Portable Grid Square LCD

Bill Pence KI4US

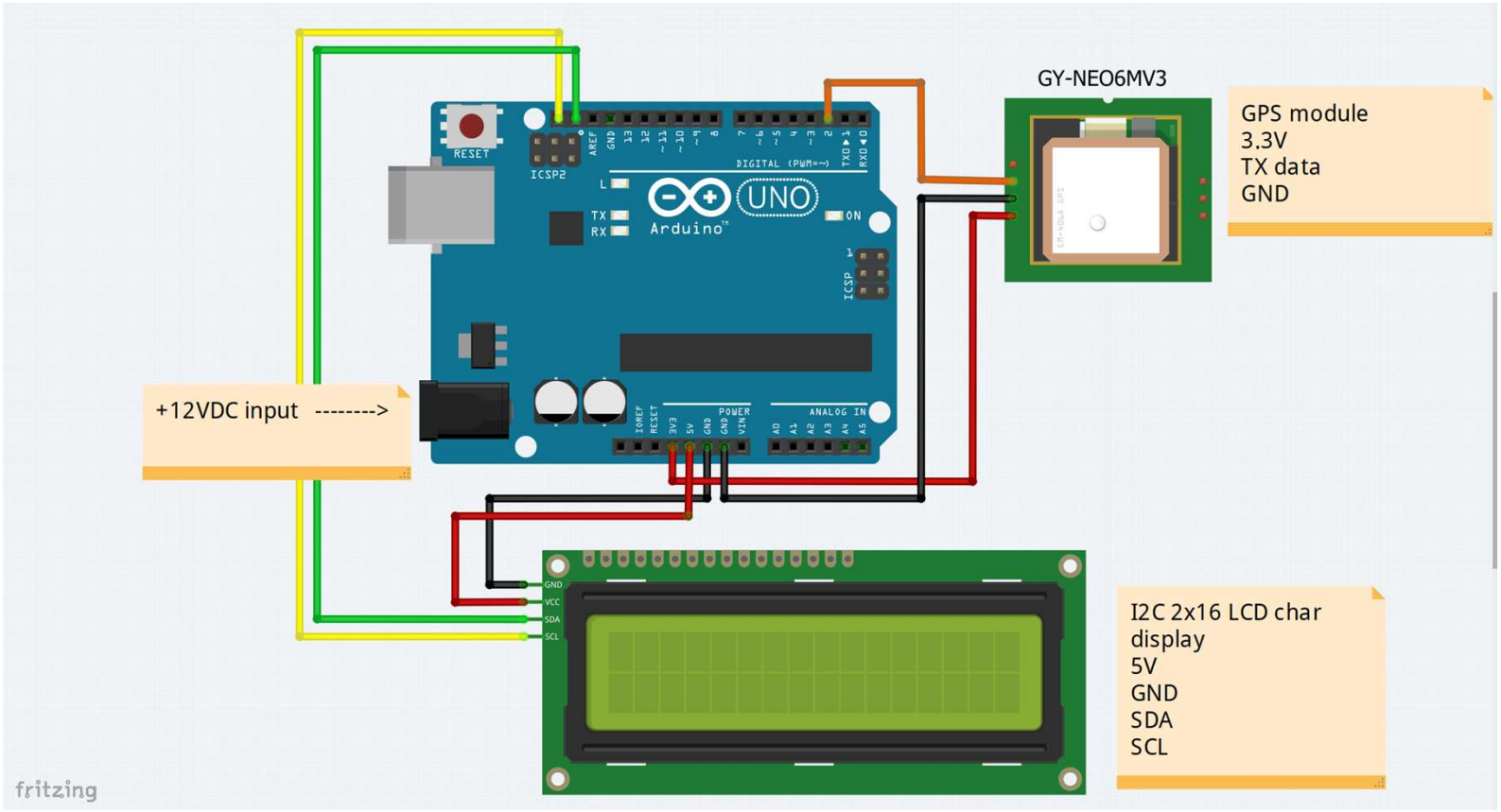
Grid Square LCD Display

- Simple, portable, stand alone low cost Grid Square LCD display hardware
  - Arduino of about any flavor
  - I2C LCD
  - GPS module
  - 7 Arduino jumpers, or can be soldered with hook up wire as desired.
- Can be powered in several ways
  - Battery connected to Arduino DC input
  - Portable USB battery
  - Direct 12v from power point in vehicle to Arduino DC input

Grid Square LCD Display

LCD showing 6 digit grid square, number of satellites used for fix, and current Latitude/Longitude.
The sketch has can be customized for LCD display content and format to show time, Lat/Long, grid, etc.

Wiring info


GY-NEO6MV3
GPS module
3.3V
TX data
GND
+12VDC input -------->
I2C 2x16 LCD char
display
5V
GND
SDA
SCL
fritzing

Components info and Sketch location

Parts easily obtained at Amazon.

GPS module

https://www.amazon.com/gp/product/B01D1D0F5M

I2C LCD module

https://www.amazon.com/GeeekPi-Character-Backlight-Raspberry-Electrical/dp/B07S7PJYM6

Arduino Uno Compatible module

https://www.amazon.com/ELEGOO-Board-ATmega328P-ATMEGA16U2-Compliant/dp/B01EWOE0UU/

Sketch (program) available at github.com with open access

https://github.com/bpguy/gps_grid_sq_lcd

Let’s talk a bit about grids….

Grids are usually used as 4 or 6 digit values, but can be extended.
The extra characters add further location precision

- 2 letters specify a 20° longitude x 10° latitude segment of the earth
- 2 numbers refine the segment to a 2° longitude x 1° latitude sub segment
- 2 letters further refine the sub segment to 5’ x 2.5’ values
- Alternating numbers and letters continue refining the location

Grid Square resources

QST January 1989, pp. 29-30, 43 contains info on the grid square notation

W8BH.net has a nice document with an algorithm for computing grids from GPS coordinates located at http://w8bh.net/grid_squares.pdf

Next, an example spreadsheet that implements the w8bh notes for computing 10 digits

	longitude	latitude	
	-77.035278	38.889484	**F M 1 8 L V 5 3 S L**
1. add 180 to long and 90 to lat to "normalize"	180	90	
	102.964722	128.889484	
2. divide by long by 20, lat by 10	20	10	
	5.1482361	12.8889484	
3. int parts are first two grid characters	5	12	A=0, B=1, etc
	F	**M**	
4. remove the first 2 characters...	2.964722	8.889484	
5. adjust by div long by 2	1.482361	8.889484	
6. int part is the 2 numbers	**1**	**8**	
7. remove 2 characters	0.964722	0.889484	
8. convert with 5' (*12) and 2.5' (*24) values	11.576664	21.347616	
9 use int part for 2 characters	11	21	
	L	**V**	
10. get remainders	0.048055333	0.014484	
11. convert to 30" (*12) and 15" (*240)	5.76664	3.47616	
	5	**3**	
12 remove integers amounts	0.006388667	0.001984	
	18.39936	11.42784	
	18	11	
	S	**L**	

-77.035278	38.889484
-84.21763	32.989893

- **Thanks for your interest**