GP-030-01 DIGITAL POT MODULE with 1ppm/C 2.5V REFERENCE (GP30)

General Description

The GP-030-01 module enables the user to quickly use a 1024 step Digital potentiometer to TRIM the on-board Precision 2.5V reference. It also can be used as a Fixed 2.5V low PPM/C reference, or as a fixed 10V supply at **125mA** from a single supply of 4.2V to 5.5V. The Digital Potentiometer also can be used for external circuitry.
It is a breadboard friendly module(or it can be used with PCB standoffs) that contains the following IC's. **MAX5481**, 10-Bit Nonvolatile Linear-Taper Digital Potentiometer 1024 Steps. **MAX6325** 1ppm/C Low-Noise +2.5V Voltage reference(with optional noise reduction circuitry) and the **MAX1681** 125mA Switch capacitor Voltage Converter (Vin x2).

Features

- ➔ Works off a single supply 4.2V to 5.5V
- ➔ Fits on a standard Breadboard
- ➔ Works in Serial Mode(SPI)
- ➔ Works in Serial Manual UP/DOWN Mode
  - ◆ On-board pushbutton switches
  - ◆ RC based built in debounce
- ➔ Easily switch between modes using slide switches
- ➔ Fixed or trimmable 2.5V precision reference
- ➔ Charge-pump Vin x2 output @ 125mA
- ➔ **Arduino Example Software supplied**

Applications uses

Gain and Offset adjustment of internal 2.5 reference
Gain and Offset of external Voltage Source
Quick verification of the **MAX5481 (digital pot)**
Quick verification of the **MAX6325 (2.5V reference)**

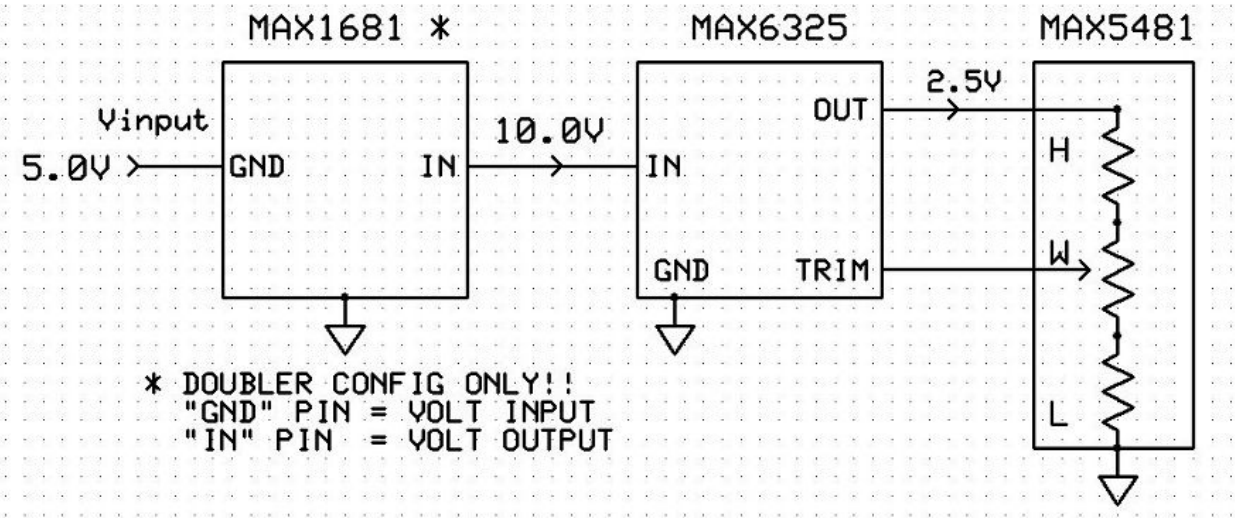
Module IC's used

- ➔ MAX5481
  - ◆ 10 Bit 1024 Step digital pot
  - ◆ Vin = 4.5V to 5.2V
- ➔ MAX6325
  - ◆ 1ppm/C 2.5V reference
  - ◆ Vin = 8V to 36V EXT
  - ◆ Vin =

