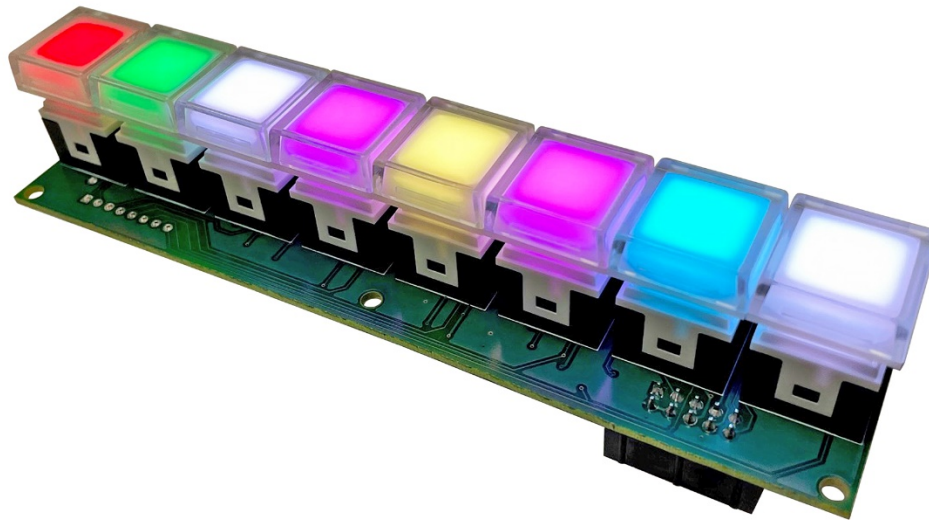


Universal KP Switch Modules User Manual

Revision A



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1. General Features

The KP modules are KP switches mounted on PCB with glue logic that allows easy control and interconnection of many modules. Six control lines can control large number of switches. The data for backlight and reading switch statuses can be achieved with SPI or bit banging.

General features:

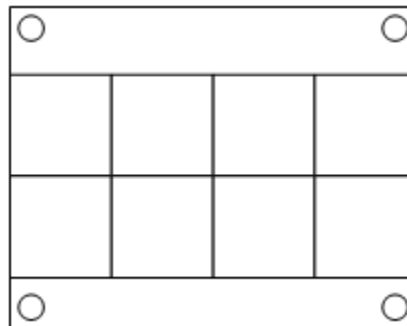
- Various switch matrix is possible
- Constant current control for backlights
- Serial scanning of the switches
- Various number of colors can be achieved with RGB backlight
- Brightness control
- Backlight voltage 4 to 5V
- Logic voltage of 3.3 to 5V
- 6 control signals can control large number of switches
- Modules can be daisy-chained via a 10 pins ribbon cables
- Parallel Switch scan ports available for PLC or other devices

2. Available Modules

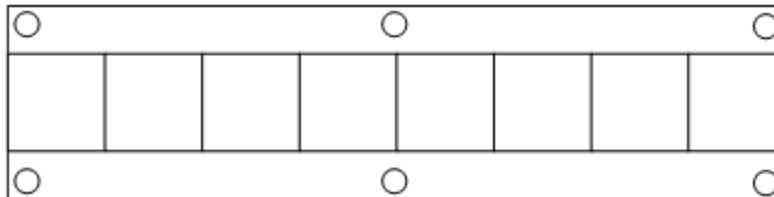
2.1. KP Modules

We currently offer two modules, and we can design different modules to customer's requirements.

Item	Part# with Socket and switch	Switch Matrix	Switch Part Number	Notes
1	IS-L08KP1-1S1	2x4	KP0115ACBKG03RGBP-3FJB	Side by side stackable
2	IS-L08KP1-1S2	2x4	KP0115ANBKG03RGBP-3FJB	Side by side stackable
3	IS-L08KP1-2S1	2x4	KP0215ACBKG03RGBP-3FJB	Side by side stackable
4	IS-L08KP1-2S2	2x4	KP0215ASBKG03RGBP-3FJB	Side by side stackable



Item	Part# with Socket and switch	Switch Matrix	Switch Part Number	Notes
5	IS-L08KP2-1S1	1x8	KP0115ACBKG03RGBP-3FJB	Side by side stackable
6	IS-L08KP2-1S2	1x8	KP0115ANBKG03RGBP-3FJB	Side by side stackable
7	IS-L08KP2-2S1	1x8	KP0215ACBKG03RGBP-3FJB	Side by side stackable
8	IS-L08KP2-2S2	1x8	KP0215ASBKG03RGBP-3FJB	Side by side stackable



2.2. Ribbon Cables

These cables are used for connecting KP Modules.

