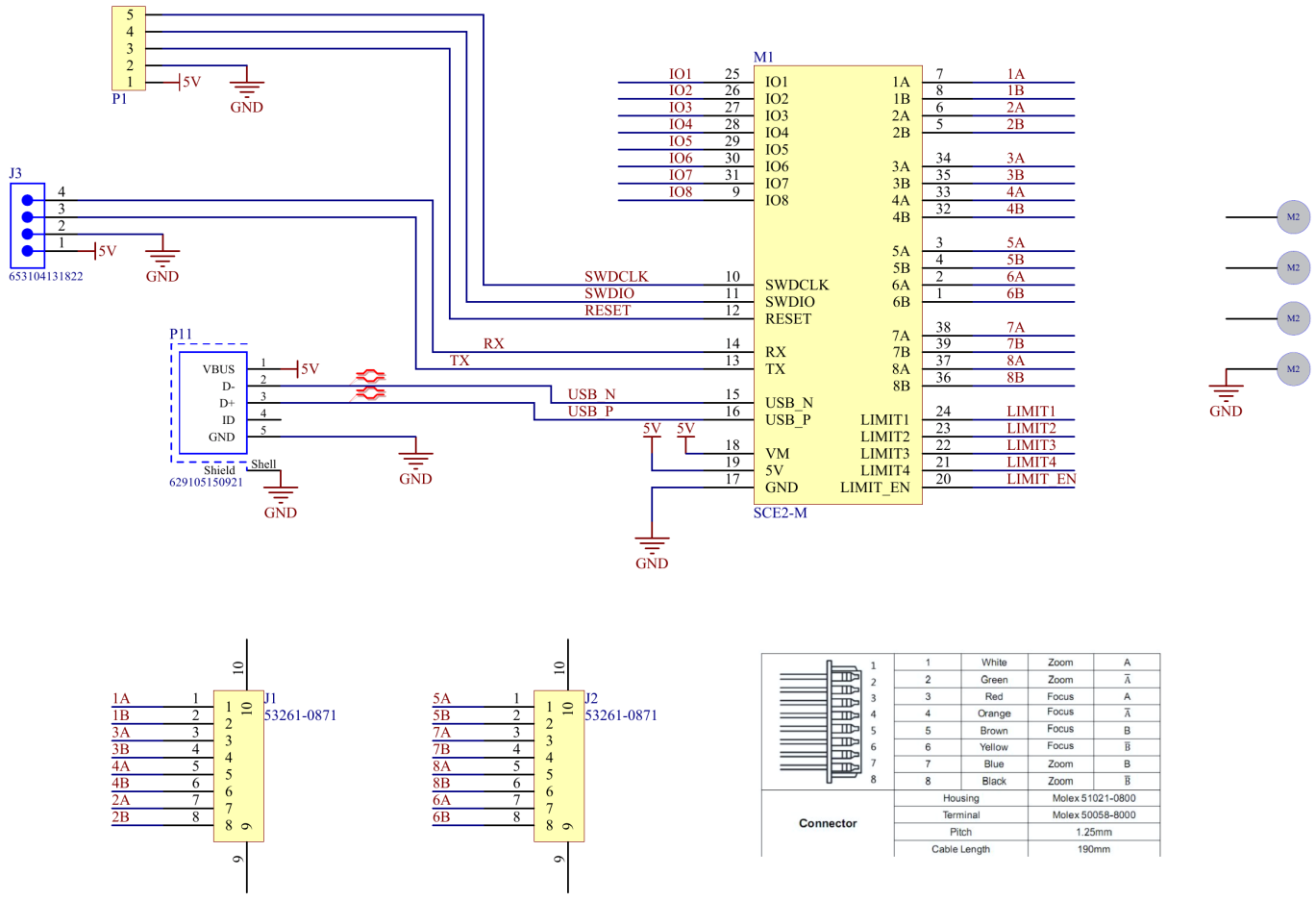
SCE2_dual_L012 dual lens controller board

SCE2_dual_L012 is a fully integrated stepper motor controller module carrier board for controlling two motorized lens zoom/focus parameters. Controller requires only 5V power supply from the USB port and controlled with text-based G-code commands over USB or optionally TTL UART.

