

TeraRanger Neo ES

Test results report

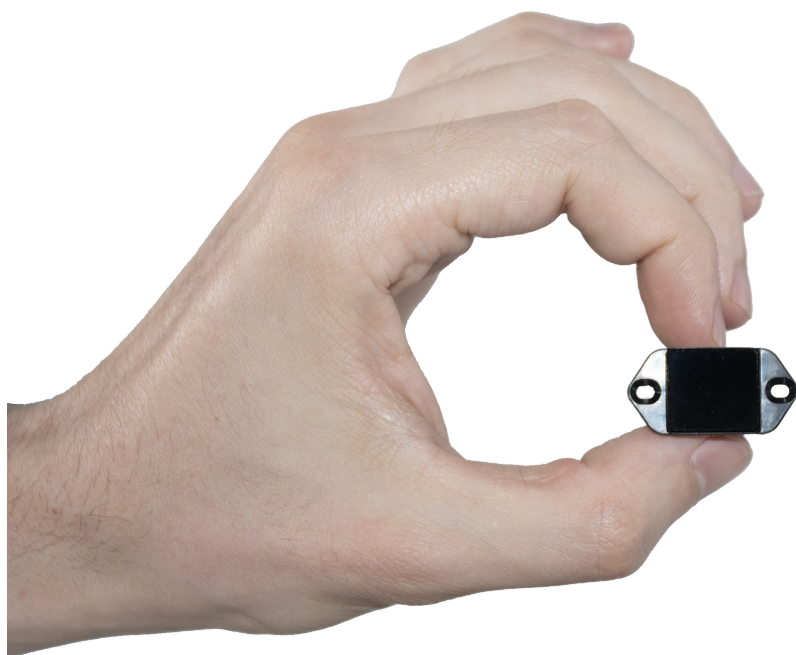


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1. Introduction

The aim of this document is to show the behavior of the sensor in a range of outdoor conditions, which by definition can be far more variable and challenging than many indoor conditions. By considering some of these more challenging operating environments, greater insight into the sensor specification sheet can be gained, notably around the maximum attainable range.

The aim of the tests is to examine different target reflectance or remission and different outdoor conditions.

- **Target remission definition:** The remission of the surface of a material is its effectiveness in reflecting infrared light in the wavelength of 850 nm. (Emission wavelength from TeraRanger Neo ES is 850 nm)
- **Outdoor conditions definition:** Two outdoor conditions were tested in the summer period. This will help users evaluate the performance of the Neo ES in different outdoor conditions:
 - Extreme condition: Sensor and target were placed in direct sunlight. 50 KLux were measured in the target surface with a Luxmeter.
 - Second condition: Sensor was placed on direct sunlight and the target was placed on the shadow. 4 KLux were measured in the target surface with a Luxmeter.

2. Setup description

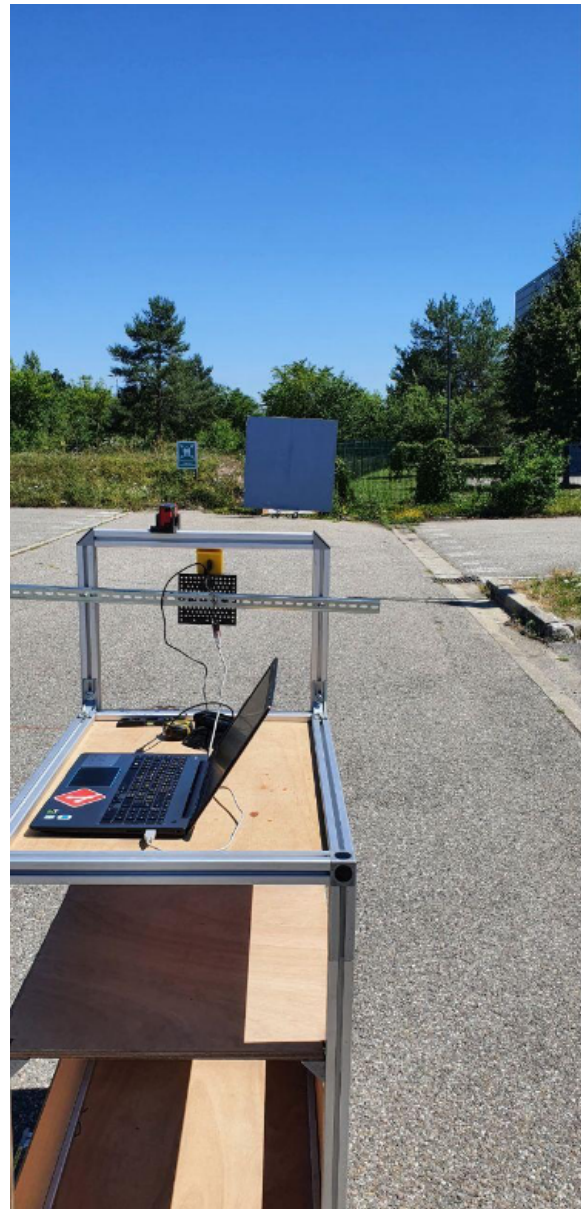
For each of the following tests described in [section 3](#) and [section 4](#), the following setup was used:

- The sensor was mounted on a trolley driven along a rail perpendicular to the target. The sensor was linked to a computer to collect the data. The data was streamed via Hterm terminal software.
- The target was fixed. Only the sensor was moved in relation to the target to change the measured distance.
- The sensor was positioned at a height that guarantees the Field of View of the sensor does not point to the floor and at a distance of 35 m from the target.
- A calibrated laser measurement device was attached to the platform and considered as a benchmark.

