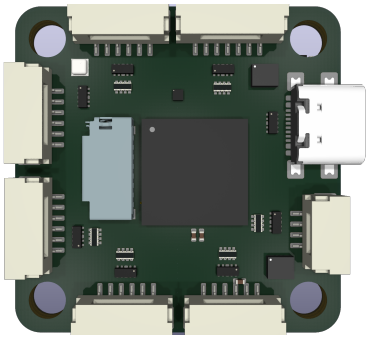
Falkr VMU 6F-RT



Product Description

The Falkr vehicle managment unit (VMU) is a high-performance vehicle controller designed and produced in **Sweden**. The vehicle controller is powered by the exceptionally powerful **NXP i.MX RT1064 M7** micro controller @600 MHz, and is equipped with dual IMU:S (**TDK ICM-45686**). The design makes it highly suitable for autonomous applications for advanced vehicle platforms, such as marine surface vehicles, underwater vehicles, aerial helicopters, fixed-wing-, and multi-rotor air-crafts. It is built for maximum reliability and redundancy with tight integration into the Drone Code foundation ecosystem with **PX4** and **MAVLINK**.

Key features

- NXP i.MX RT1064 M7 @ 600 MHz
- 4 MB internal flash
- Double redundant TDK ICM-45686 IMU:s
- 3 telemetry ports
- 8 PWM/DSHOT600 channels

Applications

- FPV applications
- Multirotor systems
- Fixed-wing aircrafts
- Helicopters
- Marine surface watercraft
- Underwater watercraft
- Autonomous functions for vehicle systems
- Robotics development and prototyping

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Electrical specifications

Parameter	Min	Max	Unit
Supply voltage (V_{in})	-0.3	6.0	V
Supply voltage (V_{batt})	-0.3	60.0	V
Output current (per peripheral)		1.0	A
Output current (total)		2.0	A
Operation temperature	-20.0	65.0	°C
Storage temperature	-40.0	85.0	°C
ESD IEC 61000-4-2		15.0	kV

Note: *Stresses above those listed above can cause permanent damage to the device. This is a stress rating only. Functional operation of the device is not implied in any conditions above those indicated in the Electrical Specifications section.*

Operating Conditions

Parameter	Symbol	Min	Typ.	Max	Unit
Supply voltage (V_{in})	V_{in}	4.5	5.0	5.5	V
Supply voltage (V_{batt})	V_{batt}	16.0		54.0	V
Operating temperature	T_A	−10.0		55.0	°C

Power Characteristics

- $5\,\text{V}$ BEC @ $2\,\text{A}$
- $16\,\text{V}$ BEC @ $2\,\text{A}$
- Seperate sensor power domains for IMUs

The VMU may be powered by either V_{in} or V_{batt}.

$V_{in} = 5.0\,\text{V}$, $T_A = 25\,^{\circ}\text{C}$, *unless otherwise noted.*

Parameter	Condition	Min	Typ	Max	Unit
Supply current (active)	[clock = 600 MHz]		[x.x]	[x.x]	mA
Supply current (standby)	[sleep mode]		[x.x]	[x.x]	µA

Sensors Characteristics

- 2x IMU ICM-45686
- 1x Barometer BMP581
- 1x Magnetometer BMM350

Parameter	Min	Typ.	Max	Unit
Gyro Full-scale	±15.625		±4000	$^{\circ}\,\text{s}^{-1}$
Gyro natural resonant frequency		29.7		kHz
Gyro output rate			6400	Hz
Accelerometer Full-scale	±2		±32	g
Accelerometer output rate			6400	Hz
Barometric Pressure range	30		125	kPa
Barometric Temperature range	-40		85	$^{\circ}$ C
Output rate			240	Hz

Connector Configuration

The VMU uses the standard Pixhawk connector set for most peripherals, including the JST-GH latching connector. Pins are rated at 1A each.

Power in — JST-GH 6-pin

Pin	Name	Description
1	V_{in}	5V power regulated power input
2	V_{in}	5V power regulated power input
3	SDA	I2C serial data input/output
4	SCL	I2C serial clock input
5	GND	GND power
6	GND	GND power

Telemetry with flow control — JST-GH 6-pin

Pin	Name	Description
1	V_{out}	5V power **output** for peripheral
2	TX	UART transmit output. Connect to RX on peripheral
3	RX	UART transmit input. Connect to TX on peripheral
4	RTS	Request to send signal for flow-control
5	CTS	Clear to send signal for flow-control
6	GND	GND power

