



USB 10-Port Data Acquisition Module User Guide

Model : USB-DA10

Web: www.titan.tw
Support: info@titan.tw
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Introduction & Features of USB 10-Port Data Acquisition Module

Introduction of USB-DA10

TITAN USB-DA10 is a low-cost 10-port data acquisition module for USB port, which allows for an easy way to link from USB ports on computers for measuring voltage, controlling and monitoring process, and acquiring temperature data. Each of 10 available ports can be configured for any of digital or analog modes; the port 6 ~10 also can be configured for temperature measuring via single-byte commands.

USB-DA10 is powered by the USB port of host PC (5V, 500mA), and it can provide output power (5VDC, 200mA) for external circuit power requirement.

Windows and Linux application programs are provided with USB-DA10 to control all available functions.

Features of USB-DA10

- Provides 10 ports digital input/output.
- Digital output: Set high, or clear to low.
- Digital input: Read the high/ low state.
- Provides 10 ports analog input.
- Read and return the voltage on each I/O pin using a 10-bit A/D: 0 ~ 5 VDC range.
- Provides 5 ports temperature measure input.
- Using a digital temperature sensor, measure temperature range from -55°C ~ 125°C (-67°F to 257°F).
- USB port powered, no external power supply need.
- USB 1.1 and USB2.0 compatible interface.
- Easy to use with single-byte commands to control all function.
- Can utilize a simple terminal emulator to control all function.
- Provides terminal block connector for easy connection.
- LED for power indication.
- Drivers and application program provides for Windows 8, 7, Vista, XP, 2000 and Linux.
- CE, FCC approval.

Application of USB-DA10

- Data Acquisition
- Industrial / Process Control
- Process Monitoring

Absolute Maximum Rating of USB-DA10

Stresses above those listed here may cause permanent damage to the USB-DA10:

Operating Temperature: **0°C ~ 70°C**

Voltage on I/O pins with respect to ground: **-0.3 VDC ~ +5.3VDC**

Sink/Source current on any I/O pins: 25mA

Diagram of USB-DA10

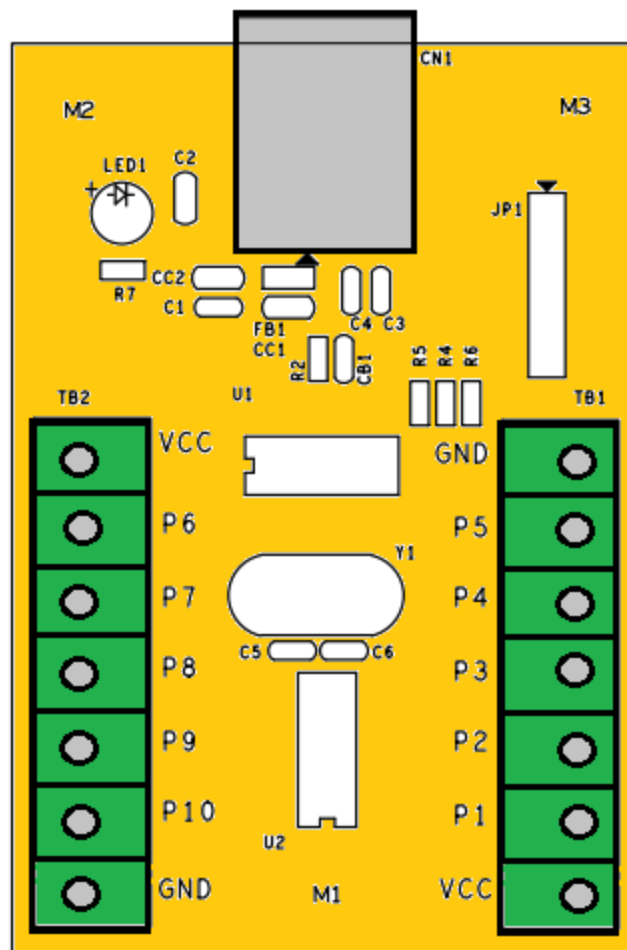
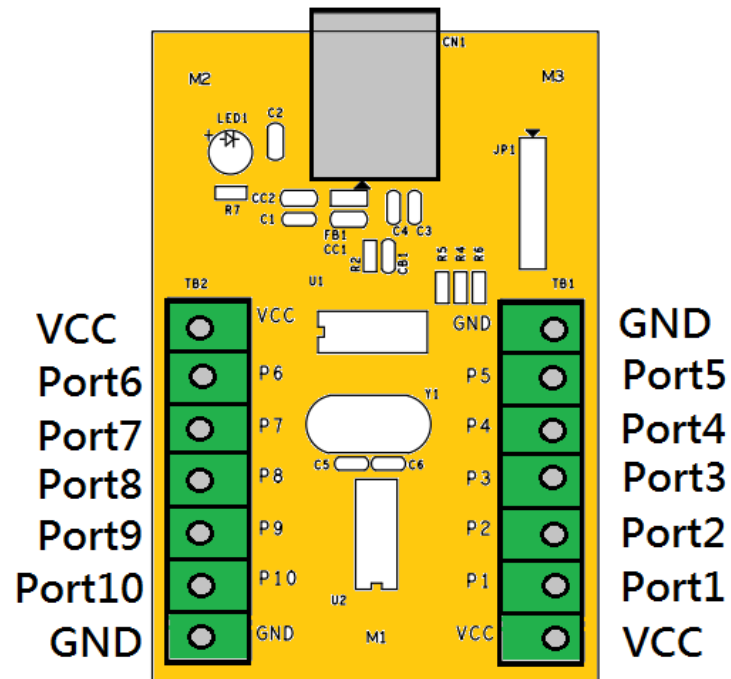


