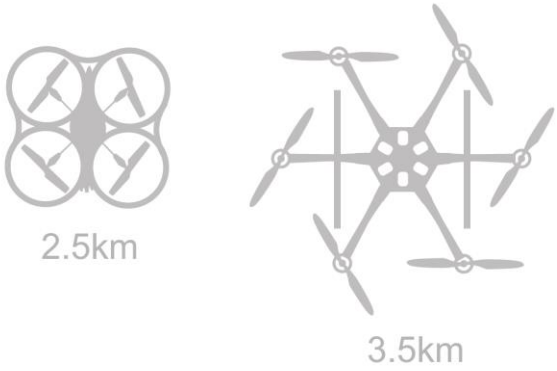

1 FEATURES

- Lightweight
- Compact
- Low power consumption
- Open frame

2 APPLICATIONS

- High clutter environments (terrestrial)
- Remote weapon stations
- Counter-UAV applications
- Observation and surveillance systems

3 DESCRIPTION

The RangePRO Model LRF-9698 is a compact, low mass OEM diode-pumped laser rangefinder module. All assemblies are integrated onto a precision bore-sighted open-frame platform.

It integrates with host systems such as weapon, sensing, or surveillance and tracking stations, and thermal imaging cameras. The standard communication interface is RS-422.

The LRF-9698 ranges at low repetition rates over distances to >10km depending on target size, target reflectivity and atmospheric conditions (typically 8km for vehicle type targets).

The transmitter is a collimated eye-safe laser system. It can provide ranging rates up to 5Hz. Special firmware is employed to limit the apparent divergence in high clutter environments. Optional upgrades are available to offer multi-pulse range-finding to further enhance distance performance.

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AUTHORISATIONS

	Name	Date	Signature
Author:	D. Denham	20 Nov. 24	
Engineering:	H. Henwood	20 Nov. 24	
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Engineering:	M. Walsh	20 Nov. 24	
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REVISION HISTORY

Modification Issue	Date	Description of Change	Ref
PS-RP-S-9698-A_1	8 Apr. 24	Initial release	
PS-RP-S-9698-B_1	14 Nov. 24	Formatting change; added minimum and maximum values	

4 SPECIFICATIONS

Notation - use of brackets in tables: [*notes & qualifications*].

4.1 System

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Wavelength		1,530		1,570	nm
Output energy	per pulse	300			µJ
Beam diameter	at exit			13	mm
Divergence			350	500	µrad
Receiver aperture				26	mm
Range read-out limits		50		20,000	m
Emitter type	Pulsed solid state laser				
Detector type	Avalanche photo diode (APD) with time variant gain				

4.2 Performance

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
Range Performance[1]	Small Drone [0.15x0.15]	Std. Clear; max.[2]		2,500		m
	Large Drone [0.3x0.3]			3,500		m
	Man [0.45x1.8]			5,000		m
	Vehicle [2.3X2.3]			8,000		m
	Building [50X50]			10,000		m
Range read-out limits		Factory selectable	50		20,000	m
Extinction ratio[3]			34			dB
Range accuracy			± 2 [4 rms over 10 shots]			m
Target discrimination	Lateral[4]				20	m
	Axial[5]				20	m
Ranging rate				60	300	Range /min

[1] Target albedo 0.3 @ 1,570nm
[2] Standard clear atmosphere; extinction coefficient 0.0448 km^{-1} @ 1,570nm (Modtran3); sea level visibility = 23.5km.
[3] Target range 500m; target albedo 85%; target size large; standard clear atmosphere; probability of detection >50%.
[4] For $1m^2$ targets at 5,000m.
[5] Between 500 & 5,000m.

4.3 Safety

PARAMETER	TEST CONDITIONS	VALUE	UNIT
Laser Classification[1]		Class 1	
NOHD		<0	m
ENOHD	7x50 binocular	<20	m
Visible Emission Filter		blocking	
Visible Emission	Distance ≥ 5m	nil	
Audible Emission	Distance ≥ 5m	nil	dB

4.4 Communications

PARAMETER	MIN	TYP	MAX	UNIT
Port(s)		1		
Baud Rate	9,600	19,200	115200	bits/sec
Type	RS-422			

4.5 Physical

PARAMETER	MIN	TYP	MAX	UNIT
Mass		226	250	g
Length		92.1		mm
Width		60.9		mm
Height		45.0		mm

4.6 Electrical

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage DC			10	12	15	V
Current Drain	Standby mode	Supply voltage = 12V			0.1	A
	Firing 1Hz				0.3	A
	Firing 5Hz				1	A
	Low power mode				0.1	A
Frame Isolation [Leakage current to frame from any connection]		+/-50Vdc			5	µA

[1] Australian/New Zealand Standard AS/NZS IEC 60825.1:2011 *Safety of Laser Products - Equipment classification and requirements.*

4.7 Environmental

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
Temperature[1]	Operate[2]		-40		63	°C
	Survive		-45		71	°C
Vibration and Shock		MIL-STD-810F [ground mobile]				
EMI / EMC		n/a [open frame]				

4.8 Support

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Operational life		10			years
Mean time between failure (MTBF)	Airborne Rotary Wing (ARW) @ 40°C	5000			hours
Mean time between failure (MTBF)	Airborne Rotary Wing (ARW) @ 40°C	10^6			shots

[1] Without wind chill or solar radiation.
[2] With some performance degradation at temperature extremes.