

**Agilent**  
U2100A Series Digital IO, 32-Terminal

Data Sheet



## Features

- **Up to 32 input terminals and 32 output terminals**
- **Supports input voltage ranging from 0 V to 24 V**
- **5 V to 24 V external supply for external load**
- **Opto-isolated IO channels**
- **Isolation voltage of 1500 Vrms**
- **USB Full Speed (12 Mbps)**
- **SCPI compatible**
- **Compatible with a wide range of Application Development Environments**
- **Fuse protected output channels (shared by 8 terminals)**

## Introduction

Agilent U2100A Series Data Acquisition (DAQ) is a portable USB Digital IO that offers you cost-effective and affordable digital data acquisition solution.

The U2100A Series DAQ is suitable for widely demanding industrial applications such as driving relays, actuators, valves and so forth. It also acts as an interface to industrial sensors, limit applications include industrial control and automation, isolated data communication, logic level interface, and laboratory automation. In addition to that, the DAQ device provides isolation to allow robust industrial automation application.

There are three models featured in the U2100A Series DAQ:

- **U2121A**  
16-Terminal Digital Input and 16-Terminal Digital Output
- **U2122A**  
32-Terminal Digital Input
- **U2123A**  
32-Terminal Digital Output

## Flexibility to Meet Industrial Demands with Various Features

- Quick and easy USB setup
- Opto isolation for more reliable and improved signal quality
- Robust 1500 Vrms isolation protection that protects your system from damage and preserve data integrity
- Programmable power-up state ensures glitch-free operations when connected to industrial automation instruments
- Agilent U2100A Series DAQ watchdog timer protects your instruments against any unexpected crisis with its fail-safe feature

- Filter undesired glitches and unwanted pulses with digital filtering function
- Edge detection detects change of input signal without continuously reading the input

## Glitch-Free Operations with Programmable Power-Up States

The programmable power-up state is an important function as it allows you to pre-configure the state of all the output lines of the device to a desired state upon power up. This function is incorporated in the U2121A/U2123A DAQ. It ensures glitch-free operations for use with automation instruments such as motors, valves and relays. These user-configurable power-up states are useful to ensure the device powers up in a known state and they can be programmed using Agilent Diagnostic application tools or specific SCPI commands.

## Fail-Safe Feature with Watchdog Timer

The watchdog timer is incorporated into U2121A/U2123A DAQ as a fail-safe feature. It is useful whenever the device is connected to industrial actuators such as motors, valves and relays. It is a robust timer that allows you to set critical output lines to a known state in the event of crisis such as software failure, driver crash or loss of any USB communication link. This is an important function as it gives you protection against any unexpected crisis.

## **Software Initialization with Edge Detection**

You can monitor the change of states on all the input lines of U2121A/U2122A DAQ through this edge detection capability. With edge detection, can also set the configuration of the individual interrupt enable register and the desired positive and/or negative edge detection register masks before any input lines perform any edge detection on the input signal. The maximum rate of edge detection is determined by the software response time that varies from system to system.

## **Filter Undesired Glitches and Noises with Digital Filtering**

This versatile digital filtering functionality is another important feature to ensure correct and precise readings. It is incorporated in the U2121A/U2122A DAQ. This function is important for applications in noisy industrial environment because it helps you filter out undesired glitches or unwanted pulses from entering the input lines to prevent false and inaccurate readings. The digital filtering can be configured to filter out pulses that are shorter than the pre-programmed timing interval. All the input lines have this digital filtering feature and can be enabled individually.

## **Quick and Easy Connectivity**

The U2100A Series DAQ comes with a simple and reliable USB Full Speed (12 Mbps) plug-and-play connectivity. The USB interface is USBTMC USB488 1.0 compatible, making system connections quick and easy, and allowing compatibility with any system which provides USB connectivity. Besides that, the U2100A Series DAQ interfaces with detachable terminal blocks for ease of field-wiring, which gives you a simple and trouble-free set up. The detachable terminal blocks also offer you long term ease of maintenance.

