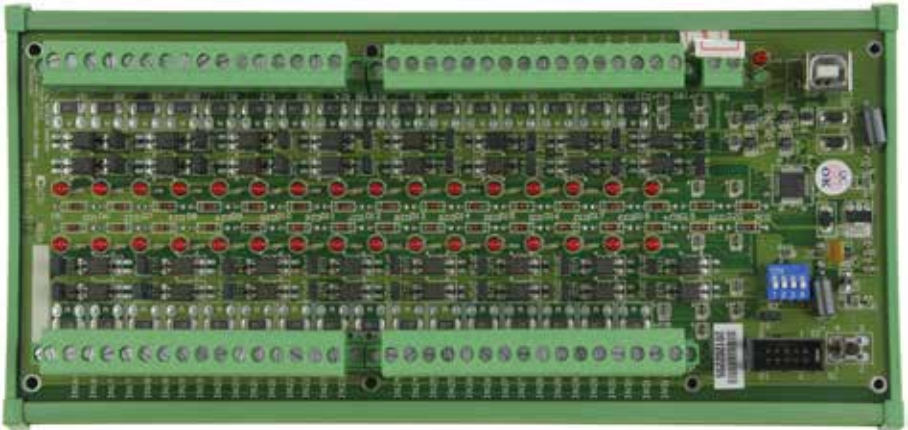


# USB-I/O Handbuch



**UHO-32 - Hutschienenadapter**

**UPO-32 - Platinenversion**

32 optoisolierte digitale Eingänge

# Daten

## Product Code:

AUSB32P USB 32 PHOTO ISO. BOARD  
UHO-32 - Hutschienenversion  
UPO-32 - Platinenversion

**Bus:** USB 2.0

## Beschreibung:

32 Optokoppler-Eingänge  
Optisch isoliert voneinander und vom Computer

## Optokoppler-Eingänge

PC817 Optokoppler  
Spannungsbereich: 3 bis 30 V DC  
Isolation: 500V Kanal-GND oder Kanal zu Kanal

Mit Jumpern können 2 Spannungsbereiche eingestellt werden  
0 - 4.5V aus und 6V - 20V ein. (0 - 20V)  
0 - 16.5V aus und 18 - 30V ein (0 - 30V)

32 Status LEDs an den Eingängen

Einfacher Austausch der Module durch Steckblock-Klemmen

## Features:

UHO-32 ist geeignet zur direkten Hutschienmontage

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

POWER DC+5V 0.7A DC ADAPTER (Optional)

Abmessungen 200mm(L) x 120mm(B) x 55mm(H)  
Betriebstemperatur-Bereich 0 bis 55C.  
Relative Feuchtigkeit von 0 bis 90%.

## Software/Treiber:

Englisches Handbuch mit Einstellplan, Anschlußplan und Programmierbeispielen auf CD. Für Windows-Vista, Win-7/8 wird das HID Interface genutzt + Programmierbeispiele.  
Linux-Treiber + Programmierbeispiele

Pro Lieferung erhalten Sie eine frisch gebrannte „Decision-Computer Deutschland Service CD“ mit aktuellen Treibern, Handbüchern, Installationsanleitungen und deutschen Zusatzinformationen.

Der Umfang ist vom Produkt abhängig!

## Packungsinhalt:

USB-I/O, USB-Kabel, Software/Handbuch-CD  
Die Hutschienenversion wird mit einem EMI-Kit geliefert.  
Dieses Kit ist bei der Platinenversion optional!

# Sicherheitshinweis

Dieses Produkt ist nicht ausfallsicher und darf daher nicht in Anwendungen verwendet werden, wo Gefahren für Gesundheit, Leben, und Sachwerte auftreten können! Anschluß und Reparaturen sind nur vom Fachmann zulässig.

Beim Einbau in eine Maschine oder Anlage, ist sicherzustellen, dass nach dem Einbau weiterhin die maßgeblichen Bestimmungen, Vorschriften und Richtlinien eingehalten werden!