Telemetry without flow control — JST-GH 4-pin

Pin	Name	Description
1	V_{out}	5V power **output** for peripheral
2	TX	UART transmit output. Connect to RX on peripheral
3	RX	UART transmit input. Connect to TX on peripheral
4	GND	GND power

CAN — JST-GH 4-pin

Pin	Name	Description
1	V_{out}	5V power **output** for peripheral
2	CAN-H	CAN High
3	CAN-L	CAN Low
4	GND	GND power

GPS with I^2C — JST-GH 6-pin

Pin	Name	Description
1	V_{out}	5V power **output** for peripheral
2	TX	UART transmit output. Connect to RX on peripheral
3	RX	UART transmit input. Connect to TX on peripheral
4	SCL	I2C clock
5	SDA	I2C data
6	GND	GND power

UART with utility for companion computer communication — JST-GH 6-pin

Pin	Name	Description
1	Bootloader request	Bootloader request input during boot.
2	TX	UART transmit output. Connect to RX on peripheral
3	RX	UART transmit input. Connect to TX on peripheral
4	nARMED	Active low armed signal output
5	FMU Reset request	FMU reset signal input. Inactive when vehicle is armed
6	GND	GND power

External SPI — JST-GH 6-pin

Pin	Name	Description
1	V_{out}	Bootloader request input during boot.
2	SCK	SPI clock output
3	MOSI	SPI master out slave input
4	MISO	SPI master input slave output
5	nCS	SPI chip select
6	GND	GND power

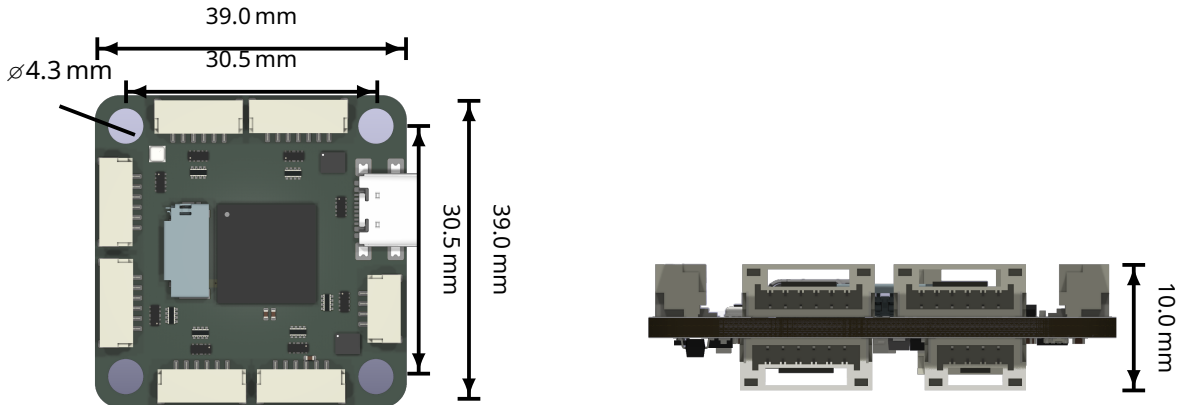
Motor 1 PWM connection. V_{batt} can power the flight controller — JST-GH 7-pin

Pin	Name	Description
1	V_{batt}	Battery power input from ESC
2	Curr	Current feedback to ADC
3	Motor 1	PWM or DSHOT
4	Motor 2	PWM or DSHOT
5	Motor 3	PWM or DSHOT
6	Motor 4	PWM or DSHOT
7	GND	GND power

Motor 2 PWM connection. — JST-GH 6-pin

Pin	Name	Description
1	Curr	Current feedback to ADC
2	Motor 5	PWM or DSHOT
3	Motor 6	PWM or DSHOT
4	Motor 7	PWM or DSHOT
5	Motor 8	PWM or DSHOT
6	GND	GND power

Mechanical specifications



(a) Top-down view

(b) Side view

Figure 1: Falkr VMU 6F-RT mechanical specifications

Package and Ordering Information

Order Code	Package	Description
Falkr-6F-RT-1	N/A	Standard

Compliance and Environmental

- RoHS compliant (Directive 2011/65/EU, amended 2015/863)
- REACH compliant (EC 1907/2006)

Product Revision History

Rev.	Date	Note
0.1.0	[2026-10-13]	First release
0.2.0	[2026-10-22]	Iusto impedit fugit et cupiditate dolor ut doloremque. Aut amet et sint quia. Voluptatem vitae sit distinctio non distinctio perspiciatis consectetur. Tenetur aliquid quasi at alias sapiente qui qui. Doloribus eveniet eum similique animi aliquid. Dolorum ut esse non necessitatibus.

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