

## Telegram Stream

**Telegram structure:** sRA LMDscandata / sSN LMDscandata

| Telegram       | Description  | Variable   | Length  | Values ASCII  | Values Binary   |
|----------------|--|--|---------|---------------|---|
| Command Type   | Sopas by name  | String   | 3       | sRA<br>sSN    | 73 52 41<br>73 53 4E  |
| Command        | Data Telegram  | String   | 11      | LMDscandata   | 4C 4D 44 73 63 61 6E 64<br>61 74 61   |
| Version Number | For detecting format changes by the version. Version is always 1 up to now | Uint_16  | 2       | 0000h - FFFFh |   |
| Device         | Device Number  | defined with Sopas   | Uint_16 | 2             | 0000h - FFFFh   |
|                | Serial Number  | defined in Factory   | Uint_32 | 4             | 00000000h - FFFFFFFFh   |
|                | Device Status  |  | Uint_8  | 2 x 1         | 00 00 OK<br>00 01 Error<br>00 02 Pollution Warning<br>00 04 Pollution Error |
| Status Info    | Telegram Counter   | Counter starting with first measured value after reaching the highest number   | Uint_16 | 2             | 0000h - FFFFh   |
|                | Scan Counter   | Counter starting with first measured value after reaching the highest number   | Uint_16 | 2             | 0000h - FFFFh   |
|                | Time since start up  | Counting the time since power up the device; starting with 0. In the output telegram this is the time at the zero index (-14°) before the measurement itself starts. | Uint_32 | 4             | 00000000h - FFFFFFFFh   |
|                | Time of transmission   | Time in µs when the complete scan is transmitted to the buffer for data output; starting with 0 at scanner bootup.   | Uint_32 | 4             | 00000000h - FFFFFFFFh   |
|                | Status of digital Inputs   | Low byte represents Input 1  | Uint_8  | 2 x 1         | 00 00 all Inputs low<br>00 03 all input high                                |
|                | Status of digital outputs  | Low byte represents Output 1   | Uint_8  | 2 x 1         | 00 00 all Outputs low<br>00 07 all Output high                              |
|                | Reserved   |  | Uint_16 | 2             |   |

|                          |                             |   |         |   |  |
|--------------------------|-----------------------------|---|---------|---|--|
| Frequencies              | Scan frequency              | Output in 1/100Hz   | Uint_32 | 4 | <p>LMS1xx:<br/>25Hz: 9C4h (2500d)<br/>50Hz: 1388h (5000d)</p> <p>LMS5xx:<br/>25Hz: 9C4h (2500d)<br/>35Hz: DACH (3500d)<br/>50Hz: 1388h (5000d)<br/>75Hz: 1A0Bh (7500d)<br/>100Hz: 2710h (10000d)</p> <p>NAV310/LD-OEM<br/>5Hz ...20Hz<br/>1F4h...7D0h<br/>( 500d...2000d)<br/>Default 320h = 8 Hz</p> <p>LD-LRS<br/>..5Hz....15Hz<br/>1F4h....5DCh<br/>( 500d.....1500d)<br/><b>Default 320h = 8 Hz)</b></p> |
|                          | Measurement frequency in Hz | Inverse of the time between two measurement shots (in 100Hz)<br>example: 50Hz,<br>0,5° Resolution →<br>720 shots/20ms →<br>36 kHz | Uint_32 | 4 | 00000000h - FFFFFFFFh  |
| <b>Amount of Encoder</b> |                             |   | Enum_16 | 2 | 0..3<br>if 0, than next two values are missing.  |
|                          | Encoder Position            | Info in Ticks   | Uint_16 | 2 | LMS1xx: 0000h - 3FFFh<br>LMS5xx: 0000h – FFFFh   |
|                          | Encoder Speed               | Ticks/mm  | Uint_16 | 2 | 0000h - FFFFh  |

