

Supplement to the  
Telegramlisting of the LD-OEM

User Protocol Services for  
Operating/Configuring the NAV300  
Laser Positioning Sensor



NAV300-2232



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# 1 Notes on this document

## 1.1 Purpose

This document is a supplement to the LDOEM Telegramlisting. It shows you how to use and configure (parameterise) the NAV300 Laser Measurement Systems by means of a extended command language (RDI Protocol Services), based on enhancement telegrams .

The document contains information on:

- Data communication between the host/driver and laser measurement system
- Configuration by means of telegrams
- Commands/responses in the telegrams

## 1.2 Target audience

This document is aimed at technicians and engineers.

## 1.3 Information content

This document contains all the information required for communicating with the NAV300 by means of telegrams.

## 1.2 Configuration Services

### 1.2.1 SET\_ROTATE\_DIRECTION

Request Command **1201h**:

<i>Description</i>	<i>Direction of rotation</i>	
<i>Parameter</i>	<i>Type</i>	<i>Meaning</i>
ROTATE_DIRECTION	WORD	<b>0001h</b> clockwise <b>0000h</b> anti-clockwise

Definition of the direction of rotation: Depending on the mounting position, the scanning head of the NAV 300 positioning system rotates clockwise (standard, without using this command) or – with upside-down mounting – anti-clockwise.

NAV300 response **9201h**:

<i>Description</i>		
<i>Parameter</i>	<i>Type</i>	<i>Meaning</i>
CONFIG_RESULT	WORD	ROTATE_DIRECTION <b>FFFFh</b> if failed <b>FF01h</b> if invalid parameter

### 1.2.1 GET\_ROTATE\_DIRECTION

Request Command **1211h**:

<i>Description</i>	<i>Read Direction of rotation</i>	
<i>Parameter</i>	<i>Type</i>	<i>Meaning</i>
-		

NAV300 response **9211h**:

<i>Description</i>		
<i>Parameter</i>	<i>Type</i>	<i>Meaning</i>
ROTATE_DIRECTION	WORD	ROTATE_DIRECTION

### 1.2.1 SET\_REFLECTOR\_CONFIG

Request Command **1202h**:

<i>Description</i>	<i>Configure reflector detection threshold</i>	
<i>Parameter</i>	<i>Type</i>	<i>Meaning</i>
REFLECTOR_TRESHOLD	WORD	[%] <b>0001h – 0064h</b> , 0 % to 100 %, default 50 %
REFLECTOR_RADIUS	WORD	[mm] { <b>0000h – 007fh</b> } Reflector Radius in [mm], "0" equals flat reflectors

For detecting reflectors in comparison with less reflective material, the NAV300 uses an internal, distance-related reflection threshold curve. The threshold curve is located in the middle, between the device-specific calibrated curve on white paper and the curve on 10-cm wide "3M Diamond Grade" reflector sheeting, with the laser beam impacting vertically. In order to make narrower or less reflective materials visible, this command enables the threshold curve to be adjusted on a percentage basis.

The following are equivalent in this case:

- the 0 % threshold curve and the calibrated curve on white paper
- the 100 % threshold curve and the calibrated curve on 10-cm wide "3M Diamond Grade" reflector sheeting

**Important** A lowering of the threshold curve will also reduce the signal-to-noise ratio between reflector sheeting and natural materials.

Raising the threshold curve will reduce availability for reflector measurements.

NAV300 response **9202h**:

<i>Description</i>		
<i>Parameter</i>	<i>Type</i>	<i>Meaning</i>
CONFIG_RESULT_1	WORD	REFLECTOR_TRESHOLD <b>FFFFh</b> if failed <b>FF01h</b> if invalid parameter
CONFIG_RESULT_2	WORD	REFLECTOR_RADIUS <b>FFFFh</b> if failed <b>FF01h</b> if invalid parameter

### 1.2.1 GET\_REFLECTOR\_CONFIG

Request Command **1212h**:

<i>Description</i>	<i>Read Reflector configuration</i>	
<i>Parameter</i>	<i>Type</i>	<i>Meaning</i>
-		