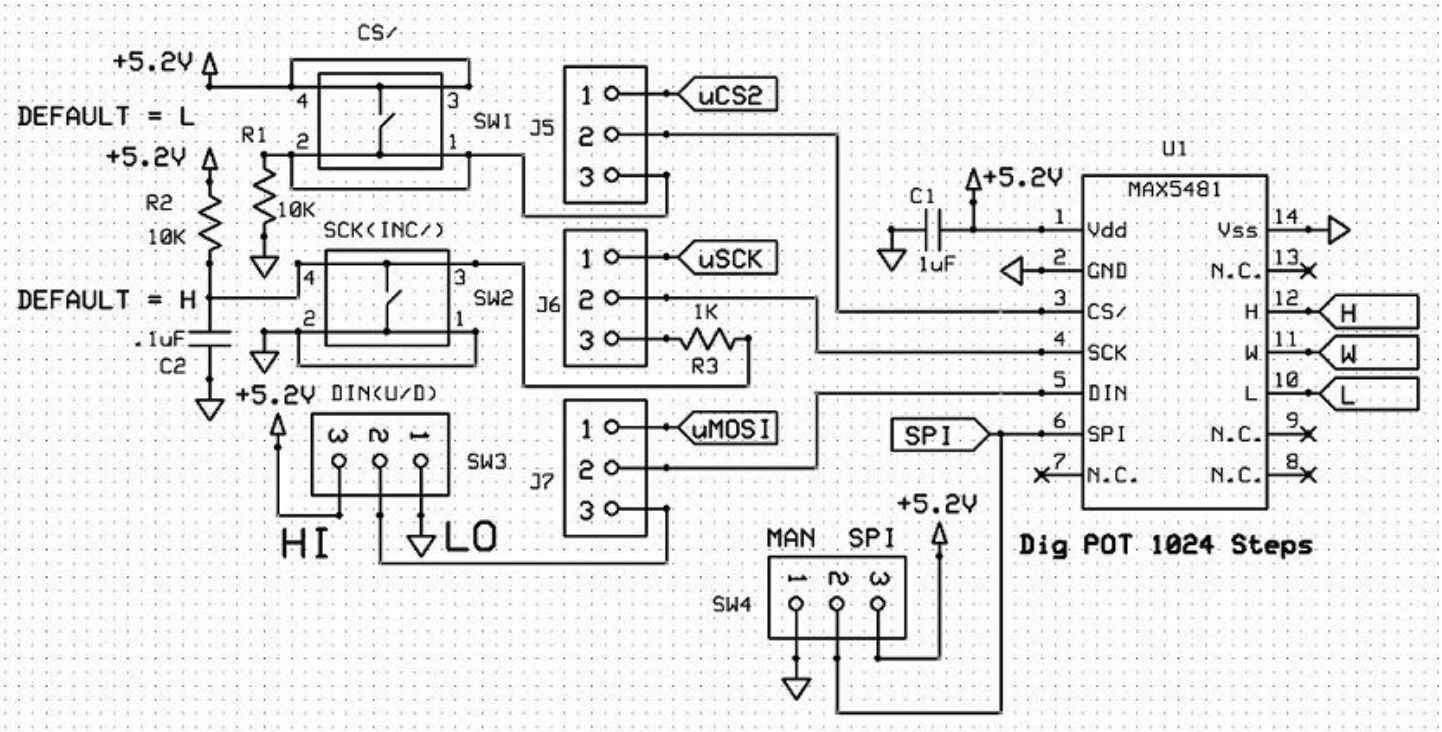
Module Specs

Input Power	4.5V to 5.2V
Current draw	50mA
