SMARTLAB
USB 14/16 BIT DATA ACQUISITION BOARD

OPERATION MANUAL

Decision Group Inc.

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CHAPTER 1

INTRODUCTION

The USB 14/16 bit data acquisition board is a high precision data conversion/acquisition system. It contains 16 analog to digital(A/D) input channels with unipolar or bipolar selection, 2 digital to analog(D/A) output channels and 1 digital I/O channel with 16 bit line.

The USB 14/16 bit data acquisition board provides Plug and Play (PnP) features; it is a programmable I/O interface card 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 USB 14/16 bit data acquisition board can be connected to computer by using USB or RS232, RS422/RS485 communication links.

❖ **<u>The features of the USB 14/16 bit data acquisition board are:</u>**

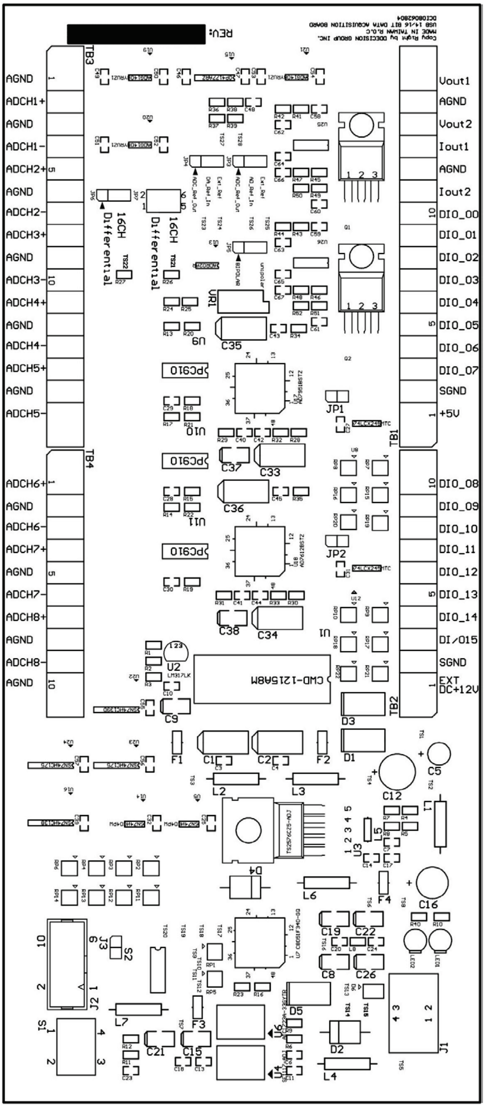
- USB 2.0 with Plug and Play (PnP) features.
- High speed 8051 uC core.
- Support USB ID selection to identify USB device.
- Provides 16 A/D input channels and the resolution is 14/16 bits.
- Provides 2 D/A output channels and the resolution is 16 bits.
- Provides 1 digital input/digital output channels and the resolution is 16 bits.

- Provides unipolar or bipolar input voltage range for A/D channel.
- Provides Differential mode for A/D channel.
- A/D input voltage range from 0 to 5V, 0 to 10V, –5V to 5V, or –10V to 10V.
- D/A voltage output range from 0 to 5 V, 0 to 10V, -5V to 5V, or –10V to 10V selectable.
- D/A current output range from 4 mA to 20 mA, 0 to 20 mA, or 0 mA to 24 mA.
- D/A output could set to normal or 10% over range.
- Allow to connect RS232 or RS422/RS485 extension board with DB9 connector.
- Power supplied from external DC +12V/2A.
- By using software commands to set up unipolar, bipolar, voltage range, current range,…etc.
- Suitable for Linux, WINDOWS/XP/VISTA/7, ... etc.
- Operating temperature range from 0 to 33C.
- Relative humidity rage from 0 to 90%.

❖ PACKAGE CONTENTS:

- USB 14/16 bit data acquisition board.
- USB cable.
- Optional extension board with DB9 connector, select one of the following:
  1. RS232 KIT DCI09031800_A
  2. RS422/485 KIT DCI09031800_B
- User's manual.
- Decision Studio CD for USB LAB KITS software.
- Warranty form.

DECISION Computer International Ltd.,



CHAPTER 2

HARDWARE CONFIGURATION

Before you use the USB 14/16 bit data acquisition board, please ensure that the jumpers and switches setting. The proper jumper and switches settings for the USB 14/16 bit data acquisition board are described in the following.

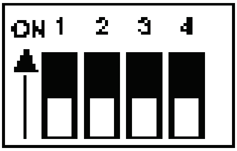
2.1 Switch Settings

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 card ID. Please set different card ID to each card (do not duplicate card ID setting).

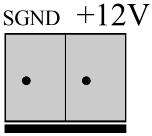
1	2	3	4	Card ID
ON	ON	ON	ON	--
OFF	ON	ON	ON	14
ON	OFF	ON	ON	13
OFF	OFF	ON	ON	12
ON	ON	OFF	ON	11
OFF	ON	OFF	ON	10
ON	OFF	OFF	ON	9
OFF	OFF	OFF	ON	8
ON	ON	ON	OFF	7
OFF	ON	ON	OFF	6
ON	OFF	ON	OFF	5
OFF	OFF	ON	OFF	4
ON	ON	OFF	OFF	3
OFF	ON	OFF	OFF	2
ON	OFF	OFF	OFF	1
OFF	OFF	OFF	OFF	0

3. Down load revised firmware

When the S2 switch is set to ON ON ON ON status, means download 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.

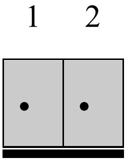
2.2 Jumper Settings

1. External Power Input (TB2)



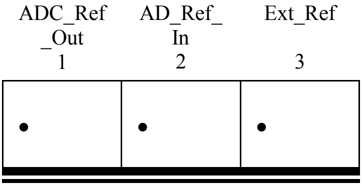
The power of USB 14/16 bit data acquisition board can be supplied from USB; however, if USB can not supply enough power, the external power is need. To input external power, please use the pin 1 and pin 2 connectors of TB2. Be careful to input DC +12V power.

