OmniMini Autopilot

DataSheet

VERSION	REVISION DATE	REVISOR	REVIEWER	REVISED CONTENTS
VO		VR	VR	
V1		VR	BW	
V2		BW	BW	

Features:

Specifications:

Microprocessor:

- 32-bit STM32F427 Cortex M4 core with FPU
- Clock Speed: 168 MHz
- RAM: 256 KB
- FLASH: 2 MB

External Memory:

- F-RAM Cypress MF25V02 256-Kbit nonvolatile memory (Flash memory that performs as fast as RAM)
- SD Card slot with support upto 32GB Micro SD card

Sensors:

- Invensense MPU-9250 3-axis accelerometer/gyroscope/magnetometer
- Invensense ICM-20608 3-axis accelerometer/gyroscope
- MEAS MS5611 barometer
- Honeywell HMC5983 magnetometer

Interfaces:

- 2x USART with Hardware flow control
- 2x UART
- 1x CAN
- Spektrum DSM / DSM2 / DSM-X Satellite compatible input up to DX9 and above.
- Futaba S.BUS & S.BUS2 compatible input
- Graupner SUMD
- Yuneec ST24
- PPM sum input signal
- OneShot PWM output (Configurable)
- RSSI (PWM or voltage) input
- 1x l2C
- External micro USB B port
- JTAG (with test points)
- 6x PWM outputs
- JST-GH connectors using Dronecode connector standard

Power System:

Ultra low noise LDO voltage regulators

Weight and Dimensions:

- Weight: 8.7g
- Width: 38mm
- Length: 38mm

General Description:

The Omnimini autopilot is engineered to deliver exceptional performance and reliability for micro and nano class drones, leveraging advanced processing capabilities and a robust array of sensors. It features a powerful 32-bit STM32F427 Cortex M4 microprocessor, operating at a clock speed of 168 MHz with 256 KB of RAM and 2 MB of flash memory. This high-performance processor ensures efficient handling of complex flight control algorithms and real-time data processing, critical for maintaining stability and responsiveness during flight.

The autopilot includes a comprehensive set of sensors such as the Invensense MPU-9250 and ICM-20608 for accurate motion detection, MEAS MS5611 barometer for precise altitude measurement, and Honeywell HMC5983 magnetometer for reliable heading data. It supports a wide range of interfaces including multiple USART and UART ports, CAN, I2C, and PWM outputs, as well as compatibility with popular remote control protocols like Spektrum DSM, Futaba S.BUS, and Graupner SUMD. The system's ultra low noise voltage regulators and lightweight design, with a compact form factor of 38mm by 38mm and weighing just 8.7g, make it an ideal choice for high-performance micro-class drone applications.

PinOut:

Connector J1:

	Sr No	Pin Name	Pin Description
	1	VDD_5V_RECEIVER	5V power supply for external receivers
	2	RC_INPUT	Signal input for radio control receiver
	3	RSSI_IN	Analog input for receiver signal strength indication
	4	VDD_3V3_SPEKTRUM	3.3V power supply for Spektrum receivers
J1	5	GND	Ground connection

Connector J2:

	Sr No	Pin Name	Pin Description
	1	FMU_CH1	First channel output for motor or servo control
	2	FMU_CH2	Second channel output for motor or servo control
	3	FMU_CH3	Third channel output for motor or servo control
	4	FMU_CH4	Fourth channel output for motor or servo control
	5	FMU_CH5	Fifth channel output for motor or servo control
	6	FMU_CH6	Sixth channel output for motor or servo control
	7	GND	Ground connection
J2	8	GND	Ground connection

Connector J3:

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	Sr No	Pin Name	Pin Description
	1	VDD_5V_PERIPH	5V power supply for peripheral devices
	2	FMU_USART3_TX	Transmit line for USART3 communication
	3	FMU_USART3_RX	Receive line for USART3 communication
	4	FMU_USART3_CTS	Clear to Send line for USART3 flow control
	5	FMU_USART3_RTS	Request to Send line for USART3 flow control
J3	6	GND	Ground connection

Connector J4:

	Sr No	Pin Name	Pin Description
	1	VDD_5V_PERIPH	5V power supply for peripheral devices
	2	CAN_CH	CAN bus high line for data communication
	3	CAN_CL	CAN bus low line for data communication
J4	4	GND	Ground connection

Connector J5:

	Sr No	Pin Name	Pin Description
	1	VDD_5V_PERIPH	5V power supply for peripheral devices
	2	FMU_USART2_TX	Transmit line for USART2 communication
	3	FMU_USART2_RX	Receive line for USART2 communication
	4	FMU_USART2_CTS	Clear to Send line for USART2 flow control
5 FMU_USART2_RTS Request to Send line for USART2 flow cont		Request to Send line for USART2 flow control	
J5	6	GND	Ground connection

Connector J6:

	Sr No	Pin Name	Pin Description
	1	VDD_5V_PERIPH	5V power supply for peripheral devices
	2	FMU_USART4_TX	Transmit line for USART4 communication
	3	FMU_USART4_RX	Receive line for USART4 communication
	4	FMU_I2C1_SCL	I2C1 clock line for communication
	5	FMU_I2C1_SDA	I2C1 data line for communication
J6	6	GND	Ground connection

Connector J7:

	Sr No	Pin Name	Pin Description
	1	VDD_5V_BRICK	5V power supply for the power module or brick
	2	VDD_5V_BRICK	5V power supply for the power module or brick
3 BAT_CURRENT_SENSE Analog input for battery current sensing		Analog input for battery current sensing	
	4	BATT_VOLT_SENS	Analog input for battery voltage sensing
5 GND Ground connection		Ground connection	
J7	6	GND	Ground connection

Connector J8:

	Sr No	Pin Name	Pin Description
	1	SAFETY_SWITCH_IN	Input for safety switch signal
	2	LED_SAFETY	Output for safety LED indication
	3	FMU_VDD_3V3	3.3V power supply for the flight management unit
	4	BUZZER-	Negative terminal for the buzzer
J8	5	BUZZER+	Positive terminal for the buzzer

Connector J9:

	Sr No	Pin Name	Pin Description
	1	VDD_5V_PERIPH	5V power supply for peripheral devices
	2	FMU_USART1_TX	Transmit line for USART1 communication
	3	FMU_USART1_RX	Receive line for USART1 communication
J9	4	GND	Ground connection

Front and back side of the board:

Front side:







Operational Conditions:

	Min	Max
Temperature	-10°C	45°C
Voltage	4.2 V	5.7 V
Current	200 mA	1.2 A



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