The U2100A Series DAQ comes with Agilent IO Libraries Suite 14.2.8931. The IO Libraries provide robust instrument control and works with the software development environment of your choice.

## **Affordable, Portable and Reliable**

Highly portable at only 154.60 mm high, 120.00 mm wide and 32.60 mm deep, it is ideal for both industrial and scientific environments. The U2100A Series DAQ can operate within its rated specifications from 0 °C up to 55 °C and at altitudes up to 3000 m.

The robust design of the U2100A Series DAQ guarantees reliable operation extending across industrial and education environments. It has also been tested in accordance to major Safety and Regulatory standards.

## **SCPI, IVI-C and IVI-COM Compatible**

You can use either the Agilent U2121 IVI Driver or SCPI commands (in any programming environment) to communicate with the U2100A Series DAQ. This helps you save time and allows you to work with the software of your choice.

For more information on Agilent DAQ products, visit [www.agilent.com/find/daq](http://www.agilent.com/find/daq).

# Product Specifications

	Agilent U2121A	Agilent U2122A	Agilent U2123A
Digital IO lines	16 I, 16 O	32 I	32 O

## INPUT CHARACTERISTICS

Input voltage	0 V to 24 V	0 V to 24 V	
Input logic low voltage	< 1.3 V	< 1.3 V	
Input logic low current source	3 mA Max	3 mA Max	
Input logic high voltage	> 3.5 V	> 3.5 V	
Maximum rating			
Input voltage	26 V Max	26 V Max	
Input propagation delay	100 $\mu$ s (Opto-isolator)	100 $\mu$ s (Opto-isolator)	
Isolation voltage	1500 Vrms	1500 Vrms	

## OUTPUT CHARACTERISTICS

Output load voltage	24 V max		24 V max
Output low voltage	1.2 V max		1.2 V max
Max output sink current per terminal with only one terminal "on"	400 mA max		400 mA max
Max output sink current per terminal for all terminals "on" in a channel	100 mA per terminal		100 mA per terminal
Max output sink current per channel (8 terminals per channel)	800 mA (max 1600 mA for 2 channels)		800 mA (max 3200 mA for 4 channels)
Maximum rating			
Max voltage	26 V max		26 V max
Fuse protected	1.5 A per channel (nominal)		1.5 A per channel (nominal)
Output propagation delay	100 $\mu$ s (Opto-isolator)		100 $\mu$ s (Opto-isolator)
Isolation voltage	1500 Vrms		1500 Vrms

## OTHER FEATURES

Device type	Software timed	Software timed	Software timed
Additional features	<ul style="list-style-type: none"> <li>• Programmable power-up states</li> <li>• Watchdog timer</li> <li>• Edge detection</li> <li>• Digital filter</li> </ul>	<ul style="list-style-type: none"> <li>• Edge detection</li> <li>• Digital filter</li> </ul>	<ul style="list-style-type: none"> <li>• Programmable power-up states</li> <li>• Watchdog timer</li> </ul>

## USB POWER REQUIREMENTS

USB	USB FS	USB FS	USB FS
USB voltage	5 V (4.75 to 5.25 V)	5 V (4.75 to 5.25 V)	5 V (4.75 to 5.25 V)
USB current consumption	100 mA min, 500 mA max, 120 mA nominal	100 mA min, 500 mA max, 120 mA nominal	100 mA min, 500 mA max, 120 mA nominal
USB suspend	200 $\mu$ A min, 2.5 mA max, 250 $\mu$ A nominal	200 $\mu$ A min, 2.5 mA max, 250 $\mu$ A nominal	200 $\mu$ A min, 2.5 mA max, 250 $\mu$ A nominal

## General Specifications

### OPERATING ENVIRONMENT

- Full accuracy at 0 °C to 55 °C
- Full accuracy up to 90 % RH at 40 °C (Non-condensing)
- Altitude up to 3000 m

