

ODrive 问题集锦

DC_BUS_UNDER_VOLTAGE

```
axis0
axis: Error(s):
  AXIS_ERROR_DC_BUS_UNDER_VOLTAGE
  AXIS_ERROR_MOTOR_FAILED
motor: Error(s):
  MOTOR_ERROR_DRV_FAULT
fet_thermistor: no error
motor_thermistor: no error
encoder: no error
controller: no error
axis1
axis: Error(s):
  AXIS_ERROR_DC_BUS_UNDER_VOLTAGE
  AXIS_ERROR_MOTOR_FAILED
motor: Error(s):
  MOTOR_ERROR_DRV_FAULT
fet_thermistor: no error
motor_thermistor: no error
encoder: no error
controller: no error
```

解决方案：

1. 询问供电方式，供电电压够不够
2. 检查供电的电流是否太小或电量不足，导致瞬间压降

CONTROL_DEADLINE_MISSED

```
In [15]: dump_errors(odrv0)
axis0
  axis: Error(s):
        AXIS_ERROR_MOTOR_DISARMED
  motor: Error(s):
        MOTOR_ERROR_CONTROL_DEADLINE_MISSED
fet_thermistor: no error
motor_thermistor: no error
encoder: no error
controller: no error
axis1
```

一般是因为速度太高，导致 odriive 不稳定

解决方式：

1. 提高 vel_limit
2. 降低 p 环参数
3. 尽量用 trap_traj 模式，并将梯形轨迹模式下的速度限制设置到低于 vel_limit(1/2)

参考

I believe that this error is just an overspeed error- ignore the control_deadline_missed. It is caused by hitting the configured velocity limit, which itself is usually caused by controller instability or an unrealistic demand.

You could:

1. *Increase the vel_limit*
2. *Reduce your controller gains*
3. *Do not set the position demand using pos_setpoint= to move a long distance. Set your trap_traj vel_limit to be below (e.g. half) the actual vel_limit, and use controller.move_to_pos() instead, to generate and follow trajectory to the new position*

<https://discourse.odriverobotics.com/t/slotless-bldc-motor/3296>

<https://discourse.odriverobotics.com/t/error-control-deadline-missed/3662/2>

PHASE_RESISTANCE_OUT_OF_RANGE

```
axis0
  axis: Error(s):
    AXIS_ERROR_MOTOR_FAILED
  motor: Error(s):
    MOTOR_ERROR_PHASE_RESISTANCE_OUT_OF_RANGE
  fet_thermistor: no error
  motor_thermistor: no error
  encoder: no error
  controller: no error
axis1
  axis: no error
  motor: no error
  fet_thermistor: no error
  motor_thermistor: no error
  encoder: no error
```

相电阻超过测量范围

解决方案：

1. 排查电机接线问题，是否存在断路
2. 排查是否是电机原因，检查所用电机的相电阻是多少，是否超过默认范围。尤其如果是云台电机，要更换 motor_type (high_current_motor→gimbal_motor)
3. 排查是否是因为校准电流电压参数设置不对，先用默认的参数尝试校准，即：

先清除配置 `odrv0.erase_configuration()`

执行电机校准 `odrv0.axis0.requested_state = AXIS_STATE_MOTOR_CALIBRATION`

如果可以，就按照默认参数改一下脚本的参数

```
Forums: https://discourse.odriverobotics.com/
Discord: https://discord.gg/k3ZZ3mS
Github: https://github.com/madcowswe/ODrive/

Please connect your ODrive.
You can also type help() or quit().

Connected to ODrive 20823493594B as odrv0
In [1]: odrv0.axis0.motor.config.calibration_current
Out[1]: 10.0

In [2]: odrv0.axis0.motor.config.resistance_calib_max_voltage
Out[2]: 2.0

In [3]:

# 电机相关参数
motor_parameter = {"pole_pairs": 7, # 电机的极对
                  "motor_type": MOTOR_TYPE_HIGH_CURRENT, # 电机类型
                  "cur_lim": 40, # 电机电流限制 (A)
                  "cal_cur": 10, # 电机校准电流限制 (A)
                  "cal_vol": 1, # 电机校准电压限制 (V)
                  "requested_cur_range": 80, # 电流采样范围 (A)
                  "kv": 800 # 电机kv值
                  }

# 编码器参数 for AS5047P
encoder_parameter = {"mode": ["5047_ABI", "5047_SPI"],
                    "encoder_mode": [ENCODER_MODE_INCREMENTAL, ENCODE
                    "cpr": [4000, 2 * 14], # 编码器cpr
                    "bandwidth": 3000, # 带宽
                    "encoder_cs_pin": 8, # SPI CS引脚
                    "cali_cur": 5, # 配置编码器时校准电机的电流
                    "cali_ramp_dis": 3.1415927410125732, # 配置编码器
                    "cali_ramp_time": 0.4, # 配置编码器时电流提高的时
                    "cali_accel": 20, # 配置编码器时电机的加速度
                    "cali_vel": 40, # 配置编码器时电机的速度
                    }
```

