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

DGND	1	DGND	DGND	2	DGND
	3	GPIO1_6	GPIO1_7	4	
	5	GPIO1_2	GPIO1_3	6	
X-MAX	7	TIMER4	TIMER7	8	X-MIN
Y-MAX	9	TIMER5	TIMER6	10	Y-MIN
FET1	11	GPIO1_13	GPIO1_12	12	X_DIR
X_STEP	13	EHRPWM2B	GPIO0_26	14	Y_DIR
Y_STEP	15	GPIO1_15	GPIO1_14	16	SPI_SPARE
ESTOPn	17	GPIO0_27	GPIO2_1	18	Z_DIR
Z_STEP	19	EHRPWM2A	GPIO1_31	20	
	21	GPIO1_30	GPIO1_5	22	
	23	GPIO1_4	GPIO1_1	24	
	25	GPIO1_0	GPIO1_29	26	ESTOP_SWn
	27	GPIO2_22	GPIO2_24	28	
	29	GPIO2_23	GPIO2_25	30	
	31	UART5_CTSN	UART5_RTSN	32	
	33	UART4_RTSN	UART3_RTSN	34	
	35	UART4_CTSN	UART3_CTSN	36	
	37	UART5_TXD	UART5_RXD	38	
	39	GPIO2_12	GPIO2_13	40	
	41	GPIO2_10	GPIO2_11	42	
	43	GPIO2_8	GPIO2_9	44	
	45	GPIO2_6	GPIO2_7	46	

eMMC
eMMC
eMMC
eMMC
HDMI
HDMI

Serial Console

P101

BeagleBone serial console pass-through header

Uses Arduino 6-pin stacking connector for low-cost

BB101

M1 Mtg
M2 Mtg
M3 Mtg
M4 Mtg

BeagleBone Black

24.576MHz Audio
Audio
Audio

P9

DGND	1	DGND	DGND	2	DGND
D3.3V	3	VDD_3V3EXP	VDD_3V3EXP	4	D3.3V
VDD_5V	5	VDD_5V	VDD_5V	6	VDD_5V
SYS_5V	7	SYS_5V	SYS_5V	8	SYS_5V
PWR_BUT	9	PWR_BUT	SYS_RESETn	10	RESETn
Z-MAX	11	UART4_RXD	GPIO1_28	12	E0_DIR
Z-MIN	13	UART4_TXD	EHRPWM1A	14	AXIS_ENAn
FET2	15	GPIO1_16	EHRPWM1B	16	E0_STEP
E1_STEP	17	I2C1_SCL	I2C1_SDA	18	E1_DIR
SCL	19	I2C2_SCL	I2C2_SDA	20	SDA
FET4	21	UART2_TXD	UART2_RXD	22	FET6
MACHINE_PWR	23	GPIO1_17	UART1_TXD	24	E2_STEP
LED	25	GPIO3_21	UART1_RXD	26	E2_DIR
FET3	27	GPIO3_19	SPI1_CS0	28	SPI_CS0
MISO	29	SPI1_D0	SPI1_D1	30	MOSI
SCK	31	SPI1_SCLK	VDD_ADC	32	ADC_VDD
THERM0	33	AIN4	GNDA_ADC	34	ADC_GND
THERM2	35	AIN6	AIN5	36	THERM1
AIN2	37	AIN2	AIN3	38	AIN3
AIN0	39	AIN0	AIN1	40	AIN1
FET5	41	CLKOUT2	GPIO0_7	42	SPI_CS1
DGND	43	DGND	DGND	44	DGND
DGND	45	DGND	DGND	46	DGND

