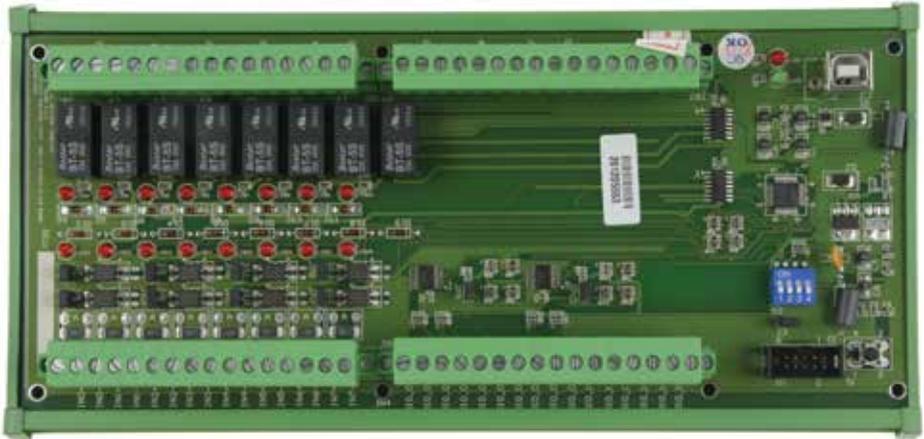


# USB-I/O Manual



**UHRO-8 - DIN-Rail-Version**

**UPRO-8 - Board-Version**

8 photo couple input / 8 relay output channels / 16 DIO

AUSB8P/R USB 8 PHOTO ISO./ RELAY BOARD

**Product Code:**

AUSB8P/R USB 8 PHOTO ISO./ RELAY BOARD  
UHRO-8 - DIN-Rail-version  
UPRO-8 - Board-version

**Bus:** USB 2.0

**Description:**

8 photo couple input / 8 relay output channels

Input maximum load voltage is 30V

By jumper, you can select two range of voltage  
0 - 4.5V off and 6V - 20V on. (0 - 20V)  
0 - 16.5V off and 18 - 30V on (0 - 30V)

PC817 photo couple chips.  
5000V isolation voltage

8 Relays - 1 x COM/NO/NC  
Max switching current: 1000mA  
Max contact rating for relay: 30V DC

16 LED correspond to I/O ports activation status  
Connections via Pluggable Screw Terminals

**Features:**

For direct DIN-Rail mounting  
Also as board without DIN Rail adapter available

High Speed 8051  $\mu$ C Core  
USB 2.0 Function Controller  
Support USB ID 0~14 SET

POWER External DC+5V (max 5,2V) 0,5A

**Software/Driver:**

Windows will use HID-interface and sample for programming,  
Linux driver and sample for programming.

**Package includes the following items:**

USB 8PR Board  
USB cable  
Software and Manual CD  
The DIN-Rail-version comes with a EMI-Protection-kit  
This kit is optional in the board-version!

Operating temperature range: 0 ~ 55C.  
Relative humidity rage: 0 ~ 90%.  
Size: 250 mm x 120 mm x 55 mm

## Security Note

This device should not be used in applications where failure may result in death or injury without proper consideration and design of associated system architecture and redundant safety features. Connection and repairs are allowed only by a specialist.

When used in a machine or plant, is to ensure that after installation continues to the relevant provisions, rules and guidelines are complied with!

These products come into contact voltage, therefore to consider the applicable VDE regulations VDE 0550 / 0551, VDE 0700, VDE 0711, especially VDE 0100 and VDE 0860.

## J1 USB Connection USB-B

A suitable cable is included

VCC	+5 VDC (USB VBUS POWER)
D-	Data -
D+	Data +
SGND	Signal Ground



**B**

USB wiring is very sensitive against EMI errors (mainly sparking when opening contacts). The U-EMI-1 Kit is included with the DIN rail version and includes two Würth folded cores for the USB data cable and a Ferrite sleeve for the power cable. If you are using a HUB, it should be protected the connection HUB/computer (U-EMI-2)! The kit includes two Würth folded cores for the USB data cable.

The cores must be mounted as shown in the illustrations, as close as possible on the connectors.

But also the avoidance of errors is very important. Therefore, the careful layout and installation of the wiring is very important!



Folding core on the USB cable to the computer



Folding core on the USB cable to the USB IO  
1 or 2 x through the core

---

## Power Supply - TB1



TB2 - External 5V DC		
16	EXT+V	5V+
15	SGND	5V-

**More than 5.2V can kill the CPU!**

Ferrite sleeve on the power supply cable

The power-supply of our products must be 5V external DC. It is to pay attention to correct polarity. Otherwise, the product could be damaged. If the board is by wrong power supply except function, you can try new store the firmware.

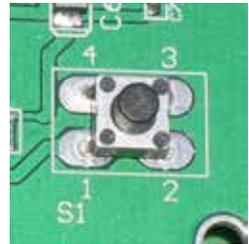
The U-EMI-1 Kit is included with the DIN rail version, and includes ferrite sleeve, shielded by EMI for the power cable. Are shown on the image above.

For earlier versions of the Decision-USB IO was also the possibility of the power supply via the USB bus. To get greater stability, this connection was removed. The USB bus power is not always able to provide enough power for the Relais switched on! The result is a loss of connection or "hanging" USB module. An external power supply provides a secure power supply!

USB Power Management in Windows - In Window System, USB communication might disconnect under Power Saving Mode or Sleep Mode. When connecting USB boards on PC, please make sure windows power management set in case interference with USB communication.

# S1 Reset Button

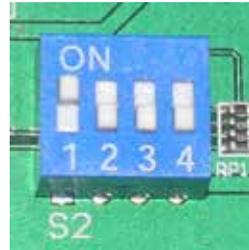
To reset the "hanging" USB-Module



# S2 USB ID

Set different ID for each board

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



## Multiple Boards Connect

When you need to connect more than 3 boards on one PC, please make sure the following below

1. Set different ID for each board.
2. Supply external 5V to each USB board.
3. Supply external 5V to USB hub.

Please make sure your external 5V power supply enough for the USB I/O boards. If input voltage is below 4.8V for USB I/O board, it can't work normally and sometimes it will cause device manager keeping refreshing itself or can't recognize the device.



# Digital Input / Output Port Setting

UHRO-8 provide 16 digital channels (TTL level) and allow user to set them as 8 channel input port or 8 channel output port. Default setting is both of the ports as input

Pin	Signal	Description TB 4
1	DIO 00	Digital input/output Ch. 00
2	DIO 01	Digital input/output Ch. 01
3	DIO 02	Digital input/output Ch. 02
4	DIO 03	Digital input/output Ch. 03
5	DIO 04	Digital input/output Ch. 04
6	DIO 05	Digital input/output Ch. 05
7	DIO 06	Digital input/output Ch. 06
8	DIO 07	Digital input/output Ch. 07
9	DIO 08	Digital input/output Ch. 08
10	DIO 09	Digital input/output Ch. 09
11	DIO 10	Digital input/output Ch. 10
12	DIO 11	Digital input/output Ch. 11
13	DIO 12	Digital input/output Ch. 12
14	DIO 13	Digital input/output Ch. 13
15	DIO 14	Digital input/output Ch. 14
16	DIO 15	Digital input/output Ch. 15

When user needs to change the port setting, it must be set in both software and hardware. In software setting, USB Init Tool.exe is a setting tool for USB series products. User can find it in Decision Studio CD with its manual. In hardware setting, JP9 and JP10 on the board are used to select input/output of digital I/O. When shorting JP9 means setting DIO\_00 to DIO\_07 as input mode, otherwise opening JP9 means setting DIO\_00 to DIO\_07 as output mode. When shorting JP10 means setting DIO\_08 to DIO\_15 as input mode, otherwise opening JP10 means setting DIO\_08 to DIO\_15 as output mode.

