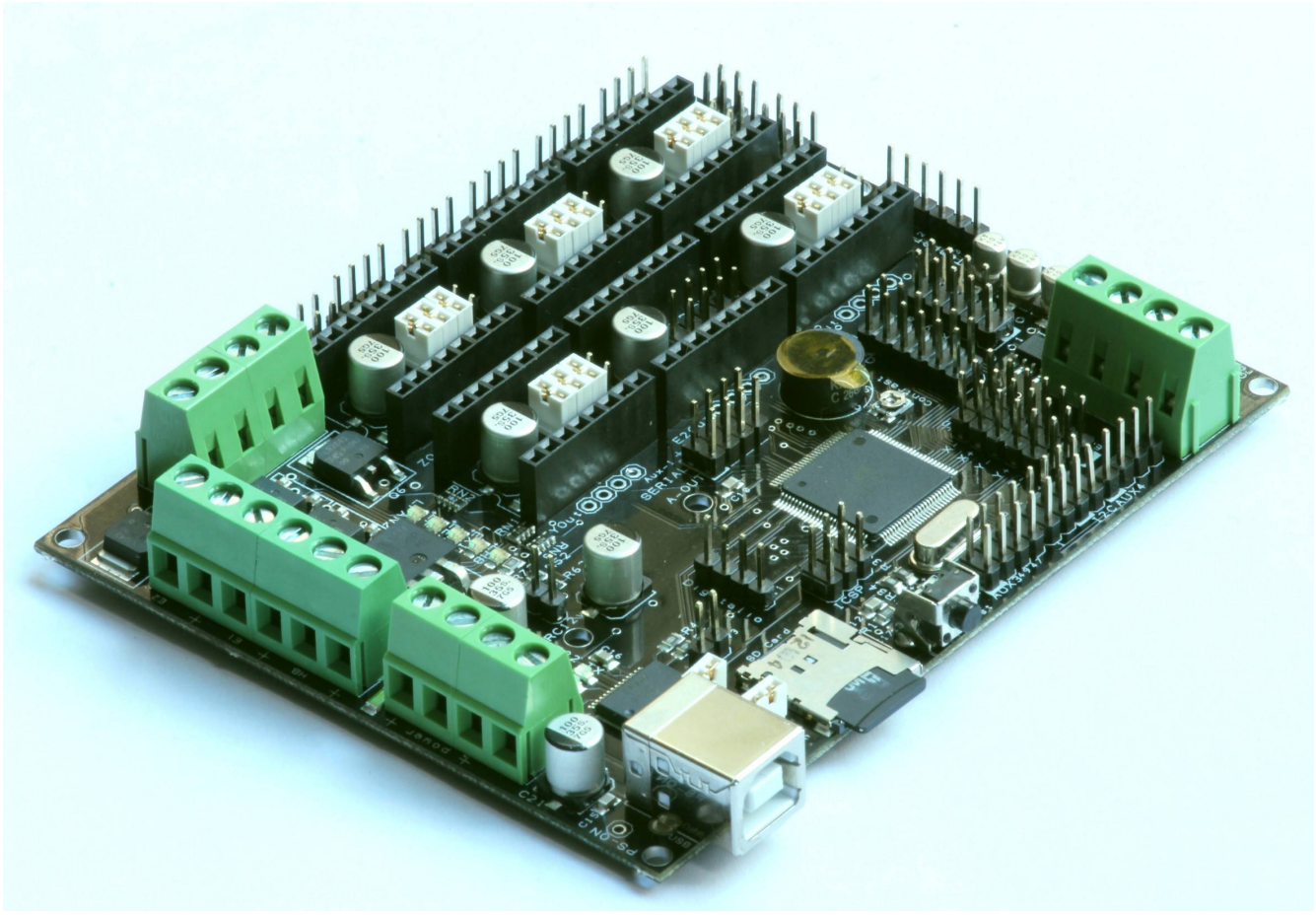
MEGATRONICS v2.0 DATASHEET



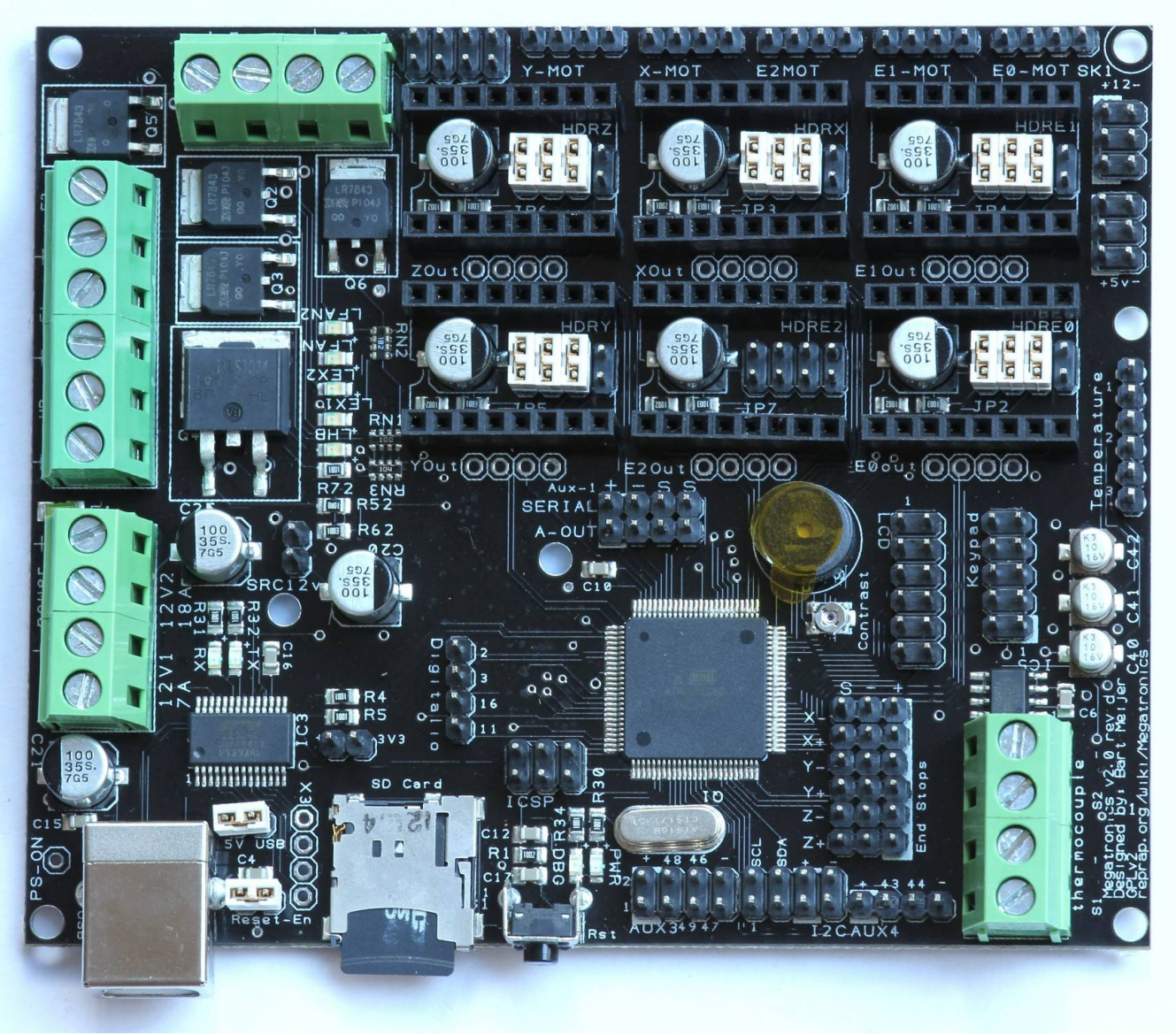
Author	Bart Meijer
Date	8th of Fabruari 2013
Document version	1.0

ReprapWorld.com

PRODUCT OVERVIEW

Megatronics is based on many famous open-source products including: Arduino Mega, RAMPS, SD Ramps. Therefor this product is an already proven design. It combines all major features of these board into a single board solution for more reliable 3D-printing.

