

# CAN PDB multifunctional

## Autopilot baseboard

Last Update:2020/4/3

Hardware version: V1.5

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## Product Profile

CAN PDB is a new integrated flight controller board, which combines the function of the flight controller board with the power module. When combined with CORE, it can provide autopilot function for multiple types of equipment such as Copter/Plane/Helicopter/VTOL/unmanned vehicle/Rover, and provide 10 channels redundant main power supply and 88 W 5/12V power output at the same time.

Both circuit design and hardware workmanship materials, CAN PDB are outstanding. Up to 95<sup>2</sup>CM dissipating copper sheet and self-developed TTI algorithm. which can provide up to 180 A of continuous operating current for any device, and at the same time provide 0.1 A current ,0.05 V voltage precision measurement comparable to precision instruments.

## Main Product Functions

1. Support 15~62 V voltage input
2. Continuous current :180 A
3. Precise measurement of voltage and current ,0.1 A ,0.05 V.
4. 13 servo channel outputs
5. Dual voltage output interface: can provide up to 88 W 5/12V power output for peripherals
6. Built-in up to 95<sup>2</sup>CM heat dissipation copper sheet, effectively reduce the heating caused by internal resistance of high current circuit
7. Power supply indication LED, visual indication Lipo voltage status
8. Ultra-low voltage drop 10 main power output
9. Future upgrades support more features such as high-precision power consumption statistics and instantaneous power push

## Hardware parameters

Processors	STM32F412 100Mhz 512K Flash 256K RAM
Input voltage	15-62 V (4-15 SLipo)
Accurate measurement of current range	0-110 A
Maximum current range	A 0-180
5V voltage regulator output	Maximum 8 A, stable 6 A
12V voltage regulator output	Maximum 4 A, stable 3.5 A
Number of servo channels	13
Remote Control Receiver Signal Support	<ul style="list-style-type: none"> <li>● RC_IN: PPM</li> <li>● DSM_SBUS_RSSI: DSM/SBUS/PWM/3.3v analog voltage</li> </ul>
CORE support	V5+CORE and Next Generation CORE
Support model	Support APM and PX4 firmware and support fixed-wing/3-8 rotor/helicopter/ VTOL vertical take-off and landing/unman vehicle/unmanship etc.
Fixed aperture	V5+CORE fixed aperture M2.5, M3 remaining
Working temperature	-20~+100°C
Product size	12 c m (long)×10 c m (wide)×1.2
Weight	214 g( Weight of wire)
Cable length	30 cm( terminal free)
Type of interface	<ol style="list-style-type: none"> <li>1. USB TYPE C *1</li> <li>2. GH2.5 5V8A *1</li> <li>3. GH2.5 12V4A *1</li> <li>4. GH2.5ADC *1</li> <li>5. GH2.5DSM_SBUS_RSSI*1</li> <li>6. GH2.5I<sup>2</sup>C *3</li> <li>7. GH2.5RC_IN*1</li> <li>8. GH2.5CAN*2</li> <li>9. GH2.5TELEM*2</li> <li>10. GH2.5GPS*1</li> <li>11. GH2.5DSU*1</li> <li>12. CORE IO*1</li> </ol>

