.12 Activate Median filter

Activate a 3x1 Median filter (floating evaluation of 3 measurement points within one scan) for distance values

Telegram structure: sWN LFPmedianfilter (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Sector function	String	15	All	LFPmedianfilter	4C 46 50 6D 65 64 69 61 6E 66 69 6C 74 65 72
Status code	Enable or disable Median filter	Bool_1	1	All	Inactive: 0 Active: 1	00 01
Reserved	Always 3	Uint_16	2	All	3	00 03

Table 257: Telegram structure: sWN LFPmedianfilter

Example: sWN LFPmedianfilter

Enable Median filter

CoLa A	ASCII	<STX>sWN{SPC}LFPmedianfilter{SPC}1{SPC}3<ETX>
	Hex	02 73 57 4E 20 4C 46 50 6D 65 64 69 61 6E 66 69 6C 74 65 72 20 31 20 33 03
CoLa B	Binary	02 02 02 02 00 00 00 17 73 57 4E 20 4C 46 50 6D 65 64 69 61 6E 66 69 6C 74 65 72 20 01 00 03 38

Table 258: Example: sWN LFPmedianfilter 1 3



Telegram structure: sWA LFPmedianfilter						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Sector function	String	15	All	LFPmedianfilter	4C 46 50 6D 65 64 69 61 6E 66 69 6C 74 65 72

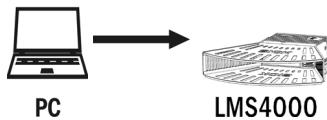
Table 259: Telegram structure: sWA LFPmedianfilter

Example: sWA LFPmedianfilter

CoLa A	ASCII	<STX>sWA{SPC}LFPmedianfilter<ETX>
	Hex	02 73 57 41 20 4C 46 50 6D 65 64 69 61 6E 66 69 6C 74 65 72 03
CoLa B	Binary	02 02 02 02 00 00 00 14 73 57 41 20 4C 46 50 6D 65 64 69 61 6E 66 69 6C 74 65 72 20 35

Table 260: Example: sWA LFPmedianfilter

4.5.13 Activate Edge filter



Activate the Edge filter to eliminate wrong measurement points at object edges.

Telegram structure: sWN LFPedgefilter (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Sector function	String	13	All	LFPedgefilter	4C 46 50 65 64 67 65 66 69 6C 74 65 72
Status code	Activate / deactivate edge filter	Bool_1	1	All	Inactive: 0 Active: 1	00 01

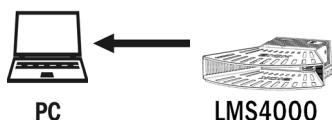
Table 261: Telegram structure: sWN LFPedgefilter

Example: sWN LFPedgefilter

Enable Edge filter

CoLa A	ASCII	<STX>sWN[SPC]LFPedgefilter[SPC]1<ETX>
	Hex	02 73 57 4E 20 4C 46 50 65 64 67 65 66 69 6C 74 65 72 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 13 73 57 4E 20 4C 46 50 65 64 67 65 66 69 6C 74 65 72 20 01 32

Table 262: Example: sWN LFPedgefilter 1

**Telegram structure: sWA LFPedgefilter**

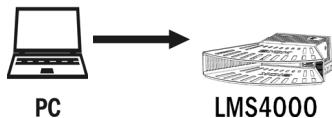
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Sector function	String	13	All	LFPedgefilter	4C 46 50 65 64 67 65 66 69 6C 74 65 72

Table 263: Telegram structure: sWA LFPmedianfilter

Example: sWA LFPedgefilter

CoLa A	ASCII	<STX>sWA[SPC]LFPedgefilter<ETX>
	Hex	02 73 57 41 20 4C 46 50 65 64 67 65 66 69 6C 74 65 72 03
CoLa B	Binary	02 02 02 02 00 00 00 12 73 57 41 20 4C 46 50 65 64 67 65 66 69 6C 74 65 72 20 3C

Table 264: Example: sWA LFPedgefilter

4.5.14 Set Edge filter

Make the Edge filter work more or less aggressively by reducing or increasing the maximum of the allowable distance difference between neighboring (valid) measurement values.

**Telegram structure: sWN LFPedgefilterMaxDist
(Authorized client)**

Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command	Write	String	3	All	sWN	73 57 4E

Telegram structure: sWN LFPedgefilterMaxDist (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
type						
Command	Sector function	String	19	All	LFPedgefilterMaxDist	4C 46 50 65 64 67 65 66 69 6C 74 65 72 4D 61 78 44 69 73 74
Distance value	Number	Uint_16	2	All	+1d ... +6000d (00 01h ... 02 58h)	00 01 ... 02 58

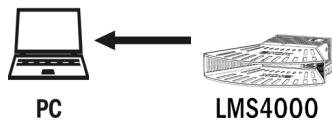
Table 265: Telegram structure: sWN LFPedgefilterMaxDist

Example: sWN LFPedgefilterMaxDist

Set Edge filter

CoLa A	ASCII	<STX>sWN{SPC}LFPedgefilterMaxDist{SPC}5<ETX>
	Hex	02 73 57 4E 20 4C 46 50 65 64 67 65 66 69 6C 74 65 72 4D 61 78 44 69 73 74 20 35 03
CoLa B	Binary	02 02 02 02 00 00 00 1B 73 57 4E 20 4C 46 50 65 64 67 65 66 69 6C 74 65 72 4D 61 78 44 69 73 74 20 00 05 48

Table 266: Example: sWN LFPedgefilterMaxDist +5



Telegram structure: sWA LFPedgefilterMaxDist						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Sector function	String	19	All	LFPedgefilterMaxDist	4C 46 50 65 64 67 65 66 69 6C 74 65 72 4D 61 78 44 69 73 74

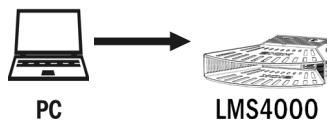
Table 267: Telegram structure: sWA LFPedgefilterMaxDist

Example: sWA LFPedgefilterMaxDist

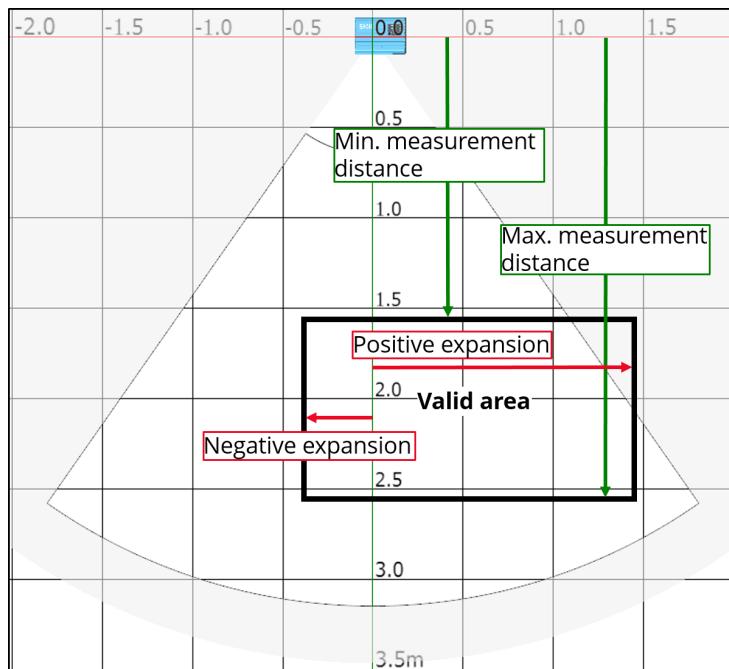
CoLa A	ASCII	<STX>sWA{SPC}LFPedgefilterMaxDist<ETX>
	Hex	02 73 57 41 20 4C 46 50 65 64 67 65 66 69 6C 74 65 72 4D 61 78 44 69 73 74 03
CoLa B	Binary	02 02 02 02 00 00 00 19 73 57 41 20 4C 46 50 65 64 67 65 66 69 6C 74 65 72 4D 61 78 44 69 73 74 20 42

Table 268: Example: sWA LFPedgefilterMaxDist

4.5.15 Set Cubic Area filter



Define area in relative distance from the device. Only measurement points within this area are valid; all other measurement points are transmitted in the telegram as invalid (=0).



Telegram structure: sWN LFPcubicareafilter (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Sector function	String	18	All	LFPcubicareafilter	4C 46 50 63 75 62 69 63 61 72 65 61 66 69 6C 74 65 72
Status code	Enable or disable Cubic Area filter	Bool_1	1	All	Inactive: 0 Active: 1	00 01
Distance value	Min. measurement distance in 1/10mm	Uint_32	4	All	0 ... 9.1776m: 0 ... 91776d (0 ... 16680h)	00 00 00 00 ... 00 01 66 80
Distance value	Max. measurement distance in 1/10mm	Uint_32	4	All	0 ... 9.1776m: 0 ... 91776d (0 ... 16680h)	00 00 00 00 ... 00 01 66 80
Distance value	Negative expansion in 1/10mm	Int_32	4	All	0 ... -4.5m: 0 ... -45000d Hex calculation: FFFFFFFF _h {minus}[value _h]{plus}1 _h	FF FF 50 38 ... FF FF FF FF
Distance value	Positive expansion in 1/10mm	Int_32	4	All	0 ... 4.5m: 0 ... 45000d (0 ... AFC8h)	00 00 00 00 ... 00 00 AF C8

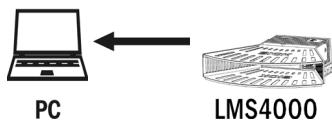
Table 269: Telegram structure: sWN LFPcubicareafilter

Example: sWN LFPcubicareafilter

Activate Cubic Area filter with area from 1 m ... 2 m and width from -1.5 m ... +1.5 m

CoLa A	ASCII	<STX>sWN[SPC]LFPcubicareafilter[SPC]1[SPC]+10000[SPC]+20000[SPC]-15000[SPC]+15000<ETX>
	Hex	02 73 57 4E 20 4C 46 50 63 75 62 69 63 61 72 65 61 66 69 6C 74 65 72 20 31 20 2B 31 30 30 30 30 20 2B 32 30 30 30 30 20 2D 31 35 30 30 30 20 2B 31 35 30 30 30 03
CoLa B	Binary	02 02 02 02 00 00 00 28 73 57 4E 20 4C 46 50 63 75 62 69 63 61 72 65 61 66 69 6C 74 65 72 20 01 00 00 27 10 00 00 4E 20 FF FF C5 68 00 00 3A 98 48

Table 270: Example: sWN LFPcubicareafilter 1 +10000 +20000 -15000 +15000



Telegram structure: sWA LFPcubicareafilter						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Sector function	String	18	All	LFPcubicareafilter	4C 46 50 63 75 62 69 63 61 72 65 61 66 69 6C 74 65 72

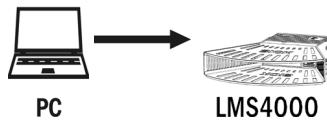
Table 271: Telegram structure: sWA LFPcubicareafilter

Example: sWA LFPcubicareafilter

CoLa A	ASCII	<STX>sWA[SPC]LFPcubicareafilter<ETX>
	Hex	02 73 57 41 20 4C 46 50 63 75 62 69 63 61 72 65 61 66 69 6C 74 65 72 03
CoLa B	Binary	02 02 02 02 00 00 00 17 73 57 41 20 4C 46 50 63 75 62 69 63 61 72 65 61 66 69 6C 74 65 72 20 56

Table 272: Example: sWA LFPedgefilterMaxDist

4.5.16 Activate Gloss compensation filter



Compensate measurement points that would be invalid due to exceedingly high received signal (direct reflection) with an assumed distance value of the third last valid point.

Telegram structure: sWN LFPglossfilter (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Sector function	String	14	All	LFPglossfilter	4C 46 50 67 6C 6F 73 73 66 69 6C 74 65 72
Status code	Activate / deactivate edge filter	Bool_1	1	All	Inactive: 0 Active: 1	00 01

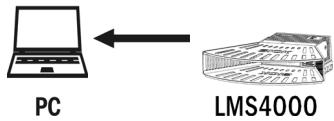
Table 273: Telegram structure: sWN LFPglossfilter

Example: sWN LFPglossfilter

Enable Gloss compensation

CoLa A	ASCII	<STX>sWN{SPC}LFPglossfilter{SPC}1<ETX>
	Hex	02 73 57 4E 20 4C 46 50 67 6C 6F 73 73 66 69 6C 74 65 72 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 14 73 57 4E 20 4C 46 50 67 6C 6F 73 73 66 69 6C 74 65 72 20 01 55

Table 274: Example: sWN LFPglossfilter 1



Telegram structure: sWA LFPglossfilter						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Sector function	String	14	All	LFPglossfilter	4C 46 50 67 6C 6F 73 73 66 69 6C 74 65 72

Table 275: Telegram structure: sWA LFPglossfilter

Example: sWA LFPglossfilter

CoLa A	ASCII	<STX>sWA{SPC}LFPglossfilter<ETX>
	Hex	02 73 57 41 20 4C 46 50 67 6C 6F 73 73 66 69 6C 74 65 72 03
CoLa B	Binary	02 02 02 02 00 00 00 13 73 57 41 20 4C 46 50 67 6C 6F 73 73 66 69 6C 74 65 72 20 5B

Table 276: Example: sWA LFPglossfilter

4.5.17 Activate long range mode



Command extends the maximum scanning distance of the MRS6224 by 1.4 compared to standard range.

Telegram structure: sWN EnableLongRangeMode (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Enable long range mode	String	14	All	EnableLongRangeMode	45 6E 61 62 6C 65 4C 6F 6E 67 52 61 6E 67 65 4D 6F 64 65
Status code	Activate / deactivate long range mode	Bool_1	1	All	Inactive: 0 Active: 1	00 01

Table 277: Telegram structure: sWN EnableLongRangeMode

Example: sWN Enable LongRangeMode

Enable EnableLongRangeMode

CoLa A	ASCII	<STX>sWN{SPCEnableLongRangeMode[SPC]1<ETX>
	Hex	02 73 57 4E 20 45 6E 61 62 6C 65 4C 6F 6E 67 52 61 6E 67 65 4D 6F 64 65 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 19 73 57 4E 20 45 6E 61 62 6C 65 4C 6F 6E 67 52 61 6E 67 65 4D 6F 64 65 20 31 2C

Table 278: Example: sWN EnableLongRangeMode 1



Telegram structure: sWA EnableLongRangeMode						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Sector function	String	14	All	EnableLongRangeMode	45 6E 61 62 6C 65 4C 6F 6E 67 52 61 6E 67 65 4D 6F 64 65

Table 279: Telegram structure: sWA EnableLongRangeMode

Example: sWA EnableLongRangeMode

CoLa A	ASCII	<STX>sWA{SPC}EnableLongRangeMode<ETX>
	Hex	02 73 57 41 20 45 6E 61 62 6C 65 4C 6F 6E 67 52 61 6E 67 65 4D 6F 64 65 03
CoLa B	Binary	02 02 02 02 00 00 00 18 73 57 41 20 45 6E 61 62 6C 65 4C 6F 6E 67 52 61 6E 67 65 4D 6F 64 65 20 12

Table 280: Example: sWA EnableLongRangeMode

4.5.18 Read status of long range mode



Telegram structure: sRN EnableLongRangeMode						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 57 4E
Command	Enable long range mode	String	14	All	EnableLongRangeMode	45 6E 61 62 6C 65 4C 6F 6E 67 52 61 6E 67 65 4D 6F 64 65

Table 281: Telegram structure: sRN EnableLongRangeMode

Example: sRN EnableLongRangeMode

Request status Long range mode

CoLa A	ASCII	<STX>sRN{SPC}EnableLongRangeMode<ETX>
	Hex	02 73 57 4E 20 45 6E 61 62 6C 65 4C 6F 6E 67 52 61 6E 67 65 4D 6F 64 03
CoLa B	Binary	02 02 02 02 00 00 00 17 73 57 4E 20 45 6E 61 62 6C 65 4C 6F 6E 67 52 61 6E 67 65 4D 6F 64 65 38

Table 282: Example: sRN EnableLongRangeMode



Telegram structure: sRA EnableLongRangeMode						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Sector function	String	14	All	EnableLongRangeMode	45 6E 61 62 6C 65 4C 6F 6E 67 52 61 6E 67 65 4D 6F 64 65
Status code	Activate / deactivate long range mode	Bool_1	1	All	Inactive: 0 Active: 1	00 01

Table 283: Telegram structure: sRA EnableLongRangeMode

Example: sRA EnableLongRangeMode 1

CoLa A	ASCII	<STX>sRA{SPC} EnableLongRangeMode<ETX>
	Hex	02 73 52 41 20 45 6E 61 62 6C 65 4C 6F 6E 67 52 61 6E 67 65 4D 6F 64 65 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 13 73 52 41 20 45 6E 61 62 6C 65 4C 6F 6E 67 52 61 6E 67 65 4D 6F 64 65 20 01 16

Table 284: Example: sWA EnableLongrangeMode

4.6 Encoder

Telegram validity overview

		LMS1xx	LMS5xx	TiM2xx	TiM5xx	TiM7xx	NAV310	LD-OEM15xx	LD-LRS36xx	MRS1000	LMS1000	MRS6000	LMS4000	LRS4000
4.6.1	Set increment source	x	x											x
4.6.2	Set encoder settings	x	x									x	x	
4.6.3	Set encoder resolution	x	x											x
4.6.4	Set fixed speed	x	x											
4.6.5	Read speed threshold	x	x											
4.6.6	Read encoder speed	x	x											x
4.6.7	Reset encoder values											x		

4.6.1 Set increment source



Telegram structure: sWN LICsrc (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set increment source	String	6	All	LICsrc	4C 49 43 73 72 63
Increment source		Enum_8	1	All	Fixed speed: 0 Encoder: 1	Fixed speed: 00 Encoder: 01

Table 285: Telegram structure: sWN LICsrc

Example: sWN LICsrc

CoLa A	ASCII	<STX>sWN{SPC}LICsrc{SPC}0<ETX>
	Hex	02 73 57 4E 20 4C 49 43 73 72 63 20 30 03
CoLa B	Binary	02 02 02 02 00 00 00 0C 73 57 4E 20 4C 49 43 73 72 63 20 01 4F

Table 286: Example: sWN LICsrc



Telegram structure: sWA LICsrc						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set increment source	String	6	All	LICsrc	4C 49 43 73 72 63

Table 287: Telegram structure: sWA LICsrc

Example: sWA LICsrc

CoLa A	ASCII	<STX>sWA{SPC}LICsrc<ETX>
	Hex	02 73 57 41 20 4C 49 43 73 72 63 03
CoLa B	Binary	02 02 02 02 00 00 00 0B 73 57 41 20 4C 49 43 73 72 63 41

Table 288: Example: sWA LICsrc

4.6.2 Set encoder settings



Telegram structure: sWN LICencset (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Encoder settings	String	9	All	LICencset	4C 49 43 65 6E 63 73 65 74
Encoder setting		Enum_8	1	All	Off: 0 Single increment/INC1: 1 Direction recognition (phase): 2 Direction recognition (level): 3	00 01 02 03
				LMS 4000	(see above +) Fixed increment speed / ticks (1 kHz): 4	04

Table 289: Telegram structure: sWN LICencset

Example: sWN LICencset

CoLa A	ASCII	<STX>sWN{SPC}LICencset{SPC}0<ETX>
	Hex	02 73 57 4E 20 4C 49 43 65 6E 63 73 65 74 20 30 03
CoLa B	Binary	02 02 02 02 00 00 00 0F 73 57 4E 20 4C 49 43 65 6E 63 73 65 74 20 00 26

Table 290: Example: sWN LICencset



Telegram structure: sWA LICencset						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Encoder settings	String	9	All	LICencset	4C 49 43 65 6E 63 73 65 74

Table 291: Telegram structure: sWA LICencset

Example: sWA LICencset

Cola A	ASCII	<STX>sWA{SPC}LICencset<ETX>
	Hex	02 73 57 41 20 4C 49 43 65 6E 63 73 65 74 03
Cola B	Binary	02 02 02 02 00 00 00 00 0E 73 57 41 20 4C 49 43 65 6E 63 73 65 74 20 29

Table 292: Example: sWA LICencset

4.6.3 Set encoder resolution



Telegram structure: sWN LICences (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set encoder resolution	String	9	All	LICences	4C 49 43 65 6E 63 72 65 73
Encoder resolution	Resolution value in mm/Inc as float according to IEEE754	Real	4	All	+0.001d ... +2000d (see IEEE 754)	3A 83 12 6F ... 44 FA 00 00

Table 293: Telegram structure: sWN LICences

Example: sWN LICences

CoLa A	ASCII	<STX>sWN{SPC}LICences{SPC}+1000<ETX>
	Hex	02 73 57 4E 20 4C 49 43 65 6E 63 72 65 73 20 2B 31 30 30 30 03
CoLa B	Binary	02 02 02 02 00 00 00 10 73 57 4E 20 4C 49 43 65 6E 63 72 65 73 20 44 7A 00 00 1E

Table 294: Example: sWN LICences



Telegram structure: sWA LICences						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set encoder resolution	String	9	All	LICences	4C 49 43 65 6E 63 72 65 73

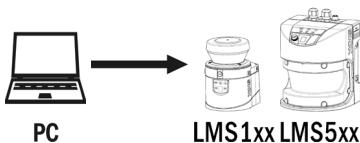
Table 295: Telegram structure: sWA LICences

Example: sWA LICences

CoLa A	ASCII	<STX>sWA{SPC}LICences<ETX>
	Hex	02 73 57 41 20 4C 49 43 65 6E 63 72 65 73 03
CoLa B	Binary	02 02 02 02 00 00 00 0D 73 57 41 20 4C 49 43 65 6E 63 72 65 73 00

Table 296: Example: sWA LICences

4.6.4 Set fixed speed



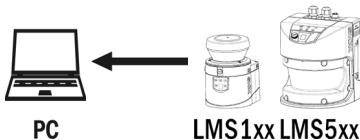
Telegram structure: sWN LICFixVel (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set fixed speed	String	9	All	LICFixVel	4C 49 43 46 69 78 56 65 6C
Fixed speed	Speed in m/s as float according to IEEE754	Real	4	All	+0.001d ... +10.0d	3A 83 12 6F... 41 20 00 00

Table 297: Telegram structure: sWN LICFixVel

Example: sWN LICFixVel

CoLa A	ASCII	<STX>sWN{SPC}LICFixVel{SPC}+5<ETX>
	Hex	02 73 57 4E 20 4C 49 43 46 69 78 56 65 6C 20 2B 35 03
CoLa B	Binary	02 02 02 02 00 00 00 0B 73 57 4E 20 4C 49 43 46 69 78 56 65 6C 20 40 A0 00 00 C4

Table 298: Example: sWN LICFixVel



Telegram structure: sWA LICFixVel						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set fixed speed	String	9	All	LICFixVel	4C 49 43 46 69 78 56 65 6C

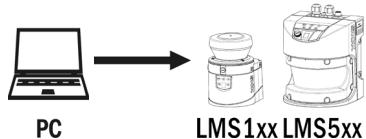
Table 299: Telegram structure: sWA LICFixVel

Example: sWA LICFixVel

CoLa A	ASCII	<STX>sWA{SPC}LICFixVel<ETX>
	Hex	02 73 57 41 20 4C 49 43 46 69 78 56 65 6C 03
CoLa B	Binary	02 02 02 02 00 00 00 0D 73 57 41 20 4C 49 43 46 69 78 56 65 6C 0B

Table 300: Example: sWA LICFixVel

4.6.5 Read speed threshold



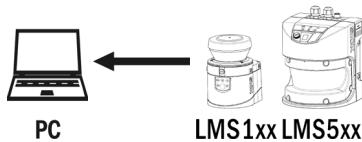
Telegram structure: sRN LICSpTh						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Read speed threshold	String	7	All	LICSpTh	4C 49 43 53 70 54 68

Table 301: Telegram structure: sRN LICSpTh

Example: sRN LICSpTh

CoLa A	ASCII	<STX>sRN{SPC}LICSpTh<ETX>
	Hex	02 73 52 4E 20 4C 49 43 53 70 54 68 03
CoLa B	Binary	02 02 02 02 00 00 00 0D 73 52 4E 20 4C 49 43 53 70 54 68 16

Table 302: Example: sRN LICSpTh



Telegram structure: sRA LICSpTh						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Speed threshold	String	7	All	LICSpTh	4C 49 43 53 70 54 68
Speed threshold	Speed threshold in %	Uint_8	2	All	+1d ... +20d (01h ... 14h)	01 ... 14

Table 303: Telegram structure: sRA LICSpTh

Example: sRA LICSpTh

CoLa A	ASCII	<STX>sRA{SPC}LICSpTh{SPC}5<ETX>
	Hex	02 73 52 41 20 4C 49 43 53 70 54 68 20 35 03
CoLa B	Binary	02 02 02 02 00 00 00 0D 73 52 41 20 4C 49 43 53 70 54 68 20 05 3C

Table 304: Example: sRA LICSpTh

4.6.6 Read encoder speed



Telegram structure: sRN LICencsp						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Read encoder speed	String	8	All	LICencsp	4C 49 43 65 6E 63 73 70

Table 305: Telegram structure: sRN LICencsp

Example: sRN LICencsp

CoLa A	ASCII	<STX>sRN{SPC}LICencsp<ETX>
	Hex	02 73 52 4E 20 4C 49 43 65 6C 63 73 70 03
CoLa B	Binary	02 02 02 02 00 00 00 11 73 52 4E 20 4C 49 43 65 6E 63 73 70 62

Table 306: Example: sRN LICencsp



Telegram structure: sRA LICencsp						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Read encoder speed	String	8	All	LICencsp	4C 49 43 65 6E 63 73 70
Encoder speed	[Speed in m/s as float according to IEEE754]	Real	4	All	0h ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF

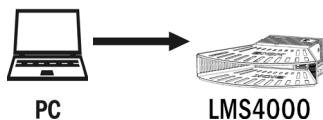
Table 307: Telegram structure: sRA LICencsp

Example: sRA LICencsp (0 m/s)

CoLa A	ASCII	<STX>sRA{SPC}LICencsp{SPC}0<ETX>
	Hex	02 73 52 41 20 4C 49 43 65 6C 63 73 70 20 30 30 30 30 30 30 30 30 03
CoLa B	Binary	02 02 02 02 00 00 00 11 73 52 41 20 4C 49 43 65 6E 63 73 70 20 00 00 00 00 4D

Table 308: Example: sRA LICencsp

4.6.7 Reset encoder values



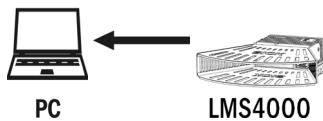
Telegram structure: sMN LIDrstencoderinc						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	73 4D 4E
Command	Reset Encoder values	String	16	All	LIDrstencoderinc	4C 49 44 72 73 74 65 6E 63 6F 64 65 72 69 6E 63

Table 309: Telegram structure: sMN LIDrstencoderinc

Example: sMN LIDrstencoderinc

CoLa A	ASCII	<STX>sMN{SPC}LIDrstencoderinc<ETX>
	Hex	02 73 4D 4E 20 4C 49 44 72 73 74 65 6E 63 6F 64 65 72 69 6E 63 03
CoLa B	Binary	02 02 02 02 00 00 00 11 73 4D 4E 20 4C 49 44 72 73 74 65 6E 63 6F 64 65 72 69 6E 63 62

Table 310: Example: sMN LIDrstencoderinc



Telegram structure: sAN LIDrstencoderinc						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	73 41 4E
Command	Read encoder speed	String	16	All	LIDrstencoderinc	4C 49 44 72 73 74 65 6E 63 6F 64 65 72 69 6E 63
Status code	[Speed in m/s as float according to IEEE754]	Enum_8	1	All	0h ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF

Table 311: Telegram structure: sAN LIDrstencoderinc

Example: sAN LIDrstencoderinc

CoLa A	ASCII	<STX>sAN{SPC}LIDrstencoderinc{SPC}0<ETX>
	Hex	02 73 41 4E 20 4C 49 44 72 73 74 65 6E 63 6F 64 65 72 69 6E 63 20 30 03
CoLa B	Binary	02 02 02 02 00 00 00 16 73 41 4E 20 4C 49 44 72 73 74 65 6E 63 6F 64 65 72 69 6E 63 20 00 58

Table 312: Example: sAN LIDrstencoderinc

4.7 Inputs and Outputs

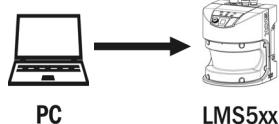
Telegram validity overview

		LMS1xx	LMS5xx	TiM2xx	TiM5xx	TiM7xx	NAV310	LD-OEM15xx	LD-LRS36xx	MRS1000	LMS1000	MRS6000	LMS4000	LRS4000
4.7.1	Read state of the ports		X											
4.7.2	Read Port Configuration of all I/Os (LRS4000 : Ports 3-8)									X	X		X	X
4.7.3	Read state of the inputs	X	X	X	X	X	X	X	X	X	X	X	X	X
4.7.4	Read state of the outputs	X	X	X	X	X	X	X	X	X	X	X	X	X
4.7.5	Receive outputstate by event	X	X	X	X	X	X	X	X	X	X	X	X	X
4.7.6	Set output state	X	X	X	X	X	X	X	X				X	X
4.7.7	Change output 6/3 function		X											
4.7.8	Change output 1 function							X	X	X				
4.7.9	Change output 1 logic state						X	X	X	X				
4.7.10	Change output 2 function							X	X	X				
4.7.11	Change output 2 logic state						X	X	X	X				
4.7.12	Set synchronization mode	X	X											
4.7.13	Set synchronization phase		X											
4.7.14	Change input 4 function		X											
4.7.15	Set debouncing time for input x	X	X		X	X								
4.7.16	Read status of external sync signal		X											

4.7.1 Read state of the ports

LIDportstate has to be available additionally or as successor of the LIDoutputstate telegram.

Valid for all sensors with Ethernet and ports (inputs / outputs).



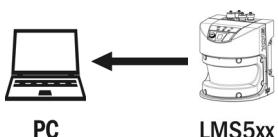
Telegram structure: sRN LIDportstate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Ask for port configuration	String	12	All	LIDportstate	4C 49 44 70 6F 72 74 73 74 61 74 65

Table 313: Telegram structure: sRN LIDportstate

Example: sRN LIDportstate

CoLa A	ASCII	<STX>sRN{SPC}LIDportstate<ETX>
	Hex	02 73 52 4E 20 4C 49 44 70 6F 72 74 73 74 61 74 65 03
CoLa B	Binary	02 02 02 02 00 00 00 10 73 52 4E 20 4C 49 44 70 6F 72 74 73 74 61 74 65 60

Table 314: Example: sRN LIDportstate



Telegram structure: sRA/sSN LIDportstate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA/sSN	73 52 41 / 73 53 4E
Command	Port state	String	12	All	LIDportstate	4c 49 44 70 6f 72 74 73 74 61 74 65
Status code	Version number	Uint_16	2	All	0 ... FFFFh Current version: 1	00 01 ... FF FF
	System counter (time in µs since power up max. 71min then starting from 0 again)	Uint_32	4		0 ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF
ARRAY which defines the number of internal ports*	0...n	UINT16	1	All	Hex 00 00-FF FFF 00 = not available 01...n number of ports	00 00-FF FF
State of the ports and count value in hex	Internal port state	Enum_8	1		00 = Output voltage low (Relays: open) 01 = Output voltage high (Relays: closed) 02 = Tri-state 03 = Input voltage high (level) Input voltage from low to high (edge) 04 = Input voltage low (level)	

Telegram structure: sRA/sSN LIDportstate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
					Input voltage high to low (edge)	
	Internal port counter	Uint_32	4		0 ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF
					
ARRAY which defines the number of external or virtual ports*	0...n	UINT16	1		Hex 00 00-FF FF 00 = not available 01...n number of ports	00 00-FF FF
State of the ports and count value in hex	External port state	Enum_8	1		00 = Output voltage low (Relays: open) 01 = Output voltage high (Relays: closed) 02 = Tri-state 03 = Input voltage high (level) Input voltage from low to high (edge) 04 = Input voltage low (level) Input voltage high to low (edge)	
	External port counter	Uint_32	4		0 ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF
					
Time	States code	Enum_16	1		No time data: 00 00 Time data: 00 01	No time data: 00 00 Time data: 00 01
Time Block (sensor time from the last change of min. one of the outputs)	Year	Array	2		e.g. 1970	e.g. 07 B2
	Month		1		1...12	01 ... 0C
	Day		1		1...31	01 ... 1F
	Hour		1		0...23	00 ... 17
	Minute		1		0...59	00 ... 3B
	Second		1		0...59	00 ... 3B
	Microsecond		4		0...999999	00 00 00 00 ... 00 0F 42 3F

Table 315: Telegram structure: sRA/sSN LIDportstate

Inputs/outputs: If the device has separate inputs and outputs (instead of general purpose ports) the ARRAY shall start with inputs followed by the outputs.

Virtual ports are ports that can be used to expand the number of ports but are not physically available. They just show up in the corresponding ethernet telegrams (like LIDportstate).

