

# DIY KIT KS232 PROXIMITY CARD READER

## INTRODUCTION

This is a low cost proximity card reader unit with RS232 interface to connect to a host directly. There are two LEDs can be controlled by host. They can also be used to drive some other circuitry. A 9 to 12V DC supply is required to power the kit, which has a current consumption of less than 200mA. A 9VDC/300mA (2.1mm center positive) plug pack will do fine.

## OPERATION

There is a 6-position dip switch for configure the operation of the unit.

<b>POSITION</b>	<b>DESCRIPTION</b>	<b>FUNCTION</b>
6	SPD0	Set the communication speed to host. The frame structure is no parity, one start bit and one stop bit. There is no flow control.
5	SPD1	
4	BEEP	ON: to generate a beep sound on valid card reading. OFF: no sound will be generated.
3	MODE	OFF: to keep sending the code to the host continuously. ON: to send the code once.
2	FMT0	To select the output format of the code.
1	FMT1	

<b>SPD1</b>	<b>SPD0</b>	<b>FUNCTION</b>
OFF	OFF	1200 bit/s.
OFF	ON	9600 bit/s.
ON	OFF	38400 Kbit/s.
ON	ON	115200 Kbit/s.

<b>FMT1</b>	<b>FMT0</b>	<b>FUNCTION</b>
OFF	OFF	Format 0, ASCII format: xxxxxxxxxxxx<0x0a><0x0d> (i.e. 11 digit + LF + CR)
OFF	ON	Format 1, ASCII format: xxx,xxxxx<0x0a><0x0d> (i.e. 3 digit + comma + 5 digit + LF + CR)
ON	OFF	Format 2, ASCII format: xxxxx,xxxxxxxxx<0x0a><0x0d> (i.e. 5 digit + comma + 8 digit + LF + CR)
ON	ON	Format 3, Packeted format.

## **Normal Operation**

In order to test the unit in interactive mode, you need a PC with a COM port running a dump terminal program, e.g. hyper terminal, tera term, etc. Then you need to setup the terminal according to the setting of the proximity card reader unit, i.e. communication speed and framing structure. For simplicity, we suggest to use one of the ASCII format, i.e. format 0, 1 or 2.

After connecting the antenna, straight through RS232 cable and power supply to the unit, a character string ("RST" + LF + CR) will be sent to the host in order to notify the unit is just powered up and ready to operate. Whenever a proximity card is placed over the antenna, the card code will be sent to the host using the programmed speed and format. If the BEEP option is on, a beep sound can be heard. If the MODE option is on, the card code will be sent once to the host only until the card is moved away and returned again. While the MODE option is off, the card code will sent to the host continuously until the card is moved away.

An input contacts is provided, if it is shorted, a character string ("PO" + LF + CR) will be sent to the host. While it is released, a character string ("PF" + LF + CR) will be sent to the host.

In order to control the state of the RED led, Yellow led and the buzzer, the following commands can