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

R101 330R
LD101 Green
LED
Q101 2N7002

BB Turned On

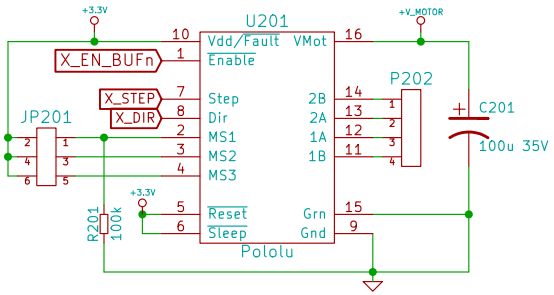
R102 330R
LD102 Green

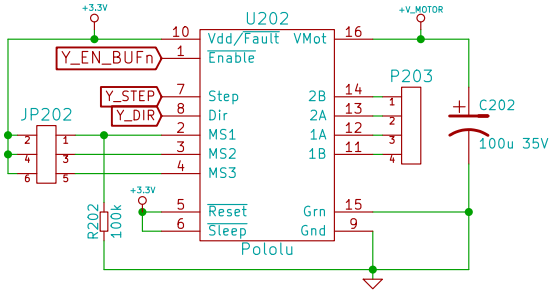
PWR_BUT
P102
SW101
Power

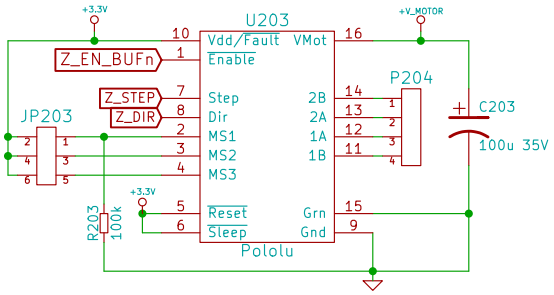
RESETn
P103
SW102
Reset

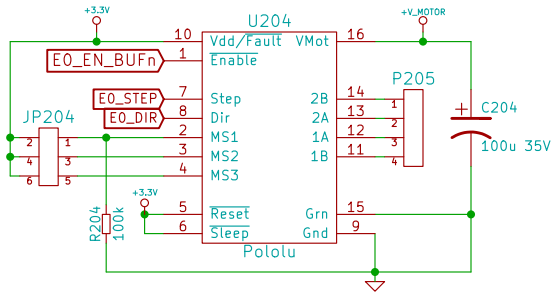
CRAMPS by Charles Steinkuehler and Murray Lindeblom
Copyright 2014 GPL v3
Derived from RAMPS-FD by Bob Cousins
Derived from RAMPS 1.4 reprap.org/wiki/RAMPS1.4

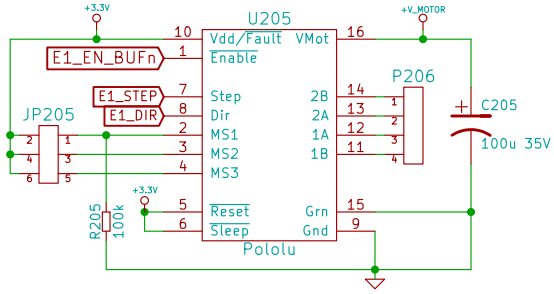
File: CRAMPS.sch
Sheet: /
Title: CRAMPS (Cape-RAMPS for BeagleBone)
Size: A | Date: 2 may 2014 | Rev: v1.0
KiCad E.D.A. | Id: 1/5

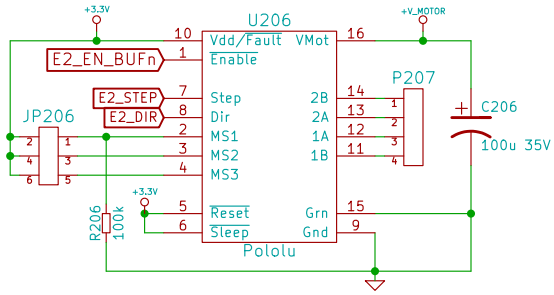










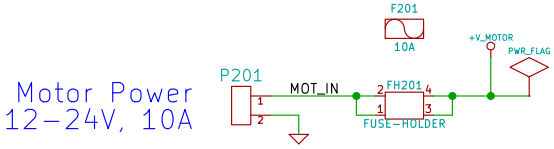


Shunts to set micro-stepping

S201 SHUNT
S202 SHUNT
S203 SHUNT
S204 SHUNT
S205 SHUNT
S206 SHUNT
S207 SHUNT
S208 SHUNT
S209 SHUNT
S210 SHUNT
S211 SHUNT
S212 SHUNT
S213 SHUNT
S214 SHUNT
S215 SHUNT
S216 SHUNT
S217 SHUNT
S218 SHUNT

