# FreeGo2-set

To check and modify the freego2-board parameters

At startup the program searches for the freego2-board and if is found shows the name and version in a dropdown select box. As long as de program has no connection with the freego2-board the data-fields are empty. When the program is not connected the button besides the boardname shows "Connect" klicking on the button connects the program toe the Frego2-board. The button will show "DisConnect" to indicate that cliking ont the same button will disconnect the program from the freego2-board.

When a write comand is given (with the Write button) a warning is given that the data-fields are not filled.
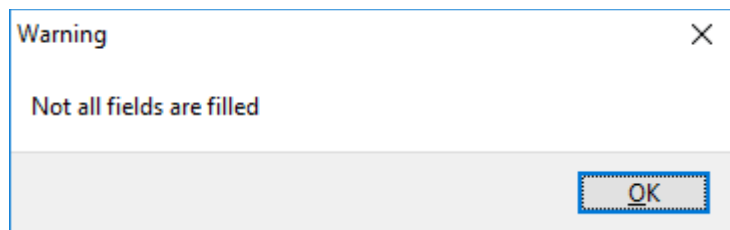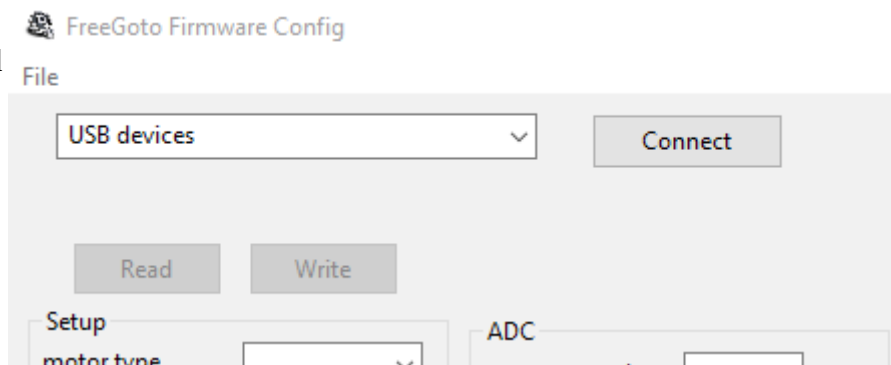
After connecting the program to the freego2-board a Read command can be given to get the current configuration of the freego2-board.
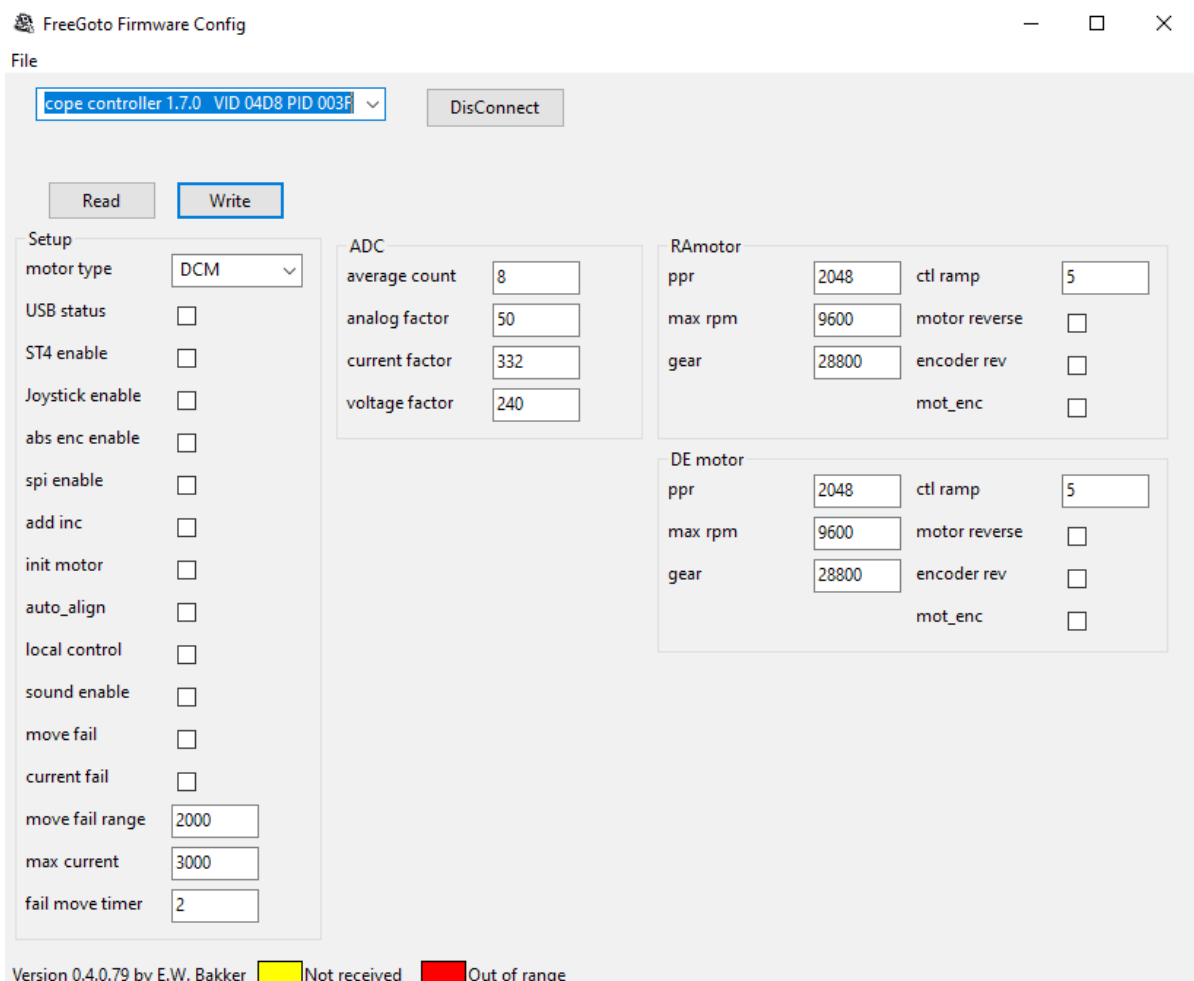
A set of groups of settings is shown.