DIO Port1 (DIO_00~DIO_07)		DIO Port2 (DIO_08~DIO_15)	
Input	Output	Input	Output
Short JP9	Open JP9	Short JP10	Open JP10

After setting by the software, the setting of JP9 and JP10 must match the setting, or it could be dangerous. Especially in setting ports as output, it must open the jump on the board, or it may cause main IC damaged.

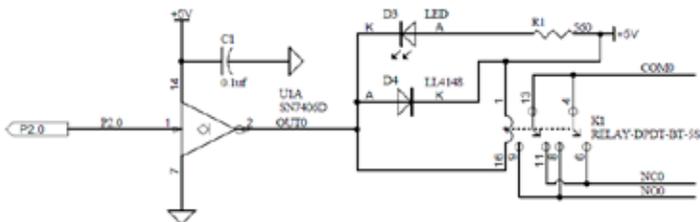
**Please use this function extremely carefully.**

# TB1/2 Relay-Output - Power-Supply

Pin	Signal	Description TB1
1	NC 0	Relay Ch. 00 - Output
2	COM 0	Relay Ch. 00 - Output
3	NO 0	Relay Ch. 00 - Output
4	NC1	Relay Ch. 01 - Output
5	COM 1	Relay Ch. 02 - Output
6	NO 1	Relay Ch. 02 - Output
7	NC 2	Relay Ch. 03 - Output
8	COM 2	Relay Ch. 03 - Output
9	NO 2	Relay Ch. 04 - Output
10	NC 2	Relay Ch. 04 - Output
11	COM 3	Relay Ch. 05 - Output
12	NO 3	Relay Ch. 05 - Output
13	NC 4	Relay Ch. 06 - Output
14	COM 4	Relay Ch. 06 - Output
15	NO 4	Relay Ch. 07 - Output
16	SGND	SGND

Pin	Signal	Description TB2
1	NC5	Relay Ch. 08 - Output
2	COM 5	Relay Ch. 08 - Output
3	NO 5	Relay Ch. 09 - Output
4	NC 6	Relay Ch. 09 - Output
5	COM 6	Relay Ch. 10 - Output
6	NO 6	Relay Ch. 10 - Output
7	NC 7	Relay Ch. 11 - Output
8	COM 7	Relay Ch. 11 - Output
9	NO 7	Relay Ch. 12 - Output
10	SGND	SGND
11	+5V	+5V
12		
13		
14		
15	SGND	SGND
16	+5V	DC +5V Stromversorgung

## Schematic Outputs



## Contact protection circuits

When a reed relay is used with an electromagnetic relay or solenoid, the energy stored will cause an inverse voltage when the reed contacts break. The voltage, although dependent on the inductance value, sometimes reaches as high as several hundred volts and becomes a major factor to deteriorate the contacts.

- DC: Protection circuit with a diode
- DC and AC: Protection circuit with Varistor or RC-element

The suppressor must be made to the load.

## Installation

The decision-computer USB devices use the HID (human interface device). The HID belongs to the generic device class is integrated in the operating system. If a new HID device is connected, no driver installation is required. The functions for access and control of HID hid.dll you can find in the Windows System32 folder.

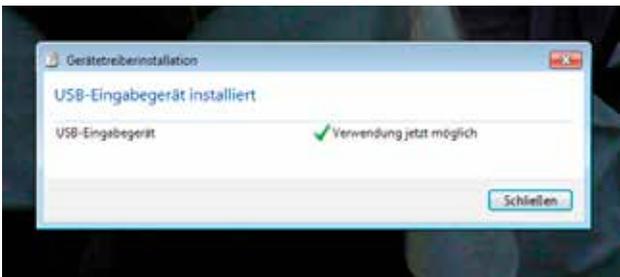
## Windows 7 installation example



1. Power supply 5V connect

2. USB connect

3. USB input device - device driver software is successfully installed



4. USB input device - use now possible



5. In the Control Panel, you can find the Decision-USB module now

6. Ready to use

# SOFTWARE PROGRAMMING UNDER WINDOWS AND LINUX

On Windows, we offer a function library and dll file as programming help. See the manual „USBdII\_Manual.pdf“ and demo code in VB/VC / Delphi on the decision-Studio CD.

We offer a C-source Linux users for direct access to the USB devices. See „DcIhid 0.5.1.tgz“ manual and example.

## DIAGNOSTICS UNDER WINDOWS/XP

USB test Program.exe is a diagnostic tool to test USB devices on Windows/XP. The USB test software can be found on the decision-Studio CD.

The examples and drivers be developed continuously. See the latest on the decision-computer-Merz „Service CD“.

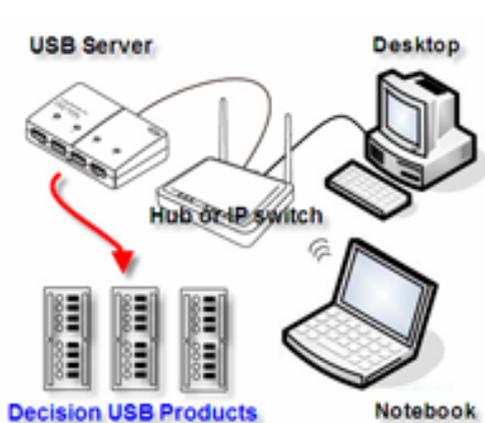
An important way to get more informations you find at <http://www.usb-industrial.com>

Software support on the short way: <http://www.usb-industrial.com/support.html>

### USB Industrial.com Overview:

<b>Windows Support</b>	2010/04 USBdII.dll 2.0.0.4	This package includes Dynamic-link library which is developed by Decision Computer to communicate with the USB Series Device. It can be included in multiple computer language (VB6, VC6, VB.NET, C# Delphi) under Windows.
<b>Watchdog Timer</b>		This watchdog timer is a kind of software timer that triggers a system reset or other corrective action if the main program, due to some fault condition. The intention is to bring the system back from the unresponsive state into normal operation. This function is new released and please contact us to get further information.
<b>VCP driver</b>	( For LABKIT Only )	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. This function is only implemented in USBLABKIT
<b>Linux Support</b>	dcIhid - 0.5.1 Basic function library and demo program 2009.05.01	This package includes a c library and a demo program which is developed by Decision Computer to communicate with the USB Series Device under Linux. It also includes a ReadMe file to demonstrate how to use it and package's format is .tgz.
<b>Firmware Update</b>	Firmware Hex file Download	This Package includes a driver and a software which is developed by Decision Computer to update the newest firmware into the USB Series Device. When new version of firmware is released, user can follow the instructions to update the firmware.
<b>LabVIEW Support</b>	LabVIEW 8 LabVIEW 2009	This package includes manual and examples which demonstrate how to connect and develop USB Series Device under LabVIEW, which is a well-known platform and development environment for a visual programming language from NI.
<b>ProfilAB Support</b>		This package includes manual and examples which demonstrate how to connect and develop USB Series Device under ProfilAB, which is a well-known platform and development environment for a visual programming language from Abacom.
<b>Init Value Setting Tool</b>	(For Output Channel)	The Init Value Setting Tool is a software tool to set init value for output channel. User can use this tool to plan output channel as default high or default low when power on.
<b>Data Acquisition and Remote Monitoring Tool</b>		The Data Acquisition and Remote Monitoring Tool (DARMT) is a software tool to record high/low state reports at local computer, and transmit them to FTP site to achieve data acquisition and remote monitoring

## USB by LAN or Wireless



The remote control of Decision USB products by LAN or wireless with a remote-PC is very simple with a multi port USB Server

Because no driver should be installed to the installation and programming is very easy.