Megatronics has a powerful Atmega2560 processor with 256 kB memory, running at 16Mhz. The board can be connected to a PC using a normal USB cable. It will register as FTDI FT232R device. The board is compatible with the Arduino Mega 2560 and will therefor be easily programmed from the Arduino IDE.



PRODUCT CHANGE HISTORY

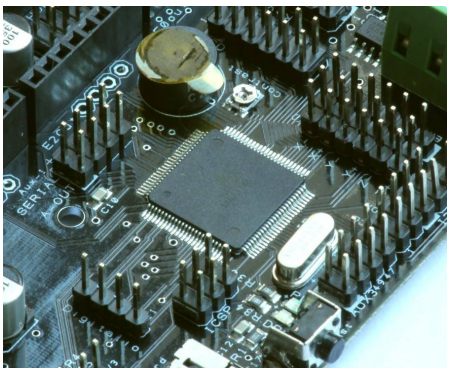
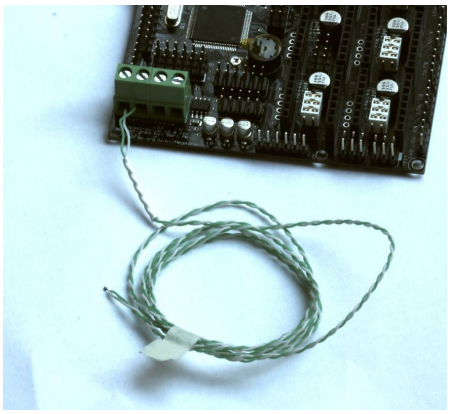
Version 2.0

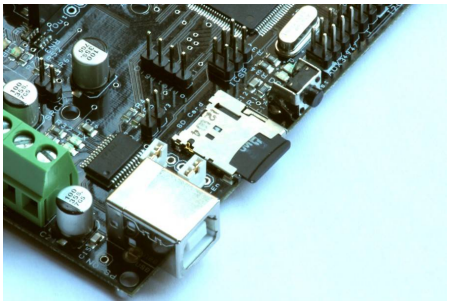
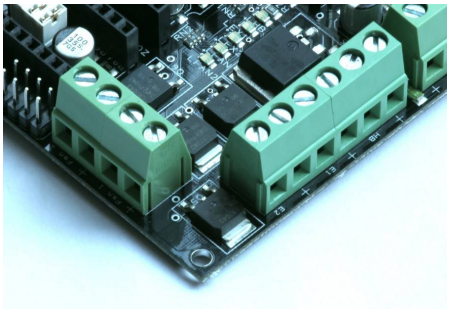
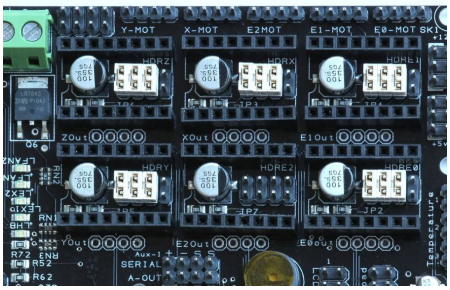
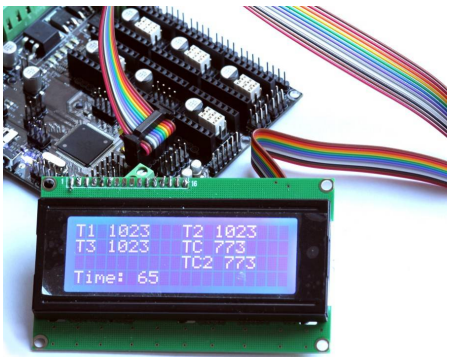
- Improved thermo couple support.
- Second thermo couple supported
- Support for 6 stepper drivers
- SMD fuses and MOSFETs
- Extra MOSFET, making 4 regular MOSFETs and one for heated bed.
- Support for the new DRV8825 Pololu stepper drivers