MAX Operating temp	70C

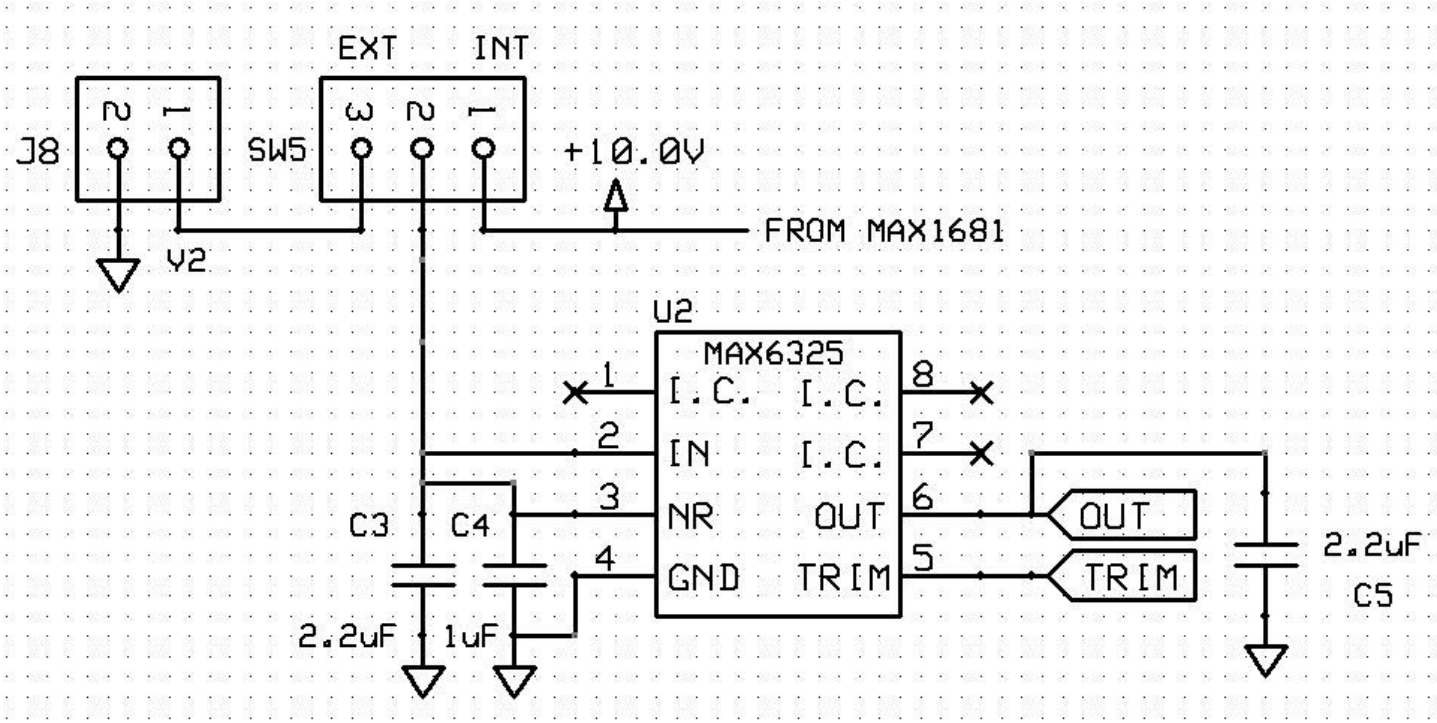
Functional Diagram



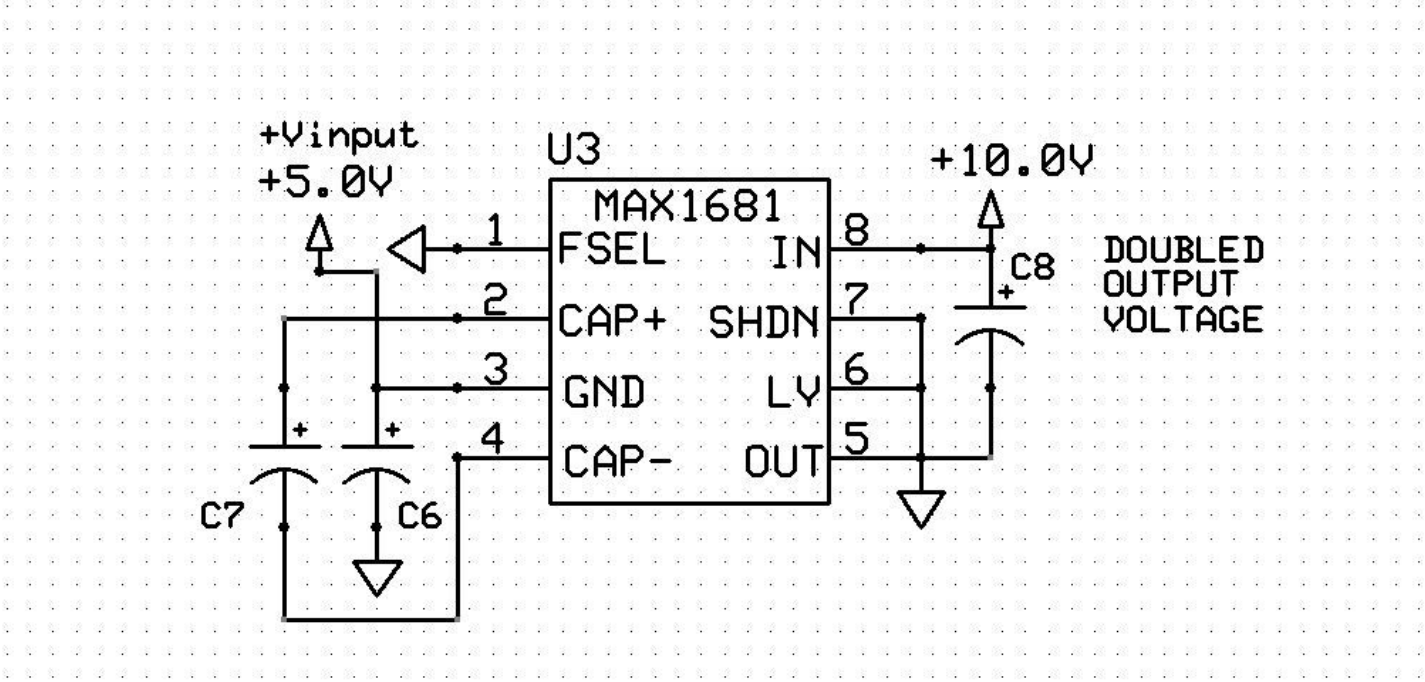