Under Windows, are the external USB I/O directly in the Device Manager and can be connect or control such as in the original host PC.

---

## The module is not recognized - troubleshooting

Should the USB module is no longer found by the computer's operating system, usually helps new plug or to change the USB port.

Can be also an unstable power supply. A switching power supply with sufficient reserve should be used

**Should the previous notes remedy not usually it helps to replace the firmware!**

## Firmware Update Manual

USBBootloader.exe is the tool software to update firmware into the USB SerialDevice Board developed by Decision Computer. When you get a new version of firmware (.hex), you can follow the steps to update firmware to the board.

1. Remove the external input signal Voltage and only support device power.
2. Set Board Id 15 (All on) for Update Mode and press the Reset button.
3. Connect PC to the Board by USB
4. If this is the first to use this function, please indicate the driver install path to the Driver Folder to install the driver.
5. Open the Software USBBootloader.exe and press the Open button and indicate the hex file and then press the Download button to update firmware.
6. Set Board Id between 0 ~ 14 and press Reset button and connect PC again.

## Communication JP1 - only option!

Some unused holes (2 x 5) for JP1 are located on the board. Here a serial port can be added at a special version, with an optional expansion board, RS-232 or RS-422/RS-485. The ports are controlled via the USB. Please contact us if necessary

# PC817 Series

- Lead forming type (I type) and taping reel type (P type) are also available. (PC817/PC817P)
- TUV (VDE0884) approved type is also available as an option.

## ■ Features

1. Current transfer ratio  
(CTR: MIN. 50% at  $I_T = 5\text{mA}$ ,  $V_{CE} = 5\text{V}$ )
2. High isolation voltage between input and output ( $V_{iso}$ : 5 000V<sub>max</sub>)
3. Compact dual-in-line package  
PC817 : 1-channel type  
PC827 : 2-channel type  
PC837 : 3-channel type  
PC847 : 4-channel type
4. Recognized by UL, file No. E64380

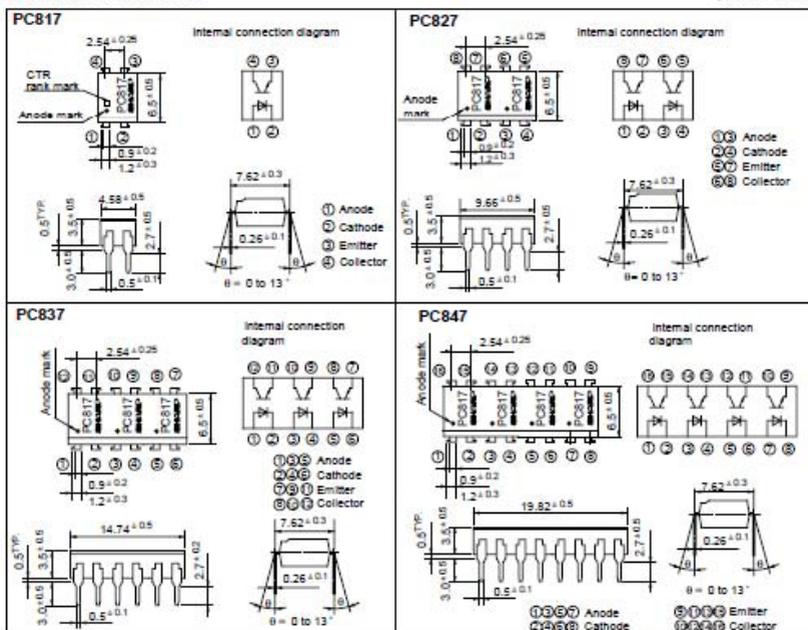
## High Density Mounting Type Photocoupler

## ■ Applications

1. Computer terminals
2. System appliances, measuring instruments
3. Registers, copiers, automatic vending machines
4. Electric home appliances, such as fan heaters, etc.
5. Signal transmission between circuits of different potentials and impedances

## ■ Outline Dimensions

(Unit : mm)



\* In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that occur in equipment using any of SHARP's devices, shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest version of the device specification sheets before using any SHARP's device. \*

## ■ Absolute Maximum Ratings

(T<sub>a</sub> = 25°C)

	Parameter	Symbol	Rating	Unit
Input	Forward current	I <sub>F</sub>	50	mA
	*Peak forward current	I <sub>FM</sub>	1	A
	Reverse voltage	V <sub>R</sub>	6	V
	Power dissipation	P	70	mW
Output	Collector-emitter voltage	V <sub>CEO</sub>	35	V
	Emitter-collector voltage	V <sub>ECO</sub>	6	V
	Collector current	I <sub>C</sub>	50	mA
	Collector power dissipation	P <sub>C</sub>	150	mW
Total power dissipation		P <sub>tot</sub>	200	mW
**Isolation voltage		V <sub>iso</sub>	5 000	V <sub>rms</sub>
Operating temperature		T <sub>op</sub>	-30 to +100	°C
Storage temperature		T <sub>stg</sub>	-55 to +125	°C
**Soldering temperature		T <sub>sd</sub>	260	°C

\*1 Pulse width = 100μs, Duty ratio : 0.001

\*2 40 to 60% RH, AC for 1 minute

\*3 For 10 seconds

## ■ Electro-optical Characteristics

(T<sub>a</sub> = 25°C)