NAV300 response **9212h**:

<i>Description</i>		
<i>Parameter</i>	<i>Type</i>	<i>Meaning</i>
REFLECTOR_TRESHOLD	WORD	REFLECTOR_TRESHOLD
REFLECTOR_RADIUS	WORD	REFLECTOR_RADIUS

## 1.3 Measurement Services

### 1.3.1 GET\_MIXED\_PROFILE

Request Command **1301h**:

Description	<i>request mixed-mode profiles</i>	
Parameter	Type	Meaning
PROFILENUM	WORD	Number of profiles, if it is 0 the NAV300 sends profiles continuously, until the user send the CANCEL_MIXED_PROFILE command
PROFILEFORMAT	DWORD	32 bit mask defines response content

#### PROFILEFORMAT

Bit	Meaning
0	Number of the transmitted profile
1	Profile counter
2	Layer number (always 1)
3	Sector number (always 1)
4	Angle step
5	Number of points
6	Time stamp at sector start
7	Start direction of sector
8	Measured distances
9	Direction of measured distances
10	Echo amplitudes
11	Time stamp at sector end
12	End direction of sector
13	SenStat
14	reserved
15	reserved
16	Number of seen reflectors
17	reserved
18	Co-ordinates of Reflectors
19	00: none 01: cartesian 10: polar 11: cartesian & polar
20	Timestamp of Refl Measure
21	mean Echo-Amplitude
22	Number of spots
23	reserved
24	reserved
25	reserved
26	reserved
27	reserved
28	reserved
29	reserved
30	reserved
31	reserved

NAV300 response **9301h**:

The response is an extension of the LD OEM response *get\_profile 8301h* (refer to the LD OEM Telegramlisting).

**ProfileFormat is a DWORD**

The NAV300 responds the first section according to the mask in the low Word of PROFILEFORMAT and the format described in the *get\_profile* response of the LD OEM. The second section is according to the mask in the high Word of PROFILEFORMAT. This data of the RDI follows the contour data:

<i>Description</i>		
<i>Parameter</i>	<i>Type</i>	<i>Meaning</i>
REFLECTORNUM	WORD	Number of Refelctors
REFLECTOR_X	DWORD	X-co-ordinate [mm]
REFLECTOR_Y	DWORD	Y- co-ordinate [mm]
REFLECTOR_DISTANCE	DWORD	DISTANCE in [mm]
REFLECTOR_ANGLE	DWORD	ANGLE in [bdeg]
ELAPSEDTIME	WORD	Zeit von ..s.o..[ms]
MEANECHO	WORD	Mittlere Echoamplitude
MEASNUM	WORD	Anzahl Einzelmessungen auf Reflektor

Sent for each reflector

Sent with each Scan

If Error, the NAV300 responds:

<i>Description</i>		
<i>Parameter</i>	<i>Type</i>	<i>Meaning</i>
PROFILE_FORMAT	DWORD	Profil Format
ERROR_CODE	WORD	ff01h : invalid format ff02h : invalid number of sectors ffffh : failed

**1.3.1 CANCEL\_MIXED\_PROFILE**

Request Command 1302h:

<i>Description</i>		
<i>Parameter</i>	<i>Type</i>	<i>Meaning</i>
		<i>Stops the mixed-mode profile output</i>

NAV300 response 9302h:

<i>Description</i>		
<i>Parameter</i>	<i>Type</i>	<i>Meaning</i>
RESULT	WORD	<b>0000h</b> <b>FFFFh</b> if failed

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## 1.4 File Services

### 1.4.1 SAVE\_PERMANENT

Request Command **1701h**:

<i>Description</i>	<i>Save the configuration</i>	
<i>Parameter</i>	<i>Type</i>	<i>Meaning</i>
-	-	-

Aktuelle Konfiguration wird permanent Stores REFLECTOR\_THRESHOLD and REFLECTOR\_RADIUS permanent.

NAV300 response **9701h**:

<i>Description</i>		
<i>Parameter</i>	<i>Type</i>	<i>Meaning</i>
RESULT	WORD	<b>0000h</b> <b>FFFFh</b> if failed

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