Diagram of USB-DA10

Pin-out of USB-DA10



Pin-out of TB1 TB2

The table below shows the pin-out of TB1 (seven-pin terminal block connector).

Pin Number	Name	Description
TB1 pin1	VCC	Provides +5VDC 100mA output power
TB1 pin2	P1	Input/ output port 1
TB1 pin3	P2	Input/ output port 2
TB1 pin4	P3	Input/ output port 3
TB1 pin5	P4	Input/ output port 4
TB1 pin6	P5	Input/ output port 5
TB1 pin7	GND	GND: Signal Ground

The table below shows the pin-out of TB2 (seven-pin terminal block connector).

Pin Number	Name	Description
TB2 pin1	VCC	Provides +5VDC 100mA output power
TB2 pin2	P6	Input/ output port 6
TB2 pin3	P7	Input/ output port 7
TB2 pin4	P8	Input/ output port 8
TB2 pin5	P9	Input/ output port 9
TB2 pin6	P10	Input/ output port 10
TB2 pin7	GND	GND: Signal Ground

Driver Installation

In most cases, the driver of USB-DA10 will be installed automatically.

Install in Windows 8, 7, Server 2008 R2

Connect your computer to Internet and plug USB-DA10 to the USB port.

The driver will be installed automatically via Internet.

Install in Windows XP, Vista, Server 2003 and 2008

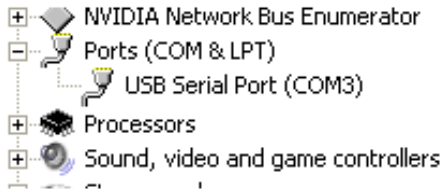
When asked to install the drivers, allow your computer to search the Internet to load and install the drivers automatically.

Install in Windows 2000, 98, SE and ME

Download drivers from <http://www.titan.tw/download/driver.html>

Using the USB-DA10

Connect USB-DA10 to the computer to initiate the loading of driver. After the drivers are loaded, you can find “**USB Serial Port (COMx)**” under Device Manager of the System Properties screen. **(Go there by Start-Setting- Control Panel- System Properties - Hardware- Device- Device Manager).**



You can use a terminal emulator program to opening this COM port, set the baud rate to **38400 bps** and send commands as shown in following :

Port 1 Commands			
ASCII Character	Hex Value	Description	Return/Commands
1	0x31	Digital Output :High	Nothing returned
Q/q	0x51/0x71	Digital Output :Low	Nothing returned
A/a	0x41/0x61	Digital Input	Returns “H” or “L”
Z/z	0x5A/0x7A	Analog Input	Returns measured voltage

