Summary of Contributions

A list of all modifications made to ODrive v0.4.11. All edits are labeled with an “ERG” comment, so edits may easily be viewed in the code [13] by searching “ERG”.

Firmware: Input commands and data collection

- I. Test input
  - a. axis.cpp and axis.hpp
    - i. Added input configuration to Axis class
      1. Added enum definition InputType_t
      2. Added struct definition InputConfig_t
      3. Added input_config argument (of type InputConfig_t) to Axis class
      4. Add input_config_ field (of type InputConfig_t)
      5. Edited make_protocol_definitions() to make input_config_ and its members user-accessible
    - ii. Added new state machine behavior to run test input
      1. Added AXIS_STATE_MOTOR_CHARACTERIZE_INPUT to State_t
      2. Edited run_state_machine_loop() to include behavior for AXIS_STATE_MOTOR_CHARACTERIZE_INPUT
      3. Added method run_motor_characterize_input() (120 lines)
  - b. main.cpp
    - i. Added array input_configs
    - ii. Added input_configs to save_configuration() and load_configuration()
    - iii. Added input_config argument to axes initialization
- II. Data recording and user-accessibility
  - a. odrive_main.h
    - i. Added ring buffer motorCharacterizeData, of size MOTORCHARACTERIZEDATA_SIZE, with index tracker motorCharacterizeData_pos
  - b. communication.cpp
    - i. Added initialization for ring buffer
    - ii. Added four static ‘get by index’ functions for timestep, voltage, position, and velocity in motorCharacterizeData
    - iii. Edited make_obj_tree() to make motorCharacterizeData_pos, motorCharacterizeData_size, and the four get functions user-accessible
  - c. axis.cpp and axis.hpp
    - i. Added method record_motor_characterize_data() (8 lines), which writes data to motorCharacterizeData at index motorCharacterData_pos when called as part of run_motor_characterize_input()

Python: User interface, data retrieval and export

- I. enums.py - added AXIS_STATE_MOTOR_CHARACTERIZE_INPUT
- II. utils.py - added method run_motor_characterize_input() (85 lines)
- III. shell.py - added run_motor_characterize_input() to launch_shell()