Setup

| | |
|---|---|
| motor type: | select motor type DCM: DCmotor, STP:Stepper, BLDC:BrushlesDCmotor |
| USB status: | Show USB status |
| ST4 enable: | Enable ST4 interface. If no ST4 interface is connected this gives unspecified behavior |
| Joystick enable: | Enable analog joystick control |
| abs enc enable: | enable absolute SSI encoders (default to 17 bits) |
| SPI enable: | enable SPI abs encoder (default to 14 bits) |
| add inc: | add incremental encoder position to absolute encoder valueADC |
| init motor: | not used any more |
| auto_align: | enables motor/encoder align at power-up |
| local control: | test for position control on controller board |
| sound enable: | enable sound at move or current fail |
| move fail: | detect motor runaway |
| current fail: | detect over current |
| move fail range: | fail threshold for motor runaway |
| max current: | fail threshold for current |
| fail move timer: | fail duration before triggered |

ADC:

| | |
|---|---|
| average count: | The number of subsequent values of which the average is calculated |
| analog factor: | Multiplication factor for calculating analog input voltage |
| current factor: | Multiplication factor for calculating current measurement |
| power factor: | Multiplication factor for calculating the motor voltage measurement |

Depending on the motor type

Two groups of motor settings are shown. One far RA motor and the other for DE motor.

