



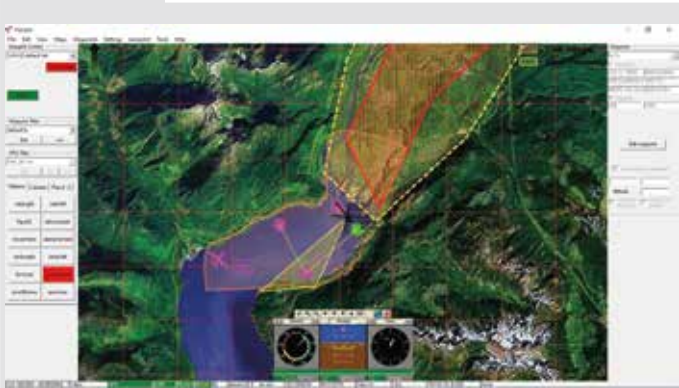
MP2x28

Family of UAV Autopilots

MicroPilot® is the choice of over 1500 clients in 100 countries. MicroPilot® flies a wide variety of aircraft (helicopter, small fixed-wing, jet, etc.). The MP2X28 series of autopilots is the world's smallest full featured family of UAV autopilots. Capabilities include airspeed hold, altitude hold, turn coordination, GPS navigation, vertical takeoff and landing (VTOL), hover to fixed-winged transition, plus autonomous operation from launch to recovery.

- Single Board Autopilots
- Enclosed Autopilots
- Triple Redundant Autopilots
- Fixed-Wing Autopilots
- Multirotor Autopilots
- Helicopter Autopilots
- Airship Autopilots
- Surface Vehicle Autopilots

HORIZON^{mp}



MicroPilot®
The choice of over 1500 clients in 100 countries



Triple Redundant



Enclosed Autopilots



Specifications

Servos

	MP1028 ^{g2}	MP2028 ^{g2}	MP2128 ^{g2}	MP2128 ^{HELI2}	MP2128 ^{HELI3}
Elevon, flaperons, 4 servo flap/aileron	Yes	Yes	Yes	Yes	Yes
Separate flaps, split flaperons, y-tail, x-tail, split rudders, no rudder, differential thrust	Yes	Yes	Yes	Yes	Yes
3 servo mechanical, 3 servo 90° Cyclic/Collective Pitch Mixing (CCPM)	No	No	No	Yes	Yes
4 servo 90° CCPM, 3 servo 120° CCPM, 4 servo 4 corner CCPM	No	No	No	Yes	Yes
Max number of servos	8	16	24	24	24
Servos update rate	50 to 400 Hz	50 to 400 Hz	50 to 400 Hz	50 to 400 Hz	50 to 400 Hz
Pegasus / Volz actuators protocols	No	No	Yes	Yes	Yes
CAN bus (mailboxes)	No	No	Yes	Yes, 14xBus0/Bus1	Yes, 32xBus0, 16xBus1
CAN open	No	No	No	Yes	Yes

Control System

Gain scheduling for optimum performance	Yes	Yes	Yes	Yes	Yes
Inner loop update rates	30 to 400 Hz	30 to 400 Hz	30 to 400 Hz	30 to 400 Hz	30 to 400 Hz
Autonomous takeoff and landing supported	Yes	Yes	Yes	Yes	Yes
User definable PID feedback loops	0	8	8	8	8
User definable table lookup functions	4	8	8	8	8
Plug-in compatible with XTENDER software developer's kit	Yes	Yes	Yes	Yes	Yes ¹
Surface vehicle control	Yes	Yes	Yes	Yes	Yes
Fixed wing aircraft and blimp control	Yes	Yes	Yes	Yes	Yes
Helicopter control	No	No	No	Yes	Yes
Multi-rotor (3, 4, 5, 6, or 8 rotors) control	Yes	Yes	Yes	Yes	Yes
Multicopter fixed wing hybrid control	Yes	Yes	Yes	Yes	Yes
Tailsitter control	Yes	Yes	Yes	Yes	Yes
Tiltrotor control	Yes	Yes	Yes	Yes	Yes
Tumble recovery / autorotation	No	No	No	Yes	Yes
Stall recovery	No	No	Yes	Yes	Yes
Calculation blocks	No	No	No	Yes	Yes
Vision system input	No	No	Yes	Yes	Yes