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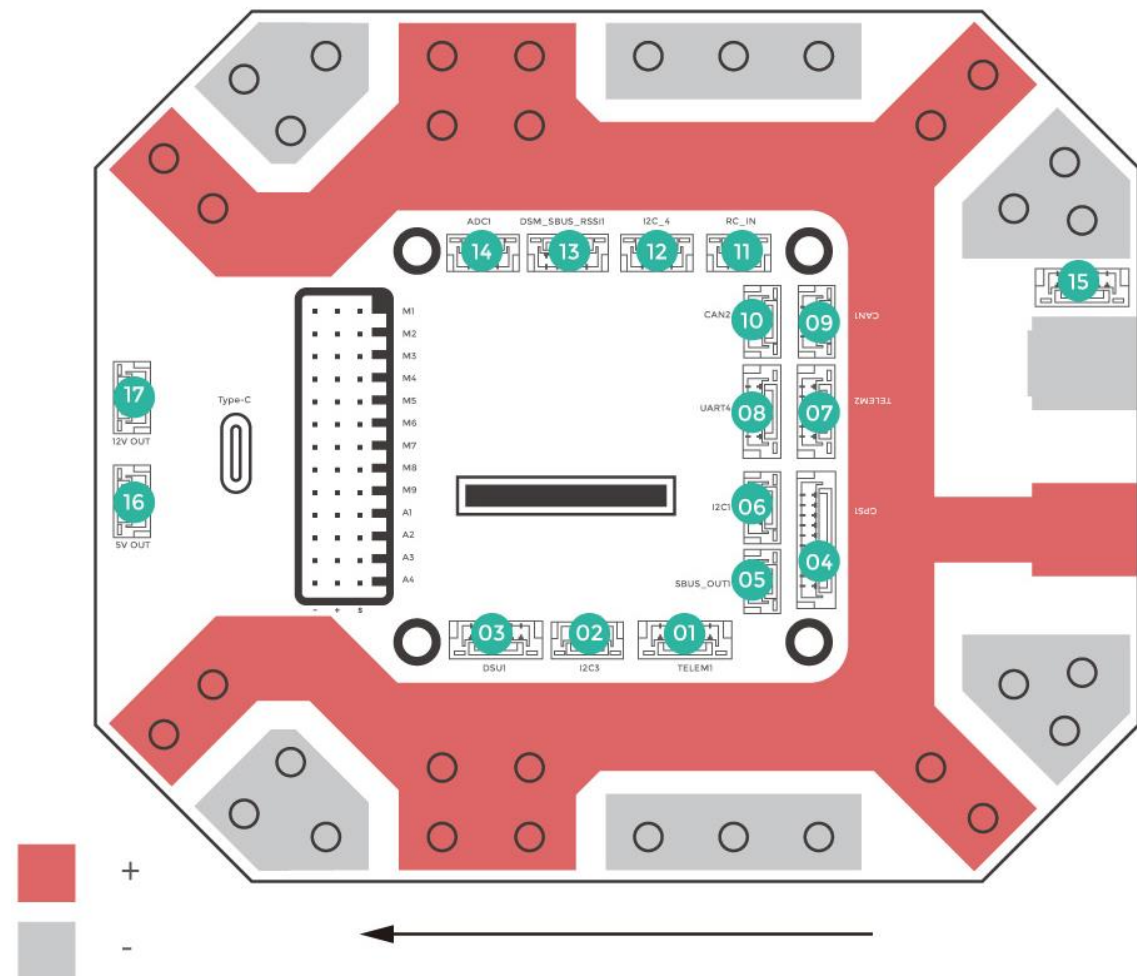
# Identification definitions

