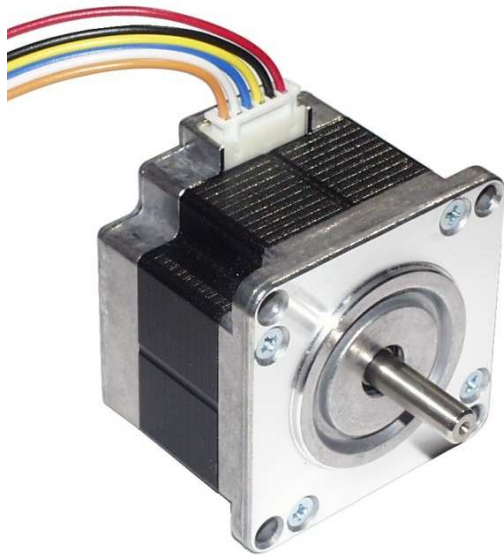


STEPPER MOTOR SPEED AND POSITION CONTROL

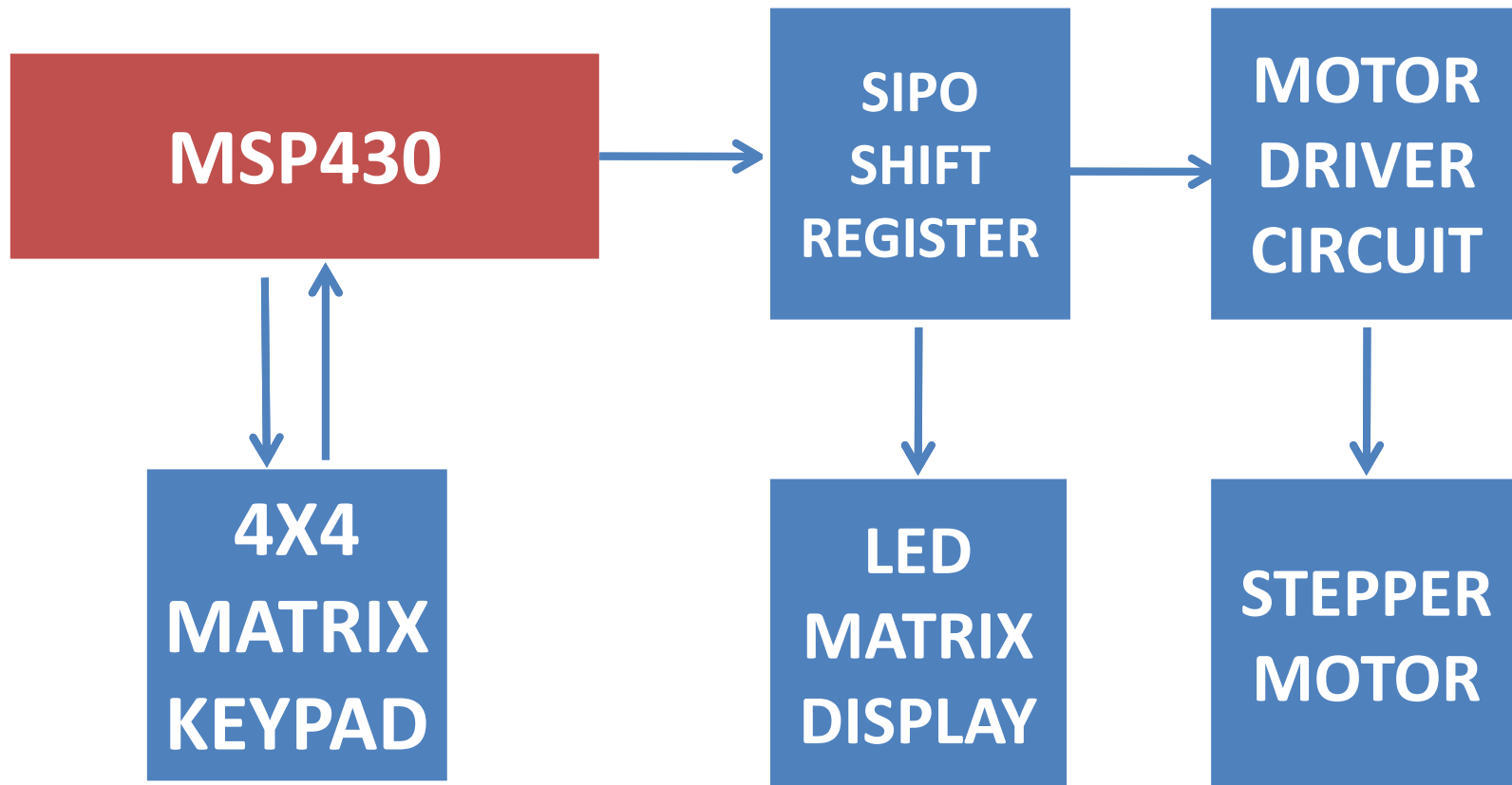


Subash Anigandla
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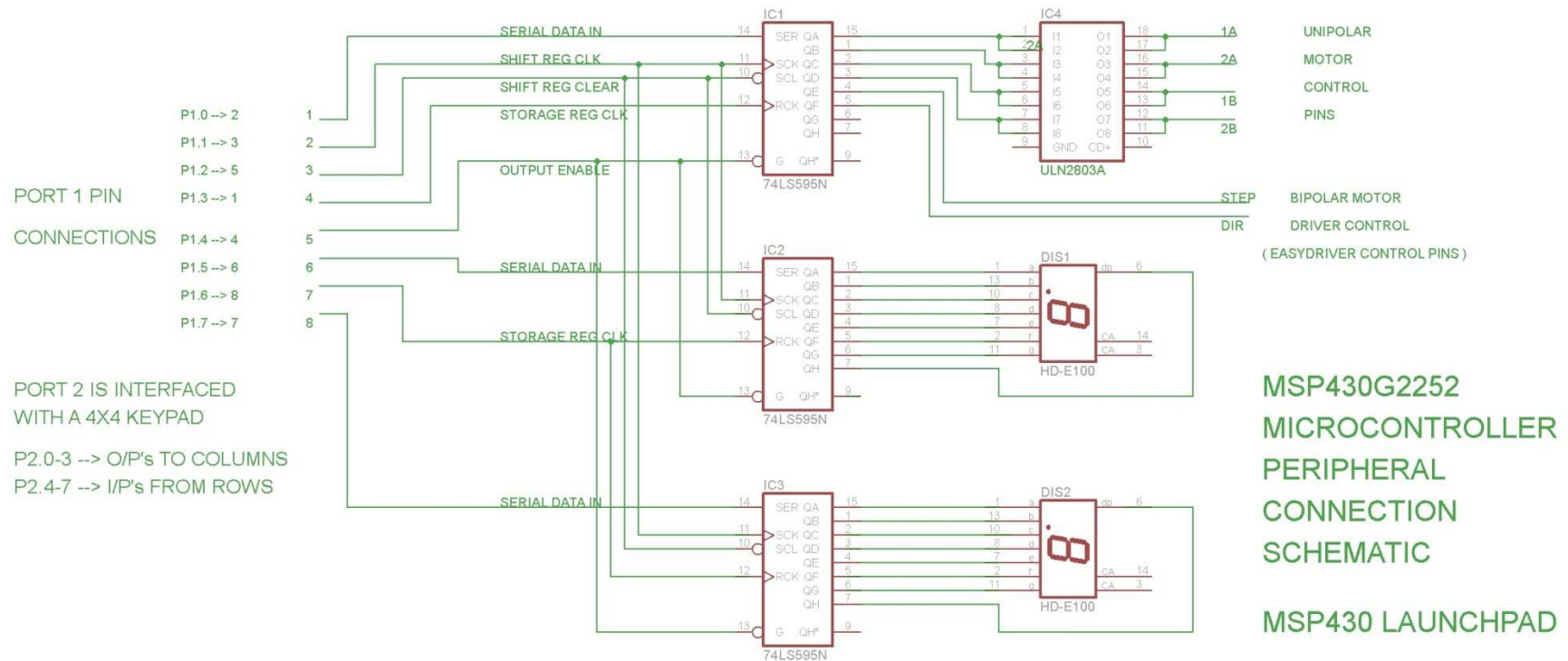
OVERALL STATUS

- Components acquired.
- Individual components tested and their respective coding is done for key-pad, 7-segment display, port expansion.
- Stepper motor control coding is in progress.
- Integrating 7-segment LED display through shift register and key-pad is in progress.

