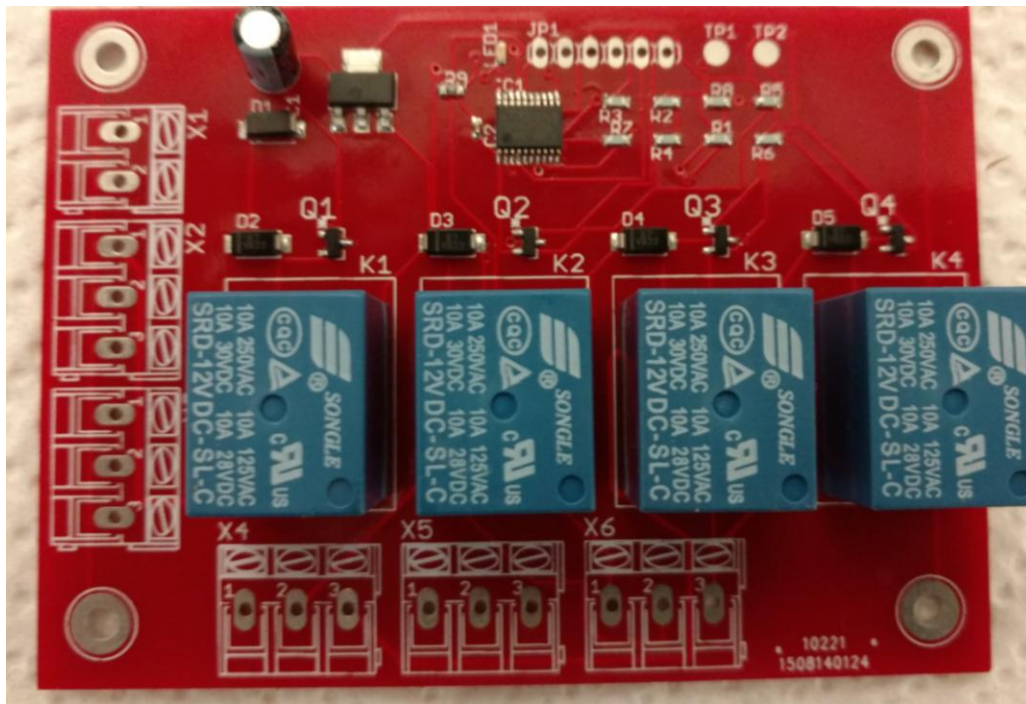# 4 Ch Serial Relay Control Board

Features:

- ✓ TTL USART serial interface (9600 Baud)
- ✓ 4 on board SPDT 12V relays
- ✓ Relay contacts rated for 250mA/28Vdc and 150mA/125Vac
- ✓ Supports 2-way communication for status feedback
- ✓ On board real time timers to control relays.
- ✓ Simple 28 exhaustive command set
- ✓ Custom commands can be added per customers request
- ✓ Reverse protection diode for the 12V input.

Introduction

This relay board is a TTL serially controlled relay board for switching potential free loads. The relay board is based off a 32 bit Cortex Processor and grantees soft real time response. The control board can be virtually controlled by any master that has a serial port or a usb to serial converter.

The unit needs one external 12V supply and will draw 29.5mA per relay that is turned on. While ordering request can be placed for custom instructions for the boards at extra cost.

Electrical Specifications

	Min	Typical	Max	Notes
Supply Voltage	11V	12V	15V	
Supply Current/relay	-	29.5mA	-	Total current for 4 relays picked up needs to just under 132mA
Stand by Current	-	14.5mA	-	
Input Voltage at USART RX	-	3.3V	5.0V	On board system is 3.3V system
Output Voltage at USART TX	-	3.3V	-	On board system is 3.3V system
Relay Contact rating Voltage	-	-	28V DC 125V AC	Rating for relay contacts
Relay Contact rating Current	-	-	250mA DC 150mA AC	Limited by the temperature rise for the tracks.