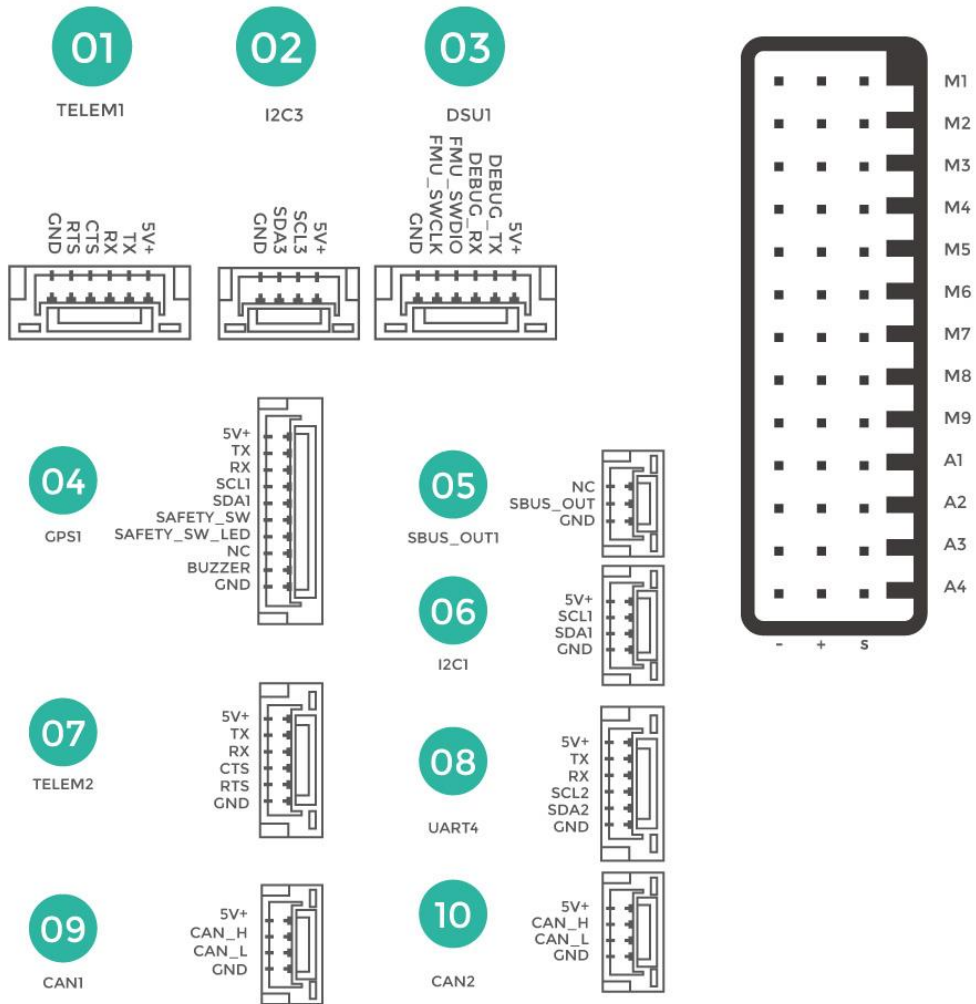
## Power Status light

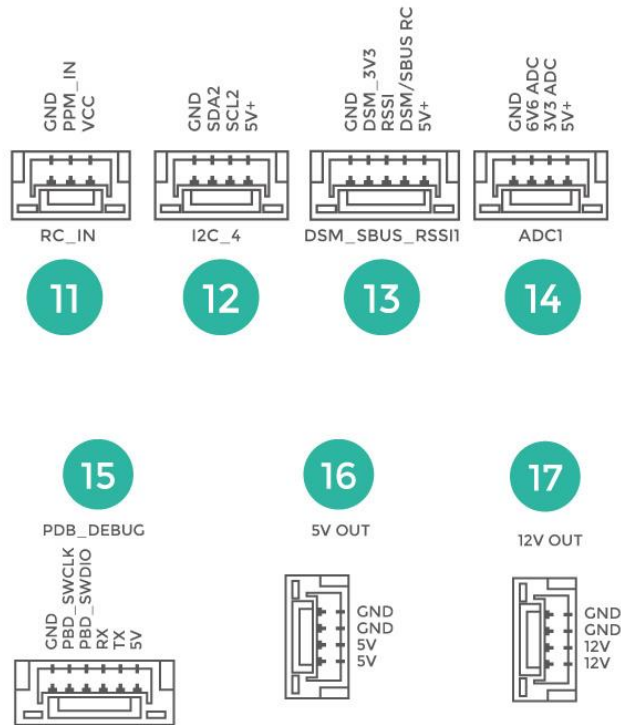
- Normal Green: Voltage 4.0~4.3 V per cell
- Yellow: Battery voltage below 4.0 V above 3.7 V per cell
- Bright red: Voltage less than 3.5 v per cell

Judging the number of battery nodes according to the initial voltage, when you power up, the LiPo voltage of each section is less than 3.7 V, may misjudge the number of battery nodes.

## Interface definitions







## Installation sequence

- Install TF card into CORE first
- Then install the CORE on the board and screw the M2 screws
- Finally fasten the plate to the aircraft or other equipment and screw M3.

Users using this hardware version need to note that the memory card can not be taken out after the memory card is installed to the CORE, and the CORE is installed into the load board.