### STORAGE COMPLIANCE

- -40 °C to 70 °C

### SAFETY COMPLIANCE

Certified by:

- IEC 61010-1:2001 / EN 61010-1:2001 (2nd Edition)
- USA: UL61010-1: 2004
- Canada: CSA C22.2 No.61010-1:2004

### ENVIRONMENTAL CONTROL

- Pollution Degree 2

### EMC COMPLIANCE

- Certified to IEC/EN 61326: 1998 / CISPR 11, Group 1, Class A

### SHOCK & VIBRATION

- Tested to IEC / EN 60086-2

### PHYSICAL CHARACTERISTICS

- *I/O connectors:* USB series B receptacle, 10 position terminal block (4 pieces)
- *Terminal block I/O wiring:* AWG 18 to 26 conductor wires with insulation stripped from the end by 7 mm. Use suitable ferrule for multistranded wires (do not solder).
- *Terminal block screw torque:* 2 kg-cm

### DIMENSION (WxDxH)

- 154.60 mm x 120.00 mm x 32.60 mm

### WEIGHT

- 270 g / 0.595 lbs

### WARRANTY

- 3 years

## Standard Shipped Components



- Agilent U2100A Series Digital IO, 32-Terminal device
- USB Interface Cable
- Terminal Block
- DIN Rail Clamp
- Connector Pin Labeling
- Quick Start Guide
- Product Reference CD-ROM
- Agilent Automation-Ready CD (contains the Agilent IO Libraries Suite)

## Software Requirements

### Agilent connectivity software included

Agilent IO Libraries Suite 14.2

### Minimum system requirements

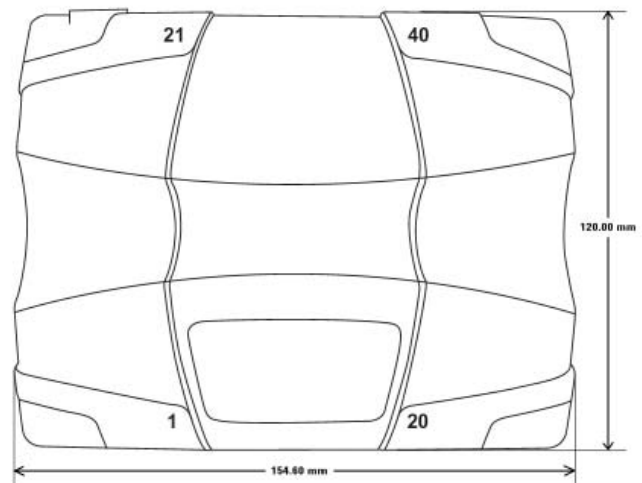
PC hardware	450 MHz Pentium II or higher, 128 MB RAM, 40 GB hard disk space, CD-ROM drive
Operating system	Windows XP Professional or Home Edition, Service Pack 1 or later, Windows 2000 Professional, Service Pack 4 or later
Computer Interface	High Speed USB 2.0

### Software driver support for programming languages:

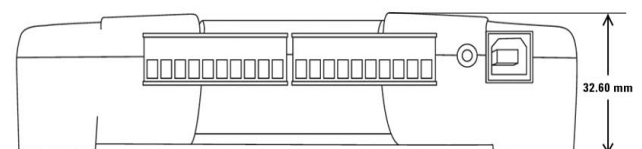
Software Driver:	IVI-COM
Compatible with programming environments"	Agilent VEE
	Microsoft Visual Studio.NET, C/C++
	Microsoft Visual Basic 6
	LabVIEW
	LabWindows/CVI