Command Set

The board responds to a series of decimal bytes sent to it over the serial port. The bytes need to be sent over TTL USART protocol and 9600 baud.

Every packet starts with a delimiter of 254. This is followed by the size of the payload to come and then finally the payload.

Sr no	Command	Function	Response	Notes
0	254,1,0	Turn Relay 0 ON	6	
1	254,1,1	Turn Relay 1 ON	6	
2	254,1,2	Turn Relay 2 ON	6	
3	254,1,3	Turn Relay 3 ON	6	
4	254,1,4	Turn Relay 0 OFF	6	
5	254,1,5	Turn Relay 1 OFF	6	
6	254,1,6	Turn Relay 2 OFF	6	
7	254,1,7	Turn Relay 3 OFF	6	
8	254,1,8	Turn all Relays ON	6	
9	254,1,9	Turn all Relays OFF	6	
10	254,2,10,x	Turn specific Relays ON/OFF, where x is the bit pattern of Relay	6	X is the relay pattern desired. This is a 4 bit long data. A '1' in the relay position will pick it up and '0' will de

					energize it.
11	254,1,11	Relay 1 status	ON=1 OFF=0		
12	254,1,12	Relay 2 status	ON=1 OFF=0		
13	254,1,13	Relay 3 status	ON=1 OFF=0		
14	254,1,14	Relay 4 status	ON=1 OFF=0		
15	254,1,15	All Relay Status	ON=1 OFF=1		
16	254,6,16,x,x,x,x,x	On Delay timer Relay 1		6	Turns the relay on after mentioned time in the command. See note 1 on how to use this instruction.
17	254,6,17,x,x,x,x,x	On Delay timer Relay 2		6	
18	254,6,18,x,x,x,x,x	On Delay timer Relay 3		6	
19	254,6,19,x,x,x,x,x	On Delay timer Relay 4		6	
20	254,6,20,x,x,x,x,x	Off Delay timer Relay 1		6	Turns the relay off after mentioned time in the command. See note 1 on how to use this instruction.
21	254,6,21,x,x,x,x,x	Off Delay timer Relay 2		6	
22	254,6,22,x,x,x,x,x	Off Delay timer Relay 3		6	
23	254,6,23,x,x,x,x,x	Off Delay timer Relay 4		6	
24	254,1,24	Test communication		6	
25	254,1,25	Reset Relay Board		6	Resets the CPU on the relay board in case it is unresponsive of a system reset is desired.
26	254,1,26	Product ID	8 byte ID		
27	254,1,27	Firmware version	xyz		Should be interpreted as x.yz.

28	254,1,28	Blink LED on board		Will blink version number for board identification on a serial port.

Notes:

1. Convert the needed delay into milli seconds. The number you get needs to be divided into 5 two digit numbers and then sent in payload as MSB 1st. Eg if a delay 10sec is needed, then this means a delay of 10000 ms is needed. This is sent in command as 254 6 16 00 00 01 00 00

Thus a minimum of 1ms and maximum of 9999999999ms can be achieved.

Connection Descriptions

X1-1	12V positive supply in
X1-2	Ground
X2-1	Relay 0 Common (C)
X2-2	Relay 0 Normally Open (NO)
X2-3	Relay 0 Normally Closed (NC)
X3-1	Relay 1 Common (C)
X3-2	Relay 1 Normally Open (NO)
X3-3	Relay 1 Normally Closed (NC)
X4-1	Relay 2 Common (C)
X4-2	Relay 2 Normally Open (NO)
X4-3	Relay 2 Normally Closed (NC)
X5-1	Relay 3 Common (C)
X5-2	Relay 3 Normally Open (NO)
X5-3	Relay 3 Normally Closed (NC)
X6-1	USART TX
X6-2	USART RX
X6-3	Ground

Document Version Control

Sr No	Author	Description	Date
1	SNR	Initial Draft	10/10/2015