





## CHAPTER 1

### INTRODUCTION

USB 32 channels relay output board provides 32 different relay output channels, and one RS232/RS422/RS485 port functions, which allow each relay channel can be used to control ON/OFF of external devices, to drive external power relays, to activate alarms... etc.

USB 32 channels relay output board provides one asynchronous serial communication port (RS232 or RS422 or RS485), which allows users to control the board by COM port.

USB 32 channels relay output board provides Plug and Play (PnP) features, it is a programmable I/O interface board for PC/486, Pentium, or compatibles. The on board high speed 8051 uC provides USB functions run at 12Mbps full speed or 1.5Mbps low speed.

#### ❖ The features of USB 32 channels relay output board are:

- USB2.0 with Plug and Play (PnP) features.
- High speed 8051 uC core.
- Support USB ID selection to identify USB device.
- Support 32 SPDT-Relays - 1 x COM/NO channels
- 32 LED correspond to 32 output ports activation status.
- Allow to connect RS232 or RS422/RS485 extension board with DB9 connector to control.
- Power supplied from external DC +5V.



- Maximum contact rating is 100V/DC 500mA, minimum response time is 1ms, maximum contact resistance is 0.1 OHM.
- Suitable for Linux, MS/WINDOWS, ... etc.
- Operating temperature range from 0 to 55°C.
- Relative humidity range from 0 to 90%.

#### ❖ PACKAGE CONTENTS:

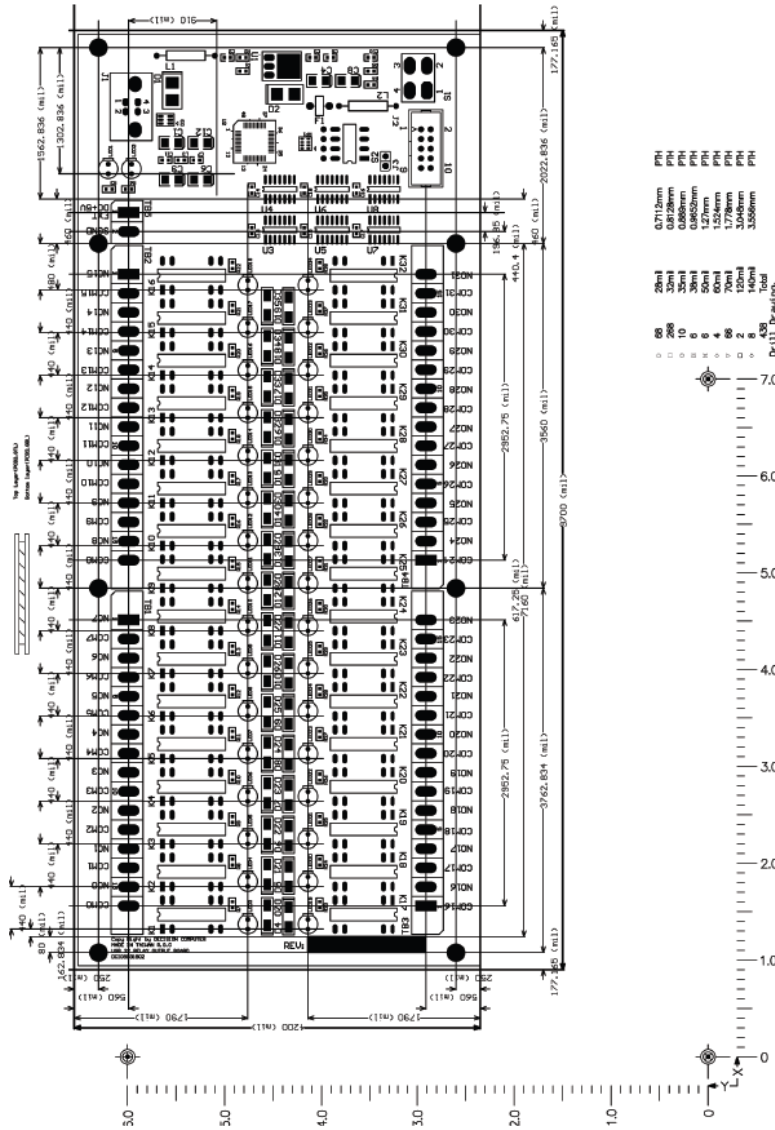
- SMARTLAB USB 32 channels relay output board.
- USB cable.
- Decision Studio and User's manual CD.
- Two Different Connector Types can be selected:

Standard: European P.C.B type terminal blocks

Professional: Pluggable terminal blocks

Optional

- Extension board with DB9 : RS232 or RS422/485
- PCB Carrier



## CHAPTER 2

### HARDWARE CONFIGURATION

Before you use USB 32 channels relay output board, please ensure that the jumpers and switches setting. The proper jumper and switches settings for the 32 channels relay output board are described in the following.

#### 2.1 Switch Settings

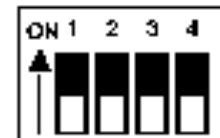
1. S1 Reset



The S1 switch is used to reset 8051, the signal assignments are shown in the following.

Pin	Signals
3,4	Reset SW+
1,2	Reset SW-

2. S2 USB ID





The S2 switch is used to identify USB board ID. Please set different board ID to each board (do not duplicate ID setting).

1	2	3	4	ID
ON	ON	ON	ON	--
OFF	ON	ON	ON	14
ON	OFF	ON	ON	13
OFF	OFF	ON	ON	12
ON	ON	OFF	ON	11
OFF	ON	OFF	ON	10
ON	OFF	OFF	ON	9
OFF	OFF	OFF	ON	8
ON	ON	ON	OFF	7
OFF	ON	ON	OFF	6
ON	OFF	ON	OFF	5
OFF	OFF	ON	OFF	4
ON	ON	OFF	OFF	3
OFF	ON	OFF	OFF	2
ON	OFF	OFF	OFF	1
OFF	OFF	OFF	OFF	0

### 3. Download revised firmware

When the S2 switch is set to ON ON ON ON status, means down load revised firmware. please follow the steps shown in the following:

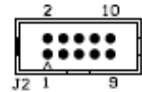
1. Set S2 to ON ON ON ON.
2. Run USBBootloader program to down load revised firmware.



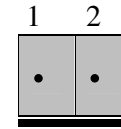
## 2.2 Jumper Settings

### Connector and Jumper for Serial Communication (J3)

To use RS422/RS485/RS232, please connect J2 to extension board by 10 pins flat cable. (Optional)



Enable Serial Port (J3)

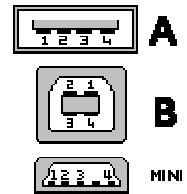


J3 is used enable serial port communication, when short the J3, means enable serial port, otherwise, when open the J3, the serial port communication is disable.

### 2.3 USB Connector

1. USB Connector

The USB connector is connected to computer USB port by using USB cable.



### 2.4 LED Status

1. LED1

The LED1 is an indicator to show the power is supplied normally.

2. LED2

The LED2 is an indicator to warning the USB link status. When it lights, it means USB connection works normally, otherwise it is fail.

## 2.5 Connector Assignments

The relay output signal pin assignments are shown in the below.

Where (NO0, COM0, NC0) is OUT00, (NO1, COM1, NC1) is OUT01, ... etc.