Item	Part#	Length	Description
1	IS-RC10-12	12"	RIBBON CABLE, 10 CONDUCTORS, 28AWG, .050" PITCH
2	IS-RC10-24	24"	RIBBON CABLE, 10 CONDUCTORS, 28AWG, .050" PITCH
3	IS-RC10-36	36"	RIBBON CABLE, 10 CONDUCTORS, 28AWG, .050" PITCH

Custom length cable can be made to order.

3. Operation

3.1. Switch scan

Switch scan is initiated by setting LPSWRD low then high. The switch statuses are transferred to the shift registers when LPSWRD is low. By toggling the clock (CLK) line the switch statuses are read from SWRDout line. The first bit received is the last switch (switch#8) of the first module. Reading all the switches require as many clock as the number of switches. The switch being pressed can be identified by the associated bit = 0.

The switch scan is also available for PLC or other devices without interfering with the serial scan. Through-hole pads with 0.1"x0.1" are provided for scanning. The number of pads equal the number of switches.

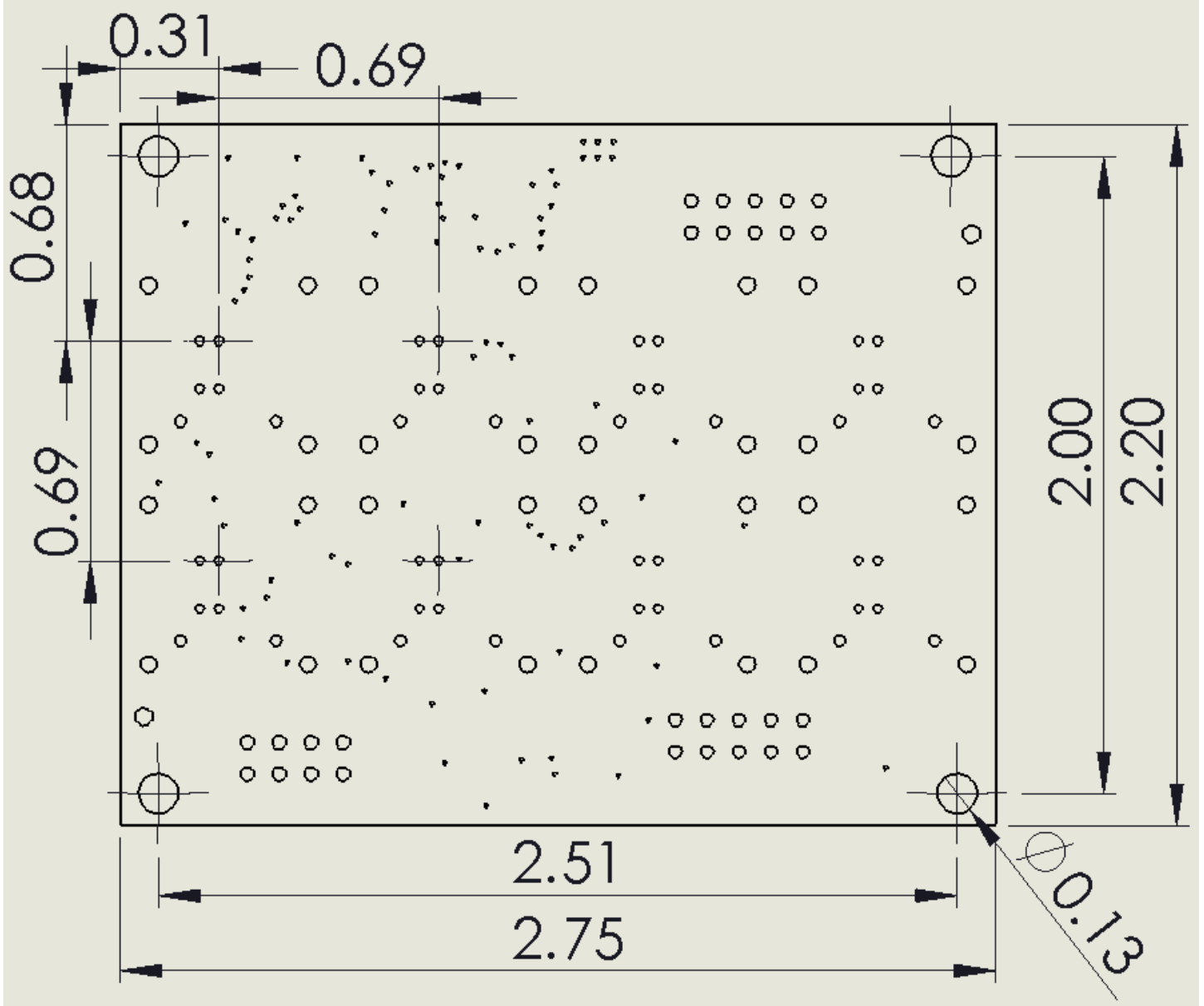
3.2. Controlling Backlight

Backlight data are shifted via clock (CLK) and DATAin. Each 8 KP switches require 24 bits of data for backlight. First bit shifted is FOR BLUE COLOR Switch #1, the 8th bit is for blue switch#8, 9th bit is for green switch#1, 17th bit is for red switch #1. When the associated bit = 1 then the backlight is on. For multiple board the first set of 24 bit is for the last board and the last set is for the first board.

4. Hardware

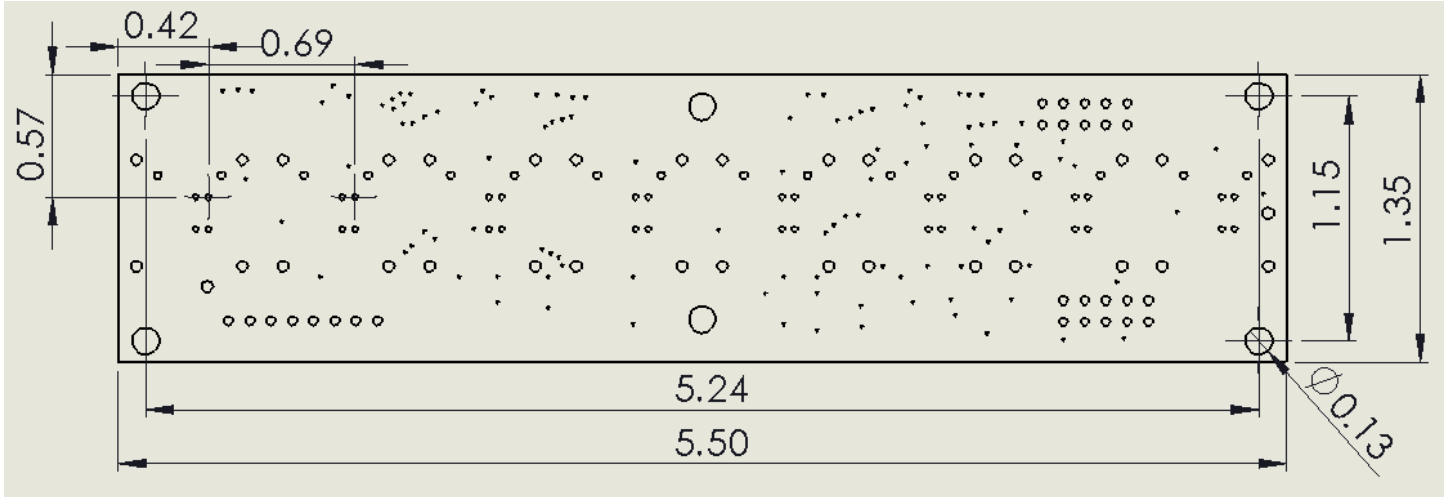
WARNING: These products are ESD sensitive. The ESD handling procedure must be followed.