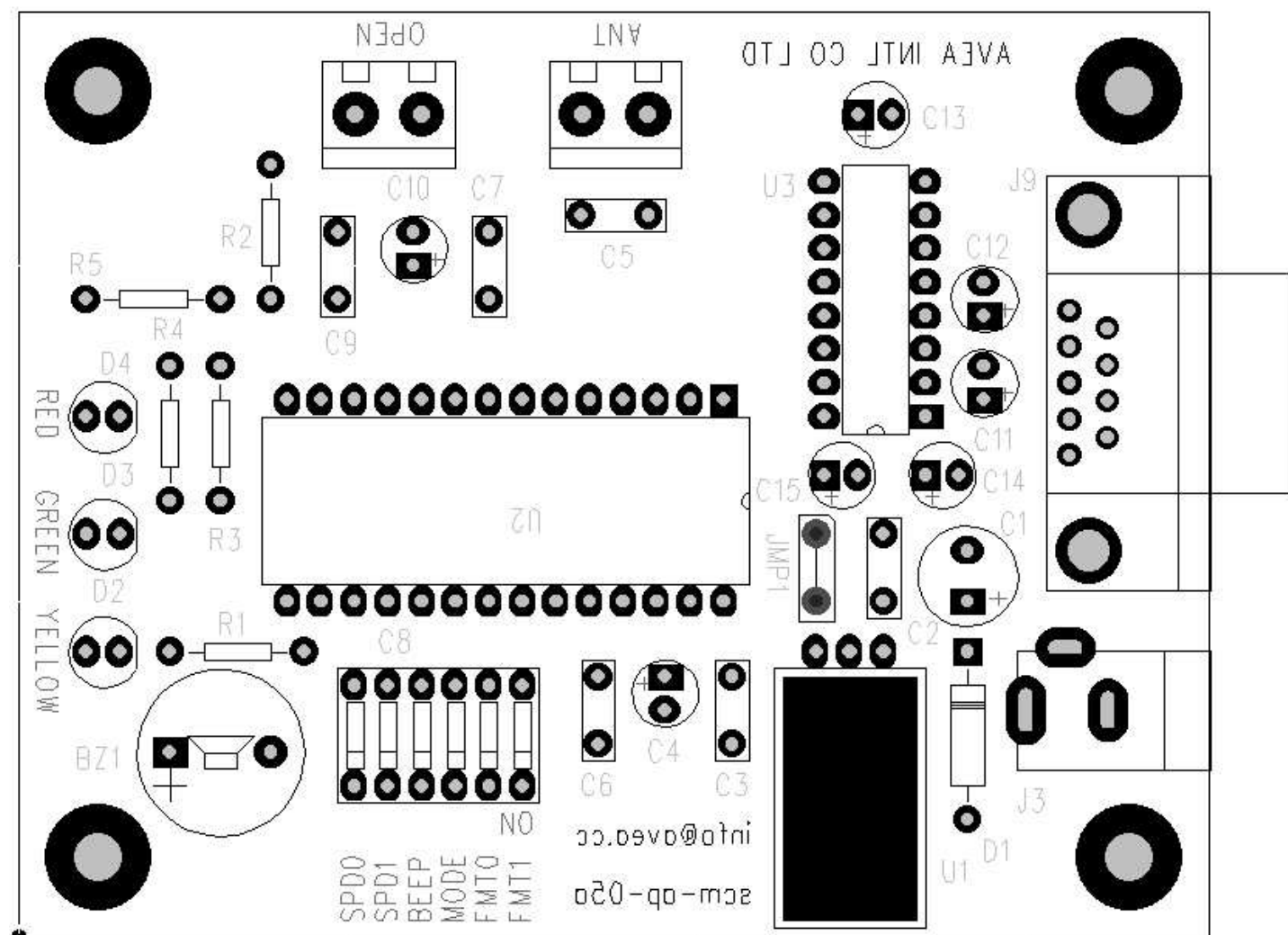
be used. To turn on the yellow led, sent two characters, ~R (0x7e, 0x52) to the unit. To turn off the yellow led, sent two characters, ~r (0x7e, 0x72) to the unit. To turn on the Red led, sent two characters, ~L (0x7e, 0x4C) to the unit. To turn off the red led, sent two characters, ~l (0x7e, 0x6c) to the unit. To turn on the buzzer, sent two characters, ~B (0x7e, 0x42) to the unit. To turn off the buzzer, sent two characters, ~b (0x7e, 0x62) to the unit. To just make a beep sound, sent two characters, ~0 (0x7e, 0x30) to the unit.

To read back the states of the leds, buzzer and the input contacts, we can issue the query command by sending two characters, ~? (0x7e, 0x3f) to the unit. It will respond [S][s1][s2][s3][s4]+LF+CR, where S (0x53) represents status response; s1 is the state of the input contacts, H for shorted and L for opened; s2 is the state of the red led, H for lite and L for dim; s3 is the state of the yellow led, H for lite and L for dim; s4 is the state of the buzzer, H for sounding and L for silent.

## CIRCUIT DESCRIPTION

The unit make use of an highly integrated module MS232 which is the heart of the unit providing all the functionalities. By adding small amounts of surrounding components, the complete proximity card reader unit is built. U1 is the regulator for the unit. U3 is used as the level shifter in order to interface to the RS232 link. By writing simple application software on the PC side, the unit can be used for attendance application, restricted access controlling, etc.

## PCB LAYOUT



## PART LIST (PCB Assembly)

ITEM	REFERENCE	COMPONENT	REMARK
1	U1	7805	Regulator
2	U2	MS232 with IC socket	Proximity card reader module
3	U3	MAX232 with IC socket	Level shifter
4	C1	470uF 25V	
5	C2, 3, 7, 9	Mono. Capacitor 0.1uF	
6	C4, 10, 11-15	E. Capacitor 10uF 25V	
7	C5, 6	C. Capacitor 470pF	Not used.
8	C8	DIP Switch 6 Position	
9	D1	Rectifier 1N4001	
10	D3	Green LED	
11	D4	Red LED	
12	D2	Yellow LED	
13	R1, 2, 3, 4	Resistor 390 ohm	
14	R5	Resistor 4.7 Kohm	
15	BZ1	5V Buzzer	
16	J3	2.1mm DC JACK	Center terminal is positive.
17	J6, L1	2-Pin Terminal Block	L1 is used to connect the coil antenna.
18	J9	DB9 Female Connector	Use straight through cable to connect to a PC.
19	PCB	scm-ap-05a	

## SCHEMATIC DIAGRAM