Pin	Signal	Description
1	SGND	Signal Ground
2	EXT+5V	<b>External DC +5V ≥1A Power In</b>

Pin	Signal	Description
1	COM0	Relay Ch. 00 - Output
2	NO0	Relay Ch. 00 - Output
3	COM1	Relay Ch. 01 - Output
4	NO1	Relay Ch. 01 - Output
5	COM2	Relay Ch. 02 - Output
6	NO2	Relay Ch. 02 - Output
7	COM3	Relay Ch. 03 - Output
8	NO3	Relay Ch. 03 - Output
9	COM4	Relay Ch. 04 - Output
10	NO4	Relay Ch. 04 - Output
11	COM5	Relay Ch. 05 - Output
12	NO5	Relay Ch. 05 - Output
13	COM6	Relay Ch. 06 - Output
14	NO6	Relay Ch. 06 - Output
15	COM7	Relay Ch. 07 - Output
16	NO7	Relay Ch. 07 - Output

Pin	Signal	Description
1	COM8	Relay Ch. 08 - Output
2	NO8	Relay Ch. 08 - Output
3	COM9	Relay Ch. 09 - Output
4	NO9	Relay Ch. 09 - Output
5	COM10	Relay Ch. 10 - Output
6	NO10	Relay Ch. 10 - Output
7	COM11	Relay Ch. 11 - Output
8	NO11	Relay Ch. 11 - Output
9	COM12	Relay Ch. 12 - Output
10	NO12	Relay Ch. 12 - Output
11	COM13	Relay Ch. 13 - Output
12	NO13	Relay Ch. 13 - Output
13	COM14	Relay Ch. 14- Output
14	NO14	Relay Ch. 14 - Output
15	COM15	Relay Ch. 15 - Output
16	NO15	Relay Ch. 15 - Output

Pin	Signal	Description
1	COM16	Relay Ch. 16 - Output
2	NO16	Relay Ch. 16 - Output
3	COM17	Relay Ch. 17 - Output
4	NO17	Relay Ch. 17 - Output
5	COM18	Relay Ch. 18 - Output
6	NO18	Relay Ch. 18 - Output
7	COM19	Relay Ch. 19 - Output
8	NO19	Relay Ch. 19 - Output
9	COM20	Relay Ch. 20 - Output
10	NO20	Relay Ch. 20 - Output
11	COM21	Relay Ch. 21 - Output



12	NO21	Relay Ch. 21 - Output
13	COM22	Relay Ch. 22- Output
14	NO22	Relay Ch. 22 - Output
15	COM23	Relay Ch. 23 - Output
16	NO23	Relay Ch. 23 - Output

Pin	Signal	Description
1	COM24	Relay Ch. 24 - Output
2	NO24	Relay Ch. 24 - Output
3	COM25	Relay Ch. 25 - Output
4	NO25	Relay Ch. 25 - Output
5	COM26	Relay Ch. 26 - Output
6	NO26	Relay Ch. 26 - Output
7	COM27	Relay Ch. 27 - Output
8	NO27	Relay Ch. 27 - Output
9	COM28	Relay Ch. 28 - Output
10	NO28	Relay Ch. 28 - Output
11	COM29	Relay Ch. 29 - Output
12	NO29	Relay Ch. 29 - Output
13	COM30	Relay Ch. 30- Output
14	NO30	Relay Ch. 30 - Output
15	COM31	Relay Ch. 31 - Output
16	NO31	Relay Ch. 31 - Output



### CHAPTER 3

## DIAGNOSTIC UNDER WINDOWS

USB Test Program.exe is a diagnostic program to test your USB devices under Windows.

User can get USB Test Program.exe programs from Decision Studio CD.

### CHAPTER 4

## SOFTWARE PROGRAMMING UNDER WINDOWS AND LINUX

Under Windows, we provide function library and dll file for users to program the device in supported language. You can find manual “USBDII\_Manual.pdf” and demo code in VB/VC/Delphi from Decision Studio CD.

Under Linux, we provide .c source to allow user directly to access device. You can find manual and example in “dcihid-0.5.4.tgz”.





## APPENDIX A

### WARRANTY INFORMATION

#### A.1 Copyright

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#### A.2 Warranty Information

SmartLab warrants that for a period of one year from the date of purchase (unless otherwise specified in the warranty card) that the goods supplied will perform according to the specifications defined in the user manual. Furthermore that the SmartLab product will be supplied free from defects



in materials and workmanship and be fully functional under normal usage.

