

D30025&35&50_V1.2

CAN Communicating Protocol

Amendant Record

Version number	Modifying Person	Time	Remarks
V1.0	Pea	2025/04/30	Editio princeps
V1.1	Pea	2025/05/23	Add and Verify
V1.2	Pea	2025/06/06	Add content

1 Communicational Parameter

baud rate: 500 kbps
Identifiers: 0x200,0x201,0x202,0x206–0x219,0x300,0x301
Frame format: DATA
Frame type: Standard frame
DLC: 8 bytes
Multi-byte alignment: Little-endian mode
Network configuration: Chrysanthemum-style chain

2 Communication Message

2.1 Control Message (0x200)

Send control commands to the thrusters, with each thruster occupying two bytes, **the high bits first**. The message 0x200 controls Thrusters 0~2, the message 0x201 controls Thrusters 3~5, and the message 0x202 controls Thrusters 6~7.

Communication direction: Host computer-> Propeller
Identifier: 0x200 Frame type: Standard frame
Frame format: DATA DLC: 8 bytes

Data field	DATA0	DATA1	DATA2	DATA3	DATA4	DATA5	DATA6	DATA7
Content	cmd0		cmd1		cmd2			Checksum

Message content definition:

cmd0: A uint16 type, the control word for propeller 0, where:

bit10~bit0: throttle, value range 1000–2000 (0x03E8–0x07D0);
bit11:0 – forward rotation, 1 – reverse rotation (i.e., throttle value + 0x0800; **for example**, 1500 corresponds to **0x05DC** + 0x0800 = 0x0DDC); bits 15–12: Reserved.

cmd1: A uint16 type, the control word for propeller 1, where:

bit10~bit0: throttle, value range 1000–2000 (0x03E8–0x07D0);
bit11:0 – forward rotation, 1 – reverse rotation (i.e., throttle value + 0x0800; **for example**, 1500 corresponds to **0x05DC** + 0x0800 = 0x0DDC); bits 15–12: Reserved.

cmd2: A uint16 type, the control word for propeller 2, where:

Bit 10–Bit 0: Throttle valve, range 0–2000 (0x03E8–0x07D0);
bit11:0 – forward rotation, 1 – reverse rotation (i.e., throttle value + 0x0800; **for example**, 1500 corresponds to **0x05DC** + 0x0800 = 0x0DDC); bits 15–12: Reserved.

Checksum: uin8 type, with verification (DATA0+DATA1+DATA2+DATA3+DATA4+DATA5+DATA6=DATA7)

Note: The control command requires sending a dedicated command packet; transmitting a single command will not enable proper rotation. After power-on, blockage, overcurrent, or other errors occur, the electric controller will lock. Send an throttle value of 1000 and reactivate the propeller.

2.2 Feedback Message (0x206~0x219)

The thruster sends status information back to the host computer. The feedback message ID for Thruster 0 through Thruster 9 is 0x206+2*id. Reply Message Frame 1:

Communication direction: Thruster-> Host computer identifier: 0x206 + Thruster ID Frame type: Standard

frame

Frame format: DATA

DLC: 8 bytes

Data field	DATA0	DATA1	DATA2	DATA3	DATA4	DATA5	DATA6	DATA7
Content	speed		torque_curr		volt	temp	status	fault

Message content definition:

Speed: int16 type, mechanical speed, unit: rpm/min;

torqueCurr: int16 type, torque current, unit: 0.01 A;

Volts: A uint8-type variable representing voltage, with a range of 100 V to 100 V; unit: V.

temp: int8 type, driver board temperature;

status: uint8 type, drive status, where: 0-

waiting for hardware stabilization; 1-waiting for trigger signal

2-Calibration current DC bias

3-Charge the bootstrap capacitor

4-Play motor music

5-Encoder Calibration

6-Clear control variables

7-Normal operation

8-Test Hardware

9-Braking: Only activate the lower tube

10-MOS transistor fault: A uint8-type variable indicating propeller failure type, where:

0 – No faults;

1-Current feedback fault;

2-Overcurrent fault;

3. Power device failure;

4-Overheat fault;

5-Undervoltage fault;

6-Overvoltage fault;

7-Protective fault activation;

8. Forward rotation failure;

Reply Message Frame 2:

Communication direction: Electrical controller-> Host computer

Identifier: 0x207 +

Frame type: Standard frame

Propeller ID

Frame format: DATA

DLC: 8 bytes

Data field	DATA0	DATA1	DATA2	DATA3	DATA4	DATA5	DATA6	DATA7
content	mtortemp							

Message content definition:

mtortemp:	int8 type, motor temperature;
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The message corresponding to the ID:

ID	0	1	2	3	4	5	6	7	8	9
Message Frame 1	206	208	20a	20c	20e	210	212	214	216	218
Message Frame 2	207	209	20b	20b	20f	211	213	215	217	219

2.3 Configuration Message (0x300)

Configure the propeller parameters. When using this command, ensure there is only one motor on the CAN bus. After configuring the parameters, power off to save changes and restart.

Communication direction: Host computer-> Propeller identifier: 0x300 Frame type: Standard frame
Frame format: DATA DLC: 8 bytes

Data field	DATA0	DATA1	DATA2	DATA3	DATA4	DATA5	DATA6	DATA7
Content	para0	setup_id	para1	Para2	para3	para4	para5	para6

setup_id: uint8 type, sets the propeller ID, where:

para0:0x0;

setup_id: The ID value to set, ranging from 0 to 9;

para1~para6: Invalid;

2.4 Configuration Message (0x301)

Configure the propeller parameters. After completing the parameter configuration, power off to save and restart.

Communication direction: Host computer-> Propeller identifier: 0x301 Frame
type: Standard frame

Frame format: DATA DLC: 8 bytes

Data field	DATA0	DATA1	DATA2	DATA3	DATA4	DATA5	DATA6	DATA7
Content	para0	para1	para2	para3	para4	para5	para6	para7

Message content definition:

setup_id: uint8 type, sets throttle polarity, where:

para0: Thruster ID, range 0-9;

para1: 0x00 indicates the motor direction is left-handed (reverse pitch), 0x01 indicates the motor direction is right-handed (forward pitch); 0x02 sets electrical angle calibration, 0x03 sets electrical angle fine-tuning; [This setting is factory defaulted and requires no additional adjustment.]

Repeat this operation

para2~para7: Invalid;

After the setup is completed, the propeller will send back the same data frame with identifier 0x401.