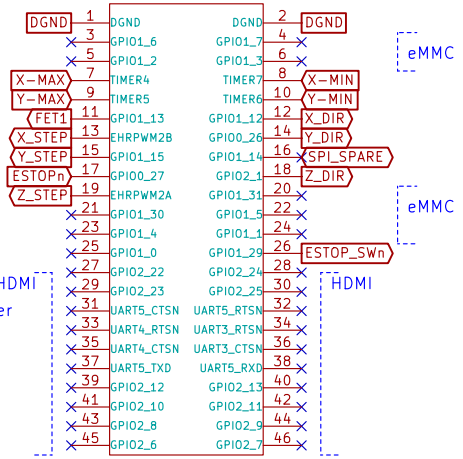
To save money on all the pin headers
when buying parts for a few boards,
you can get large breakaway headers
instead of the individual parts. You
will need a total of:

18 pins of single-row header
82 pins of dual-row header

Which you can get using
(1) Harwin M20-9993645 36-pin single-row header
(2) Harwin M20-9983645 72-pin dual-row header

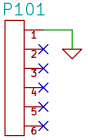
If you want to use standard pin headers instead
of the latching KK headers for the stepper and
ESTOP headers, you need another 32 pins of
single-row header

P8



Serial
Console

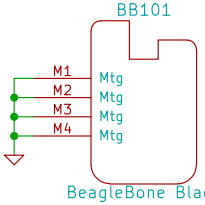
P101



BeagleBone serial
console pass-through
header

Uses Arduino 6-pin
stacking connector
for low-cost

BB101

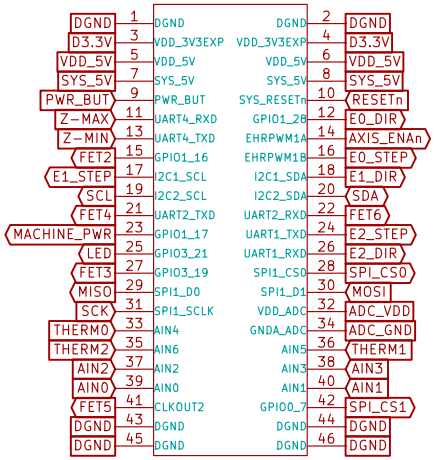


BeagleBone Black

24.576MHz Audio

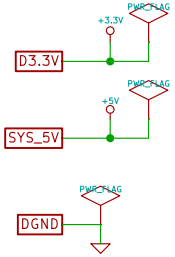
Audio
Audio

P9



SCL1 UART1_TX
SDA1 UART1_RX
Audio

BeagleBone Logic supply is always 3.3V



D3.3V: Low-current supply
from 500 mA LDO on BeagleBone

SYS_5V: Low-current supply
provided by BeagleBone PMIC
Active when BeagleBone is running