Setup Circuit (MAX5481)



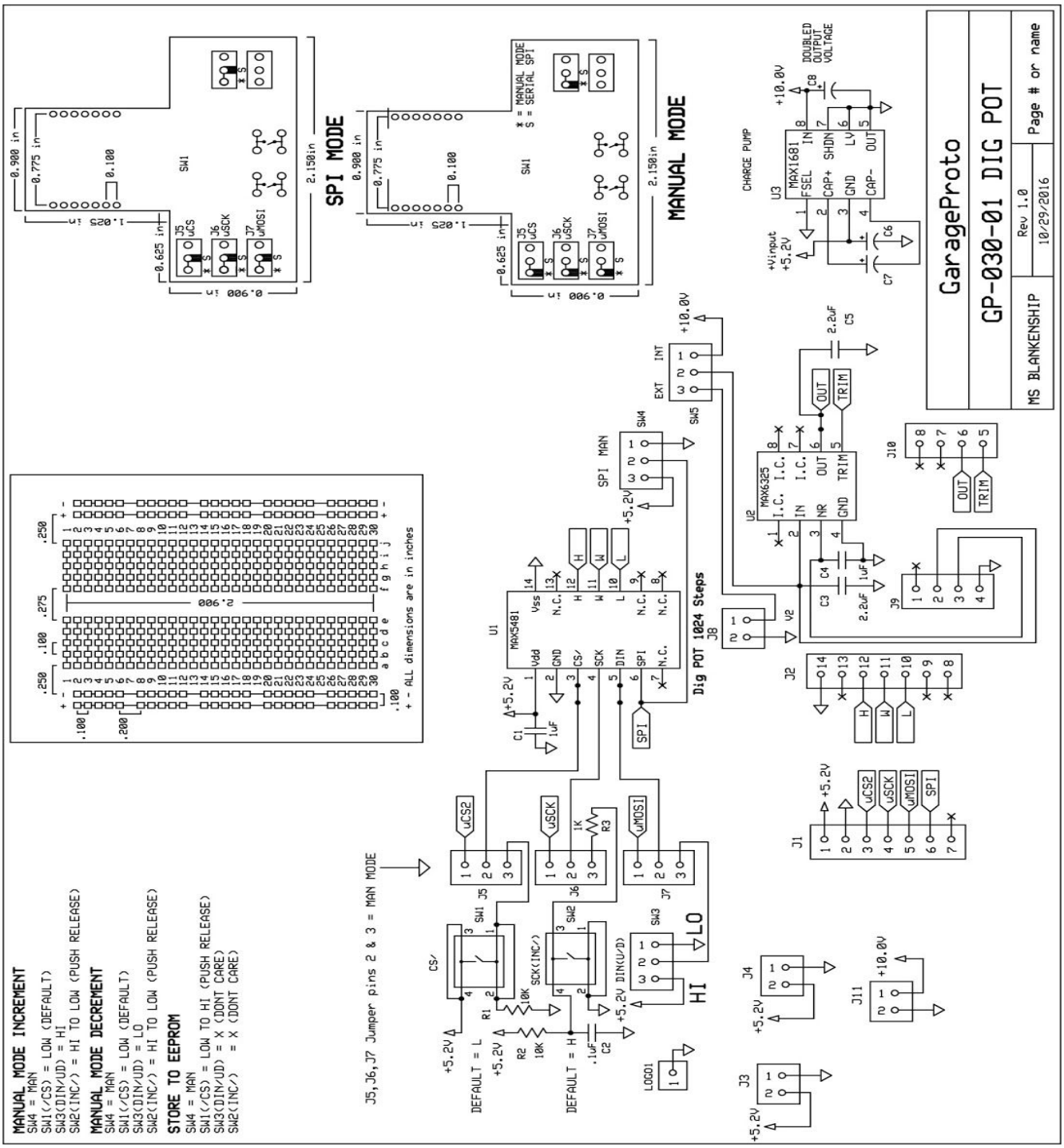
Setup Circuit (MAX6325)