Navigation

GPS update rate	4 Hz	4 Hz	4 Hz	4 Hz	4 Hz
Position update rate	30-200 Hz	30-200 Hz	30-200 Hz	30-200 Hz	30-200 Hz
User definable holding patterns	Yes	Yes	Yes	Yes	Yes
User definable error handlers	Yes	Yes	Yes	Yes	Yes
UAV, RPV and arcade modes	Yes	Yes	Yes	Yes	Yes
Dead Reckoning if GPS is lost ²	No	Yes	Yes	Yes	Yes
1000 entry command buffer	Yes	Yes	Yes	Yes	Yes
Trimble RTK GPS support	No	No	Yes	Yes	Yes
NovAtel Dual Frequency RTK, ALIGN Heading and Relative Positioning	No	No	Yes	Yes	Yes
Ublox RTK GPS Support	Yes	Yes	Yes	Yes	Yes
User defined threads	4	8	16	24	24
Draping	No	No	Yes	Yes	Yes
Backtrack	No	No	Yes	Yes	Yes
Supported GNSS	GPS	GPS	GPS	GPS	GPS/GLONASS/Galileo/BeiDou
Concurrent constellations	1	1	1	1	3

Ground Control Station HORIZON^{mp}

HORIZONmp ground control software included with system	Yes	Yes	Yes	Yes	Yes
SWIL simulator for operator training	Yes	Yes	Yes	Yes	Yes
In-flight adjustable gains	Yes	Yes	Yes	Yes	Yes
Add & delete waypoints in flight	No	No	Yes	Yes	Yes
Move waypoints, reprogram all waypoints in flight	Yes	Yes	Yes	Yes	Yes
Multi-UAV support / Multi-GCS support / Ownership / Binding	No	No	Yes	Yes	Yes
Point and click waypoint editor	Yes	Yes	Yes	Yes	Yes
Second GCS port / Serial port pass through	No	No	Yes	Yes	Yes

¹ - XTENDER⁶³ SDK is available separately. ² - MP Compass is required.



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MicroPilot®
World Leader in Professional UAV Autopilots



Telemetry, Datalog and Video

	MP1028 ^{g2}	MP2028 ^{g2}	MP2128 ^{g2}	MP2128 ^{HELI2}	MP2128 ^{HELI3}
Telemetry (100 user definable fields transmitted in five groups of 20)	No	Yes	Yes	Yes	Yes
Telemetry update rate	5 Hz	5 Hz	5/30 Hz	5/30 Hz	5/30 Hz
Camera Telemetry	No	Yes	Yes	Yes	Yes
Traffic Telemetry	No	Yes	Yes	Yes	Yes
Datalog Size and Fields	69 MB and 47 standard fields	69 MB and 47+48 custom fields	69 MB and 47+48 custom fields	69 MB and 47+48 custom fields	312.5 MB and 47+48 custom fields
Datalog update rate	5 Hz	5 Hz	5/30 Hz	5/30 Hz	5/30 Hz
Ability to log feedback loop P/I/D term contributions in datalog	No	No	Yes	Yes	Yes

Other Features

Autopilot version and model override	No	No	Yes	Yes	Yes
Iridium satellite modem support	No	No	Yes	Yes	Yes
Transponder support	No	No	Yes	Yes	Yes
Roke Manor radar altimeter support	No	No	Yes	Yes	Yes
AGL sensor support - Garmin LIDAR-Lite v3 or LIDAR-Lite v3HP, LeddarOne, Carlson ILM	Yes	Yes	Yes	Yes	Yes
Programmable I/O pins (Digital input/output, Pulse measurement, PWM output, Edge detect, PPM Input)	1	2	14	14	14
VRS locking	Yes	Yes	Yes	Yes	Yes
trueHWIL available	No	No	Yes	Yes ³	Yes ³
Support duration	3 months	6 months	12 months	12 months	12 months
Support service level	Basic	Premium	Premium	Premium	Premium
Warranty	3 months	6 months	12 months	12 months	12 months

Sensors

Max pressure altitude	1,250 m	12,000 m	12,000 m	12,000 m	12,000 m
Max airspeed	187 kph	500 kph	500 kph	500 kph	500 kph
3-axis accelerometers(maximum)	5 g	5 g	5 g	5 g/40g	40g
3-axis gyros(maximum)	300°/s	300°/s	300°/s	300°/s	450°/s
Attitude update rate	200 Hz	200 Hz	200 Hz	200 Hz	200 Hz
Attitude accuracy	<3°	<3°	<2°	<1°	<1°
MP-Compass	Option	Option	Option	Included	Included
CAN Compass support	Yes	Yes	Yes	Yes	Yes ¹

