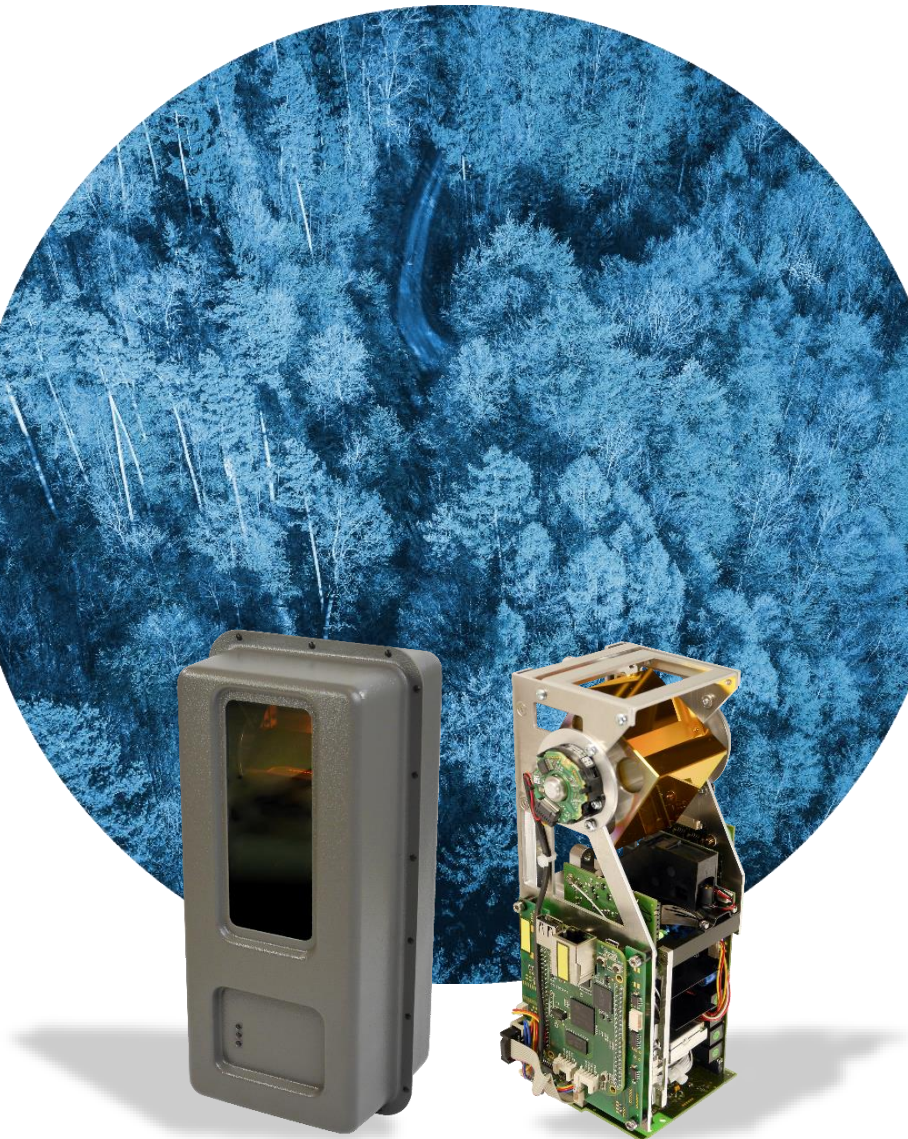


# PS Lightweight

## PS Lightweight Range Module

2D Laser Scanner for UAVs | Smart Sensor



- + **Ultra-lightweight**, less than 1100 g
- + Application Programmable Unit
- + **Web interface**  
User friendly integrated web interface  
Parameters configuration  
Measured profiles preview
- + **Long range**, up to 300 m
- + **Fast scan rate**, up to 60 Hz
- + **PPS input for data synchronization**
- + Small spot size
- + High lateral resolution
- + Very high accuracy
- + **Multi-echo evaluation technology**, up to 4 selectable echoes
- + Operating with rain and snow
- + Real time data through Ethernet
- + **Low power consumption**
- + **Available as integration module**

### PS Lightweight Applications

Triple-IN developed the PS Lightweight to meet emerging technologies needs and offer the best LiDAR data collection experience. PS Lightweight is especially dedicated to UAVs and their applications:

Inspection

Monitoring

Detection, Surveying

Volume measurement

Automation

→ powerline, pipeline, railway tracks, inaccessible areas

→ rock faces, crops, tree canopy, urban areas, cultural heritage

→ structures and data collection in hostile environments

→ stockyards, open pit mines, landfills, garbage dumps, silos

→ precision agriculture, fertilizer spraying

# PS Lightweight Technical Data

Sensor	PS Lightweight	PS Lightweight RM
Article No.	SR-LWXX-110D-P2	SR-LWEM-110D-P1
<b>WORKING RANGE</b>		
Maximum range @ R = 100%, Lambertian reflector (m)	300	300
Maximum range @ R = 10%, Lambertian reflector (m)	95	95
Minimum range (m)	2.5	2.5
<b>ACCURACY DATA</b>		
Resolution (mm)	1	1
Repeatability 1 $\sigma$ @ strong signal (mm)	5	5
Repeatability 1 $\sigma$ @ weak signal (mm)	20	20
Accuracy (systematic error) (mm)	$\leq 5$	$\leq 5$
<b>SPOT PROPERTIES</b>		
Divergence in scan direction ( $^{\circ}$ )	0.096	0.096
Divergence in scan direction (mrad)	1.67	1.67
Divergence perpendicular to scan direction ( $^{\circ}$ )	0.029	0.029
Divergence perpendicular to scan direction (mrad)	0.5	0.5
Spot close to the sensor window (mm)	12 x 18	12 x 18
Focusing distance (m)	45	45
<b>SCAN AND PROFILE PROPERTIES</b>		
Maximum scan and profile angle ( $^{\circ}$ )	90	90
Scan mirror type	4-mirror polygon	4-mirror polygon
Maximum scanning duty cycle	50%	50%
<b>OPERATIONAL MODES</b>		
<b>Normal Mode</b>		
Beam scan angle step ( $^{\circ}$ )	0.09	0.09
Measurements in 90 $^{\circ}$ scan	1000	1000
Scan rate (Hz)	30	30
Scan time @ 90 $^{\circ}$ scan (ms)	16.65	16.65
Gap between spots in scan ( $^{\circ}$ )	-0.006 (overlap)	-0.006 (overlap)
<b>Fine Mode</b>		
Beam scan angle steps in profile ( $^{\circ}$ )	0.0225	0.0225
Measurements in 90 $^{\circ}$ scan	1000	1000
Scan rate (Hz)	30	30
Scan time @ 90 $^{\circ}$ scan (ms)	16.65	16.65
Number of scans per profile	4	4
Profile rate (Hz)	7.5	7.5
Profile time @ 90 $^{\circ}$ scan (ms)	134	134
Measurements per profile	4000	4000
Gap between spots in scan ( $^{\circ}$ )	-0.0735 (overlap)	-0.0735 (overlap)
<b>Fast Mode</b>		
Beam scan angle step ( $^{\circ}$ )	0.18	0.18
Measurements in 90 $^{\circ}$ scan	500	500
Scan rate (Hz)	60	60
Scan time @ 90 $^{\circ}$ scan (ms)	8.5	8.5
Gap between spots in scan ( $^{\circ}$ )	0.084	0.084