BLOCK DIAGRAM

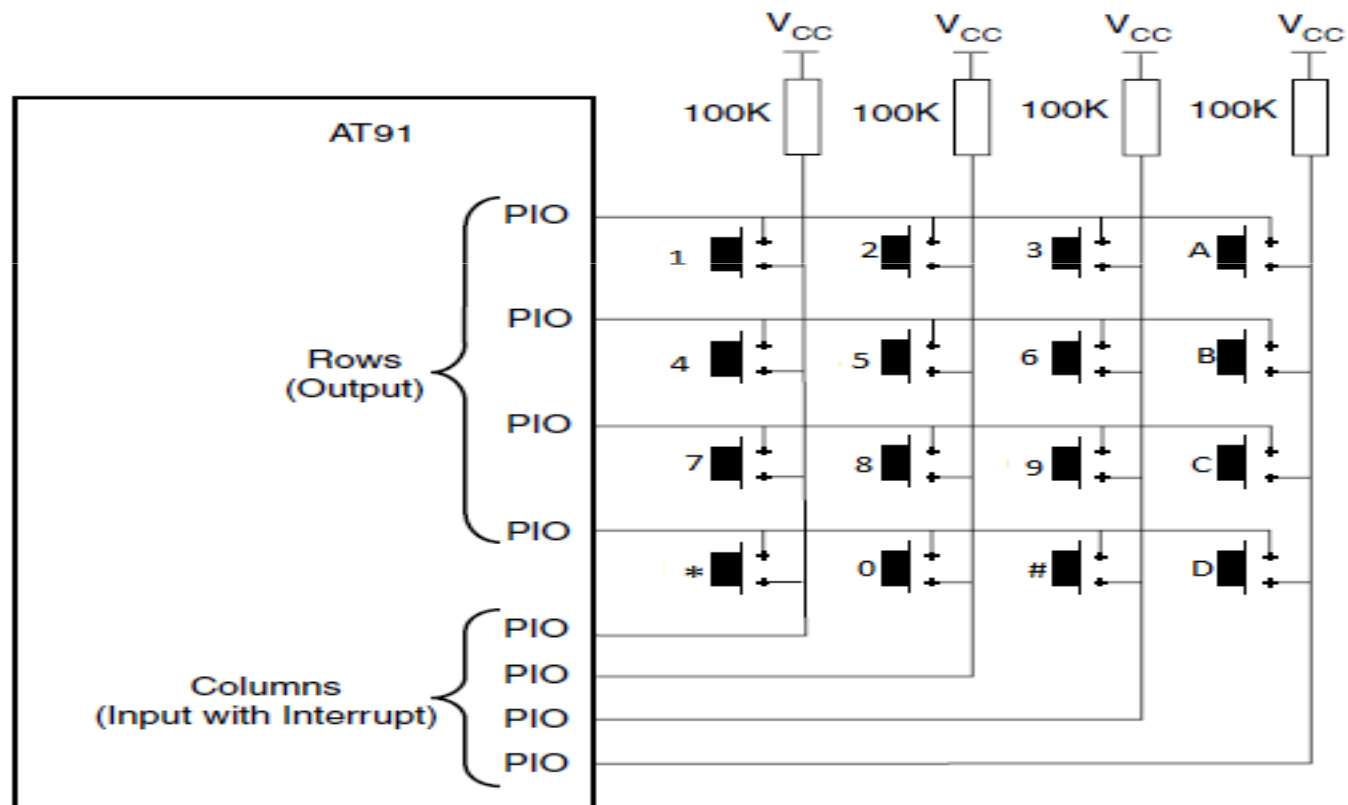


PERIPHERAL SCHEMATIC



KEYPAD

Keyboard Interface



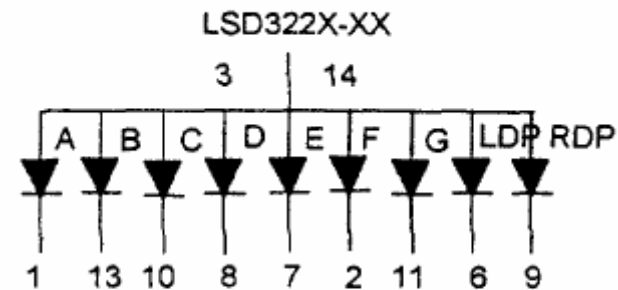
COMPONENT - ACQUIRED, TESTED.

DISPLAY

Electrical Connection

PIN NO.	LSD322X-XX
1	Cathode A
2	Cathode F
3	Common Anode
4	No Pin
5	No Pin
6	Cathode LDP
7	Cathode E
8	Cathode D
9	Cathode RDP
10	Cathode C
11	Cathode G
12	No Pin
13	Cathode B
14	Common Andoe

INTERNAL CIRCUIT DIAGRAM



COMPONENT - ACQUIRED , TESTED

STEPPER MOTOR

Coil Type	- Unipolar
Voltage	- Rated 5VDC
Steps per Revolution	- 48
Step Angle	- 7.5°
Torque- Holding (oz-in /mNm)	- 1.6 / 11.5
Wiring Configuration	- 6 wire interface

