

# Robomaster Type A Board Special Port Information

Wilson 2020.7.12

# FAQ

1. How to download program to the development board?

Use J-Link or ST-Link via the SWD port, or via USB with the BOOT pin configured to FU mode. Only use 3.3V.

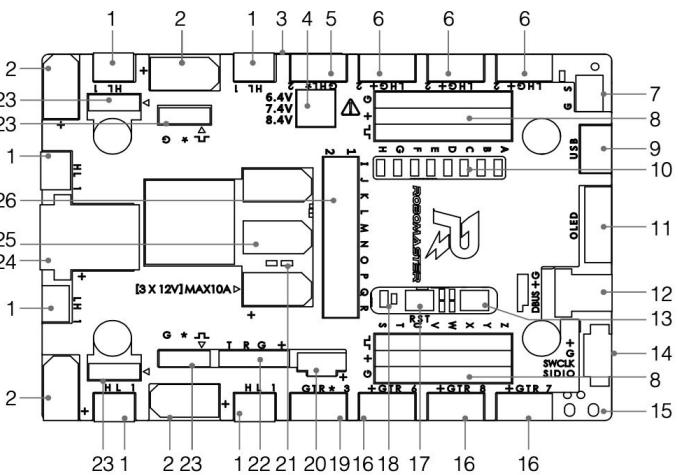
2. Processor model?

STM32F427I-IH6.

3. On-board buzzer not working?

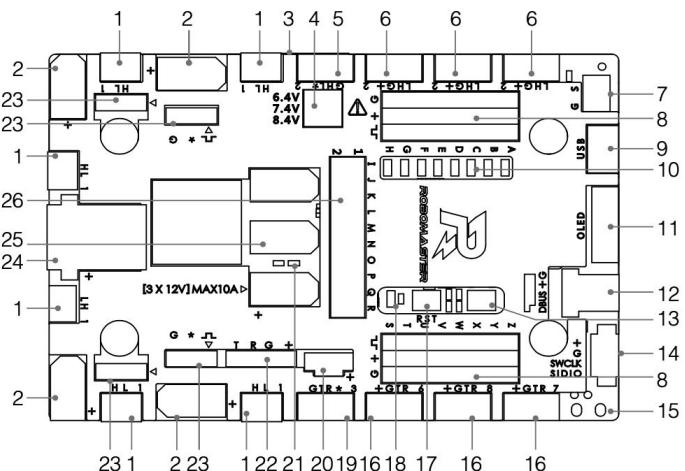
On-board buzzer is passive. Need a wave to drive it. Maximum loudness at ~2700 Hz.

# Layout



- 1. CAN1 Port
- 2. Controllable Power Output Port
- 3. TF Card Slot
- 4. DIP Switch for Voltage Adjustment
- 5. SDK CAN2 Port
- 6. CAN2 Port
- 7. Signal Synchronization Port
- 8. PWM Port × 8
- 9. USB Port
- 10. Customizable LED × 8
- 11. OLED Port
- 12. D-Bus Port
- 13. Customizable Button
- 14. SWD Port
- 15. 3.3 V Power Holes
- 16. UART Port
- 17. Reset Button
- 18. Customizable LED × 2
- 19. SDK UART Port
- 20. 5V Power Outlet Port
- 21. 12V Power Source Indicators
- 22. BTUART Port
- 23. PWM Port
- 24. Power Input Port
- 25. 12 V Power Output Port × 3
- 26. GPIO Pin × 18 & 5 V Power Source

# Some Ports Explained



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# CAN vs. PWM

From reddit: "CAN is completely different than PWM. It's a network bus standard (think ethernet/wifi, but originally for vehicles) rather than a signal-level connection. "

So one does not need to connect CAN ports on a one-to-one basis.

PWM does need the connection on a one-to-one basis.

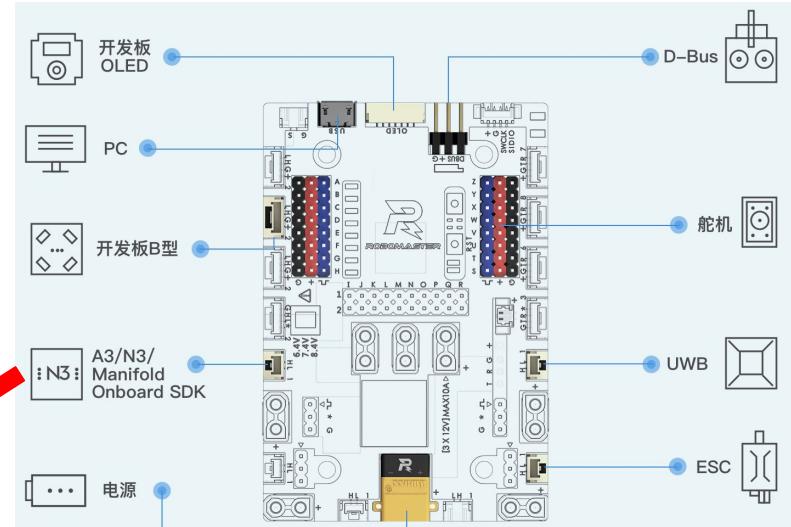
On the type A board, think CAN1 and CAN2 as two subnets. Multiple devices can be connected to the same subnet.

I haven't tested it yet whether it is possible from CAN1 and CAN2 to communicate with each other.