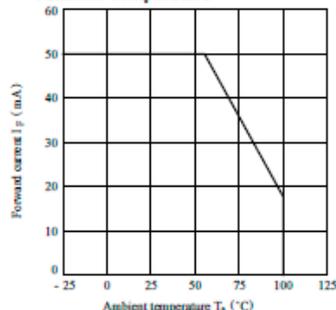
	Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	V <sub>F</sub>	I <sub>F</sub> = 20mA	-	1.2	1.4	V
	Peak forward voltage	V <sub>FM</sub>	I <sub>FM</sub> = 0.5A	-	-	3.0	V
	Reverse current	I <sub>R</sub>	V <sub>R</sub> = 4V	-	-	10	μA
	Terminal capacitance	C <sub>t</sub>	V = 0, f = 1kHz	-	30	250	pF
Output	Collector dark current	I <sub>CEO</sub>	V <sub>CE</sub> = 20V	-	-	10 <sup>-7</sup>	A
Transfer characteristics	**Current transfer ratio	CTR	I <sub>F</sub> = 5mA, V <sub>CE</sub> = 5V	50	-	600	%
	Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>F</sub> = 20mA, I <sub>C</sub> = 1mA	-	0.1	0.2	V
	Isolation resistance	R <sub>iso</sub>	DC500V, 40 to 60% RH	5 × 10 <sup>10</sup>	10 <sup>11</sup>	-	Ω
	Floating capacitance	C <sub>f</sub>	V = 0, f = 1MHz	-	0.6	1.0	pF
	Cut-off frequency	f <sub>c</sub>	V <sub>CE</sub> = 5V, I <sub>C</sub> = 2mA, R <sub>L</sub> = 100Ω, 3dB	-	80	-	kHz
Response time	Rise time	t <sub>r</sub>	V <sub>CE</sub> = 2V, I <sub>C</sub> = 2mA, R <sub>L</sub> = 100Ω	-	4	18	μs
	Fall time	t <sub>f</sub>		-	3	18	μs

\*4 Classification table of current transfer ratio is shown below.

Model No.	Rank mark	CTR (%)
PC817A	A	80 to 160
PC817B	B	130 to 260
PC817C	C	200 to 400
PC817D	D	300 to 600
PC8 ● 7AB	A or B	80 to 260
PC8 ● 7BC	B or C	130 to 400
PC8 ● 7CD	C or D	200 to 600
PC8 ● 7AC	A, B or C	80 to 400
PC8 ● 7BD	B, C or D	130 to 600
PC8 ● 7AD	A, B, C or D	80 to 600
PC8 ● 7	A, B, C, D or No mark	50 to 600

● : 1 or 2 or 3 or 4

Fig. 1 Forward Current vs. Ambient Temperature



## ■ FEATURES

- 2 Form C Contact
- DIL Pitch Terminals
- High Reliability Bifurcated Contact
- Conforms to FCC Part 68 1500V Surge and Dielectric Strength 1000VAC
- Fully sealed
- 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	167	30	3.5	0.5	6.0	150
6	240	25	4.2	0.6	7.2	150
9	540	16.6	6.3	0.9	10.8	150
12	960	12.5	8.4	1.2	14.4	150
24	2880	8.3	16.8	2.4	28.8	200
48	7680	6.25	33.6	4.8	57.6	300

## ■ ORDERING INFORMATION

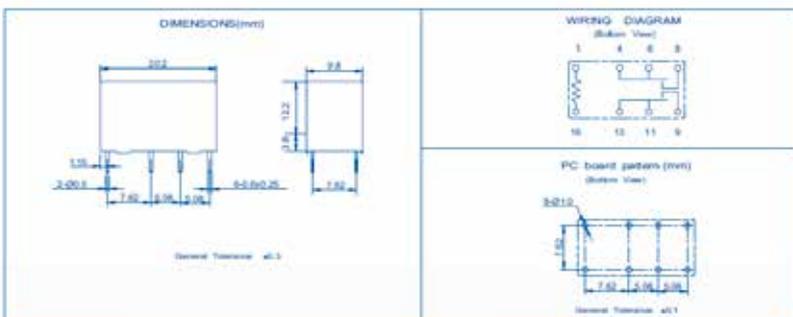
RT-12 S

Coil Voltage	Coil Sensitivity
See Coil Rating	S : 150-300mW low consumption type

\*Nil : Power Consumption up to 560mW available upon request

## SPECIFICATIONS

<b>Model No.</b>		BT
<b>Contact Arrangement</b>		2 Form C
<b>Contact Type</b>		Bifurcated
<b>Contact Material</b>		AgPd+Au Clad
<b>Contact Resistance</b>		Max. 60mΩ (initial)
<b>Contact Rating (at Resistive Load)</b>	<b>Max. Switching Voltage</b>	220VAC, 150VDC
	<b>Max. Switching Current</b>	2A
	<b>Max. Switching Power</b>	30W(DC), 50VA(AC)
	<b>Rated Load</b>	1.25A 24VDC/0.5A 100VAC
<b>Dielectric Strength</b>		
<b>Between Coil &amp; Contacts</b>		1000VAC(1 minute)
<b>Between Contacts</b>		1000VAC(1 minute)
<b>Surge Strength</b>		1500V
<b>Operate Time</b>		Max. 6m Sec
<b>Release Time</b>		Max. 4m Sec
<b>Ambient Temperature</b>		-30°C~+80 °C
<b>Insulation Resistance</b>		Min. 1000MΩ at 500VDC
<b>Vibration Resistance</b>		1.5mm D.A, 10-55HZ
<b>Shock</b>	<b>Functional</b>	10G
	<b>Destruction</b>	100G
<b>Mechanical Life</b>		2 x 10 <sup>7</sup> operations (at no load)
<b>Electrical Life (Resistive Load)</b>		2 x 10 <sup>6</sup> operations at 1mA 20m VAC
		2 x 10 <sup>6</sup> operations at 20mA 20 VDC
		1 x 10 <sup>5</sup> operations at 1.25A 24 VDC
		1 x 10 <sup>5</sup> operations at 0.5A 100 VAC
<b>Weight</b>		Approx. 6g



# CERTIFICATE



## VERIFICATION OF COMPLIANCE

APPLICANT            DESICION GROUP INC.

ADDRESS             4<sup>th</sup> Floor, No. 31, Alley 4, Lane 36, Sec. 5, Ming-Shen  
East Road, Taipei Postal code: 10576, Taiwan, R.O.C.

EQUIPMENT            USB Automation I/O board

MODEL NAME         AUSB series

TRADE NAME         

REPORT NO.          WSCE1608014

STANDARD(S)        EMI --- EN 55032 CLASS B: 2012  
                              EN 61000-3-2: 2014  
                              EN 61000-3-3: 2013  
                              EMS --- EN 55024: 2010  
                              IEC 61000-4-2 : 2008  
                              IEC 61000-4-3 : 2006+A1: 2007+A2:2010  
                              IEC 61000-4-4 : 2012  
                              IEC 61000-4-5 : 2014  
                              IEC 61000-4-6 : 2013  
                              IEC 61000-4-8 : 2010  
                              IEC 61000-4-11 : 2004

The above equipment was tested by WEISHANG Certification Co., Ltd. for compliance with the requirements set forth in the EUROPEAN COUNCIL Directive 2014/30/EU and the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance.

Approved By: \_\_\_\_\_

  
Brian Yu / Manager

Issued Date: SEP. 06, 2016



WEISHANG Certification Corp.  
12F.-5, No.27-1, Ln. 168, Kangning St., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

# DECLARATION OF CONFORMITY

For the following equipment :

Equipment : USB Automation I/O board

Model Name: AUSB series

Applicant: DESICION GROUP INC.

Address: 4<sup>th</sup> Floor, No. 31, Alley 4, Lane 36, Sec. 5, Ming-Shen East Road,  
Taipei Postal code: 10576, Taiwan, R.O.C.