Diese Produkte kommen mit elektrischer Spannung in Berührung, daher müssen die gültigen VDE-Vorschriften beachtet werden, insbesondere VDE 0100, VDE 0550/0551, VDE 0700, VDE 0711 und VDE 0860.

# J1 USB Anschluss USB-B

Ein passendes Kabel ist im Lieferumfang

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



**B**

USB-Verkabelung ist sehr empfindlich gegen EMI-Störungen (hauptsächlich Funkenbildung bei öffnenden Kontakten). Das Kit U-EMI-1 ist im Lieferumfang der Hutschienenversion und beinhaltet zwei Würth-Klappkerne für das USB-Datenkabel und eine Ferrithülse für das Stromversorgungskabel. Bei Verwendung eines HUB sollte auch die Verbindung HUB/Computer (U-EMI-2) geschützt werden! Das Kit beinhaltet zwei Würth-Klappkerne für das USB-Datenkabel.

Die Kerne müssen, wie auf den Abbildungen gezeigt, möglichst dicht an den Steckern montiert werden.

Sehr wichtig ist aber auch die Vermeidung von Störungen. Daher ist die sorgfältige Anordnung und Verlegung der Verkabelung sehr wichtig!



Klappkern auf dem USB-Kabel am Computer



Klappkern auf dem USB-Kabel am USB-IO  
1 oder 2 x durch den Kern geführt

## Stromversorgung - TB5



TB5 - Extern 5V DC		
1	EXT+V	5V+
2	SGND	5V-

Maximal 5,2V - höhere Spannung kann die CPU zerstören!

Ferrithülse auf dem Stromversorgungskabel

Die Stromversorgung unserer Produkte muss extern mit DC 5V erfolgen. Dabei ist auf richtige Polarität zu achten. Andernfalls könnte das Produkt beschädigt werden. Wenn die Platine durch falsche Stromversorgung außer Funktion ist, können Sie versuchen, die Firmware neu einzuspeichern.

Das Kit U-EMI-1 ist im Lieferumfang der Hutschienenversion und beinhaltet Ferrithülse, zur Abschirmung von EMI, für das Stromversorgungskabel. Montage erfolgt wie auf dem Bild oben.

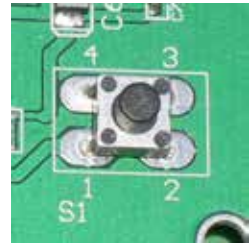
Bei früheren Versionen der Decision-USB-IO bestand auch die Möglichkeit der Stromversorgung über den USB-Bus. Um eine höhere Stabilität zu erreichen, wurde hiervon wurde jedoch Abstand genommen. Die USB-Stromversorgung ist nicht immer in der Lage, bei eingeschalteten Relais, genügend Strom zu liefern! Die Folge ist ein Verbindungsabbruch oder „hängendes“ USB-Modul. Ein externes Schaltteil bietet eine sichere Stromversorgung!

USB-Energieverwaltung in Windows

In Window-System könnte die USB-Kommunikation im Power Saving Mode oder Sleep Mode unterbrochen werden. Abhilfe schafft die Anpassung der Einstellungen im Windows Management.

# S1 Reset Taster

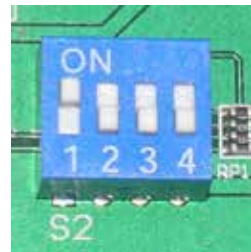
Systemreset bei "hängendem" USB-Modul



# S2 USB ID

Einstellung der USB-Modul-Identifikation

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



# Mehrere USB-Module mit einem PC verbinden

Wenn Sie mehrere USB-Module mit einem PC verbinden müssen, sind folgende Punkte zu beachten:

1. Auf jedem Modul muß eine andere ID eingestellt werden.
2. Anschluß einer ausreichenden, externen 5V Stromversorgung für jedes USB-Modul.
3. Verbindung mit dem PC über einen aktiven USB-HUB.