3. Outdoor - Illuminated target 50 Klux

3.1. Testing conditions

Date: Monday, 11 July, 2022, 11:00 am
SGP: Terabee Parking, Sun, 28°C
TeraRanger Neo Firmware: v1.0.1-1-gfbc2955
Ambient light on target surface: 49.2 Klux



3.2. Results

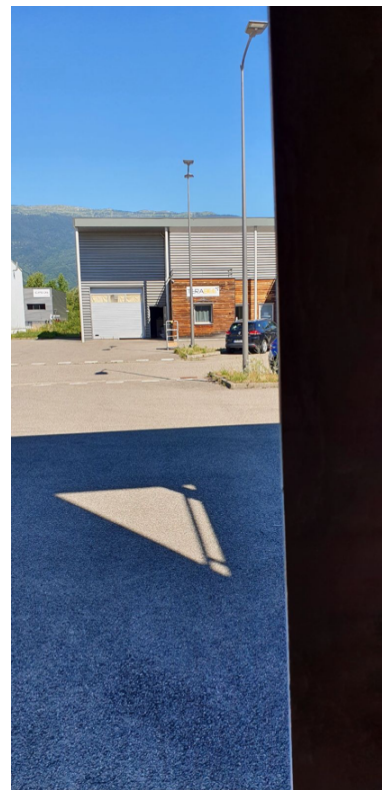
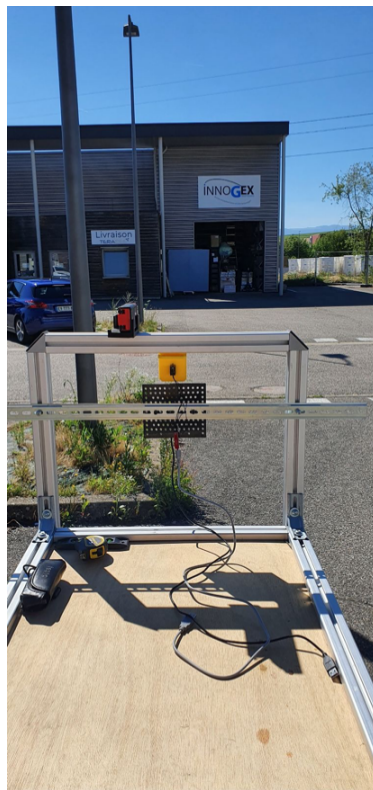
Target remission 25.8%		
Lasers [mm]	Neo ToF [mm]	Neo error [mm]
100	106	6
201	202	1
299	297	2
401	396	5
502	497	5
603	598	5
703	697	6
803	789	14
901	883	18
1008	1004	4
2007	1992	15
2995	2972	23
4005	3978	27
5001	4982	19
6003	5993	10
6988	6993	5
7993	8038	45
9003	9045	42
10005	10064	59
12005	12044	39
12982	13012	30
14004	13944	60
15021	15040	19
19980	19856	124
21007	21385	378
22049	N.A	N.A
Target remission 45.9%		
Lasers [mm]	Neo ToF [mm]	Neo error [mm]
19972	19927	45
21007	21381	374
22014	22281	267
25007	N.A	N.A

Target remission 72.6%		
Laser [mm]	Neo ToF [mm]	Neo error [mm]
19990	20035	45
25078	N.A	N.A

4. Outdoor - Illuminated target 4 Klux

4.1. Testing conditions

Date: Friday, 8 July, 2022, 11:00 am
SGP: Terabee Parking, Sun, 23°C
TeraRanger Neo Firmware: v1.0.1-1-gfbc2955
Ambient light on target surface: 4.2 Klux




4.2. Results

Target remission 5.4%		
Laser [mm]	Neo ToF [mm]	Neo error [mm]
54	80	26
100	106	6
201	202	1
299	297	2

401	396	5
502	497	5
603	598	5
703	697	6
803	789	14
901	883	18
1000	982	18
7760	8250	490
11813	11544	269
Target remission 25.8%		
Laser [mm]	Neo ToF [mm]	Neo error [mm]
110	126	16
202	212	10
298	303	5
403	399	4
499	504	5
602	601	1
702	698	4
802	798	4
902	896	6
1000	1035	35
26069	26250	181
30032	30287	255
Target remission 45.9%		
Laser [mm]	Neo ToF [mm]	Neo error [mm]
198	194	4
304	296	8
398	386	12
496	485	11
600	585	15
704	688	16
803	789	14
895	877	18
1000	988	12
30000	30575	575
Target remission 72.6%		
Laser [mm]	Neo ToF [mm]	Neo error [mm]
65	54	11

104	78	26
198	193	5
300	272	28
401	371	30
503	476	27
600	566	34
704	681	23
895	875	20
1000	970	30
30014	30236	222

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