Is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility (2014/30/EU). For the evaluation regarding the electromagnetic compatibility, the following standards were applied :

EN 55032 CLASS B: 2012

EN 61000-3-2: 2014

EN 61000-3-3: 2013

EN55024: 2010

IEC 61000-4-2: 2008

IEC 61000-4-3: 2006+A1: 2007+A2:2010

IEC 61000-4-4: 2012

IEC 61000-4-5: 2014

IEC 61000-4-6: 2013

IEC 61000-4-8: 2010

IEC 61000-4-11: 2004

The following manufacturer/importer is responsible for this declaration :

Person responsible for marking this declaration :

*Casper Kan Chang*

201609 6

(Place)

(Date)

(Signature)



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**USB  
Dynamic Industrial Interface  
V 2.0.1.9**

**A Universal  
Application Programming Interface  
To Data Acquisition Products**

**Users Manual**

Design & Implementation by  
Decision Computer International Company

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# 1. Introduction

This document provides the USB Dynamic Industrial Interface Specifications, including all function calls, and operating procedures.

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# 2. Features

The USB Dynamic Industrial Interface (USBDI) was created to provide a standard way to access the functionality provided by all USB data acquisition products. Specifically, the USBDI provides the following features:

## **Platform-independent**

The library is compatible under Windows 98, Windows ME, Windows 2000, windows XP, Vista, and Win7. The compatibility under these operation systems guarantees that programs written for either operating system will work unchanged on the other, even without recompilation.

## **Abstracts Card Functionality from Card Design**

The interface concentrates on a card's functionality and hides the user from having to know specifics about the card design, for example, which port needs to be accessed in order to access specific functionality. All details of the card implementation are hidden from the user.

## **Multiple Device Support**

You could access device by its name or by its information (device type, id index).

## **Programming Language Independent**

The library provides a language independent way to access the USB industrial I/O cards, by using a Dynamic-Link-Library architecture.

### 3. Device Type Definition

Below are names for device types and its' corresponding defined value:

USB_16PIO	0x01	// USB 16 Channel Photo Input / 16 Channel Photo Output Board
USB_LABKIT	0x02	// USB LABKIT
USB_16PR	0x03	// USB 16 Channel Photo Input / 16 Channel Relay Output Board
USB_STARTER	0x04	// USB STARTER
USB_8PR	0x06	// USB 8 Channel Photo Input / 8 Channel Relay Output Board
USB_4PR	0x07	// USB 4 Channel Photo Input / 4 Channel Relay Output Board
USB_8PI	0x08	// USB 8 Channel Photo Input Board
USB_8RO	0x09	// USB 8 Channel Relay Output Board
USB_16PI	0x0A	// USB 16 Channel Photo Input Board
USB_16RO	0x0B	// USB 16 Channel Relay Output Board
USB_32PI	0x0C	// USB 32 Channel Photo Input Board
USB_32RO	0x0D	// USB 32 Channel Relay Output Board
USB_IND	0x0E	// USB Industry Board
USB_M_4IO	0x10	// USB Mini 4 I/O

Notice : Please use this function to open USB\_14ADDA or USB\_16ADDA.

### 4. Data Types of Function calls

Since the USBDI was developed in the C++ language, some data types used may not be present in the programming language you want to use. Please find the following data type conversion table for your convenience:

HANDLE	An opaque 32-bit integer
BYTE	A 8-bit unsigned integer
BOOL	A 32-bit integer, either 0 (FALSE) or 1 (TRUE)
DWORD	A 32-bit unsigned integer
HWND	A 32-bit integer representing a valid handle to a Window
LPTSTR	A 32-bit flat pointer to a zero terminated string
LPBOOL	A 32-bit flat pointer to a variable of type BOOL
LPBYTE	A 32-bit flat pointer to a variable of type BYTE
LPDWORD	A 32-bit flat pointer to a variable of type DWORD

Also note that the DLL employs the Standard Call (Pascal) calling mechanism, which is used for all system. USBDI as well and is compatible with VB, VC, Delphi, .NET, and notice the variable with same type name may have different define in different program language. For example, in Visual Basic 6, the width of Integer is 16 bits and the width of Long is 32 bits, but in Visual Basic. Net, the width of Integer becomes 32 bits and the width of Long becomes 64 bits. If you declare variable with different width from our define, it may cause some run-time error.

## 5. Functions to open and close Devices

### hid\_OpenDevice

This function opens a device for further access by USB. Please do not use this function to open USB\_14ADDA or USB\_16ADDA.

#### Declaration

```
HANDLE hid_OpenDevice ( DWORD device_type,  
                        DWORD device_id );
```

#### Parameters

device\_type        The type of the device to open.

device\_id         Device's id on the Board.

For more information, please see "Device Type Table & ID Table" following below.

#### Return value

A valid handle representing the device, or INVALID\_HANDLE\_VALUE (-1) if an error occurred. For USB\_STARTER, there is no ID selection and device\_id = 0

#### Example

```
HANDLE hDevice = hid_OpenDevice(Device Type, Device Index); if (hDevice == INVALID_  
HANDLE_VALUE)  
{  
  MessageBox (NULL, "Open Failed!", "Error", MB_OK);  
}
```

---

### hid\_CloseDevice

This function closes a device by USB.

#### Declaration

```
BOOL    hid_CloseDevice (HANDLE hDevice)
```

#### Parameters

hDevice    A valid device handle.

#### Return value

TRUE if successful, FALSE otherwise.

#### Example

```
hid_CloseDevice(hDevice);
```

## **com\_OpenDevice**

This function opens a device for further access by Serial Port. Please use this function to open USB\_14ADDA or USB\_16ADDA.

### **Declaration**

```
HANDLE com_OpenDevice ( DWORD device_type,  
                        DWORD device_id,  
                        DWORD port_num );
```

### **Parameters**

device_type	The type of the device to open.
device_id	Device's id on the board. For more information, please see "Device Type Table & ID Table" following below.
port_num	Com Port Num to open.

### **Return value**

A valid handle representing the device, or INVALID\_HANDLE\_VALUE (-1) if an error occurred.

### **Example**

```
HANDLE hDevice = com_OpenDevice(Device Type, Device Index, 1); if (hDevice == INVALID_  
HANDLE_VALUE)  
    MessageBox (NULL, "Open Failed!", "Error", MB_OK);
```

## **com\_CloseDevice**

This function closes a device by Serial Port.

### **Declaration**

```
BOOL com_CloseDevice(HANDLE hDevice)
```

### **Parameters**

hDevice A valid device handle.

### **Return value**

TRUE if successful, FALSE otherwise.

### **Example**

```
com_CloseDevice(hDevice);
```

### **Remarks**

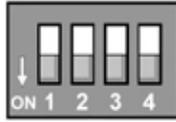
Please see "Serial\_Communication.pdf" to set hardware for serial communication, and USB\_LAB-KIT, USB\_STARTER, USB\_8PR are not supported by serial communication.

