

## Description



uSense LITE is the portable version of the uSense imaging station, designed for on-site inspections and monitoring. Incorporating a wide range of signal analysis and processing methods, uSense LITE is used for material characterization, thickness measurement, and the detection of foreign bodies or voids.

It is compatible with all dielectric materials, including plaster, wood, paper, cardboard, ceramics, polymers, and composites. Depending on the nature and shape of the target to be inspected, different add-ons are available.

## Features

- Three distinct radar-equipped sensors each with their own unique bandwidth :
  - 113.9 → 135.9 GHz ;
  - 222.5 → 267.5 GHz ;
  - 287 → 328.5 GHz
- Applications-specific add-ons such as a "Trackballs" add-on that allows for manual mapping
- Rugged tactile tablet for increased portability

## Applications

- See-through non-intrusive sensing for foreign body detection such as wet spots, delamination, glue, metallic or plastic objects or knots in wood
- Thickness measurement
- Material properties characterization in research and development
- Quality control and on-site inspection on large and/or static objects such as boats, airplanes, trains, walls, etc. by technicians

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## Electrical specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit	Comment
Input voltage	$V_{in}$	4.75	5	5.25	V	uSense is powered using USB <sup>1</sup> .
Power draw	$P_{in}$	-	3.709	4.725	W	Computed from sub-components datasheets.
Battery life <sup>2</sup>	$t_{batt}$	-	9	16	h	Battery life given by the specification of the tablet <sup>2</sup> .

### Notes :

<sup>1</sup>uSense<sub>LITE</sub> connects to the tablet using a USB-C connector and is designed to work with third-party computers and tablets aside from Optikan's. It is therefore theoretically compatible with any compliant USB-C port (that is : featuring support for USB 2.0 communication protocol and capable of delivering 900 mA of current).

<sup>2</sup>By default, the uSense<sub>LITE</sub> connects to a Microsoft<sup>®</sup> Surface<sup>®</sup> Pro tactile tablet provided by Optikan. The battery provides energy for both the tablet and the sensor.

## Mechanical specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit	Comment
Length <sup>1</sup>	L	-	-	86	mm	
Width <sup>1</sup>	W	-	-	118	mm	
Height <sup>1</sup>	H	-	-	256	mm	
Weight <sup>1</sup>	m	-	-	0.8	kg	

### Note :

<sup>1</sup>Dimensions and weight include both the sensor and a "Trackballs" add-on, but do not account for the tablet.

## Optical performance

Parameter	Symbol	Min.	Typ.	Max.	Unit	Comment
Acquisition rate	$f_{acq}$	10	-	60	Hz	-
Depth resolution	$R_z$	-	7	-	mm	-
Signal to Noise Ratio	SNR	40	50	60	dB	-
Optical power <sup>1</sup>	$P_{opt}$	-	-3	3.5	dBm	-
Working distance <sup>2</sup>	WD	25	-	100	mm	HDPE lenses have an index of 1.53.
Focal length <sup>2</sup>	F	25	-	125	mm	
Numerical Aperture	NA	0.2	-	0.51	-	-

### Notes :

<sup>1</sup>Maximum power transmitted by the antenna. For reference, -3 dBm  $\approx$  0.501 mW, and 3.5 dBm  $\approx$  2.239 mW.

<sup>2</sup>Working distance is set by lenses and are available in 25 mm steps focal lengths : 25, 50, 75, 100, and 125 mm. Due to its different geometry, the 125 mm focal lens limit the working distance to 100 mm.



## Computer requirements

uSense LITE comes with its own tactile tablet to make it easier to use for first-time users. It is however possible to use your own hardware, provided the following requirements are met :

- Operating system : Windows 11 with administrative privileges
- Memory : At least 8 GB of RAM
- Storage : At least 2 GB for the software, with 120 GB recommended for storing the measurements
- Connectivity : at least one USB-C port with USB 2.0 capability or better
- Monitor size : for a better experience, it is recommended to use a monitor with at least a 2880x1920 resolution and a 3:2 aspect ratio

## Others

Parameter	Symbol	Min.	Typ.	Max.	Unit	Comment
Humidity	HR	40	-	50	%	Non-condensing.
Operating temperature	T <sub>op</sub>	0	-	35	°C	-
Storage temperature	T <sub>sto</sub>	0	-	35	°C	-

For more information, please contact Optikan at : [support@optikan.com](mailto:support@optikan.com).