Sensor	PS Lightweight	PS Lightweight RM
<b>MULTI-ECHO EVALUATION</b>		
Evaluated echoes	Up to 4	Up to 4
Selectable master echo	From 1 <sup>st</sup> to 4 <sup>th</sup> or last echo	From 1 <sup>st</sup> to 4 <sup>th</sup> or last echo
<b>TARGET SURFACE TEMPERATURE</b>		
Surface temperature range	T < 500°C	T < 500°C
<b>LASER DATA</b>		
<b>Measurement Laser</b>		
Measurement laser type	Pulse Laser Diode	Pulse Laser Diode
Wavelength (nm)	905	905
Safety Class; EN 60825-1; 94,96,01	1	1
Measurement or pulse rate (kHz)	Up to 60	Up to 60
<b>Red Laser Marker</b>		
Red laser marker type (indicate the spot)	DC Laser Diode	DC Laser Diode
Wavelength (nm)	635-678	635-678
Safety Class; EN 60825-1; 94,96,01	2	2
<b>PROGRAMMABLE INTERNAL BOARD</b>		
Processor	ARM Cortex A8	ARM Cortex A8
Processing power	1 GHz	1 GHz
Board memory	512 MB	512 MB
On-board flash storage	4 GB	4 GB
Operating system	Linux OS	Linux OS
<b>HARDWARE INTERFACES</b>		
Ethernet	TCP/UDP 100 Mb/s	TCP/UDP 100 Mb/s
RS232	115 kBaud, 8n1	115 kBaud, 8n1
Digital outputs	2 x 3.3 to 5 VDC programmable isolated switching outputs	2 x 3.3 to 5 VDC programmable isolated switching outputs
Digital inputs	2 x 3.3 to 5 VDC programmable isolated inputs	2 x 3.3 to 5 VDC programmable isolated inputs
External encoder inputs	none	3.3 to 5 VDC TTL input, channels A/B
<b>SOFTWARE INTERFACES</b>		
Ethernet address configuration	Static and DHCP	Static and DHCP
Sensor configuration	Terminal mode, Binary commands, Web interface for Web interface	Terminal mode, Binary commands, Web interface for Web interface
HTTP Server		
<b>POWER SUPPLY</b>		
Power supply	24 VDC ± 5 VDC power supply, 3.3 to 5 VDC for I/O	24 VDC ± 5 VDC power supply, 3.3 to 5 VDC for I/O
Direct power supply	✓	✓
Power consumption (W)	7.5	7.5
Start-up time (s)	< 30	< 30
<b>SENSOR PROTECTION</b>		
Ingress Protection rating	IP65	none
Operating temperature range	-10°C to +50°C	-10°C to +50°C
Storage temperature range	-30°C to +70°C	-30°C to +70°C
Enclosure	Polycarbonate (aviation standard) 1.5mm dark gray	none
Front window	AR-coated glass	none
Function in strong sunshine	Ambient light control	Ambient light control

## PS Lightweight Technical Data

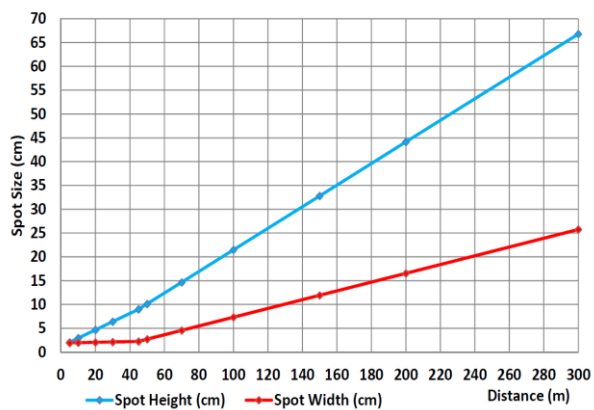
Sensor	PS Lightweight	PS Lightweight RM
<b>DIMENSIONS &amp; WEIGHT</b>		
Height x Width x Length (mm)	261 x 125 x 120	225 x 108 x 90
Weight (g)	< 1200	< 1100

### Accessories

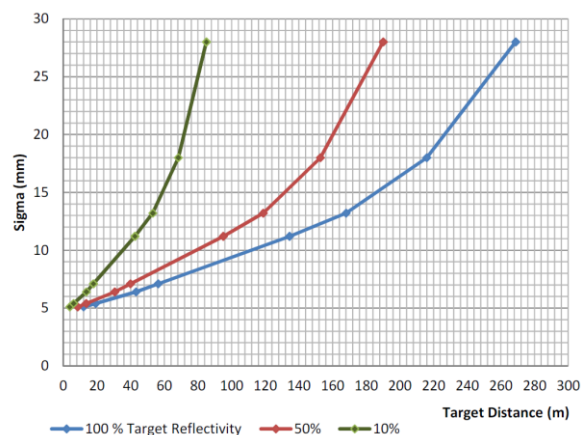
Article No.	Description
300-060-005 A	Front glass
AC-CBXX-1A3B-00	Multifunction cable with connectors (LW), 2 m
AC-DKXX-XA4X-00	Developer kit for PS Lightweight
AC-DKXX-XA2X-00	Developer kit for Range Modules

## PS Lightweight Performances

Spot Size function of Distance



Sigma function of Distance



# Triple-IN

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