Initial setup of CAN_Drv modules

WARNING: *Firmware 2.66b1 and above is required to support CAN drivers*

Address Assignment

1) Connect the modules to the free CAN ports of the controller, or to single port through a splitter.

   TIP: It is easier to determine the required module if modules are connected one by one, single module at a time.

2) Go to the CAN Modules tab, and click "**SCAN DEVICES**" button. The connected module will appear in the device list:
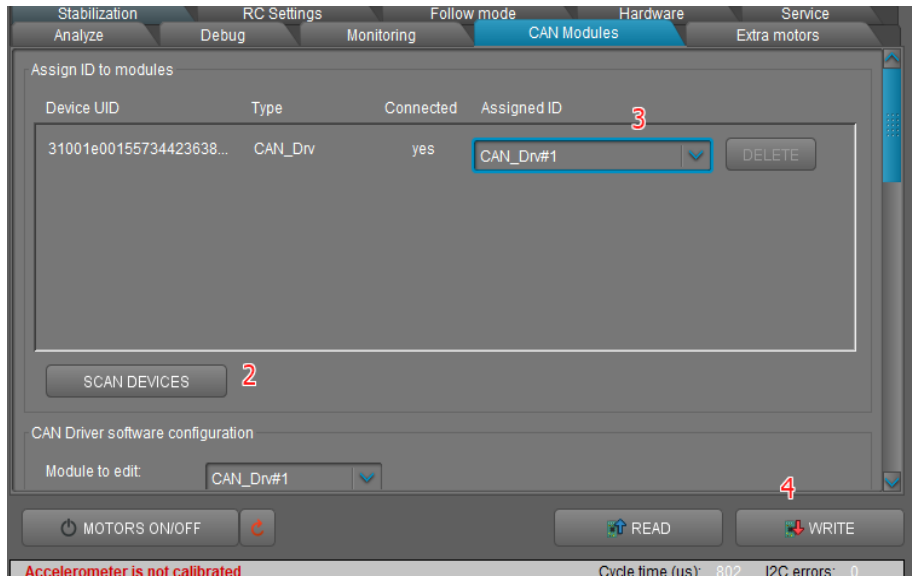

3) In the drop-down list in the "Assigned ID" column,any free module identification number should be selected. This ID will be used as the motor name on the "Hardware" tab in the "Motor outputs" section.
4) To assign the selected number, write setting to the board pressing "**WRITE**" button.

   NOTE: Address also can be selected by soldering the address selection jumper on the back side of the module's PCB. Detailed information in the documentation for the module.

Module configuration

The following describes only a simplified configuration of basic parameters. A full description of all the parameters of the module can be found in the user manual.

> **IMPORTANT NOTE:** To perform calibration, the battery and the motor must be connected to the module, and the modules themselves are assigned to the corresponding functions (for example, assigned to main stabilization axes in the "Hardware" - "Motor outputs") - only then the modules are initialized at system start.
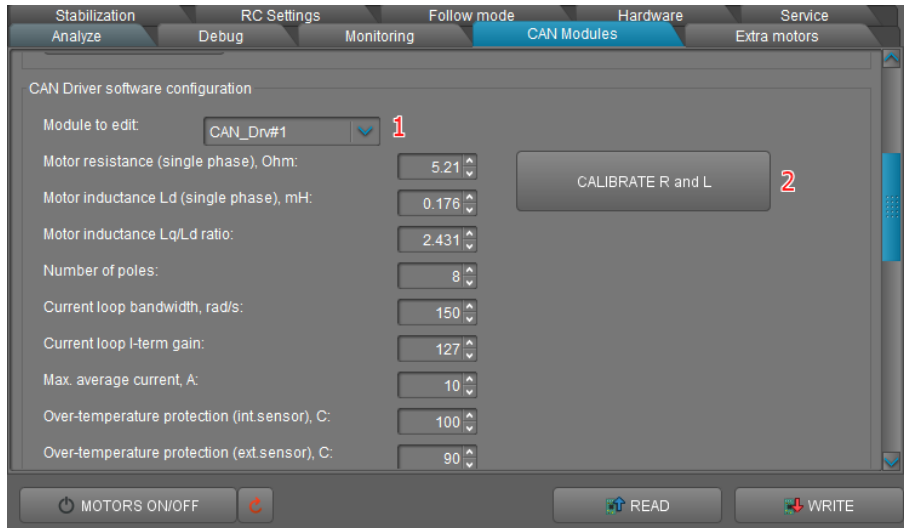
1) On the "CAN_DRV" tab, select the corresponding module for configuration in the "Module to edit" drop-down list