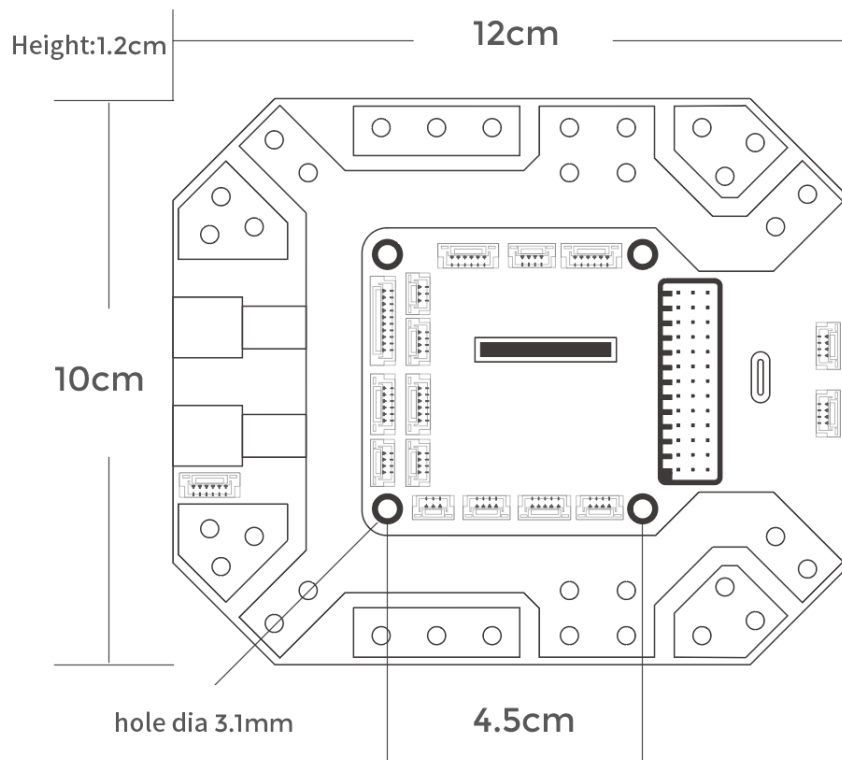
## Mechanical dimensions

## Enable current voltage detection

This project needs to install CORE to the CAN PDB and start CORE.



## ArduPilot firmware



Sets the following parameters in the Mission planner full parameter table and restarts after writing:

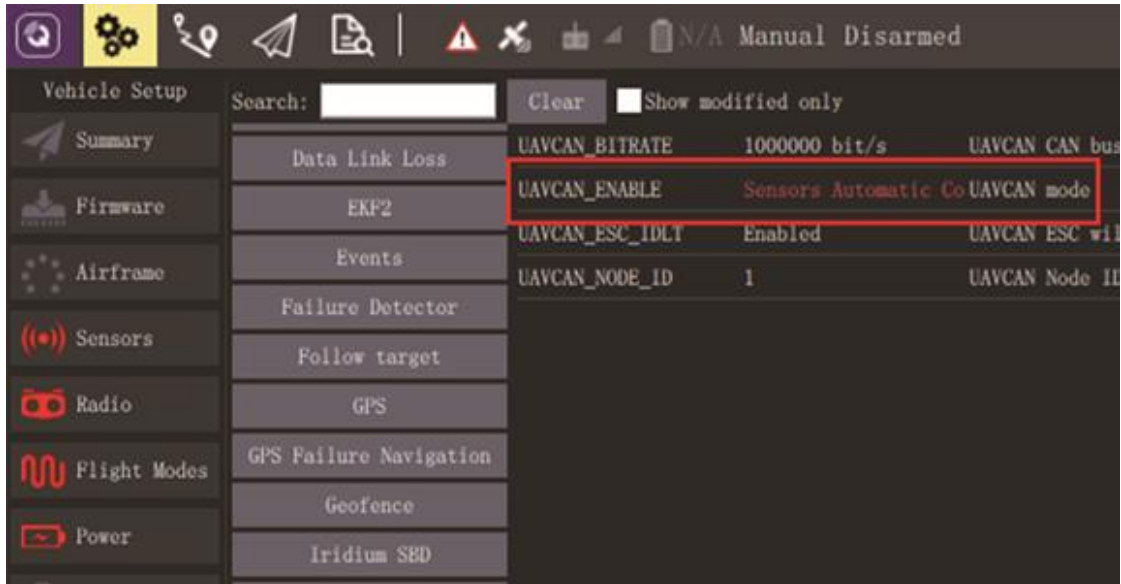
- CAN\_P1\_DRIVER set to 1
- CAN\_P2\_DRIVER set to 1
- BATT\_MONITOR set to 8

Advanced Params			
User Params	CAN_P1_BITRATE	1000000	10000 1000000
Full Parameter List	CAN_P1_DRIVER	1	0: Disabled 1: First driver 2: Second driver
Full Parameter Tree	CAN_P2_BITRATE	1000000	10000 1000000
Planner	CAN_P2_DRIVER	1	0: Disabled 1: First driver 2: Second driver
	CAN_SLCAN_CPORT	1	0: Disabled 1: First driver 2: Second driver
BATT_MONITOR	8	0: Disabled 3: Analog Voltage Only 4: Analog Voltage and Current 5: Solo 6: Bebop 7: SMBus-Maxell 8: UAVCAN-BatteryInfo 9: BLHeli ESC 10: SumOfFollowing 11: FuelFlow 12: FuelLevelPWM	Controls enabling mon