Tri-State: Port is neither input nor output; the port is set inactive in SOPAS

Example with 3 internal and 4 external ports:

Example: sRA LIDportstate

CoLa A	ASCII	<STX>sRA{SPC}LIDportstate{SPC}1{SPC}41F84EC5{SPC}3{SPC}1{SPC}20{SPC}1{SPC}20{SPC}3{SPC}20{SPC}4{SPC}1{SPC}20{SPC}1{SPC}20{SPC}0{SPC}20{SPC}03{SPC}20{SPC}1{SPC}7D9{SPC}2{SPC}12{SPC}C{SPC}29{SPC}E{SPC}975E0<ETX>
	Hex	02 73 52 41 20 4C 49 44 70 6F 72 74 73 74 61 74 65 20 31 20 34 31 46 38 34 45 43 35 20 33 20 31 20 32 30 20 31 20 32 30 20 33 20 32 30 20 34 20 31 20 32 30 20 31 20 32 30 20 30 20 32 30 20 30 33 20 32 30 20 31 20 37 44 39 20 32 20 31 32 20 43 20 32 39 20 45 20 39 37 35 45 30 03
CoLa B	Binary	02 02 02 02 00 00 00 5B 73 52 41 20 4C 49 44 70 6F 72 74 73 74 61 74 65 20 01 00 41 F8 4E C5 00 03 00 01 00 20 00 04 00 01 00 20 00 01 00 20 00 00 00 20 00 03 00 20 00 01 00 07 D9 00 02 00 12 00 0C 00 29 00 0E 00 09 75 E0 21

Table 316: Example: sRA LIDportstate

4.7.2 Read Port Configuration of all I/Os (LRS4000 : Ports 3-8)



Telegram structure: sRN PortConfiguration						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Ask for port configuration	String	12	All	PortConfiguration	50 6F 72 74 43 6F 6E 66 69 67 75 72 61 74 69 6F 6E

Table 317: Telegram structure: sRN PortConfiguration

Example: sRN PortConfiguration

CoLa A	ASCII	<STX>sRN{SPC}PortConfiguration<ETX>
	Hex	02 73 52 4E 20 50 6F 72 74 43 6F 6E 66 69 67 75 72 61 74 69 6F 6E 03
CoLa B	Binary	02 02 02 02 00 00 00 15 73 52 4E 20 50 6F 72 74 43 6F 6E 66 69 67 75 72 61 74 69 6F 6E 26

Table 318: Example: sRN PortConfiguration

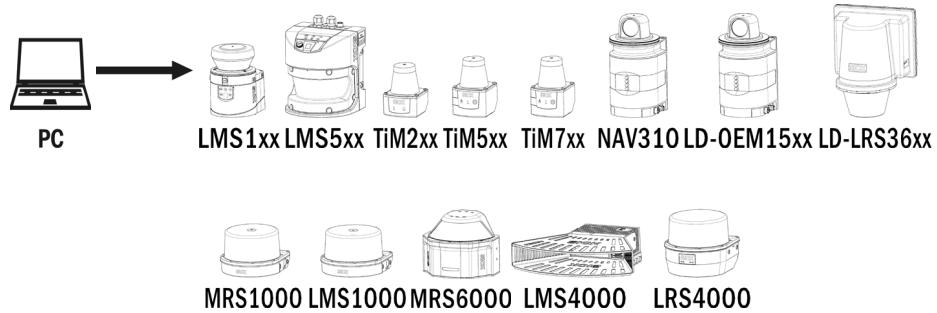


Telegram structure: sRA PortConfiguration						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Configuration of all I/Os	String	12	All	PortConfiguration	50 6F 72 74 43 6F 6E 66 69 67 75 72 61 74 69 6F 6E
Start of loop, number of loops = amount of all current and future Inputs and Outputs of device family						
Port Type	Input or Output	Enum_8	1	All	Input: 0 Output: 1	00 01
Port Name	Amount of characters of the following port name	Uint_16	2	All	0h ... 20h	00 00 ... 00 20
	Port name	String	16	All	[Port name]	[Port name]
Input Settings	Logic	Bool_1	1	All	Active High: 0 Active low: 1	00 01
	Debouncing	Uint_16	2	All	0h ... 27 10 (max. 10,000ms)	00 00 ... 27 10
	Sensitivity	Enum_8	1	All	Edge: 0 Level: 1	00 01
	Reserved	Uint_16	2	All	0h	00 00
	Reserved	Uint_16	2	All	0h	00 00
Output Settings	Logic	Bool_1	1	All	Active High: 0 Active low: 1	00 01
	Output Mode	Enum_8	1	All	PNP: 0 NPN: 1 Push-Pull: 2	00 01 02
	Restart type	Enum_8	1	All	Immediately: 0 Time: 1	00 01
	Restart time	Uint_32	4	All	14h ... 927C0 (20 ms ... 600,000 ms)	00 00 00 14 ... 00 09 27 C0
	Combination	Enum_8	1	All	AND: 0 OR: 1 XOR: 2	00 01 02
			1	LMS 4000	Always: 0	00
	Reserved	Uint_16	2	All	0h	00 00
Reserved	Reserved value 4	Uint_16	2	All	0h	00 00
Sources	Amount (n) of	Uint_16	2	All	0h ... FFFFh	00 00 ... FF FF

Telegram structure: sRA PortConfiguration						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
combined sources	combined sources			LMS 4000	0 ... 1	00 00 ... 00 01
	Start of source loop, number of loops = amount of combined sources					
	Source name	String	4	All	[Source] DRDY = Device State SCxx = Sopas Command (xx = Number of output port) SROT = Indexsignal SCLK = SyncOutByClock Input = Port Name = INxx (INxx = Number of input port)	[Source]
	Source Inverted or not	Bool_1	1	All	Not inverted: 0 Inverted: 1	00 01
	Reserved value 5	Uint_8	1	All	0h	00
	Reserved value 6	Uint_8	1	All	0h	00
	Stop of source loop					
Reserved	Reserved value 7	Uint_16	2	All	0h	00 00
Reserved	Reserved value 8	Uint_16	2	All	0h	00 00
Reserved	Reserved value 9	Uint_16	2	All	0h	00 00
Reserved	Reserved value 10	Uint_16	2	All	0h	00 00
Stop of loop						

4.7.3 Read state of the inputs

Use “sEN LIDinputstate 1” to receive a telegram each time an input signal (e.g. by trigger) changes. Compare with chapter 4.7.5 Receive outputstate by event.



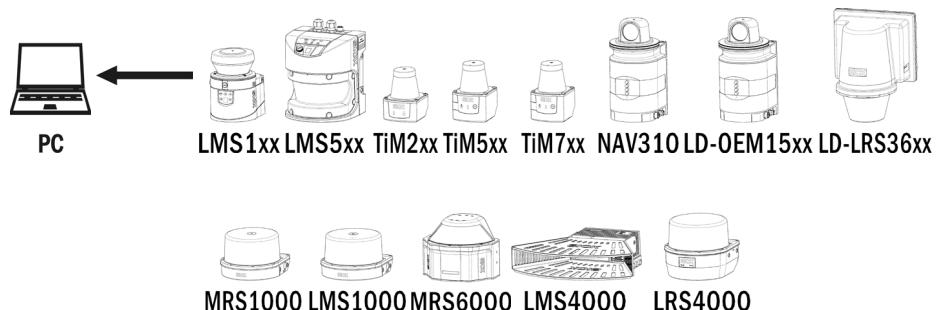
Telegram structure: sRN LIDinputstate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Output state	String	14	All	LIDinputstate	4C 49 44 69 6E 70 75 74 73 74 61 74 65

Table 319: Telegram structure: sRN LIDinputstate

Example: sRN LIDinputstate

CoLa A	ASCII	<STX>sRN{SPC}LIDinputstate<ETX>
	Hex	02 73 52 4E 20 4C 49 44 69 6E 70 75 74 73 74 61 74 65 03
CoLa B	Binary	02 02 02 02 00 00 00 11 73 52 4E 20 4C 49 44 69 6E 70 75 74 73 74 61 74 65 0F

Table 320: Example: sRN LIDinputstate



Telegram structure: sRA LIDinputstate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Output state	String	14	All	LIDinputstate	4C 49 44 69 6E 70 75 74 73 74 61 74 65
Status	Version number	Uint_16	2	All	0 ... FFFFh	00 00 ... FF FF

Telegram structure: sRA LIDinputstate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
code	System counter (time in μ s since power up max. 71min then starting from 0 again)	Uint_32	4		0 ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF
State of the inputs 1 ... n	Amount of inputs (n) depending of device family	Enum_8	1	All	Not active: 0 Active: 1 Input not used: 2	Not active: 00 Active: 01 Input not used: 02
Time	States code	Uint_16	2	All	No time data: 0 Time data: 1	No time data: 00 00 Time data: 00 01
Time Block (sensor-time from the last change of min. one of the outputs)	Year	Array	2	All	e.g. 1970	e.g. 07 B2
	Month		1		1 ... 12	01 ... 0C
	Day		1		1 ... 31	01 ... 1F
	Hour		1		0 ... 23	00 ... 17
	Minute		1		0 ... 59	00 ... 3B
	Second		1		0 ... 59	00 ... 3B
	Microsecond		4		0 ... 999999	00 00 00 00 ... 00 0F 42 3F

Table 321: Telegram structure: sRA LIDinputstate

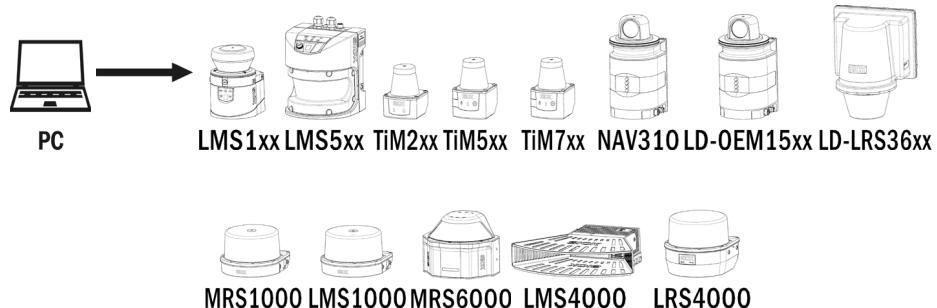
Example: sRA LIDinputstate In1 active, In2 active, In3 inactive, In4 not used, In5 not used, In6 inactive, In7 inactive, In8 not used, time: 2022-04-25 14:10 46.946sec

CoLa A	ASCII	<STX>sRA{SPC}LIDinputstate{SPC}1{SPC}98E71BD7{SPC}1{SPC}1{SPC}0{SPC}2{SPC}2{SPC}0{SPC}0{SPC}2{SPC}1{SPC}7E6{SPC}4{SPC}19{SPC}E{SPC}A{SPC}2E{SPC}E6F50<ETX>
	Hex	02 73 52 41 20 4C 49 44 69 6E 70 75 74 73 74 61 74 65 20 31 20 39 38 45 37 31 42 44 37 20 31 20 31 20 30 20 32 20 32 20 30 20 32 20 31 20 37 45 36 20 34 20 31 39 20 45 20 41 20 32 45 20 45 36 46 35 30 03
CoLa B	Binary	02 02 02 02 00 00 00 2D 73 52 41 20 4C 49 44 69 6E 70 75 74 73 74 61 74 65 20 00 01 98 E7 1B D7 01 01 00 02 02 00 00 02 00 01 07 E6 04 19 0E 0A 2E 00 0E 6F 50 76

Table 322: Example: sRA LIDinputstate

4.7.4 Read state of the outputs

Generally status of all outputs, for LRS4000 Out 3-8



Telegram structure: sRN LIDoutputstate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Output state	String	14	All	LIDoutputstate	4C 49 44 6F 75 74 70 75 74 73 74 61 74 65

Table 323: Telegram structure: sRN LIDoutputstate

Example: sRN LIDoutputstate

CoLa A	ASCII	<STX>sRN{SPC}LIDoutputstate<ETX>
	Hex	02 73 52 4E 20 4C 49 44 6F 75 74 70 75 74 73 74 61 74 65 03
CoLa B	Binary	02 02 02 02 00 00 00 12 73 52 4E 20 4C 49 44 6F 75 74 70 75 74 73 74 61 74 65 66

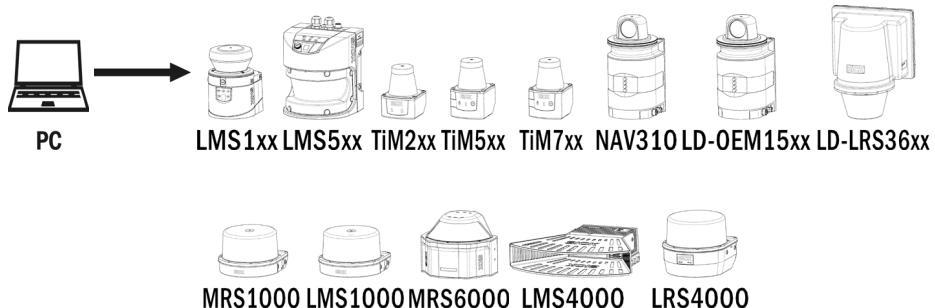
Table 324: Example: sRN LIDoutputstate

Telegram structure: sRA LIDoutputstate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Find complete telegram structure of the answer in section 4.7.5 „Receive outputstate by event“ on page 175.						

Table 325: Telegram structure: sRA LIDoutputstate

4.7.5 Receive outputstate by event

Output telegram is sent every time an output state changes.



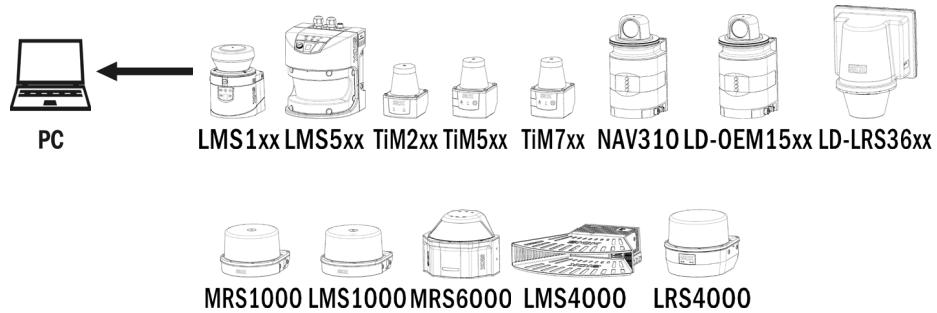
Telegram structure: sEN LIDoutputstate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Event	String	3	All	sEN	73 45 4E
Command	Output state	String	14	All	LIDoutputstate	4C 49 44 6F 75 74 70 75 74 73 74 61 74 65
	Start/stop	Enum_8	1	All	Start: 1 Stop: 0	Start: 01 Stop: 00

Table 326: Telegram structure: sEN LIDoutputstate

Example: sEN LIDoutputstate

CoLa A	ASCII	<STX>sEN{SPC}LIDoutputstate{SPC}1<ETX>
	Hex	02 73 45 4E 20 4C 49 44 6F 75 74 70 75 74 73 74 61 74 65 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 14 73 45 4E 20 4C 49 44 6F 75 74 70 75 74 73 74 61 74 65 20 01 50

Table 327: Example: sEN LIDoutputstate



Telegram structure: sRA/sSN LiDoutputstate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA/sSN	73 52 41 / 73 53 4E
Command	Output state	String	14	All	LiDoutputstate	4C 49 44 6F 75 74 70 75 74 73 74 61 74 65
Status code	Version number	Uint_16	2	All	0 ... FFFFh	00 00 ... FF FF
	System counter (time in µs since power up max. 71min then starting from 0 again)	Uint_32	4		0 ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF
State of the outputs and count value in hex	Out1 state	Enum_8	1	All	Not active: 0 Active: 1 Output not used: 2	Not active: 00 Active: 01 Output not used: 02

Telegram structure: sRA/sSN LIDoutputstate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
	Out1 count	Uint_32	4		0 ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF
	Out2 state	Enum_8	1	TiM24x TiM7xx LMS1xx LMS5xx LD-OEM15xx LD-LRS36xx MRS1000 LMS4000 MRS6000	Not active: 0 Active: 1 Output not used: 2	Not active: 00 Active: 01 Output not used: 02
	Out2 count	Uint_32	4		0 ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF
	Out3 state	Enum_8	1	TiM7xx LMS1xx LMS5xx LD-OEM15xx LD-LRS36xx MRS1000 LMS4000 MRS6000 LRS4000	Not active: 0 Active: 1 Output not used: 2	Not active: 00 Active: 01 Output not used: 02
	Out3 count	Uint_32	4		0 ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF
	Out4 state	Enum_8	1	TiM7xx LMS5xx LD-OEM15xx LD-LRS36xx MRS1000 LMS4000 MRS6000 LRS4000	Not active: 0 Active: 1 Output not used: 2	Not active: 00 Active: 01 Output not used: 02
	Out4 count	Uint_32	4		0 ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF
	Out5 state	Enum_8	1	LMS5xx LD-OEM15xx LD-LRS36xx MRS1000 LMS4000 MRS6000 LRS4000	Not active: 0 Active: 1 Output not used: 2	Not active: 00 Active: 01 Output not used: 02
	Out5 count	Uint_32	4		0 ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF
	Out6 state	Enum_8	1		Not active: 0 Active: 1 Output not used: 2	Not active: 00 Active: 01 Output not used: 02
	Out6 count	Uint_32	4		0 ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF
	Out7 state	Enum_8	1	MRS1000 LMS4000 MRS6000 LRS4000	Not active: 0 Active: 1 Output not used: 2	Not active: 00 Active: 01 Output not used: 02
	Out7 count	Uint_32	4		0 ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF
	Out8 state	Enum_8	1		Not active: 0 Active: 1 Output not used: 2	Not active: 00 Active: 01 Output not used: 02
	Out8 count	Uint_32	4		0 ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF
	Out9 state	Enum_8	1	LMS4000	Always not used: 2	Output not used: 02
	Out9 count	Uint_32	4		0	00 00 00 00
	Ext.Out1 state	Enum_8	1	LMS1xx	Not active: 0	Not active: 0

Telegram structure: sRA/sSN LIDoutputstate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
LMS5xx				LMS5xx	Active: 1	Active: 1
	Ext.Out1 count	Uint_32	4		Output not used: 2	Output not used: 2
	Ext.Out2 state	Enum_8	1		0 ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF
	Ext.Out2 count	Uint_32	4		Not active: 0	Not active: 0
	Ext.Out3 state	Enum_8	1		Active: 1	Active: 1
	Ext.Out3 count	Uint_32	4		Output not used: 2	Output not used: 2
	Ext.Out4 state	Enum_8	1		0 ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF
	Ext.Out4 count	Uint_32	4		Not active: 0	Not active: 0
	Ext.Out5 state	Enum_8	1		Active: 1	Active: 1
	Ext.Out5 count	Uint_32	4		Output not used: 2	Output not used: 2
	Ext.Out6 state	Enum_8	1		0 ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF
	Ext.Out6 count	Uint_32	4		Not active: 0	Not active: 0
	Ext.Out7 state	Enum_8	1		Active: 1	Active: 1
	Ext.Out7 count	Uint_32	4		Output not used: 2	Output not used: 2
	Ext.Out8 state	Enum_8	1		0 ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF
	Ext.Out8 count	Uint_32	4		Not active: 0	Not active: 0
Time	States code	Uint_16	2	All	No time data: 0 Time data: 1	No time data: 00 00 Time data: 00 01

Telegram structure: sRA/sSN LIOutputstate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
(sensor-time from the last change of min. one of the outputs)	Year	Array	2	All	e.g. 1970	e.g. 07 B2
	Month		1		1 ... 12	01 ... 0C
	Day		1		1 ... 31	01 ... 1F
	Hour		1		0 ... 23	00 ... 17
	Minute		1		0 ... 59	00 ... 3B
	Second		1		0 ... 59	00 ... 3B
	Microsecond		4		0 ... 999999	00 00 00 00 ... 00 OF 42 3F

Table 328: Telegram structure: sRA/sSN LIDoutputstate

Example: sRA LIDoutputstate Out1 active Count 5, Out2 active Count 5, Out3 active Count 5, all other Outputs not used. time: 2009-02-18 12:41 14.62sec

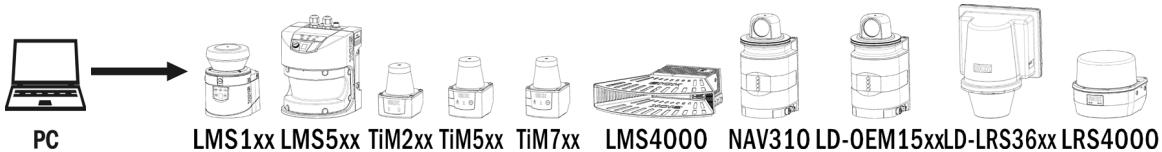
ColA A	ASCII	<STX>sRA[SPC]LIDoutputstate[SPC]1[SPC]41F84EC5[SPC]1[SPC]5[SPC]1[SPC]5[SPC]1[SPC]5[SPC]2[SPC]0[SPC]2[SPC]0[SPC]2[SPC]0[SPC]2[SPC]0[SPC]2[SPC]0[SPC]2[SPC]0[SPC]2[SPC]0[SPC]2[SPC]0[SPC]1[SPC]7D9[SPC]2[SPC]12[SPC]C[SPC]29[SPC]E[SPC]975E0<ETX>
	Hex	02 73 52 41 20 4C 49 44 6F 75 74 70 75 74 73 74 61 74 65 20 31 20 41 F8 4E C5 20 31 20 35 20 31 20 35 20 31 20 35 20 32 20 30 20 32 20 30 20 32 20 30 20 32 20 30 20 32 20 30 20 32 20 30 20 32 20 30 20 32 20 30 20 32 20 30 20 31 20 37 44 39 20 32 20 31 32 20 43 20 32 39 20 45 20 39 37 35 45 30 03
ColA B	Binary	02 02 02 02 00 00 00 5D 73 52 41 20 4C 49 44 6F 75 74 70 75 74 73 74 61 74 65 20 00 01 41 F8 4E C5 01 00 00 00 05 01 00 00 00 05 01 00 00 00 05 02 00 00 00 00 02 00 00 00 00 02 00 00 00 00 00 02 00 00 00 00 00 00 02 00 00 00 00 00 00 00 00 00 01 07 D9 02 12 0C 29 0E 00 09 75 E0 06

Table 329: Example: sRA LIDoutputstate

4.7.6 Set output state

**NOTE**

Output source needs to be set to “SOPAS command” and the port configured as Output (in case of I/O).



Telegram structure: sMN mDOSetOutput						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	73 4D 4E
Command	Set output state	String	12	All	mDOSetOutput	6D 44 4F 53 65 74 4F 75 74 70 75 74
Output number		Uint_8	1	LMS1xx	1 ... 3	01 ... 03
				LMS12x	1 ... 2	01 ... 02
				LMS 4000	1 ... 4	01 ... 04
				LMS5xx	1 ... 6	01 ... 06
				TiMxxx	1	01
				TiM24x	2	02
				LD-OEM 1500	1... 4	01 ... 04
				LD-LRS 3600		
				LD-LRS 3610		
				LD-OEM 1501	01	01
				LD-LRS 3601		
				LD-LRS 3611		
				LRS4000	03...08	03...008
Output state		Enum_8	1	All	Inactive: 0 Active: 1	Inactive: 00 Active: 01

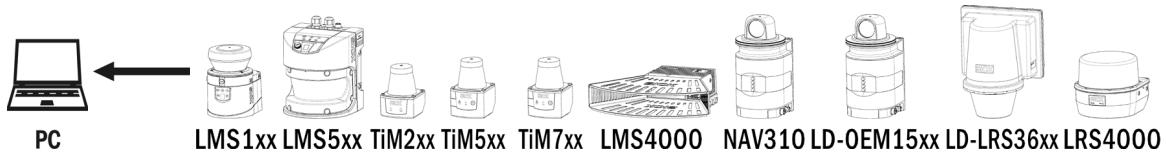
Table 330: Telegram structure: sMN mDOSetOutput

Example: sMN mDOSetOutput

CoLa A	ASCII	<STX>sMN{SPC}mDOSetOutput{SPC}1{SPC}1<ETX>
CoLa A	Hex	02 73 4D 4E 20 6D 44 4F 53 65 74 4F 75 74 20 31 20 31 03

CoLa B	Binary	02 02 02 02 00 00 00 13 73 4D 4E 20 6D 44 4F 53 65 74 4F 75 74 70 75 74 20 01 01 69
--------	--------	--

Table 331: Example: sMN mDOSetOutput



Telegram structure: sAN mDOSetOutput						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	73 41 4E
Command	Set output state	String	12	All	mDOSetOutput	6D 44 4F 53 65 74 4F 75 74 70 75 74
Status Code	Status code	Bool_1	1	All	Error: 0 Success: 1	Error: 00 Success: 01

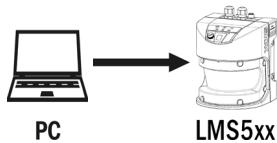
Table 332: Telegram structure: sAN mDOSetOutput

Example: sAN mDOSetOutput

CoLa A	ASCII	<STX>sAN{SPC}mDOSetOutput{SPC} 1 <ETX>
	Hex	02 73 41 4E 20 6D 44 4F 53 65 74 4F 75 74 70 75 74 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 12 73 41 4E 20 6D 44 4F 53 65 74 4F 75 74 70 75 74 20 01 67

Table 333: Example: sAN mDOSetOutput

4.7.7 Change output 6/3 function



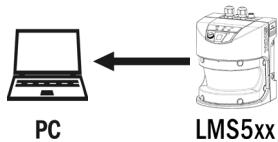
Telegram structure: sWN DO6Fnc/sWN DO3Fnc (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Output function	String	6	LMS5xx PRO	D06Fnc	44 4F 36 46 6E 63
				LMS5xx Lite	D03Fnc	44 4F 33 46 6E 63
Output state		Enum_8	1	All	No Function: 0 SOPAS command: 1 Device Ready: 2 Application: 3 Applic./Device Ready: 4 Dev.ready/Contamination: 5 Contamination: 6 Master Synchronisation: 7	Not available

Table 334: Telegram structure PRO: sWN DO6Fnc/Lite: sWN DO3Fnc

Example: sWN DO6Fnc → Set Out6 to Master Synchronisation

CoLa A	ASCII	<STX>sWN[SPC]D06Fnc[SPC]7<ETX>
	Hex	02 73 57 4E 20 44 4F 36 46 6E 63 20 37 03
CoLa B	Binary	Unavailable with current firmware.

Table 335: Example: sWN DO6Fnc → Out6 to master sync



Telegram structure: sWA DO6Fnc						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Output function	String	6	LMS5xx PRO	D06Fnc	44 4F 36 46 6E 63
				LMS5xx Lite	D03Fnc	44 4F 33 46 6E 63

Table 336: Telegram structure: PRO: sWN D06Fnc/Lite: sWN D03Fnc

Example: sWA D06Fnc

CoLa A	ASCII	<STX>sWA{SPC}D06Fnc<ETX>
	Hex	02 73 57 41 20 44 4F 36 46 6E 63 03
CoLa B	Binary	Not available with firmware V1.10

Table 337: Example: sWA D06Fnc

4.7.8 Change output 1 function



Telegram structure: sWN D01Fnc (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Output function	String	6	All	D01Fnc	44 4F 31 46 6E 63
Output 1 function	Selected function	Enum_8	1	All	No function: 0 Command: 1 Device ready: 2 Application dev. ready: 3 Sync pulse: 4 Sync index: 5	No function: 00 Command: 01 Device ready: 02 Application dev. ready: 03 Sync pulse: 04 Sync index: 05

Table 338: Telegram structure: sWN D01Fnc

Example: sWN D01Fnc → Set Out1 to Device Ready

CoLa A	ASCII	<STX>sWN[SPC]D01Fnc[SPC]2<ETX>
	Hex	02 73 57 4E 20 44 4F 31 46 6E 63 20 32 03
CoLa B	Binary	02 02 02 02 00 00 00 0C 73 57 4E 20 44 4F 31 46 6E 63 20 02 19

Table 339: Example: sWN D01Fnc → Out1 to device ready



Telegram structure: sWA D01Fnc						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Output function	String	6	All	D01Fnc	44 4F 31 46 6E 63

Table 340: Telegram structure: sWA D01Fnc

Example: sWA D01Fnc

CoLa A	ASCII	<STX>sWA[SPC]D01Fnc<ETX>
	Hex	02 73 57 41 20 44 4F 31 46 6E 63 03
CoLa B	Binary	02 02 02 02 00 00 00 0A 73 57 41 20 44 4F 31 46 6E 63 34

Table 341: Example: sWA D01Fnc

Functions:

No function: 0

Command: 1

Device ready (for field application): 2

Application dev. ready: 3

Sync pulse (10 ms puls when timer register is read “sRN STlms”): 4

Sync index: 5

The output signal depends on the scanner head position
(high (+24 V): 0° ... 179°/low (0 V): 180° ... 360°).

4.7.9 Change output 1 logic state



Telegram structure: sWN DO1Logic (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Output function	String	8	All	DO1Logic	44 4F 31 4C 6F 67 69 63
Output 1 logic state	State of the output	Enum_8	1	All	Active_High: 0 Active_Low: 1	Active_High: 00 Active_Low: 01

Table 342: Telegram structure: sWN DO1Logic

Example: sWN DO1Logic → Active_High

CoLa A	ASCII	<STX>sWN[SPC]DO1Logic[SPC]1<ETX>
	Hex	02 73 57 4E 20 44 4F 31 4C 6F 67 69 63 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 00 0E 73 57 4E 20 44 4F 31 4C 6F 67 69 63 20 01 1F

Table 343: Example: sWN DO1Logic → Active_Low



Telegram structure: sWA DO1Logic						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Output logic	String	8	All	DO1Logic	44 4F 31 4C 6F 67 69 63

Table 344: Telegram structure: sWA DO1Logic

Example: sWA DO1Logic

CoLa A	ASCII	<STX>sWA[SPC]DO1Logic<ETX>
	Hex	02 73 57 41 20 44 4F 31 4C 6F 67 69 63 03
CoLa B	Binary	02 02 02 02 00 00 00 0C 73 57 41 20 44 4F 31 4C 6F 67 69 63 31

Table 345: Example: sWA DO1Logic

4.7.10 Change output 2 function



Telegram structure: sWN DO2Fnc (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Output function	String	6	All	DO2Fnc	44 4F 32 46 6E 63
Output 2 function	Code number	Enum_8	1	All	No function: 0 Command: 1 Device ready: 2 Application dev. ready: 3	No function: 00 Command: 01 Device ready: 02 Application dev. ready: 03

Table 346: Telegram structure: sWN DO2Fnc

Example: sWN DO2Fnc → Out2 to device ready

CoLa A	ASCII	<STX>sWN[SPC]DO2Fnc[SPC]2<ETX>
	Hex	02 73 57 4E 20 44 4F 32 46 6E 63 20 32 03
CoLa B	Binary	02 02 02 02 00 00 00 0C 73 57 4E 20 44 4F 32 46 6E 63 20 02 1A

Table 347: Example: sWN DO2Fnc → Out2 to device ready



Telegram structure: sWA DO2Fnc						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Output function	String	6	All	DO2Fnc	44 4F 32 46 6E 63

Table 348: Telegram structure: sWA DO2Fnc

Example: sWA DO2Fnc

CoLa A	ASCII	<STX>sWA[SPC]DO2Fnc<ETX>
	Hex	02 73 57 41 20 44 4F 32 46 6E 63 03
CoLa B	Binary	02 02 02 02 00 00 00 0A 73 57 41 20 44 4F 32 46 6E 63 37

Table 349: Example: sWA DO2Fnc

4.7.11 Change output 2 logic state

Identical for TiM7xx Outputs 3 and 4 with DO3Logic and DO4Logic.