2. Digital Input/Digital Output Mode Selection (JP1 to JP2)



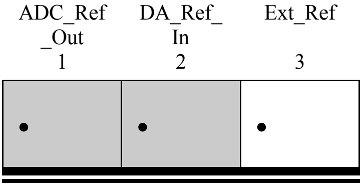
JP1 and JP2 are used to select input/output mode of digital I/O. When short JP1 means select input mode for DIO0 to DIO7, otherwise open JP1 means select output mode for DIO0 to DIO7. When short JP2 means select input mode for DIO8 to DIO15, otherwise open JP2 means select output mode for DIO8 to DIO15.

3. Voltage Reference Source Selection for ADC (JP3)



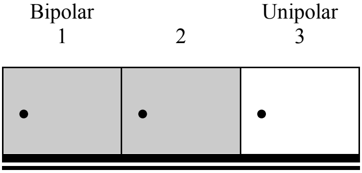
Please open all of jumpers as default value.

4. Voltage Reference Source Selection for DAC (JP4)



JP4 is used to select voltage reference source for DAC. When short pin 1 and pin 2 means select a default +5V as reference source for DAC, otherwise short pin 2 and pin 3 means select an adjusted +5V (which is adjustable using VR1) as reference source for DAC.

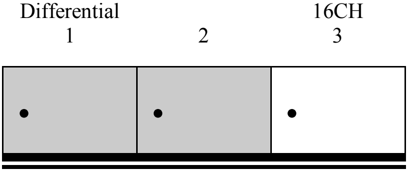
5. ADC converter range selection (JP5)



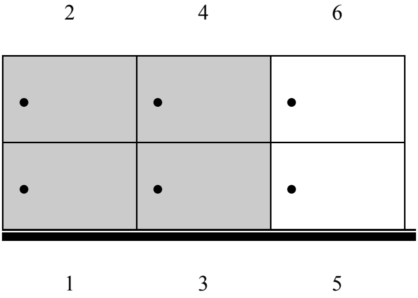
JP5 is used to select Bipolar/Unipolar of ADC converter range. When short pin 1 and pin 2 means select bipolar of ADC input, otherwise short pin 2 and pin 3 means select unipolar of ADC input.

6. ADC input mode selection (JP6 to JP7)

JP6



JP7



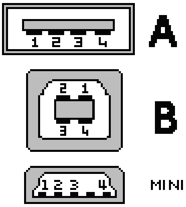
JP6 and JP7 are used to select ADC input mode. When short pin 1 and pin 2 of JP6 and pin 1 and pin 3, pin 2 and pin 4 of JP7 means select Differential mode of ADC input. In Differential mode, the ADC provides 8 input channels. To short pin 2 and pin 3 of JP6 and pin 4 and pin 6, pin 3 and pin 5 of JP7 means select 16 channels of ADC input.

The channel address of Differential mode and 16 channels modes are shown in below:

Channel address	**Differential mode**		**16 channels mode**	
	+ input	**- input**	**+ input**	**- input**
0	ADCH1+	ADCH1-	ADCH1+	AGND
1	ADCH2+	ADCH2-	ADCH2+	AGND
2	ADCH3+	ADCH3-	ADCH3+	AGND
3	ADCH4+	ADCH4-	ADCH4+	AGND
4	ADCH5+	ADCH5-	ADCH5+	AGND
5	ADCH6+	ADCH6-	ADCH6+	AGND
6	ADCH7+	ADCH7-	ADCH7+	AGND
7	ADCH8+	ADCH8-	ADCH8+	AGND
8	N/A	N/A	ADCH1-	AGND
9	N/A	N/A	ADCH2-	AGND
10	N/A	N/A	ADCH3-	AGND
11	N/A	N/A	ADCH4-	AGND
12	N/A	N/A	ADCH5-	AGND
13	N/A	N/A	ADCH6-	AGND
14	N/A	N/A	ADCH7-	AGND
15	N/A	N/A	ADCH8-	AGND

2.3 USB Connector

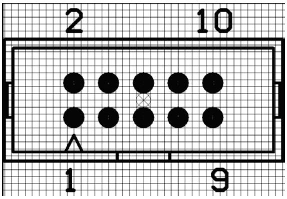
1. USB Connector (J1)



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

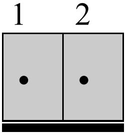
2.4 Connector and Jumper for Serial Communication

1. The connector of serial communication (J2)



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

2. Enable Serial Port (J3)



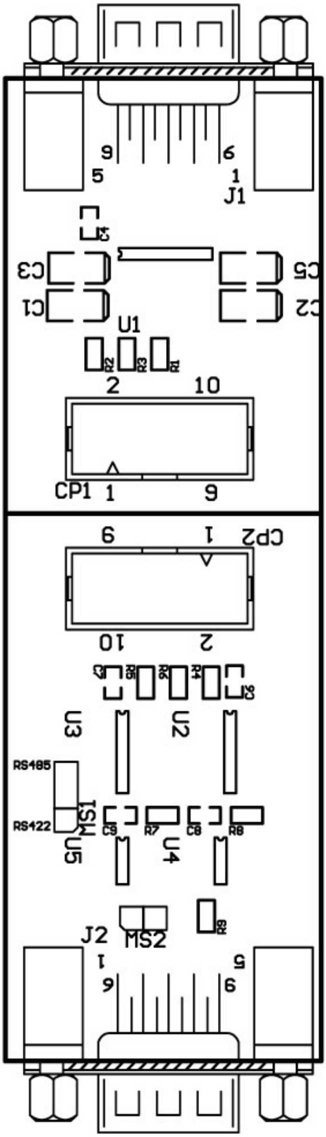
J3 is used enable serial port communication, when short the J3, means enable serial port, otherwise, when open the J3, the serial port communication is disabled.

2.5 Extension Board for Serial Communication

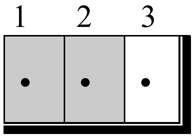
Extension boards with DB9 connector for RS232 or RS422/RS485 are optional products; user can connect USB industry control board to computer by using serial communication. Please follow the steps in bellows:

1. By using 10 pins flat cable to connect J2 of USB 14/16 bit data acquisition board and CP1(RS232)/CP2(RS422/RS485) on the extension board.
2. Connect J1(RS232)/J2(TS422/RS485) of extension board to computer RS232 or RS422/RS485 port.

The diagram of these extension boards are shown in the following:


9
6
5
1
J1
C4
C3
C5
C1
C2
U1
R2
R3
R1
2
10
CP1
1
9
9
1
CP2
10
2
C7
R6
R5
R4
C6
U3
U2
RS485
RS422
SW1
C9
R7
C8
R8
U5
U4
R9
J2
MS2
1
5
6
9

5. RS422/RS485 Selection (MS1)



The MS1 is located at RS422/RS485 extension board. MS1 is used to set RS422/RS485 communication, when short pin 1 and pin 2, means set RS422. When short pin 2 and pin 3, means set RS485.

