

## MP2128<sup>LRC2</sup> MP2128<sup>HELI-LRC2</sup>

### Enclosed UAV Autopilot

As a world leader in miniature UAV autopilots, MicroPilot is continuously developing dynamic new systems to serve clients in the industry. "LRC" stands for "Long Range Communication," which refers to the LRC's most significant benefit, a redundant, long-range data communication link allowing greater distance and flexibility. The LRC ground unit uses standard, off-the-shelf radio modems. The ground station adds RC control information to the existing GCS datalink and a second redundant datalink, which reduces possible failure modes.

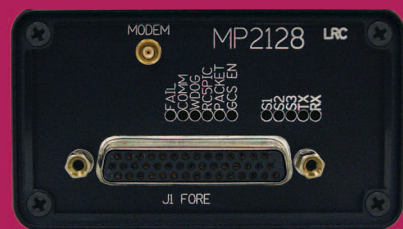
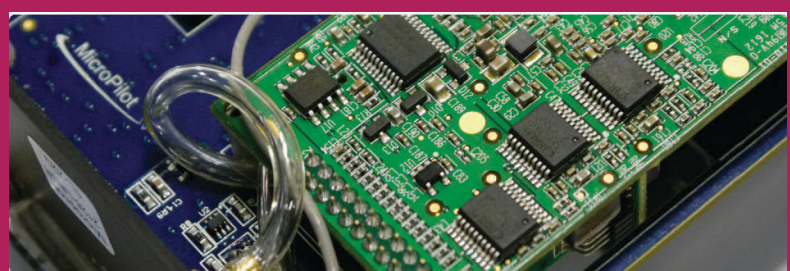
Emergency override on the LRC units is automatic. Their small, low-weight, but rugged aluminum enclosures protect sensitive electronics and are convenient to install in a variety of airframes.

The MP2x28 family of autopilots is the choice for UAV operators who need a reliable, integrated system that performs in all scenarios.

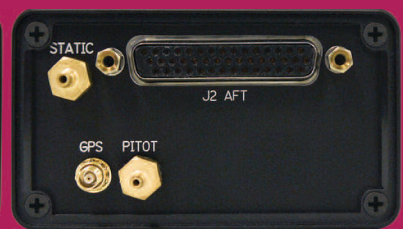
- Dual datalinks and dual frequencies
- Redundant manual control
- 12 servo outputs
- 8 high current drivers
- 8 analog inputs
- Backup manual control



**MicroPilot**  
The choice of over 1000 clients in 85 countries



Front



Back

**Incorporate all the functionality you need to fly both VTOL and fixed-wing UAV's in an enclosed autopilot**



# Specifications

## Servos

- Elevon, flaperons, 4 servo flap/aileron, separate flaps, v-tail, x-tail, split rudders
- 12 servo outputs
- 50 Hz servo update rate
- Separate servo and main battery power supply
- Separate voltage monitor for main and servo battery power supplies
- Integrated RC override
- 11 bit servo resolution

## Control System

- 30 Hz PID loop update rate
- Gain scheduling for optimum performance
- Rudder aileron feed forward for improved turn performance
- Aileron/elevator feed forward for improved altitude hold during turns
- Autonomous takeoff and landing
- User definable PID feedback loops
- User definable table lookup functions

## Navigation

- 4 Hz GPS update rate
- Move servo at waypoint
- Change altitude at waypoint
- Change airspeed at waypoint
- User definable holding patterns
- User definable error handlers
- RPV and UAV modes
- Supports GFPS accuracy
- 1,000 waypoint command buffer

## Telemetry, Datalog and Video

- Telemetry (100 user definable fields transmitted each second)
- 5 to 30 Hz telemetry update rate
- Onboard datalog: 52 standard fields, 24 customizable, 69 MB
- 5 or 30 Hz datalog update rate
- Can record for approximately 58 hours at 5 Hz

## Sensors

- Airspeed max speed: 500kph
- Altimeter max altitude 12,000m
- 5 g, 3-axis accelerometers
- 300°/s, 3-axis rate gyro