Telegram structure: sWN DO2Logic (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Output function	String	8	All	DO2Logic	44 4F 32 4C 6F 67 69 63
Output 2 logic state	State of the output	Enum_8	1	All	Active_High: 0 Active_Low: 1	Active_High: 00 Active_Low: 01

Table 350: Telegram structure: sWN DO2Logic

Example: sWN DO2Logic → Active_High

CoLa A	ASCII	<STX>sWN[SPC]DO2Logic[SPC]0<ETX>
	Hex	02 73 57 4E 20 44 4F 32 4C 6F 67 69 63 20 30 03
CoLa B	Binary	02 02 02 02 00 00 00 0E 73 57 4E 20 44 4F 32 4C 6F 67 69 63 20 00 1C

Table 351: Example: sWN DO2Logic → Active_High



Telegram structure: sWA DO2Logic						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Output logic	String	8	All	DO2Logic	44 4F 32 4C 6F 67 69 63

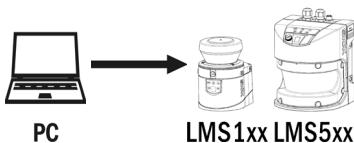
Table 352: Telegram structure: sWA DO2Logic

Example: sWA DO2Logic

CoLa A	ASCII	<STX>sWA[SPC]DO2Logic<ETX>
	Hex	02 73 57 41 20 44 4F 32 4C 6F 67 69 63 03
CoLa B	Binary	02 02 02 02 00 00 00 0C 73 57 41 20 44 4F 32 4C 6F 67 69 63 32

Table 353: Example: sWA DO2Logic

4.7.12 Set synchronization mode



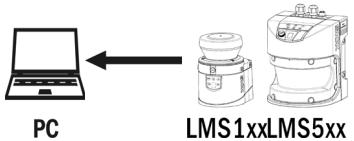
Telegram structure: sWN SYMode (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set sync mode	String	6	All	SYMode	53 59 4D 6F 64 65
Sync mode data	Synchronization mode data	Bool_1	1	All	No sync = 0 Sync by wire = 1 Sync by CAN = 2	Not possible

Table 354: Telegram structure: sWN SYMode

Example: sWN SYMode

CoLa A	ASCII	<STX>sWN{SPC}SYMode{SPC}1<ETX>
	Hex	02 73 57 4E 20 53 59 4D 6F 64 65 20 31 03
CoLa B	Binary	Not possible

Table 355: Example: sWN SYMode



Telegram structure: sWA SYMode						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set sync mode	String	6	All	SYMode	53 59 4D 6F 64 65

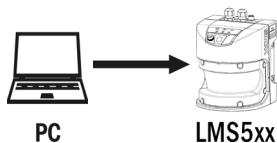
Table 356: Telegram structure: sWA SYMode

Example: sWA SYMode

CoLa A	ASCII	<STX>sWA{SPC}SYMode<ETX>
	Hex	02 73 57 41 20 53 59 4D 6F 64 65 03
CoLa B	Binary	Not possible

Table 357: Example: sWA SYMode

4.7.13 Set synchronization phase



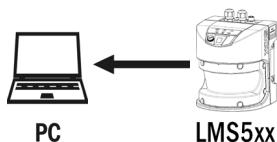
Telegram structure: sWN SYPhase (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	Not possible
Command	Set sync phase	String	7	All	SYPhase	Not possible
Sync phase data	Synchronization phase data	Int_16	2	All	-180d ... +180d (FF4Ch ... 00B4h)	Not possible

Table 358: Telegram structure: sWN SYPhase

Example: sWN SYPhase +90

CoLa A	ASCII	<STX>sWN{SPC}SYPhase{SPC}+90<ETX>
	Hex	02 73 57 4E 20 53 59 50 68 61 73 65 20 2B 39 30 03
CoLa B	Binary	Not possible

Table 359: Example: sWN SYPhase +90



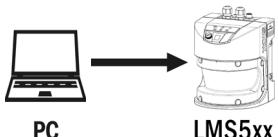
Telegram structure: sWA SYPhase						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	Not possible
Command	Set sync phase	String	7	All	SYPhase	Not possible

Table 360: Telegram structure: sWA SYPhase

Example: sWA SYPhase

CoLa A	ASCII	<STX>sWA{SPC}SYPhase<ETX>
	Hex	02 73 57 41 20 53 59 50 68 61 73 65 03
CoLa B	Binary	Not possible

Table 361: Example: sWA SYPhase

4.7.14 Change input 4 function

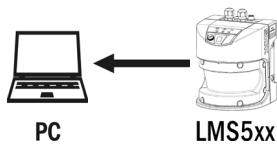
Telegram structure: sWN DO3And4Fnc (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Input function	String	10	All	DO3And4Fnc	44 4F 33 41 6E 64 34 46 6E 63
Input state	Code number	Enum_8	1	All	No function: 0 Encoder: 1 Slave sync: 2 Digital input: 3	

Table 362: Telegram structure: sWN DO3And4Fnc

Example: sWN In4 → In3+4 to slave sync

CoLa A	ASCII	<STX>sWN{SPC}DO3And4Fnc{SPC}2<ETX>
	Hex	02 73 57 4E 20 44 4F 33 41 6E 64 34 46 6E 63 20 02 03
CoLa B	Binary	Not available with firmware V1.10

Table 363: Example: sWN In4 → In3+4 to slave sync



Telegram structure: sWA DO3And4Fnc						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Input function	String	10	All	DO3And4Fnc	44 4F 33 41 6E 64 34 46 6E 63

Table 364: Telegram structure: sWA DO3And4Fnc

Example: sWA DO3And4Fnc

CoLa A	ASCII	<STX>sWA{SPC}DO3And4Fnc<ETX>
	Hex	02 73 57 41 20 44 4F 33 41 6E 64 34 46 6E 63 03
CoLa B	Binary	Not available with firmware V1.10

Table 365: Example: sWA DO3And4Fnc

4.7.15 Set debouncing time for input x

The telegram applies for the inputs 1 to 4 (DIxDebTim, x = 1 ... 4). The following tables show the data for input 3.



Telegram structure: sWN DI3DebTim (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set debouncing time for input 3	String	9	All	DI3DebTim	44 49 33 44 65 62 54 69 6D
Debouncing time data	[ms]	Uint_16	2	All	0d ... +10000d (00h ... 2710h)	00 00 ... 27 10

Table 366: Telegram structure: sWN DI3DebTim

Example: sWN DI3DebTim

CoLa A	ASCII	<STX>sWN[SPC]DI3DebTim[SPC]+10<ETX>
	Hex	02 73 57 4E 20 44 49 33 44 65 62 54 69 6D 20 2B 31 30 03
CoLa B	Binary	02 02 02 02 00 00 00 10 73 57 4E 20 44 49 33 44 65 62 54 69 6D 20 00 OA 77

Table 367: Example: sWN DI3DebTim



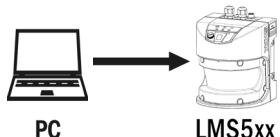
Telegram structure: sWA DI3DebTim						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set debouncing time for input 3	String	9	All	DI3DebTim	44 49 33 44 65 62 54 69 6D

Table 368: Telegram structure: sWA DI3DebTim

Example: sWA DI3DebTim

CoLa A	ASCII	<STX>sWA[SPC]DI3DebTim<ETX>
	Hex	02 73 57 4E 20 44 49 33 44 65 62 54 69 6D 03
CoLa B	Binary	02 02 02 02 00 00 00 0E 73 57 41 20 44 49 33 44 65 62 54 69 6D 20 48

Table 369: Example: sWA DI3DebTim

4.7.16 Read status of external sync signal

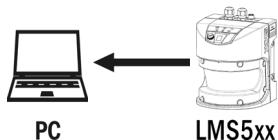
Telegram structure: sRN SYextmon						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Status of external sync signal	String	8	All	SYextmon	53 59 65 78 74 6D 6F 6E

Table 370: Telegram structure: sRN SYextmon

Example: sRN SYextmon

CoLa A	ASCII	<STX>sRN{SPC}SYextmon<ETX>
	Hex	02 73 52 4E 20 53 59 65 78 74 6D 6F 6E 03
CoLa B	Binary	02 02 02 02 00 00 00 0C 73 52 4E 20 53 59 65 78 74 6D 6F 6E 40

Table 371: Example: sRN SYextmon



Telegram structure: sRA SYextmon						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Status of external sync signal	String	8	All	SYextmon	53 59 65 78 74 6D 6F 6E
Sync status data	Synchronization status data	Uint_8	1	All	None: 1 Too slow: 2 Good: 4 Too fast: 8	None: 01 Too slow: 02 Good: 04 Too fast: 08
Signal frequency	[Frequency in Hz as float according to IEEE754]	Real	4	All	0h ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF

Table 372: Telegram structure: sRA SYextmon

Example: sRA SYextmon (49.9 Hz)

CoLa A	ASCII	<STX>sRA{SPC}SYextmon{SPC}4{SPC}4247BD87<ETX>
	Hex	02 73 52 41 20 53 59 65 78 74 6D 6F 6E 20 34 20 34 32 34 37 42 44 38 37 03
CoLa B	Binary	02 02 02 02 00 00 00 12 73 52 41 20 53 59 65 78 74 6D 6F 6E 20 04 42 47 BD 87 54

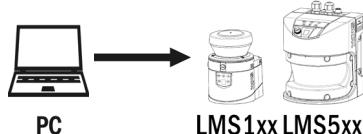
Table 373: Example: sRA SYextmon

4.8 Status

Telegram validity overview

		LMS1xx	LMS5xx	TiM2xx	TiM5xx	TiM7xx	NAV310	LD-OEM15xx	LD-LRS36xx	MRS1000	LMS1000	MRS6000	LMS4000	LRS4000
4.8.1	Read contamination status of the LMS	X	X											
4.8.2	Read firmware version	X	X	X	X	X	X	X	X	X	X	X	X	X
4.8.3	Read the device state	X	X	X	X	X	X	X	X	X	X	X	X	X
4.8.4	Status commands for LD-XXX and NAV310						X	X	X					
4.8.5	Read device order number	X	X	X	X	X	X	X	X	X	X	X	X	X
4.8.6	Read device type	X	X	X	X	X	X	X	X	X	X	X	X	X
4.8.7	Read operating hours	X	X	X	X	X				X	X	X	X	X
4.8.8	Read power on counter	X	X	X	X	X				X	X	X	X	X
4.8.9	Read temperature	X	X		X	X							X	X
4.8.10	Set device name	X	X	X	X	X				X	X	X	X	X
4.8.11	Read device name	X	X	X	X	X				X	X	X	X	X
4.8.12	Read angle compensation sine						X							
4.8.13	Reset output counter	X	X	X	X	X						X	X	X
4.8.14	Read heating state	X	X											
4.8.15	FieldEvalLoggingList by Event									X	X			
4.8.16	FieldEvalLoggingList on Request									X	X			

4.8.1 Read contamination status of the LMS



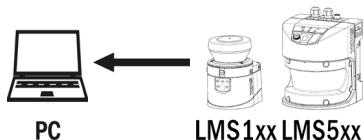
Telegram structure: sRN LCMstate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Status of LMS	String	8	All	LCMstate	4C 43 4D 73 74 61 74 65

Table 374: Telegram structure: sRN LCMstate

Example: sRN LCMstate

CoLa A	ASCII	<STX>sRN{SPC}LCMstate<ETX>
	Hex	02 73 52 4E 20 4C 43 4D 73 74 61 74 65 03
CoLa B	Binary	02 02 02 02 00 00 00 0C 73 52 4E 20 4C 43 4D 73 74 61 74 65 7A

Table 375: Example: sRN LCMstate



Telegram structure: sRA LCMstate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Status of LMS	String	8	All	LCMstate	4C 43 4D 73 74 61 74 65
Status code		Enum_8	1	All	No contamination: 0 Contamination warning: 1 Contamination error: 2 Contamination measurement functionality defective: 3	No contamination: 00 Contamination warning: 01 Contamination error: 02 Contamination measurement functionality defective: 03

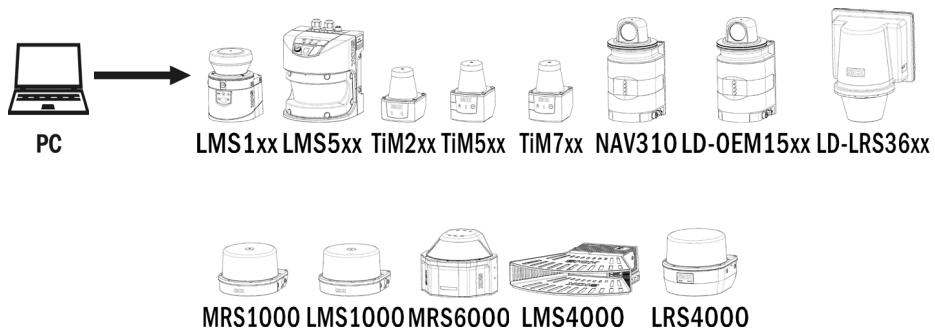
Table 376: Telegram structure: sRA LCMstate

Example for LMS100: sRA LCMstate

CoLa A	ASCII	<STX>sRA{SPC}LCMstate{SPC}0<ETX>
	Hex	02 73 52 41 20 4C 43 4D 73 74 61 74 65 20 30 03
CoLa B	Binary	02 02 02 02 00 00 00 0E 73 52 41 20 4C 43 4D 73 74 61 74 65 20 00 55

Table 377: Example for LMS100: sRA LCMstate

4.8.2 Read firmware version



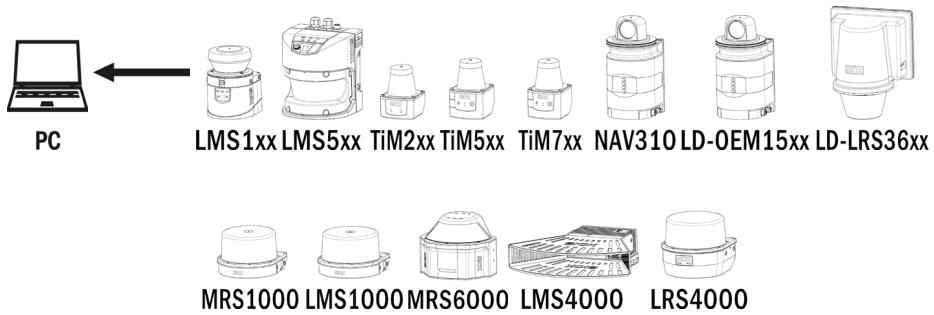
Telegram structure: sRN Deviceldent						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Read firmware version	String	11	All	Deviceldent	44 65 76 69 63 65 49 64 65 6E 74

Table 378: Telegram structure: sRN Deviceldent

Example: sRN Deviceldent

CoLa A	ASCII	<STX>sRN{SPC}Deviceldent<ETX>
	Hex	02 73 52 4E 20 44 65 76 69 63 65 49 64 65 6E 74 03
CoLa B	Binary	02 02 02 02 00 00 00 0F 73 52 4E 20 44 65 76 69 63 65 49 64 65 6E 74 25

Table 379: Example: sRN Deviceldent



Telegram structure: sRA Deviceldent						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command		String	11	All	Deviceldent	44 65 76 69 63 65 49 64 65 6E 74
Value	Length of firmware designation	Enum_16	2	All	0 ... 22h	0 ... 22h
Value	Firmware designation for device family	String		All	(See example)	(See example)
Value	Length of firmware version	Enum_16	2	All	0 ... 22h	0 ... 22h
Value	Firmware version	String		All	(See example)	(See example)

Table 380: Telegram structure: sRA Deviceldent

Example: sRA Deviceldent

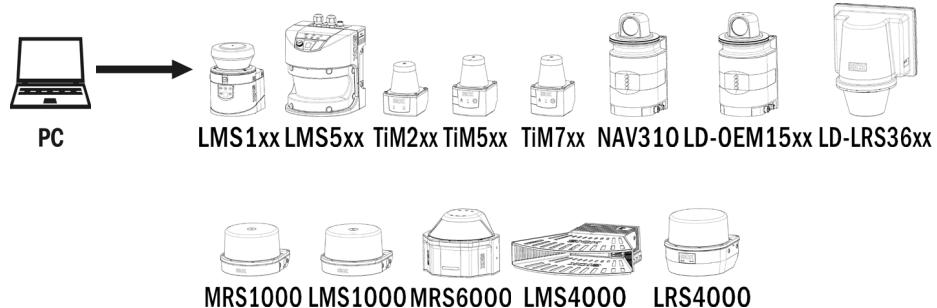
CoLa A	ASCII	<STX>sRA{SPC}Deviceldent{SPC}10{SPC}LMS10x_FieldEval{SPC}10{SPC}V1.36-21.10.2010<ETX>
	Hex	Always ASCII answer
CoLa B	Binary	02 02 02 02 00 00 00 34 73 52 41 20 44 65 76 69 63 65 49 64 65 6E 74 20 00 10 4C 4D 53 31 30 78 5F 46 69 65 6C 64 45 76 61 6C 00 10 56 31 2E 33 36 2D 32 31 2E 31 30 2E 32 30 31 30 62

Table 381: Example: sRA Deviceldent

4.8.3 Read the device state

This telegram reads the general device state.

Remark: The status of the measurement function of LMS1 and LMS5 can be read separately with the telegram STlms



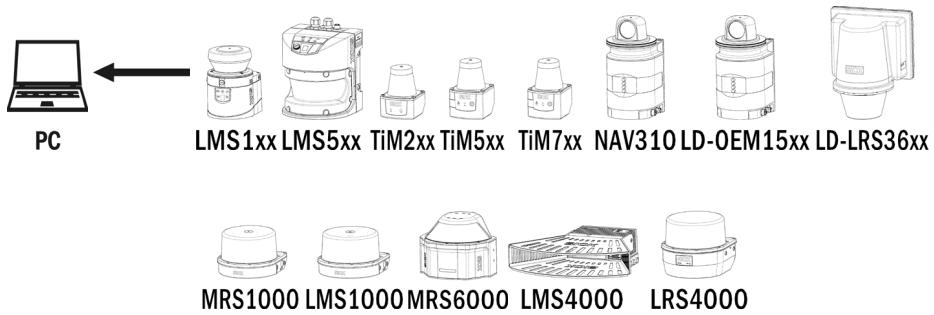
Telegram structure: sRN SCdevicestate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command		String	13	All	SCdevicestate	53 43 64 65 76 69 63 65 73 74 61 74 65

Table 382: Telegram structure: sRN SCdevicestate

Example: sRN SCdevicestate

ColA A	ASCII	<STX>sRN{SPC}SCdevicestate<ETX>
	Hex	02 73 52 4E 20 53 43 64 65 76 69 63 65 73 74 61 74 65 03
ColA B	Binary	02 02 02 02 00 00 00 11 73 52 4E 20 53 43 64 65 76 69 63 65 73 74 61 74 65 30

Table 383: Example: sRN SCdevicestate



Telegram structure: sRA SCdevicestate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command		String	13	All	SCdevicestate	53 43 64 65 76 69 63 65 73 74 61 74 65
Status code	Code number	Enum_8	1	All	Busy / logged-in: 0	00
					Ready: 1	01
				LMS5xx	Error: 2	02
					Busy / logged-in: 0	00
				LMS1xx	Ready: 1	01
					Error: 2	02
					Standby: 3	03

Table 384: Telegram structure: sRA SCdevicestate

Example: sRA SCdevicestate

CoLa A	ASCII	<STX>sRA{SPC}SCdevicestate{SPC}O<ETX>
	Hex	02 73 52 41 20 53 43 64 65 76 69 63 65 73 74 61 74 65 20 00 03
CoLa B	Binary	02 02 02 02 00 00 00 13 73 52 41 20 53 43 64 65 76 69 63 65 73 74 61 74 65 20 00 1F

Table 385: Example: sRA SCdevicestate

4.8.4 Status commands for LD-XXX and NAV310

The following status commands will be explained in the subsequent sections:

- [LMCmeasstate](#): Status of the internal Statemachine
- [SCdevicestate](#): Status of the Sensors (actual measurement status)
- [EMCustomerInfo](#): Additional error information
- [LDMSenStat](#): Status of the state machine of the measurement core, Motor status

How status commands for for LD-XXX and NAV310 work together:

- If [LMCmeasstate](#) changes to "Idle" or an other status, although the measurement status "Measure2D" is expected, there is an error during the measurement (or during start up of the measurement).
- [SCdevicestate](#) is always "Ready", if the measurement is active.
If "Busy" will be indicated the unit is not measuring (e.g. IDLE). If there is any failure "Error" will be indicated. (However [LMCmeasstate](#) could indicate "Measure2D", if the failure occurs during the measurement, because it is only an indication of the status of the State machine).
- In case of a failure [EMCustomerInfo](#) can provide an information about the error.
In case of an motor failure there are following condition visible:
 - Motor blocked during operation → DEVICE_FAILURE
 - Motor blocked during spin up → CHECK_PARAMETER
- It is also possible to read [LDMSenStat](#) (and to register as an event). This value equals the Sensorstatus of the NAV310/LD-XXX. A status "B1" of the measurement core means "Motor error and Idle").
- During the measurement it is possible to monitor a deviation of the target rotation frequency. (If the device detects rotation values that are too slow, it will terminate the measurement.)

In case of an failure this value will not always be updated, therefore it is necessary to monitor [LMCmeasstate](#) and [SCdevicestate](#) in parallel.

NOTE

- In case of an failure (Scanner does not change to MEASURE2D or switches back to IDLE), it is necessary to send the command [LMCstopmeas](#) (even if the Status is indicated as IDLE)
- If at [EMCustomerInfo](#) the message CHECK_PARAMETER is indicated, a reset is only possible by a power cycle of the scanner.

Ask for Device Measurement State



Telegram structure: sRN LMCmeasstate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Ask for measurement state	String	12	All	LMCmeasstate	4C 4D 43 6D 65 61 73 73 74 61 74 65

Table 386: Telegram structure: sRN LMCmeasstate

Example: sRN LMCmeasstate

CoLa A	ASCII	<STX>sRN{SPC}LMCmeasstate<ETX>
	Hex	02 73 52 4E 20 4C 4D 43 6D 65 61 73 73 74 61 74 65 03
CoLa B	Binary	02 02 02 02 00 00 00 11 73 52 4E 20 4C 4D 43 6D 65 61 73 73 74 61 74 65 30

Table 387: Example: sRN LMCmeasstate



Telegram structure: sRA LMCmeasstate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Report measurement state	String	12	All	LMCmeasstate	4C 4D 43 6D 65 61 73 73 74 61 74 65
Status code	Current measurement state	Enum_16	2	All	Idle: 3 Ready 2D: 6 Measure 2D: 7 Other state codes may show up during booting, firmware update or transition between states.	Idle: 0003 Ready 2D: 0006 Measure 2D: 0007

Table 388: Telegram structure: sRA LMCmeasstate

Example: sRA LMCmeasstate is Measure 2D

CoLa A	ASCII	<STX>sRA{SPC}LMCmeasstate{SPC}7<ETX>
	Hex	02 73 52 41 20 4C 4D 43 6D 65 61 73 73 74 61 74 65 20 00 07 03
CoLa B	Binary	02 02 02 02 00 00 00 13 73 52 41 20 4C 4D 43 6D 65 61 73 73 74 61 74 65 20 00 07 1F

Table 389: Example: sRA LMCmeasstate is Measure 2D

Ask for customer info of sensor

This telegram will provide additional error information.



Telegram structure: sRN EMCustomerInfo						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Ask for customer info	String	14	All	EMCustomerInfo	45 4D 43 75 73 74 6F 6D 65 72 49 6E 66 6F

Table 390: Telegram structure: sRN EMCustomerInfo

Example: sRN EMCustomerInfo

CoLa A	ASCII	<STX>sRN{SPC}EMCustomerInfo<ETX>
	Hex	02 73 52 4E 20 45 4D 43 75 73 74 6F 6D 65 72 49 6E 66 6F 03
CoLa B	Binary	02 02 02 02 00 00 00 12 73 52 4E 20 45 4D 43 75 73 74 6F 6D 65 72 49 6E 66 6F 4D

Table 391: Example: sRN EMCustomerInfo



Telegram structure: sRA EMCustomerInfo						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Report customer info	String	14	All	EMCustomerInfo	45 4D 43 75 73 74 6F 6D 65 72 49 6E 66 6F
Status code	Customer info	Enum_16	2	All	0: DEVICE_OK 1: DEFECTIVE_DEVICE 2: DEVICE_TEMP_FAILURE 3: DEVICE_FAILURE 4: DEVICE_NOT_READY 5: CHECK_PARAMETER	0000: DEVICE_OK 0001: DEFECTIVE_DEVICE 0002: DEVICE_TEMP_FAILURE 0003: DEVICE_FAILURE 0004: DEVICE_NOT_READY 0005: CHECK_PARAMETER
					DEFECTIVE_DEVICE: Please return device to SICK DEVICE_TEMP_FAILURE: Device failure. Please check temperature. DEVICE_FAILURE: Please switch off for 20 seconds and power up again. DEVICE_NOT_READY: Please wait. CHECK_PARAMETER: Warning – please check parametrization.	

Table 392: Telegram structure: sRA EMCustomerInfo

Example: sRA EMCustomerInfo = Device OK

CoLa A	ASCII	<STX>sRA{SPC}EMCustomerInfo{SPC}0<ETX>
	Hex	02 73 52 41 20 45 4D 43 75 73 74 6F 6D 65 72 49 6E 66 6F 20 00 03
CoLa B	Binary	02 02 02 02 00 00 00 14 73 52 4E 20 45 4D 43 75 73 74 6F 6D 65 72 49 6E 66 6F 20 00 6D

Table 393: Example: sRA EMCustomerInfo = Device OK

Ask for Sensorstatus

This telegram provides status information of the State Machine of measurement core and the Motor Status



Telegram structure: sRN LDMSenStat						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Ask for state	String	10	All	LDMSenStat	4C 44 4D 53 65 6E 53 74 61 74

Table 394: Telegram structure: sRN LDMSenStat

Example: sRN LDMSenStat

CoLa A	ASCII	<STX>sRN[SPC]LDMSenStat<ETX>
	Hex	02 73 52 4E 20 4C 44 4D 53 65 6E 53 74 61 74 03
CoLa B	Binary	02 02 02 02 00 00 00 00 0E 73 52 4E 20 4C 44 4D 53 65 6E 53 74 61 74 60

Table 395: Example: sRN LDMSenStat



Telegram structure: sRA LDMSenStat						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Report state	String	10	All	LDMSenStat	4C 44 4D 53 65 6E 53 74 61 74

Telegram structure: sRA LDMSenStat						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Status code	Current state regarding ...	Uint_32	4	All	Idle: 3 Ready 2D: 6 Measure 2D: 7 Other state codes may show up during booting, firmware update or transition between states.	Idle: 0003 Ready 2D: 0006 Measure 2D: 0007
	Working mode				Idle: 1 Rotate: 2 Measure: 3 Error: 4 (Other bits: reserved)	Idle: 1 Rotate: 2 Measure: 3 Error: 4 (Other bits: reserved)
	Motor mode				Motor ok: 0 Motor spin to low: 4 Motor spin to high: 9 Motor stops or coder error: B (Other bits: reserved)	Motor ok: 0 Motor spin to low: 4 Motor spin to high: 9 Motor stop or coder error: B (Other bits: reserved)
	(Reserved)				(Reserved)	(Reserved)

Table 396: Telegram structure: sRA LDMSenStat

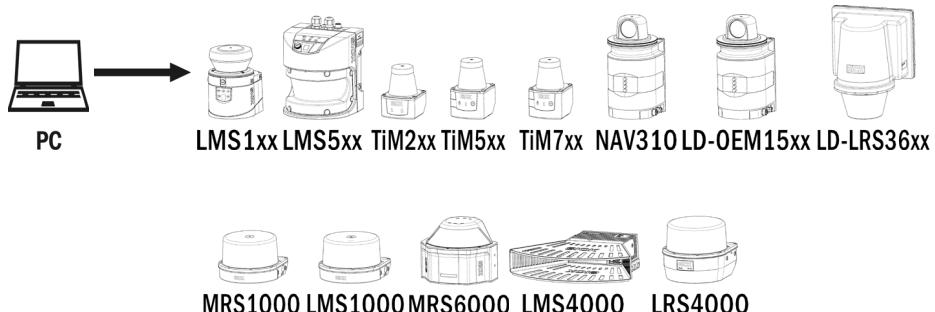
Example: sRA LDMSenStat Device in Idle mode

CoLa A	ASCII	<STX>sRA{SPC}LDMSenStat{SPC} 1<ETX>
	Hex	02 73 52 41 20 4C 44 4D 53 65 6E 53 74 61 74 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 13 73 52 41 20 4C 44 4D 53 65 6E 53 74 61 74 20 00 00 00 01 4E

Table 397: Example: sRA LDMSenStat Device is in Idle mode

4.8.5 Read device order number

This telegram reads the device order number.



Telegram structure: sRN Dlornr						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Read state	String	6	All	Dlornr	44 49 6F 72 6E 72

Table 398: Telegram structure: sRN Dlornr

Example: sRN Dlornr

CoLa A	ASCII	<STX>sRN{SPC}Dlornr<ETX>
	Hex	02 73 52 4E 20 44 49 6F 72 6E 72 03
CoLa B	Binary	02 02 02 02 00 00 00 0A 73 52 4E 20 44 49 6F 72 6E 72 43

Table 399: Example: sRN Dlornr



Telegram structure: sRA Dlornr						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command		String	6	All	Dlornr	44 49 6F 72 6E 72
Order number	Order number in 7 digits	String	7	All	0000000 ... 9999999	00 00 00 00 00 00 00 ... FF FF FF FF FF FF FF

Table 400: Telegram structure: sRA Dlornr

Example: sRA Dlornr 1047782 (Order Number for LMS511-20100)

CoLa A	ASCII	<STX>sRA{SPC}Dlornr{SPC}1047782<ETX>
CoLa B	Hex	02 73 52 41 20 44 49 6F 72 6E 72 20 31 30 34 37 37 38 32 03
CoLa B	Binary	02 02 02 02 00 00 00 12 73 52 41 20 44 49 6F 72 6E 72 20 31 30 34 37 37 38 32 53

Table 401: Example for LMS511-20100: sRA Dlornr

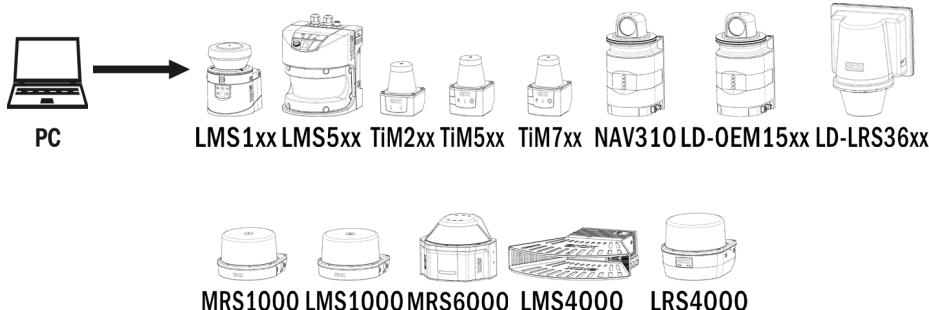
Example: sRA Dlornr 10671419 (Order Number for TiM561-2050101)

CoLa A	ASCII	<STX>sRA{SPC}Dlornr{SPC}10671419<ETX>
CoLa B	Hex	02 73 52 41 20 44 49 6F 72 6E 72 20 31 30 37 31 34 31 39 03
CoLa B	Binary	02 02 02 02 00 00 00 12 73 52 41 20 44 49 6F 72 6E 72 20 31 30 37 31 34 31 39 57

Table 402: Example for TiM561-2050101: sRA Dlornr

4.8.6 Read device type

This telegram asks for the device type.