6. Long Distance Communication (MS2)

The MS2 is located at RS422/RS485 extension board. MS2 is used to set long distance communication, when short the MS2, means long distance communication. Otherwise, open the MS2, means normal distance communication.

2.6 Connector Assignments

The input/output signals of USB 14/16 bit data acquisition board are assigned in the TB1 to TB4 connector, its pin assignments are show in the below.

TB1

Pin	Signal	Description
1	+5V	+5V
2	SGND	Signal Ground
3	DIO_07	DIO Line 7
4	DIO_06	DIO Line 6
5	DIO_05	DIO Line 5
6	DIO_04	DIO Line 4
7	DIO_03	DIO Line 3
8	DIO_02	DIO Line 2
9	DIO_01	DIO Line 1
10	DIO_00	DIO Line 0
11	IOUT2	D/A Current Output 2
12	AGND	Analog Ground
13	IOUT1	D/A Current Output 1
14	VOUT2	D/A Voltage Output 2
15	AGND	Analog Ground
16	VOUT1	D/A Voltage Output 1

TB2

Pin	Signal	Description
1	EXT DC+12V	External DC +12V Power
2	SGND	Signal Ground
3	DIO_15	DIO Line 15
4	DIO_14	DIO Line 14
5	DIO_13	DIO Line 13
6	DIO_12	DIO Line 12
7	DIO_11	DIO Line 11
8	DIO_10	DIO Line 10
9	DIO_9	DIO Line 9
10	DIO_8	DIO Line 8

TB3

Pin	Signal	Description
1	AGND	Analog Ground
2	ADCH1+	Analog input channel 1 +
3	AGND	Analog Ground
4	ADCH1-	Analog input channel 1 -
5	ADCH2+	Analog input channel 2 +
6	AGND	Analog Ground
7	ADCH2-	Analog input channel 2 -
8	ADCH3+	Analog input channel 3 +
9	AGND	Analog Ground
10	ADCH3-	Analog input channel 3 -
11	ADCH4+	Analog input channel 4 +
12	AGND	Analog Ground
13	ADCH4-	Analog input channel 4 -
14	ADCH5+	Analog input channel 5 +
15	AGND	Analog Ground
16	ADCH5-	Analog input channel 5 -

TB4

Pin	Signal	Description
1	ADCH6+	Analog input channel 6 +
2	AGND	Analog Ground
3	ADCH6-	Analog input channel 6 -
4	ADCH7+	Analog input channel 7 +
5	AGND	Analog Ground
6	ADCH7-	Analog input channel 7 -
7	ADCH8+	Analog input channel 8 +
8	AGND	Analog Ground
9	ADCH8-	Analog input channel 8 -
10	AGND	Analog Ground

CHAPTER 3

WINDOWS/XP/VISTA/7 CONFIGURATION

The USB 14/16 bit data acquisition board can be install to Windows/XP/VISTA/7 via USB plug and play function, please follow the steps shown in the following:

1. For optimum PnP functionality, please install one board at a time.
2. Windows will detect the new USB 14/16 bit data acquisition board that is installed in your computer, and will prompt you for a proper driver.
3. Install Virtual COM port (VCP) drivers which is in Drivers \ Virtual COM \ Virtual_COM.inf.. Virtual COM port (VCP) drivers cause the USB device to appear as an additional COM port available to the PC. Application software can access the USB device in the same way as it would access a standard COM port.
4. After Windows/XP has detected and configured all ports, you may begin using the USB 14/16 bit data acquisition board. To verify that the installation process completed successfully, please proceed into the Control Panel / System / Device Manager.
5. Locate the additional COM ports in the ports section with VID 6666 and PID 81BB.

CHAPTER 4

SOFTWARE PROGRAMMING UNDER WINDOWS/XP/VISTA/7 AND LINUX

The LABKIT_host is a diagnostic program to test your USB industry control board under Windows/XP/VISTA/7. User can get LABKIT_host programs from Decision Studio CD.

The USB 14/16 bit data acquisition board can be installed in the Linux by using serial device driver supported by Linux. For more details, please refer to 'setserial' man-pages. After the Linux recognizes the serial port, it will assign device name as /dev/ttyACM0 for the first serial port, and /dev/ttyACM1 for the second serial port, …etc.

To input/output data from USB 14/16 bit data acquisition board, please use Hid API functions. User can get Hid API functions from Decision Studio package.

