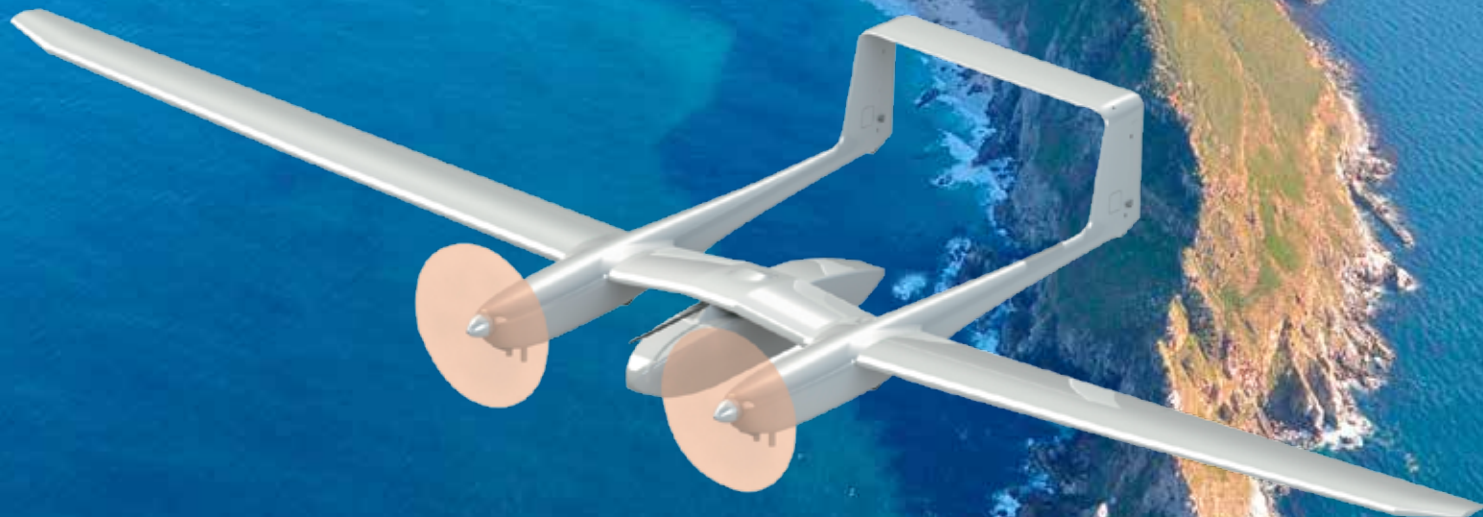


Focus on CSIR

Long Endurance Modular UAV (LEMU)



The CSIR Long Endurance Modular UAV (LEMU) is a research platform, designed to provide the capability for validating novel technology components and/or basic subsystems by integration and demonstration in a relevant flight environment.

A central hard point on the wing provides the capability to mount custom-sized payload pods. All major aerodynamic control surfaces (ailerons, elevator, rudders and flaps) are replicated (exist on both sides) introducing redundancy into the airframe. A horizontal stabiliser joins the two vertical fins.

Two variants of LEMU have been developed at the CSIR:

- a. **LEMU Internal Combustion Variant** – powered by two fuel injected internal combustion engines and providing up to 8 hours of endurance.
- b. **LEMU Electric Variant** – powered by two brushless electric motors and providing up to 1 hour endurance.

Contact details

John Morgan

*Contract Research and
Development Manager*

Tel: 012 841 2738

Email: JMorgan@csir.co.za

Kimal Hiralall

*Contract Research and
Development Manager*

Tel: 012 841 3187

Email: KHiralall@csir.co.za

www.csir.co.za

SYSTEM SPECIFICATIONS	LEMU INTERNAL COMBUSTION	LEMU ELECTRIC
PERFORMANCE CHARACTERISTICS		
Maximum take-off mass	65 kg	65 kg
Payload capability	Up to 20 kg (excluding fuel)	Up to 20 kg
Take-off distance	Assuming a tar runway (0.03 coefficient of rolling resistance): At 0 ft altitude 103 m At 1804 ft altitude 114 m At 5000 ft altitude 138 m	Assuming a tar runway (0.03 coefficient of rolling resistance): At 0 ft altitude 97 m At 1804 ft altitude 99 m At 5000 ft altitude 105 m
Maximum cross wind take-off capabilities	10 knots	10 knots
Maximum speed	48 m/s	38 m/s
Maximum climb rate	>250 ft/min	>250 ft/min
Endurance/range requirements	Up to 8 hours endurance (dependent on payload)	Up to 1 hour endurance (dependent on payload)
Stall Speed	<35 knots at maximum take-off weight in clean configuration	<35 knots at maximum take-off weight in clean configuration
PHYSICAL CHARACTERISTICS		
Airframe composition	<ul style="list-style-type: none"> Starboard fuselage with vertical fin and rudder Port fuselage with vertical fin and rudder Port wing Starboard wing Central wing Horizontal stabiliser Undercarriage 	<ul style="list-style-type: none"> Starboard fuselage with vertical fin and rudder Port fuselage with vertical fin and rudder Port wing Starboard wing Central wing Horizontal stabiliser Undercarriage
Avionics	<ul style="list-style-type: none"> Flight mission computer Sensor pack capable of sensing airspeed and altitude, accelerations and rotations. Data link Health conditioning unit. Flight/Payload operator control unit Ground tracker and antenna 	<ul style="list-style-type: none"> Flight mission computer Sensor pack capable of sensing airspeed and altitude, accelerations and rotations. Data link Health conditioning unit. Flight/Payload operator control unit Ground tracker and antenna
Payload	Pod with specified mounting on central wing	Pod with specified mounting on central wing
Wingspan	6,3 m	6,3 m
Length	2,3 m	2,3 m
Powerplant	2 x 5,5 HP internal combustion engines	2 x 4,5 kW brushless electric motors
Maximum loading	Designed to withstand flight loads from of -3 g to +6 g at maximum take-off mass.	Designed to withstand flight loads from of -3 g to +6 g at maximum take-off mass.
Undercarriage	Provide ground clearance of at least 120 mm	Provide ground clearance of at least 120 mm
Wheels and braking	Solid wheels with no braking mechanism	Solid wheels with no braking mechanism
Controls	Servo driven control consisting of: 2 x Throttles 2 x Ailerons 2 x Elevators 2 x Rudders with tail wheels 2 x Flaps	Servo driven control consisting of: 2 x Throttles 2 x Ailerons 2 x Elevators 2 x Rudders with tail wheels 2 x Flaps