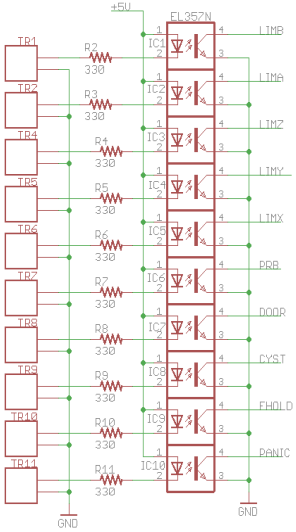
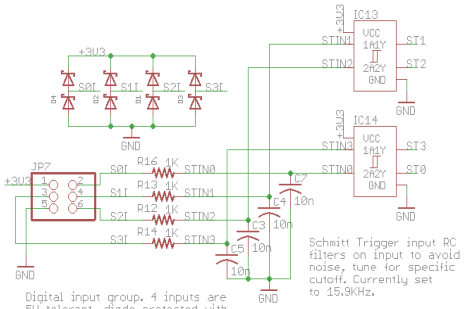
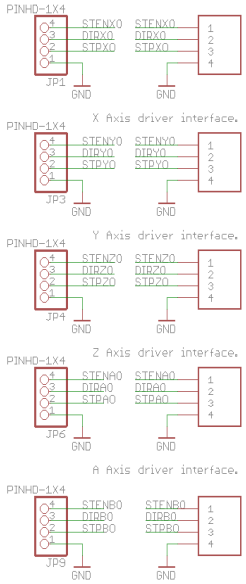


Limit and Probe Interfaces.
5V operation on LED side.
3.3V operation on photo-
transistor side. LED If set to
slightly higher than 10 mA.



Digital input group. 4 inputs are
5V tolerant, diode protected with
schmitt triggers. RC Low Pass
noise filters.

Schmitt Trigger input RC
filters on input to avoid
noise, tune for specific
cutoff. Currently set
to 15.9KHz.



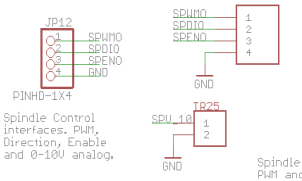
X Axis driver interface.

Y Axis driver interface.

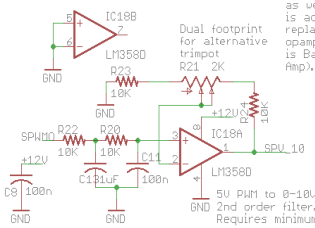
Z Axis driver interface.

A Axis driver interface.

B Axis driver interface.



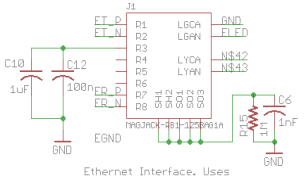
Spindle Control
interfaces. PWM,
Direction, Enable
and 0-10V analog.



Dual footprint
for alternative
trimpot

Spindle Control. Supports direct
PWM and on/off (via Spindle enable)
as well as 0-10V control. 10V output
is adjustable via trim pot. Consider
replacing LM358 with smaller
opamp, single channel (JLC LM358
is Basic part and lowest cost Op
Amp).

5V PWM to 0-10V.
2nd order filter.
Requires minimum 11.5V.

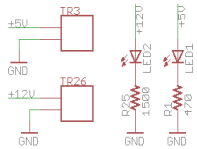


Ethernet Interface. Uses
MagJack. 1nF cap should
be 2KV. Add support for
2nd LED?

12V Input. Needed
for relays and OPAMP
for spindle PWM to 0-10V
conversion.

Misc Input Interfaces.
5V operation.

5V output (from USB)
Max 150 mA.



Board can be powered from external
5V or via USB power. To connect
via USB and use external +5V, cut
JP105. If connected via ethernet,
use external +5V, either from the
microUSB connector or the +5V
screw terminal.