|   |   |   |        |  |  |  |   |                |                                    |                |   |                |                                  |                |   |                |                                    |                |
|---|---|---|--------|--|--|--|---|----------------|------------------------------------|----------------|---|----------------|----------------------------------|----------------|---|----------------|------------------------------------|----------------|
| <b>Amount of 16 Bit Channels</b>          | Amount of 16 Bit channels, giving out the Measured Data                                 | Enum_16                                   | 2      | <p>LMS1xx: 1..2 Outputchannels</p> <p>LMS5xx: 0 or 5 Outputchannels</p> <p>NAV310/LD-OEM/LRS:<br/>Depending on amount of sectors and selection of output of Distance or Distance + Remiision RSSI</p> <p>For Example ( 2 Sectors ):<br/><u>If 2 channels: Sectors 1 + 2 contain Dist1</u><br/><u>If 4: channels Sectors 1 + 2 contain Dist + RSSI1</u></p> |  |  |   |                |                                    |                |   |                |                                  |                |   |                |                                    |                |
| Outputchannel 1..4 (16 bit)               | Content   | Defines the Content of the Output channel | String | 5  | <p>LMS1xx:</p> <table border="0" data-bbox="867 636 1214 867"> <tr> <td>DIST1: radial Values of first pulse in mm</td> <td>44 49 53 54 31</td> </tr> <tr> <td>RSSI1:Energy Values of first pulse</td> <td>52 53 53 49 31</td> </tr> <tr> <td>DIST2: radial Values of 2nd pulse in mm</td> <td>44 49 53 54 32</td> </tr> <tr> <td>RSSI2:Energy Values of 2nd pulse</td> <td>52 53 53 49 32</td> </tr> </table> <p>LMS5xx:<br/>DIST1<br/>DIST2<br/>DIST3<br/>DIST4<br/>DIST5<br/>No RSSI Values</p> <p>NAV310/LD-OEM/LRS</p> <table border="0" data-bbox="867 1150 1214 1266"> <tr> <td>DIST1: radial Values of first pulse in mm</td> <td>44 49 53 54 31</td> </tr> <tr> <td>RSSI1:Energy Values of first pulse</td> <td>52 53 53 49 31</td> </tr> </table> |  | DIST1: radial Values of first pulse in mm | 44 49 53 54 31 | RSSI1:Energy Values of first pulse | 52 53 53 49 31 | DIST2: radial Values of 2nd pulse in mm | 44 49 53 54 32 | RSSI2:Energy Values of 2nd pulse | 52 53 53 49 32 | DIST1: radial Values of first pulse in mm | 44 49 53 54 31 | RSSI1:Energy Values of first pulse | 52 53 53 49 31 |
|   | DIST1: radial Values of first pulse in mm   | 44 49 53 54 31                            |        |  |  |  |   |                |                                    |                |   |                |                                  |                |   |                |                                    |                |
|   | RSSI1:Energy Values of first pulse  | 52 53 53 49 31                            |        |  |  |  |   |                |                                    |                |   |                |                                  |                |   |                |                                    |                |
|   | DIST2: radial Values of 2nd pulse in mm   | 44 49 53 54 32                            |        |  |  |  |   |                |                                    |                |   |                |                                  |                |   |                |                                    |                |
|   | RSSI2:Energy Values of 2nd pulse  | 52 53 53 49 32                            |        |  |  |  |   |                |                                    |                |   |                |                                  |                |   |                |                                    |                |
| DIST1: radial Values of first pulse in mm | 44 49 53 54 31  |   |        |  |  |  |   |                |                                    |                |   |                |                                  |                |   |                |                                    |                |
| RSSI1:Energy Values of first pulse        | 52 53 53 49 31  |   |        |  |  |  |   |                |                                    |                |   |                |                                  |                |   |                |                                    |                |
| Scale factor                              | Scale factor or of the measurement values (in LMS5xx depends on the angular resolution) | Float_32                                  | 4      | <p>3F800000h = factor x1<br/>40000000h = factor x2 (values have to be scaled by factor two)<br/>NAV310 /LD-OEM /LD-LRS :<br/>40800000h = factor x 4</p>  |  |  |   |                |                                    |                |   |                |                                  |                |   |                |                                    |                |
| Scale factor offset                       | LMS = 0   | Float_32                                  | 4      | 00000000h - FFFFFFFFh  |  |  |   |                |                                    |                |   |                |                                  |                |   |                |                                    |                |
| Start angle                               | Output format :<br>1/10.000°  | Uint_32                                   | 4      | <p>LMS1xx:<br/>-450.000 +2250.000</p> <p>LMS5xx:<br/>-50.000 +1850.000</p> <p>NAV310/LD-OEM/LRS<br/><b>-360000d....360000d</b><br/>FFFC91180h ..0036EE80h</p>  |  |  |   |                |                                    |                |   |                |                                  |                |   |                |                                    |                |
| Steps                                     | Output format :<br>1/10.000°  | Uint_16                                   | 2      | <p>LMS1xx: 1000 10.000</p> <p>LMS5xx: 1667..10.000</p> <p>NAV310/LD-OEM/LRS:<br/>10.000</p>  |  |  |   |                |                                    |                |   |                |                                  |                |   |                |                                    |                |

|                  |  |         |   |   |  |
|------------------|--|---------|---|---|--|
| Amount of Data   | Defines the number of items on measured output | Uint_16 | 2 | 0000h – FFFFh   |  |
| Data_1<br>Data_n | Data stream starting Data_1 to Data_n          | Uint_16 | 2 | 0000h - 4E20 (LMS100)<br>C350 (LMS150)<br>FDE8 (LMS 1xx without limit)<br>NAV310/LD-OEM/LRS<br>0000h -0992h |  |

### For NAV310/LD-OEM/LRS:

The array "Outputchannel 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-OEM/LRS scanner are working with a single pulse measurement, it is always "1".

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