Setup Circuit (MAX1681)



Setup Circuit (COMPLETE) _____



Detailed Description

The GP-030-01 is a highly stable, low noise, multi-use module that contains three separate IC's that form the base of a quick and easy development environment using 3 different MAXIM IC's. The front end of the circuit is the **MAX1681** which is a 125mA Switch-Capacitor Voltage Converter. This IC is the only IC on board that is in a "HARDWIRED" configuration set to operate at a 1MHz frequency. It will double the input voltage. Using a 5V input as an example, it will convert this voltage to 10V. The 10V can be fed into the MAX6325 input as an option(SW5 controls this, EXT = separate voltage, INT(10V) = output from the **MAX1681**). The **MAX6325** has an operating voltage from 8V to 36V. The **MAX6325** OUT and TRIM pins are "free floating" and can offer a FIXED and TRIM mode. If used as a FIXED mode simply feed the OUT pin to a desired source. In TRIM mode you must jumper the OUT pin to the HIGH side of the Digital POT MAX5481 ("H" pin) and tie the "TRIM" pin to the wiper("W" pin) of the **MAX5481**, now you can feed the OUT pin to the desired source. Refer to the "Mode Selection" below.

Mode Selection

MODE 0
This MODE uses all the on-board MAXIM IC's to **MANUALLY TRIM** the MAX6325 with the MAX5481. Simply adjust ALL on-board switches to the LEFT position. Select what direction you want the wiper to move in with SW3 (HI or LO) and press SW2 which is a tactile SPST switch

MODE 2
This MODE sets the MAX6325 as a FIXED reference with NO TRIM

MODE 1
This MODE uses all the on-board MAXIM IC's to **serially(SPI) TRIM** the MAX6325 with the MAX5481

