

# MINDRACER SPECIFICATION

## Highlights

- Ultra mini size, weight only ~6g
- High performance F4 168MHz floating point processor, super fast throttle response
- Support OneShot ESC
- Support PPM/SBUS/DSM radio receivers, support D.Port/S.Port/Wifi telemetry
- On board flight data recorder
- Support IMU isolation
- DroneCode standard compliant connector

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## Physical

	MindRacer
Flight controller / Processor	F427 VIT6
Weight	~6g
Dimension	35 x 35mm
PWM outputs	maximum 6
IMU	10DOF
IMU isolation	YES/Optional
Radio receiver	PPM/S.BUS/SUMD/SPEKTRUM
Telemetry	FrSky D.Port, S.Port, Wifi, 3DR radio
on board TF card for flight data recording	YES
OneShot ESC support	YES
Expansion ports	2 x 7(pin) x 2
on board Real time clock	YES
connector	JST GH (compliance with DroneCode standard)

## Power

Input voltage: 5V DC (+4.7V ~ +5.2 V, from PDB)

Current: ~150ma (no peripheral)



### Important

Input voltage exceeds the specified range may damage the flight controller permanently.

MindRacer can power small peripheral devices through its ports. MindRacer can provide 2 kinds of voltage, +5V and +3.3V. Check MindRacer specification for the pin out of power supply.

MindRacer can supply maximum 100mA@5V or 100mA@3.3V.



### Important

Please make sure peripheral devices do not draw more currents than the specified range as in specification, or the MindRacer may reboot or even be damaged.

## IMU

On board IMU components include:

Accelerometer: MPU-6500

Gyroscope: MPU-6500

Compass: HMC5983

Barometer: MS5611

MindRacer supports the option to mount redundant, isolated IMUs through its on board connector.

## Connectors

J1 - USB (micro)

J3 - TF card slot

J7 - vibration isolated IMU interface

J15 - SWD/Serial 5

J8 - General purpose telemetry port (TELEM2)

J9 - RC input

J10 - Main outputs

J13 - Power

## Remote

MindRacer supports PPM, S.BUS, SUMD, SPEKTRUM DSM/Satellite receivers through its one-wire serial remote control input port.

Spektrum satellite receiver uses 3.3V output as power supply so a different cable is provided than other receivers.