Port 2 Commands			
ASCII Character	Hex Value	Description	Return/Commands
2	0x32	Digital Output :High	Nothing returned
W/w	0x57/0x77	Digital Output :Low	Nothing returned
S/s	0x53/0x73	Digital Input	Returns “H” or “L”
X/x	0x58/0x78	Analog Input	Returns measured voltage

Port 3 Commands			
ASCII Character	Hex Value	Description	Return/Commands
3	0x33	Digital Output :High	Nothing returned
E/e	0x45/0x65	Digital Output :Low	Nothing returned
D/d	0x44/0x64	Digital Input	Returns “H” or “L”
C/c	0x43/0x63	Analog input	Returns measured voltage

Port 4 Commands			
ASCII Character	Hex Value	Description	Return/Commands
4	0x34	Digital Output :High	Nothing returned
R/r	0x52/0x72	Digital Output :Low	Nothing returned
F/f	0x46/0x66	Digital Input	Returns “H” or “L”
V/v	0x56/0x76	Analog input	Returns measured voltage

Port 5 Commands			
ASCII Character	Hex Value	Description	Return/Commands
5	0x35	Digital Output :High	Nothing returned
T/t	0x54/0x74	Digital Output :Low	Nothing returned
G/g	0x47/0x67	Digital Input	Returns “H” or “L”
B/b	0x42/0x62	Analog input	Returns measured voltage

Port 6 Commands			
ASCII Character	Hex Value	Description	Return/Commands
6	0x36	Digital Output :High	Nothing returned
Y/y	0x59/0x79	Digital Output :Low	Nothing returned
H/h	0x48/0x68	Digital Input	Returns “H” or “L”
N/n	0x4E/0x6E	Analog Input	Returns measured voltage
-	0x2D	Temperature Input	Returns current temperature

Note: If the digital temperature sensor is not connected to the USB-DA10 for measuring temperature, the message box will show “999.99°”.

Port 7 Commands			
ASCII Character	Hex Value	Description	Return/Commands
7	0x37	Digital Output :High	Nothing returned
U/u	0x55/0x75	Digital Output :Low	Nothing returned
J/j	0x4A/0x6A	Digital Input	Returns “H” or “L”
M/m	0x4D/0x6D	Analog Input	Returns measured voltage
=	0x3D	Temperature Input	Returns current temperature

Port 8 Commands			
ASCII Character	Hex Value	Description	Return/Commands
8	0x38	Digital Output :High	Nothing returned
l/i	0x49/0x69	Digital Output :Low	Nothing returned
K/k	0x4B/0x6B	Digital Input	Returns “H” or “L”
,	0x2C	Analog Input	Returns measured voltage
[0x5B	Temperature Input	Returns current temperature

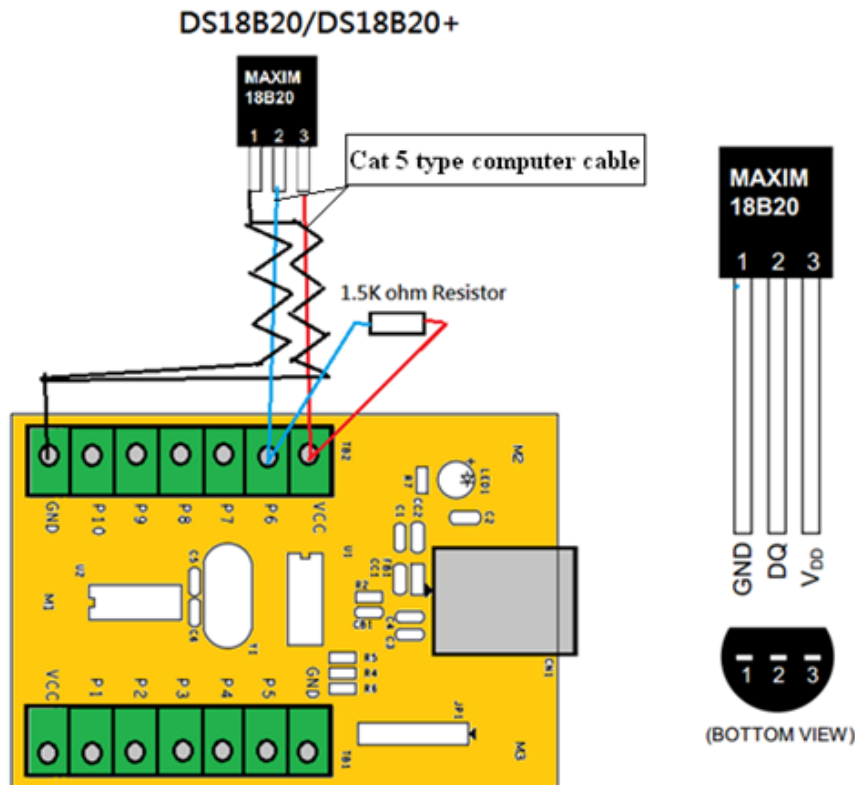
Port 9 Commands			
ASCII Character	Hex Value	Description	Return/Commands
9	0x39	Digital Output :High	Nothing returned
O/o	0x4F/0x6F	Digital Output :Low	Nothing returned
L/l	0x4C/0x6C	Digital Input	Returns “H” or “L”
.	0x2E	Analog Input	Returns measured voltage
]	0x5D	Temperature Input	Returns current temperature