SMARTLAB

USB 14/16 BIT
Data Acquisition BOARD

INSTALLATION GUIDE

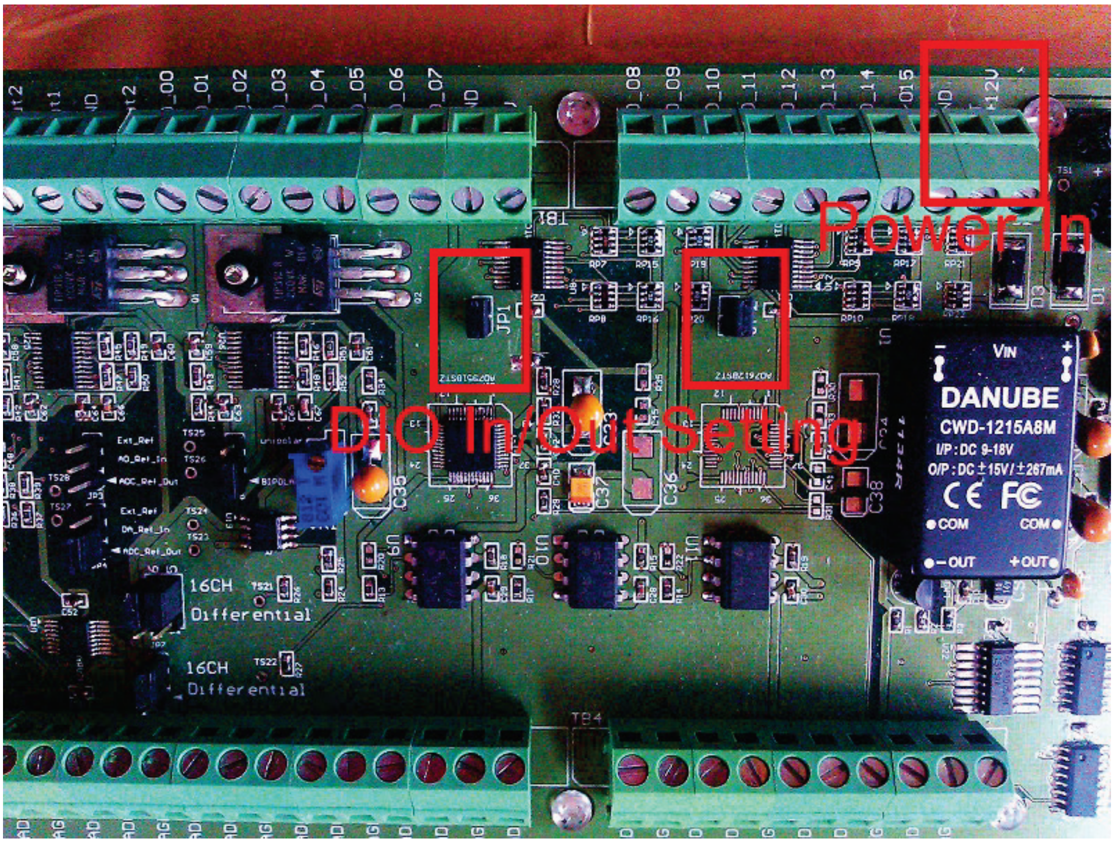
27 Oct 2011

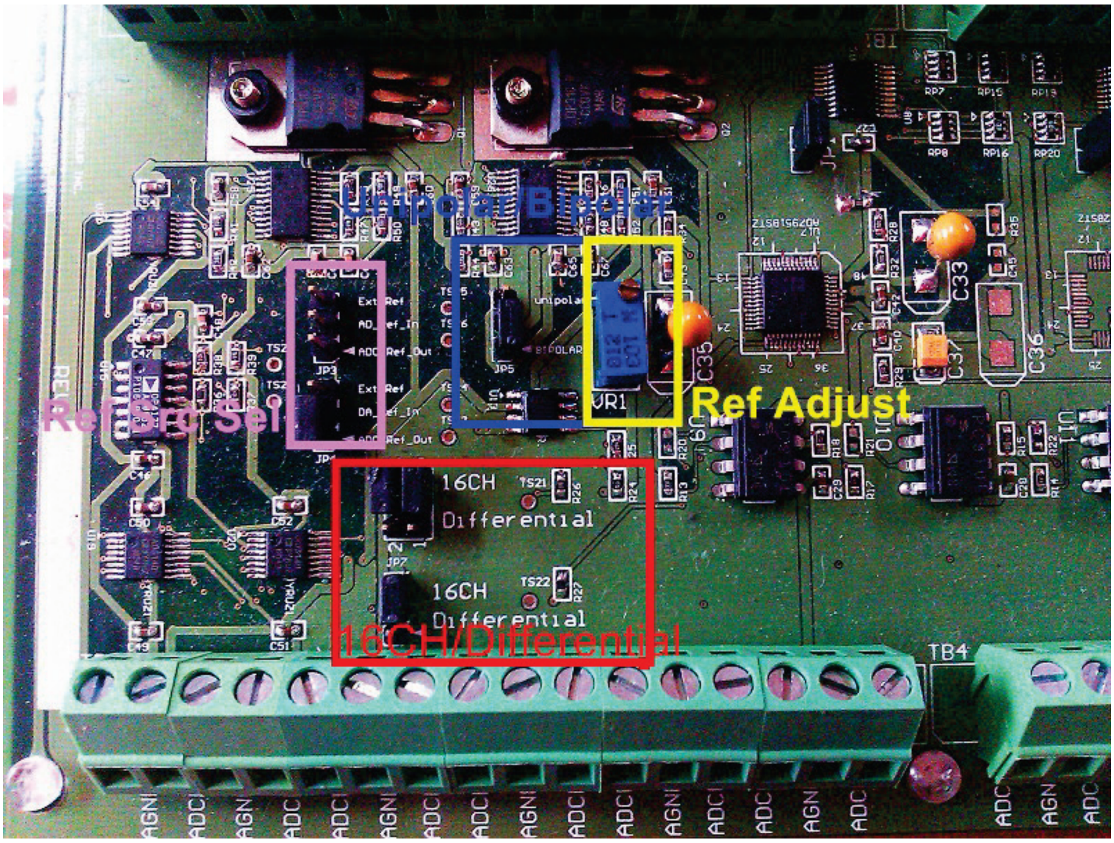
Prepared by:

Wilson Chen

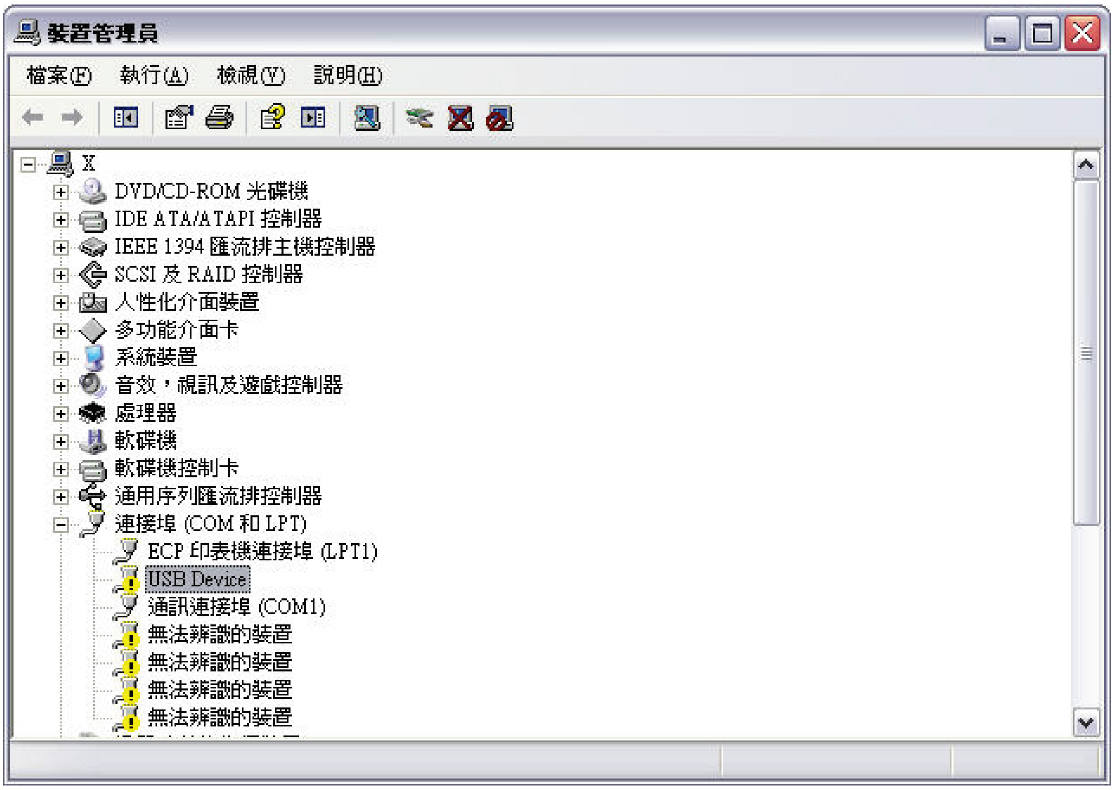
Decision-Computer RD department

1. Please check jumper setting first.
   JP1/JP2 : DIO in/out setting : short is input, open is output.
   JP3/JP4 : Reference source select, please leave JP3 open and JP4 short 1-2, currently we don’t provide external reference input.
   JP5 : unipolar / bipolar select, short 1-2 for bipolar, short 2-3 for unipolar
   JP6/JP7 : single end / differential mode select, short JP6 1-2 and JP7 1-3,2-4 for differential mode, short JP6 2-3 and JP7 5-3,6-4 for single end.



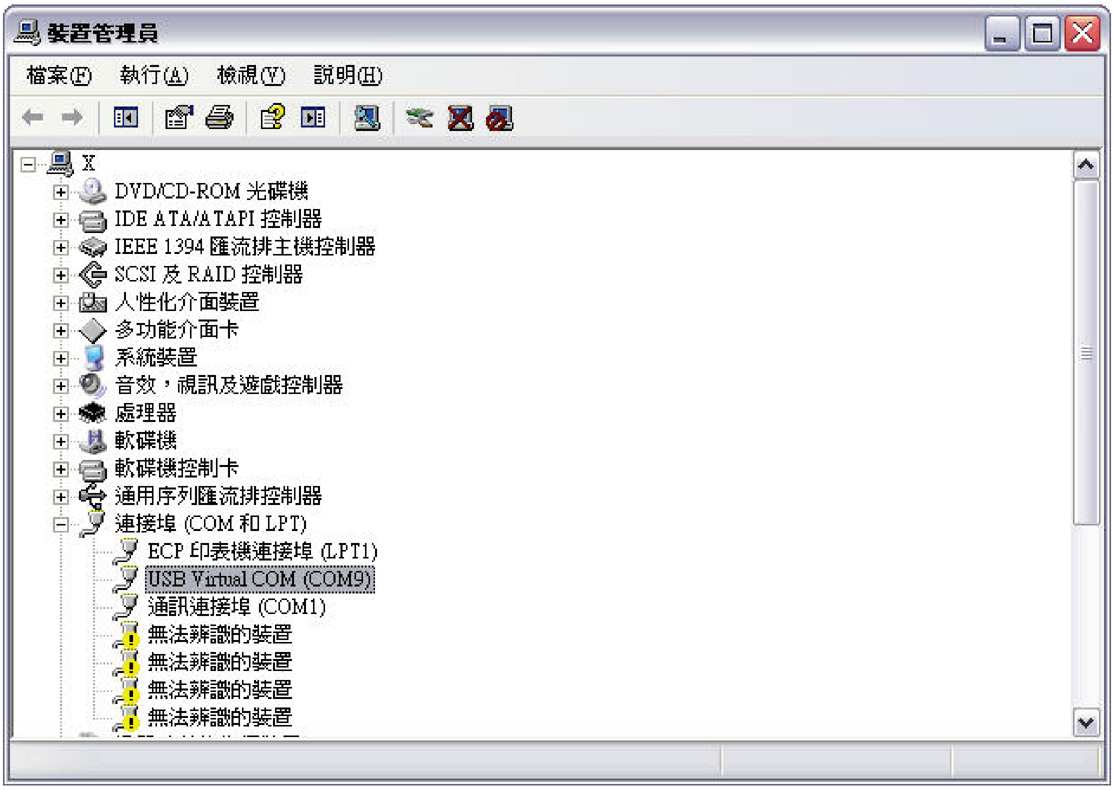


2. Connect +12 external power, check if the power led (LED1) is on.
3. Connect USB cable to PC.
4. PC will find an unknown device named “USB Device”.