MODE 3
This MODE allows an External voltage to be trimmed with the MAX5481

Pushbutton / Switch select

```
MANUAL MODE INCREMENT
SW4 = MAN
SW1(/CS) = LOW (DEFAULT)
SW3(DIN/UD) = HI
SW2(INC/) = HI TO LOW (PUSH RELEASE)
MANUAL MODE DECREMENT
SW4 = MAN
SW1(/CS) = LOW (DEFAULT)
SW3(DIN/UD) = LO
SW2(INC/) = HI TO LOW (PUSH RELEASE)
STORE TO EEPROM
SW4 = MAN
SW1(/CS) = LOW TO HI (PUSH RELEASE)
SW3(DIN/UD) = X (DONT CARE)
SW2(INC/)   = X (DONT CARE)
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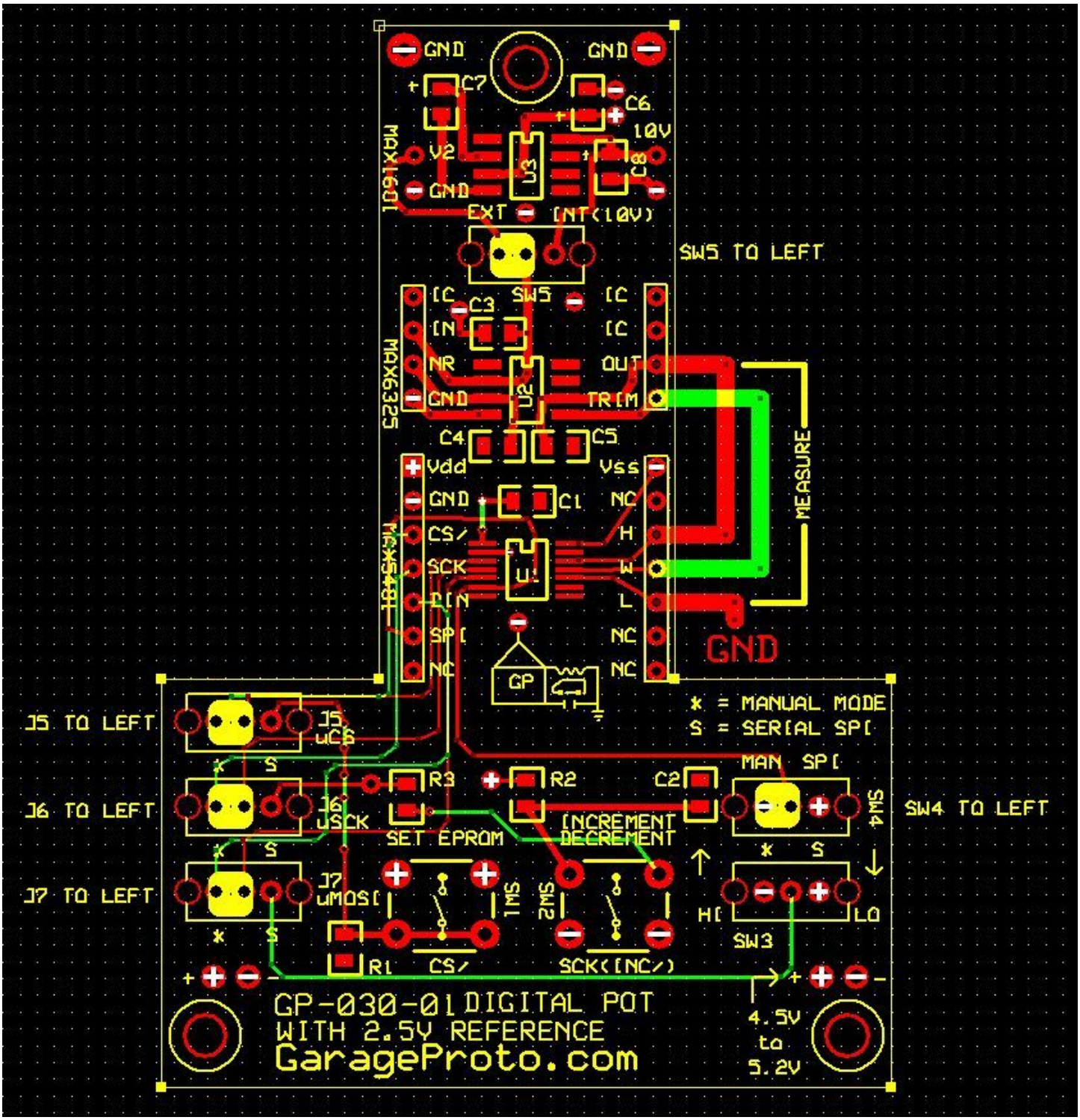
MODE 0



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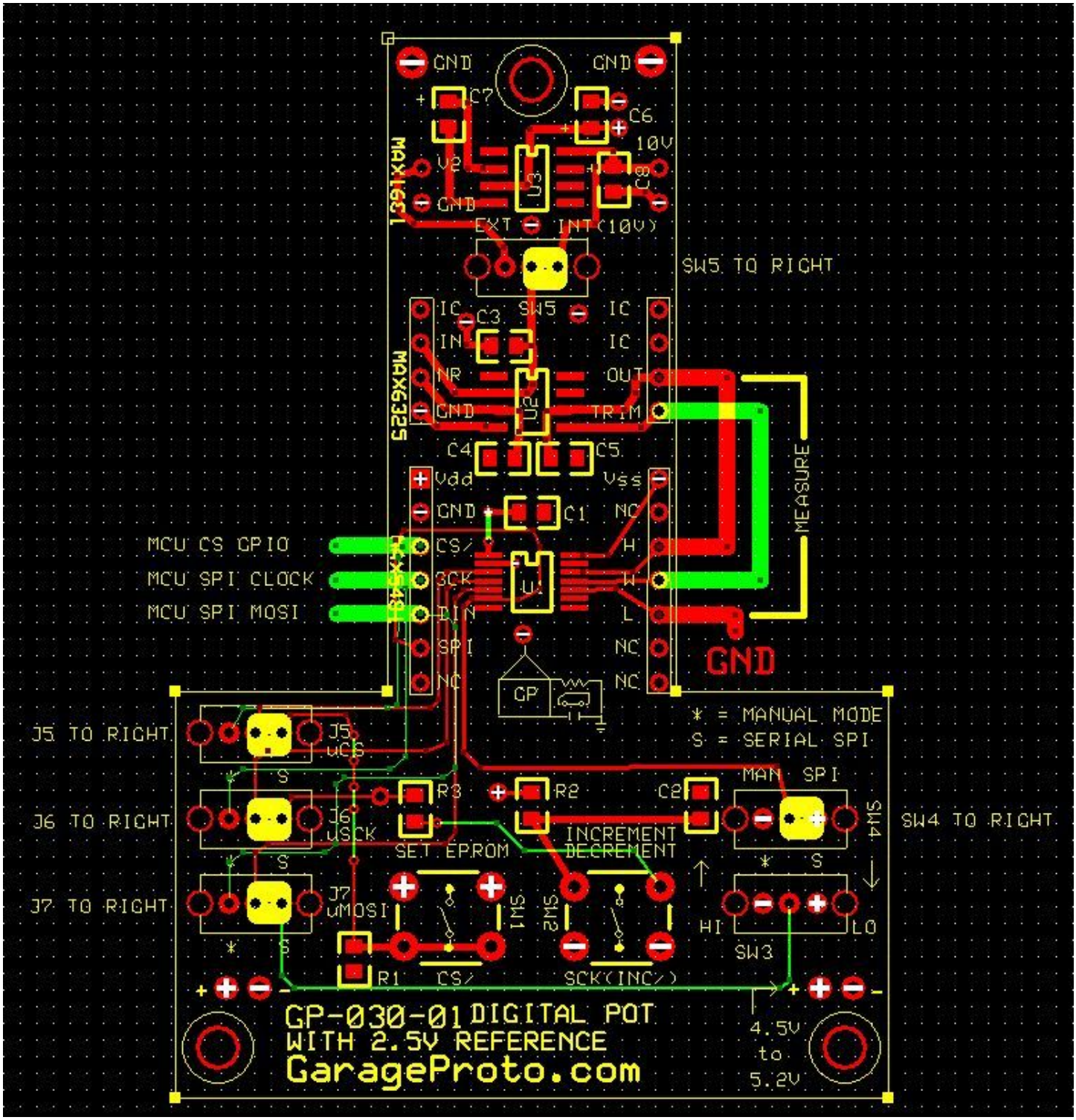
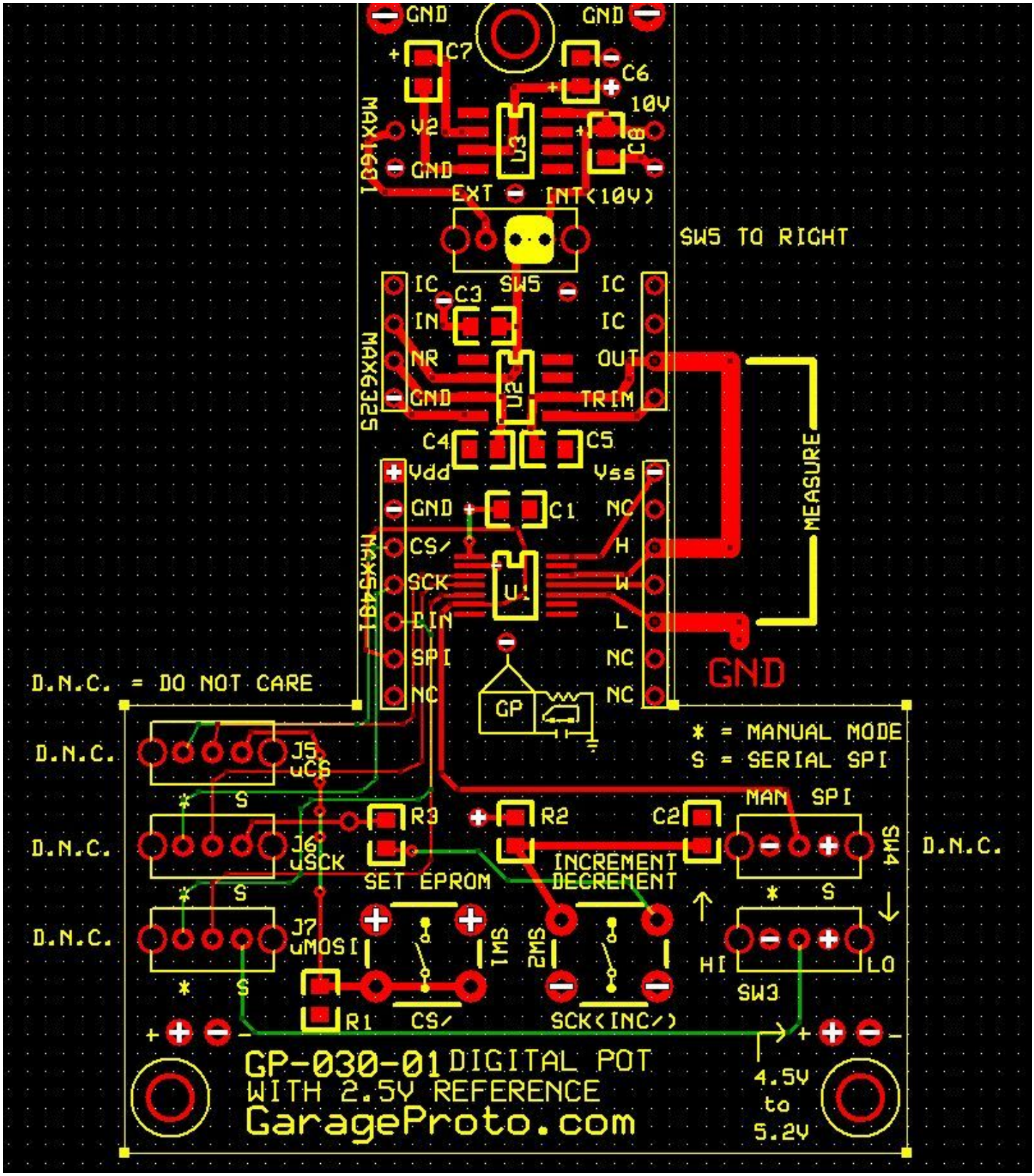
MODE 1



MODE 2


GND
GND
C7
C6
10V
MAX1601
VO
GND
L3
C8
EXT
INT(10V)
SW5 TO RIGHT
IC
C3
SW5
IC
IN
IC
NR
OUT
MAX6325
GND
U2
TRIM
C4
C5
MEASURE
Vdd
Vss
GND
C1
NC
CS/
H
SCK
U1
W
DIN
L
SPI
NC
NC
GND
GP
D.N.C. = DO NOT CARE
* = MANUAL MODE
S = SERIAL SPI
D.N.C.
J5
uCS
MAN
SPI
R3
R2
C2
SW4
D.N.C.
D.N.C.
J6
uSCK
SET EPROM
INCREMENT
DECREMENT
D.N.C.
J7
uMOSI
SW1
SW2
HI
LO
SW3
R1
CS/
SCK(INC/)
GP-030-01 DIGITAL POT
WITH 2.5V REFERENCE
GarageProto.com
4.5V
to
5.2V