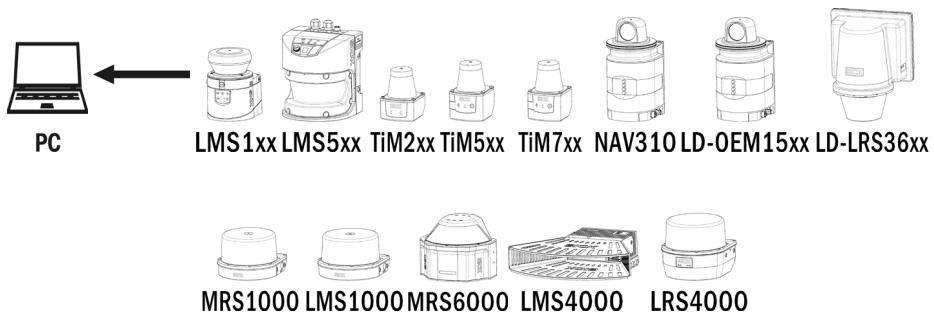
Telegram structure: sRN Dltype						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Ask state	String	6	All	Dltype	44 49 74 79 70 65

Table 403: Telegram structure: sRN Dltype

Example: sRN Dltype

CoLa A	ASCII	<STX>sRN{SPC}Dltype<ETX>
CoLa B	Hex	02 73 52 4E 20 44 49 74 79 70 65 03
CoLa B	Binary	02 02 02 02 00 00 00 0A 73 52 4E 20 44 49 74 79 70 65 5A

Table 404: Example: sRN Dltype



Telegram structure: sRA Dltype						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Ask state	String	6	All	Dltype	44 49 74 79 70 65
Length of type key	Number of digits of the following type code length	Uint_8	1	All	0d ... 255d (0h ... FF)	00 ... FF
Device type	Type code of the device	String	(var.)	All	(Device type)	(Device type)

Table 405: Telegram structure: sRA Dltype

Example for LMS511-20100

CoLa A	ASCII	<STX>sRA{SPC}Dltype{SPC}C{SPC}LMS511-20100<ETX>
	Hex	02 73 52 41 20 44 49 74 79 70 65 20 43 20 4C 4D 53 35 31 31 2D 32 30 31 30 30 03
CoLa B	Binary	02 02 02 02 00 00 00 18 73 52 41 20 44 49 74 79 70 65 20 0C 4C 4D 53 35 31 31 2D 32 30 31 30 30 00

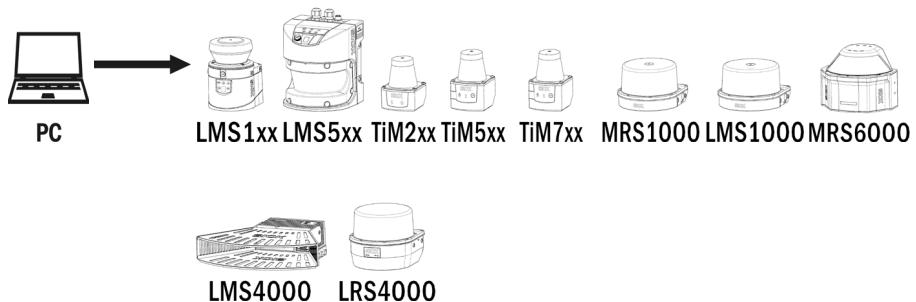
Table 406: Example for LMS511-20100: sRA Dltype

Example for TiM561-2050101

CoLa A	ASCII	<STX>sRA{SPC}Dltype{SPC}E{SPC}TIM561-2050101<ETX>
	Hex	02 73 52 41 20 44 49 74 79 70 65 20 45 20 54 49 4D 35 36 31 2D 32 30 35 30 31 30 31 03
CoLa B	Binary	02 02 02 02 00 00 00 1A 73 52 41 20 44 49 74 79 70 65 20 0E 54 49 4D 35 36 31 2D 32 30 35 30 31 30 31 03

Table 407: Example for TiM561-2050101: sRA Dltype

4.8.7 Read operating hours



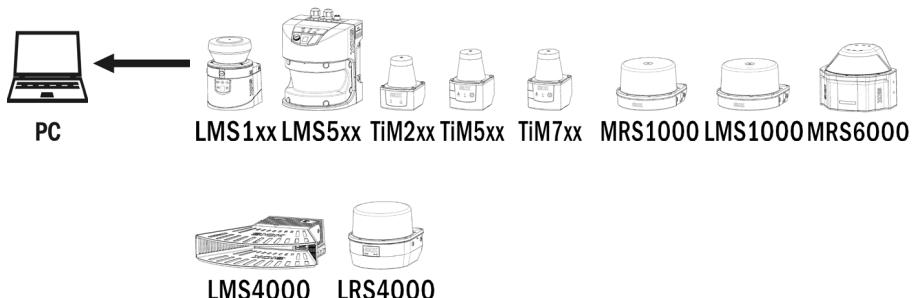
Telegram structure: sRN ODoprh						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Read operating hours	String	6	All	ODoprh	4F 44 6F 70 72 68

Table 408: Telegram structure: sRN ODoprh

Example: sRN ODoprh

CoLa A	ASCII	<STX>sRN{SPC}ODoprh<ETX>
	Hex	02 73 52 4E 20 4F 44 6F 70 72 68 03
CoLa B	Binary	02 02 02 02 00 00 00 0A 73 52 4E 20 4F 44 6F 70 72 68 41

Table 409: Example: sRN ODoprh



Telegram structure: sRA ODoprh						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Read operating hours	String	6	All	ODoprh	4F 44 6F 70 72 68
Value	Operating hours in 1/10 h	Uint_32	4	All	0h ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF

Table 410: Telegram structure: sRA ODoprh

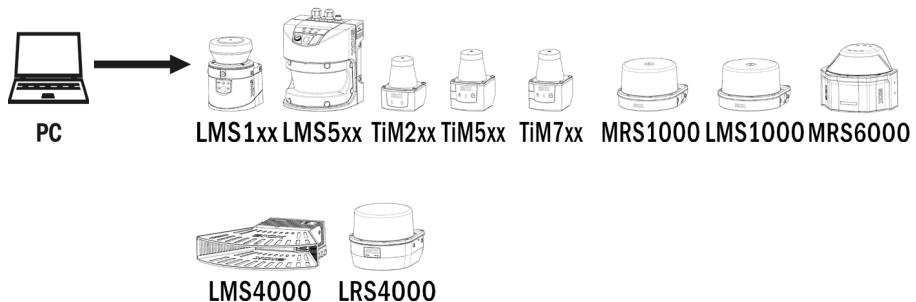
Example: sRA ODoprh

CoLa A	ASCII	<STX>sRA{SPC}ODoprh{SPC}2DC8B<ETX>
	Hex	02 73 52 41 20 4F 44 6F 70 72 68 20 32 44 43 38 42 03
CoLa B	Binary	02 02 02 02 00 00 00 0F 73 52 41 20 4F 44 6F 70 72 68 20 00 02 DC 8B 36

Table 411: Example: sRA ODoprh

Calculation of the value: 2DC8B (hex) → 187531 (dez) × 1/10 h = 18753.1 h

4.8.8 Read power on counter



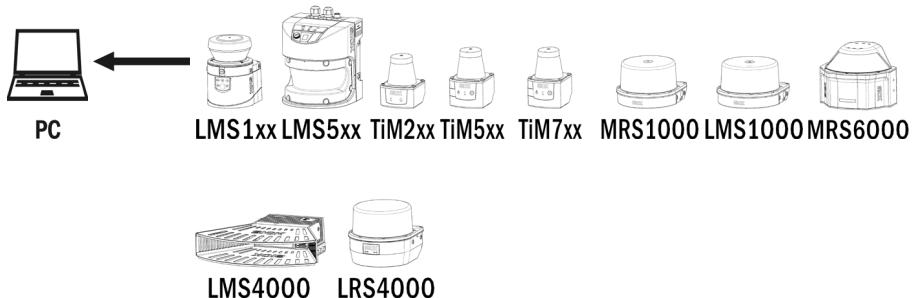
Telegram structure: sRN ODpwrc						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Read power on counter	String	6	All	ODpwrc	4F 44 70 77 72 63

Table 412: Telegram structure: sRN ODpwrc

Example: sRN ODpwrc

CoLa A	ASCII	<STX>sRN{SPC}ODpwrc<ETX>
	Hex	02 73 52 4E 20 4F 44 70 77 72 63 03
CoLa B	Binary	02 02 02 02 00 00 00 0A 73 52 4E 20 4F 44 70 77 72 63 52

Table 413: Example: sRN ODpwrc



Telegram structure: sRA ODpwrc						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Read power on counter	String	6	All	ODpwrc	4F 44 70 77 72 63
Value	Power on counter	Uint_32	4	All	0h ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF

Table 414: Telegram structure: sRA ODpwrc

Example: sRA ODpwrc

CoLa A	ASCII	<STX>sRA{SPC}ODpwrc{SPC}752D<ETX>
	Hex	02 73 52 41 20 4F 44 70 77 72 63 20 752D 03
CoLa B	Binary	02 02 02 02 00 00 00 0F 73 52 41 20 4F 44 70 77 72 63 20 00 00 75 2D 36

Table 415: Example: sRA ODpwrc

4.8.9 Read temperature

With this command the internal temperature of the device can be identified. Please note that it does not give an indication of the current ambient temperature.



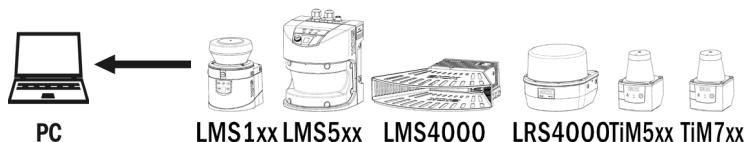
Telegram structure: sRN OPcurtmpdev						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Read temperature of the device	String	11	All	OPcurtmpdev	4F 50 63 75 72 74 6D 70 64 65 76

Table 416: Telegram structure: sRN OPcurtmpdev

Example: sRN OPcurtmpdev

CoLa A	ASCII	<STX>sRN{SPC}OPcurtmpdev<ETX>
	Hex	02 73 52 4E 20 4F 50 63 75 72 74 6D 70 64 65 76 03
CoLa B	Binary	02 02 02 02 00 00 00 0F 73 52 4E 20 4F 50 63 75 72 74 6D 70 64 65 76 2A

Table 417: Example: sRN OPcurtmpdev



Telegram structure: sRA OPcurtmpdev						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Read temperature of the device	String	11	All	OPcurtmpdev	4F 50 63 75 72 74 6D 70 64 65 76
Temperature data	[°C as float according to IEEE754]	Real	4	All	C2480000h ... 42C80000h (-50°C ... +100°C)	C2 48 00 00 ... 42 C8 00 00

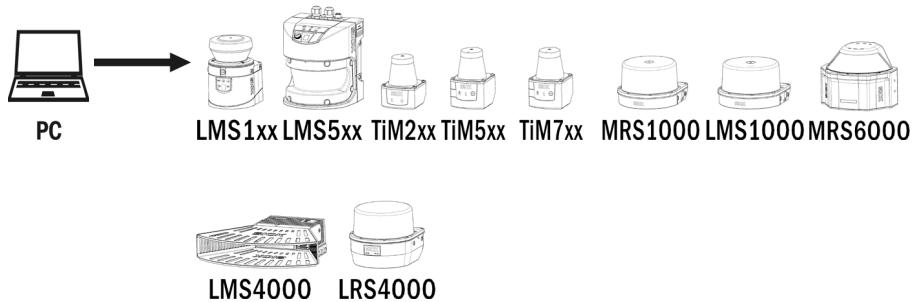
Table 418: Telegram structure: sRA OPcurtmpdev

Example: sRA OPcurtmpdev (35°C)

CoLa A	ASCII	<STX>sRA{SPC}OPcurtmpdev{SPC}420C0000<ETX>
	Hex	02 73 52 41 20 4F 50 63 75 72 74 6D 70 64 65 76 20 34 32 30 43 30 30 30 30 03
CoLa B	Binary	02 02 02 02 00 00 00 14 73 52 41 20 4F 50 63 75 72 74 6D 70 64 65 76 20 42 0C 00 00 4B

Table 419: Example: sRA OPcurtmpdev

4.8.10 Set device name



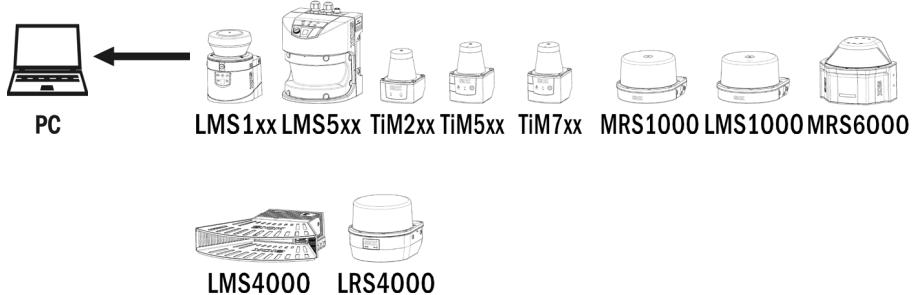
Telegram structure: sWN LocationName (Maintenance)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set device name	String	12	All	LocationName	4C 6F 63 61 74 69 6F 6E 4E 61 6D 65
Value	Array of characters of the following device name	Uint_16	2	All	0d ... +16d (0h ... 10h)	00 00 ... 00 10
Value	Device name	String	16	All	[Device name]	[Device name]

Table 420: Telegram structure: sWN LocationName

Example: sWN LocationName +13 OutdoorDevice

CoLa A	ASCII	<STX>sWN[SPC]LocationName[SPC]+13[SPC]OutdoorDevice<ETX>
	Hex	02 73 57 4E 20 4C 6F 63 61 74 69 6F 6E 4E 61 6D 65 20 2B 31 33 20 4F 75 74 64 6F 6F 72 44 65 76 69 63 65 03
CoLa B	Binary	02 02 02 02 00 00 00 20 73 57 4E 20 4C 6F 63 61 74 69 6F 6E 4E 61 6D 65 20 00 0D 4F 75 74 64 6F 6F 72 44 65 76 69 63 65 1D

Table 421: Example: sWN LocationName +13 OutdoorDevice



Telegram structure: sWA LocationName						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set device name	String	12	All	LocationName	4C 6F 63 61 74 69 6F 6E 4E 61 6D 65

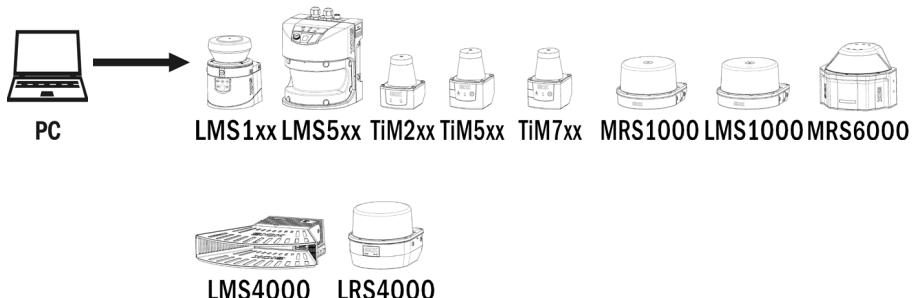
Table 422: Telegram structure: sWA LocationName

Example: sWA LocationName

CoLa A	ASCII	<STX>sWA{SPC}LocationName<ETX>
	Hex	02 73 57 41 20 4C 6F 63 61 74 69 6F 6E 4E 61 6D 65 03
CoLa B	Binary	02 02 02 02 00 00 00 20 73 57 41 20 4C 6F 63 61 74 69 6F 6E 4E 61 6D 65 74

Table 423: Example: sWA LocationName

4.8.11 Read device name



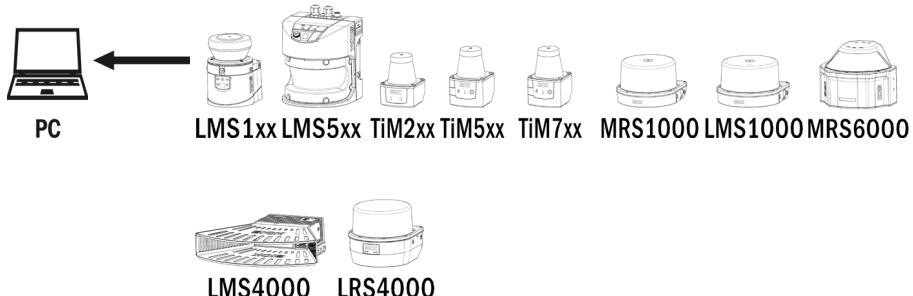
Telegram structure: sRN LocationName						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Read device name	String	12	All	LocationName	4C 6F 63 61 74 69 6F 6E 4E 61 6D 65

Table 424: Telegram structure: sRN LocationName

Example: sRN LocationName

CoLa A	ASCII	<STX>sRN{SPC}LocationName<ETX>
	Hex	02 73 52 4E 20 4C 6F 63 61 74 69 6F 6E 4E 61 6D 65 03
CoLa B	Binary	02 02 02 02 00 00 00 10 73 52 4E 20 4C 6F 63 61 74 69 6F 6E 4E 61 6D 65 55

Table 425: Example: sRN LocationName



Telegram structure: sRA LocationName						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Read device name	String	12	All	LocationName	4C 6F 63 61 74 69 6F 6E 4E 61 6D 65
Value	Array of characters of the following device name	Uint_16	2	All	0d ... +16d (0h ... 10h)	00 00 ... 00 10
Value	Device name	String	16	All	[Device name]	[Device name]

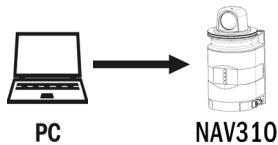
Table 426: Telegram structure: sRA LocationName

Example: sRA LocationName

CoLa A	ASCII	<STX>sRA{SPC}LocationName{SPC}D{SPC}OutdoorDevice<ETX>
	Hex	02 73 52 41 20 4C 6F 63 61 74 69 6F 6E 4E 61 6D 65 20 44 20 4F 75 74 64 6F 6F 72 44 65 76 69 63 65 03
CoLa B	Binary	02 02 02 02 00 00 00 17 73 52 41 20 4C 6F 63 61 74 69 6F 6E 4E 61 6D 65 20 00 0D 4F 75 74 64 6F 6F 72 44 65 76 69 63 65 20

Table 427: Example: sRA LocationName

4.8.12 Read angle compensation sine



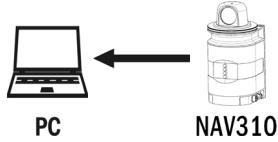
Telegram structure: sRN MCAngleCompSin						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Read angle compensation sine	String	14	All	MCAngleCompSin	4D 43 41 6E 67 6C 65 43 6F 6D 70 53 69 6E

Table 428: Telegram structure: sRN MCAngleCompSin

Example: sRN MCAngleCompSin

CoLa A	ASCII	<STX>sRN{SPC}MCAngleCompSin<ETX>
	Hex	02 73 52 4E 20 4D 43 41 6E 67 6C 65 43 6F 6D 70 53 69 6E 03
CoLa B	Binary	02 02 02 02 00 00 00 12 73 52 4E 20 4D 43 41 6E 67 6C 65 43 6F 6D 70 53 69 6E 65

Table 429: Example: sRN MCAngleCompSin



Telegram structure: sRA MCAngleCompSin						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Angle compensation sine	String	14	All	MCAngleCompSin	4D 43 41 6E 67 6C 65 43 6F 6D 70 53 69 6E
Amplitude	[1/10000°]	Int_16	2	All	-10000d ... +10000d (D8F0h ... 2710h)	D8 F0 ... 27 10
Phase	[1/10000°]	Int_32	4	All	-3600000d ... +3600000d (FFC91180h ... 36EE80h)	FF C9 11 80 ... 00 36 EE 80
Offset	[1/10000°]	Int_16	2	All	-10000d ... +10000d (D8F0h ... 2710h)	D8 F0 ... 27 10

Table 430: Telegram structure: sRA MCAngleCompSin

Example: sRA MCAngleCompSin

CoLa A	ASCII	<STX>sRA[SPC]MCAngleCompSin[SPC]0[SPC]0[SPC]0<ETX>
	Hex	02 73 52 41 20 4D 43 41 6E 67 6C 65 43 6F 6D 70 53 69 6E 20 30 20 30 20 30 03
CoLa B	Binary	02 02 02 02 00 00 00 18 73 52 41 20 4D 43 41 6E 67 6C 65 43 6F 6D 70 53 69 6E 20 00 00 00 00 00 00 00 00 4A

Table 431: Example: sRA MCAngleCompSin

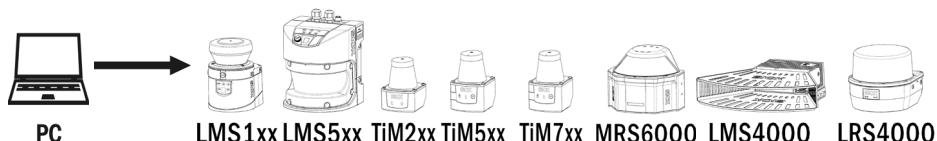
The values of the angular compensation could be retrieved from the memory of the NAV310 to improve the angular measurement accuracy.

The applied formula is:

$$\text{AngleComp} = \text{AngleRaw} + (\text{AngleCompAmp} * \sin(\text{AngleRaw} - \text{AngleCompPhase})) + \text{AngleCompOffset}$$

Example (C coded):

```
angleRaw: Raw angle as float in degrees (0.000 ... 359999)
angleComp: Compensated angle as float in degrees (0.000 ... 359999)
AngleCompAmp
AngleCompPhase
AngleCompOffset: Compensation parameters as int in 1/1000 degrees
float compensateAngle(float angleRaw)
{
    float angleComp;
    angleRaw += ((float) AngleCompOffset)/1000.0;
    angleRaw += (((float) AngleCompAmp)/1000.0) *
        sin((DEGTORAD * (angle - ((float) AngleCompPhase)/1000.0)));
    return angleComp;
}
```

4.8.13 Reset output counter

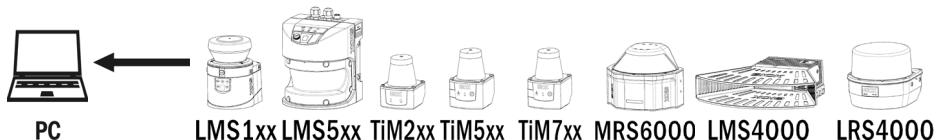
Telegram structure: sMN LIDrstoutpcnt (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	73 4D 4E
Command	Reset output counter	String	13	All	LIDrstoutpcnt	4C 49 44 72 73 74 6F 75 74 70 63 6E 74

Table 432: Telegram structure: sMN LIDrstoutpcnt

Example: sMN LIDrstoutpcnt

CoLa A	ASCII	<STX>sMN[SPC]LIDrstoutpcnt<ETX>
	Hex	02 73 4D 4E 20 4C 49 44 72 73 74 6F 75 74 70 63 6E 74 03
CoLa B	Binary	02 02 02 02 00 00 00 11 73 4D 4E 20 4C 49 44 72 73 74 6F 75 74 70 63 6E 74 03

Table 433: Example: sMN LIDrstoutpcnt



Telegram structure: sAN LIDrstoutpcnt						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	73 41 4E
Command	Reset state	String	13	All	LIDrstoutpcnt	4C 49 44 72 73 74 6F 75 74 70 63 6E 74
Status code	Code number	Bool_1	1	All	Success: 0 Error: 1	Success: 00 Error: 01

Table 434: Telegram structure: sAN LIDrstoutpcnt

Example: sAN LIDrstoutpcnt

CoLa A	ASCII	<STX>sAN[SPC]LIDrstoutpcnt[SPC]0<ETX>
	Hex	02 73 41 4E 20 4C 49 44 72 73 74 6F 75 74 70 63 6E 74 20 30 03
CoLa B	Binary	02 02 02 02 00 00 00 13 73 41 4E 20 4C 49 44 72 73 74 6F 75 74 70 63 6E 74 20 00 2F

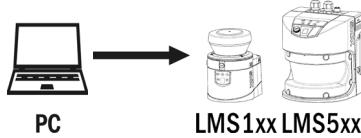
Table 435: Example: sAN LIDrstoutpcnt

4.8.14 Read heating state

Note



It is not allowed to request this telegram in a faster cycle than 10 ms!



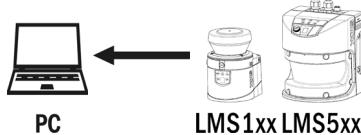
Telegram structure: sRN OPheatstateext (no required user level)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command		String	14	All	OPheatstateext	4F 50 68 65 61 74 73 74 61 74 65 65 78 74

Table 436: Telegram structure: sRN OPheatstateext

Example: sRN OPheatstateext

CoLa A	ASCII	<STX>sRN[SPC]OPheatstateext<ETX>
	Hex	02 73 52 4E 20 4F 50 68 65 61 74 73 74 61 74 65 65 78 74 03
CoLa B	Binary	02 02 02 02 00 00 00 12 73 52 4E 20 4F 50 68 65 61 74 73 74 61 74 65 65 78 74 56

Table 437: Example: sRN OPheatstateext



Telegram structure: sRA OPheatstateext (no required user level)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command		String	14	All	OPheatstateext	4F 50 68 65 61 74 73 74 61 74 65 65 78 74

Telegram structure: sRA OPheatstateext (no required user level)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Heating state	Heating state	Enum_8	1	All	Heating active : 0d Electrical current for heating too low: 1d Heating inactive: 2d Power supply for heating not connected: 3d	Heating active : 00 Electrical current for heating too low: 01 Heating inactive: 02 Power supply for heating not connected: 03

Table 438: Telegram structure: sRA OPheatstateext

Example: sRA OPheatstateext 2

CoLa A	ASCII	<STX>sRA{SPC}OPheatstateext{SPC}2<ETX>
	Hex	02 73 52 41 20 4F 50 68 65 61 74 73 74 61 74 65 65 78 74 20 32 03
CoLa B	Binary	02 02 02 02 00 00 00 14 73 52 41 20 4F 50 68 65 61 74 73 74 61 74 65 65 78 74 20 02 7B

Table 439: Example: sRA OPheatstateext 2

4.8.15 FieldEvalLoggingList by Event

Start/Stop of the Event.



Telegram structure: sEN FieldEvalLoggingList						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Event	String	3	All	sEN	73 45 4E
Command		String	20	All	FieldEvalLoggingList	46 69 65 6C 64 45 76 61 6C 4C 6F 67 67 69 6E 67 4C 69 73 74
		Bool_1	1	All	Start: 1 Stop: 0	Start: 01 Stop: 00

Table 440: Telegram structure: sEN FieldEvalLoggingList

Example: sEN FieldEvalLoggingList 1

Explanation

CoLa A	ASCII	<STX>sEN{SPC}FieldEvalLoggingList{SPC}1<ETX>
	Hex	02 73 45 4E 20 46 69 65 6C 64 45 76 61 6C 4C 6F 67 67 69 6E 67 4C 69 73 74 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 1A 73 45 4E 20 46 69 65 6C 64 45 76 61 6C 4C 6F 67 67 69 6E 67 4C 69 73 74 20 01 64

Table 441: Example sEN FieldEvalLoggingList

Acknowledge for Start/Stop of the Event



Telegram structure: sEA FieldEvalLoggingList						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sEA	73 45 41
Command		String	20	All	FieldEvalLoggingList	46 69 65 6C 64 45 76 61 6C 4C 6F 67 67 69 6E 67 4C 69 73 74
		Bool_1	1	All	Start: 1 Stop: 0	Start: 01 Stop: 00

Table 442: Telegram structure: sEA FieldEvalLoggingList

Example: sEA FieldEvalLoggingList 1

Explanation

CoLa A	ASCII	<STX>sEA{SPC}FieldEvalLoggingList {SPC}1<ETX>
	Hex	02 73 45 41 20 46 69 65 6C 64 45 76 61 6C 4C 6F 67 67 69 6E 67 4C 69 73 74 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 1A 73 45 41 20 46 69 65 6C 64 45 76 61 6C 4C 6F 67 67 69 6E 67 4C 69 73 74 20 01 6B

Table 443: Example: sEA FieldEvalLoggingList 1

This is a readonly telegram



Telegram structure: sSN FieldEvalLogging List						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sSN	73 53 4E
Command		String	20	All	FieldEvalLogging List	46 69 65 6C 64 45 76 61 6C 4C 6F 67 67 69 6E 67 4C 69 73 74
Array size	0..100	Uint_16	2	All	0h..00 64h	00 00... 00 64
Index of Array	0..65535	Uint_16	2	All	0h..FFFFh	00 00..FF FF
Year	0..2105	Uint_16	2	All	0h..839h	00 00..0839
Month	1..12	Uint_8	1	All	1h..Ch	01..0C
Day	1..31	Uint_8	1	All	1h..1Fh	01..1F
Hour	0..23	Uint_8	1	All	0h..17h	00..17
Minute	0..59	Uint_8	1	All	0h..3Bh	00..3B
second	0..59	Uint_8	1	All	0h..3Bh	00..3B
microsecond	0..999	Uint_32	4	All	0h..3E7	00..03E7
EvaluationNumber	1..255	Uint_8	1	All	0h..FFh	00..FF
X Coordinate	X-Position of first violation in world coordinates [mm] -2147483648 ..2147483647	Int_32	4	All		
Y Coordinate	Y-Position of first violation in world coordinates [mm] -2147483648 ..2147483647	Int_32	4	All		
Z Coordinate	Z-Position of first violation in world coordinates [mm] -2147483648 ..2147483647	Int_32	4	All		
RadialDistance	0..4294967295	Uint_32	4	All	0h...FF FF FF FFh	00 00 00 00..FF FF FF FF
HorizontalAngle	-1800000.. 1800000	Int_32	4	All		
VerticalAngle	-9000..9000	Int_16	2	All		
ObjectSize in mm	0..4294967295	Uint_32	4	All	0h...FF FF FF FFh	00 00 00 00..FF FF FF FF
Reserved 1	0..4294967295	Uint_32	4	All	0h...FF FF FF FFh	00 00 00 00..FF FF FF

Telegram structure: sSN FieldEvalLogging List							
Telegram part		Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
	Reserverd 2	0..4294967295	Uint_32	4	All	0h...FF FF FF FFh	00 00 00 00..FF FF FF FF

Table 444: Telegram structure: sSN Field EvalLogging List

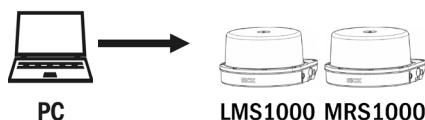
Example: sSN Field EvalLogging List

Explanation

Table 445: Example: sSN Field EvalLogging List

4.8.16 FieldEvalLoggingList on Request

Request the actual Field Eval logging List



Telegram structure: sRN FieldEvalLoggingList						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Event	String	3	All	sRN	73 52 4E
Command		String	20	All	FieldEvalLoggingList	46 69 65 6C 64 45 76 61 6C 4C 6F 67 67 69 6E 67 4C 69 73 74

Table 446: Telegram structure: `sRN FieldEvalLoggingList`

Example: sRN FieldEvalLoggingList

Explanation

ColA A	ASCII	<STX>sRN{SPC}FieldEvalLoggingList<ETX>
	Hex	02 73 52 4E 20 46 69 65 6C 64 45 76 61 6C 4C 6F 67 67 69 6E 67 4C 69 73 74 03
ColA B	Binary	02 02 02 02 00 00 00 18 73 52 4E 20 46 69 65 6C 64 45 76 61 6C 4C 6F 67 67 69 6E 67 4C 69 73 74 52

Table 447: Example *sEN FieldEvalLoggingList 1*



Telegram structure: sRA FieldEvalLoggingList						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command		String	20	All	FieldEvalLoggingList	46 69 65 6C 64 45 76 61 6C 4C 6F 67 67 69 6E 67 4C 69 73 74
Please check the list in SN Field EvalLogging List. Same content						

Table 448: Telegram structure: *sRA FieldEvalLoggingList*

Example: *sRA FieldEvalLoggingList*

Explanation

CoLa A	ASCII	<STX>sRA{SPC}FieldEvalLoggingList{SPC}64{SPC}1{SPC}7E4{SPC}C{SPC}16{SPC}9{SPC}3A{SPC}20{SPC}13{SPC}1{SPC}140{SPC}FFFFFECC{SPC}0{SPC}1A7{SPC}FFF9B4AC{SPC}0{SPC}E2{SPC}0{SPC}0{SPC}2.....<ETX>
	Hex	02 73 52 41 20 46 69 65 6C 64 45 76 61 6C 4C 6F 67 67 69 6E 67 4C 69 73 74 20 36 34 20 31 20 37 45 34 20 43 20 31 36 20 39 20 33 41 20 32 30 20 31 33 20 31 20 31 34 30 20 46 46 46 46 45 45 43 20 30 20 31 41 37 20 46 46 46 39 42 34 41 43 20 30 20 45 32 20 30 20 30 20 32 20 30 20 3203
CoLa B	Binary	02 02 02 02 00 00 12 13 73 52 41 20 46 69 65 6C 64 45 76 61 6C 4C 6F 67 67 69 6E 67 4C 69 73 74 20 00 64 00 01 07 E4 OC 16 09 3A 20 00 13 01 00 00 01 40 FF FF FE EC 00 00 00 00 00 00 01 A7 FF F9 B4 AC 00 00 00 00 00 E2 00 00 00 00 00 00 00 00 02F5

Table 449: Example: *sEA FieldEvalLoggingList 1*

4.9 Interfaces

Telegram validity overview

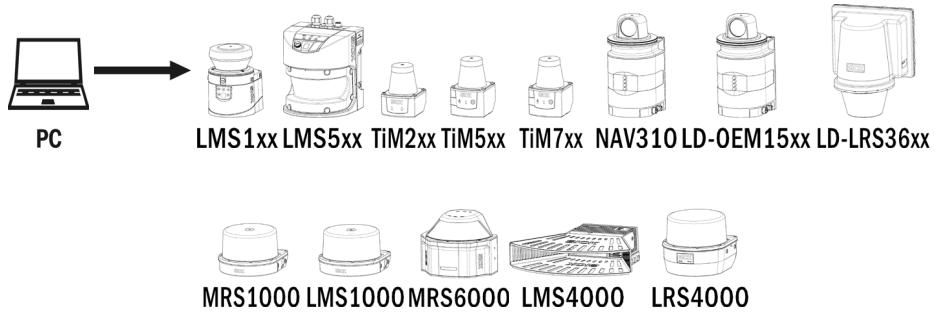
		LMS1xx	LMS5xx	TiM2xx	TiM5xx	TiM7xx	NAV310	LD-OEM15xx	LD-LRS36xx	MRS1000	LMS1000	MRS6000	LMS4000	LRS4000
4.9.1	Set IP address	X	X	X	X	X	X	X	X	X	X	X	X	X
4.9.2	Read IP address	X	X	X	X	X	X	X	X	X	X	X	X	X
4.9.3	Set Ethernet gateway	X	X	X	X	X	X	X	X	X	X	X	X	X
4.9.4	Read Ethernet gateway	X	X	X	X	X	X	X	X	X	X	X	X	X
4.9.5	Set IP mask	X	X	X	X	X	X	X	X	X	X	X	X	X
4.9.6	Read IP mask	X	X	X	X	X	X	X	X	X	X	X	X	X
4.9.7	Set baud rate for host interface	X	X				X		X					
4.9.8	Read baud rate of host interface	X	X											
4.9.9	Set interface type	X	X		X	X								
4.9.10	Read interface type	X	X		X	X								
4.9.11	Set Host port number	X	X		X	X	X	X	X	X	X	X	X	X
4.9.12	Set Host port Command Language (CoLa dialect)	X	X		X	X	X	X	X	X	X	X	X	X
4.9.13	Set Motor synchronization													X
4.9.14	Set Phase Shift of Slave for motor synchronization													X
4.9.15	Enable/Disable Front Panel	X	X											
4.9.16	Set function front panel	X	X											
4.9.17	Set front LEDs	X	X											
4.9.18	Set function of LED1						X	X						X
4.9.19	Set function of LED2						X	X						
4.9.20	Switch on/off LED1 or LED2						X	X						
4.9.21	Set 7-segment display to specific symbol or number	X	X											

4.9.1 Set IP address



IMPORTANT

- Save permanently to set values. Changes will be active after rebooting the device.
- Settings must correspond with network in which scanner is used. Else device cannot be found any more.