## PX4 firmware

Sets the following parameters in the QGroundControl parameter table and restarts after writing:

- UAVCAN\_ENABLE set to sensors Automatic config



## Parameter configuration

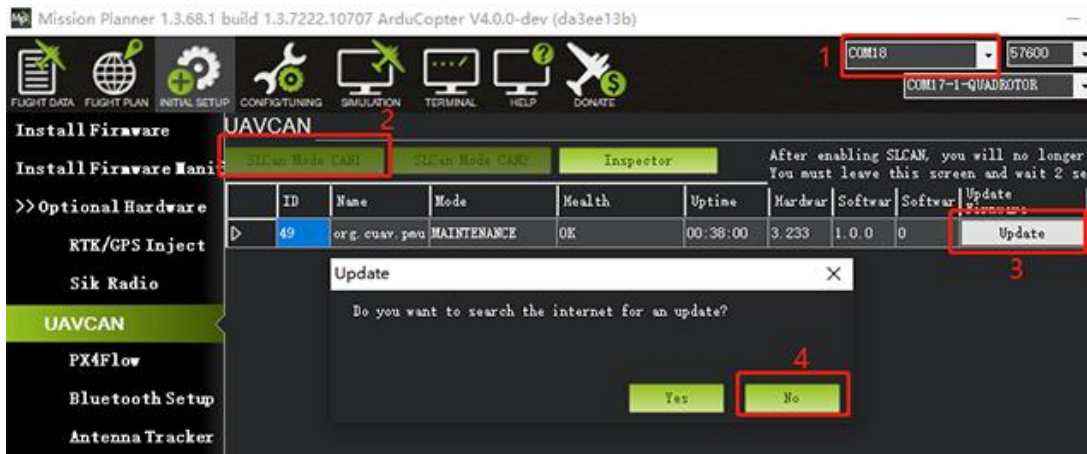
You need to install the V5+CORE on the CAN PDB and start it before upgrading the firmware V5V5+CORECORE, then set the following parameters to enable it

- CAN\_SLACN\_CPORT set to 1.
- Serial7\_protocol set to 22.
- CAN\_PDB restart

## Upgrade process

Method 1: Use Mission planner for firmware upgrade

### Firmware Download



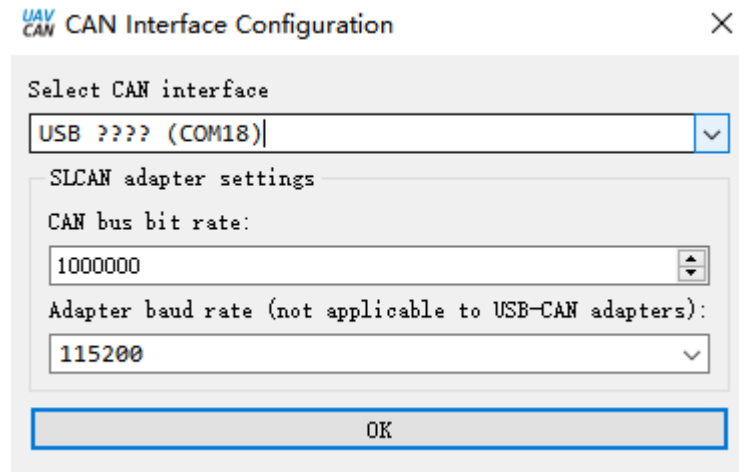
1. Select slcan corresponding device port (AP4.0/AP4.0 firmware will have two usb drive ports, one is flight control usb port, one is slcan port)
2. Click "slcan mode CAN1" on UAVCAN interface
3. Click "Update", select NO in the pop-up prompt box (yes is select online firmware; No select local firmware)
4. Select firmware