## Physical Characteristics

- Embedded long-range data communication link, frequency-hopping, spread spectrum 2.4 GHz, 900 MHz, other frequency optional
- 8 high current drivers,
- 8 analog sensor inputs to be displayed on the GCS
- 2 control modes
  - Autopilot mode (UAV/RVP)
  - Manually piloted mode for emergency response
- Wide range of input voltage (6.5-30 v)
- Weight 413 g
- 146 mm x 81.7 mm x 46 mm
- Failsafe watchdog timer

## A Family of UAV Autopilots

MicroPilot's small UAV product offering spans a range of product from our board level autopilots to enclosed autopilots. No matter what your customers require, be it a fixed-wing UAV, a helicopter UAV, a parafoil UAV, a blimp, a VTOL UAV or even a land based autonomous vehicle, MicroPilot has a solution for you.



- Board level autopilots for the smallest micro UAVs and fully integrated LRC autopilots for the most complex UAVs.
- Fixed-wing and helicopter autopilots, board level and highly integrated autopilots one learning curve and you know them all.
- All software is easily field upgradeable.
- RC override, fly by datalink or redundant fly-by-datalink.
- High value MP1028<sup>g2</sup> through high function MP2128<sup>g2</sup> and redundant autopilots anticipate all of our market requirements.
- Simple export controls classification lets you tap into the world market.

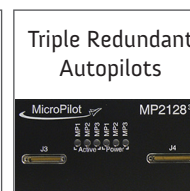
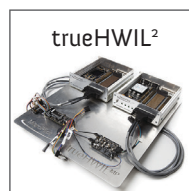
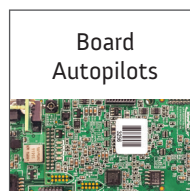


## Superior Technical Support

There is nothing more frustrating than waiting days or weeks for a response from a supplier's technical support. At MicroPilot, superior technical support has always been a priority. MicroPilot is committed to ensuring our technical support team has the people and equipment needed to answer your questions quickly and accurately.

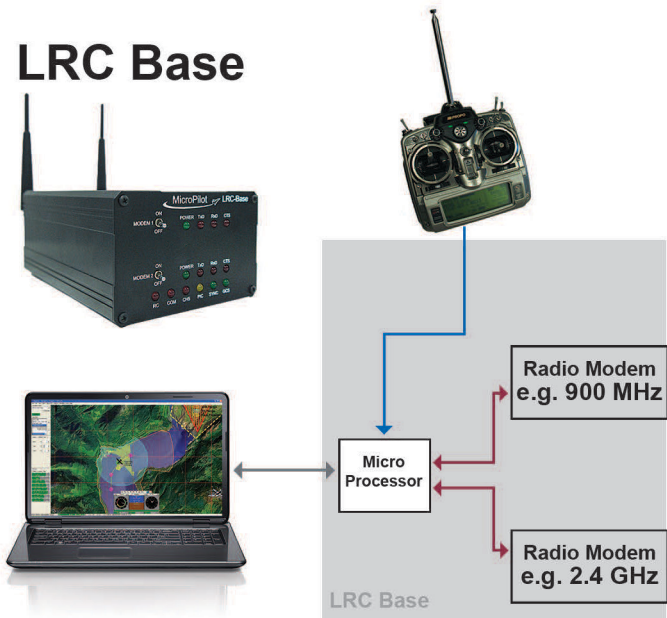
- MicroPilot consistently provides industry leading technical support so we are there during your integration and through to completion.
- Typically same day response on email and phone technical support keeps your team moving.
- Technical support management tools track your request from start to resolution to ensure that your questions and issues are addressed quickly and accurately.
- MicroPilot's technical support website provides a wealth of information to help you with your integration efforts.
- Common questions, technical notes, known problems, release notes, historical software versions are all available online.