Port 10 Commands			
ASCII Character	Hex Value	Description	Return/Commands
0	0x30	Digital Output :High	Nothing returned
P/o	0x50/0x70	Digital Output :Low	Nothing returned
;	0x3B	Digital Input	Returns “H” or “L”
/	0x2F	Analog Input	Returns measured voltage
`	0x60	Temperature Input	Returns current temperature

Setup Commands			
ASCII Character	Hex Value	Description	Return/Commands
!	0x21	Set the Centigrade(°C) is temperature unit	Default setting; nothing returned
@	0x40	Set the Fahrenheit(°F) is temperature unit	Nothing returned

Temperature Measurement

USB-DA10 provides 5 channels temperature measure input (P6~P10). You can use a MAXIM BS18B20 or DB18B20+ digital temperature sensor to connect to USB-DIO for measuring temperature. Following shows an example of the connection using I/O port 6 (P6).



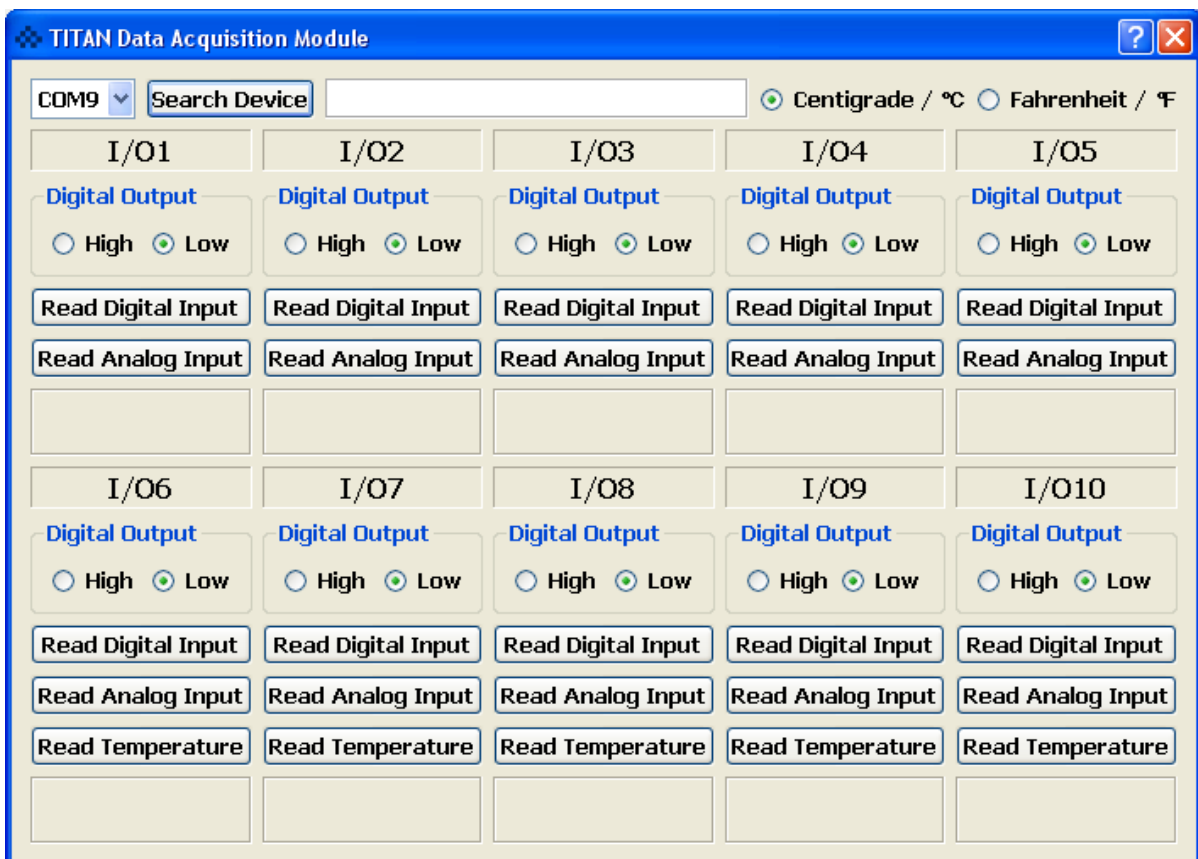
For best performance, use Cat5 type computer cable to connect the digital temperature sensor to USB-DA10. Two pairs of wires in the Cat 5 cable are required for the connection. The first pair is for power (VDD) and ground, and the second pair is data (DQ) and ground. In this temperature measure circuit, a pull-up resistor is required for the data line of approximately 1.5K ohms. If the length of Cat 5 is greater than 100 feet, it may require a pull-up resistor value of less than 1.5K ohms in order to achieve usable rise times at the sensor. The minimum safe resistance for the pull-up resistor is 240 ohms.

Application Program

TITAN USB-DA10 provides application program to interface with the USB-DA10 10-port data acquisition module under Windows and Linux O.S. This application program allows the users to control all available functions.

Download the application program (USB-DA10-AP.exe) from our webpage:

<http://www.titan.tw/download/USB-DA10.html>. Double click “**USB-DA10-AP.exe**” to start the USB-DA10 Windows application program, or click “**USB-DA10-AP**” for the program in Linux.



