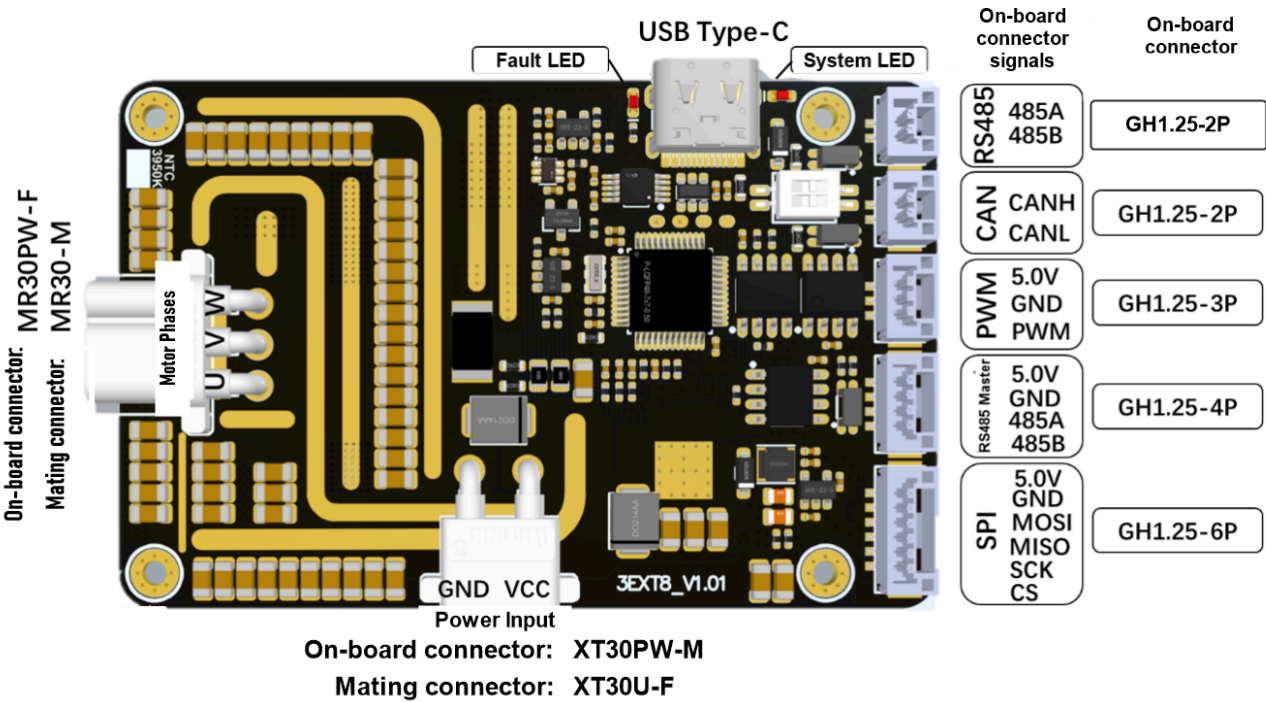


SDC300 External Drive Board User Guide V1.01



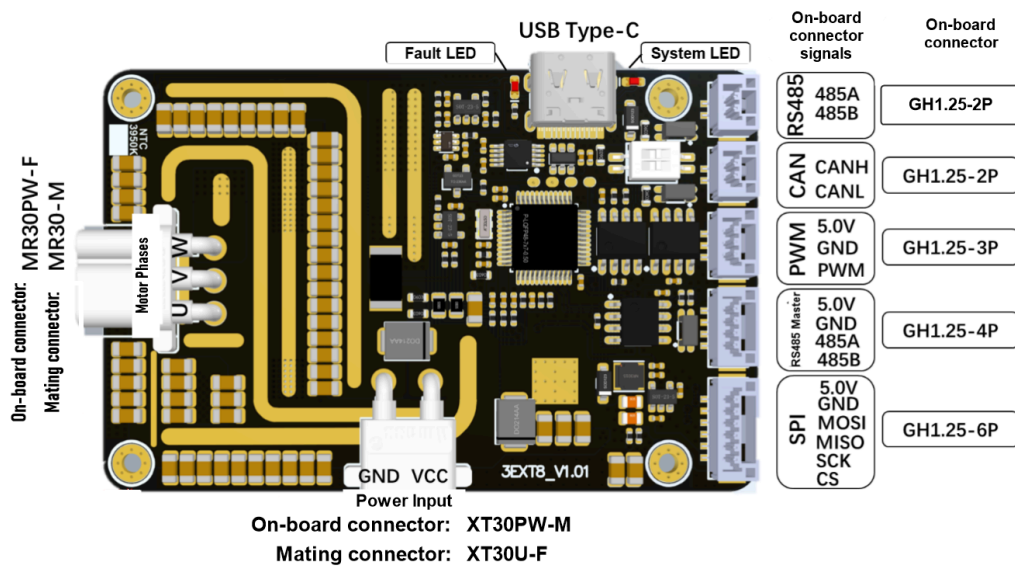
Overview

The SDC300 is a brushless motor controller that uses the field-oriented control (FOC) algorithm and is designed to control brushless gimbal motors. When used with a high-precision angle sensor, it supports position control and speed control.

Product characteristics

- Wide voltage input range, with an operating voltage of 12V-40V;
- All signal connectors use GH1.25 connectors to ensure reliable signal connections
- Integrated USB interface for convenient connection to a host computer during parameter tuning
- Supports both RS485 and CAN bus interfaces
- The RS485 baud rate and CAN bit rate can both be configured using the host computer
- The drive board device address can be configured using the host computer
- Host software for parameter tuning and related materials are provided free of charge
- The drive is rated for operation in ambient temperatures of -40~85°C
- Multiple protection functions: overvoltage and overcurrent protection
- Designed for medium- and low-speed, high-torque precision servo-control applications, such as high-tech robots, lidar, laboratory test equipment at educational and research institutions, security inspection, and surveying and exploration equipment

Interface specifications



- RS485 interface (on-board connector model: GH1.25-2P): communicates with a host computer or RS485 master controller for drive board parameter configuration and motor operation control.
