

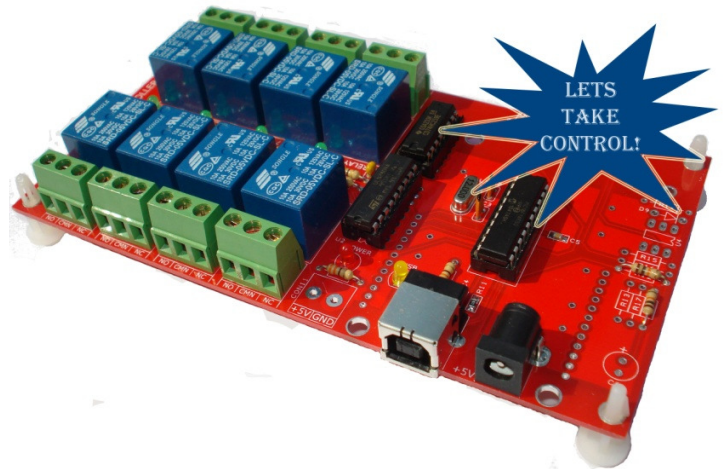
# Smart USB Relay Controller

## Introduction

This is a simple 8 channel USB based general purpose Relay controller which allows computer controlled switching of external devices. It appears as a Virtual Serial COM port and is capable of switching loads rated up to 250VAC/10A. The controller supports simple *ASCII protocol* to enable easy custom application development and is also supplied with free software **Smart Control** so that the product can be used straight away out of the box.

## Features

- Connects to PC through USB port
- Appears as a Virtual Serial (COM) port allowing easy communication with the board through any programming language that supports serial communications
- Simple ASCII protocol to Change/Get Relay status so any Serial terminal program like Hyper terminal can be used
- Led indicators for each Relay, Power & USB
- Screw terminals for Relay connections
- Free Graphical User Interface based software *Smart Control*
- Controller supported by standoffs at each corner for improved safety



## Specifications

- UL, CUL & TUV recognized SPDT Relays
- Relay contact rating
  - Normally Open (NO)  
AC:10A@250V, DC:10A@30V
  - Normally Close (NC)  
AC:5A@125V, DC:10A@28V
- Screw terminals for Common (C), Normally Open (NO) & Normally Close (NC) contacts
- 5VDC input through 2.1mm DC jack (center +ve), max. current consumption 800mA
- Commands to control one or all Relays at a time
- 3mm mounting holes at each corner
- Dimensions : 152mm x 82mm
- Operating temperature -20C to +85C

### Disclaimer

*This device should not be used without proper consideration and design of associated system architecture and redundant safety features in applications where failure may result in death or injury. The manufacturer accepts no responsibility for injury, death or loss caused by the use or misuse of this device.*

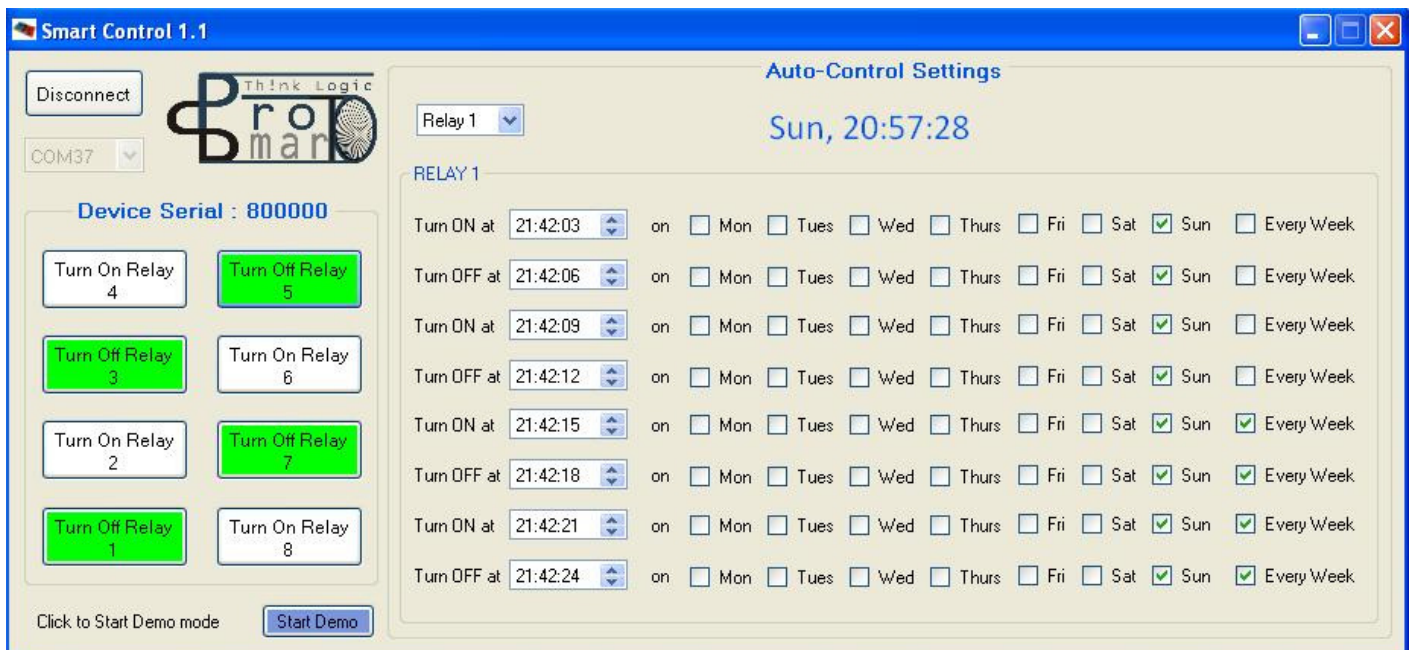
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## Software