The main dialog box consists of COM port, Search Device, COM port status, Temperature unit, Digital Output, Read Digital Input, Read Analog input and Read Temperature.

COMx (COM port): When this field is checked, it shows the available COM port of your computer. You can select the COM port for connecting the USB-DA10 data acquisition module to your computer by manual. (After the USB-DIO drivers are loaded, you can find “**USB Serial Port (COMx)**” under Device Manager of the System Properties screen).

Search Device: When this field is checked, your USB-DA10 application program will acquire a COM port and connected to your computer automatically.

COM port status: This field showed the status of COM port when the USB-DA10 connected to your computer, it will show “**Open Success!! Find USB-DA10**”.

Centigrade/°C: When this field is checked, set the Centigrade (°C) as temperature unit.

Fahrenheit/°F: When this field is checked, set the Fahrenheit (°F) as temperature unit.

Digital Output: This is an output digital signal function. When “High” field is checked, the selected port of USB-DA10 outputs a high level signal. When “Low” field is checked, the selected port of USB-DA10 outputs a low level signal.

Read Digital Input: This is a read digital signal function. After the “**Read Digital Input**” field is checked, the message box shows “H”, when the selected port of USB-DA10 detects a high level digital signal. The message box shows “L”, when the selected port of USB-DA10 detected a low level digital signal.

Read Analog Input: This is an analog signal measuring function. When the “**Read Analog Input**” field is checked, the message box shows the input voltage for the selected port of USB-DA10.

Read Temperature: This is a temperature measuring function. When the “**Read Temperature**” field is checked, the message box shows the measured temperature for the selected port of USB-DA10. If the digital temperature sensor is not connected to the USB-DA10 for measuring temperature, the message box will show “999.99°”.

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