CPR_POLEPAIRS_MISMATCH

```
(python37) C:\Users\Administrator>python "setting
是否需要设置参数? (Y/N)n
是否需要校准电机? (Y/N)y
正在校准电机.....
axis0
axis: Error(s):
  AXIS_ERROR_ENCODER_FAILED
motor: no error
fet_thermistor: no error
motor_thermistor: no error
encoder: Error(s):
  ENCODER_ERROR_CPR_POLEPAIRS_MISMATCH
controller: no error
axis1
axis: no error
```

解决流程

- 使用的是什么编码器模式？
 - ABI 模式
 - 查看硬件连接——有没有固定好电机和编码器

- 查看配置程序，询问电机型号、极对数——确保极对数设置正确，编码器的 CPR 设置正确。AS5047P 的 ABI 模式 CPR 为 4000，SPI 模式为 16382 (2^{14})

→SPI 模式

- SPI 模式按照说明文档，第一次只配置参数不校准电机，第二次不配置参数，校准电机。需要特别说明这是 ODrive 在 SPI 模式下的 BUG。

- 同 ABI 模式

- 多试几次

- 终极判断

- 先清除配置，然后用脚本程序，配置参数，但不要校准电机，不要校准编码器，不要进入闭环
- 保存配置，重启
- 然后进入 odrivetool
- 输入 `odrv0.axis0.encoder.shadow_count`
- 电机手动转一圈，在输入 `odrv0.axis0.encoder.shadow_count`
- 对比两次的值

usb.core.NoBackendError: No backend available

```
c:\programs\Odrive\Python3.8.6\Scripts>odrivetool
ODrive control utility v0.5.1.post0
Website: https://odriverobotics.com/
Docs: https://docs.odriverobotics.com/
Forums: https://discourse.odriverobotics.com/
Discord: https://discord.gg/k3ZZ3mS
Exception in thread Thread-1:
Github: https://github.com/madcowswe/ODrive/:

Traceback (most recent call last):

Please connect your ODrive.
File "c:\programs\Odrive\Python3.8.6\lib\threading.py", line 932, in _bootstrap_
You can also type help() or quit().

    self.run()
File "c:\programs\Odrive\Python3.8.6\lib\threading.py", line 870, in run
    self._target(*self._args, **self._kwargs)
File "c:\programs\Odrive\Python3.8.6\lib\site-packages\libusb\usbbulk_transport.py", line 1309, in _find_devices
    devices = usb.core.find(find_all=True, custom_match=device_matcher)
File "c:\programs\Odrive\Python3.8.6\lib\site-packages\usb\core.py", line 1309, in find
    raise NoBackendError('No backend available')
usb.core.NoBackendError: No backend available
In [1]:
```

解决流程

- pyusb 没有安装成功
 - 重新安装 pyusb : pip install pyusb

使用云台电机

校准电机时没有声音

不会测量出电阻电感

ODrive.Motor.Error.MODULATION_MAGNITUDE

```
设置电机为速度模式
是否需要校准电机? (Y/N) (不会有反应)y
正在校准电机.....
校准电机成功
是否需要校准编码器? (Y/N)y
正在校准编码器.....
axis0
  axis: Error(s):
    AXIS_ERROR_MOTOR_FAILED
  motor: Error(s):
    MOTOR_ERROR_MODULATION_MAGNITUDE
  fet_thermistor: no error
  motor_thermistor: no error
  encoder: no error
  controller: no error
axis1
  axis: no error
  motor: no error
  fet_thermistor: no error
  motor_thermistor: no error
  encoder: no error
  controller: no error
```

<https://discourse.odriverobotics.com/t/motor-error-gimbal-motor-modulation-magnitude/924/8>

如果使用航模电机 更换电机接线顺序

ERROR_CURRENT_LIMIT_VIOLATION

电流超过限制一般是指超过 `motor.config.current_lim+motor.config.current_lim_margin` 的值。电流控制是通过 PI 控制的，因此有可能会过冲。PI 环增益会根据 `config.current_control_bandwidth`、电机的电阻和电感自动计算，所以有时候过冲是正常的，在 `current_limit` 已经比较大的前提下，比较好的一个解决方案是在提高一下 `current_limit_margin`。

The motor current exceeded `motor.config.current_lim + motor.config.current_lim_margin`.