Bitte stellen Sie sicher, daß Ihre externe 5V Stromversorgung für alle USB I/O-Module auch dann ausreichend Strom liefert, wenn alle Relais angezogen sind. Bei einer Versorgungsspannung unter 4.8V, kann es zu Fehlfunktionen kommen, wie Aktualisierung des Geräte-Managers, oder das Gerät wird nicht erkannt!

## TB1-4 Opto-Isolierte Eingänge

Pin	Signal	Description - TB2
1	IN0+	Opto-isolator Ch. 00 + Input
2	IN0-	Opto-isolator Ch. 00 - Input
3	IN1+	Opto-isolator Ch. 01 + Input
4	IN1-	Opto-isolator Ch. 01- Input
5	IN2+	Opto-isolator Ch. 02 + Input
6	IN2-	Opto-isolator Ch. 02 - Input
7	IN3+	Opto-isolator Ch. 03 + Input
8	IN3-	Opto-isolator Ch. 03 - Input
9	IN4+	Opto-isolator Ch. 04 + Input
10	IN4-	Opto-isolator Ch. 04 - Input
11	IN5+	Opto-isolator Ch. 05 + Input
12	IN5-	Opto-isolator Ch. 05 - Input
13	IN6+	Opto-isolator Ch. 06 + Input
14	IN6-	Opto-isolator Ch. 06 - Input
15	IN7+	Opto-isolator Ch. 07 + Input
16	IN7-	Opto-isolator Ch. 07 - Input

Pin	Signal	Description - TB3
1	IN8+	Opto-isolator Ch. 08 + Input
2	IN8-	Opto-isolator Ch. 08 - Input
3	IN9+	Opto-isolator Ch. 09 + Input
4	IN9-	Opto-isolator Ch. 09 - Input
5	IN10+	Opto-isolator Ch. 10 + Input
6	IN10-	Opto-isolator Ch. 10 - Input
7	IN11+	Opto-isolator Ch. 11 + Input
8	IN11-	Opto-isolator Ch. 11 - Input
9	IN12+	Opto-isolator Ch. 12 + Input
10	IN12-	Opto-isolator Ch. 13 - Input
11	IN13+	Opto-isolator Ch. 14 + Input
12	IN13-	Opto-isolator Ch. 14 - Input
13	IN14+	Opto-isolator Ch. 14 + Input
14	IN14-	Opto-isolator Ch. 14- Input
15	IN15+	Opto-isolator Ch. 15+ Input
16	IN15-	Opto-isolator Ch. 15 - Input

Pin	Signal	Description - TB1
1	IN16+	Opto-isolator Ch. 16 + Input
2	IN16-	Opto-isolator Ch. 16 - Input
3	IN17+	Opto-isolator Ch. 17 + Input
4	IN17-	Opto-isolator Ch. 17 - Input
5	IN18+	Opto-isolator Ch. 18 + Input
6	IN18-	Opto-isolator Ch. 18 - Input
7	IN19+	Opto-isolator Ch. 19 + Input
8	IN19-	Opto-isolator Ch. 19 - Input
9	IN20+	Opto-isolator Ch. 20 + Input
10	IN20-	Opto-isolator Ch. 20 - Input
11	IN21+	Opto-isolator Ch. 21 + Input
12	IN21-	Opto-isolator Ch. 21 - Input
13	IN22+	Opto-isolator Ch. 22 + Input
14	IN22-	Opto-isolator Ch. 22 - Input
15	IN23+	Opto-isolator Ch. 23 + Input
16	IN23-	Opto-isolator Ch. 23 - Input