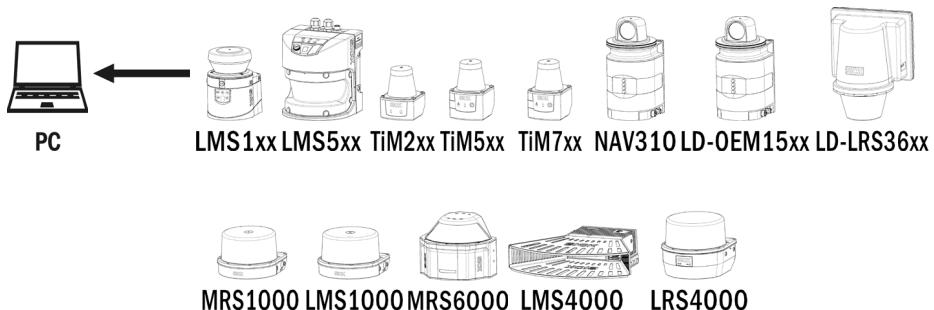
Telegram structure: sWN EllpAddr (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set IP address	String	8	All	EllpAddr	45 49 49 50 41 64 64 72
IP address	Set values in hex	Uint_32	4	All	00 00 00 00h ... FF FF FF FFh (decimal values unwieldy)	00 00 00 00 ... FF FF FF FF

Table 450: Telegram structure: sWN EllpAddr

Example: sWN EllpAddr 192.168.0.2

CoLa A	ASCII	<STX>sWN{SPC}EllpAddr{SPC}CO{SPC}A8{SPC}0{SPC}2<ETX>
	Hex	02 73 57 4E 20 45 49 49 70 41 64 64 72 20 43 30 20 41 38 20 30 20 32 03
CoLa B	Binary	02 02 02 02 00 00 00 11 73 57 4E 20 45 49 49 70 41 64 64 72 20 CO A8 00 02 05

Table 451: Example: sWN EllpAddr 192.168.0.2



Telegram structure: sWA EllpAddr						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set IP address	String	8	All	EllpAddr	45 49 49 50 41 64 64 72

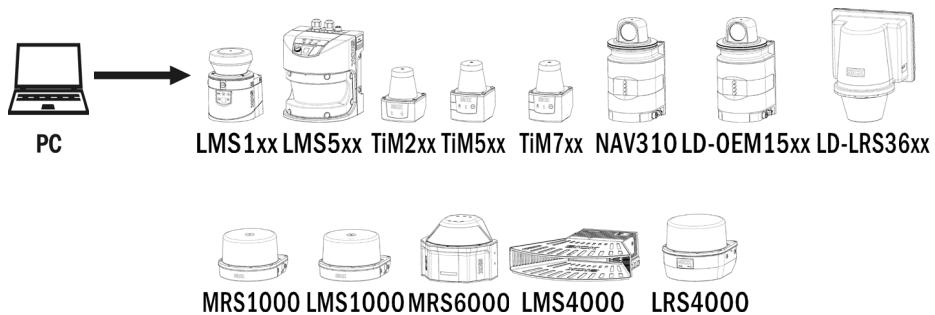
Table 452: Telegram structure: sWA EllpAddr

Example: sWA EllpAddr

CoLa A	ASCII	<STX>sWA[SPC]EllpAddr<ETX>
	Hex	02 73 57 41 20 45 49 49 70 41 64 64 72 03
CoLa B	Binary	02 02 02 02 00 00 00 0D 73 57 41 20 45 49 49 70 41 64 64 72 63

Table 453: Example: sWA EllpAddr

4.9.2 Read IP address



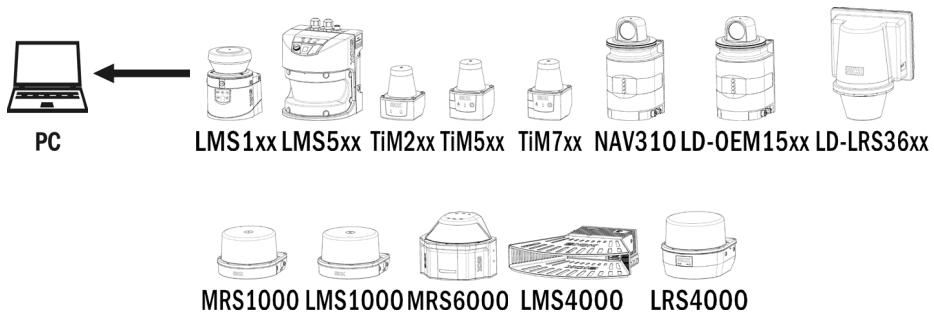
Telegram structure: sRN EllpAddr						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Read IP address	String	8	All	EllpAddr	45 49 49 50 41 64 64 72

Table 454: Telegram structure: sRN EllpAddr

Example: sRN EllpAddr

CoLa A	ASCII	<STX>sRN{SPC}EllpAddr<ETX>
	Hex	02 73 57 4E 20 45 49 49 70 41 64 64 72 03
CoLa B	Binary	02 02 02 02 00 00 00 0C 73 52 4E 20 45 49 49 70 41 64 64 72 49

Table 455: Example: sRN EllpAddr



Telegram structure: sRA EllpAddr						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Set IP address	String	8	All	EllpAddr	45 49 49 50 41 64 64 72
IP address	Set values in hex	Uint_32	4	All	00 00 00 00h ... FF FF FF FFh (decimal values unwieldy)	00 00 00 00 ... FF FF FF FF

Table 456: Telegram structure: sRA EllpAddr

Example: sRA EllpAddr 192.168.0.2

CoLa A	ASCII	<STX>sRA{SPC}EllpAddr{SPC}CO{SPC}A8{SPC}00{SPC}02<ETX>
	Hex	02 73 57 41 20 45 49 49 70 41 64 64 72 03
CoLa B	Binary	02 02 02 02 00 00 00 11 73 52 41 20 45 49 49 70 41 64 64 72 20 CO A8 00 02 0C

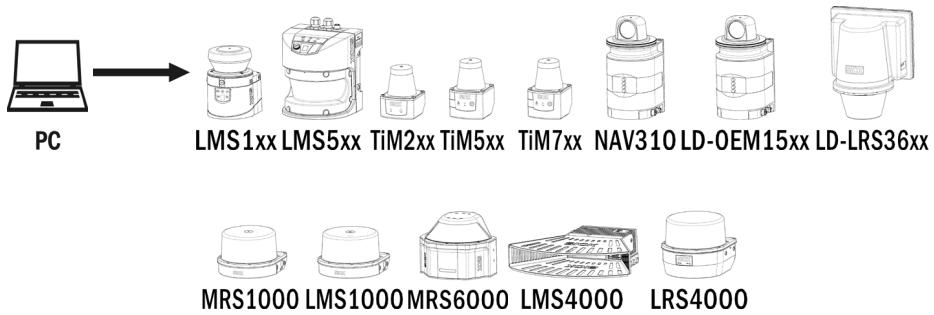
Table 457: Example: sRA EllpAddr 192.168.0.2

4.9.3 Set Ethernet gateway

Change Ethernet gateway IP address (TCP/IP)

**IMPORTANT**

- ▶ Save permanently to set values. Changes will be active after rebooting the device.
- ▶ Settings must correspond with network in which scanner is used. Else device cannot be found any more.



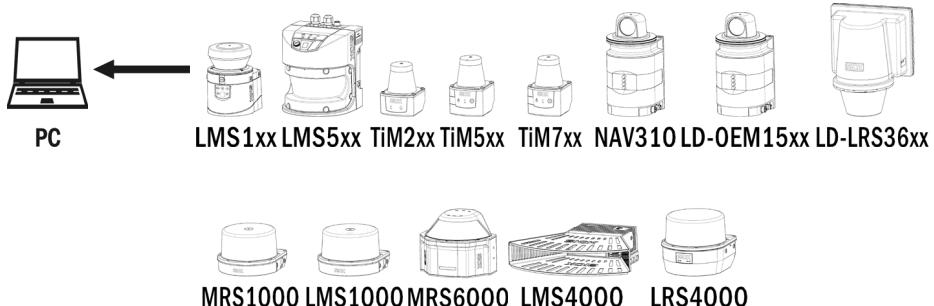
Telegram structure: sWN Elgate (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set gateway address	String	6	All	Elgate	45 49 67 61 74 65
Gateway address	Set values in hex	Uint_32	4	All	00 00 00 00h ... FF FF FF FFh (decimal values unwieldy)	00 00 00 00 ... FF FF FF FF

Table 458: Telegram structure: sWN Elgate

Example: sWN Elgate 192.168.0.1

CoLa A	ASCII	<STX>sWN[SPC]Elgate[SPC]CO[SPC]A8[SPC]00[SPC]01<ETX>
	Hex	02 73 57 4E 20 45 49 67 61 74 65 20 43 30 20 41 38 20 30 30 20 30 31 03
CoLa B	Binary	02 02 02 02 00 00 00 0F 73 57 4E 20 45 49 67 61 74 65 20 CO A8 00 01 5A

Table 459: Example: sWN Elgate 192.168.0.1



Telegram structure: sWA Elgate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set gateway address	String	6	All	Elgate	45 49 67 61 74 65

Table 460: Telegram structure: sWA Elgate

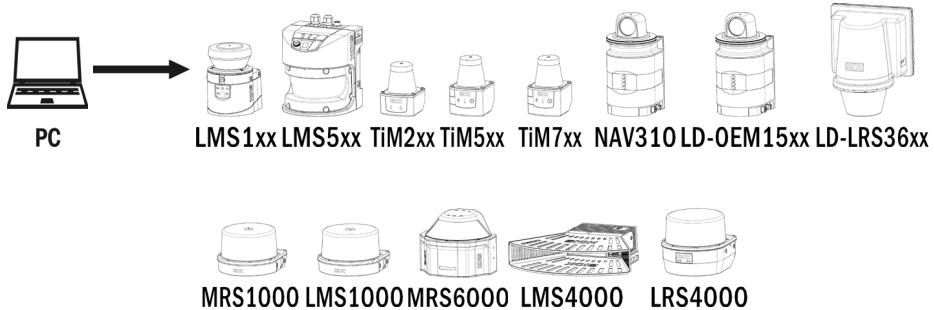
Example: sWA Elgate

CoLa A	ASCII	<STX>sWA{SPC}Elgate<ETX>
	Hex	02 73 57 41 20 45 49 67 61 74 65 03
CoLa B	Binary	02 02 02 02 00 00 00 0A 73 57 41 20 45 49 67 61 74 65 5E

Table 461: Example: sWA Elgate

4.9.4 Read Ethernet gateway

Read for the Ethernet gateway (TCP/IP)



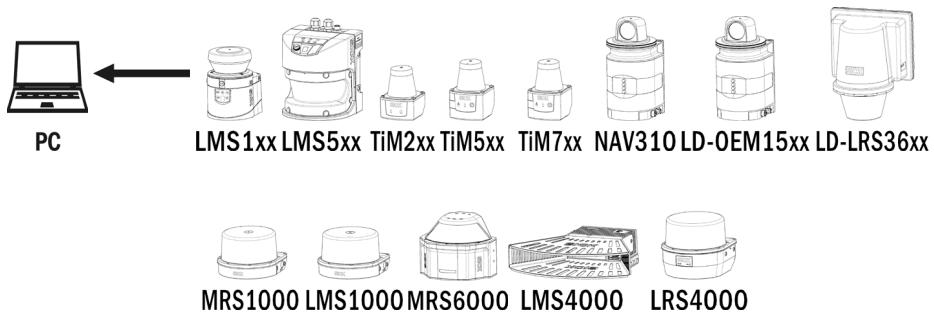
Telegram structure: sRN Elgate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Read gateway address	String	6	All	Elgate	45 49 67 61 74 65

Table 462: Telegram structure: sRN Elgate

Example: sRN Elgate

CoLa A	ASCII	<STX>sRN{SPC}Elgate<ETX>
	Hex	02 73 52 4E 20 45 49 67 61 74 65 03
CoLa B	Binary	02 02 02 02 00 00 00 0A 73 52 4E 20 45 49 67 61 74 65 54

Table 463: Example: sRN Elgate



Telegram structure: sRA Elgate						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Read gateway address	String	6	All	Elgate	45 49 67 61 74 65
Gateway address	Values in hex	Uint_32	4	All	00 00 00 00h ... FF FF FF FFh (decimal values unwieldy)	00 00 00 00 ... FF FF FF FF

Table 464: Telegram structure: sRA Elgate

Example: sRA Elgate 192.168.0.1

CoLa A	ASCII	<STX>sRA{SPC}Elgate{SPC}CO{SPC}A8{SPC}00{SPC}01<ETX>
	Hex	02 73 52 41 20 45 49 67 61 74 65 20 C0 A8 00 01 03
CoLa B	Binary	02 02 02 02 00 00 00 0F 73 52 41 20 45 49 67 61 74 65 20 C0 A8 00 01 12

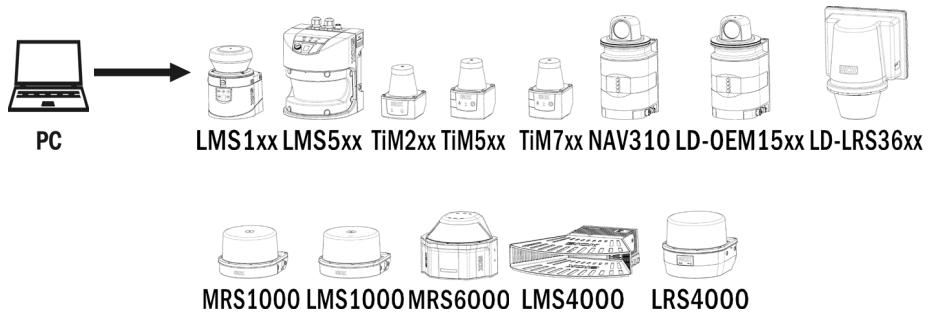
Table 465: Example: sRA Elgate 192.168.0.1

4.9.5 Set IP mask



IMPORTANT

- ▶ Save permanently to set values. Changes will be active after rebooting the device.
- ▶ Settings must correspond with network in which scanner is used. Else device cannot be found any more.



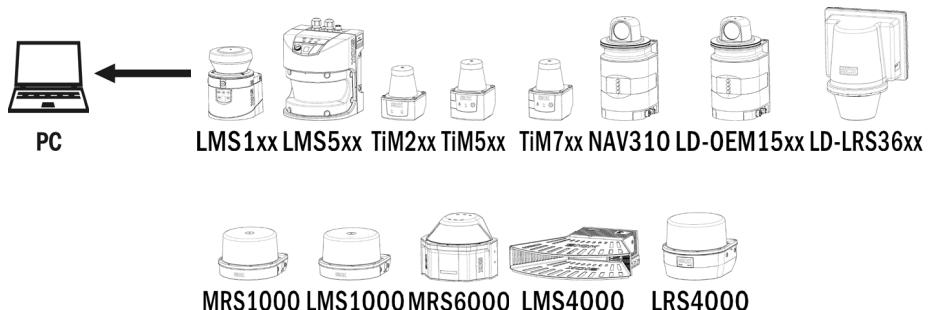
Telegram structure: sWN Elmask (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set IP mask	String	6	All	Elmask	45 49 6D 61 73 6B
IP mask	Set values in hex	Uint_32	4	All	00 00 00 00h ... FF FF FF FFh (decimal values unwieldy)	00 00 00 00 ... FF FF FF FF

Table 466: Telegram structure: sWN Elmask

Example: sWN Elmask 255.255.254.0

CoLa A	ASCII	<STX>sWN{SPC}Elmask{SPC}FF{SPC}FF{SPC}FE{SPC}00<ETX>
	Hex	02 73 57 4E 20 45 49 6D 61 73 6B 20 46 46 20 46 46 20 46 45 20 30 30 03
CoLa B	Binary	02 02 02 02 00 00 00 0F 73 57 4E 20 45 49 6D 61 73 6B 20 FF FF FE 00 8C

Table 467: Example: sWN Elmask 255.255.254.0



Telegram structure: sWA Elmask						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set IP mask	String	6	All	Elmask	45 49 6D 61 73 6B

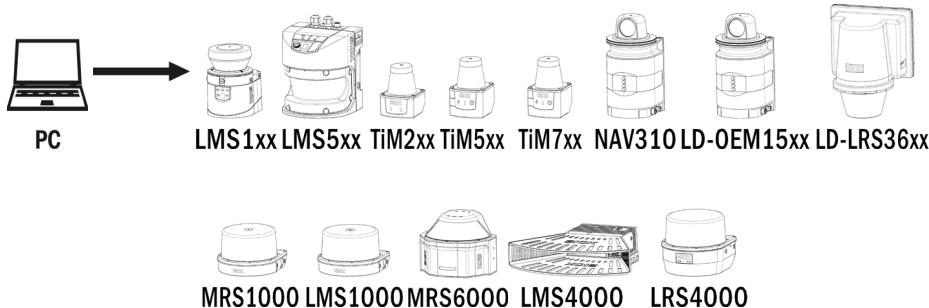
Table 468: Telegram structure: sWA Elmask

Example: sWA Elmask

CoLa A	ASCII	<STX>sWA{SPC}Elmask<ETX>
	Hex	02 73 57 41 20 45 49 6D 61 73 6B 03
CoLa B	Binary	02 02 02 02 00 00 00 0A 73 57 41 20 45 49 6D 61 73 6B 63

Table 469: Example: sWA Elmask

4.9.6 Read IP mask



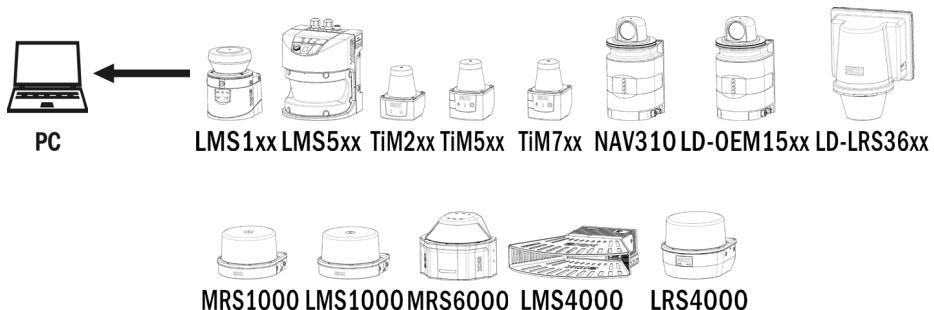
Telegram structure: sRN Elmask						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Read IP mask	String	6	All	Elmask	45 49 6D 61 73 6B

Table 470: Telegram structure: sRN Elmask

Example: sRN Elmask

CoLa A	ASCII	<STX>sRN{SPC}Elmask<ETX>
	Hex	02 73 52 4E 20 45 49 6D 61 73 6B 03
CoLa B	Binary	02 02 02 02 00 00 00 0A 73 52 4E 20 45 49 6D 61 73 6B 57

Table 471: Example: sRN Elmask



Telegram structure: sRA Elmask						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Read IP mask	String	6	All	Elmask	45 49 6D 61 73 6B
IP mask	Values in hex	Uint_32	4	All	00 00 00 00h ... FF FF FF FFh (decimal values unwieldy)	00 00 00 00 ... FF FF FF FF

Table 472: Telegram structure: sRA Elmask

Example: sRA Elmask 255.255.254.0

CoLa A	ASCII	<STX>sRA{SPC}Elmask{SPC}FF{SPC}FF{SPC}FE{SPC}00<ETX> <STX>sRN{SPC}Elmask<ETX>
	Hex	02 73 52 41 20 45 49 6D 61 73 6B 20 45 49 6D 61 73 6B 03
CoLa B	Binary	02 02 02 02 00 00 00 0F 73 52 41 20 45 49 6D 61 73 6B 20 FF FF FE 00 86

Table 473: Example: sRA Elmask 255.255.254.0

4.9.7 Set baud rate for host interface



Telegram structure: sWN SIHstBaud (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set baud rate for host interface	String	9	All	SIHstBaud	53 49 48 73 74 42 61 75 64
Baud rate data	Baud rate data for host interface	Enum_8	1	All	9600: +5d (05h) 19200: +6d (06h) 38400: +7d (07h) 57600: +8d (08h) 115200: +9d (09h)	9600: 05 19200: 06 38400: 07 57600: 08 115200: 09
					LMS1xx, LMS5xx	250000: +10d (0Ah) 500000: +11d (0Bh)
						250000: 0A 500000: 0B

Table 474: Telegram structure: sWN SIHstBaud

Example: sWN SIHstBaud

CoLa A	ASCII	<STX>sWN[SPC]SIHstBaud[SPC]+8<ETX>
	Hex	02 73 57 4E 20 53 49 48 73 74 42 61 75 64 20 08 03
CoLa B	Binary	02 02 02 02 00 00 00 0F 73 57 4E 20 53 49 48 73 74 42 61 75 64 20 08 05

Table 475: Example: sWN SIHstBaud



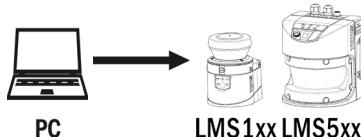
Telegram structure: sWA SIHstBaud						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set baud rate for host interface	String	9	All	SIHstBaud	53 49 48 73 74 42 61 75 64

Table 476: Telegram structure: sWA SIHstBaud

Example: sWA SIHstBaud

CoLa A	ASCII	<STX>sWA[SPC]SIHstBaud<ETX>
	Hex	02 73 57 41 20 53 49 48 73 74 42 61 75 64 03
CoLa B	Binary	02 02 02 02 00 00 00 0E 73 57 41 20 53 49 48 73 74 42 61 75 64 20 02

Table 477: Example: sWA SIHstBaud

4.9.8 Read baud rate of host interface

Telegram structure: sRN SIHstBaud						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Read baud rate of host interface	String	9	All	SIHstBaud	53 49 48 73 74 42 61 75 64

Table 478: Telegram structure: sRN SIHstBaud

Example: sRN SIHstBaud

CoLa A	ASCII	<STX>sRN[SPC]SIHstBaud<ETX>
	Hex	02 73 52 4E 20 53 49 48 73 74 42 61 75 64 03
CoLa B	Binary	02 02 02 02 00 00 00 0D 73 52 4E 20 53 49 48 73 74 42 61 75 64 28

Table 479: Example: sRN SIHstBaud



Telegram structure: sRA SIHstBaud						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Read baud rate of host interface	String	9	All	SIHstBaud	53 49 48 73 74 42 61 75 64
Baud rate data	Baud rate data of host interface	Enum_8	1	All	9600: 5d (05h) 19200: 6d (06h) 38400: 7d (07h) 57600: 8d (08h) 115200: 9d (09h)	9600: 05 19200: 06 38400: 07 57600: 08 115200: 09
					LMS1xx, LMS5xx	250000: 10d (0Ah) 500000: 11d (0Bh)
						250000: 0A 500000: 0B

Table 480: Telegram structure: sRA SIHstBaud

Example: sRA SIHstBaud

CoLa A	ASCII	<STX>sRA{SPC}SIHstBaud{SPC}8<ETX>
	Hex	02 73 52 41 20 53 49 48 73 74 42 61 75 64 20 08 03
CoLa B	Binary	02 02 02 02 00 00 00 0F 73 52 41 20 53 49 48 73 74 42 61 75 64 20 08 0F

Table 481: Example: sRA SIHstBaud

4.9.9 Set interface type



Telegram structure: sWN SIHstHw (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set hardware settings for host interface	String	7	All	SIHstHw	53 49 48 73 74 48 77
Interface type data	Hardware settings data for host interface	Enum_8	1	All	TX_RS232: 0 TX_RS485_2WIRE: 1 TX_RS422_485_4WIRE: 2	TX_RS232: 00 TX_RS485_2WIRE: 01 TX_RS422_485_4WIRE: 02

Table 482: Telegram structure: sWN SIHstHw

Example: sWN SIHstHw

CoLa A	ASCII	<STX>sWN{SPC}SIHstHw{SPC}0<ETX>
	Hex	02 73 57 4E 20 53 49 48 73 74 48 77 20 00 03
CoLa B	Binary	02 02 02 02 00 00 00 0D 73 57 4E 20 53 49 48 73 74 48 77 20 00 00

Table 483: Example: sWN SIHstHw



Telegram structure: sWA SIHstHw						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set hardware settings for host interface	String	7	All	SIHstHw	53 49 48 73 74 48 77

Table 484: Telegram structure: sWA SIHstHw

Example: sWA SIHstHw

CoLa A	ASCII	<STX>sWA{SPC}SIHstHw<ETX>
	Hex	02 73 57 41 20 53 49 48 73 74 48 77 03
CoLa B	Binary	02 02 02 02 00 00 00 0C 73 57 41 20 53 49 48 73 74 48 77 20 0F

Table 485: Example: sWA SIHstHw

4.9.10 Read interface type



Telegram structure: sRN SIHstHw						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Read hardware settings of host interface	String	7	All	SIHstHw	53 49 48 73 74 48 77

Table 486: Telegram structure: sRN SIHstHw

Example: sRN SIHstHw

CoLa A	ASCII	<STX>sRN{SPC}SIHstHw<ETX>
	Hex	02 73 52 4E 20 53 49 48 73 74 48 77 03
CoLa B	Binary	02 02 02 02 00 00 00 0B 73 52 4E 20 53 49 48 73 74 48 77 25

Table 487: Example: sRN SIHstHw



Telegram structure: sRA SIHstHw						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Read hardware settings of host interface	String	7	All	SIHstHw	53 49 48 73 74 48 77
Interface type data	Hardware settings data of host interface	Enum_8	1	All	TX_RS232: 0 TX_RS485_2WIRE: 1 TX_RS422_485_4WIRE: 2	TX_RS232: 00 TX_RS485_2WIRE: 01 TX_RS422_485_4WIRE: 02

Table 488: Telegram structure: sRA SIHstHw

Example: sRA SIHstHw

CoLa A	ASCII	<STX>sRA{SPC}SIHstHw{SPC}0<ETX>
	Hex	02 73 57 41 20 53 49 48 73 74 48 77 20 00 03
CoLa B	Binary	02 02 02 02 00 00 00 0D 73 52 41 20 53 49 48 73 74 48 77 20 00 0A

Table 489: Example: sRA SIHstHw

4.9.11 Set Host port number

Note



Command for UDP port = EIUDPPort (45 49 55 44 50 50 6F 72 74)



Telegram structure: sWN EIHstPort (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sWN	73 57 4E
Command	Read hardware settings of host interface	String	7	All	EIHstPort	45 49 48 73 74 50 6F 72 74
Port number	Host port number (Default = 2112)	Uint_16	2	All	+0d ... +65535d (0h ... FF FFh)	00 00 ... FF FF

Table 490: Telegram structure: sWN EIHstPort

Example: sWN EIHstPort +2110 (Host Port 2110)

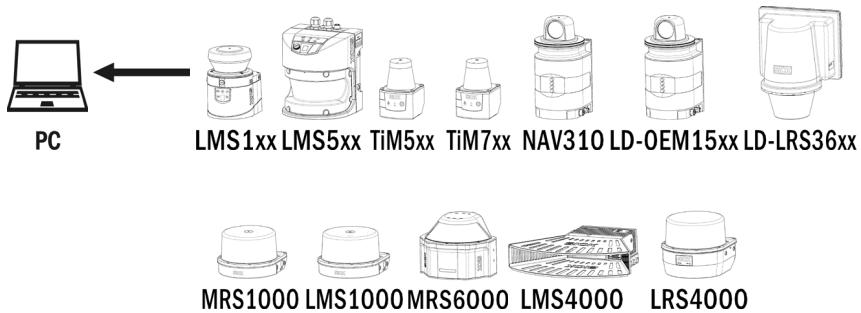
CoLa A	ASCII	<STX>sWN{SPC}EIHstPort{SPC}+2110<ETX>
	Hex	02 73 57 4E 20 45 49 48 73 74 50 6F 72 74 20 08 3E 03
CoLa B	Binary	02 02 02 02 00 00 00 10 73 57 4E 20 45 49 48 73 74 50 6F 72 74 20 08 3E 26

Table 491: Example: sWN EIHstPort +2110

Example: sWN EIUDPPort +2214 (UDP Port 2214)

CoLa A	ASCII	<STX>sWN{SPC}EIUDPPort{SPC}+2214<ETX>
	Hex	02 73 57 4E 20 45 49 55 44 50 50 6F 72 74 20 08 A6 03
CoLa B	Binary	02 02 02 02 00 00 00 10 73 57 4E 20 45 49 55 44 50 50 6F 72 74 20 08 A6 B0

Table 492: Example: sWN EIUDPPort +2214



Telegram structure: sWA EIHstPort						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Read hardware settings of host interface	String	7	All	EIHstPort	45 49 48 73 74 50 6F 72 74

Table 493: Telegram structure: sWA EIHstPort

Example: sWA EIHstPort (Host Port)

CoLa A	ASCII	<STX>sWA{SPC}EIHstPort<ETX>
	Hex	02 73 57 41 20 45 49 48 73 74 50 6F 72 74 03
CoLa B	Binary	02 02 02 02 00 00 00 0E 73 57 41 20 45 49 48 73 74 50 6F 72 74 20 1F

Table 494: Example: sWA EIHstPort

Example: sWA EIUDPPort (UDP Port)

CoLa A	ASCII	<STX>sWA{SPC}EIUDPPort<ETX>
	Hex	02 73 57 41 20 45 49 55 44 50 50 6F 72 74 03
CoLa B	Binary	02 02 02 02 00 00 00 0E 73 57 41 20 45 49 55 44 50 50 6F 72 74 20 11

Table 495: Example: sWA EIUDPPort

4.9.12 Set Host port Command Language (CoLa dialect)

Note

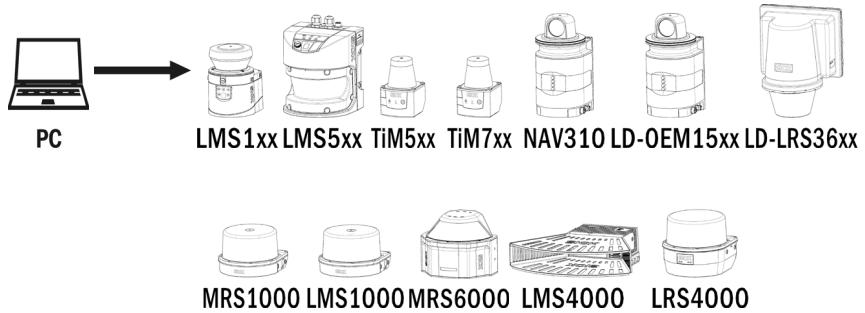


It is not allowed to use this telegram in a faster cycle than 10 ms!

After switching the CoLa dialect by this telegram, you have to store the changes permanently and reboot the sensor to activate the chosen CoLA dialect.

Binary CRC32 is available since the firmware version V1.80.0

Command for UDP port = EIUDPCola (45 49 55 44 50 43 6F 6C 61)



Telegram structure: sWN EIHstCola (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sWN	73 57 4E
Command	Read hardware settings of host interface	String	7	All	EIHstCola	45 49 48 73 74 43 6F 6C 61
Command language	Host port Command language	Enum_8	1	All	CoLa ASCII: 0 CoLa binary: 1	00 01
					CoLa ASCII: 0 CoLa binary: 1 Binary CRC32: 2	00 01 02
					CoLa ASCII: 0 CoLa binary: 1	00 01

Table 496: Telegram structure: sWN EIHstCola

Example: sWN EIHstCola 1 (Host Port CoLa binary)

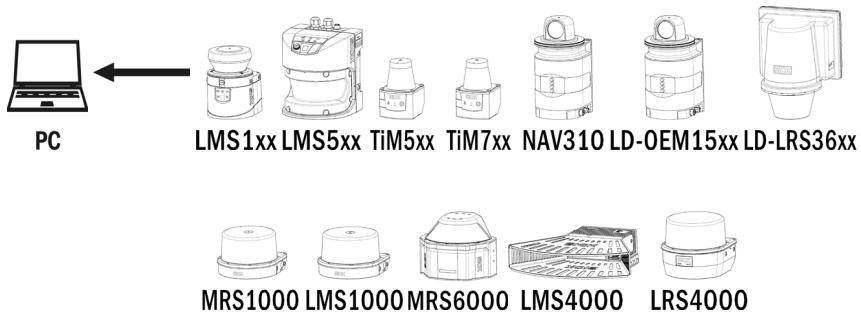
CoLa A	ASCII	<STX>sWN{SPC}EIHstCola{SPC}1<ETX>
	Hex	02 73 57 4E 20 45 49 48 73 74 43 6F 6C 61 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 0F 73 57 4E 20 45 49 48 73 74 43 6F 6C 61 20 01 09

Table 497: Example: sWN EIHstCola 1

Example: sWN EIUDPCola 0 (UDP Port CoLa ASCII)

CoLa A	ASCII	<STX>sWN{SPC}EIUDPCola{SPC}0<ETX>
	Hex	02 73 57 4E 20 45 49 55 44 50 43 6F 6C 61 20 30 03
CoLa B	Binary	02 02 02 02 00 00 00 0F 73 57 4E 20 45 49 55 44 50 43 6F 6C 61 20 00 06

Table 498: Example: sWN EIUDPCola 0



Telegram structure: sWA EIHstCola						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Read hardware settings of host interface	String	7	All	EIHstCola	45 49 48 73 74 43 6F 61

Table 499: Telegram structure: sWA EIHstCola

Example: sWA EIHstCola (Host Port)

CoLa A	ASCII	<STX>sWA{SPC}EIHstCola<ETX>
	Hex	02 73 57 41 20 45 49 48 73 74 43 6F 6C 61 03
CoLa B	Binary	02 02 02 02 00 00 00 0E 73 57 41 20 45 49 48 73 74 43 6F 6C 61 20 07

Table 500: Example: sWA EIHstCola

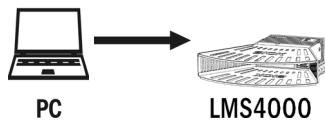
Example: sWA EIUDPCola (UDP Port)

CoLa A	ASCII	<STX>sWA{SPC}EIUDPCola<ETX>
	Hex	02 73 57 41 20 45 49 55 44 50 43 6F 6C 61 03
CoLa B	Binary	02 02 02 02 00 00 00 0E 73 57 41 20 45 49 55 44 50 43 6F 6C 61 20 09

Table 501: Example: sWA EIUDPCola

4.9.13 Set Motor synchronization

To increase the width of the field for the intended application or to avoid shadowing effects caused by geometrical properties, multiple sensors (one Master, several Slaves) can be assembled side by side. For further information see operating instructions.