In the event of the failure of a SmartLab product within the specified warranty period, SmartLab will, at its option, replace or repair the item at no additional charge. This limited warranty does not cover damage resulting from incorrect use, electrical interference, accident, or modification of the product.

All goods returned for warranty repair must have the serial number intact. Goods without serial numbers attached will not be covered by the warranty.

The purchaser must pay transportation costs for goods returned. Repaired goods will be dispatched at the expense of SmartLab.

To ensure that your SmartLab product is covered by the warranty provisions, it is necessary that you return the Warranty card.

Under this Limited Warranty, SmartLab's obligations will be limited to repair or replacement only, of goods found to be defective a specified above during the warranty period. SmartLab is not liable to the purchaser for any damages or losses of any kind, through the use of, or inability to use, the SmartLab product. SmartLab reserves the right to determine what constitutes warranty repair or replacement.

Return Authorization: It is necessary that any returned goods are clearly marked with an RA number that has been issued by SmartLab. Goods returned without this authorization will not be attended to.



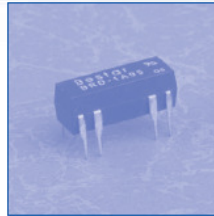


## APPENDIX B

### DATA SHEET

#### ■ FEATURES

- 1 Form A Contact
- DIP Terminal
- Application for Fax Modem, Telecommunication, Security Alarm System
- UL File No. E147052



#### ■ COIL RATING (at 20 °C)

Nominal Voltage (VDC)	Coil Resistance ( $\Omega \pm 10\%$ )	Nominal Current (mA)	Pick-Up Voltage (VDC)	Drop-Out Voltage (VDC)	Maximum Allowable Voltage (VDC)	Power Consumption (mW)
5	500	10.0	3.75	0.6	15	50
12	1000	12.0	9.0	1.44	30	144
24	2150	11.2	18.0	2.88	44	268

#### ■ ORDERING INFORMATION

BRD-1A05-D

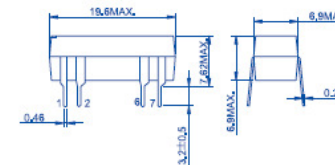
Coil Voltage	Option
See Coil Rating	Nil: Standard D: With Diode



#### ■ SPECIFICATIONS

Contact Arrangement		1 Form A
Contact Material		Ru / Rh
Contact Resistance		Max. 150m $\Omega$ (initial)
Contact Rating (at Resistive Load)	Max. Switching Voltage	100VDC
	Max. Switching Current	0.5A
	Max. Switching Power	10W (DC) / 10VA (AC)
	Max. Carrying Current	1A
Dielectric Strength		
Between Coil & Contact		1400 VDC (1 minute)
Between Contacts		250VDC (1 minute)
Operate Time		Max. 1.0m Sec.
Release Time		Max. 0.5m Sec.
Ambient Temperature		-40 °C ~ +85 °C
Insulation Resistance		Min. 100M $\Omega$ at 500VDC
Vibration Resistance		1.5mm D.A. 10-55HZ
Shock	Functional	20G
	Destruction	100G
Mechanical Life		1 x 10 <sup>6</sup> operations (at no load)
Electrical Life		1 x 10 <sup>6</sup> operations (at rated load)
Weight		Approx. 2g

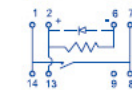
#### DIMENSIONS(mm)



General Tolerance  $\pm 0.3$

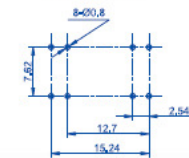
#### WIRING DIAGRAM

(Bottom View)



#### PC board pattern (mm)

(Bottom View)