GRBL/HAL Teensy 4.1 Motion Controller
T4.1U5XBB V2.05

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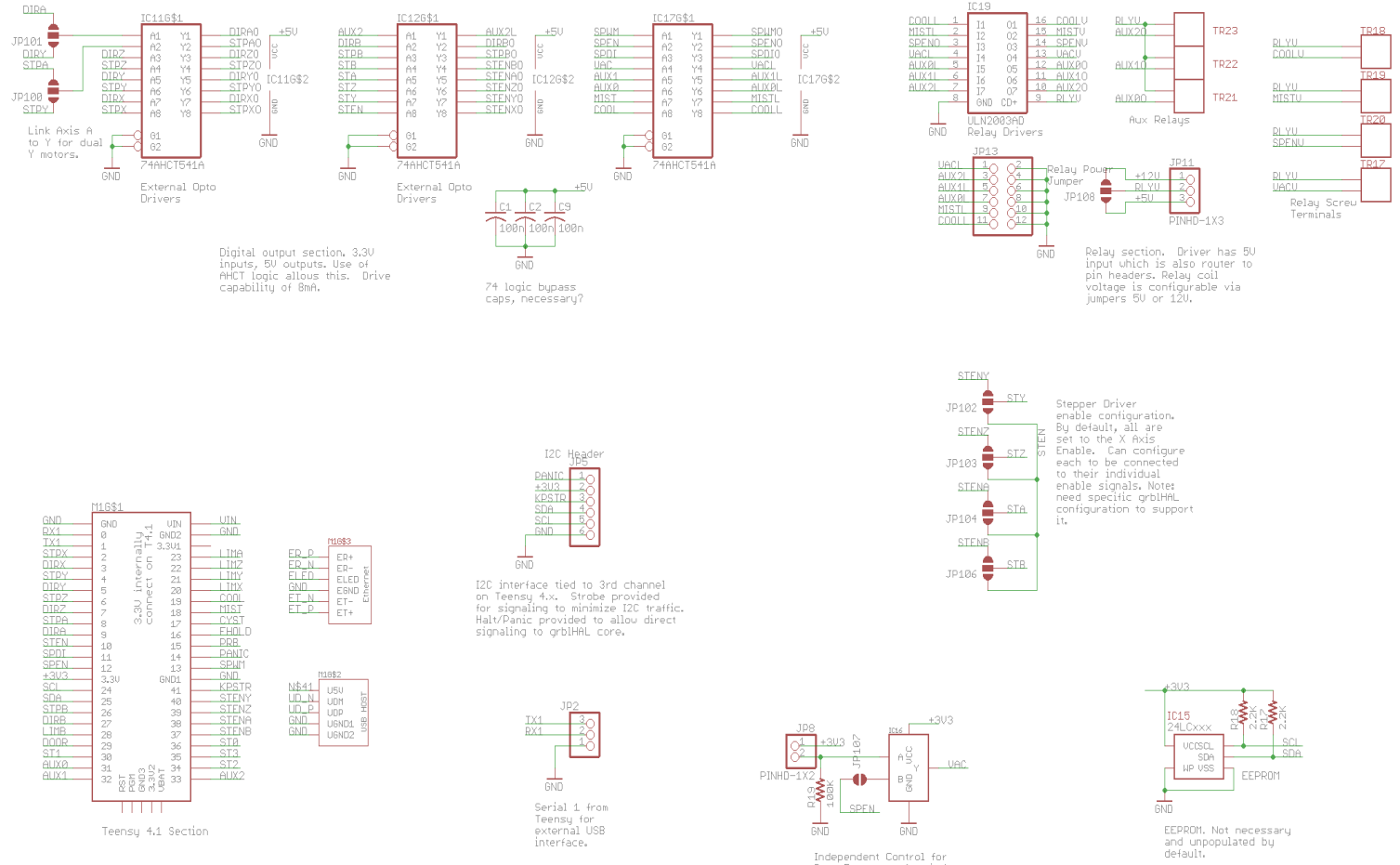

GRBL/HAL Teensy 4.1 Motion Controller T4.1U5XBB

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