Smart USB Relay controller comes with a free simple to use software *Smart Control* which has following features:

- Instant Switching of Relays
- Auto Switching of Relays
  - At any time of day
  - On any day of week
  - Ability to repeat switching every week
- Auto Switching also allows to use a Relay
  - As a one shot Relay (Pulse)
  - As timed Controlled Relay
- Supports hot keys for instant Relay control
- Auto control settings are restored on Software/Computer restart

Screenshot of the software is shown below.



**Note** that depending on Operating system setting the underscore in the buttons above might not be visible until "Alt" key is pressed

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## Protocol

To allow the users to design & develop their own software, Smart USB Relay controller supports simple ASCII commands to change/get Relay status. For example,

Turn on Relay 1: 00=1<ENTER>  
 Turn off Relay 6: 05=0<ENTER>  
 Read Relay 8 Status: 07?<ENTER>

This simple ASCII protocol offers following advantages:

- Allows use of standard Serial terminal programs like Hyper Terminal & Docklight to change/get Relay status
- All commands follow same format
- Each command has a response which gives confirmation that the command has been executed by the controller

Table below lists all the supported commands with examples. In the following table,

<CR> is Carriage Return (hex 0x0D). Same as <ENTER> key  
 <LF> is Line feed (hex 0x0A)

Command Type	Command	Command Parameters	Response	Response Parameters	Comments
<b>Read Commands</b>					
<i>Command</i> Read Single Relay # status	0#?<CR>	'#' is Relay number 0 to 7	<CR><LF> 0#=<STATUS><CR><LF>	# is Relay number as in Command, <STATUS> is 0 if Relay is OFF & 1 if Relay is ON	Relay number in commands start from 0. So for Relay N, # in command should be N-1.
<i>Example</i> Read Relay 4 status	03?<CR>	# is 3 for Relay 4	<CR><LF>03=1<CR><LF>	'1' in response means Relay 4 is ON	
<i>Command</i> Read All Relays status	0A?<CR>	'A' implies all Relays	<CR><LF> 0A=<8 VALUES> <CR><LF>	<8 VALUES> represent status of each Relay as '1' or '0'	Most significant value is for Relay 8
<i>Example</i> Read all Relays status	0A?<CR>		<CR><LF> 0A=11000001 <CR><LF>	Means Relays 8,7 & 1 are ON and Relays	

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				6,5,4,3 & 2 are OFF	
<b>Write Commands</b>					
<i>Command</i> Turning On/Off a Relay	O#=<VALUE> <CR>	'#' is Relay number 0 to 7. <VALUE> is either '1' or '0'	<CR><LF> OK <CR><LF>	OK means desired Relay has been turned on/off as requested	Relay number in commands start from 0. So for Relay N, # in command should be N-1.
<i>Example</i> Turn on Relay 5	04=1<CR>	# is 4 for Relay 5. <VALUE> is '1' to turn ON	<CR><LF> OK <CR><LF>	OK means Relay 5 has been turned ON	
<i>Example</i> Turn off Relay 8	07=0<CR>	# is 7 for Relay 8. <VALUE> is '0' to turn OFF	<CR><LF> OK <CR><LF>	OK means Relay 8 has been turned OFF	
<i>Command</i> Turning On/Off All Relays at once	0A=<8 VALUES> <CR>	'A' implies all Relays. <VALUES> represent 8 chars as '0', '1' or 'X'. 0 means turn OFF, 1 means turn ON & X means no change	<CR><LF> OK <CR><LF>	OK means desired Relays have been turned on/off as requested	Most significant character is for Relay 8
<i>Example</i> Turn on Relay 2 & 3, turn off Relay 8 & 7 & leave others unchanged	0A=00XXX11X <CR>		<CR><LF> OK <CR><LF>		