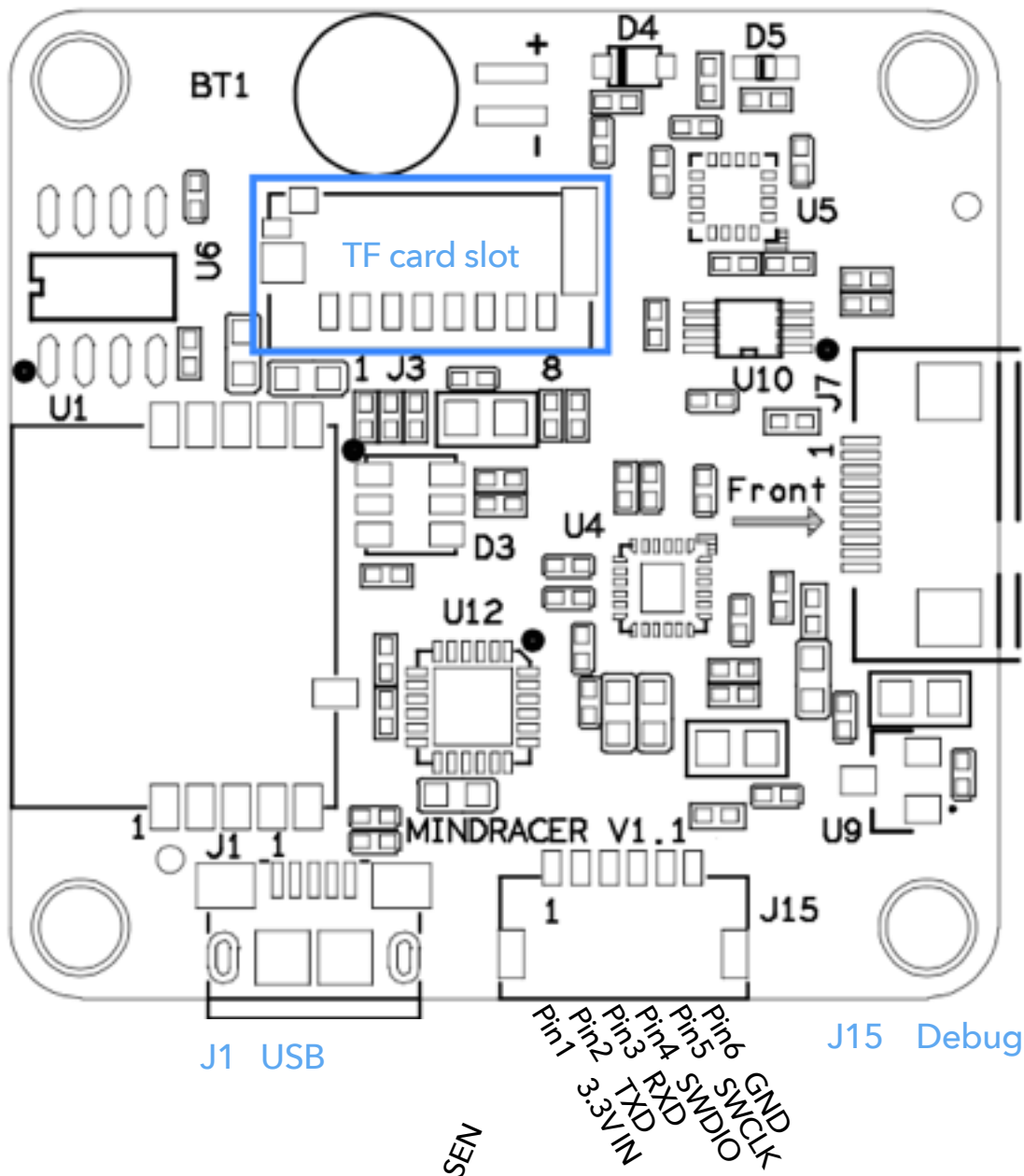
## Telemetry

MindRacer supports 3DR radio and Wifi telemetry through its telemetry ports. MindRacer also provides support to FrySky D.Port and S.Port telemetry through its expansion ports (use a breakout board).

## Connectors pin out map



BT1 Real time clock battery



J7 isolated IMU interface

- Pin 1 3.3V
- Pin 2 GND
- Pin 3 ACC\_DRDY
- Pin 4 MAG\_DRDY
- Pin 5 MPU\_DRDY
- Pin 6 ACC\_MAG\_CS
- Pin 7 MPU\_CS
- Pin 8 SPI\_MOSI
- Pin 9 SPI\_MISO
- Pin 10 SPI\_SCK