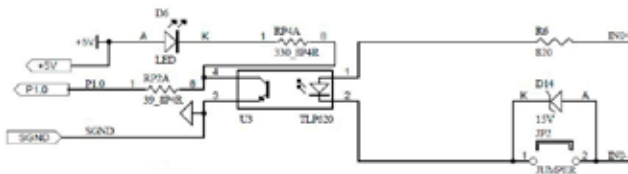
Pin	Signal	Description - TB4
1	IN24+	Opto-isolator Ch. 24 + Input
2	IN24-	Opto-isolator Ch. 24 - Input
3	IN25+	Opto-isolator Ch. 25 + Input
4	IN25-	Opto-isolator Ch. 25 - Input
5	IN26+	Opto-isolator Ch. 26 + Input
6	IN26-	Opto-isolator Ch. 26 - Input
7	IN27+	Opto-isolator Ch.27 + Input
8	IN27-	Opto-isolator Ch. 27 - Input
9	IN28+	Opto-isolator Ch. 28 + Input
10	IN28-	Opto-isolator Ch. 28 - Input
11	IN29+	Opto-isolator Ch. 29 + Input
12	IN29-	Opto-isolator Ch. 29 - Input
13	IN30+	Opto-isolator Ch. 30 + Input
14	IN30-	Opto-isolator Ch. 30 - Input
15	IN31+	Opto-isolator Ch. 31 + Input
16	IN31-	Opto-isolator Ch. 31 - Input

## Opto-Isolierte Eingänge - Einstellung JP1 bis JP32

Mit JP1 bis JP32 ist der Spannungsbereich für Logisch "1" der Eingänge einstellbar. Bei aufgestecktem Jumper ist die Zenerdiode vor den Optokopplern überbrückt. Logisch "1" ist daher von ca. 3 bis 30 V. Wenn der Jumper abgezogen ist sperrt die Zenerdiode bis 16,5V. Logisch "1" ist daher von ca. 18 bis 30 V.

Jumper	Bereich	Logisch "0"	Logisch "1"
gesteckt	0 bis 30V	0 bis 1.5V	3 bis 30V
offen	0 bis 30V	0 bis 16.5V	18 bis 30V

## Schaltplan Eingänge



Starke elektromagnetischen Quellen wie Stromleitungen, großen Elektromotoren, Schaltern oder Schweißmaschinen können starke elektromagnetische Interferenzen verursachen. Auch bei Video-Monitore und -Kabel sind starke Störquellen.

Wenn das Kabel durch einen Bereich mit beträchtlicher elektromagnetischer Störung geführt werden muss, sollten abgeschirmte Leitungen mit Erdung an der Signalquelle verlegt werden.

Vermeiden Sie es Ihre Signalkabel parallel zu einer Hochspannungsleitung platzieren! Legen Sie das Signalkabel in rechten Winkel zur Stromleitung um unerwünschte Auswirkungen zu minimieren.

## Installation

Die Decision-Computer USB Geräte nutzen das HID (Human Interface Device). Da das HID zur Generic Device Class gehört ist der Treiber im Betriebssystem integriert. Wenn ein neues HID-Gerät angeschlossen wird ist keine Treiberinstallation erforderlich. Die Funktionen für Zugriff und Kontrolle des HID befinden sich in der Windows hid.dll im System32 Ordner.

## Installationsbeispiel Windows-7



1. Stromversorgung 5V anschließen
2. USB-Verbindung herstellen
3. USB-Eingabegerät - Gerätetreiber-  
software erfolgreich installiert



4. USB-Eingabegerät - Verwendung  
jetzt möglich



5. In der Systemsteuerung erscheint  
jetzt das Decision-USB-Modul
6. Fertig

# SOFTWARE-PROGRAMMIERUNG UNTER WINDOWS UND LINUX

Unter Windows bieten wir als Programmierhilfe eine Funktions-Bibliothek und DLL-Datei. Das Handbuch „USBII\_Manual.pdf“ und Demo-Code in VB/VC/Delphi finden Sie auf der Decision-Studio-CD.