M101
PCB_GREEN_RMC

M102
OSHW_logo_2
LOGO_OSHW

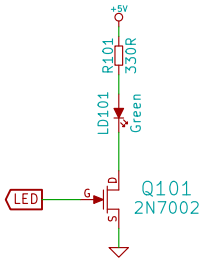
Stepper Drivers
steppers.sch

Emergency Stop
e-stop.sch

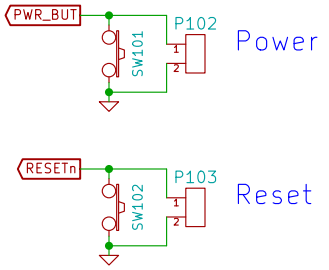
Inputs
con_inputs.sch

Mosfet Outputs
con_outputs.sch

Status LED



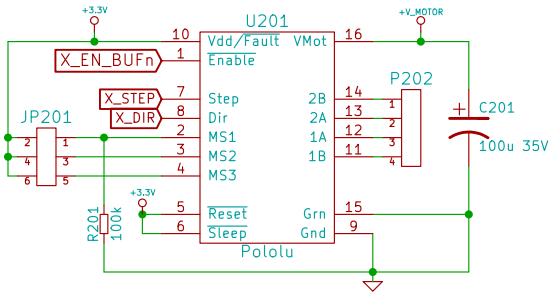
BB Turned On

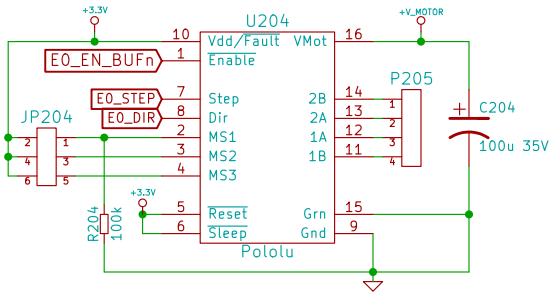


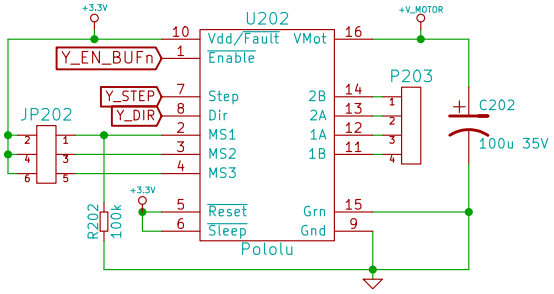
CRAMPS by Charles Steinkuehler and Murray Lindeblom
Copyright 2014 GPL v3
Derived from RAMPS-FD by Bob Cousins
Derived from RAMPS 1.4 reprap.org/wiki/RAMPS1.4

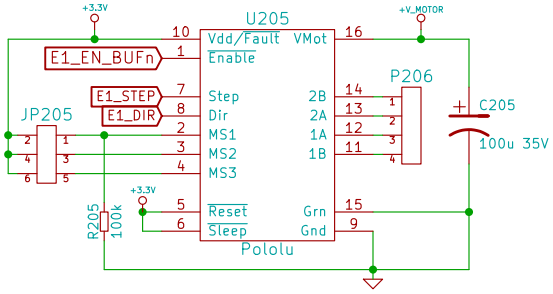
File: CRAMPS.sch
Sheet: /
Title: CRAMPS (Cape-RAMPS for BeagleBone)

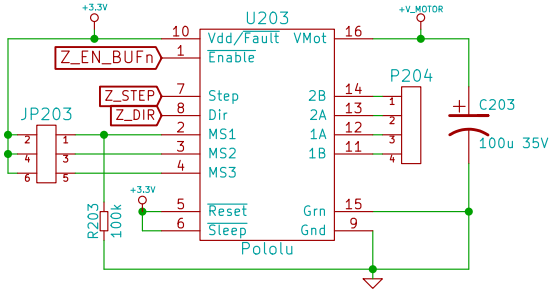
Size: A	Date: 2 may 2014	Rev: v1.0
KiCad E.D.A.		Id: 1/5