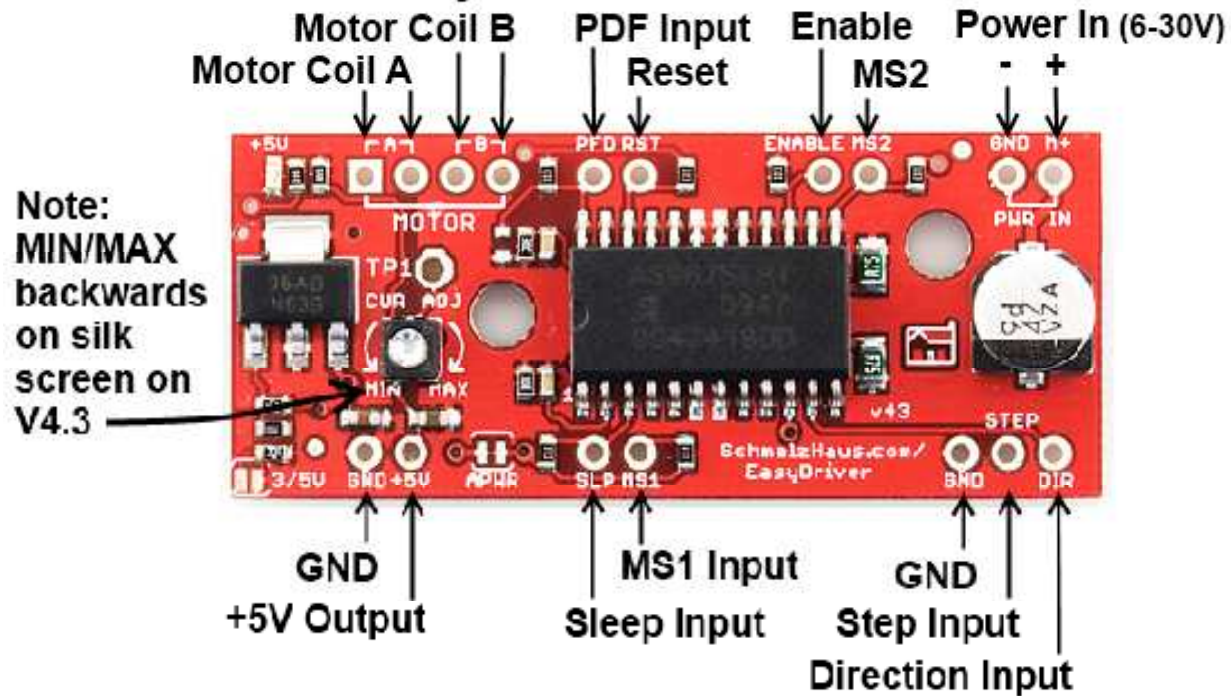


As this motor has a 6 wire interface, it can be used as both unipolar and bipolar depending on the wiring.

COMPONENT ACQUIRED – UNDERGOING TESTING

DRIVER CIRCUIT

EasyDriver v4.3 Pins



COMPONENT ACQUIRED – UNDERGOING TESTING

DRIVER CIRCUIT

A3967 microstepping driver

MS1 and MS2 pins broken out to change microstepping resolution to full, half, quarter and eighth steps (defaults to eighth)

Compatible with 4, 6, and 8 wire stepper motors of any voltage

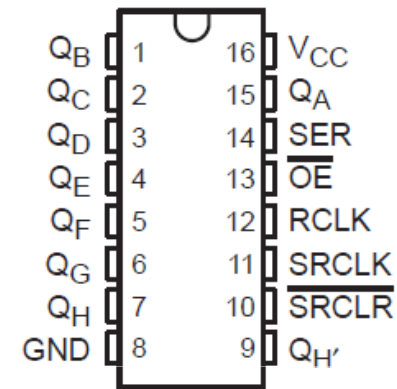
Adjustable current control from 150mA/phase to 750mA/phase

Power supply range from 7V to 30V. The higher the voltage, the higher the torque at high speeds

COMPONENT ACQUIRED – UNDERGOING TESTING

PORT EXPANSON

Three Shift Register ICs are being used to expand one 8-bit port of the microcontroller to three 8-bit ports.



FUNCTION TABLE

INPUTS					FUNCTION
SER	SRCLK	SRCLR	RCLK	OE	
X	X	X	X	H	Outputs QA-QH are disabled.
X	X	X	X	L	Outputs QA-QH are enabled.
X	X	L	X	X	Shift register is cleared.
L	↑	H	X	X	First stage of the shift register goes low. Other stages store the data of previous stage, respectively.
H	↑	H	X	X	First stage of the shift register goes high. Other stages store the data of previous stage, respectively.
X	X	X	↑	X	Shift-register data is stored in the storage register.

PROJECT STATUS

Overall Progress

Building of prototype circuit is completed.
Integration of code is under progress.

CHALLENGES

- Controlling the motor and Led's independently through serial to parallel interface.
- Interfacing both Unipolar and Bipolar motors with the microcontroller.

Alternative:

- Making both motors as unipolar.



Thank you!