24-pin Single-Row sockets for Pololus

P208 POLOLU_SOCKET
P210 POLOLU_SOCKET
P209 POLOLU_SOCKET
P211 POLOLU_SOCKET



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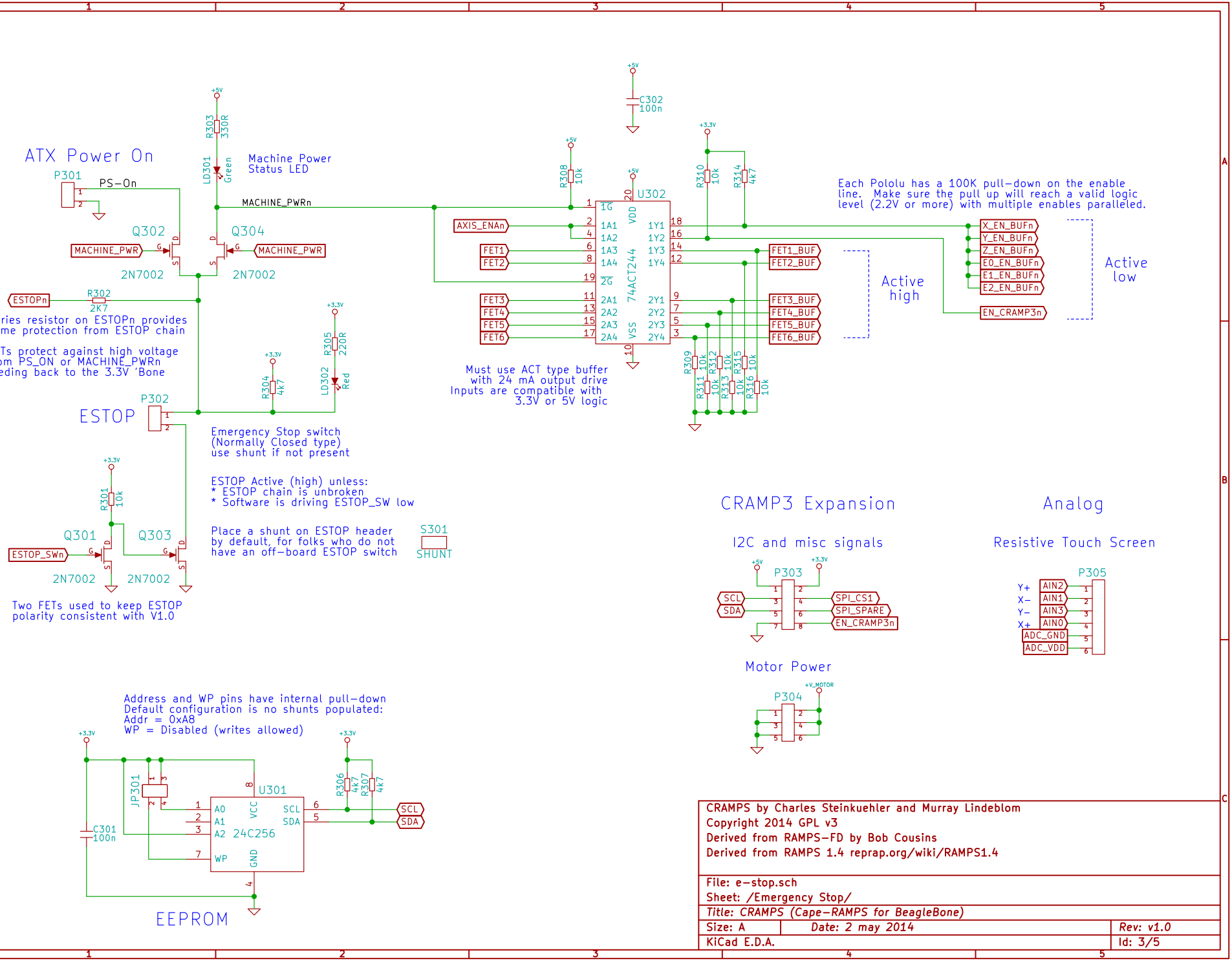
File: steppers.sch
Sheet: /Stepper Drivers/
Title: CRAMPS (Cape-RAMPS for BeagleBone)
Size: A | Date: 2 may 2014 | Rev: v1.0
KiCad E.D.A. | Id: 2/5