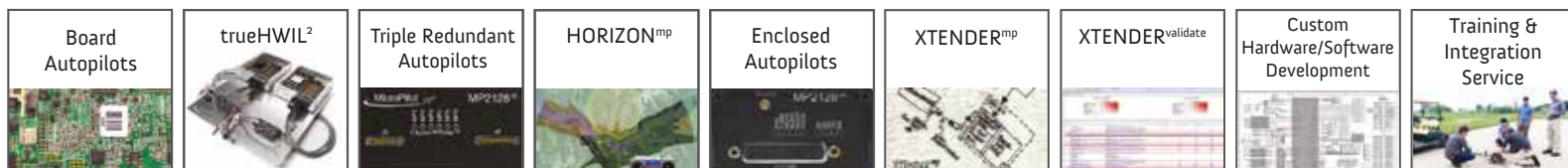
Camera

Stabilize and control servo based cameras	Yes	Yes	Yes	Yes	Yes
DST / DRS / Controp / UAV Vision camera support	No	No	Yes	Yes	Yes
NextVision camera support	No	Yes	Yes	Yes	Yes
Fly/loiter by camera	No	No	Yes	Yes	Yes
Look here feature	Yes	Yes	Yes	Yes	Yes
SightLine Applications (onboard video processor) support	No	No	Yes	Yes	Yes
Video overlay (16 user definable fields)	Yes	Yes	Yes	Yes	Yes
High rate camera telemetry	No	No	Yes	Yes	Yes

Physical Characteristics

Weight (including GPS receiver and all other sensors)	24 grams	40 grams	40 grams	40 grams	42 grams
Operating voltage	6.5V to 60V ⁴	6.5V to 60V ⁴	6.5V to 60V ⁴	6.5V to 60V ⁴	6.5V to 60V
Current @ 6.5 VDC	192 mA	192 mA	192 mA	192 mA	TDB
Dimensions		10 cm in length	4 cm in width	1.5 cm in height	
Software upgradable in the field	Yes	Yes	Yes	Yes	Yes
IMU Calibration temperature range	10°C to 30°C	0°C to 45°C	-20°C to 65°C	-40°C to 85°C	-40°C to 85°C
Pressure Sensor Calibration temperature range	10°C to 30°C	0°C to 40°C	-20°C to 50°C	-27°C to 65°C	-27°C to 65°C
Calibration points	3	5	8	10	10
Accelerometer and gyro alignment compensation	No	No	Yes	Yes	Yes
Certificate of conformity ⁵	No	No	Yes	Yes	Yes
Conformal coated printed circuit board	No	No	No	Yes	Yes
Underfilled printed circuit board	No	No	Yes	Yes	Yes
Environmental stress screening	None	Random Sample	100%	100%	100%
Final check	None	Random Sample	Full	Full	Full
MTBF hours at 0°C	-	-	78,135	78,135	TBD
MTBF hours at 25°C	-	-	49,915	49,915	TBD
MTBF hours at 50°C	-	-	37,215	37,215	TBD
Expected Product Lifespan	-	-	2027	2030	2035
Offsite inventory	No	No	Yes	Yes	Yes

³ - emulates 5 g accelerometer rather than 50 g. ⁴ - legacy g2 autopilots operating voltage is 6.5V to 30V. ⁵ - MicroPilot may use refurbished components in both MP1028^{g2} and MP2028^{g2} autopilots.



CONFIGURATION TOOLS

Setup Wizard - Provides a step by step guide to configuring a MicroPilot[®] autopilot for fixed-wing, helicopter or multirotor style vehicles.

Vibration Analyzer - Provides frequency analysis of vibration data from both accelerometers and gyros.

Datalog - Powerful post flight analysis tool.

qHWIL - Quasi hardware in the loop simulator allows simulation via serial port.

Status Monitor - Powerful in-flight analysis tool that allows you to see the inner workings of your MicroPilot[®] autopilot in flight. Provides detailed feedback loop performance information in graphic form to facilitate fine-tuning your control system.

Configuration Analyzer - Automatically reviews your autopilot configuration for conflicting or incorrect settings.

ADC Calibrator - Calibrate extra ADC channels for higher precision.

AVL Editor - An easy to use setup utility for the open source CFD program AVL. Enter your aircraft, use AVL to generate its linearized stability derivatives and automatically import them into the HORIZON[™] simulator

Five Autopilots, One Learning Curve



MP2128^{HELI3}

- Flies multirotor, fixed-winged, VTOL, helicopter, and transitioning.
- 3rd generation autopilot based on a safety-critical microprocessor.
- Improved I/O and sensors.
- ARINC 653 partitioned RTOS.
- Software and form factor compatible with 2nd generation autopilot.

MP2128^{HELI2}

- Flies multirotor, fixed-wing and helicopter.
- Richest feature set of all MP2x28 autopilots.
- Tumble recovery and autorotation.
- Sophisticated calibration and screening for widest temperature range and highest reliability.
- Upward compatibility with all MP2x28 autopilots.

MP2128^{g2}

- Flies multirotor and fixed-wing.
- Expanded feature set for fixed-wing vehicles.
- High quality components and wide temperature range.
- Wide range of communication options.

MP2028^{g2}

- Flies multirotor and fixed-wing.
- Offers the flexibility you need to satisfy your customers.
- Excellent price-performance.

MP1028^{g2}

- Flies multirotor and fixed-wing.
- Suitable for entry-level applications where cost is the overriding consideration.



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