Linux-Anwendern bieten wir eine C-Source für den direkten Zugriff auf die USB-Geräte. Handbuch und Beispiel finden Sie unter „Dchid-0.5.1.tgz“.

## DIAGNOSE UNTER WINDOWS

USB Test Program.exe ist ein Diagnoseprogramm zum Testen USB-Geräten unter Windows  
Die USB-Test Software ist auf der Decision-Studio-CD zu finden.

Die Beispiele und Treiber werden fortlaufend weiterentwickelt. Die aktuelle Version finden Sie auch auf der Decision-Computer-Merz „Service-CD“.

Eine wichtige Informationsquelle ist immer das Internet <http://www.usb-industrial.com>

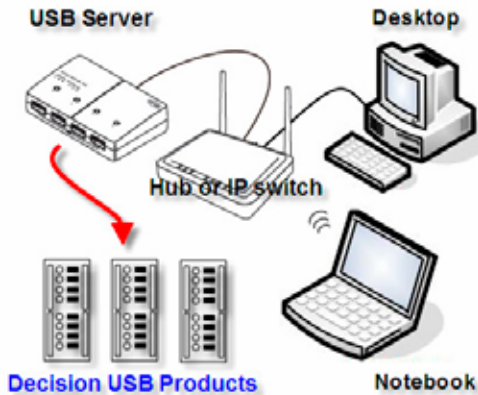
Software-Support auf dem kurzen Weg: <http://www.usb-industrial.com/support.html>

## USB-Industrial.com Übersicht:

<b>Windows Support</b>	2010/04 USBII.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>	dchid - 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 per LAN oder Wireless



Die Fernbedienung von Decision-USB-Produkten per LAN oder Wireless mit einem Steuer-PC ist sehr einfach mit einem Multi-Port-USB-Server oder auch einer Fritzbox möglich.

Da kein Treiber installiert werden muss, ist die Installation und Programmierung sehr einfach.

Unter Windows sind die externen USB-I/O direkt im Geräte-Manager zu sehen und lassen sich verbinden oder steuern wie im ursprünglichen Host-PC.

## Das Modul wird nicht erkannt - Problembehandlung

Sollte das USB-Modul nicht (mehr) vom Betriebssystem des Computers gefunden werden, hilft meistens das USB-Kabel neu einzustecken oder den USB-Port zu wechseln.

Ursache kann aber auch eine un stabile Stromversorgung sein. Es sollte ein Schaltnetzteil mit ausreichend Reserve für einschaltende Relais verwendet werden.

**Sollten die vorhergehenden Hinweise keine Abhilfe schaffen, hilft meistens das Ersetzen der Firmware!**

## USB Firmware Update Anleitung

USBBootloader.exe ist das Softwaretool für die Aktualisierung der Firmware des von Decision-Computer entwickelten USB Serial Device Board. Wenn Sie eine neue Version der Firmware (.hex) erhalten, befolgen Sie die folgenden Schritte, um die Firmware des Board zu aktualisieren:

1. Entfernen Sie die externe Eingangsspannung und unterstützen Sie nur die Gerätestromversorgung.
2. Stellen Sie Board ID 15 (Alle ein) für den Update Modus ein und drücken Sie die Taste Reset.
3. Verbinden Sie den PC über USB mit dem Board.
4. Wenn diese Funktion erstmalig verwendet wird, geben Sie bitte den Ordner Treiber als Installationspfad für den Treiber an, um diesen zu installieren.
5. Öffnen Sie die Software USBBootloader.exe, klicken Sie auf die Schaltfläche öffnen und wählen Sie die hex Datei aus; klicken Sie anschließend auf die Schaltfläche Download, um die Firmware zu aktualisieren.
6. Stellen Sie die Board Id zwischen 0 ~ 14 ein und drücken Sie die Taste Reset; schließen Sie dann den PC wieder an.