# SDK CAN & SDK UART



For connecting peripherals:



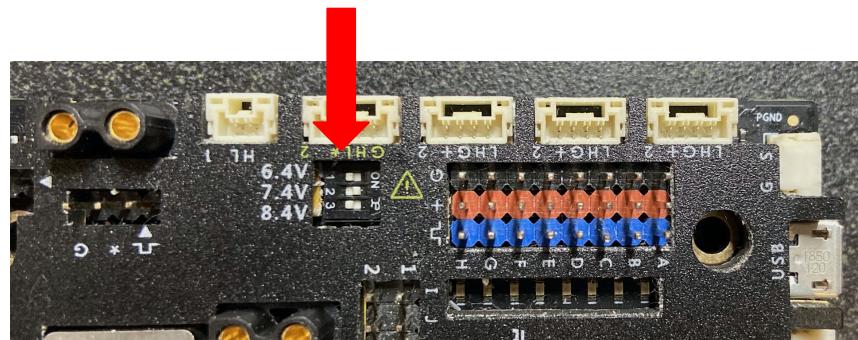
From DJI: "The Manifold is a high-performance embedded computer specially designed for the DJI Onboard SDK. It enables developers to transform aerial platforms into truly intelligent flying robots that can perform complex computing tasks and advanced image processing literally on the fly."

# DIP Switch for Adjusting Voltage

DIP Switch encoding found on the back of the board/user manual:

1	2	3	输出
OFF	OFF	OFF	5V
ON	OFF	OFF	6.4V
OFF	ON	OFF	7.4V
OFF	OFF	ON	8.4V
ON	ON	ON	12V
ON	ON	OFF	8.8V
OFF	ON	ON	10.8V
ON	OFF	ON	9.8V

“Output” in English



# DBUS

For connecting the remote control transceiver:



# SWD

For downloading and debugging.

Computer cannot communicate with the type A board via SWD port directly, a translator is needed: we use J-Link.

We are not using JTAG. JTAG/J-Link are different protocols to communicate with board/microprocessor.

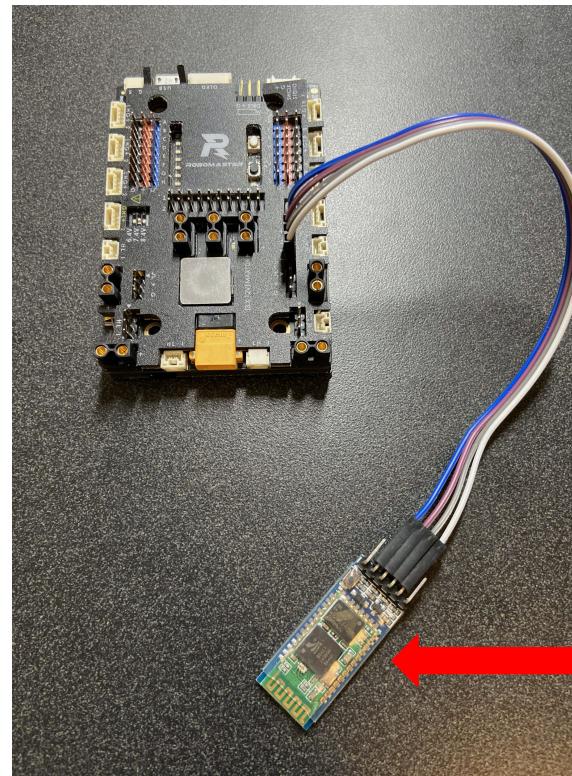


One picture I found on Amazon for downloading bitstream to Xilinx FPGA. It's JTAG.

# BTUART

BTUART = Bluetooth + UART

One scenario: control the robot using smartphone app.



iOS uses  
BLE  
Bluetooth.

# References

<https://www.roboMaster.com/zh-CN/products/components/general/development-board>

[https://www.reddit.com/r/FRC/comments/5gr62z/explain\\_like\\_im\\_five\\_can\\_and\\_pwm\\_how\\_do\\_they\\_work/](https://www.reddit.com/r/FRC/comments/5gr62z/explain_like_im_five_can_and_pwm_how_do_they_work/)

<https://www.dji.com/manifold>

[https://www.amazon.com/Compatible-Platform-Cable-USB-Programmer/dp/B00KM70UFG/ref=sxts\\_sxwds-bia-wc-p13n1\\_0?cv\\_ct\\_cx=jtag&dchild=1&keywords=jtag&pd\\_rd\\_i=B00KM70UFG&pd\\_rd\\_r=e815e174-acef-42dd-8353-c3b74730ffb0&pd\\_rd\\_w=Wh3OQ&pd\\_rd\\_wg=HrUxG&pf\\_rd\\_p=1da5beeb-8f71-435c-b5c5-3279a6171294&pf\\_rd\\_r=GFV4BMJTF7HHDEYFQMA&psc=1&qid=1594566402&sr=1-1-70f7c15d-07d8-466a-b325-4be35d7258cc](https://www.amazon.com/Compatible-Platform-Cable-USB-Programmer/dp/B00KM70UFG/ref=sxts_sxwds-bia-wc-p13n1_0?cv_ct_cx=jtag&dchild=1&keywords=jtag&pd_rd_i=B00KM70UFG&pd_rd_r=e815e174-acef-42dd-8353-c3b74730ffb0&pd_rd_w=Wh3OQ&pd_rd_wg=HrUxG&pf_rd_p=1da5beeb-8f71-435c-b5c5-3279a6171294&pf_rd_r=GFV4BMJTF7HHDEYFQMA&psc=1&qid=1594566402&sr=1-1-70f7c15d-07d8-466a-b325-4be35d7258cc)