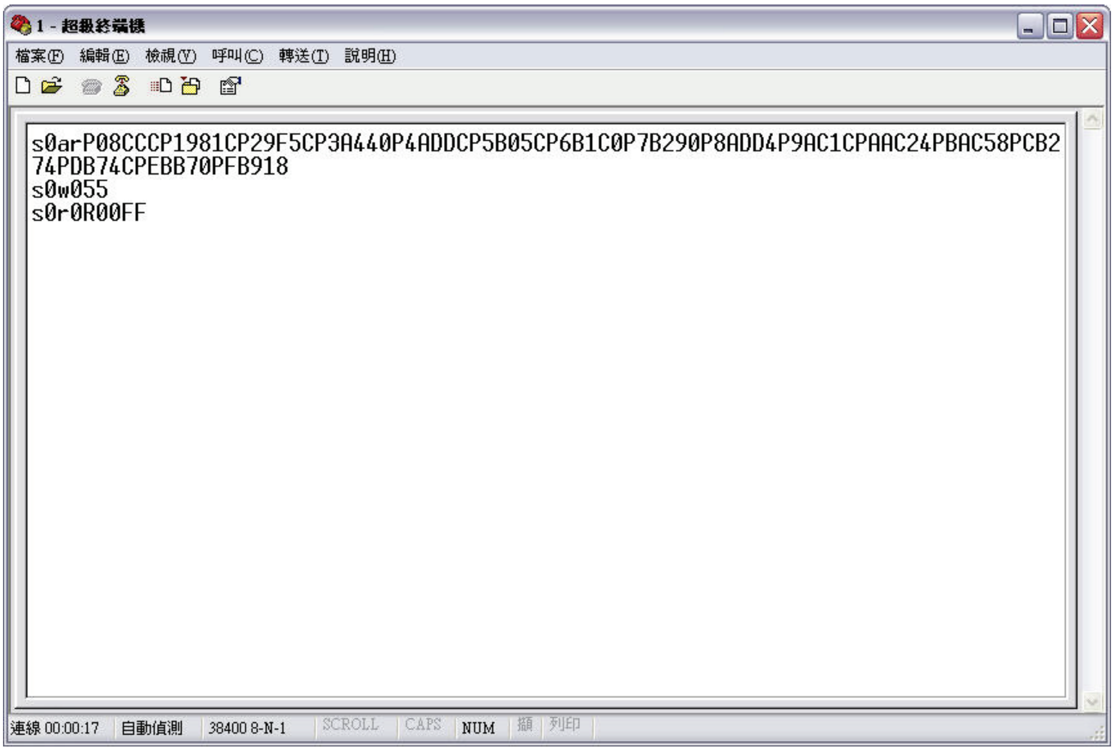


```
X
  DVD/CD-ROM 光碟機
  IDE ATA/ATAPI 控制器
  IEEE 1394 匯流排主機控制器
  SCSI 及 RAID 控制器
  人性化介面裝置
  多功能介面卡
  系統裝置
  音效，視訊及遊戲控制器
  處理器
  軟碟機
  軟碟機控制卡
  通用序列匯流排控制器
  連接埠 (COM 和 LPT)
    ECP 印表機連接埠 (LPT1)
    USB Device
    通訊連接埠 (COM1)
    無法辨識的裝置
    無法辨識的裝置
    無法辨識的裝置
    無法辨識的裝置
```

5. Install the device driver “Decision_VCP_driver_32” in the driver folder.
6. After driver installing, you will find a “USB Virtual COM (COMxx)” in the device manager. You may also change the port number by setting COM port setting in the property.

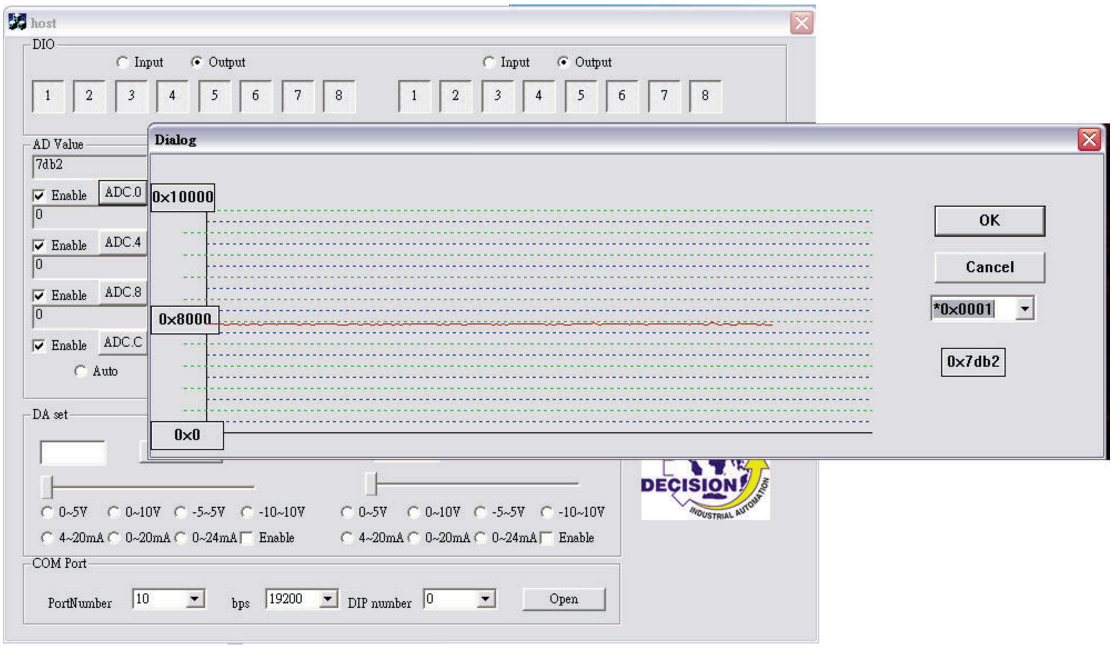


7. Now you can access the USB ADDA board with hyper terminal. Please refer to the “ADDA_CMD manual.doc” to see how to operate.



```
s0arP08CCCP1981CP29F5CP3A440P4ADDCP5B05CP6B1C0P7B290P8ADD4P9AC1CPAAC24PBAC58PCB2
74PDB74CPEBB70PFB918
s0w055
s0r0R00FF
```

8. Or you may write a COM port communication program to operate the USB ADDA board. There is also an example VC program in the software directory called “USBtest_hostxp_vc_110519ad_beta”.



host

DIO

○ Input ● Output ○ Input ● Output

AD Value

7db2

☑ Enable ADC.0

0

☑ Enable ADC.4

0

☑ Enable ADC.8

0

☑ Enable ADC.C

○ Auto

DA set

○ 0~5V ○ 0~10V ○ -5~5V ○ -10~10V ○ 0~5V ○ 0~10V ○ -5~5V ○ -10~10V

○ 4~20mA ○ 0~20mA ○ 0~24mA □ Enable ○ 4~20mA ○ 0~20mA ○ 0~24mA □ Enable

COM Port

PortNumber 10 bps 19200 DIP number 0

Dialog

*0x0001

0x7db2

SMARTLAB

USB 14/16 BIT
Data Acquisition BOARD

COMMAND MANUAL

22 July 2011

Prepared by:

Wilson Chen

Decision-Computer RD department

How to read this table: 4
Command content: 5
    Category : I/O 6
        SiWnxx 6
        SiRn 7
    Category : ADC 8
        SiAGx 8
        SiADn 9
        SiAEn 10
        SiAR 11
        SiAAxx 12
    Category : DAC 13
        SiDnxxxx 13
        SiDJnxxxx 14
        SiDGnx 15
        SiDRn 16
    Category : Timer 17
        SiTnxxxx 17
        SiTEnxx 18
        SiTTn 19
        SiTOn 20
    Category : Flash 21
        SiFSnx 21
        SiFRn 22
        SiFNxxxx 23
        SiFLxxxx 24
        SiFMxxxx 25
        SiFDx 26
        SiFBn 27
        SiFAx 28
        SiFZ 29
        SiFTx 30
    Category : System 31
        SiYR 31
        SYT 32
        SYD 33
        SiYE 34
        SiYF 35

SiYS 36

How to read the table:

Name:

The name of this function

Category:

The category of this function

Detail description:

Detail description of this function

Command:

Byte					
Content					
Detail					

Return:

Byte					
Content					
Detail					

Example:

Start code: *Represent with a "S". Send "s" or "S" to start a command*

Return start code : *Represent with a "R". Every command with return value start with "R".*

DIP switch setting : *Represent with a "i"*

Channel number : *Represent with a "n"*

A hex value : *Represent with a "x"*

Command code: *Represent with 1~2 upper case words.*

Category : I/O

Name:

SiWnxx

Category:

I/O

Detail description:

Write output value xx to DIO channel n.