    NOTE: To configure the 4th and subsequent axes, before calibrations, it is necessary to set the number of poles of the motor in the "Number of poles" line and only then perform the adjustment.

2) Press the "Calibrate R and L" button.
    ○ Starting from firmware 1.11 calibration is done automatically – motor rotates to some small angle and vibrates. Don't block a free rotation during the calibration.
    ○ Prior to version 1.11, user should rotate it by hands – slowly and as evenly as possible rotate in both directions alternately until the calibration is completed.
      For more details please refer to the "CAN_Drv module configuration reference manual".

3) Next, it is necessary to calibrate "Magnetic link of rotor to stator", press the button (see the picture below) and quickly rotate the motor by hand.
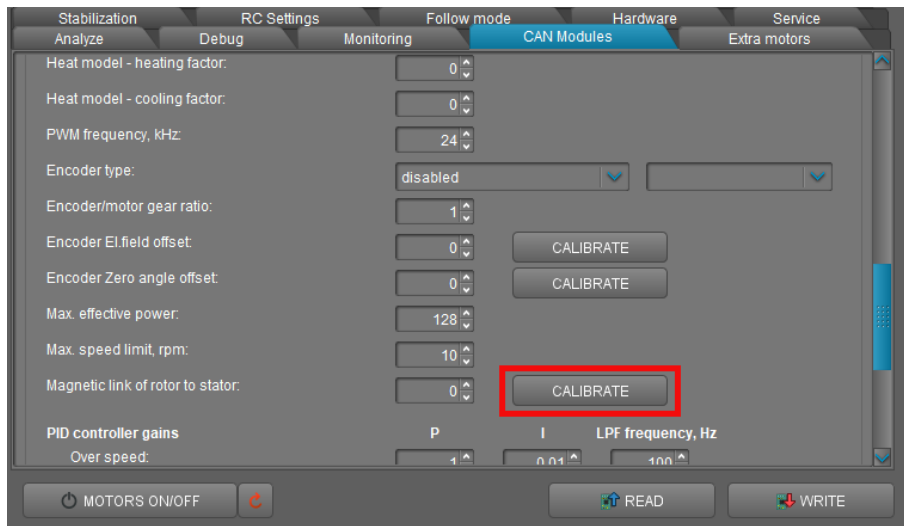
4) After configuration and calibration is complete, it is necessary to save the result in the controller's EEPROM by pressing "**WRITE**" button.

IMPORTANT NOTE: "WRITE TO MODULE" button in "CAN Driver hardware configuration" section overwrites the internal hardware settings of the module. It is not recommended to overwrite them unless absolutely necessary, as this may cause damage to the module!

5) After completing modules setup, the power supply should be turned off and the next module plugged in. Afterwards repeat all steps from "Address Assignment" and "Module Configuration" instructions.

NOTE: The error "CAN_Drv parameters not set" disappears after calibration.

In a case of errors, the system information can be requested on the "Debug" tab. - "Request state". Among the other information about the system, information about the current status of all involved CAN_DRV and their errors (if any) will be displayed.

Encoder configuration when using CAN_DRV for additional axes

NOTE: Encoder configuration for the 3 main stabilizing axes is performed on the "Encoders" tab and is described in a separate manual for the main controller.