L08KP1 Dimensions in inches:



Secondary side, looking down at switches

L08KP2 Dimensions in inches:

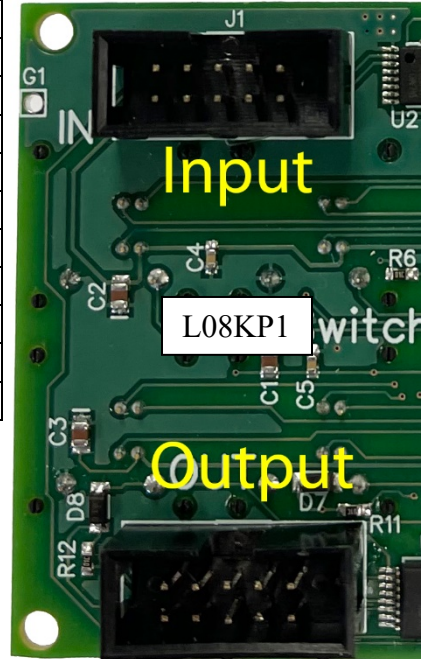


Secondary side, looking down at switches

Connectors:

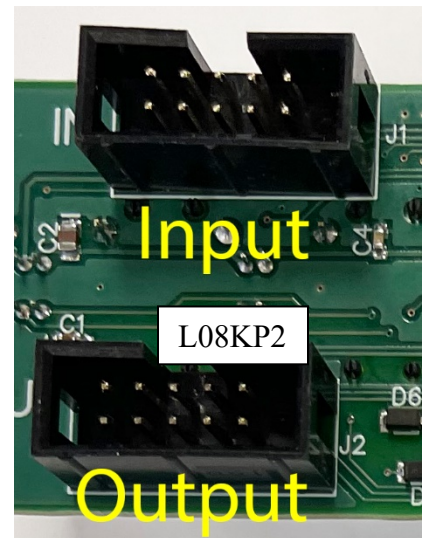
J1 Input port: 5x2 male header 0.1"x0.1" spacing.
This connector connects to the controller or J2 of the previous module board in the daisy chain.

Pin	Function
1	DATAin Data for backlights from controller or previous module
2	GND
3	CLK Clock for LED backlights and switch scan
4	GND
5	SWRDout Switch read data to previous board or controller
6	VDD
7	LPSWRD Latch pulse for switch status to shift register
8	VLED Voltage for backlight. 4 to 5V
9	LPLED Latch pulse for shifted data to the driver
10	ENLED Enable/Disable LED driver