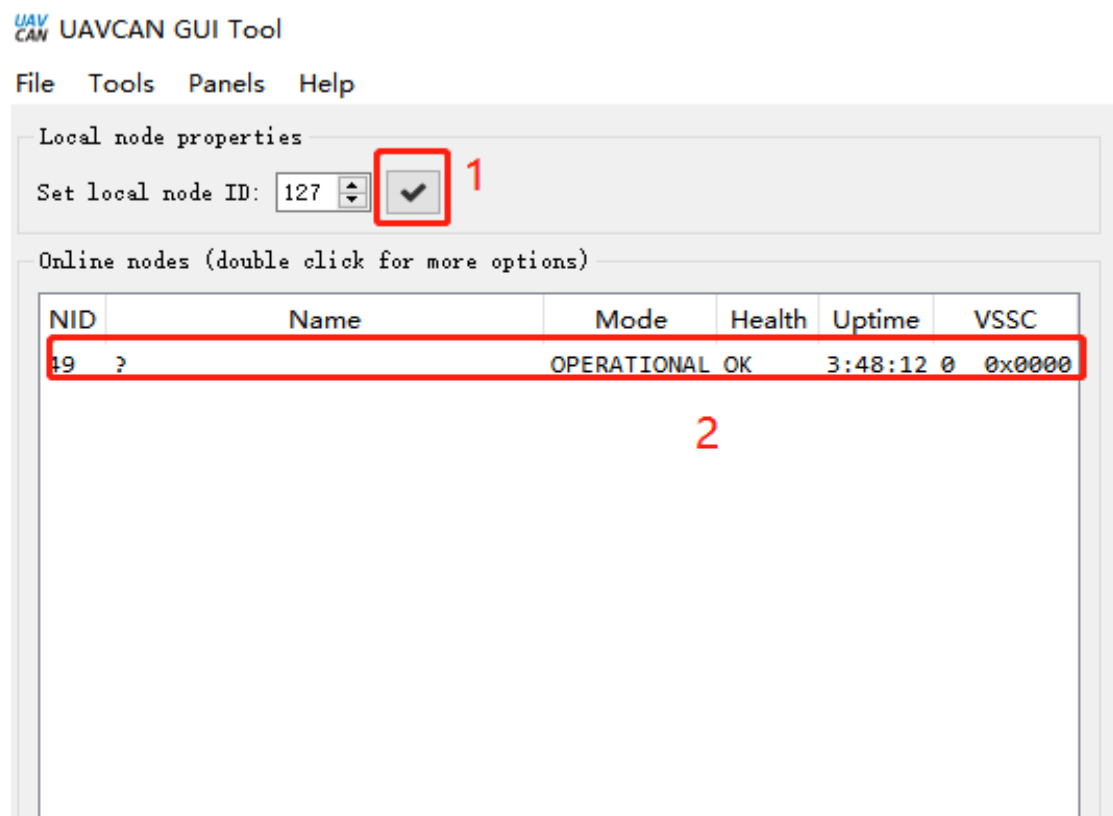
5. Wait until the burn program is complete

## Method 2: Upgrade using UAVCAN GUI TOOL software

1. [UAVCAN GUI TOOL download](#)
2. Select slcan appropriate device port, click ok



3. :: Click "√"; then double-click on the device information (2 identified below)



4. Click "update firmware", pop-up box "yes".

The screenshot shows the 'Node info' section with fields for Node ID (49), Name (org.cuav.pmu), Mode (OPERATIONAL (0)), Health (OK (0)), and Uptime (3:50:12). In the 'Node controls' section, the 'Update Firmware' button is highlighted with a red box and a red number '1'. Below this, there are buttons for 'Fetch All', 'Store All', and 'Erase All'. A table with columns 'Idx', 'Name', 'Type', 'Value', 'Default', 'Min', and 'Max' is partially visible. Overlaid on this is a dialog box titled 'Suspicious configuration' with a question mark icon. The text in the dialog reads: 'The local dynamic node ID allocator is not running (see the main window). Some nodes will not be able to perform firmware update unless a dynamic node ID allocator is available on the bus. Do you want to continue anyway?'. The 'Yes' button in the dialog is highlighted with a red box and a red number '2'. At the bottom left of the dialog area, the word 'Cancelled' is visible.

5. mode/health/uptime became SOFTWARE\_UPDATE(3)"

The screenshot shows the 'Node info' section. The 'Mode / Health / Uptime' field is highlighted in pink and displays 'SOFTWARE\_UPDATE (3)'. Other fields include Node ID (49) and Name (org.cuav.pmu).

6. Waiting for firmware writing complete

Node info			
Node ID / Name	49	org.cuav.pmu	
Mode / Health / Uptime	OPERATIONAL (0)	OK (0)	0:00:32
Vendor-specific code	0	0x0000	0b00000000_00000000
Software version/CRC64	1.0		
Hardware version/UID	3.233	04 00 15 00 0c 51 38 31 33 35 39 37 00 00 00 00	
Cert. of authenticity			

7. Waiting for firmware to complete