*It is necessary to use only **one** of them.*
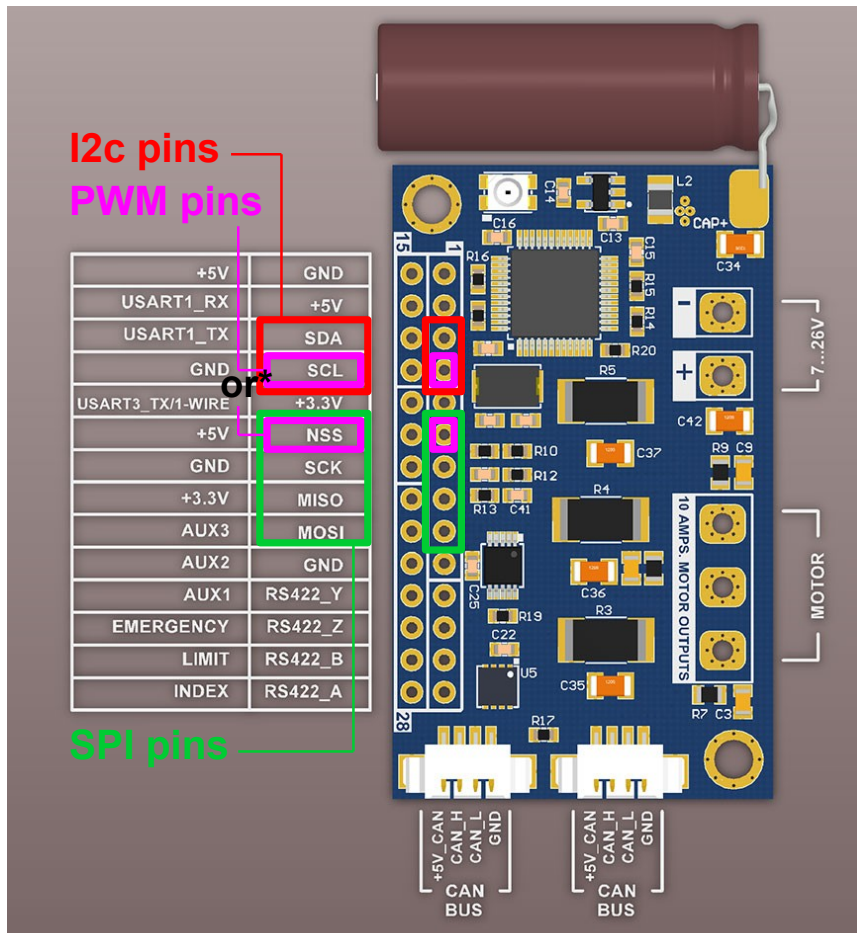
* NSS and SCL pins are combined to connect the PWM signal wire

1) Connect the encoder to the module on the appropriate interface (choose only one of supported by the encoder): SPI, PWM, I2C or RS422. The detailed connection diagram is shown in the figure. All signals on the board have 3.3V logic. All encoder port pins are +5V tolerant and can handle 5V logic levels.

   NOTE: SPI "clock" pin may be labeled as SCK or CLK. SPI "device select" pin may be labeled as NSS or CSn.

2) Select the encoder's type and the type of connection in the "Encoder type" drop-down list and click "**WRITE**" button. Encoder status can be checked by requesting the system information on the "Debug" tab. - "Request state".

3) Calibrate "El. Field " by pressing **"CALIBRATE"** button. The motor shaft will rotate during the calibration process. It should rotate absolutely freely, with minimal effort, otherwise the result will be incorrect!

4) Set the motor to the desired initial position and calibrate the "Zero angle offset" by pressing the "CALIBRATE" button. It is most convenient to turn off the motors with the interface button "MOTORS OFF / ON" and adjust the position of the axis with your hands.

5) After configuration complete, it is necessary to save the result in the non-volatile memory of the main controller (EEPROM) by pressing **"WRITE"** button.

Parameters of CAN_DRV modules are stored in the main controller's EEPROM, so you can backup and restore configuration using profiles and the "Backup Manager" utility, like all other settings in the gimbal.