J1 USB

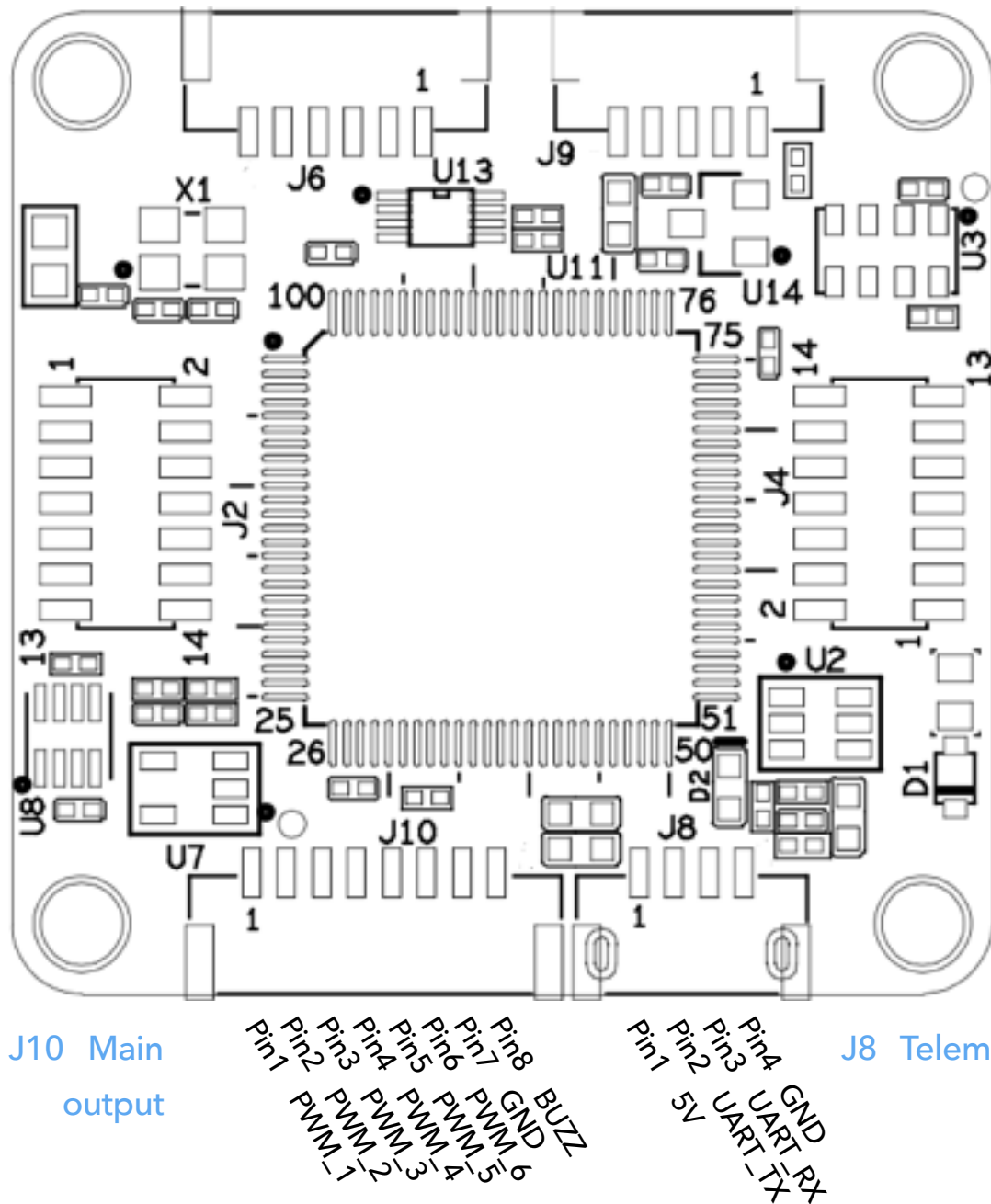
J15 Debug

- Pin 6 GND
- Pin 5 GND
- Pin 4 VOLT\_SEN
- Pin 3 CURRENT\_SEN
- Pin 2 5V
- Pin 1 5V

- Pin 5 GND
- Pin 4 3.3V
- Pin 3 Rssi
- Pin 2 RCIN
- Pin 1 5V

J6 Power

J9 RC input



J10 Main output

J8 Telem 2

- Pin 8 BUZZ
- Pin 7 GND
- Pin 6 PWM1
- Pin 5 PWM2
- Pin 4 PWM3
- Pin 3 PWM4
- Pin 2 PWM5
- Pin 1 PWM6

- Pin 4 GND
- Pin 3 UART
- Pin 2 RX
- Pin 1 TX
- 5V

Fig. 1 pin out map

## Expansion ports

MindRacer has two 2x7 1.27mm pitch pin headers for port replication/expansion. The pin out map for the 2 expansion ports are defined as following.

### J2 Sensor expansion port

Table 1 sensor expansion port pin out

PIN #	Signal
1	BAT_VOLT_SEN
2	+5V
3	FMU_UART2_TX
4	BAT_CURRENT_SEN
5	CAN_L
6	FMU_UART2_RX
7	RSSI_IN
8	CAN_H
9	SPEAKER_OUT
10	RC_IN
11	FRSKY_IN (UART_RX)
12	V3.3_OUT
13	GND
14	FRSKY_OUT(UART_TX)

### J4 PWM expansion port

Table 2 PWM expansion port pin out

PIN #	Signal
1	FMU_UART4_TX
2	+5V
3	FMU_PWM_CH2
4	FMU_UART4_RX
5	FMU_PWM_CH4
6	FMU_PWM_CH1
7	FMU_PWM_CH6
8	FMU_PWM_CH3
9	USB_EXT_DM
10	FMU_PWM_CH5
11	FMU_I2C2_SDA
12	USB_EXT_DP
13	GND
14	FMU_I2C2_SCL

## Color LED Indicator

The main LED indicator is a tricolor LED and can show different status information with the combination of different colors and blinks. The status information it indicates is listed below:

LED color	meaning (status)	remark
Solid any color	Armed	
Breathing any color	Standby	
Amber	Low battery or Failsafe	(Return to home, etc)
Blue	GPS not locked	
Green	GPS Locked	
Fast Blink & Red	Arming error	
Blink & Red	Other error	
Transitional Green	Mode switch success	

Table 3 LED indicator

## Support

Please visit [www.mindpx.org](http://www.mindpx.org) for more information. Or you can send email to [support@mindpx.net](mailto:support@mindpx.net) for any inquiries or help.