TECHNICAL SPECIFICATION

Microcontroller	Atmega2560-16AU
Operating Voltage Electronics	5V
Operating Voltage High	12-24V (15A heated bed, 7A electronics)
DC Current per I/O Pin	40mA
Clock Speed	16Mhz

MAJOR FEATURES

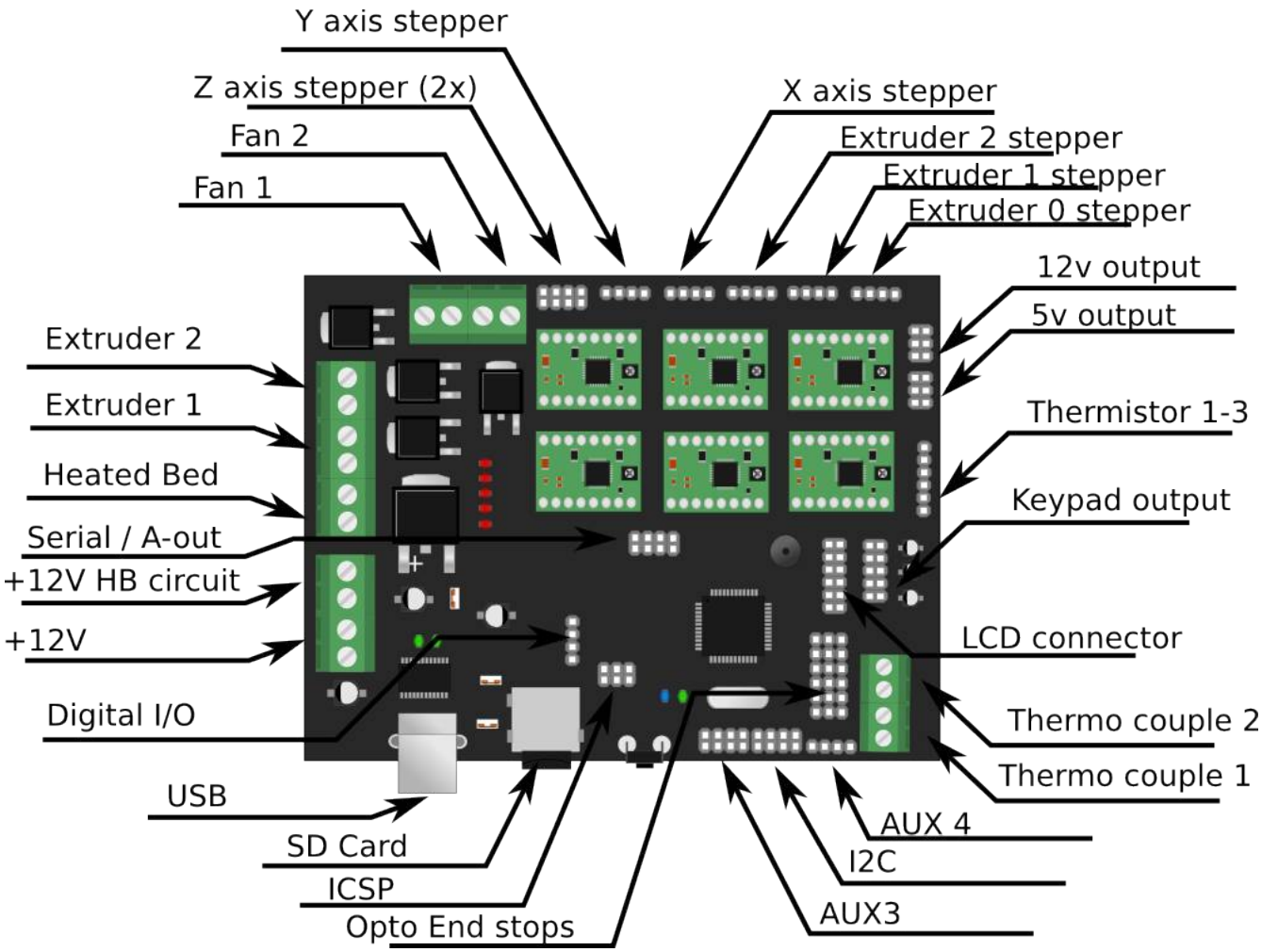
	**Atmega2560** Powerful Atmega2560 processor with 256 kB memory, running at 16Mhz
	**Thermocouple** On board support for connecting two thermo couples