## **Device Type Table**

<b>Product</b>	<b>device_type</b>
USB_16PIO	0x01
USB_LABKIT	0x02
USB_16PR	0x03
USB_STARTER	0x04
USB_8PR	0x06
USB_4PR	0x07
USB_8PI	0x08
USB_8RO	0x09
USB_16PI	0x0A
USB_16RO	0x0B
USB_32PI	0x0C
USB_32RO	0x0D
USB_IND	0x0E
USB_M_4IO	0x10

## Device ID Table

( Switch Setting on the Device Board )



Switch Setting	device_id
1, 2, 3, 4 OFF	0
2, 3, 4 OFF, 1 ON	1
1, 3, 4 OFF, 2 ON	2
3, 4 OFF, 1, 2 ON	3
1, 2, 4 OFF, 3 ON	4
2, 4 OFF, 1, 3 ON	5
1, 4 OFF, 2, 3 ON	6
4 OFF, 2, 3, 4 ON	7
1, 2, 3 OFF, 4 ON	8
2, 3 OFF, 1, 4 ON	9
1, 3 OFF, 2, 4 ON	10
3 OFF, 1, 2, 4 ON	11
1, 2 OFF, 3, 4 ON	12
2 OFF, 1, 3, 4 ON	13
1 OFF, 2, 3, 4 ON	14
1, 2, 3, 4 ON	Firmware update

## 6. Functions for digital input/output

### hid\_SetDigitalByte

This function sets or clears a byte on a digital output line by USB.

#### Declaration

```
BOOL hid_SetDigitalByte ( HANDLE hDevice,  
                          DWORD dwPort,  
                          BYTE byPortState  
                          );
```

#### Parameters

hDevice	A valid device handle, previously obtained from hid_OpenDeviceDevice
dwPort	The index of the port on the card to manipulate. The first port has index 0. For more information, please see "Write Address Table" following below.
byPortState	The new state of the port

#### Return value

TRUE if successful, FALSE otherwise.

If an error occurred, GetLastError() may return the following values:

ERROR\_INVALID\_PARAMETER - The handle passed was invalid, or the port number was out of range for the device selected.

#### Example

```
HANDLE hDevice = hid_OpenDevice(0x01,0);  
if (hDevice != INVALID_HANDLE_VALUE)  
{  
    hid_SetDigitalByte( hDevice, 0, 0xFF); // set's all bits on the first port  
    hid_CloseDevice(hDevice);  
}
```

## **com\_SetDigitalByte**

This function sets or clears a byte on a digital output line by Serial Port.

### **Declaration**

```
BOOL com_SetDigitalByte ( HANDLE hDevice,  
                          DWORD dwPort,  
                          BYTE byPortState  
                          );
```

### **Parameters**

hDevice	A valid device handle, previously obtained from com_OpenDevice
dwPort	The index of the port on the card to manipulate. The first port has index 0. For more information, please see "Write Address Table" following below.
byPortState	The new state of the port

### **Return value**

TRUE if successful, FALSE otherwise.

If an error occurred, GetLastError() may return the following values:

ERROR\_INVALID\_PARAMETER - The handle passed was invalid, or the port number was out of range for the device selected.

### **Example**

```
HANDLE hDevice = com_OpenDevice(0x01,0);  
if (hDevice != INVALID_HANDLE_VALUE)  
{  
    com_SetDigitalByte( hDevice, 0, 0xFF); // set's all bits on the first port  
    com_CloseDevice(hDevice);  
}
```

### **Remarks**

Please see "Serial\_Communication.pdf" to set hardware for serial communication, and USB\_LAB-KIT, USB\_STARTER, USB\_8PR are not supported by serial communication.

## Write Address Table

Product	dwPort	Content
USB_16PIO	0x02	OUT07 to OUT00
	0x03	OUT15 to OUT08
USB_LABKIT	0x03	P1D07 to P1D00
	0x03	P1D07 to P1D00
USB_16PR	0x02	OUT07 to OUT00
	0x03	OUT15 to OUT08
USB_8PR	0x01	OUT07 to OUT00
	0x02	DIO7 to DIO0
	0x03	DIO15 to DIO8
USB_4PR	0x02	OUT03 to OUT00
USB_8RO	0x02	OUT07 to OUT00
USB_16RO	0x02	OUT07 to OUT00
	0x03	OUT15 to OUT08
USB_32RO	0x00	OUT07 to OUT00
	0x01	OUT15 to OUT08
	0x02	OUT23 to OUT16
	0x03	OUT31 to OUT24
USB_IND	0x00	Port 0
	0x01	Port 1
	0x02	Port 2
	0x03	Port 3
	0x04	Port 4
	0x05	Port 5
	0x06	Port 6
	0x07	Port 7
	0x08	DIO
	0x0D	IOCONFIG
USB_M_4IO	0x02	OUT03 to OUT00

## hid\_GetDigitalByte

This function reads a complete byte from a digital input port of a device by USB.

### Declaration

```
BOOL hid_GetDigitalByte ( HANDLE hDevice,  
                        DWORD dwPort,  
                        LPBYTE lpbyPortState  
                        );
```

### Parameters

hDevice	A valid device handle, previously obtained from hid_OpenDeviceDevice
dwPort	The index of the port on the card to manipulate. The first port has index 0. For more information, please see "Read Address Table" following below.
lpbyPortState	A pointer to a variable of type BYTE receiving the new state of the port

### Return value

TRUE if successful, FALSE otherwise.

If an error occurred, GetLastError() may return the following values:

ERROR\_INVALID\_PARAMETER – The handle passed was invalid, or the port number was out of range for the device selected.

### Example

```
HANDLE hDevice = hid_OpenDevice(0x01,0); if (hDevice != INVALID_HANDLE_VALUE)  
{  
  hid_GetDigitalByte( hDevice, 0, &byState); // reads the state of the first input port hid_  
  CloseDevice(hDevice);  
}
```

## com\_GetDigitalByte

This function reads a complete byte from a digital input port of a device by Serial Port.

### **Declaration**

```
BOOL com_GetDigitalByte ( HANDLE hDevice,  
                          DWORD dwPort,  
                          LPBYTE lpbyPortState  
                          );
```

### **Parameters**

hDevice	A valid device handle, previously obtained from com_OpenDevice
dwPort	The index of the port on the card to manipulate. The first port has index 0. For more information, please see "Read Address Table" following below.
lpbyPortState	A pointer to a variable of type BYTE receiving the new state of the port

### **Return value**

TRUE if successful, FALSE otherwise.

If an error occurred, GetLastError() may return the following values:

ERROR\_INVALID\_PARAMETER – The handle passed was invalid, or the port number was out of range for the device selected.

### **Example**

```
HANDLE hDevice = com_OpenDevice(0x01,0);  
if (hDevice != INVALID_HANDLE_VALUE)  
{  
    com_GetDigitalByte( hDevice, 0, &byState); // reads the state of the first input port  
    com_CloseDevice(hDevice);  
}
```

### **Remarks**

Please see "Serial\_Communication.pdf" to set hardware for serial communication, and USB\_LAB-KIT, USB\_STARTER, USB\_8PR are not supported by serial communication.