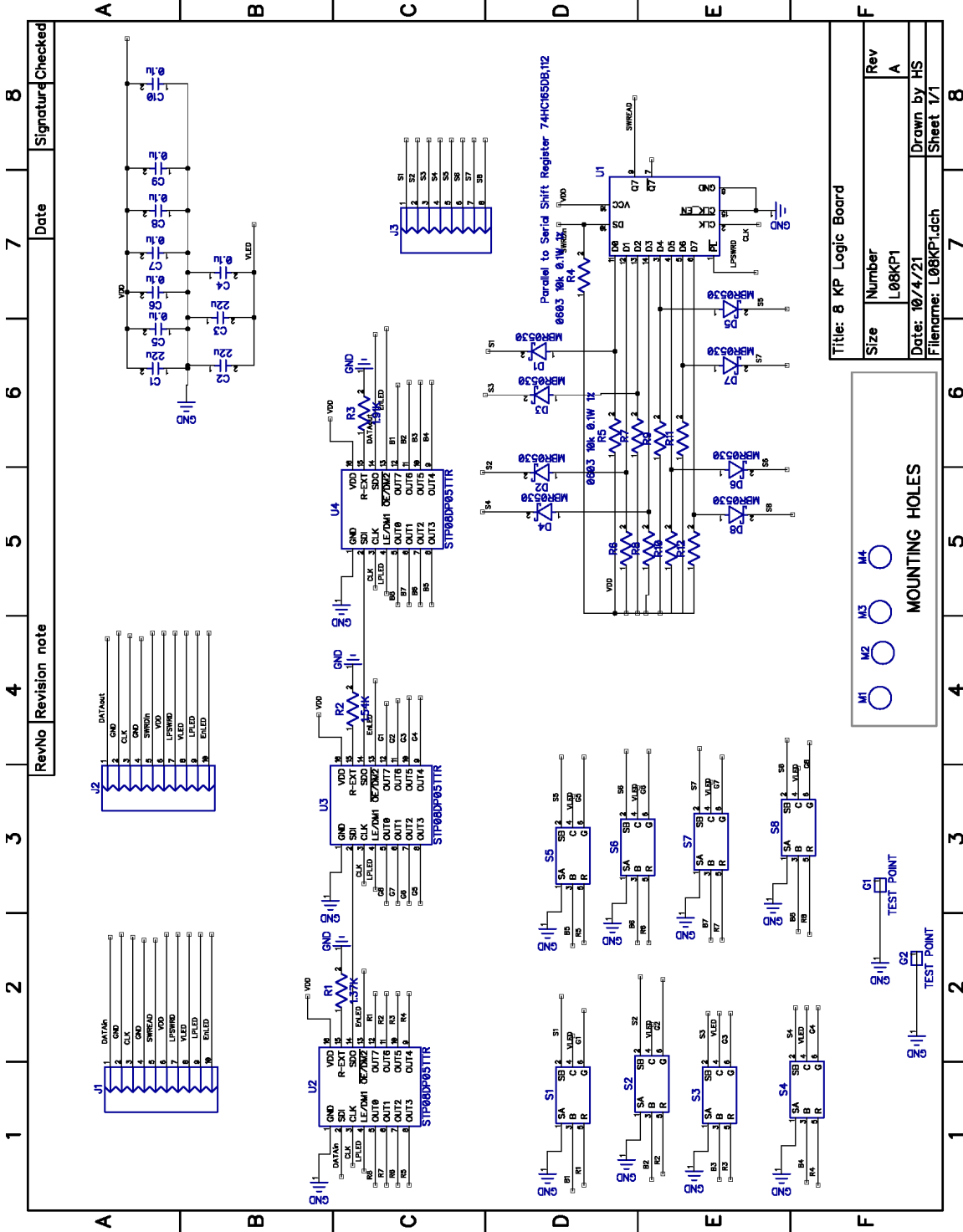
J2 Output port: 5x2 male header 0.1"x0.1" spacing.
This connector connects to J1 of the next logic board in the daisy chain.

Pin	Function
1	DATAout Data for next module backlight
2	GND
3	CLK Clock for LED backlights and switch scan
4	GND
5	SWRDin Switch read data from next module
6	VDD
7	LPSWRD Latch pulse for switch status to shift register
8	VLED Voltage for backlight. 4 to 5V
9	LPLED Latch pulse for shifted data to the driver
10	ENLED Enable/Disable LED driver