The current controller is a PI controller, so it can experience overshoot. The PI gains are automatically calculated based on config.current_control_bandwidth and the motor resistance and inductance (pole placement). Some overshoot is normal, so a sensible solution is to increase the current limit margin if your current limit is large.

USB.Core NoBackendError: No backend available

```
pip install libusb1
```

```
pip install PyUSB
```

DC_BUS_OVER_REGEN_CUIRR

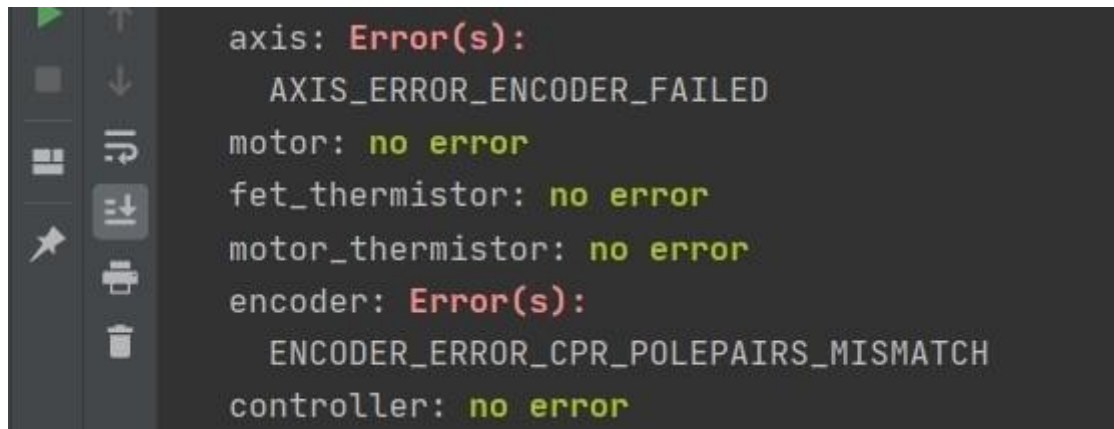
```
In [7]: dump_errors(odrv0)
axis0
  axis: Error(s):
        AXIS_ERROR_BRAKE_RESISTOR_DISARMED
  motor: Error(s):
        MOTOR_ERROR_DC_BUS_OVER_REGEN_CURRENT
fet_thermistor: no error
motor_thermistor: no error
encoder: no error
controller: no error
axis1
  axis: Error(s):
        AXIS_ERROR_BRAKE_RESISTOR_DISARMED
        AXIS_ERROR_MOTOR_DISARMED
  motor: Error(s):
        MOTOR_ERROR_DC_BUS_OVER_REGEN_CURRENT
fet_thermistor: no error
motor_thermistor: no error
encoder: no error
controller: no error
```

解决流程：

odrv0.config.dc_max_negative_current 以及 odrv0.config.max_regen_current

dc_max_negative_current 要负值,另一个 max_regen_current 是正值
这个是设置 dcbus 的反向电流的, 绝对值设大一点
具体看电池能吸收的反向电流,也就是充电电流

ENCODER_ERROR_CPR_POLEPAIRS_MISMATCH



```
axis: Error(s):  
    AXIS_ERROR_ENCODER_FAILED  
motor: no error  
fet_thermistor: no error  
motor_thermistor: no error  
encoder: Error(s):  
    ENCODER_ERROR_CPR_POLEPAIRS_MISMATCH  
controller: no error
```

解决流程：

检查极对数是否正确，在极对数正确的情况下：

先用脚本配置使用 abi 模式，不要校准，配置完直接保存，重启。然后再在命令行打开 odrivetool，输入 `odrv0.axis0.encoder.shadow_count` 电机转完整一圈，在输入上面的指令，对比两次的差值，就是实际的 cpr 值 cpr 值一般可能是 2000/2048/4000/4096