## Read Address Table

Product	dwPort	Content
USB_16PIO	0x00	IN07 to IN00
	0x01	IN15 to IN08
USB_LABKIT	0x02	P0D07 to P0D00
USB_STARTER	0x02	P0D07 to P0D00
USB_16PR	0x00	IN07 to IN00
	0x01	IN15 to IN08
USB_8PR	0x00	IN07 to IN00
	0x02	DIO7 to DIO0
	0x03	DIO15 to DIO8
	0x10	JP9/JP10 Settings
USB_4PR	0x00	IN03 to IN00
USB_8PI	0x00	IN07 to IN00
USB_16PI	0x00	IN07 to IN00
	0x01	IN15 to IN08
USB_32PI	0x00	IN07 to IN00
	0x01	IN15 to IN08
	0x02	IN23 to IN16
	0x03	IN31 to IN24
USB_IND	0x00	Port 0
	0x01	Port 1
	0x02	Port 2
	0x03	Port 3
	0x04	Port 4
	0x05	Port 5
	0x06	Port 6
	0x07	Port 7
	0x08	DIO
	0x0D	IOCONFIG

	0x10	Port 0 default value
	0x11	Port 1 default value
	0x12	Port 2 default value
	0x13	Port 3 default value
	0x14	Port 4 default value
	0x15	Port 5 default value
	0x16	Port 6 default value
	0x17	Port 7 default value
	0x18	Port DIO default value
	0x19	Input/output default setting
USB_M_4IO	0x00	IN03 to IN00

### **Remarks**

In USB\_8PR, we provide 2 digital ports for user to define either as input or output. It can be defined by Jumper 10 and Jumper 11 on the board. And we can use `hid_GetDigitalByte` / `com_GetDigitalByte` function to read Jumper State to determine which port is either input or output.

`hid_GetDigitalByte( hDevice, 0x10, &byState);` // or use `com_GetDigitalByte` for serial communication

When JP9 is closed, DIO7 - DIO0 is for Input.      The fifth bit of `byState` is 0

When JP9 is opened, DIO7 - DIO0 is for Output.      The fifth bit of `byState` is 1

When JP10 is closed, DIO15 – DIO8 is for Input.      The sixth bit of `byState` is 0

When JP10 is opened, DIO15 – DIO8 is for Output.      The sixth bit of `byState` is 1

## 7. Functions for reset hardware device

### **hid\_ResetHW**

This function directly resets the hardware device by USB. And all channels on the board will load default value. If you need to control the device again, please use hid\_open to get the handle again.

#### **Declaration**

BOOL hid\_ResetHW(HANDLE hDevice)

#### **Parameters**

hDevice A valid device handle.

#### **Return value**

TRUE if successful, FALSE otherwise.

#### **Example**

```
hid_ResetHW (hDevice);
```

---

### **com\_ResetHW**

This function directly resets the hardware device by Serial Port. And all channels on the board will load default value.

#### **Declaration**

BOOL com\_ResetHW(HANDLE hDevice)

#### **Parameters**

hDevice A valid device handle.

#### **Return value**

TRUE if successful, FALSE otherwise.

#### **Example**

```
com_ResetHW(hDevice);
```

## 8. Functions for analog input/output

### hid\_GetAnalogChannel

This function reads a complete word from an analog input port of a device by USB.

#### Declaration

```
BOOL hid_GetAnalogChannel ( HANDLE hDevice,  
                           DWORD dwPort,  
                           LPDWORD lpdwPortState  
                           );
```

#### Parameters

hDevice	A valid device handle, previously obtained from hid_OpenDeviceDevice
Port	The index of the port on the card to manipulate. The first port has index 0.
lpdwPortState	A pointer to a variable of type DWORD receiving the new state of the port

#### Return value

TRUE if successful, FALSE otherwise.

If an error occurred, GetLastError() may return the following values:

ERROR\_INVALID\_PARAMETER - The handle passed was invalid, or the port number was out of range for the device selected.

#### Example

```
HANDLE hDevice = hid_OpenDevice(0x02,0); // USB_LABKIT  
if (hDevice != INVALID_HANDLE_VALUE)  
{  
    hid_GetAnalogChannel ( hDevice, 0, &dwState); // reads the state of the first analog input port  
    hid_CloseDevice (hDevice);  
}
```

#### Remarks

This function now only enable in USB\_LABKIT and USB\_STARTER device. The range of dwPort is from 0~7.

## **com\_GetADHex**

This function reads a complete word in hex from an analog input port of a device by USB.

### **Declaration**

```
BOOL com_GetADHex(HANDLE hDevice,  
                  UINT dwPort,  
                  UINT *lpdwValue  
                  );
```

### **Parameters**

hDevice	A valid device handle, previously obtained from com_OpenDevice
dwPort	The index of the port on the card to manipulate. The first port has index 0.
lpdwValue	A pointer to a variable of type UINT receiving the new state of the port

### **Return value**

TRUE if successful, FALSE otherwise.

If an error occurred, GetLastError() may return the following values:

ERROR\_INVALID\_PARAMETER - The handle passed was invalid, or the port number was out of range for the device selected.

### **Example**

```
HANDLE hDevice = com_OpenDevice(card_id,card_number,10);  
if (hDevice != INVALID_HANDLE_VALUE)  
{  
    com_GetAnalogChannel ( hDevice, 0, &dwState); // reads the state of the first analog input port  
    com_CloseDevice (hDevice);  
}
```

### **Remarks**

This function now only enable in USB\_14ADDA and USB\_16ADDA device. The range of dwPort

## **com\_GetADMilli**

This function reads the result in decimal millivolt from an analog input port of a device by USB.

### **Declaration**

```
BOOL com_GetADMilli (HANDLE hDevice,  
                    UINT dwPort,  
                    LONG *lpdwValue  
                    );
```

### **Parameters**

hDevice	A valid device handle, previously obtained from com_OpenDevice
dwPort	The index of the port on the card to manipulate. The first port has index 0.
lpdwValue	A pointer to a variable of type signed 32-bit integer receiving the
new state of the port	

### **Return value**

TRUE if successful, FALSE otherwise.

If an error occurred, GetLastError() may return the following values:

ERROR\_INVALID\_PARAMETER - The handle passed was invalid, or the port number was out of range for the device selected.

### **Example**

```
HANDLE hDevice = com_OpenDevice(card_id,card_number,10);  
if (hDevice != INVALID_HANDLE_VALUE)  
{  
    com_GetADMilli ( hDevice, 0, &dwState); // reads the state of the first analog input port  
    com_CloseDevice (hDevice);  
}
```

### **Remarks**

This function now only enable in USB\_14ADDA and USB\_16ADDA device. The range of dwPort is from 0~15.

## **com\_GetADMicro**

This function reads the result in decimal microvolt from an analog input port of a device by USB.

### **Declaration**

```
BOOL com_GetADMicro (HANDLE hDevice,  
                    UINT dwPort,  
                    Long *lpValue  
                    );
```

### **Parameters**

hDevice A valid device handle, previously obtained from com\_OpenDevice  
dwPort The index of the port on the card to manipulate. The first port has index 0.  
lpValue A pointer to a variable of type signed 32-bit integer receiving the new state of the port

### **Return value**

TRUE if successful, FALSE otherwise.

If an error occurred, GetLastError() may return the following values:

ERROR\_INVALID\_PARAMETER - The handle passed was invalid, or the port number was out of range for the device selected.

### **Example**

```
HANDLE hDevice = com_OpenDevice(card_id,card_number,10);  
if (hDevice != INVALID_HANDLE_VALUE)  
{  
    com_GetADMicro ( hDevice, 0, &dwState); // reads the state of the first analog input port  
    com_CloseDevice (hDevice);  
}
```

### **Remarks**

This function now only enable in USB\_14ADDA and USB\_16ADDA device. The range of dwPort is from 0~15

## **com\_SetDAHex**

This function writes a complete word in hex to an analog output port of a device by USB.