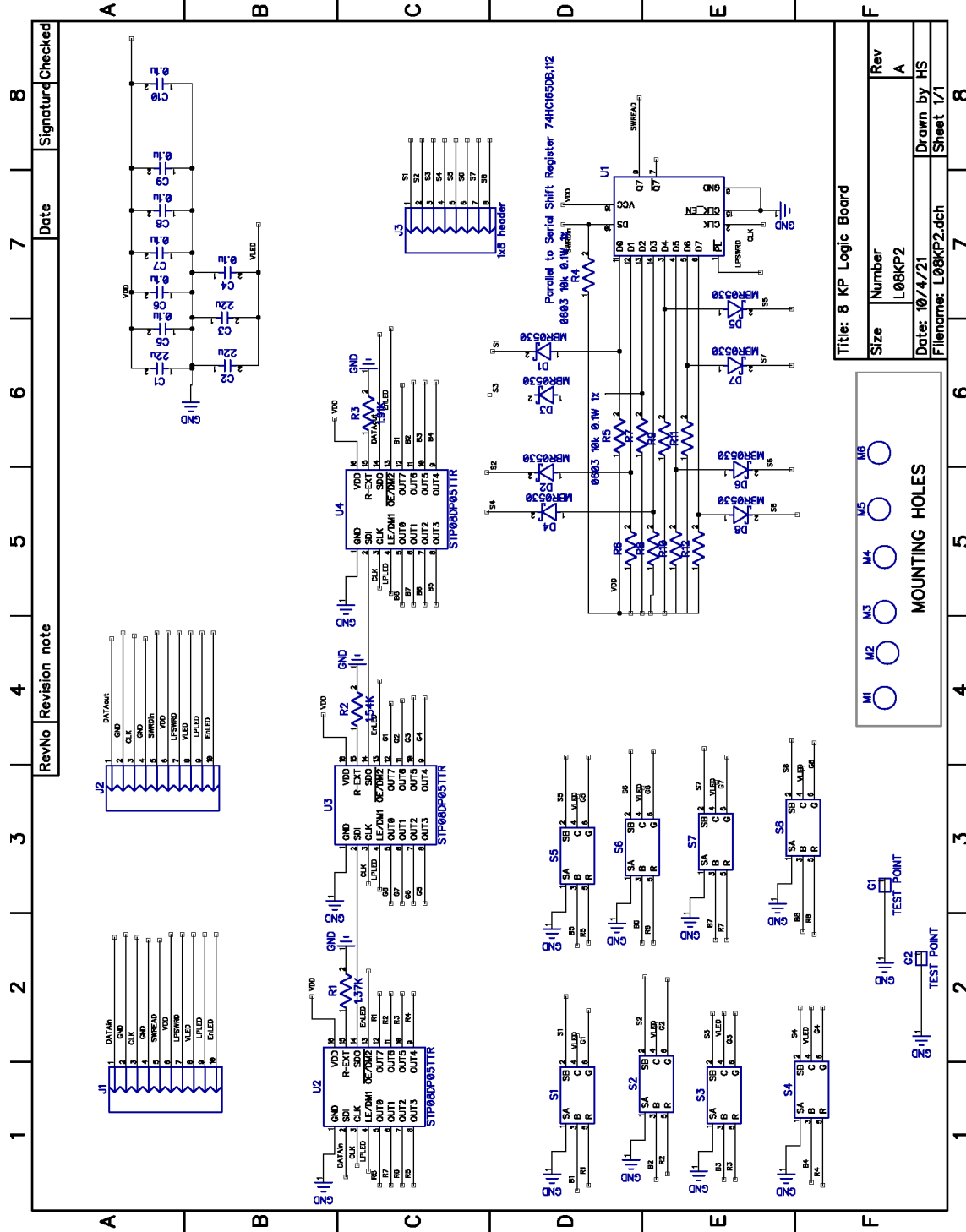


Note: Pin 1 of the connector must be matched with pin 1 of the preceding connector.

Controller Schematic, L08KP1:



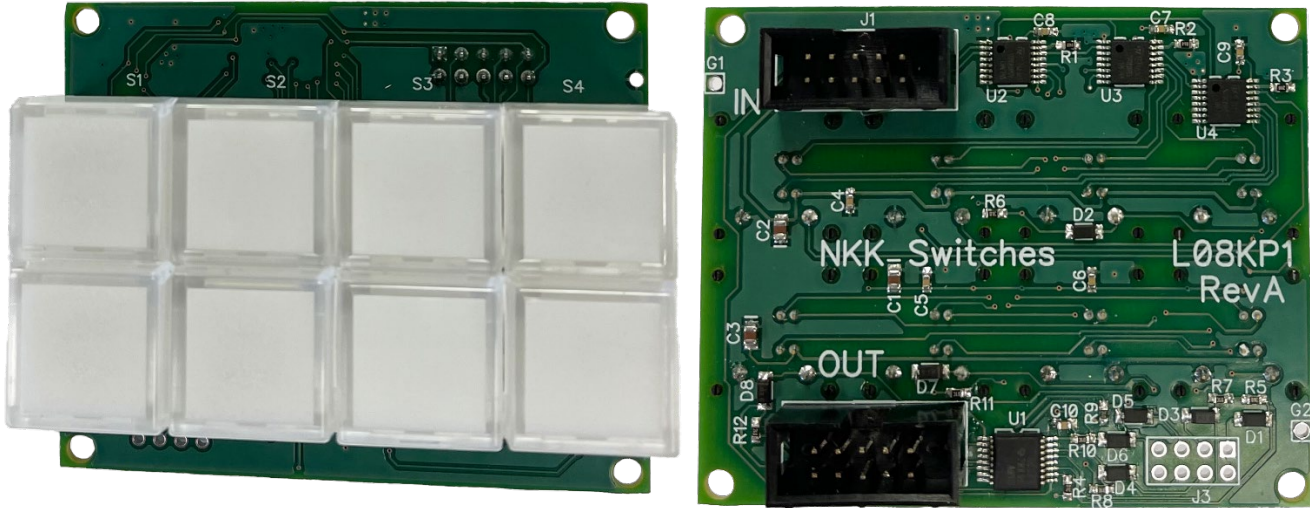
Controller Schematic, L08KP2:



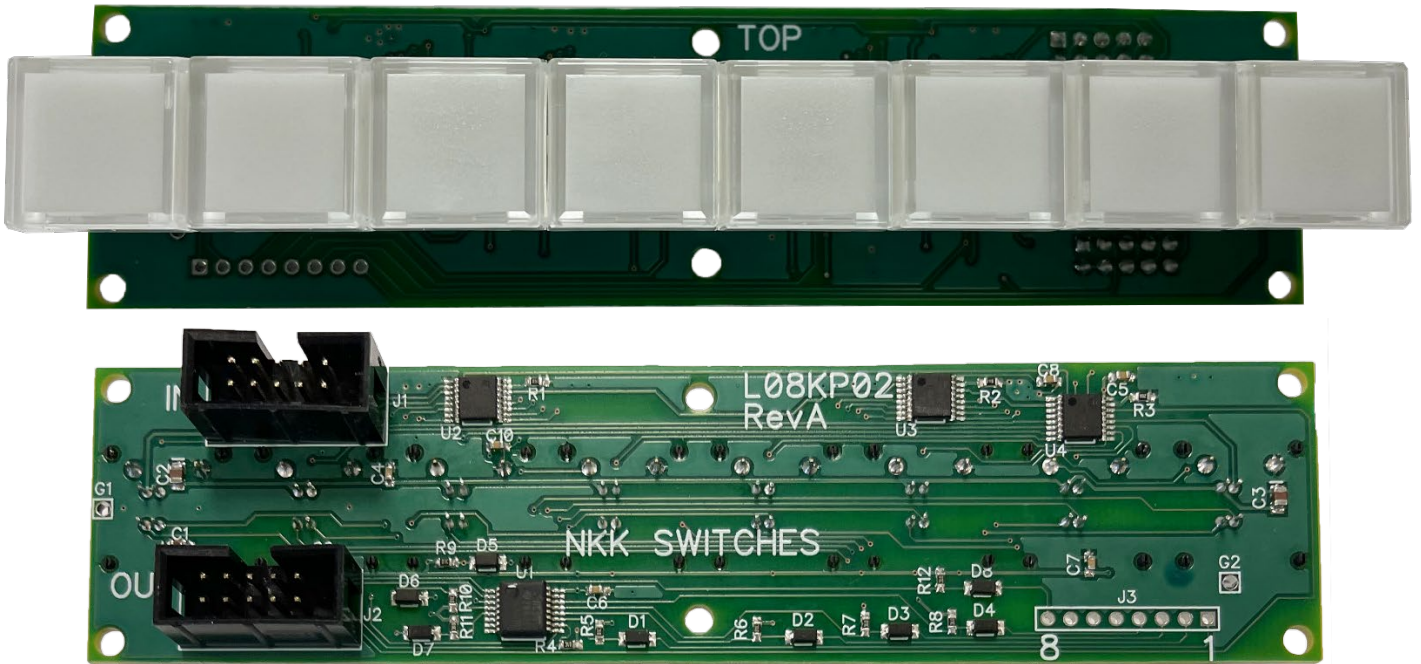
Title: 8 KP Logic Board	
Size	Number
	L08KP2
Date: 10/4/21	Rev
Filename: L08KP2.dch	A
	Drawn by HS
	Sheet 1/1

Board photos

L08KP1 with flat cap



L08KP2 with flat cap



Warranty

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