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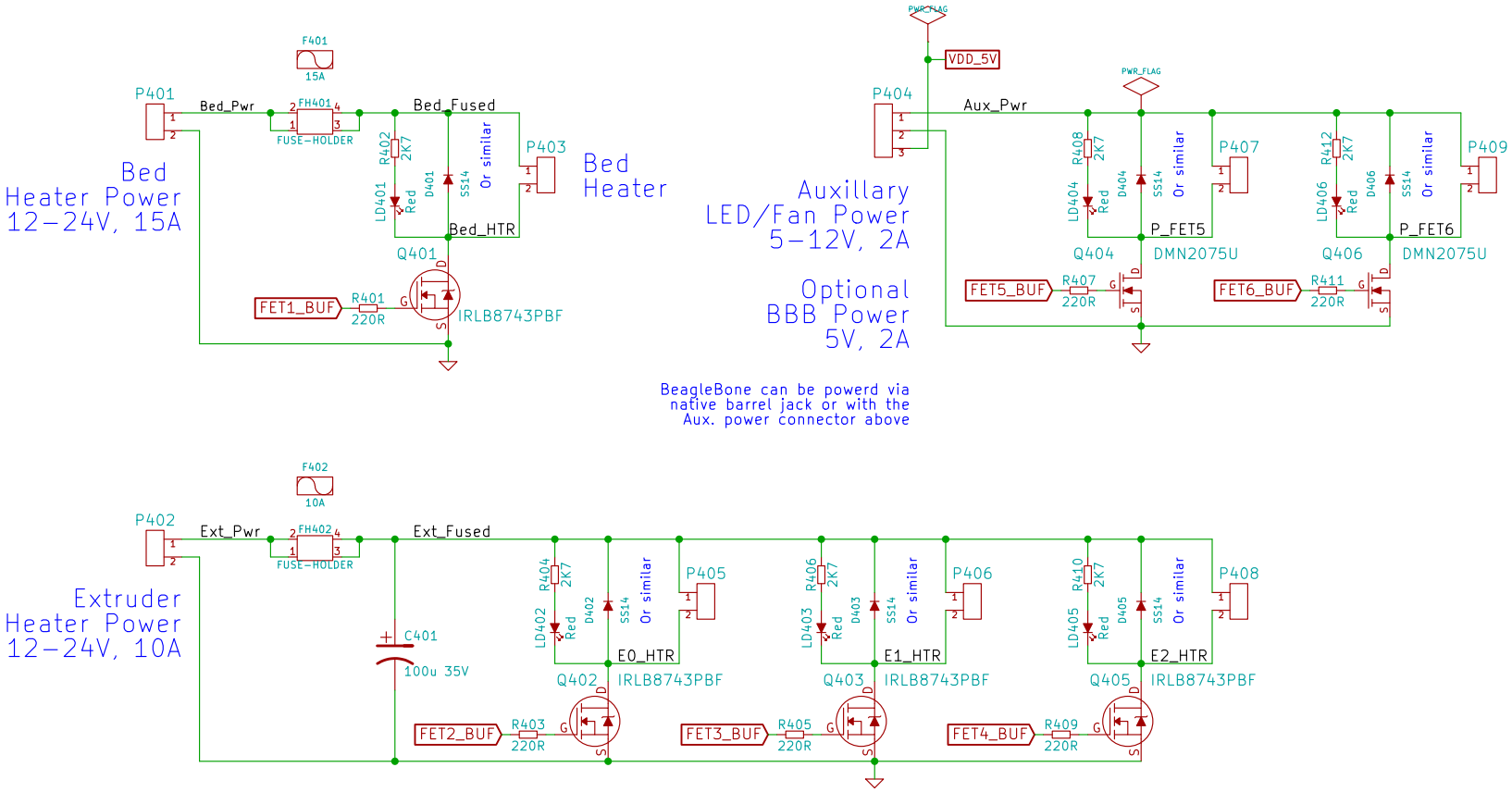
File: e-stop.sch		
Sheet: /Emergency Stop/		
Title: CRAMPS (Cape-RAMPS for BeagleBone)		
Size: A	*Date: 2 may 2014*	*Rev: v1.0*
KiCad E.D.A.		Id: 3/5