**MicroPilot®**  
World Leader in Professional UAS Autopilots

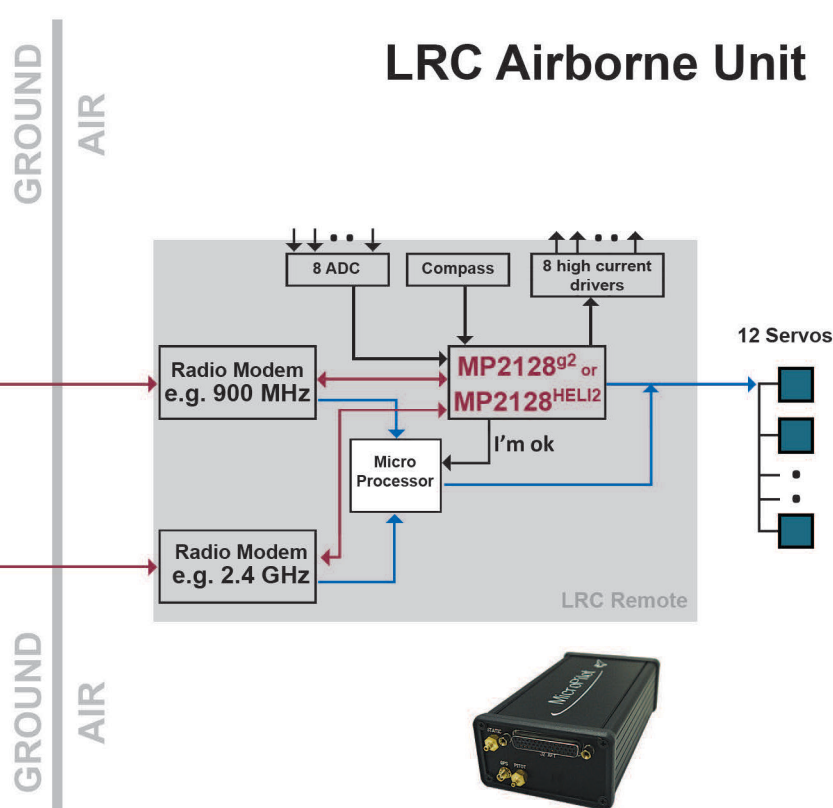




# LRC Base



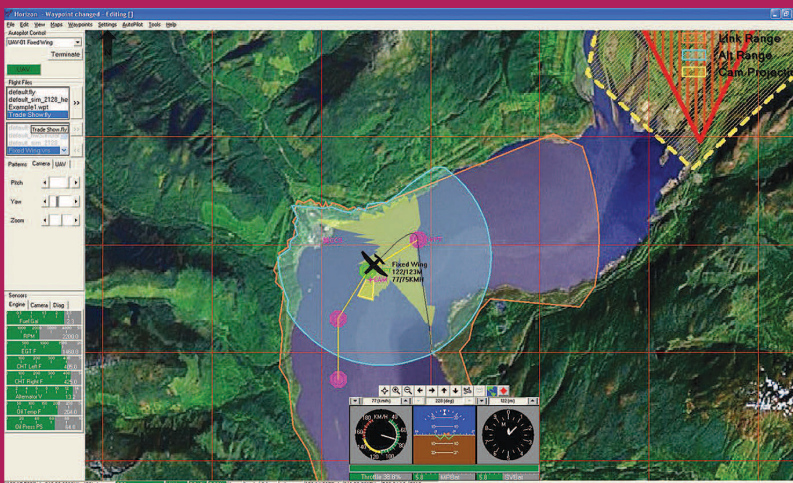
# LRC Airborne Unit



- RC Control
- Horizon Information
- Horizon & RC Control Information

## HORIZON<sup>mp</sup>

- Includes HORIZON<sup>mp</sup> ground control software
- MP2x28 simulator for operator training
- In-flight adjustable gains
- Change waypoints in flight
- Payload servos controlled from ground station
- Point and click waypoint editor
- Annotate video: text, icons, hand drawn
- Video clips for in flight playback
- Geo-reference stills
- Look here, fly by camera
- Video footprint, history, video cursor on map