Schematics



1	White	Zoom	A
2	Green	Zoom	$\bar{A}$
3	Red	Focus	A
4	Orange	Focus	$\bar{A}$
5	Brown	Focus	B
6	Yellow	Focus	$\bar{B}$
7	Blue	Zoom	B
8	Black	Zoom	$\bar{B}$
Connector	Housing	Molex 51021-0800	
	Terminal	Molex 50058-8000	
	Pitch	1.25mm	
	Cable Length	190mm	

Motor wiring vs axis definition

Axis	Motor function	Connector
X	Focus	J1
Y	Zoom	J1
Z	Focus	J2

A	Zoom	J2

Controlling the lenses

Recommended GRBL settings

Controller is shipped with default settings as listed below.

```
$0=6
$1=255
$2=0
$3=31
$4=1
$5=0
$6=0
$10=19
$11=0.010
$12=0.002
$13=0
$20=0
$21=0
$22=1
$23=15
$24=50.000
$25=200.000
$26=250
$27=5.000
$30=1000
$31=0
$32=0
$100=111.110
$101=111.110
$102=111.110
$103=111.110
$110=50000.000
$111=50000.000
$112=50000.000
$113=50000.000
$120=5000.000
$121=5000.000
```

```
$122=5000.000
$123=5000.000
$130=360.000
$131=360.000
$132=360.000
$133=360.000
$N0=G100P9L144N0S0F1R1
```

Startup sequence

Default TMC2300 power is too high for small stepper motors and will overheat and damage them. Motor drive/sleep current has to be decreased with commands listed below:

```
G100 P0 L144 N0 S0 F1 R1
G100 P1 L144 N0 S0 F1 R1
G100 P2 L144 N0 S0 F1 R1
G100 P3 L144 N0 S0 F1 R1
```

Or in a single command (valid since 20200103 firmware update)

```
G100 P9 L144 N0 S0 F1 R1
```

Which then can be added in GRBL startup sequence `$N0=G100P9L144N0S0F1R1`

Homing sequence

Lenses have no limit switches, thus precision homing is not possible. Instead each motor is driven to max position until hard stop and it is assumed that home position is achieved.

```
G91 # set motion to relative coordinate system
F30000 # set default motion speed
G1 X-500
G1 Y-1200
G1 Z-500
G1 A-1200
G90 # set motion to absolute coordinate system
G92 X0 Y0 Z0 A0 # set current position as 0
```

Control sequence

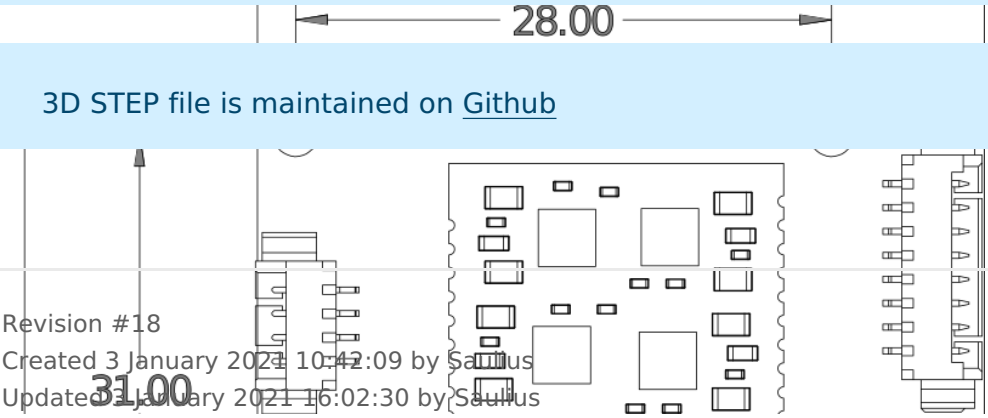
If power settings are reduced in startup stage, lens motors can be operated right away. Standard G-code motion commands can be used to drive motors. For example:

```
```

```
G1 Y100 A100 F40000
G1 Y-100 A100 F40000
G1 Y100 A-100 F40000
G1 Y-100 A-100 F10000
```

Dimensions

Mounting hole diameter is (not indicated) in drawing is 2.3mm



3D STEP file is maintained on Github

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