### **Declaration**

```
BOOL com_SetDAHex(HANDLE hDevice,  
                  UINT dwPort,  
                  UINT dwValue  
                  );
```

### **Parameters**

hDevice	A valid device handle, previously obtained from hid_OpenDeviceDevice
dwPort	The index of the port on the card to manipulate. The first port has index 0.
dwValue	An unsigned hex value to assign new value to DA channel

### **Return value**

TRUE if successful, FALSE otherwise.

If an error occurred, GetLastError() may return the following values:

ERROR\_INVALID\_PARAMETER - The handle passed was invalid, or the port number was out of range for the device selected.

### **Example**

```
HANDLE hDevice = com_OpenDevice(card_id,card_number,10);  
if (hDevice != INVALID_HANDLE_VALUE)  
{  
    com_SetDAHEX ( hDevice, 0, dwState); // writes the state to the first analog output port  
    com_CloseDevice (hDevice);  
}
```

### **Remarks**

This function now only enable in USB\_14ADDA and USB\_16ADDA device. The range of dwPort is from 0~15.

## **com\_SetDAMilli**

This function writes a signed decimal value in millivolt to an analog output port of a device by USB.

### **Declaration**

```
BOOL com_SetDAMilli(HANDLE hDevice,  
                   UINT dwPort,  
                   LONG InValue  
                   );
```

### **Parameters**

hDevice	A valid device handle, previously obtained from com_OpenDevice
dwPort	The index of the port on the card to manipulate. The first port has index 0.
InValue	An signed decimal value to assign new value to DA channel

### **Return value**

TRUE if successful, FALSE otherwise.

If an error occurred, GetLastError() may return the following values:

ERROR\_INVALID\_PARAMETER - The handle passed was invalid, or the port number was out of range for the device selected.

### **Example**

```
HANDLE hDevice = com_OpenDevice(card_id,card_number,10);  
if (hDevice != INVALID_HANDLE_VALUE)  
{  
    com_SetDAMilli ( hDevice, 0, dwState); // writes the state to the first analog output port  
    com_CloseDevice (hDevice);  
}
```

### **Remarks**

This function now only enable in USB\_14ADDA and USB\_16ADDA device. The range of dwPort is from 0~15.

## **com\_SetDAMicro**

This function writes a signed decimal value in microvolt to an analog output port of a device by USB.

### **Declaration**

```
BOOL com_GetADHex(HANDLE hDevice,  
                  UINT dwPort,  
                  LONG InValue  
                  );
```

### **Parameters**

hDevice	A valid device handle, previously obtained from hid_OpenDeviceDevice
dwPort	The index of the port on the card to manipulate. The first port has index 0.
InValue	An signed decimal value to assign new value to DA channel

### **Return value**

TRUE if successful, FALSE otherwise.

If an error occurred, GetLastError() may return the following values:

ERROR\_INVALID\_PARAMETER - The handle passed was invalid, or the port number was out of range for the device selected.

### **Example**

```
HANDLE hDevice = com_OpenDevice(card_id,card_number,10);  
if (hDevice != INVALID_HANDLE_VALUE)  
{  
    com_SetDAMicro ( hDevice, 0, dwState); // writes the state to the first analog output port  
    com_CloseDevice (hDevice);  
}
```

### **Remarks**

This function now only enable in USB\_14ADDA and USB\_16ADDA device. The range of dwPort is from 0~15.

## 9. Functions for Watch dog

### hid\_SetWD

This function sets time interval for Watch Dog.

#### Declaration

```
BOOL hid_SetWD( HANDLE hDevice,  
                BYTE byMode );
```

#### Parameters

hDevice A valid device handle, previously obtained from hid\_OpenDeviceDevice

byMode Time interval for Watch Dog (Value 1~5 as 1/5/10/30/60 seconds, default as 10s)

#### Return value

TRUE if successful, FALSE otherwise.

If an error occurred, GetLastError() may return the following values:

ERROR\_INVALID\_PARAMETER - The handle passed was invalid, or the port number was out of range for the device selected.

---

### hid\_EnableWD

This function enables/disables Watch Dog.

#### Declaration

```
BOOL hid_EnableWD( HANDLE hDevice,  
                   BOOL bEnabled );
```

#### Parameters

hDevice A valid device handle, previously obtained from hid\_OpenDeviceDevice

bEnabled Enable/disable watch dog.

#### Return value

TRUE if successful, FALSE otherwise.

If an error occurred, GetLastError() may return the following values:

ERROR\_INVALID\_PARAMETER - The handle passed was invalid, or the port number was out of range for the device selected.

## **10. Using the Dynamic Industrial Interface with different programming languages**

This chapter provides an overview about how to best utilize the Dynamic Industrial Interface in various programming languages.

If you experience difficulties calling the Dynamic Industrial Interface functions from your programming language, or are using a programming language not covered in this documentation, please feel free to visit our web-site, to which we will post updated information regarding DII programming issues. You may also contact our technical support through our website: [www.decision.com.tw](http://www.decision.com.tw)

### **10.1. C++**

Since the DII DLL was developed using C++, you may easily use it to access Industrial I/O devices. For this purpose, a C++ header file ("USBDI.h") as well as an import library ("USBDI.lib") are being shipped with the interface library. Make sure that you have installed the development release, not the retail release, which does not include support programming files. In your C/C++ source code files, just include the "USBDI.h" include file, then you can use any of the functions provided by the USBDI DLL. Be sure to include the import library "USBDI.lib" during the linking step of your application. So your applications successfully references the actual interface DLL.

### **10.2. Visual Basic**

Since the Dynamic Industrial Interface is fully 32-bit compliant, only 32-bit versions of Visual Basic are supported. Specifically, Version 6.0 are tested and supported. If you are using Visual Basic to access any I/O Devices supported by the USB Dynamic Industrial Interface (USBDI), you can call the USBDI DLL directly. But before that, you should import them. You may also consult the Visual Basic sample application for more information about using Visual Basic to access the USB Dynamic Industrial Interface (USBDI).

## **11. Technical Support and Feedback**

We believe that customer input is the most valuable source for creating successful products. We continuously update and extend the Dynamic Industrial Interface with new functionality, for specific devices, for specific applications, to meet your specific needs, and provide supportive products around the USBDI.

You may also contact our technical support through our website: [www.decision.com.tw](http://www.decision.com.tw)

## 12. Release notes

2015/02/17

Version 2.0.1.9

Fix multiple cards open for USB\_M\_4IO Version 2.0.1.8

Fix slow open speed for USB\_M\_4IO Version 2.0.1.7

Add support for USB\_M\_4IO

2012/11/09

Version 2.0.1.6

x64 version released

2011/11/17

Version 2.0.1.3

Release analog input/output functions for virtual com port.

2011/11/16

Version 2.0.1.2

Remove address checking

Fix the problem of hid\_GetDigitalByte can not read some address of USBIND.

Provide default value read back function for USBIND.

2011/11/3

Version 2.0.1.1

Fix address limitations for USB Industry.

2010/04/20

Version 2.0.1.0

Update for supporting USB Industry.