Command:

Byte	0	1	2	3	4~5
Content	S	i	W	n	xx
Detail	Start code	DIP setting	Command code	Channel number(0~4)	Value(0~ff)

Return:

None.

Example:

s9w055

// Write 55 to channel 0, board ID 9.

Name:

SiRn

Category:

I/O

Detail description:

Read DIO channel n back.

Command:

Byte	0	1	2	3	
Content	S	i	R	n	
Detail	Start code	DIP setting	Command code	Channel number(0~4)	

Return:

Byte	0	1	2	3~4	
Content	R	i	n	xx	
Detail	Return start code	DIP setting	Channel number	value	

Example:

s6r2

//Read channel 2, board ID 6.

r : R62AF

//board ID 6 channel 2 read result is 0xAF

Category : ADC

Name:

SiAGx

Category:

ADC

Detail description:

Set ADC measuring range to set x

x value	0	1	2	3	
Range	0~5V	0~10V	+-5V	+-10V	

Command:

Byte	0	1	2~3	4	
Content	S	i	AG	x	
Detail	Start code	DIP setting	Command code	range(0 ~ 3)	

Return:

None

Example:

s3ag3

//set adc to measure range +-10V, board ID 3.

Name:

SiADn

Category:

ADC

Detail description:

Disable ADC channel n

Command:

Byte	0	1	2	4	
Content	S	i	AD	n	
Detail	Start code	DIP setting	Command code	Channel number(0~f)	

Return:

None.

Example:

s7ada

//disable ADC channel A, board ID 7.

Name:

SiAEn

Category:

ADC

Detail description:

Enable ADC channel n

Command:

Byte	0	1	2~3	4	
Content	S	i	AE	n	
Detail	Start code	DIP setting	Command code	Channel number(0~f)	

Return:

None

Example:

s9ae7

//Enable ADC channel 7, board ID 9.

Name:

SiAR

Category:

ADC

Detail description:

Sample ADC once and read back.

Command:

Byte	0	1	2~3		
Content	S	I	AR		
Detail	Start code	DIP setting	Command code		

Return:

Byte	0	1	2	3	4~7
Content	R	i	P	n	xxxx
Detail	Return start code	DIP setting	Command code	Channel number	Read value
Byte	6n+2	6n+3	6n+4~6n+7		
Content	P	n	xxxx		
Detail	Command code	Channel number	Read value		

Example:

s5ar

//read ADC result of board ID 5.

r: R5P08000P19000P2A000

//the result of board ID 5 is : channel 0 is 0x8000, channel 1 is 0x9000, channel 2 is
//0xA000

Name:

SiAAxx

Category:

ADC

Detail description:

set ad average value

Command:

Byte	0	1	2~3	4~5	
Content	S	i	AA	xx	
Detail	Start Code	DIP setting	Command code	Average value(0~ff)	

Return:

None.

Example:

s6AA10

//when SiAR is called, it will sample 10 times and return the average of these 10
//results.

Category : DAC

Name:

SiDnxxxx

Category:

DAC

Detail description:

Set DAC channel n to value xxxx

Command:

Byte	0	1	2	3	4~7
Content	S	i	D	n	xxxx
Detail	Start code	DIP setting	Command code	Channel number(0~1)	Value(0~0xFFFF)

Return:

None

Example:

s9d08000

//set DAC channel 0 to 0x8000, board ID 9.

Name:

SiDJnxxxx

Category:

DAC

Detail description:

Set DAC channel n to value xxxx

Command:

Byte	0	1	2~3	4	5~8
Content	S	i	DJ	n	xxxx
Detail	Start code	DIP setting	Command code	Channel number(0~1)	Value(0~0xFFFF)

Return:

None

Example:

s8dj0AAAA

//set DAC channel 0 to 0xAAAA, board ID 8, use only in adjusting.

Name:

SiDGnx

Category:

DAC

Detail description:

Set DAC channel n to x range

x value	0	1	2	3
range	0~5V	0~10V	+-5V	+-10V
x value	4	5	6	7
range	-(not available)	4~20mA	0~20mA	0~24mA
x value	8	9	A	B
range	0~5V (+10%)	0~10V (+10%)	+-5V (+10%)	+-10V (+10%)
x value	C	D	E	F
range	-(not available)	4~20mA (+10%)	0~20mA (+10%)	0~24mA (+10%)

Command:

Byte	0	1	2~3	4	5
Content	S	i	DG	N	x
Detail	Start code	DIP setting	Command code	Channel number (0~1)	Range (0 ~ f)

Return:

None

Example:

s6dg03

//set DAC channel 0 output range +-10V, board ID 6.

Name:

SiDRn

Category:

DAC

Detail description:

Reset DAC channel n to GND

Command:

Byte	0	1	2~3	4	
Content	S	i	DR	n	
Detail	Start code	DIP setting	Command code	Channel number(0~1)	

Return:

None.

Example:

s8dr1

//reset DAC channel 1 to GND, board ID 8.

Category : Timer

Name:

SiTnxxxx

Category:

Timer

Detail description:

Set timer value

Command:

Byte	0	1	2	3	4~7
Content	S	i	T	n	xxxx
Detail	Start code	DIP setting	Command code	Timer number	Timer value

Return:

None.

Example:

s8t09999

//set timer 0 reload value to 0x9999, board ID 8

Name:

SiTEnxx

Category:

Timer

Detail description:

set timer execute times

Command:

Byte	0	1	2~3	4	5~6
Content	S	i	TE	n	xx
Detail	Start code	DIP setting	Command code	Timer number	Value

Return:

None.