- CAN interface (on-board connector model: GH1.25-2P): communicates with a CAN master controller for drive board motor operation control.
- PWM interface (on-board connector model: GH1.25-3P): reserved.
- RS485 master interface (on-board connector model: GH1.25-4P): connects to an encoder with an RS485 interface.
- SPI interface (on-board connector model: GH1.25-6P): connects to an encoder with an SPI or PWM interface;
- Power interface (on-board connector model: XT30PW-M; mating connector model: XT30U-F): accepts a supply voltage range of 12V-40V.
- Three-phase motor interface (on-board connector model: MR30PW-F; mating connector model: MR30-M): connects the motor's three-phase wires in any order.
- The USB interface incorporates an on-board CH340x USB-to-UART bridge. If the driver is required, click "CH34x Driver Download" to download and install it. Note: the USB and RS485 interfaces share the same UART and cannot be used simultaneously.
- System status LED: flashes periodically to indicate system operation and can indicate the current device address;
- Fault indicator LED: indicates system faults and remains off when the system has no faults. The correspondence between red LED flash patterns and fault codes is shown below: (Connecting the drive board to the host computer via USB or RS485 provides a more direct view of the fault type.)

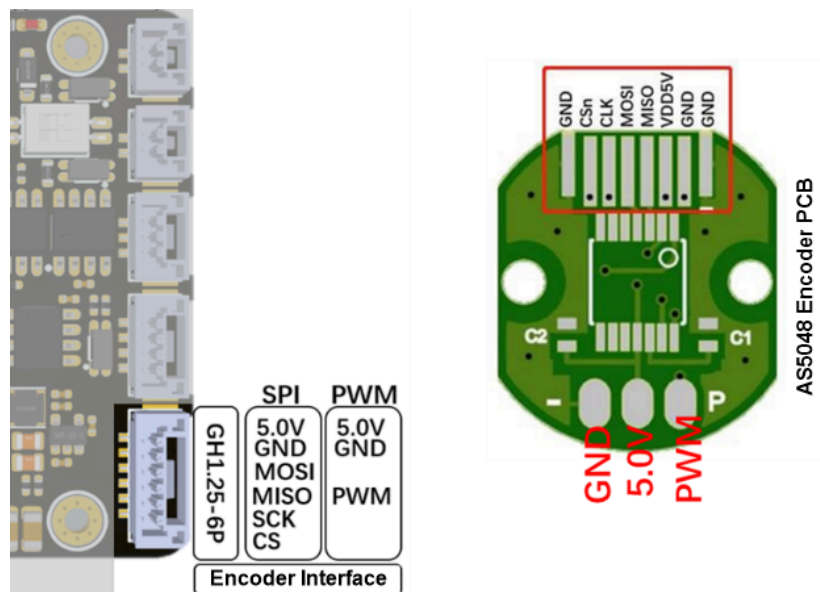
Red LED status	Fault type
Off	System operating normally
Flashes once per cycle	Voltage fault
Flashes twice per cycle	Current fault
Flashes three times per cycle	Temperature fault
Other	Displayed in the host software or readable via the communication protocol