## Dimensions

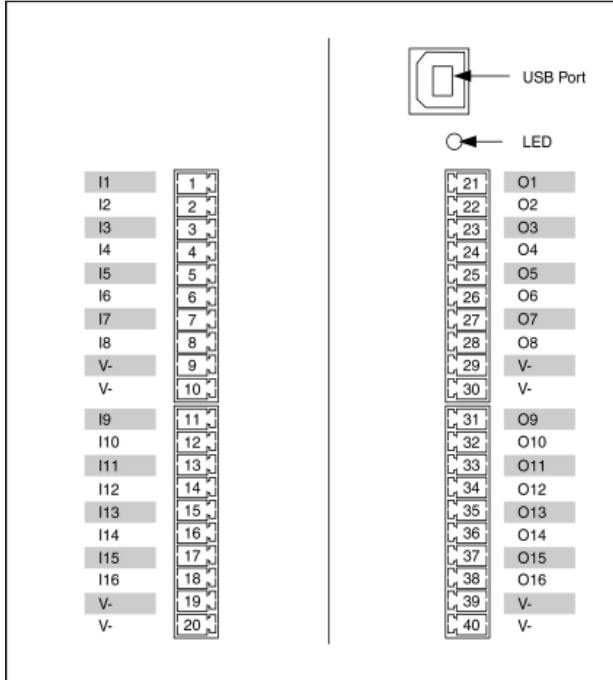
### Top View



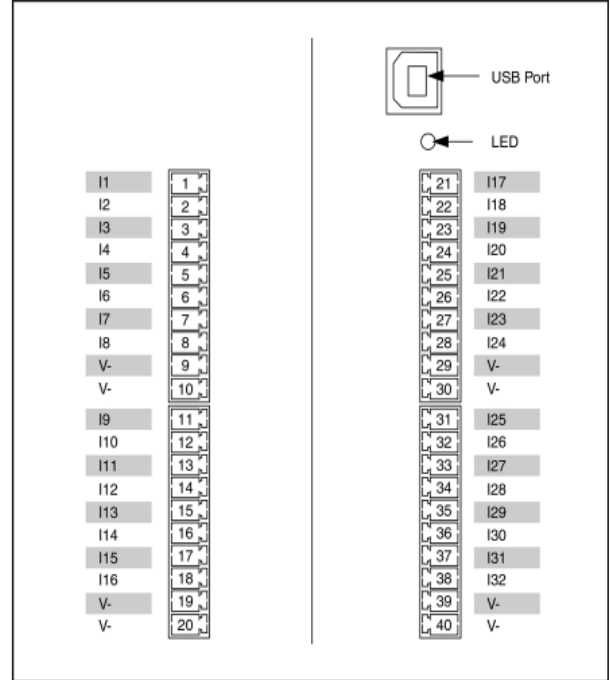
### Front View



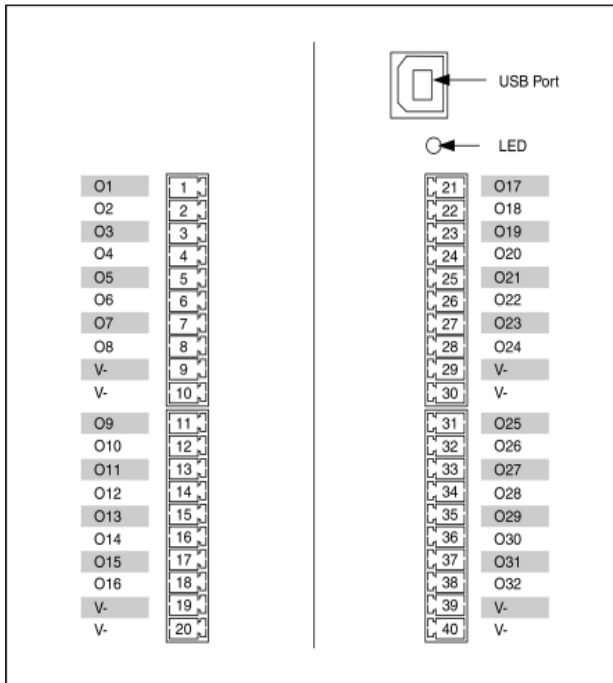
# Pin Assignments



U2121A Pin Assignment



U2122A Pin Assignment



U2123A Pin Assignment



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