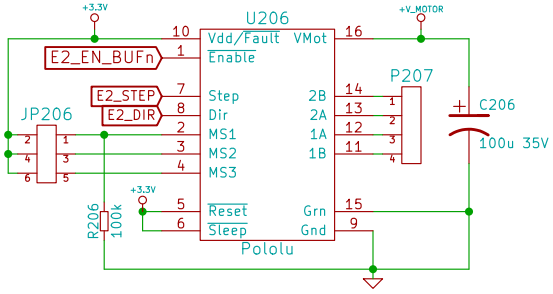




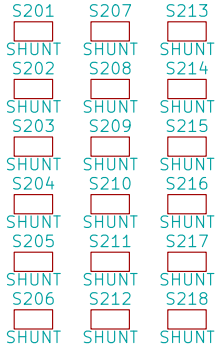




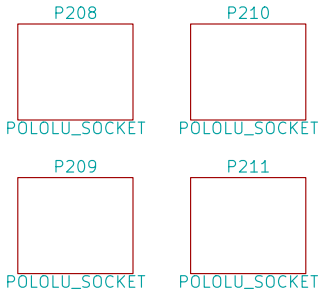




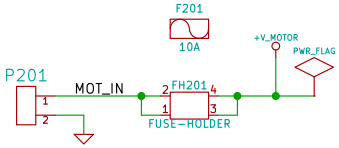
Shunts to set micro-stepping



24-pin Single-Row sockets for Pololus



Motor Power 12-24V, 10A



CRAMPS by Charles Steinkuehler and Murray Lindeblom
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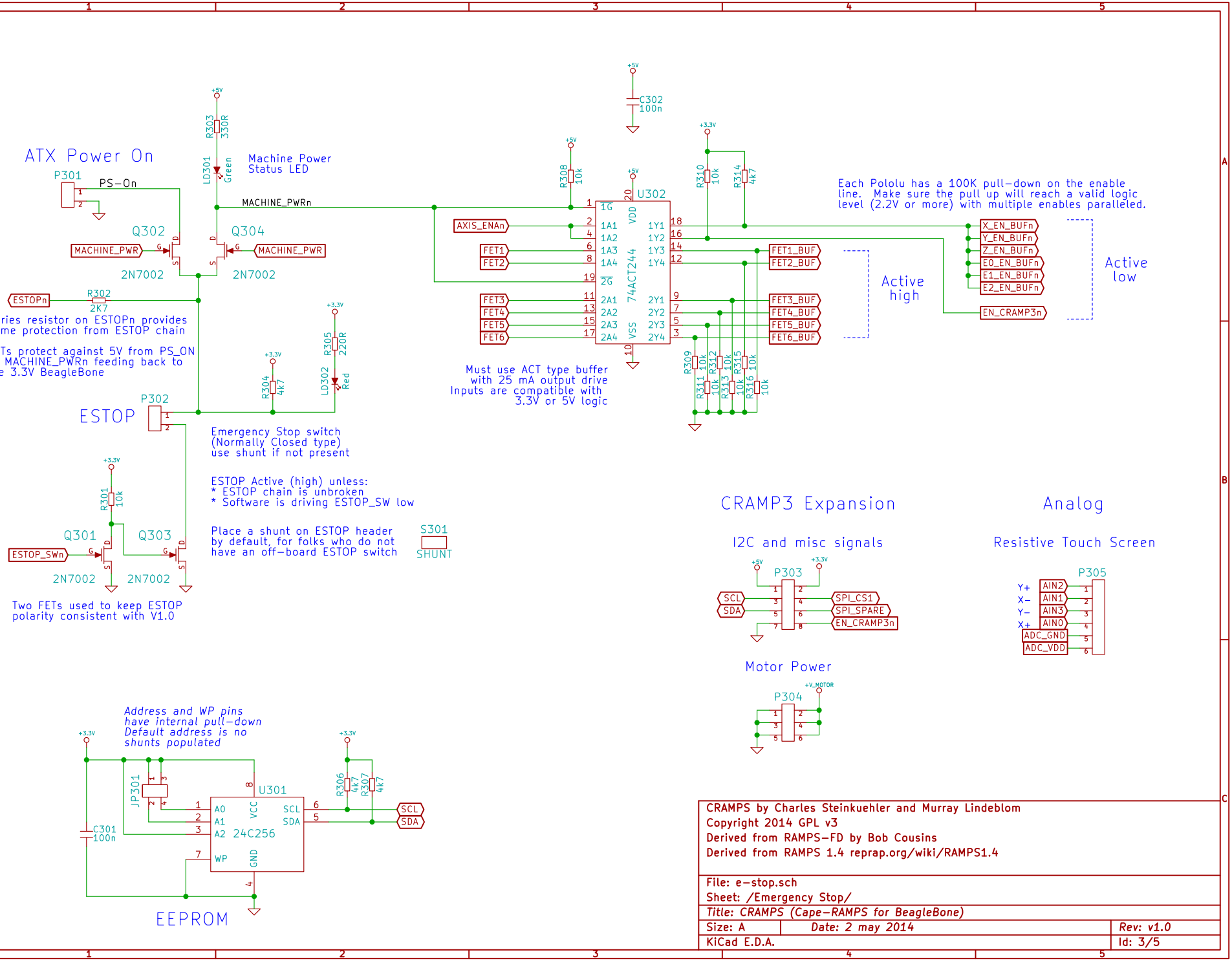
Derived from RAMPS-FD by Bob Cousins
Derived from RAMPS 1.4 reprap.org/wiki/RAMPS1.4