Drive board instructions

I. Hardware connections

Make all hardware connections correctly before controlling the motor;

- 1) Connect the motor's three-phase wires to the drive board's three-phase interface using an MR30-M connector cable. The three-phase wires may be connected in any order.
- 2) Connect an encoder supported by the drive board firmware. Mount the magnetic encoder concentrically with the motor shaft and secure it firmly. Connections for encoders with SPI and PWM interfaces are shown below:

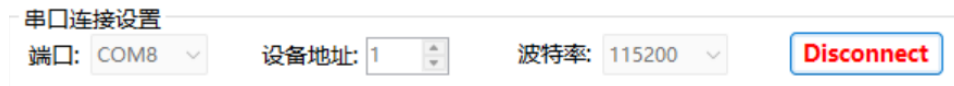


- 3) Select a 12V-40V DC supply according to the motor's rated operating voltage and power the drive board through its power interface. When the power polarity is correct, the system status LED flashes periodically. If the system status LED does not light, check the wiring. After confirming that the input DC power wiring is correct, disconnect the DC power and proceed to the next step.

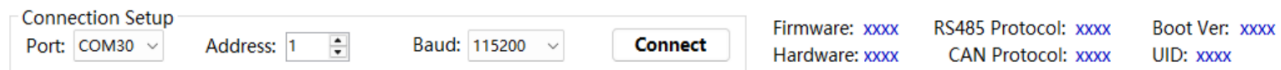
II. Connecting the drive board to the host computer

- 4) Connect the motor's three-phase wires and encoder cable correctly to the drive board.
- 5) Power the drive board through the power interface; the system status LED flashes;
- 6) Connect the data cable. (Note: the USB interface cannot power the drive board. The USB device can be detected only after the drive board is powered through the power interface.)
- 7) Open the host software and click the serial-port drop-down list. If the correct serial port is detected, click "Connect" to connect (the drive board's default device address is 1, and its default baud rate is 115200). If the

host software cannot detect the serial port of the current USB device, click "CH34x Driver Download" to download and install the driver.



8) After the drive board successfully connects to the host computer, the host software displays the current drive board version information, as shown below:



9) After connecting to the host computer, configure the encoder model currently in use in the host software's [User Parameters] window, then write and save the settings. Configure or import the motor parameters currently in use in the [Motor Hardware Parameters] window, then write and save them. After saving, click [System Restart] in the [Control Commands] window to restart the drive board. The configured encoder parameters and motor hardware parameters take effect after the system restarts.

10) Turn the motor by hand. If the circular gauge in the host software rotates with the motor, the encoder is connected correctly to the drive board. Otherwise, check the wiring between the drive board and encoder, and verify that the encoder model selected in the host software matches the connected interface.

III. Motor encoder calibration

11) After confirming that the encoder is connected correctly to the drive board, supply the drive board with 12V-40V DC power through its power interface.

12) If all the steps above have been completed correctly, the conditions for motor encoder angle calibration are met. During motor encoder calibration, the motor must be unloaded; ensure that no external force interferes with its rotation. Click [Encoder Angle Calibration] in the host software's [Control Commands] window to start encoder calibration. Calibration takes approximately 30-90 s. When the operating status indicated by the host software changes from [Voltage Control] to [Idle], encoder calibration is complete.

13) To verify that motor encoder angle calibration was successful, click [Shortest-Distance Return to Origin]. If the motor rotates to a position and holds that position while the host software gauge indicates 0°, motor calibration was successful.

Precautions

- Use the motor drive strictly in accordance with this document.
- During motor encoder calibration, the motor must be unloaded; ensure that no external force interferes with its rotation.
- If the motor encoder rear cover is removed or replaced, or if the motor is replaced, recalibrate the motor encoder by strictly following the drive board instructions.
- The USB and RS485 interfaces share the same UART and cannot operate simultaneously.
- Ensure that the wiring is correct before use, especially the power and encoder cables.
- Ensure that the encoder PCB is installed correctly and securely before use.
- Ensure that the motor is installed correctly and securely before use.
- Avoid damaging the cables during use to prevent abnormal motor operation.
- Do not touch the motor rotor during use to avoid cuts.
- The motor may become hot when producing high torque. Take precautions to prevent burns.