DCM:

| | |
|---|---|
| ppr: | pulses per rotation of the incrimental motor encoders |
| max rpm: | maximum rotations per minute of the motor |

RAmotor

| | | | |
|---|---|---|---|
| ppr | 2048 | ctl ramp | 5 |
| max rpm | 9600 | motor reverse | ☐ |
| gear | 28800 | encoder rev | ☐ |
| | | mot_enc | ☐ |

gear: total reduction from motor chaft to telescope chaft

ctl ramp: indication of rampspeed the higher the faster thr rampup/down

motor reverse: reverse motor direction

encoder rev: reverse encoder direction this also invluences motor direction

mot_enc: this is read only indication of relation between motor and motor-encoder

STEP:

Steps per rot: step count for full rotation

power reduction %: reduce motor power if stepper runs on lower voltage then board power.

Fraction: gear fracktion (gear.fraction)

gear: total reduction from motor chaft to telescope chaft

ctl ramp: indication of rampspeed the higher the faster thr rampup/down

motor reverse: reverse motor direction

**RA motor**

| | |
|---|---|
| Steps per rot | 200 |
| power reduction % | 0 |
| fraction | 0 |
| gear | 360 |
| ctl ramp | 10 |
| motor reverse | ☐ |

If joystick is enabled in Setup an extra set of parameters appears.

offset: joystick offset before detecting movement

sense: start factor n/1000 for joystick sensetivity

step: multiply sense with every joystick button press (if higher then 10 go back to sense)

auto_detect: if set movement will start after detecting max joystick value

invert hor: invert horizontal movment

invert vert: invert vertical movement

**Joy Stick**

| | |
|---|---|
| offset | 50 |
| sense | 100 |
| step | 10 |
| auto_detect | ☐ |
| invert hor | ☐ |
| invert_vert | ☐ |

if abs enc is enabled in Setup an extra set of parameters appears. These settings depend on the type of absolute encoder.

SSI encoder (absolute)

bits encx: number of bits the encoder word is wide.

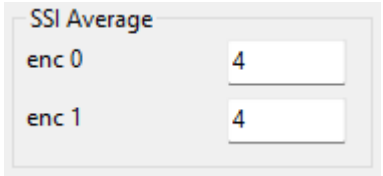lshift encx: left shifts needed after reading encoder

grey encx: encoder data is Grey format

the above 3 values are depending on the encoder type and should not be changed once the encoder is configured.

inv encx: change count direction of the encoder

**SSI encoder**

| | |
|---|---|
| bits enc0 | 17 |
| lshift enc0 | 1 |
| grey enc0 | ☑ |
| inv enc0 | ☐ |
| bits enc1 | 17 |
| lsift enc1 | 1 |
| gray enc1 | ☑ |
| inv enc1 | ☐ |

SSI Average

| | | SSI Average | |
|---|---|---|---|
| encx: | number of bits for everage count count is $2^n$ (e.g. 4=> $2^4 = 16$). This means that the average of 16 subsequent values is calculated and returned as encoder value | enc 0 | 4 |
| | | enc 1 | 4 |

Local control

With local control the board can be configured to track stand-alone. This is a simple constant speed movement. These tracking settings are expirimental.
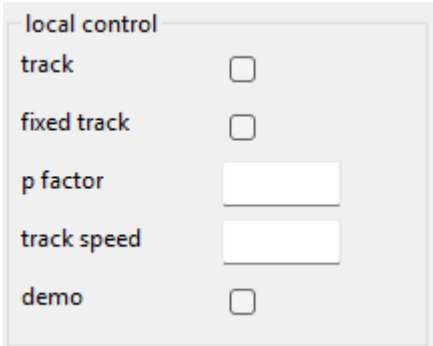
| | | local control | |
|---|---|---|---|
| track: | Enable tracking (sidereal time) | track | ☐ |
| fixed_track: | Enable fixed tracking | fixed track | ☐ |
| p factor: | Adjustment to sidereal speed (in micro seconds). | p factor | |
| track speed: | Speed value used by fixed_track speed (dempending on gear values, moostly around 20) | track speed | |
| demo: | Set board in demo mode to simulate a connected telescope. | demo | ☐ |