BLACK MAGIC MISSILE WORKS
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Top View with Inertial Sensor and Battery Options

Black Magic Missile Works™ is pleased to introduce its UFC-4 fourth generation Universal Flight Controller, the most advanced single board flight computer for Amateur Level II, III and Research grades available. Its advanced capabilities provide unprecedented user control of numerous digital and analog I/O ports, up to 40 mile telemetry range, five fix per second GPS, Inertial Sensor and much more. It is about half the cost of its predecessor (UFC-2) with improved performance and is much more highly integrated. It takes the best features of UFC-3 while minimizing cost, size and weight. It features the same high level user programmability as all other Universal Flight Controllers.

Bottom View with Telemetry Module (Heat Sink)

A three axis magnetic compass (Honeywell HMC6343) is being developed as an option. Support for user software/hardware customization similar to the UFC-3 Open System Developers Module (OSDM) may be made available to certain parties. Universities and commercial users are encouraged to inquire.

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UFC-4 Specifications

Size (not including GPS)	2.500"x 6.000" x 1.550" high	
Input Power	6-25 VDC	
Maximum Input Current	4 Amps (1 Watt Typical when Idle)	
Maximum Acceleration, Bump/Shock	500g, MIL-STD 810F (40g)	
Operating Temperature Range	-40°C to +85°	
Humidity	Not to exceed 95% non-condensing	
Module Finish	Immersion Gold on exposed copper, Conformal Coating	
CPU	Cypress CY8C5588AXI-060 (32-bit ARM Cortex)	
SRAM/EEPROM	64Kbytes/2Kbytes	
Flash (on-chip/external NAND)	256Kbytes/128Mbytes (4-bit ECC)	
Serial port	RS-232 Ground Support	
User Digital I/O	Up to 8	
Pyro Channels w/Continuity Testing	2 @ 1 Amp (2 Amps optional)	
Accelerometer(s)	X/Y/Z-axis selectable 6/12/24g (16-bit). Optional 100g (12-bit)	
Altimeter	0.15-16.2 psia (up to 24-bit ADC), 64-1,024 sps	
Indicator LEDs	Status, GPS Lock, Pyro 0/1 Continuity	
Module Weight (grams/ounces)	208/7.4	
RF Modem Type (Optional)	Digi 9XTend	
RF Modem Frequency	ISM 900 MHz frequency band	
RF Modem Output Power	1 W (lower power selectable)	
RF Modem Data Rate	9,600 baud	115,200 baud
Range (line of sight, high gain antenna)	40 miles	20 miles
Available channels/addresses per channel	10/65,000+	
License requirements	None	
GPS Type (Optional)	Garmin GPS-18 5Hz.	
GPS Mounting	External Receiver/Antenna Module (RS-232)	
Fixes per Second	5	
Position Accuracy	15m Standard, 3m WAAS	
Velocity Accuracy	0.12m/s	
Maximum Velocity	1,150 mph (514m/s) above 60,000' (18,288m)	
Reacquisition Time	< 2 sec.	
GPS Weight (grams/ounces)	70/2.5	
GPS Size	61mm dia., 19.5mm high	
Number of ADC Channels	Up to 8	
ADC Resolution	15/16/18/20-bit depending on sample rate and number of channels	
Standard D.C. Input Range	2.048 Volts	
D.C. Accuracy (est.)	0.25% max./0.1% typical	
ADC Options	Single-ended/Differential Input, Custom Input Scale/Offset, Programmable Gain Amplifier (PGA), Thermocouple support	
PGA Gain	1, 2, 4, 8, 16, 24, 32, 48, 50, 64, 96, 100, 128, 192, 200, 256, 384, 400	
Thermocouple Range (Type K)	-180°C to +1,200°C	
Inertial Sensor (Optional)	Analog Devices ADIS16365	
Sensor Resolution	14-bits	
Sensor Range	±300 degree/second, ±17g	
Sensor Bandwidth	350 Hz	
Battery (Optional)	2 x 7.4V Lithium	14.4V Lithium
Capacity Ah	0.75	
Surge Current Amps (1 second)	3.8	

3D SolidWorks 2008, Step models, Acrobat 3D and 2D mechanical drawings and User Guide available on the website downloads page (http://www.blackmagicmissileworks.com/downloads.htm).