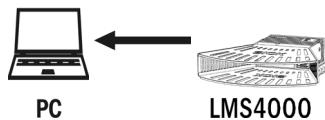
Telegram structure: sWN SYtype (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set motor synchronization	String	6	All	SYtype	53 59 74 79 70 65
Function	Code number	Enum_8	1	All	No function: 0 Master: 1 Slave: 2	00 01 02

Table 502: Telegram structure: sWN SYtype

Example: sWN SYtype

CoLa A	ASCII	<STX>sWN{SPC}SYtype{SPC}2<ETX>
	Hex	02 73 57 4E 20 53 59 74 79 70 65 20 32 03
CoLa B	Binary	02 02 02 02 00 00 00 00 OC 73 57 4E 20 53 59 74 79 70 65 20 02 7A

Table 503: Example: sWN SYtype 2



Telegram structure: sWA SYtype						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set motor synchronization	String	11	All	SYtype	53 59 74 79 70 65

Table 504: Telegram structure: sWA SYtype

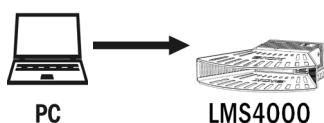
Example: sWA SYtype

CoLa A	ASCII	<STX>sWA[SPC]SYtype<ETX>
	Hex	02 73 57 41 20 53 59 74 79 70 65 03
CoLa B	Binary	02 02 02 02 00 00 00 0B 73 57 41 20 53 59 74 79 70 65 20 77

Table 505: Example: sWA SYtype

4.9.14 Set Phase Shift of Slave for motor synchronization

The phase shift should correspond with the angle of rotation of each slave device relative to the master



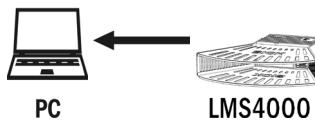
Telegram structure: sWN SYphas (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set phase shift of slave device	String	6	All	SYphas	53 59 70 68 61 73
Function	Phase value in 1/10000°	Uint_32	4	All	0 ... 80°; 0 ... 800000d (0 ... C3500h)	00 00 00 00 ... 00 0C 35 00

Table 506: Telegram structure: sWN SYphas

Example: sWN SYphas (Slave phase shift = 10°)

CoLa A	ASCII	<STX>sWN[SPC]SYphas[SPC]+100000<ETX>
	Hex	02 73 57 4E 20 53 59 70 68 61 73 20 2B 31 30 30 30 30 30 03
CoLa B	Binary	02 02 02 02 00 00 00 0F 73 57 4E 20 53 59 70 68 61 73 20 00 01 86 A0 4D

Table 507: Example: sWN SYphas +100000



Telegram structure: sWA SYphas						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set phase shift of slave device	String	6	All	SYphas	53 59 70 68 61 73

Table 508: Telegram structure: sWA SYphas

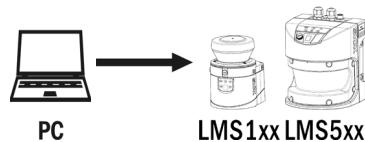
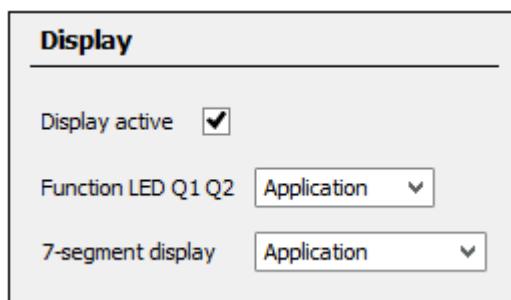
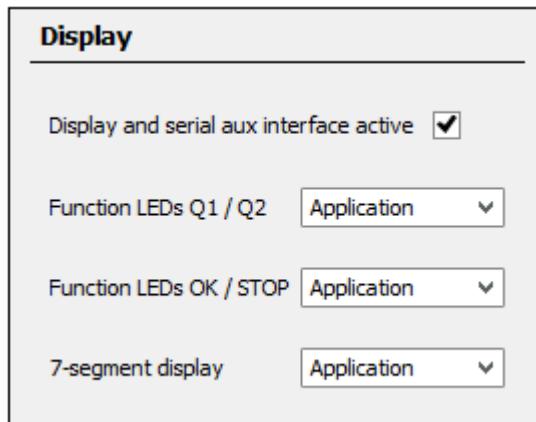
Example: sWA SYphas

CoLa A	ASCII	<STX>sWA{SPC}SYphas<ETX>
	Hex	02 73 57 41 20 53 59 70 68 61 73 03
CoLa B	Binary	02 02 02 02 00 00 00 0B 73 57 41 20 53 59 70 68 61 73 20 65

Table 509: Example: sWA SYphas

4.9.15 Enable/Disable Front Panel

The following telegram “LMLfpen” corresponds to the SOPAS GUI check box “Display and serial aux interface active” in LMS1xx and “Display active” in LMS5xx.



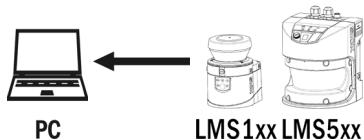
Telegram structure: sWN LMLfpen (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set front panel display and serial aux interface	String	7	All	LMLfpen	4C 4D 4C 66 70 65 6E
Status	Enable/Disable(Active/inactive)	Bool_1	1	All	Enable(Active): 1 Disable(Inactive): 0	Enable(Active): 01 Disable(Inactive): 00

Table 510: Telegram structure: *sWN LMLfpen*

Example: sWN LMLfpen

CoLa A	ASCII	<STX>sWN[SPC]LMLfpen[SPC]1<ETX>
	Hex	02 73 57 4E 20 4C 4D 4C 66 70 65 6E 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 0D 73 57 4E 20 4C 4D 4C 66 70 65 6E 20 01 3B

Table 511: Example: sWN LMLfpen 1 (Enable Front Panel)



Telegram structure: sWA LMLfpen

Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Set front panel display and serial aux interface	String	8	All	LMLfpen	4C 4D 4C 66 70 65 6E

Table 512: Telegram structure: sWA LMLfpen

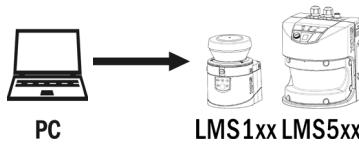
Example: sWA LMLfpen

CoLa A	ASCII	<STX>sWA[SPC]LMLfpFen<ETX>
	Hex	02 73 57 41 20 4C 4D 4C 66 70 65 6E 03
CoLa B	Binary	02 02 02 02 00 00 00 0C 73 57 41 20 4C 4D 4C 66 70 65 6E 20 35

Table 513: Example: sWA LMLfpen

For LMS1xx Security sensors (LMS12x, LMS13x, LMS14x), telegram “LLMfpemode” corresponds to the selection of “Mode” between “State dependent” (the mode is dependent on the state of the selection of “Arm”/“Disarmed”/“Walk Test”) or “Permanent”(the always active mode).

The figure displays two side-by-side configuration dialog boxes, both titled "Display". Each box contains several dropdown menus and checkboxes. In the left box (State dependent mode), the "Mode" dropdown is set to "State dependent". In the right box (Permanent mode), the "Mode" dropdown is set to "Permanent". Both boxes show other settings like "Function LEDs Q1 / Q2" and "Function LEDs OK / STOP" both set to "Application".



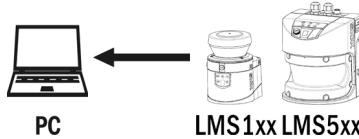
Telegram structure: sWN LLMfpmode						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	LMS1xx Security	sWN	73 57 4E
Command	Set front panel display and serial aux interface	String	7	LMS1xx Security	LLMfpmode	4C 4C 4D 66 70 6D 6F 64 65
Status	Enable/Disable(Active/inactive)	Bool_1	1	LMS1xx Security	Permanent(Active): 0 State dependent(Inactive): 1	Permanent(Active): 00 State dependent(Inactive): 01

Table 514: Telegram structure: sWN LLMfpmode

Example: sWN LLMfpmode

CoLa A	ASCII	<STX>sWN{SPC}LLMfpmode {SPC}1<ETX>
	Hex	02 73 57 4E 20 4C 4C 4D 66 70 6D 6F 64 65 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 00 0D 73 57 4E 20 4C 4C 4D 66 70 6D 6F 64 65 20 00 12

Table 515: Example: sWN LLMfpmode 0(set to "Permanent")



Telegram structure: sWA LLMfpmode						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	LMS1xx Security	sWA	73 57 41
Command	Set front panel display and serial aux interface	String	8	LMS1xx Security	LLMfpmode	4C 4C 4D 66 70 6D 6F 64 65

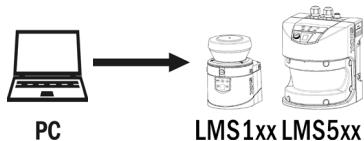
Table 516: Telegram structure: sWA LLMfpmode

Example: sWA LLMfpmode

CoLa A	ASCII	<STX>sWA{SPC}LLMfpmode <ETX>
	Hex	02 73 57 41 20 4C 4C 4D 66 70 6D 6F 64 65 03
CoLa B	Binary	02 02 02 02 00 00 00 0C 73 57 41 20 4C 4D 4C 66 70 65 6E 20 3D

Table 517: Example: sWA LLMfpmode

4.9.16 Set function front panel



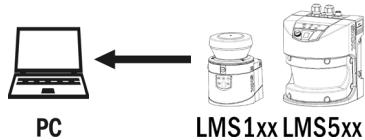
Telegram structure: sWN LMLfpFcn (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set function of the front panel	String	8	All	LMLfpFcn	4C 4D 4C 66 70 46 63 6E
Reserved	Reserved	Bool_1	1	All	1	01
LED function Q1/Q2	Code number	Enum_8	1	All	No function: 0 Application: 1 Command: 2	No function: 00 Application: 01 Command: 02
LED function OK/Stop	Code number	Enum_8	1	All	Application: 0 Command: 1	Application: 00 Command: 01
Display function	Code number	Enum_8	1	All	No function: 0 Application: 1 Command: 2	No function: 00 Application: 01 Command: 02

Table 518: Telegram structure: sWN LMLfpFcn

Example: sWN LMLfpFcn

CoLa A	ASCII	<STX>sWN[SPC]LMLfpFcn[SPC]1[SPC]1[SPC]0[SPC]1<ETX>
	Hex	02 73 57 4E 20 4C 4D 4C 66 70 46 63 6E 20 31 20 31 20 30 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 11 73 57 4E 20 4C 4D 4C 66 70 46 63 6E 20 01 01 00 01 7B

Table 519: Example: sWN LMLfpFcn



Telegram structure: sWA LMLfpFcn						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Front panel function	String	8	All	LMLfpFcn	4C 4D 4C 66 70 46 63 6E

Table 520: Telegram structure: sWA LMLfpFcn

Example: sWA LMLfpFcn

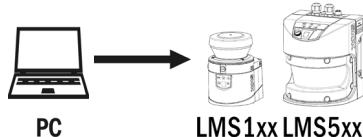
CoLa A	ASCII	<STX>sWA{SPC}LMLfpFcn<ETX>
	Hex	02 73 57 41 20 4C 4D 4C 66 70 46 63 6E 03
CoLa B	Binary	02 02 02 02 00 00 00 0D 73 57 41 20 4C 4D 4C 66 70 46 63 6E 75

Table 521: Example: sWA LMLfpFcn

4.9.17 Set front LEDs

To use this command, it is necessary to set the function of the LED to “Command” (use sWN LMLfpFcn), otherwise this command will have no influence to the LEDs.

OK and Stop LED can only alternate, if one is switched on, the other will turn automatically off.



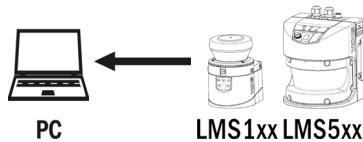
Telegram structure: sMN mLMLSetLed						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	73 4D 4E
Command	Set front LED	String	10	All	mLMLSetLed	6D 4C 4D 4C 53 65 74 4C 65 64
LED	LED to turn on/off	Int_8	1	All	Stop: 1 OK: 2 Q1: 3 Q2: 4	Stop: 01 OK: 02 Q1: 03 Q2: 04
Status	On or Off	Int_8	1	All	On: 1 Off: 0	On: 01 Off: 00

Table 522: Telegram structure: sMN mLMLSetLed

Example: sMN mLMLSetLed 1 1 (Stop LED)

CoLa A	ASCII	<STX>sMN{SPC}mLMLSetLed{SPC}1{SPC}1<ETX>
	Hex	02 73 4D 4E 20 6D 4C 4D 4C 53 65 74 4C 65 64 20 31 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 12 73 4D 4E 20 6D 4C 4D 4C 53 65 74 4C 65 64 20 01 20 01 7F

Table 523: Example: sMN mLMLSetLed 1 1 (Stop LED)



Telegram structure: sAN mLMLSetLed						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	73 41 4E
Command	Front LED	String	10	All	mLMLSetLed	6D 4C 4D 4C 53 65 74 4C 65 64
Status code	Code number	Bool_1	1	All	Error: 0 Success: 1	Error: 00 Success: 01

Table 524: Telegram structure: sAN mLMLSetLed

Example: sAN mLMLSetLed

CoLa A	ASCII	<STX>sAN{SPC}mLMLSetLed{SPC}0<ETX>
	Hex	02 73 41 4E 20 6D 4C 4D 4C 53 65 74 4C 65 64 20 00 03
CoLa B	Binary	02 02 02 02 00 00 00 10 73 41 4E 20 6D 4C 4D 4C 53 65 74 4C 65 64 20 00 53

Table 525: Example: sAN mLMLSetLed

4.9.18 Set function of LED1

With this command the operation of LED1 can be defined.

NAV310 / LE-OEM15xx: Either it has no function, it flashes when output Q1 or application is active or it can be turned on and off by another telegram command (sMN mHMISetLed). LMS4000: Either it has no function, or it flashes when either In/Out1, In/Out2 or Out4 is active (selectable).



Telegram structure: sWN HMIfpFcn_Y1 (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set function of the front panel LED1	String	11	All	HMIfpFcn_Y1	48 4D 49 66 70 46 63 6E 5F 59 31
LED1 function Q1	Code number	Enum_8	1	NAV310, LD- OEM15xx	No function: 0 Application: 1 Command: 2	No function: 00 Application: 01 Command: 02
				LMS 4000	No function: 0 In/Out1: 1 In/Out2: 2 Out4: 4	00 01 02 04

Table 526: Telegram structure: sWN HMIfpFcn_Y1

Example: sWN HMIfpFcn_Y1 +2 = Command / In/Out2

CoLa A	ASCII	<STX>sWN{SPC}HMIfpFcn_Y1{SPC}2<ETX>
	Hex	02 73 57 4E 20 48 4D 49 66 70 46 63 6E 5F 59 31 20 32 03
CoLa B	Binary	02 02 02 02 00 00 00 11 73 57 4E 20 48 4D 49 66 70 46 63 6E 5F 59 31 20 02 4E

Table 527: Example: sWN HMIfpFcn_Y1 2



Telegram structure: sWA HMIfpFcn_Y1						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	LED1 function	String	11	All	HMIfpFcn_Y1	48 4D 49 66 70 46 63 6E 5F 59 31

Table 528: Telegram structure: sWA HMIfpFcn_Y1

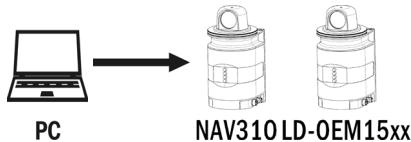
Example: sWA HMIfpFcn_Y1

CoLa A	ASCII	<STX>sWA[SPC]HMIfpFcn_Y1<ETX>
	Hex	02 73 57 41 20 48 4D 49 66 70 46 63 6E 5F 59 31 03
CoLa B	Binary	02 02 02 02 00 00 00 00 F7 35 74 12 20 48 4D 49 66 70 46 63 6E 5F 59 31 20 43

Table 529: Example: sWA HMIfpFcn_Y1

4.9.19 Set function of LED2

With this command the operation of LED2 can be defined. Either it has no function (00), it flashes when output Q2 or application is active (01) or it can be turned on and off (02) by another telegram command (sMN mHMISetLed).



Telegram structure: sWN HMIfpFcn_Y2 (Authorized client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Set function of the front panel LED2	String	11	All	HMIfpFcn_Y2	48 4D 49 66 70 46 63 6E 5F 59 32
LED2 function Q2	Code number	Enum_8	1	All	No function: 0 Application: 1 Command: 2	No function: 00 Application: 01 Command: 02

Table 530: Telegram structure: sWN HMIfpFcn_Y2

Example: sWN HMIfpFcn_Y2 = Command

CoLa A	ASCII	<STX>sWN{SPC}HMIfpFcn_Y2{SPC}2<ETX>
	Hex	02 73 57 4E 20 48 4D 49 66 70 46 63 6E 5F 59 32 20 32 03
CoLa B	Binary	02 02 02 02 00 00 00 11 73 57 4E 20 48 4D 49 66 70 46 63 6E 5F 59 32 20 02 7D

Table 531: Example: sWN HMIfpFcn_Y2 = Command



Telegram structure: sWA HMIfpFcn_Y2

Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	LED2 function	String	11	All	HMIfpFcn_Y2	48 4D 49 66 70 46 63 6E 5F 59 32

Table 532: Telegram structure: sWA HMIfpFcn_Y2

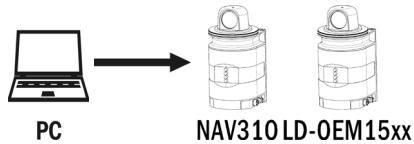
Example: sWA HMIfpFcn_Y2

CoLa A	ASCII	<STX>sWA{SPC}HMIfpFcn_Y2<ETX>
	Hex	02 73 57 41 20 48 4D 49 66 70 46 63 6E 5F 59 32 03
CoLa B	Binary	02 02 02 02 00 00 00 0F 73 57 41 20 48 4D 49 66 70 46 63 6E 5F 59 32 60

Table 533: Example: sWA HMIfpFcn_Y2

4.9.20 Switch on/off LED1 or LED2

With this command the LEDs can be switched on and off (e.g. to locate the sensor or test the connection). As a prerequisite, the operation of LED1 and LED2 must have been set to the right function (sWN HMIfpFcn_).



Telegram structure: sMN mHMISetLed						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Method	String	3	All	sMN	73 4D 4E
Command	Set function of the front panel	String	10	All	mHMISetLed	6D 48 4D 49 53 65 74 4C 65 64
LED number 1/2	LED number	Uint_8	1	All	LED 1: 3 LED 2: 4	LED 1: 03 LED 2: 04
LED function off/on	Code number	Uint_8	1	All	Off: 0 On: 1	Off: 00 On: 01

Table 534: Telegram structure: sMN mHMISetLed

Example: sMN mHMISetLed 1 = On

CoLa A	ASCII	<STX>sMN{SPC}mHMISetLed{SPC}3{SPC}1<ETX>
	Hex	02 73 4D 4E 20 6D 48 4D 49 53 65 74 4C 65 64 20 33 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 12 73 4D 4E 20 6D 48 4D 49 53 65 74 4C 65 64 20 03 20 01 7C

Table 535: Example: sMN mHMISetLed 1 = On



Telegram structure: sAN mHMISetLed						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sAN	73 41 4E
Command	LED status	String	10	All	mHMISetLed	6D 48 4D 49 53 65 74 4C 65 64
Result	Code number	Bool_1	1	All	No success: 0 Success: 1	No success: 00 Success: 01

Table 536: Telegram structure: sAN mHMISetLed

Example: sAN mHMISetLed 01

CoLa A	ASCII	<STX>sAN{SPC}mHMISetLed{SPC}1<ETX>
	Hex	02 73 41 4E 20 6D 48 4D 49 53 65 74 4C 65 64 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 10 73 41 4E 20 6D 48 4D 49 53 65 74 4C 65 64 20 01 53

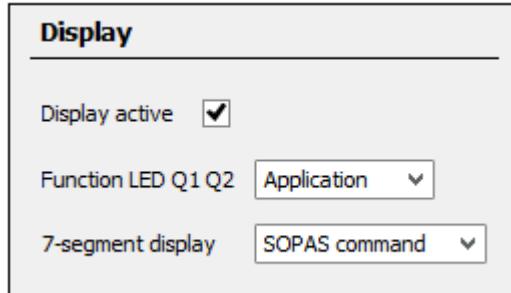
Table 537: Example: sAN mHMISetLed 01

4.9.21 Set 7-segment display to specific symbol or number

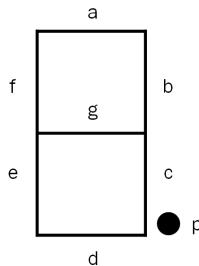
Precondition



It is mandatory to define that the 7-segment display should react to SOPAS commands. This option needs to be activated via sWN LMLfpFcn or using the configuration software SOPAS ET. Choose “SOPAS command” in the drop-down list for the 7-segment display (as shown in the figure below). Afterwards the segments of the display can be set via telegram.



The display is consisting of the segments A-P:



The segments A-G are operated using the bits 0 to 6, the segment P using bit 7:

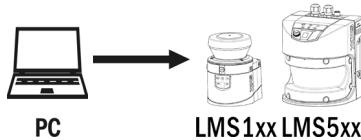
Segment	p	g	f	e	d	c	b	a
Related bit	7	6	5	4	3	2	1	0

Example: Showing the number “7” on the display:

Segment	p	g	f	e	d	c	b	a
On/Off for showing the required symbol	off	off	off	off	off	on	on	on
Binary	0	0	0	0	0	1	1	1

Transfer binary into ASCII:

00000111 bin \triangleq 07 ASCII



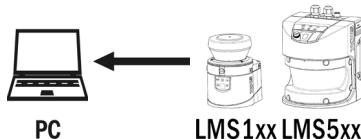
Telegram structure: sMN mLMLSetDisp (no required user level)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Request (SOPAS method by name)	String	3	All	sMN	73 4D 4E
Command	Set 7-segment display	String	11	All	mLMLSetDisp	6D 4C 4D 4C 53 65 74 44 69 73 70
Display	7-segment display in the display of the LMS. The segments A-G are operated using the bits 0 to 6, the point P using bit 7.	Uint_8	1	All	Display off: 0 ... Display shows 2: 5Bh Display shows 7: 7 ... Display fully on (8.): FFh	00 ... 5B 07 ... FF

Table 538: Telegram structure: sMN mLMLSetDisp

Example: sMN mLMLSetDisp 07 (Showing the number “7” on the display)

CoLa A	ASCII	<STX>sMN{SPC}mLMLSetDisp{SPC}07<ETX>
	Hex	02 73 4D 4E 20 6D 4C 4D 4C 53 65 74 44 69 73 70 20 30 37 03
CoLa B	Binary	02 02 02 02 00 00 00 11 73 4D 4E 20 6D 4C 4D 4C 53 65 74 44 69 73 70 20 07 3B

Table 539: Example: sMN mLMLSetDisp 07 (Showing the number “7” on the display)



Telegram structure: sAN mLMLSetDisp						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer (SOPAS answer)	String	3	All	sAN	73 41 4E
Command	Set 7-segment display	String	11	All	mLMLSetDisp	6D 4C 4D 4C 53 65 74 44 69 73 70
ErrorCode	The command has been accepted if the error code 1 is returned.	Enum8	1	All	0 error 1 no error	00 error 01 no error

Table 540: Telegram structure: sAN mLMLSetDisp

Example: sAN mLMLSetDisp 1

ColA A	ASCII	<STX>sAN{SPC}mLMLSetDisp{SPC}1<ETX>
ColA B	Hex	02 73 41 4E 20 6D 4C 4D 4C 53 65 74 44 69 73 70 20 31 03
ColB B	Binary	02 02 02 02 00 00 00 11 73 41 4E 20 6D 4C 4D 4C 53 65 74 44 69 73 70 20 01 31

Table 541: Example: sAN mLMLSetDisp 1

4.10 Application

		LMS1xx	LMS5xx	TiM2xx	TiM5xx	TIM7xx	NAV310	LD-OEM15xx	LD-LRS36xx	MRS1000	LMS1000	MRS6000	LMS4000	LRS4000
4.10.1	Request status change of monitoring fields on event	X	X											
4.10.2	Individual request of monitoring fields to their status changes – ECR xy	X	X											
4.10.3	Request SOPAS field data structure	X	X											
4.10.4	Request perpendicular distance once	X	X											
4.10.5	Request perpendicular distance continuously on event	X	X											
4.10.6	Request latest field infringement info	X	X											
4.10.7	Request field infringement info continuously on event	X	X											
4.10.8	Fieldset selection method					X								
4.10.9	Read active fieldset					X								
4.10.10	Write active fieldset					X								

4.10.1 Request status change of monitoring fields on event

Precondition



Necessary sensor setup:

1. Setup detection fields
2. Setup evaluation cases and assign outputs to the evaluation cases

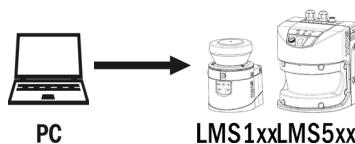
Advantage of this telegram:

Status of the evaluation case (1=field free, 2=detecting or 3=infringement) is transmitted if there is a status change of the monitoring field within the application.

For example if the object size in the field exceeds the set object size parameter but the duration of the object inside the field is below the set time parameter. Then the status change from “field free” to “detecting” will be given out via telegram.

Necessary procedure after each power up of the sensor:

1. Establish Ethernet connection to LMS
2. Activate Ethernet output



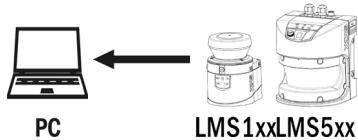
Telegram structure: sEN ECRChangeArr (no required user level)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sEN	73 45 4E
Command	Data telegram	String	12	All	ECRChangeArr	45 43 52 43 68 61 6E 67 65 41 72 72
Reporting	Start/stop	Enum_8	1	LM1xx LMS5XX	Stop: 0 Start: 1	00 01

Table 542: Telegram structure: sEN ECRChangeArr

Example: sEN ECRChangeArr 1

CoLa A	ASCII	<STX>sEN{SPC}ECRChangeArr{SPC}1<ETX>
	Hex	02 73 45 4E 20 45 43 52 43 68 61 6E 67 65 41 72 72 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 12 73 45 4E 20 45 43 52 43 68 61 6E 67 65 41 72 72 20 01 4A

Table 543: Example: sEN ECRChangeArr 1



Telegram structure: sEA ECRChangeArr (no required user level)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sEA	73 45 41
Command	Data telegram	String	12	All	ECRChangeArr	45 43 52 43 68 61 6E 67 65 41 72 72
Reporting	Start/stop	Enum_8	1	LM1xx LMS5XX	Stop: 0 Start: 1	00 01

Table 544: Telegram structure: sEA ECRChangeArr

Example: sEA ECRChangeArr 1

CoLa A	ASCII	<STX>sEA[SPC]ECRChangeArr[SPC]1<ETX>
	Hex	02 73 45 41 20 45 43 52 43 68 61 6E 67 65 41 72 72 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 00 12 73 45 41 20 45 43 52 43 68 61 6E 67 65 41 72 72 20 01 45

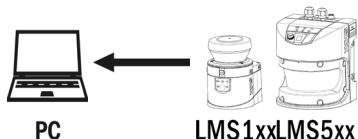
Table 545: Example: sEA ECRChangeArr 1



NOTE

The answer to the telegram will be followed by data that is sent on event.

The sensor only sends the following answer if there is a status change of the evaluation case within the application.



Telegram structure: sSN ECRChangeArr (no required user level)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sSN	73 53 4E
Command	Data telegram	String	12	All	ECRChangeArr	45 43 52 43 68 61 6E 67 65 41 72 72
System counter	Time in μ s since power up max.	Uint_32	4	LM1xx LMS5XX	0 ... FFFFFFFFh	00 00 00 00 ... FF FF FF FF

Telegram structure: sSN ECRChangeArr (no required user level)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
	71min then starting from 0 again					
Array	1-10	UInt_16	2	LM1xx LMS5XX	0h ... Ah (0d ...10d)	00 01 ...00 0A
EVC number	1-10	UInt_8	1	LM1xx LMS5XX	0h ... Ah (0d ...10d)	00 01 ...00 0A
Object detection		Enum_8	1	LM1xx LMS5XX	1= field free 2= detecting 3= infringement	LMS1xx: 01= field free 02= detecting 03= infringement LMS5xx: 31= field free 32= detecting 33= infringement
Year		Uint_16	2	LM1xx LMS5XX	0000h ... 270Fh (0d...9999d)	00 00 ... 27 0F
Month	1 to 12	Uint_8	1	LM1xx LMS5XX	00h ... 0Ch (0d ... 12d)	00 ... 0C
Day	Day of month 1 to 31	Uint_8	1	LM1xx LMS5XX	00h ... 1Fh (0d ... 31d)	00 ... 1F
Hour	0 to 23	Uint_8	1	LM1xx LMS5XX	00h ... 17h (0d ... 23d)	00 ... 17
Minute	0 to 59	Uint_8	1	LM1xx LMS5XX	00h ... 3Bh 0d ... 59d	00 ... 3B
Second	0 to 59	Uint_8	1	LM1xx LMS5XX	00h ... 3Bh (0d ... 59d)	00 ... 3B
µSecond	0 to 9999999	Uint_32	4	LM1xx LMS5XX	00000000h ... 000F423Fh (0d ... 999999d)	00 00 00 00 ... 00 0F 42 3F

Table 546: Telegram structure: sSN ECRChangeArr

Example: sSN ECRChangeArr 1

CoLa A	ASCII	<STX>sSN{SPC}ECRChangeArr{SPC}97F8C2E3{SPC}1{SPC}1{SPC}7B2{SPC}1{SPC}0{SPC}2A{SPC} }1D{SPC}63DA8<ETX>
	Hex	02 73 53 4E 20 45 43 52 43 68 61 6E 67 65 41 72 72 20 39 37 46 38 43 32 45 33 20 31 20 31 20 37 42 32 20 31 20 30 20 32 41 20 31 44 20 36 33 44 41 38 03
CoLa B	Binary	02 02 02 02 00 00 00 24 73 53 4E 20 45 43 52 43 68 61 6E 67 65 41 72 72 20 CF 09 10 99 00 01 01 02 07 B2 01 01 02 09 1C 00 03 47 D8 2E

Table 547: Example: sSN ECRChangeArr 1

4.10.2 Individual request of monitoring fields to their status changes – ECR xy



NOTE

The telegram “ECRxy” is available with the LMS12x, LMS13x, LMS14x from firmware version V1.32

The telegram “ECRxy” available with the LMS531 from firmware version V2.10

Precondition:

Necessary sensor setup:

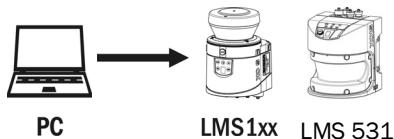
1. Setup detection fields
2. Setup evaluation cases.
3. Setup output assignments to the evaluation cases

Necessary proceeding after each Laser Scanner power up:

1. Establish Ethernet connection to LMS
2. If the user wants to register an event, it is necessary to send a telegram to register it each time after establishing connection

Read/Poll the status of an evaluation case

It is possible to send (poll repeatedly) this telegram to Ethernet port 2111 or Ethernet port 2112 to check the evaluation status.



Telegram structure: sRN ECRxy (no required User Level)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Data telegram	String	12	LMS1xx	ECRxy: (concrete number should be used for xy as shown below) ECR01(evaluation1) ECR02(evaluation2) ECR10(evaluation10)	ECR01: 45 43 52 30 31 ECR02: 45 43 52 30 32 ... ECR10: 45 43 52 31 30

Table 548: Telegram structure: sRN ECRxy

Example: sRN ECR01

CoLa A	ASCII	<STX>sRN{SPC}ECR01<ETX>
	Hex	02 73 52 4E 20 45 43 52 30 31 03
CoLa B	Binary	02 02 02 02 00 00 00 09 73 52 4E 20 45 43 52 30 31 1A

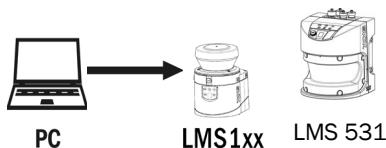
Table 549: Example: sRN ECR01

The response telegram is shown in *Table 7: Telegram structure: sRA/sSN ECRxy*

Register an event to get the status update of an evaluation

It is also possible to register an event by “sEN ECRxy” for receiving the change of the an evaluation. So, when there a change happens in the field of this evaluation, an update telegram will be sent out automatically.