	**SD Card** Autonomous printing from Micro SD card on board
	**Five MOSFETs** The board has 4 regular MOSFETs (25A) and one MOSFET for the heated bed (IRLS3034PBF) to support many needs.
	**Up to 6 stepper drivers** Compatible with RAMPS, 6 slots for stepper drivers (not included). Modularized to make replacement easy for damaged drivers. Also the new DRV8825 Pololu stepper drivers are supported.
	**Support for many peripherals** The board's functions can be easily extended with LCD, keypad etc. See the connectors section for more information

OTHER FEATURES

- Auto reset can be disabled by removing a jumper
- The board can be powered from 12V1 (12V MAX), by setting a jumper
- The LCD contrast can be adjusted with a trimpot
- 12V1 has a diode to protect against reverse polarization
- The 5V line is protected by a 500mA resettable fuse
- A piezo is included to allow the printer to give feedback with sound
- Each stepper driver slot has a breakout to connect external stepper drivers to the board.
- Four layer high quality PCB board

CONNECTORS



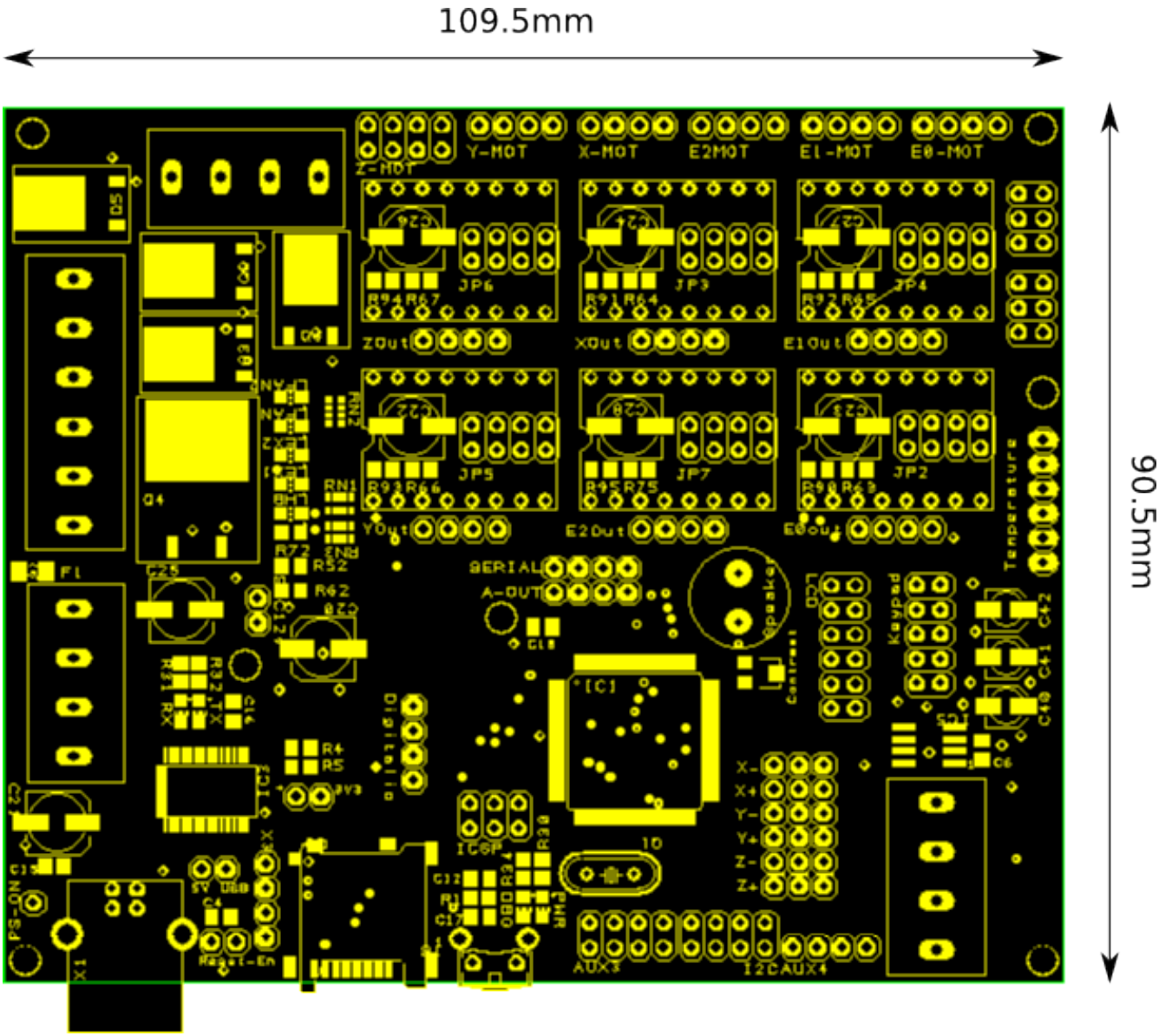
Name	Description
JP_5VUSB	When jumpered powers the board from USB (5V)
RESET-EN	When jumpered enables reset (DTR). Without it the board cannot be programmed using the IDE. It's recommended to remove the jumper for production machines.
X3	Breakout for FT232 pins
ICSP	2x3 header to program the Atmega chip directly
JP3V3	3.3V connector
PS-ON	Power on output. This can be connected to the power supply