Example:

s9te080

//set timer 0 to execute 0x80 times, board ID 9.

Name:

SiTTn

Category:
Timer

Detail description:
start timer

Command:

Byte	0	1	2~3	4	
Content	S	i	TT	n	
Detail	Start code	DIP setting	Command code	Timer number	

Return:
None.
Example:
s8tt0
//start timer 0, board ID 8

Name:

SiTOn

Category:
Timer
Detail description:
stop timer

Command:

Byte	0	1	2~3	4	
Content	S	i	TO	n	
Detail	Start code	DIP setting	Command code	Timer number	

Return:
None.

Example:
s7to0
//stop timer 0, board ID 7

Category : Flash

Name:

SiFSnx

Category:
Flash

Detail description:
save channel[n] default value

Command:

Byte	0	1	2~3	4	5~6
Content	S	i	FS	n	xx
Detail	Start code	DIP setting	Command code	Channel number	Value(0~FF)

Return:
None.

Example:
s9fs2cc
//setting default value of channel 2 to 0xCC, board ID 9

Name:

SiFRn

Category:
Flash

Detail description:
read channel[n] default value

Command:

Byte	0	1	2~3	4	
Content	S	i	FR	n	
Detail	Start code	DIP setting	Command code	Channel number	

Return:

Byte	0	1	2	3	4~5
Content	R	i	U	n	xx
Detail	Return start code	DIP setting	Command code	Channel number	value

Example:
s7fr3
//read channel 3 default value, board ID 7
r : R7U3BB
//channel 3 default value is 0xBB, board ID 7.

Name:

SiFNxxxx

Category:
Flash

Detail description:
save da n value as Min

Command:

Byte	0	1	2~3	4~7	
Content	S	i	FN	xxxx	
Detail	Start code	DIP setting	Command code	DAC value	

Return:
None.

Example:
s8fn0010
//save 0010 as DAC Min value, board ID 8

Name:

SiFLxxxx

Category:
Flash

Detail description:
save da n value as middle

Command:

Byte	0	1	2~3	4~7	
Content	S	i	FL	xxxx	
Detail	Start code	DIP setting	Command code	DAC value	

Return:
None.
Example:
s8fl8010
//save 8010 as DAC middle value, board ID 8

Name:

SiFMxxxx

Category:
Flash

Detail description:
save da n value as Max

Command:

Byte	0	1	2~3	4~7	
Content	S	i	FM	xxxx	
Detail	Start code	DIP setting	Command code	DAC value	

Return:
None.
Example:
s8fmFF80
//save FF80 as DAC Max value, board ID 8

Name:

SiFDx

Category:
Flash

Detail description:
read da saved value table with range x

Command:

Byte	0	1	2~3	4	
Content	S	I	FD	x	
Detail	Start code	DIP setting	Command code	DAC range value	

Return:

Byte	0	1	2	3~6	7~A	B~E
Content	R	i	T	xxxx	xxxx	Xxxx
Detail	Return start code	DIP setting	Command code	DAC Min value	DAC middle value	DAC Max value

Example:
s8fd3
//read DAC adjusting table with range 3, board ID 8.
R8T00108123FFF8
//Min is 0010,middle is 8123,Max isFFF8.

Name:

SiFBn

Category:
Flash

Detail description:
save ad table with da n

Command:

Byte	0	1	2~3	4	
Content	S	i	FB	n	
Detail	Start code	DIP setting	Command code	DAC channel number	

Return:
None.
Example:
s7fb0
//base on DAC channel n to adjust ADC.

Name:

SiFAx

Category:
Flash

Detail description:
read ad table with range x

Command:

Byte	0	1	2~3	4	
Content	S	i	FA	x	
Detail	Start code	DIP setting	Command code	range value	

Return:

Byte	0	1	2	3~6	7~A
Content	R	i	T	xxxx	xxxx
Detail	Return start code	DIP setting	Command code	DAC Min value	DAC middle value
Byte					
Content					
Detail					

Example:

Name:

SiFZ

Category:
Flash

Detail description:
clear ADC and DAC adjusting table

Command:

Byte	0	1	2~3		
Content	S	I	FZ		
Detail	Start code	DIP setting	Command code		

Return:
None.

Example:
s7fz
// clear ADC and DAC adjusting table, board ID 7

Name:

SiFTx

Category:

Flash

Detail description:

Read da temp saved value with range x

Command:

Byte	0	1	2~3	4	
Content	S	i	FT	x	
Detail	Start code	DIP setting	Command code	range value	

Return:

None.

Example:

s7ft0

// read DA temp table with range 0, board ID 7

Category : System

Name:

SiYR

Category:
System

Detail description:
reset

Command:

Byte	0	1	2~3		
Content	S	i	YR		
Detail	Start code	DIP setting	Command code		

Return:
None.

Example:
s3yr
//reset, board ID 3.

Name:

SYT

Category:
System

Detail description:
read card type

Command:

Byte	0	1~2			
Content	S	YT			
Detail	Start code	Command code			

Return:

Byte	0	1	2~3		
Content	R	Y	xx		
Detail	Return start code	Command code	Card type number		

Example:
syt
//read card type
r : ry01

Name:

SYD

Category:
System

Detail description:
read card ID

Command:

Byte	0	1~2			
Content	S	YD			
Detail	Start code	Command code			

Return:

Byte	0	1	2		
Content	R	I	x		
Detail	Return start code	Command code	DIP setting		

Example:
syd
// read board DIP setting
r : RI3
//board ID is 3

Name:

SiYE

Category:
System

Detail description:
echo on

Command:

Byte	0	1	2~3		
Content	S	i	YE		
Detail	Start code	DIP setting	Command code		

Return:
None.

Example:
s8ye
//turn on echo, board ID 8

Name:

SiYF

Category:
System

Detail description:
echo off

Command:

Byte	0	1	2~3		
Content	S	i	YF		
Detail	Start code	DIP setting	Command code		

Return:
None.

Example:
s9yf
//turn off echo, board ID 9

Name:

SiYS

Category:
System

Detail description:
Save and reset

Command:

Byte	0	1	2~3		
Content	S	i	YS		
Detail	Start code	DIP setting	Command code		

Return:
None.

Example:
s9ys
//save and reset, board ID 9