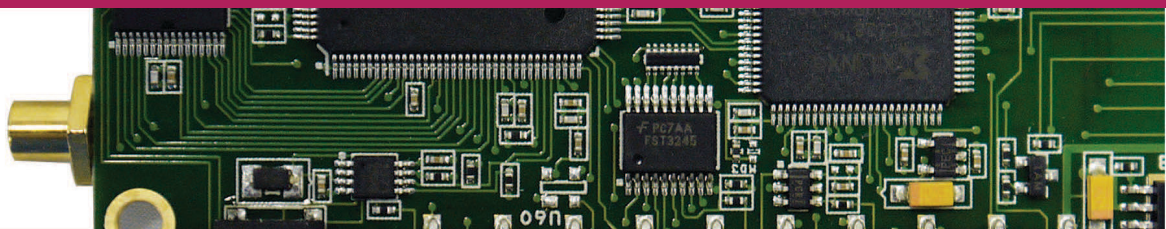
The HORIZON<sup>mp</sup> ground control software is included with all MicroPilot autopilots and offers a user friendly point-and-click interface. Developed by MicroPilot specifically for our autopilots, HORIZON<sup>mp</sup> runs on any Windows computer or laptop. HORIZON<sup>mp</sup> allows the operator to monitor the MicroPilot autopilot, change waypoints, upload new flight plans, initiate holding patterns and adjust feedback loop gains all while the UAV is flying.

The MicroPilot autopilots, coupled with HORIZON<sup>mp</sup> will get your UAV project off the concept page and into the air autonomously.

		<p>Custom Hardware/Software Development</p>	<p>Training &amp; Integration Service</p>
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**Flexibility...**  
**Reliability...**  
**Range...**



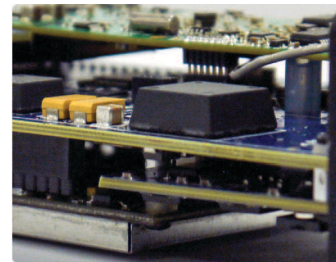
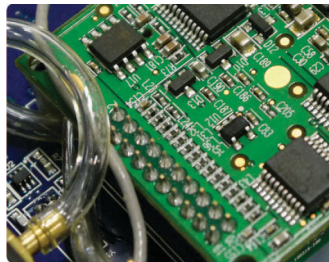
## Your Reliable UAV Partner

The autopilot is among the most critical components in your UAV. When you choose MicroPilot, you get much more than an autopilot – you get a partner. MicroPilot is here to service your UAV needs today and into the future. You can be sure that MicroPilot will continue to invest in our products and processes so that we can provide you with the most reliable UAV autopilots with the most functionality for the best possible cost.

- ISO9001 certification ensures that MicroPilot has the business practices in place to be your UAV autopilot partner.
- Nightly build and regression test processes catch errors as they occur.
- Advanced static code analysis processes find errors before they occur.
- Automated calibration system provides reliable, repeatable autopilots in the quantities you need when you need them.
- MicroPilot randomly flight tests our autopilots prior to shipment to ensure the highest quality.
- Issue tracking system linked to our version control system allows the traceability that helps solve problems when they occur.
- Release notes for all version of the software.



- The LRC's 1-Watt data radio modem provides reliable communications for telemetry and GCS-originated control at a range of about 20 km with a directional antenna.
- Fly-by-radio modem capability lets you manually pilot your UAV to a range of about 20 km with directional antenna and is compatible with off-the-shelf JR and Futaba transmitters.
- Dual radio modem design allows for two distinct frequencies for manual control due to RF interference.
- Redundant microprocessors provide manual control even in the event of a complete autopilot failure.
- The LRC's small, low-weight but rugged aluminum enclosure protects sensitive electronics and is convenient to install in a variety of airframes.
- By preventing interference with other UAV subsystems, the aluminum enclosure provides optimum EMI/RFI protection that simplifies integration.
- With three control modes including autopilot, manually piloted and emergency direct servo override, you can be confident that your UAV will perform in all scenarios. Automatic switching between manually piloted and emergency direct servo mode allows instant recovery.
- In the event of both autopilot and communications failure, a failsafe watchdog timer activates the parachute.
- The LRC's high current drivers simplify on/off control of onboard devices such as lights and cameras.
- Integrating the data radio modem, ADC converters, and high current drivers into a single package dramatically simplifies your wiring harness, reducing possible failure modes.
- Aviation grade connectors integrated into package.



**Range and Redundancy = Reliability**

**Integration = Simple Installation**

**Control = Confidence**

**Convenience = Time to Market**