File: steppers.sch		
Sheet: /Stepper Drivers/		
Title: CRAMPS (Cape-RAMPS for BeagleBone)		
Size: A	*Date: 2 may 2014*	*Rev: v1.0*
KiCad E.D.A.		Id: 2/5


ATX Power On
P301
PS-On
R303
330R
LD301
Green
Machine Power
Status LED
MACHINE_PWRn
Q302
Q304
MACHINE_PWR
2N7002
ESTOPn
R302
2K7
Series resistor on ESTOPn provides
some protection from ESTOP chain
FETs protect against 5V from PS_ON
or MACHINE_PWRn feeding back to
the 3.3V BeagleBone
R304
4k7
R305
220R
LD302
Red
P302
ESTOP
Emergency Stop switch
(Normally Closed type)
use shunt if not present
ESTOP Active (high) unless:
* ESTOP chain is unbroken
* Software is driving ESTOP_SW low
R301
10k
Q301
Q303
ESTOP_SWn
Place a shunt on ESTOP header
by default, for folks who do not
have an off-board ESTOP switch
S301
SHUNT
Two FETs used to keep ESTOP
polarity consistent with V1.0
C302
100n
R308
10k
U302
74ACT244
AXIS_ENAn
FET1
FET2
FET3
FET4
FET5
FET6
FET1_BUF
FET2_BUF
FET3_BUF
FET4_BUF
FET5_BUF
FET6_BUF
R309
R311
R312
R313
R315
R316
10k
R310
10k
R314
4k7