## Kommunikation J2 - nur optional!

Auf der Platine befindet sich ein unbestücktes Lochraster oder Stiftleise (2 x 5) für J2. Hier kann bei einer Sonderversion, mit einer optionalen Erweiterungsplatine, eine serielle Schnittstelle RS-232 oder RS-422 / RS-485 hinzugefügt werden. J3 aktiviert den Port, Die Ansteuerung erfolgt dann über den USB. Bei Bedarf bitte anfragen

# 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

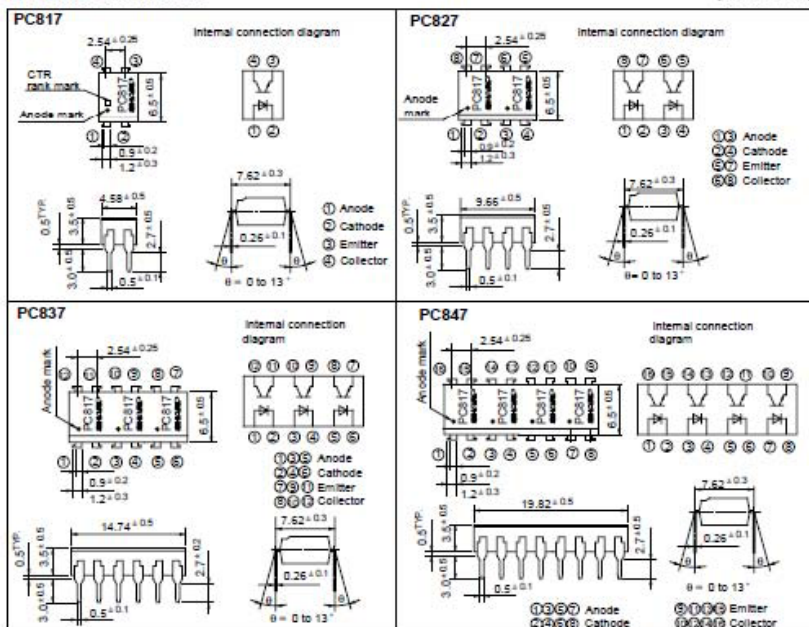
## High Density Mounting Type Photocoupler

## ■ 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
	*1 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
*2 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
*3 Soldering temperature		T <sub>SD</sub>	260	°C

\*1 Pulse width = 100 μs, 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)

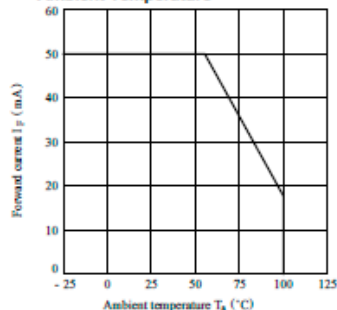
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	V <sub>F</sub>	I <sub>F</sub> = 20mA	-	1.2	1.4	V
	Peak forward voltage	V <sub>FM</sub>	I <sub>FM</sub> = 0.5A	-	-	3.0	V
	Reverse current	I <sub>R</sub>	V <sub>R</sub> = 4V	-	-	10	μA
	Terminal capacitance	C <sub>t</sub>	V = 0, f = 1kHz	-	30	250	pF
Output	Collector dark current	I <sub>CEO</sub>	V <sub>CE</sub> = 20V	-	-	10 <sup>-7</sup>	A
Transfer characteristics	*4 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> = 100 Ω, 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> = 100 Ω	-	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



# 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



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# DECLARATION OF CONFORMITY

For the following equipment :

Equipment : USB Automation I/O board

Model Name: AUSB series

Applicant: DESICION GROUP INC.

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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 hexical 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 ("USBDII.h") as well as an import library ("USBDII.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 "USBDII.h" include file, then you can use any of the functions provided by the USBDII DLL. Be sure to include the import library "USBDII.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 (USBDII), you can call the USBDII 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 (USBDII).

## **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 USBDII.

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.