	to enable 12V from the board.
AUX3	Break out for digital pins 46,47,48,49
AUX4	Break out for digital pins 43,44
I2C	Break out to connect extra peripherals using I2C
Thermocouple	Terminal block to connect two thermocouples
Keypad	2x5 header to connect to a keypad 1. 5V 2. GND 3. D59/A5 (E1) 4. D43 (Encoder switch) 5. D64/A10 (E2) 6. D40 (shift out) 7. D63/A9 (Shift clock) 8. D42 (Shift LD) 9. D66/A12 10. D65/A11
End Stops	6x3 header to connect end stops
LCD	2x6 header to connect a LCD screen. Compatible with most LCD screens 1. GND 2. 5V 3. LCD Contrast 4. RS 5. GND 6. Enable 7. D4 8. D5 9. D6 10. D7 11. 5V 12. GND
Temperature	1x6 header to connect up to three thermistors
A-OUT	Analog output (compatible with RAMPS)
SERIAL	Serial output (compatible with RAMPS)
DigitalIO	Break out for digital pins 2,3,4,5,6,11,35,39
JP_5V	2x3 header for 5V output
JP_12V	2x3 header for 12V output (+12V1 line)

12V1	+12V1 line input (11A Max) when SRC12v is **NOT** jumpered up to 24V is accepted. *
12V2	+12V2 line input for heated BED (11A Max) can handle up to 24V. *
X-MOT,Y-MOT,Z-MOT,E0-MOT,E1-MOT,E2-MOT	Connectors for bipolar stepper drivers
JP2-6	Stepper mode selector for stepper drivers
SRC12v	Power the board from 12V1. **WARNING: MAX 12V is accepted**
Zout, Xout, E0Out, Yout, E1Out	Breakout to hook up external stepper drivers. Enable, step, dir, gnd

* When powering from 24V make sure your stepper drivers, heaters and other peripherals can handle 24V as well.

BOARD DIMENSIONS



List of M3 holes (measured from the bottom left):

2.3,	2.3
107.5,	2.3
25.0,	32.8
51.5,	37.8
107.5,	61.0
3.0,	87.8
107.3,	88.3