The registration telegram format is: sEN ECRxy 0/1 (shown below)



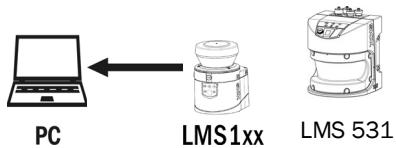
Telegram structure: sEN ECRxy (no required User Level)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sEN	73 45 4E
Command	Data telegram	String	12	LMS1xx	ECRxy: (concrete number should be used for xy as shown below) ECR01(evaluation1) ECR02(evaluation2) ECR10(evaluation10)	ECR01: 45 43 52 30 31 ECR02: 45 43 52 30 32 ... ECR10: 45 43 52 31 30
Reporting	Start/stop	Enum_8	1	LMS1XX	Stop: 0 Start: 1	Stop: 00 Start: 01

Table 550: Telegram structure: sEN ECRxy

Example: sEN ECR01 1

CoLa A	ASCII	<STX>sEN{SPC}ECR01{SPC}1<ETX>
	Hex	02 73 45 4E 20 45 43 52 30 31 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 0B 73 45 4E 20 45 43 52 30 31 20 01 2C

Table 551: Example: sEN ECR01 1



Telegram structure: sEA ECRxy (no required User Level)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sEA	73 45 41
Command	Data telegram	String	12	LMS1xx	ECRxy: (concrete number should be used for xy as shown below) ECR01(evaluation1) ECR02(evaluation2) ECR10(evaluation10)	ECR01: 45 43 52 30 31 ECR02: 45 43 52 30 32 ... ECR10: 45 43 52 31 30
Reporting	Start/stop	Enum_8	1	LMS1XX	Stop: 0 Start: 1	Stop: 00 Start: 01

Table 552: Telegram structure: sEA ECRxy

Example: sEA ECR01 1

CoLa A	ASCII	<STX>sEA{SPC}ECR01{SPC}1<ETX>
	Hex	02 73 45 41 20 45 43 52 30 31 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 0B 73 45 41 20 45 43 52 30 31 20 01 23

Table 553: Example: sEA ECR01 1

Notes.

- 1.The event registration is not a parameter and cannot be saved permanently.
Therefor it is necessary to send the telegram to register an event each time after establishing a connection to the device (especially, when the Ethernet port is in server mode).
- 2.Ethernet port 2112 has a special function and can be set as client mode (as shown in Figure 1). Then, the corresponding telegram can be selected for the expected evaluation (for example evaluation 1, as shown below). There is no further need to manually register an event by sending a separate telegram. When there is a change in the registered field evaluation, LMS12x, LMS13x, LMS14x will automatically connect to the specified server (such as 192.168.0.1, as shown below) to send an update telegram.If the settings are saved permanently, this is the same situation even after the sensor power cycle.

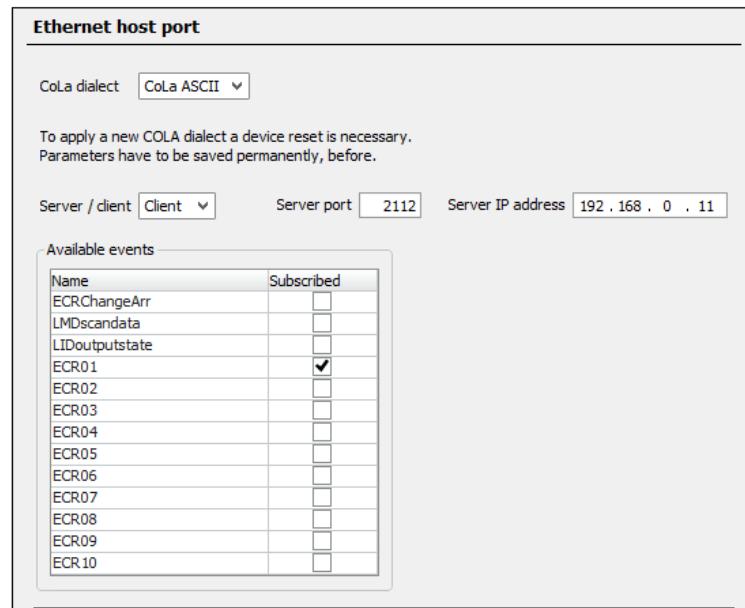
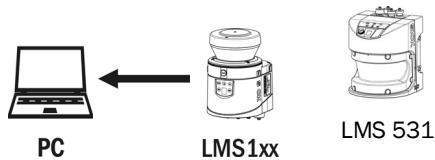


Figure 1: Ethernet host port setting (LMS12x, LMS13x, LMS14x)

The response telegram to “sRN ECRxy” and the event status update telegram for “sEA ECRxy 1” follows the format in table 7 as shown below.



Telegram structure: sRA/sSN ECRxy (no required User Level)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRA: for sRN ECRxy sSN: for sEN ECRxy	73 52 41 73 53 4E
Command	Data telegram	String	12	LMS1xx	ECRxy: (concrete number should be used for xy as shown below) ECR01(evaluation1) ECR02(evaluation2) ECR10(evaluation10)	ECR01: 45 43 52 30 31 ECR02: 45 43 52 30 32 ... ECR10: 45 43 52 31 30
Reporting	Object detection	Enum_8	1	LMS1XX	0 =DON'T CARE 1 =FIELD FREE 2 =DETECTING 3 =INFRINGEMENT	00=DON'T CARE 01=FIELD FREE 02=DETECTING 03=INFRINGEMENT
Timestamp	Transmission time stamp of the current telegram (unit:µs)	Uint_32	4	LMS1XX	00000000h.... FFFFFFFFh	00 00 00 00 ... FF FF FF FF
Year		Uint_16	2	LMS1XX	0000h ... 270Fh (0d...9999d)	00 00 ... 27 0F
Month	1 to 12	Uint_8	1	LMS1XX	00h ... 0Ch (0d ... 12d)	00 ... 0C
Day	Day of month 1 to 31	Uint_8	1	LMS1XX	00h ... 1Fh (0d ... 31d)	00 ... 1F
Hour	0 to 23	Uint_8	1	LMS1XX	00h ... 17h (0d ... 23d)	00 ... 17
Minute	0 to 59	Uint_8	1	LMS1XX	00h ... 3Bh 0d ... 59d	00 ... 3B
Second	0 to 59	Uint_8	1	LMS1XX	00h ... 3Bh (0d ... 59d)	00 ... 3B
µSecond	0 to 9999999	Uint_32	4	LMS1XX	00000000h ... 000F423Fh (0d ... 999999d)	00 00 00 00 ... 00 0F 42 3F

Table 554: Telegram structure: sRA/sSN ECRxy

Example: sRA ECR01

ColA A	ASCII	<STX>sRA{SPC}ECR01{SPC}1{SPC}1B14A215 7B2 1 1 0 7 22 4CE78<ETX>
	Hex	02 73 52 41 20 45 43 52 30 31 20 31 20 31 42 31 34 41 32 31 35 20 37 42 32 20 31 20 31 20 30 20 37 20 32 32 20 34 43 45 37 38 03
ColA B	Binary	02 02 02 02 00 00 00 29 73 52 41 20 45 43 52 30 31 20 01 1B 14 A2 15 07 B2 01 01 00 07 22 04 CE 78 AE

Table 555: Example: sRA ECR01

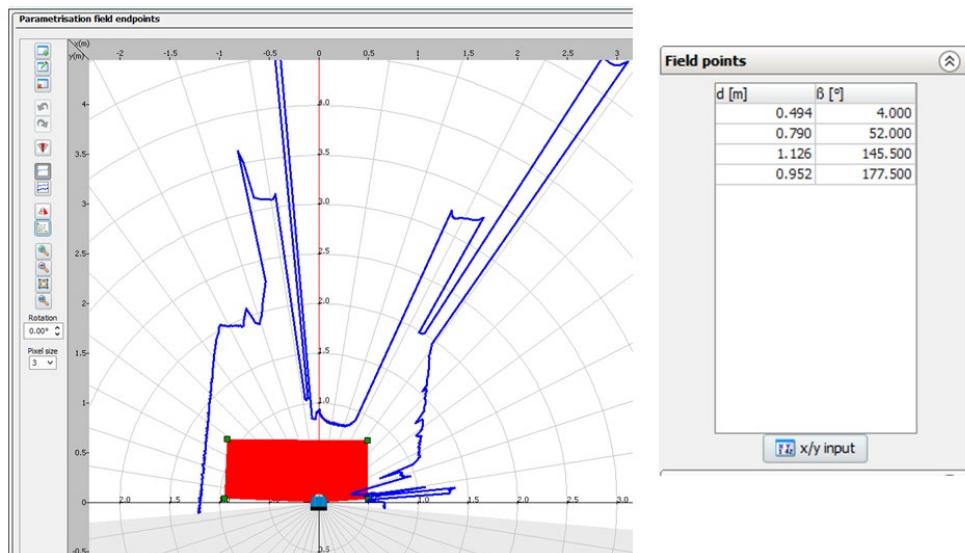
4.10.3 Request SOPAS field data structure

Note



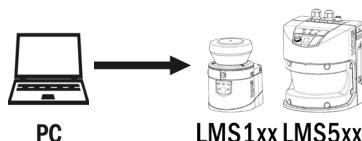
The SOPAS telegram “mLFEgetField” requests a field number as parameter and returns the corresponding SOPAS field data structure. If the field number is not configured, the answer telegram will be filled with 0.

Example – Request the field data structure of an evaluation field (field number: 1) that has been parameterized in the engineering tool SOPAS.



The answer telegram will include information regarding the field data structure of the requested evaluation field (type: segmented, number of field points etc.)

Please note: The sensor will switch to the state “Stop measurement” during read out. After the read out you have to switch the sensor back to “Run measurement”.



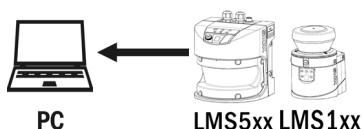
Telegram structure: sMN mLFEgetField (required user level: Authorized Client)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Request	String	3	LMS1xx LMS5XX	sMN	73 4D 4E
Command	Only one telegram	String	14	LMS1xx LMS5XX	mLFEgetField	6D 4C 46 45 67 65 74 46 69 65 6C 64
Command		UInt_32	4	LMS1xx LMS5XX	1...10	00 00 00 01...00 00 01 01

Table 556: Telegram structure: sMN mLFEgetField

Example: sMN mLFEgetField 1

CoLa A	ASCII	<STX>sMN{SPC}mLFEgetField{SPC}1<ETX>
	Hex	02 73 4D 4E 20 6D 4C 46 45 67 65 74 46 69 65 6C 64 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 15 73 4D 4E 20 6D 4C 46 45 67 65 74 46 69 65 6C 64 20 00 00 00 01 67

Table 557: Example: sMN mLFEgetField 1



Telegram structure: sAN mLFEgetField						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Read		String	3	All	sAN	73 41 4E
Data telegram		String	12	All	mLFEgetField	6D 4C 46 45 67 65 74 46 69 65 6C 64
Field header	Distance Scale Factor	Scale factor or factor of the measurement values (for the LMS5xx this depends on the angular resolution)	Real as float according to IEEE754	4	All	Factor × 1: 3F800000h Factor × 2: 40000000h
	Distance Scale Offset	Sets starting point of measurement	Real as float according to IEEE754	4	All	No offset: 0
	Angle Scale Factor	Angle resolution	UInt_32	4	LMS1xx	50 Hz: 1388h
					LMS5xx	25 Hz: 9C4h 35 Hz: DACH 50 Hz: 1388h 75 Hz: 1D4Ch 100Hz:2710h
	Angle Scale Offset	Starting angle	Int_32	4	LMS1xx	-450000d ... +2250000d (FFF92230h ... 225510h)
					LMS5xx	-50000d ... +1850000d (FFFF3CB0h ... 1C3A90h)
	Field type		Enum_8	1	All	0 = Radial 1 = Rectangle 2 = Segmented 3 = Dynamic
Field number		UInt_8	1	All	0 .. Ah	00 ... OA

	Segmented field configured	UInt_16	2	All	0 = no data for segmented field available, i.e. field type is not segmented field 1 = data for segmented field available	00 00...00 01	
Segmented field	Only shown if field type is configured	Number of field points	UInt_16	2	All	0 ... 571: 0h ... 23Bh	00 00... 02 3B
	Angle index n	UInt_16	2	LMS1xx	0 ... 1081: 0h ... 0439h	00 00 ... 04 39	
					0 ... 1140: 0h ... 0474h	00 00 ... 04 74	
	Start distance	UInt_16	2	All	0 .. 65535: 0h ... FFFFh	00 00 ... FF FF	
	End distance	UInt_16	2	All	0 .. 65535: 0h ... FFFFh	00 00 ... FF FF	
	Angle index n+1	
	Start distance	
	End distance	
	
Rectangular field	Rectangular field configured	UInt_16	2	All	0 = no data for rectangular field available, i.e. field type is not rectangular field 1 = data for rectangular field available	00 00...00 01	
	Only shown if field type is configured	Angle of reference point	Int_32	4	LMS1xx	-450000d ... +2250000d (FFF92230h ... 225510h)	FF F9 22 30 ... 00 22 55 10
				LMS5xx	-50000d ... +1850000d (FFFF3CB0h ... 1C3A90h)	FF FF 3C B0 ... 00 1C 3A 90	
					0 .. 65535: 0h ... FFFFh	00 00 ... FF FF	
	Distance of reference point	UInt_16	2	All	-1800000d .. 1800000d (FFE488C0h ... 001B7740h)	FF E4 88 C0 ... 00 1B 77 40	
	Rotation angle	Int_32	4	All	0 ... 4294967295d (0 ... FFFFFFFFh)	00 00 00 00 ... FF FF FF FF	
	Width	UInt_32	4	All	0 ... 4294967295d (0 ... FFFFFFFFh)	00 00 00 00 ... FF FF FF FF	
Dynamic field	Radial field configured	UInt_16	2	All	0 (radial fields are not available)	00 00	
	Dynamic field configured	UInt_16	2	All	0 = no data for dynamic field available, i.e. field type is not dynamic field 1 = data for dynamic field available	00 00...00 01	
	Only shown if field type is configured	Angle of reference point	Int_32	4	LMS1xx	-450000d ... +2250000d (FFF92230h ... 225510h)	FF F9 22 30 ... 00 22 55 10
				LMS5xx	-50000d ... +1850000d (FFFF3CB0h ... 1C3A90h)	FF FF 3C B0 ... 00 1C 3A 90	
					0 .. 65535: 0h ... FFFFh	00 00 ... FF FF	
	Distance of reference point	UInt_16	2	All	-1800000d .. 1800000d (FFE488C0h ... 001B7740h)	FF E4 88 C0 ... 00 1B 77 40	
	Rotation angle	Int_32	4	All	00 00 00 00 ... FF FF FF FF		

		UInt_32	4	All	0 ... 4294967295d (0 ... FFFFFFFFh)	00 00 00 00 ... FF FF FF FF
		UInt_32	4	All	0 ... 4294967295d (0 ... FFFFFFFFh)	00 00 00 00 ... FF FF FF FF
	Maximum speed	Int_16	2	All	0 ... 30000d (0 ... 7530h)	00 00 ... 75 30
	Maximum length	UInt_32	4	All	0 .. 4294967295	00 00 00 00 ... 7F FF FF FF
Version number		UInt_16	2	All	0 .. 65535	00 00 ... FF FF
Length of field name		UInt_16	2	All	0 .. 32	00 00..00 20
Field name		String	0...32	All	FIELD1	46 49 45 4c 44 31
Length of comment	If no comment, also no length with a string type ...	UInt_16	2	All	0 ... 128d 0 ... 80h)	00 00 ... 00 80
Comment		String	0...128	All		

Table 558: Example: sAN mLFEgetField

Example: sAN mLFEgetField

ColA	ASCII	<STX>sAN{SPC}mLFEgetField{SPC}40000000{SPC}00000000{SPC}1388{SPC}FFFF3CB0{SPC}2{SPC}1{SPC}1{SPC}4{SPC}12{SPC}FFFF{SPC}F7{SPC}72{SPC}FFFF{SPC}18B{SPC}12D{SPC}FFFF{SPC}233{SPC}16D{SPC}FFF{SPC}1DC{SPC}0{SPC}0{SPC}1{SPC}6{SPC}FIELD1{SPC}0<ETX>
	Hex	02 73 41 4E 20 6D 4C 46 45 67 65 74 46 69 65 6C 64 20 34 30 30 30 30 30 30 20 30 30 30 30 30 30 30 30 30 30 20 31 33 38 38 20 46 46 46 46 33 43 42 30 20 32 20 31 20 34 20 31 32 20 46 46 46 46 20 46 37 20 37 32 20 46 46 46 46 20 31 38 42 20 31 32 44 20 46 46 46 46 20 32 33 33 20 31 36 44 20 46 46 46 46 20 31 44 43 20 30 20 30 20 30 20 31 20 36 20 46 49 45 4C 44 31 20 30 03
ColB	Binary	02 02 02 02 00 00 00 51 73 41 4E 20 6D 4C 46 45 67 65 74 46 69 65 6C 64 20 40 00 00 00 00 00 00 00 00 00 00 13 88 FF FF 3C B0 02 01 00 01 00 04 00 12 FF FF 00 F7 00 72 FF FF 01 8B 01 2D FF FF 02 33 01 6D FF FF 01 DC 00 00 00 00 00 00 01 00 06 46 49 45 4C 44 31 00 00 FE

Table 559: Example: sAN mLFEgetField

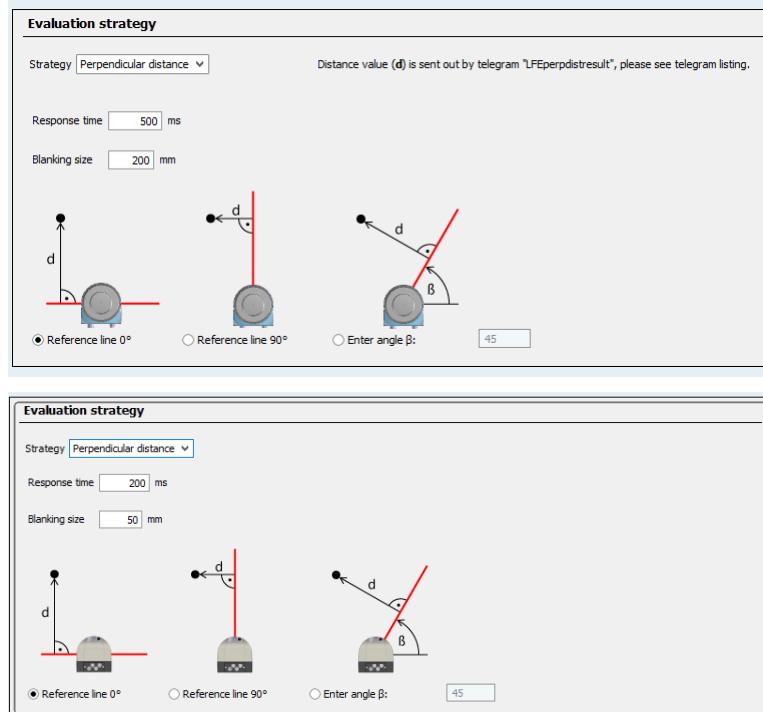
4.10.4 Request perpendicular distance once

Precondition

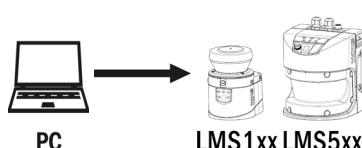
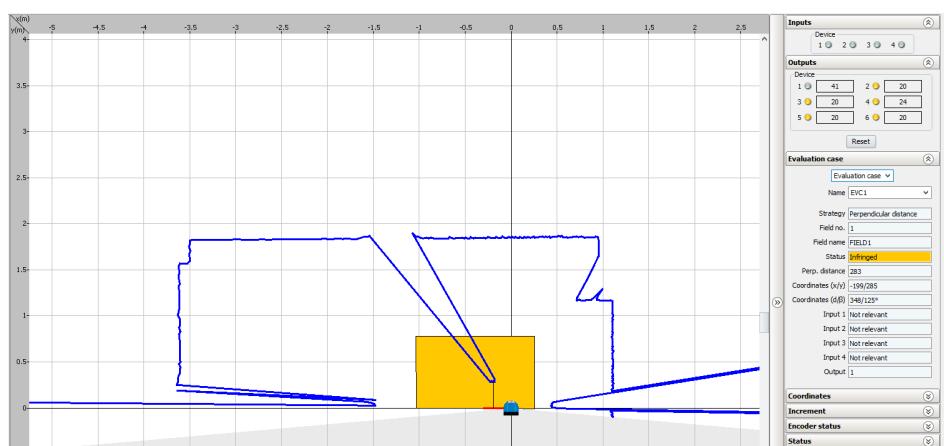


The evaluation strategy “Perpendicular distance” has to be activated in the engineering tool SOPAS. After you get the perpendicular distance displayed in SOPAS as shown below, you are able to read out the telegram.

Set the EVC to evaluation strategy “Perpendicular distance” and choose the field which you like to read out. Also keep in mind, that the field evaluation will only be activated by choosing an output.



Fehler! Es ist nicht möglich, durch die Bearbeitung von Feldfunktionen Objekte zu erstellen.



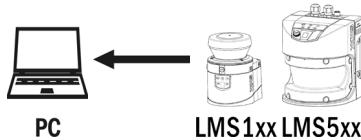
Telegram structure: sRN LFEperpdistresult (no required user level)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Only one telegram	String	14	All	LFEperpdistresult	4C 46 45 70 65 72 70 64 69 73 74 72 65 73 75 6C 74

Table 560: Telegram structure: sRN LFEperpdistresult

Example: sRN LFEperpdistresult

CoLa A	ASCII	<STX>sRN[SPC]LFEperpdistresult<ETX>
	Hex	02 73 52 4E 20 4C 46 45 70 65 72 70 64 69 73 74 72 65 73 75 6C 74 03
CoLa B	Binary	02 02 02 02 00 00 00 15 73 52 4E 20 4C 46 45 70 65 72 70 64 69 73 74 72 65 73 75 6C 74 14

Table 561: Example: sRN LFEperpdistresult



Telegram structure: sRA LFEperpdistresult (no required user level)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRA	73 52 41
Command	Data telegram	String	14	All	LFEperpdistresult	4C 46 45 70 65 72 70 64 69 73 74 72 65 73 75 6C 74
Array	1-10	UInt_16	2	All	0 ... 10d (0 ... Ah)	00 00...00 0A
EVC number	1-10	UInt_8	1	All	0 ... 10d (0 ... Ah)	00 ... 0A
Perpendicular distance	LMS100, LMS111: 0 m ... 20 m	UInt_32	4	LMS100, LMS111	0 ... 20000d (0 ... 4E20h)	00 00 00 00 ... 00 00 4E 20
	LMS151: 0 m ... 50 m			LMS151	0 ... 50000d (0 ... C350h)	00 00 00 00 ... 00 00 C3 50
	LMS5xx: 0 m ... 80 m			LMS5xx	0 ... 80000d (0 ... 13880h)	00 00 00 00 ... 00 01 38 80
Reserved	default 0	UInt_32	4	All	0	00 00 00 00
Reserved	default 0	UInt_32	4	All	0	00 00 00 00
X-Pos [mm]	LMS100, LMS111: 0 m ... 20 m	Int_32	4	LMS100, LMS111	-20000d ... 20000d (FFFFB1E0h ... 4E20h)	FF FF B1 E0 ... 00 00 4E 20
	LMS151: 0 m ... 50 m			LMS151	-50000d ... 50000d (FFFF3CB0h...C350h)	FF FF 3C B0 ... 00 00 C3 50
	LMS5xx: 0 m ... 80 m			LMS5xx	-80000d ... 80000d (FFFEC780h ... 13880h)	FF FE C7 80 ... 00 01 38 80
Y-Pos [mm]	LMS100, LMS111: 0 m ... 20 m	Int_32	4	LMS100, LMS111	-20000d ... 20000d (FFFFB1E0h ... 4E20h)	FF FF B1 E0 ... 00 00 4E 20
	LMS151: 0 m ... 50 m			LMS151	-50000d ... 50000d (FFFF3CB0h...C350h)	FF FF 3C B0 ... 00 00 C3 50
	LMS5xx: 0 m ... 80 m			LMS5xx	-80000d ... 80000d (FFFEC780h ... 13880h)	FF FE C7 80 ... 00 01 38 80
Reserved	default 0	Int_32	4	LMS1xx LMS5XX	0	00 00 00 00
Radial distance	LMS100, LMS111: 0 m ... 20 m	UInt_32	4	LMS100, LMS111	0 ... 20000d (0 ... 4E20h)	00 00 00 00 ... 00 00 4E 20
	LMS151: 0 m ... 50 m			LMS151	0 ... 50000d (0 ... C350h)	00 00 00 00 ... 00 00 C3 50
	LMS5xx: 0 m ... 80 m			LMS5xx	0 ... 80000d (0 ... 13880h)	00 00 00 00 ... 00 01 38 80
Radial distance	LMS1xx: -45° ... 225°	Int_32	4	LMS1xx	-450000d ... +2250000d (FFF92230h ... 225510h)	FF F9 22 30 ... 00 22 55 10

Telegram structure: sRA LFEperpdistresult (no required user level)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
angle	LMS5xx: -5° ... 185°			LMS5xx	-50000d ... +1850000d (FFFF3CB0h ... 1C3A90h)	FF FF 3C B0 ... 00 1C 3A 90
Reserved	default 0	Int_32	4	All	0	00 00 00 00
Reference line angle	LMS1xx: -45° ... 225°	Int_32	4	LMS1xx	-450000d ... +2250000d (FFF92230h ... 225510h)	FF F9 22 30 ... 00 22 55 10
	LMS5xx: -5° ... 185°			LMS5xx	-50000d ... +1850000d (FFFF3CB0h ... 1C3A90h)	FF FF 3C B0 ... 00 1C 3A 90
Reserved	default 0	Int_32	4	All	0	00 00 00 00
Reserved	default 0	Int_32	4	All	0	00 00 00 00
Reserved	default 0	Int_32	4	All	0	00 00 00 00
Reserved	default 0	Int_32	4	All	0	00 00 00 00
Reserved	default 0	Int_32	4	All	0	00 00 00 00
Reserved	default 0	Int_32	4	All	0	00 00 00 00
Reserved	default 0	Int_32	4	All	0	00 00 00 00
Reserved	default 0	Int_32	4	All	0	00 00 00 00

Table 562: Telegram structure: sRA LFEperpdistresult

Example: sRA LFEperpdistresult

CoLa A	ASCII	<STX>sRA{SPC}LFEperpdistresult{SPC}1{SPC}2{SPC}21A{SPC}0{SPC}0{SPC}21A{SPC}0{SPC}21A{SPC}D BBA0{SPC}0{SPC}0{SPC}0{SPC}0{SPC}0{SPC}0{SPC}0{SPC}0{SPC}<ETX>
	Hex	02 73 52 41 20 4C 46 45 70 65 72 70 64 69 73 74 72 65 73 75 6C 74 20 31 20 32 20 32 31 41 20 30 20 30 20 30 20 32 31 41 20 30 20 32 31 41 20 44 42 42 41 30 20 30 20 30 20 30 20 30 20 30 20 30 20 30 20 30 20 30 20 30 20 30 03
CoLa B	Binary	02 02 02 02 00 00 61 73 52 41 20 4C 46 45 70 65 72 70 64 69 73 74 72 65 73 75 6C 74 20 00 01 02 00 38

Table 563: Example: sRA LFEperpdistresult

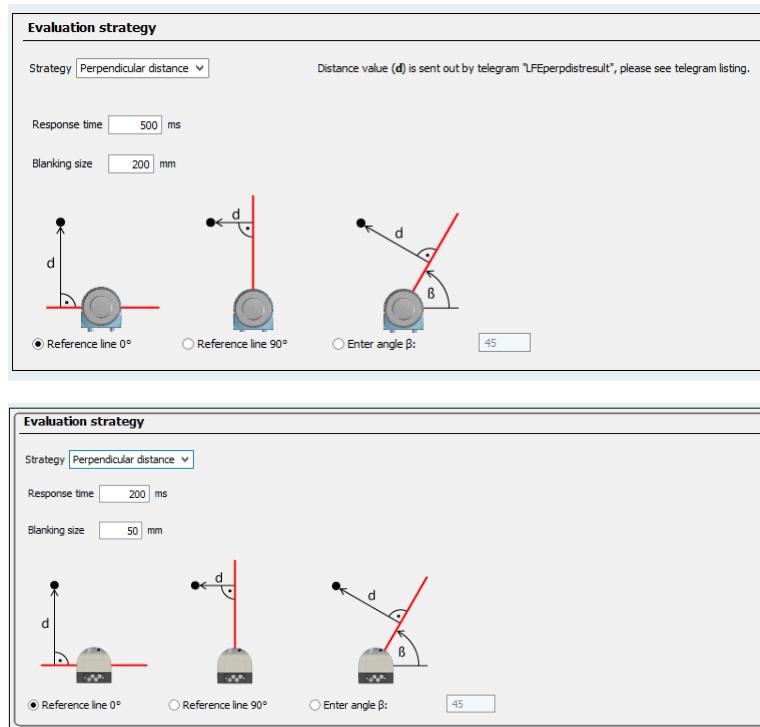
4.10.5 Request perpendicular distance continuously on event

Precondition

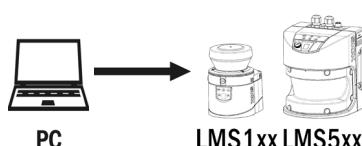
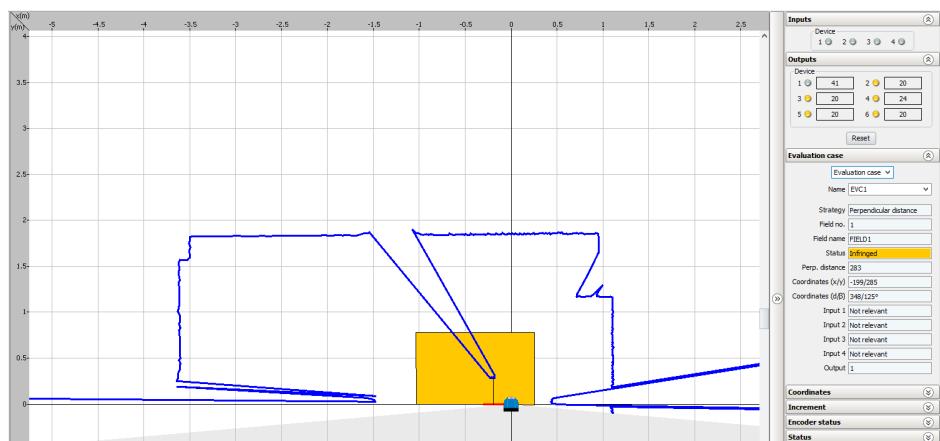


The evaluation strategy “Perpendicular distance” has to be activated in the engineering tool SOPAS. After you get the perpendicular distance displayed in SOPAS as shown below, you are able to read out the telegram.

Set the EVC to evaluation strategy “Perpendicular distance” and choose the field which you like to read out. Also keep in mind, that the field evalutation will only be activated by choosing an output.



Fehler! Es ist nicht möglich, durch die Bearbeitung von Feldfunktionen Objekte zu erstellen.



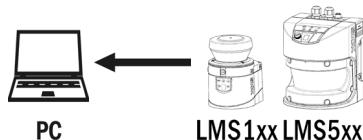
Telegram structure: sEN LFEperpdistresult (no required user level)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sEN	73 45 4E
Command	Only one telegram	String	14	All	LFEperpdistresult	4C 46 45 70 65 72 70 64 69 73 74 72 65 73 75 6C 74
Reporting	Start/stop	Enum_8	1	LMS1xx LMS5XX	Stop: 0 Start: 1	Stop: 00 Start: 01

Table 564: Telegram structure: sEN LFEperpdistresult

Example: sEN LFEperpdistresult 1

CoLa A	ASCII	<STX> sEN{SPC}LFEperpdistresult{SPC}1<ETX>
	Hex	02 73 45 4E 20 4C 46 45 70 65 72 70 64 69 73 74 72 65 73 75 6C 74 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 17 73 45 4E 20 4C 46 45 70 65 72 70 64 69 73 74 72 65 73 75 6C 74 20 01 22

Table 565: Example: sEN LFEperpdistresult 1



Telegram structure: sEA LFEperpdistresult (no required user level)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sEA	73 45 41
Command	Only one telegram	String	14	All	LFEperpdistresult	4C 46 45 70 65 72 70 64 69 73 74 72 65 73 75 6C 74
Reporting	Start/stop	Enum_8	1	LMS1xx LMS5XX	Stop: 0 Start: 1	Stop: 00 Start: 01

Table 566: Telegram structure: sEA LFEperpdistresult

Example: sEA LFEperpdistresult 1

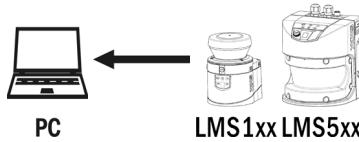
ColA A	ASCII	<STX> sEA{SPC}LFEperpdistresult{SPC}1<ETX>
ColA B	Hex	02 73 45 41 20 4C 46 45 70 65 72 70 64 69 73 74 72 65 73 75 6C 74 20 31 03
ColB B	Binary	02 02 02 02 00 00 00 17 73 45 41 20 4C 46 45 70 65 72 70 64 69 73 74 72 65 73 75 6C 74 20 01 2D

Table 567: Example: sEA LFEperpdistresult 1

**NOTE**

The answer to the telegram will be followed by data that is sent on event.

The sensor only sends the following answer if there are perpendicular distance values calculated within the application.