MOSFET Outputs

Non-inverting drivers



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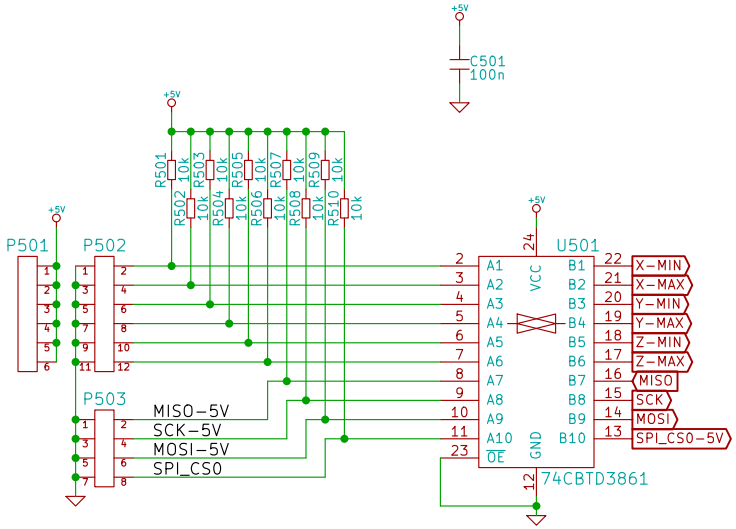
File: con_outputs.sch		
Sheet: /Mosfet Outputs/		
Title: CRAMPS (Cape-RAMPS for BeagleBone)		
Size: A	*Date: 2 may 2014*	*Rev: v1.0*
KiCad E.D.A.		Id: 4/5

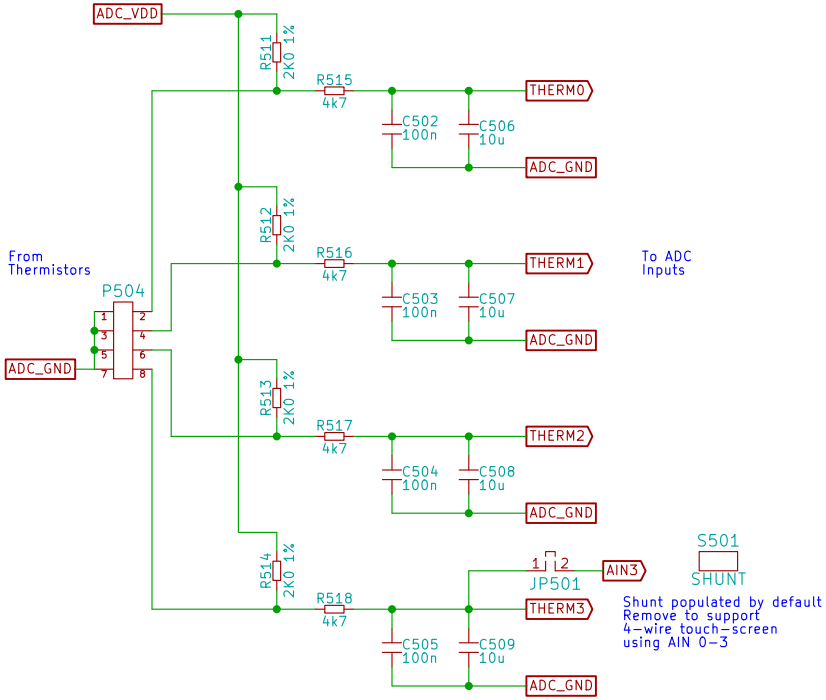
Endstops

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