Each Pololu has a 100K pull-down on the enable
line. Make sure the pull up will reach a valid logic
level (2.2V or more) with multiple enables paralleled.
X_EN_BUFn
Y_EN_BUFn
Z_EN_BUFn
E0_EN_BUFn
E1_EN_BUFn
E2_EN_BUFn
EN_CRAMP3n
Active
high
Active
low
Must use ACT type buffer
with 25 mA output drive
Inputs are compatible with
3.3V or 5V logic
CRAMP3 Expansion
I2C and misc signals
P303
SCL
SDA
SPI_CS1
SPI_SPARE
EN_CRAMP3n
Analog
Resistive Touch Screen
P305
Y+
X-
Y-
X+
AIN2
AIN1
AIN3
AIN0
ADC_GND
ADC_VDD
Motor Power
P304
+V_MOTOR
Address and WP pins
have internal pull-down
Default address is no
shunts populated
JP301
U301
24C256
A0
A1
A2
WP
VCC
GND
SCL
SDA
C301
100n
R306
4k7
R307
4k7
EEPROM
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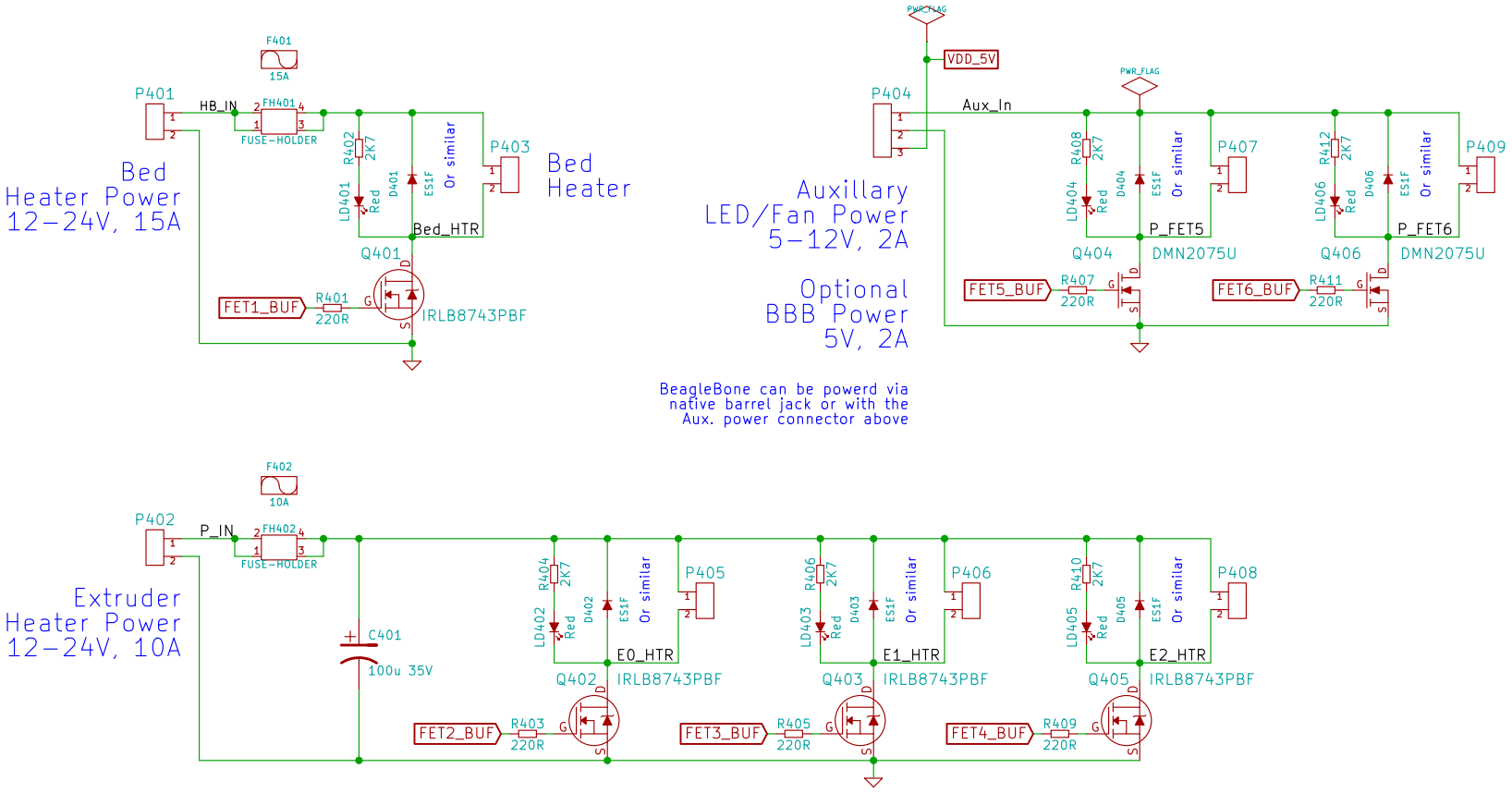
Derived from RAMPS-FD by Bob Cousins
Derived from RAMPS 1.4 reprap.org/wiki/RAMPS1.4
File: e-stop.sch
Sheet: /Emergency Stop/
Title: CRAMPS (Cape-RAMPS for BeagleBone)
Size: A
Date: 2 may 2014
Rev: v1.0
KiCad E.D.A.
Id: 3/5