Telegram structure: sSN LFEperpdistresult (no required user level)						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sSN	73 53 4E
Command	Data telegram	String	14	All	LFEperpdistresult	4C 46 45 70 65 72 70 64 69 73 74 72 65 73 75 6C 74
Array	1-10	UInt_16	2	All	0 ... 10d (0 ... Ah)	00 00...00 0A
EVC number	1-10	UInt_8	1	All	0 ... 10d (0 ... Ah)	00 ... 0A
Perpendicular distance	LMS100, LMS111: 0 m ... 20 m	UInt_32	4	LMS100, LMS111	0 ... 20000d (0 ... 4E20h)	00 00 00 00 ... 00 00 4E 20
	LMS151: 0 m ... 50 m			LMS151	0 ... 50000d (0 ... C350h)	00 00 00 00 ... 00 00 C3 50
	LMS5xx: 0 m ... 80 m			LMS5xx	0 ... 80000d (0 ... 13880h)	00 00 00 00 ... 00 01 38 80
Reserved	default 0	UInt_32	4	All	0	00 00 00 00
Reserved	default 0	UInt_32	4	All	0	00 00 00 00
X-Pos [mm]	LMS100, LMS111: 0 m ... 20 m	Int_32	4	LMS100, LMS111	-20000d ... 20000d (FFFFB1E0h ... 4E20h)	FF FF B1 E0 ... 00 00 4E 20
	LMS151: 0 m ... 50 m			LMS151	-50000d ... 50000d (FFFF3CB0h...C350h)	FF FF 3C B0 ... 00 00 C3 50
	LMS5xx: 0 m ... 80 m			LMS5xx	-80000d ... 80000d (FFFEC780h ... 13880h)	FF FE C7 80 ... 00 01 38 80
Y-Pos [mm]	LMS100, LMS111: 0 m ... 20 m	Int_32	4	LMS100, LMS111	-20000d ... 20000d (FFFFB1E0h ... 4E20h)	FF FF B1 E0 ... 00 00 4E 20
	LMS151: 0 m ... 50 m			LMS151	-50000d ... 50000d (FFFF3CB0h...C350h)	FF FF 3C B0 ... 00 00 C3 50
	LMS5xx: 0 m ... 80 m			LMS5xx	-80000d ... 80000d (FFFEC780h ... 13880h)	FF FE C7 80 ... 00 01 38 80
Reserved	default 0	Int_32	4	All	0	00 00 00 00
Radial distance	LMS100, LMS111: 0 m ... 20 m	UInt_32	4	LMS100, LMS111	0 ... 20000d (0 ... 4E20h)	00 00 00 00 ... 00 00 4E 20
	LMS151: 0 m ... 50 m			LMS151	0 ... 50000d (0 ... C350h)	00 00 00 00 ... 00 00 C3 50
	LMS5xx: 0 m ... 80 m			LMS5xx	0 ... 80000d (0 ... 13880h)	00 00 00 00 ... 00 01 38 80
Radial distance angle	LMS1xx: -45° ... 225°	Int_32	4	LMS1xx	-450000d ... +2250000d (FFF92230h ... 225510h)	FF F9 22 30 ... 00 22 55 10
	LMS5xx:			LMS5xx	-50000d ... +1850000d	FF FF 3C B0 ... 00 1C 3A 90

Table 568: Telegram structure: sSN LFEperpdistresult

Example: sSN LFEperpdistresult

Table 569: Example: sSN LFEperpdistresult

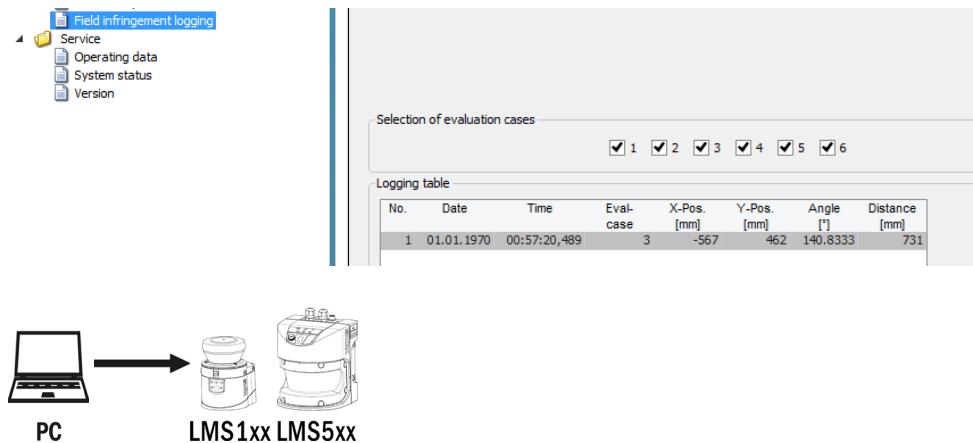
4.10.6 Request latest field infringement info

Note



The command is used to request entries from the “field infringement logging” via telegram. Using this command, only the latest field infringement is given out. The answer telegram includes information regarding date and time of the infringement as well as the associated EVC and infringement position.

Please note: Only activated EVCs will be considered. An EVC is only valid, when an output is defined in the EVC. Using this telegram, an EVC without a defined output is not taken into consideration.



Telegram structure: sRN LFEinfringementinfo						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Only one telegram	String	19	LMS1xx LMS5XX	LFEinfringementinfo	4C 46 45 69 6E 66 72 69 6E 67 65 6D 65 6E 74 69 6E 66 6F

Table 570: Telegram structure: sRN LFEinfringementinfo

Example: sRN LFEinfringementinfo

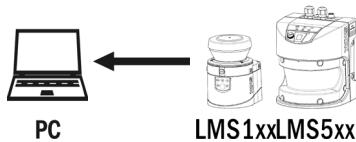
Cola A	ASCII	<STX>sRN{SPC}LFEinfringementinfo<ETX>
	Hex	02 73 52 4E 20 4C 46 45 69 6E 66 72 69 6E 67 65 6D 65 6E 74 69 6E 66 6F 03
Cola B	Binary	02 02 02 02 00 00 00 17 73 52 4E 20 4C 46 45 69 6E 66 72 69 6E 67 65 6D 65 6E 74 69 6E 66 6F 0A

Table 571: Example: sEN LFEinfringementinfo



NOTE

The answer telegram refers to the latest recorded field infringement. Therefore the device outputs the latest field infringement entry from the logging table.



Telegram structure: sRA LFEinfringementinfo						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRA	73 52 41
Command	Data telegram	String	19	All	LFEinfringementinfo	4C 46 45 69 6E 66 72 69 6E 67 65 6D 65 6E 74 69 6E 66 6F
Time Info	Counter	continious counter of infringements	Uint_16	2	All	0 ... 9999d (0 ... 270Fh)
	Year		Uint_16	2	All	0 ... 9999d (0 ... 270Fh)
	Month	1 to 12	Uint_8	1	All	0 ... 12d (0 ... Ch)
	Day	Day of month 1 to 31	Uint_8	1	All	0 ... 31d (0 ... 1Fh)
	Hour	0 to 23	Uint_8	1	All	0 ... 23d (0 ... 17h)
	Minute	0 to 59	Uint_8	1	All	0 ... 59d (0 ... 3Bh)
	Second	0 to 59	Uint_8	1	All	0 ... 59d (0 ... 3Bh)
	µSecond	0 to 999999	Uint_32	4	All	0 ... 999999d (0 ... 000F423Fh)
Infrigment-Info	EVC number	1-10	UInt_8	1	All	0 ... 10d (0 ... Ah)
	X-Pos [mm]	LMS100, LMS111: 0 m ... 20 m	Int_32	4	LMS100, LMS111	-20000d ... 20000d (FFFFFB1E0h ... 4E20h)
					LMS151	-50000d ... 50000d (FFFF3CB0h...C350h)
					LMS5xx	-80000d ... 80000d (FFFEC780h ... 13880h)
	Y-Pos [mm]	LMS100, LMS111: 0 m ... 20 m	Int_32	4	LMS100, LMS111	-20000d ... 20000d (FFFFFB1E0h ... 4E20h)
					LMS151	-50000d ... 50000d (FFFF3CB0h...C350h)
					LMS5xx	-80000d ... 80000d (FFFEC780h ... 13880h)
Distance [mm]	LMS100, LMS111: 0 m ... 20 m	UInt_32	4		LMS100, LMS111	0 ... 20000d (0 ... 4E20h)
					LMS151	0 ... 50000d (0 ... C350h)

Telegram structure: sRA LFEinfringementinfo						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
	0 m ... 50 m LMS5xx: 0 m ... 80 m			LMS5xx	0 ... 80000d (0 ... 13880h)	00 00 00 00 ... 00 01 38 80
Angle [°]	LMS1xx: -45° ... 225°	Int_32	4	LMS1xx	-450000d ... +2250000d (FFF92230h ... 225510h)	FF F9 22 30 ... 00 22 55 10
	LMS5xx: -5° ... 185°			LMS5xx	-50000d ... +1850000d (FFFF3CB0h ... 1C3A90h)	FF FF 3C B0 ... 00 1C 3A 90
Angle of Layer [°]	LMS1xx: -45° ... 225°	Int_32	4	LMS1xx	-450000d ... +2250000d (FFF92230h ... 225510h)	FF F9 22 30 ... 00 22 55 10
	LMS5xx: -5° ... 185°			LMS5xx	-50000d ... +1850000d (FFFF3CB0h ... 1C3A90h)	FF FF 3C B0 ... 00 1C 3A 90
Object Size [mm]	LMS100, LMS111: 0 m ... 20 m	UInt_32	4	LMS100, LMS111	0 ... 20000d (0 ... 4E20h)	00 00 00 00 ... 00 00 4E 20
	LMS151: 0 m ... 50 m			LMS151	0 ... 50000d (0 ... C350h)	00 00 00 00 ... 00 00 C3 50
	LMS5xx: 0 m ... 80 m			LMS5xx	0 ... 80000d (0 ... 13880h)	00 00 00 00 ... 00 01 38 80

Table 572: Example: sRA LFEinfringementinfo

Example: sRA LFEinfringementinfo

CoLa A	ASCII	<STX>sRA{SPC}LFEinfringementinfo{SPC}4{SPC}7B2{SPC}1{SPC}1{SPC}2{SPC}32{SPC}1F{SPC}3A1B0{SPC}1{SPC}FFFFFDAAE{SPC}D6{SPC}277{SPC}187083{SPC}4A<ETX>
	Hex	02 73 52 41 20 4C 46 45 69 6E 66 72 69 6E 67 65 6D 65 6E 74 69 6E 66 6F 20 34 20 37 42 32 20 31 20 31 20 32 20 33 32 20 31 46 20 33 41 31 42 30 20 31 20 46 46 46 46 44 41 45 20 44 36 20 32 37 37 20 31 38 37 30 38 33 20 34 41 03
CoLa B	Binary	02 02 02 02 00 00 00 3A 73 52 41 20 4C 46 45 69 6E 66 72 69 6E 67 65 6D 65 6E 74 69 6E 66 6F 20 00 04 07 B2 01 01 02 32 1F 00 03 A1 B0 01 FF FF FD AE 00 00 00 D6 00 00 02 77 00 18 70 83 00 00 00 4A F9

Table 573: Example: sRA LFEinfringementinfo

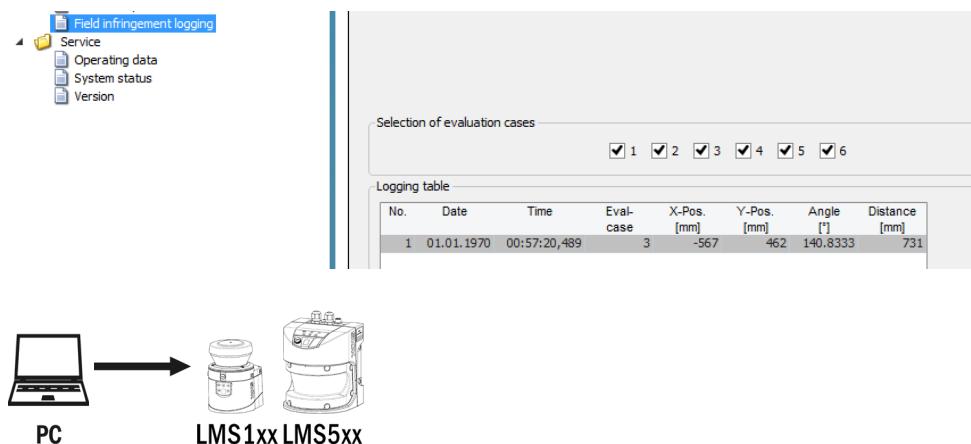
4.10.7 Request field infringement info continuously on event

Note



The command is used to request entries from the “field infringement logging” via telegram. Using this command, a telegram will be sent from the sensor on event (in case of a new field infringement). The answer telegram includes information regarding date and time of the infringement as well as the associated EVC and infringement position.

Please note: Only activated EVCs will be considered. An EVC is only valid, when an output is defined in the EVC. Using this telegram, an EVC without a defined output is not taken into consideration.



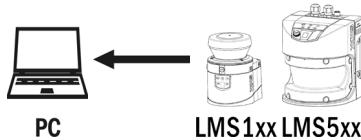
Telegram structure: sEN LFEinfringementinfo						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Event	String	3	All	sEN	73 45 4E
Command	Data telegram	String	19	All	LFEinfringementinfo	4C 46 45 69 6E 66 72 69 6E 67 65 6D 65 6E 74 69 6E 66 6F
Reporting	Start/stop	Enum_8	1	All	Stop: 0 Start: 1	00 01

Table 574: Telegram structure: sEN LFEinfringementinfo

Example: sEN LFEinfringementinfo 1

CoLa A	ASCII	<STX>sEN{SPC}LFEinfringementinfo{SPC}1<ETX>
	Hex	02 73 45 4E 20 4C 46 45 69 6E 66 72 69 6E 67 65 6D 65 6E 74 69 6E 66 6F 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 19 73 45 4E 20 4C 46 45 69 6E 66 72 69 6E 67 65 6D 65 6E 74 69 6E 66 6F 20 01 3C

Table 575: Example: sEN LFEinfringementinfo 1



Telegram structure: sEA LFEinfringementinfo						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Event	String	3	All	sEA	73 45 41
Command	Data telegram	String	19	All	LFEinfringementinfo	4C 46 45 69 6E 66 72 69 6E 67 65 6D 65 6E 74 69 6E 66 6F
Reporting	Start/stop	Enum_8	1	All	Stop: 0 Start: 1	00 01

Table 576: Telegram structure: sEA LFEinfringementinfo

Example: sEA LFEinfringementinfo 1

ColA A	ASCII	<STX>sEA{SPC}LFEinfringementinfo{SPC}1<ETX>
	Hex	02 73 45 41 20 4C 46 45 69 6E 66 72 69 6E 67 65 6D 65 6E 74 69 6E 66 6F 20 31 03
ColA B	Binary	02 02 02 02 00 00 00 19 73 45 41 20 4C 46 45 69 6E 66 72 69 6E 67 65 6D 65 6E 74 69 6E 66 6F 20 01 33

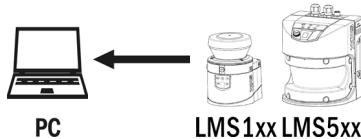
Table 577: Example: sEA LFEinfringementinfo 1



NOTE

The answer to the telegram is followed by data that is sent on event.

The sensor only sends the following data if there is a new field infringement detected and noted in the field infringement logging.



Telegram structure: sSN LFEinfringementinfo							
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)	
Command type	Read	String	3	All	sSN	73 53 4E	
Command	Data telegram	String	19	All	LFEinfringementinfo	4C 46 45 69 6E 66 72 69 6E 67 65 6D 65 6E 74 69 6E 66 6F	
Time Info	Counter	continuous counter of infringements	Uint_16	2	All	0 ... 9999d (0 ... 270Fh)	00 00 ... 27 0F

Telegram structure: sSN_LFEInfringementinfo							
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)	
Infringement-Info	Year	Uint_16	2	All	0 ... 9999d (0 ... 270Fh)	00 00 ... 27 OF	
	Month	Uint_8	1	All	0 ... 12d (0 ... Ch)	00 ... 0C	
	Day	Day of month 1 to 31	Uint_8	1	All	0 ... 31d (0 ... 1Fh)	
	Hour	0 to 23	Uint_8	1	All	0 ... 23d (0 ... 17h)	
	Minute	0 to 59	Uint_8	1	All	0 ... 59d (0 ... 3Bh)	
	Second	0 to 59	Uint_8	1	All	0 ... 59d (0 ... 3Bh)	
	µSecond	0 to 999999	Uint_32	4	All	0 ... 999999d (0 ... 000F423Fh)	
EVC number	1-10	UInt_8	1	All	0 ... 10d (0 ... Ah)	00 ... 0A	
	X-Pos [mm]	LMS100, LMS111: 0 m ... 20 m	Int_32	4	LMS100, LMS111	-20000d ... 20000d (FFFFFB1E0h ... 4E20h)	FF FF B1 E0 ... 00 00 4E 20
	LMS151: 0 m ... 50 m	LMS151			-50000d ... 50000d (FFFF3CB0h...C350h)	FF FF 3C B0 ... 00 00 C3 50	
	LMS5xx: 0 m ... 80 m	LMS5xx			-80000d ... 80000d (FFFEC780h ... 13880h)	FF FE C7 80 ... 00 01 38 80	
	Y-Pos [mm]	LMS100, LMS111: 0 m ... 20 m	Int_32	4	LMS100, LMS111	-20000d ... 20000d (FFFFFB1E0h ... 4E20h)	FF FF B1 E0 ... 00 00 4E 20
	LMS151: 0 m ... 50 m	LMS151			-50000d ... 50000d (FFFF3CB0h...C350h)	FF FF 3C B0 ... 00 00 C3 50	
	LMS5xx: 0 m ... 80 m	LMS5xx			-80000d ... 80000d (FFFEC780h ... 13880h)	FF FE C7 80 ... 00 01 38 80	
	Distance [mm]	LMS100, LMS111: 0 m ... 20 m	UInt_32	4	LMS100, LMS111	0 ... 20000d (0 ... 4E20h)	00 00 00 00 ... 00 00 4E 20
	LMS151: 0 m ... 50 m	LMS151			0 ... 50000d (0 ... C350h)	00 00 00 00 ... 00 00 C3 50	
	LMS5xx: 0 m ... 80 m	LMS5xx			0 ... 80000d (0 ... 13880h)	00 00 00 00 ... 00 01 38 80	
Angle [°]	LMS1xx: -45° ... 225°	Int_32	4	LMS1xx	-450000d ... +2250000d (FFF92230h ... 225510h)	FF F9 22 30 ... 00 22 55 10	
	LMS5xx: -5° ... 185°			LMS5xx	-50000d ... +1850000d (FFFF3CB0h ... 1C3A90h)	FF FF 3C B0 ... 00 1C 3A 90	
	Angle of Layer [°]	LMS1xx: -45° ... 225°	Int_32	4	LMS1xx	-450000d ... +2250000d (FFF92230h ... 225510h)	FF F9 22 30 ... 00 22 55 10
	LMS5xx: -5° ... 185°	LMS5xx			-50000d ... +1850000d (FFFF3CB0h ... 1C3A90h)	FF FF 3C B0 ... 00 1C 3A 90	
Object Size	LMS100, LMS111:	UInt_32	4	LMS100, LMS111	0 ... 20000d (0 ... 4E20h)	00 00 00 00 ... 00 00 4E 20	

Telegram structure: sSN LFEinfringementinfo						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
[mm]	0 m ... 20 m LMS151: 0 m ... 50 m LMS5xx: 0 m ... 80 m			LMS151	0 ... 50000d (0 ... C350h)	00 00 00 00 ... 00 00 C3 50
	LMS5xx			0 ... 80000d (0 ... 13880h)	00 00 00 00 ... 00 01 38 80	

Table 578: Example: sSN LFEinfringementinfo

Example: sSN LFEinfringementinfo

CoLa A	ASCII	<STX>sSN{SPC}LFEinfringementinfo{SPC}6{SPC}7B2{SPC}1{SPC}1{SPC}0{SPC}19{SPC}21{SPC}9D788{SPC}1{SPC}41{SPC}C3{SPC}0{SPC}CE{SPC}AE8F8{SPC}0{SPC}A8<ETX>
	Hex	02 73 53 4E 20 4C 46 45 69 6E 66 72 69 6E 67 65 6D 65 6E 74 69 6E 66 6F 20 36 20 37 42 32 20 31 20 31 20 30 20 31 39 20 32 31 20 39 44 37 38 38 20 31 20 34 31 20 43 33 20 30 20 43 45 20 41 45 38 46 38 20 30 20 41 38 03
CoLa B	Binary	02 02 02 02 00 00 40 73 53 4E 20 4C 46 45 69 6E 66 72 69 6E 67 65 6D 65 6E 74 69 6E 66 6F 20 00 06 07 B2 01 01 00 19 21 00 09 D7 88 01 00 00 41 00 00 00 C3 00 00 00 00 00 00 00 CE 00 0A E8 F8 00 00 00 00 00 A8 09

Table 579: Example: sSN LFEinfringementinfo

4.10.8 Fieldset selection method

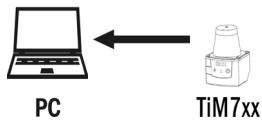
Telegram structure: sWN FieldSetSelectionMethod						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Fieldset selection Method	String	23	All	FieldsSetSelectionMethod	46 69 65 6C 64 53 65 74 53 65 6C 65 63 74 69 6F 6E 4D 65 74 68 6F 64 20 31 03
			1	All	0: digital inputs 1: telegram	00 01

Table 580: Telegram structure: sWN FieldSetSelectionMethod

Example for TiM781: sWN FieldSetSelectionMethod

CoLa A	ASCII	<STX>sWN{SPC}FieldSetSelection{SPC}1<ETX>
	Hex	02 73 57 4E 20 46 69 65 6C 64 53 65 74 53 65 6C 65 63 74 69 6F 6E 4D 65 74 68 6F 64 20 31 03
CoLa B	Binary	02 02 02 02 00 00 00 13 73 57 4E 20 46 69 65 6C 64 53 65 74 53 65 6C 65 63 74 69 6F 6E 4D 65 74 68 6F 64 20 01 14

Table 581: Example: sWN FieldSetSelectionMethod



Telegram structure: sWA FieldSetSelectionMethod						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Fieldset selection Method is active	String	23	All	FieldSetSelectionMethod	46 69 65 6C 64 53 65 74 53 65 6C 65 63 74 69 6F 6E 4D 65 74 68 6F 64

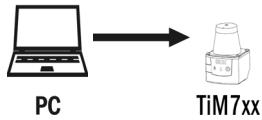
Table 582: Telegram structure: sWA FieldSetSelectionMethod

Example: sWA FieldSetSelectionMethod

CoLa A	ASCII	<STX>sWA{SPC}FieldSetSelectionMethod<ETX>
	Hex	02 73 57 41 20 46 69 65 6C 64 53 65 74 53 65 6C 65 63 74 69 6F 6E 4D 65 74 68 6F 64 03
CoLa B	Binary	02 02 02 02 00 00 00 15 73 52 41 20 46 69 65 6C 64 53 65 74 53 65 6C 65 63 74 69 6F 6E 4D 65 74 68 6F 64 20 1A

Table 583: Example: sWA FieldSetSelectionMethod

4.10.9 Read active fieldset



Telegram structure: sRN ActiveFieldSet						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Read	String	3	All	sRN	73 52 4E
Command	Info of active fieldset	String	14	All	ActiveFieldSet	41 63 74 69 76 65 46 69 65 6C 64 53 65 74

Table 584: Telegram structure: sRN ActiveFieldSet

Example: sRN ActiveFieldSet

CoLa A	ASCII	<STX>sRN{SPC}ActiveFieldSet<ETX>
	Hex	02 73 52 4E 20 41 63 74 69 76 65 46 69 65 6C 64 53 65 74 03
CoLa B	Binary	02 02 02 02 00 00 00 13 73 52 4E 20 41 63 74 69 76 65 46 69 65 6C 64 53 65 74 20 63

Table 585: Example: sRN ActiveFieldSet



Telegram structure: sRA ActiveFieldSet						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sRA	73 52 41
Command	Active fieldset	String	14	All	ActiveFieldSet	41 63 74 69 76 65 46 69 65 6C 64 53 65 74
Active Fieldset			1	All	1h ...10h	00 01 ...00 10

Table 586: Telegram structure: sRA ActiveFieldSet

Example: sRA ActiveFieldSet

CoLa A	ASCII	<STX>sRA{SPC}ActiveFieldSet{SPC}F<ETX>
	Hex	02 73 52 41 20 41 63 74 69 76 65 46 69 65 6C 64 53 65 74 20 46 03
CoLa B	Binary	02 02 02 02 00 00 00 15 73 52 41 20 41 63 74 69 76 65 46 69 65 6C 64 53 65 74 20 00 0F 43

Table 587: Example: sRA ActiveFieldSet

4.10.10 Write active fieldset



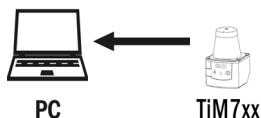
Telegram structure: sWN ActiveFieldSet						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Write	String	3	All	sWN	73 57 4E
Command	Active fieldset	String	14	All	ActiveFieldSet	41 63 74 69 76 65 46 69 65 6C 64 53 65 74
			2	All	0h ... 10h	00 01 ... 0010

Table 588: Telegram structure: sWN ActiveFieldSet

Example: sWN ActiveFieldSet

CoLa A	ASCII	<STX>sWN{SPC}ActiveFieldSet{SPC}E<ETX>
	Hex	02 73 57 4E 20 41 63 74 69 76 65 46 69 65 6C 64 53 65 74 20 45 03
CoLa B	Binary	02 02 02 02 00 00 00 13 73 57 4E 20 41 63 74 69 76 65 46 69 65 6C 64 53 65 74 20 00 0E 63

Table 589: Example: sWN ActiveFieldSet



Telegram structure: sWA ActiveFieldSet						
Telegram part	Description	Variable	Length	Sensor	Values CoLa A (ASCII)	Values CoLa B (Binary)
Command type	Answer	String	3	All	sWA	73 57 41
Command	Active Fieldset	String	14	All	ActiveFieldSet	41 63 74 69 76 65 46 69 65 6C 64 53 65 74

Table 590: Telegram structure: sWA ActiveFieldSet

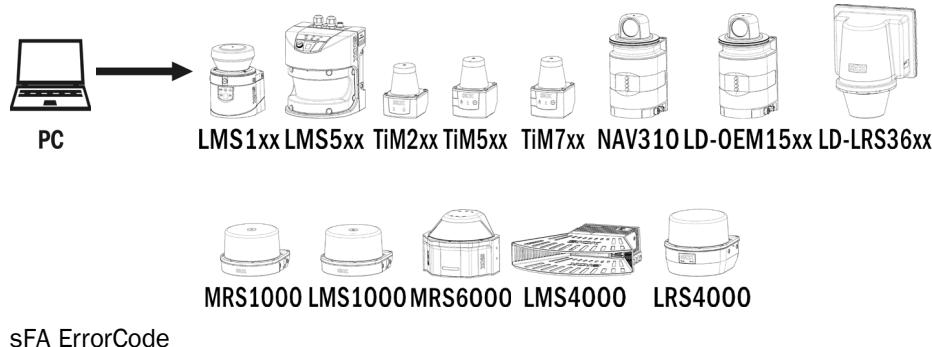
Example: sWA ActiveFieldSet

CoLa A	ASCII	<STX>sWA{SPC}ActiveFieldSet<ETX>
	Hex	02 73 57 41 20 41 63 74 69 76 65 46 69 65 6C 64 53 65 74 03
CoLa B	Binary	02 02 02 02 00 00 00 13 73 57 41 20 41 63 74 69 76 65 46 69 65 6C 64 53 65 74 20 49

Table 591: Example: sWA ActiveFieldSet

5 Diagnostics

5.1 SOPAS error codes



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

Telegram structure: sFA ErrorCode			
Error code	Description	Dec.	Hex.
Sopas_Error_EVENTREG_UNKNOWNINDEX	The event you wanted to register for does not exist, the index is unknown.	15	F
Sopas_Error_COLA_A_VALUE_OVERFLOW	The value does not fit into the value field, it is too large.	16	10
Sopas_Error_COLA_A_INVALID_CHARACTER	Character is unknown, probably not alphanumeric.	17	11
Sopas_Error_OSAI_NO_MESSAGE	Only when using SRTOS in the firmware and distributed variables this error can occur. It is an indication that no operating system message could be created. This happens when trying to GET a variable.	18	12
Sopas_Error_OSAI_NO_ANSWER_MESSAGE	This is the same as Sopas_Error_OSAI_NO_MESSAGE with the difference that it is thrown when trying to PUT a variable.	19	13
Sopas_Error_INTERNAL	Internal error in the firmware, probably a pointer to a parameter was null.	20	14
Sopas_Error_HubAddressCorrupted	The Sopas Hubaddress is either too short or too long.	21	15
Sopas_Error_HubAddressDecoding	The Sopas Hubaddress is invalid, it can not be decoded (Syntax).	22	16
Sopas_Error_HubAddressAddressExceeded	Too many hubs in the address	23	17
Sopas_Error_HubAddressBlankExpected	When parsing a HubAddress an expected blank was not found. The HubAddress is not valid.	24	18
Sopas_Error_AsyncMethodsAreSuppressed	An asynchronous method call was made although the device was built with "AsyncMethodsSuppressed". This is an internal error that should never happen in a released device.	25	19
Sopas_Error_ComplexArraysNotSupported	Device was built with „ComplexArraysSuppressed“ because the compiler does not allow recursions. But now a complex array was found. This is an internal error that should never happen in a released device.	26	20

Table 592: SOPAS error codes

Example: sFA ErrorCode Wrong userlevel

Col A	ASCII	<STX>sFA{SPC}1<ETX>
	Hex	02 73 46 41 20 31 03
Col B	Binary	02 02 02 02 00 00 00 05 73 46 41 20 00 01 75

Table 593: Example: sFA ErrorCode Wrong userlevel

5.2 Additional information

SOPAS communication is a index based communication and can be identified with telegram beginning of: sRI,sWI,sMI, sAI, sEI,sSI. A parallel usage of one port can confuse. So we recommend a separat usage of different ports, if possible.

Every response telegram starts with a separat framed string:

<STX>sSI 2 1<ETX><STX>“Answer”<ETX>

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Australia
Phone +61 (3) 9457 0600
1800 33 48 02 – tollfree
E-Mail sales@sick.com.au

Austria
Phone +43 (0) 2236 62288-0
E-Mail office@sick.at

Belgium/Luxembourg
Phone +32 (0) 2 466 55 66
E-Mail info@sick.be

Brazil
Phone +55 11 3215-4900
E-Mail comercial@sick.com.br

Canada
Phone +1 905.771.1444
E-Mail cs.canada@sick.com

Czech Republic
Phone +420 234 719 500
E-Mail sick@sick.cz

Chile
Phone +56 (2) 2274 7430
E-Mail chile@sick.com

China
Phone +86 20 2882 3600
E-Mail info.china@sick.net.cn

Denmark
Phone +45 45 82 64 00
E-Mail sick@sick.dk

Finland
Phone +358-9-25 15 800
E-Mail sick@sick.fi

France
Phone +33 1 64 62 35 00
E-Mail info@sick.fr

Germany
Phone +49 (0) 2 11 53 010
E-Mail info@sick.de

Greece
Phone +30 210 6825100
E-Mail office@sick.com.gr

Hong Kong
Phone +852 2153 6300
E-Mail ghk@sick.com.hk

Hungary
Phone +36 1 371 2680
E-Mail ertekesites@sick.hu

India
Phone +91-22-6119 8900
E-Mail info@sick-india.com

Israel
Phone +972 97110 11
E-Mail info@sick-sensors.com

Italy
Phone +39 02 27 43 41
E-Mail info@sick.it

Japan
Phone +81 3 5309 2112
E-Mail support@sick.jp

Malaysia
Phone +603-8080 7425
E-Mail enquiry.my@sick.com

Mexico
Phone +52 (472) 748 9451
E-Mail mexico@sick.com

Netherlands
Phone +31 (0) 30 229 25 44
E-Mail info@sick.nl

New Zealand
Phone +64 9 415 0459
0800 222 278 – tollfree
E-Mail sales@sick.co.nz

Norway
Phone +47 67 81 50 00
E-Mail sick@sick.no

Poland
Phone +48 22 539 41 00
E-Mail info@sick.pl

Romania
Phone +40 356-17 11 20
E-Mail office@sick.ro

Russia
Phone +7 495 283 09 90
E-Mail info@sick.ru

Singapore
Phone +65 6744 3732
E-Mail sales.gsg@sick.com

Slovakia
Phone +421 482 901 201
E-Mail mail@sick-sk.sk

Slovenia
Phone +386 591 78849
E-Mail office@sick.si

South Africa
Phone +27 10 060 0550
E-Mail info@sickautomation.co.za

South Korea
Phone +82 2 786 6321/4
E-Mail infokorea@sick.com

Spain
Phone +34 93 480 31 00
E-Mail info@sick.es

Sweden
Phone +46 10 110 10 00
E-Mail info@sick.se

Switzerland
Phone +41 41 619 29 39
E-Mail contact@sick.ch

Taiwan
Phone +886-2-2375-6288
E-Mail sales@sick.com.tw

Thailand
Phone +66 2 645 0009
E-Mail marcom.th@sick.com

Turkey
Phone +90 (216) 528 50 00
E-Mail info@sick.com.tr

United Arab Emirates
Phone +971 (0) 4 88 65 878
E-Mail contact@sick.ae

United Kingdom
Phone +44 (0)17278 31121
E-Mail info@sick.co.uk

USA
Phone +1 800.325.7425
E-Mail info@sick.com

Vietnam
Phone +65 6744 3732
E-Mail sales.gsg@sick.com

Detailed addresses and further locations at www.sick.com