General Tolerance  $\pm 0.1$





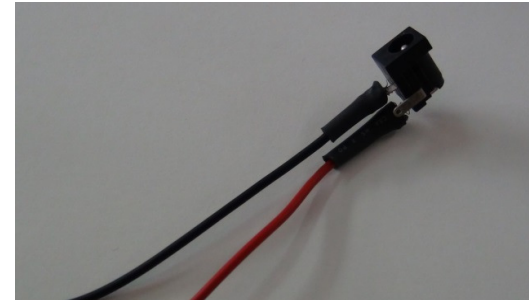
APPENDIX C **External Power Installation:**

*\*\*Optional for Decision Group USB I/O series of items  
\*\* The materials of the external power for Decision Group  
USB I/O series items are customer-self-supplied or optional  
purchase, they are not covered in the standard package of  
Decision Group USB I/O series items.*

**1. The Materials of the external power (customer-self-supplied)**



*\* 5V / 1A AC adapter (Power plug type is subject to the  
different varieties in different country.).*



\* AC power cord

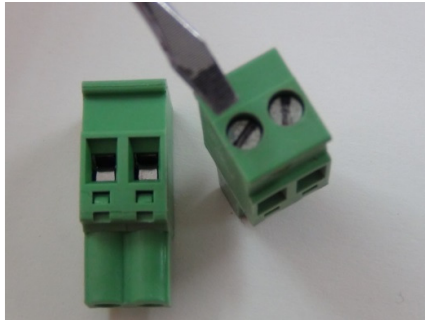
**2. Terminal blocks built-in on Decision Group USB I/O series of Items:**



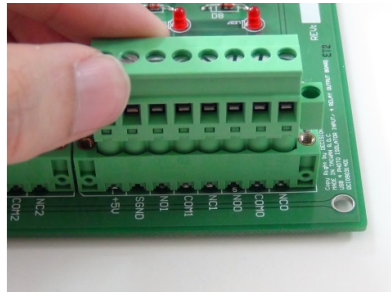
e.g. PCB pluggable terminal blocks. (for PRO type only)

**3. External Power Installation procedure:**

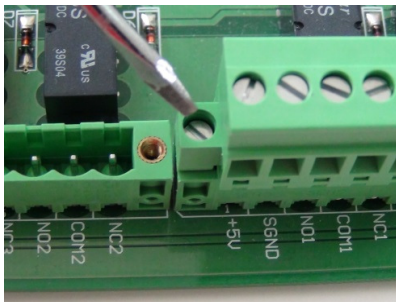




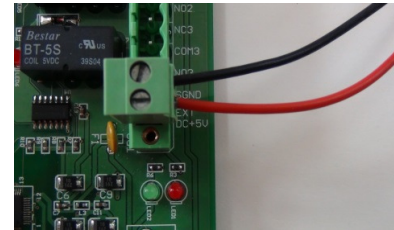
To tight / loose  
the terminal  
with a minus  
screwdriver.



Plug the  
terminal blocks  
into the socket.  
(PRO type  
only)



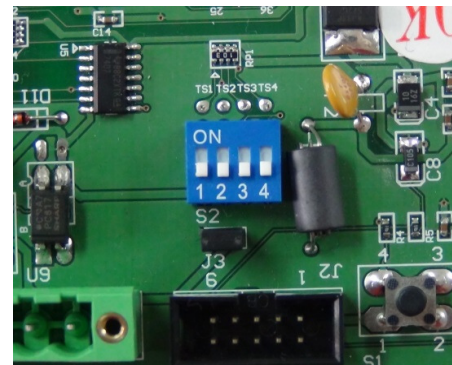
Fasten both  
sides of the  
screws (PRO  
type only)



Attach the  
**black** cord to  
the **SGND** and  
the **red** cord to  
the **EXT  
DC+5V.**, as  
well as the  
signals cords



Connect your  
device to the  
computer with  
a USB cable



To confirm all  
the switches  
and jumper