MOSFET Outputs

Non-inverting drivers



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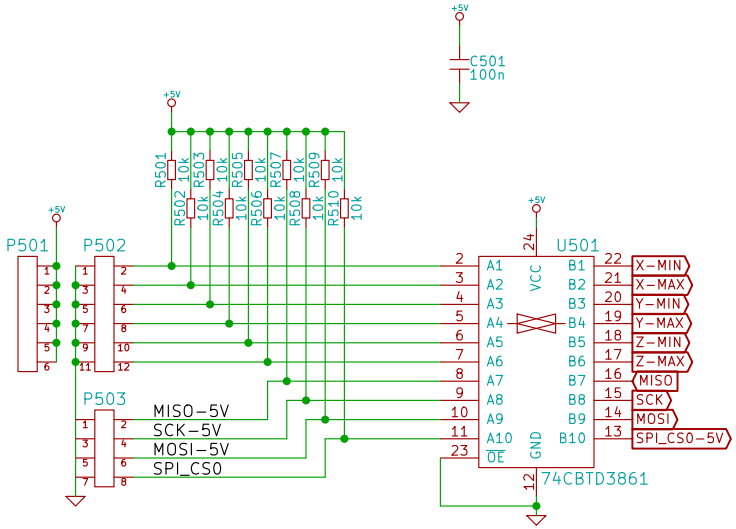
File: con_outputs.sch		
Sheet: /Mosfet Outputs/		
Title: CRAMPS (Cape-RAMPS for BeagleBone)		
Size: A	*Date: 2 may 2014*	*Rev: v1.0*
KiCad E.D.A.		Id: 4/5

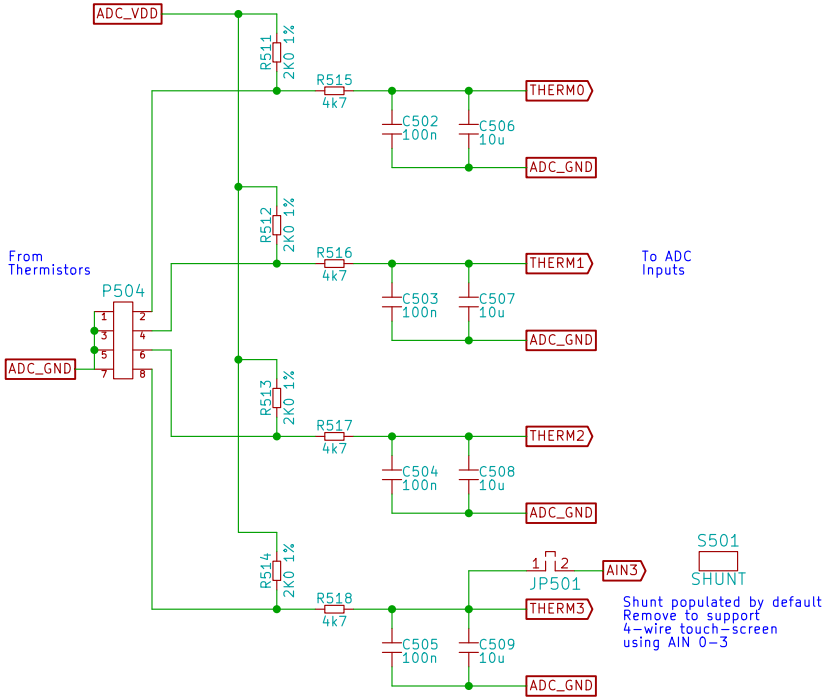
Endstops

Endstop inputs are 5V tolerant
and may also be used as 3.3V
output signals if desired



P503 may be used for:
* Additional digital I/O
* CRAMP3 add-on board
* SPI expansion

Thermistor Inputs



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Derived from RAMPS 1.4 reprap.org/wiki/RAMPS1.4

File: con_inputs.sch		
Sheet: /Inputs/		
Title: CRAMPS (Cape-RAMPS for BeagleBone)		
Size: A	*Date: 2 may 2014*	*Rev: v1.0*
KiCad E.D.A.		Id: 5/5