

Non-isolated bidirectional digital I/O terminal for USB2.0

## DIO-24DY-USB



\* Specifications, color and design of the products are subject to change without notice.

### Features

#### Non-insulated LVTTTL-level inputs/outputs (Positive)

The product is provided with 24 non-insulated LVTTTL-level I/O ports with a response speed of 200 nsec (positive logic). This allows you to use a total of up to 24 channels of I/O digital signals in three sets of eight.

#### Compatible to USB1.1/USB2.0 and not necessary to power this product externally as the bus power is used.

Compatible to USB1.1/USB2.0 and capable to achieve high speed transfer at HighSpeed (480 Mbps). Not necessary to power this product externally as the bus power of USB is used.

#### Easy-to-wire terminal connector adopted

Adoption of terminal connector (with screws) enables to achieve easy wiring.

#### Windows compatible driver libraries are attached.

Using the attached driver library API-USBP(WDM) makes it possible to create applications of Windows. In addition, a diagnostic program by which the operations of hardware can be checked is provided.

#### LabVIEW is supported by a plug-in of dedicated library VI-DAQ.

Using the dedicated library VI-DAQ makes it possible to create each application for LabVIEW.

This product is a USB2.0-compatible terminal that allows your PC to expand the bidirectional I/O functionality of digital signals. The terminal comes with 24 channels of non-insulated LVTTTL-level inputs/outputs. Inputs and outputs can be switched in blocks of eight by software. Its compact appearance makes it suitable for PC application. In addition, no external power supply is required, as the terminal operates on the USB bus power.

Windows driver is bundled with this product.

Possible to be used as a data recording device for LabVIEW, with dedicated libraries.

### Specification

Item	Specifications
I/O	
Number of I/O channels	24 channels
I/O format	LVTTTL-level (Positive logic)
Input resistance	33Ω
Output rating	3.3VDC 8mA
Response time	Within 200nsec *1
USB	
Bus specification	USB Specification 2.0/1.1 standard
USB transfer rate	12Mbps(Full-speed), 480Mbps(High-speed) *1
Power supply	Bus power
Common	
Connector	14 pin (screw-terminal) plug header
Number of terminals used at the same time	127 terminals (Max.) *2
Current consumption (Max.)	5VDC 250mA
Operating conditions	0 - 50°C, 10 - 90%RH(No condensation)
Allowable distance of signal extension	Approx. 1.5m (depending on wiring environment)
Physical dimensions(mm)	64(W) x 62(D) x 24(H) (exclusive of protrusions)
Weight	70g (Not including the USB cable, attachment)
Attached cable	USB cable 1.8m
Compatible wires	AWG28 - 16

\*1 Actual throughput is hundreds of μseconds (This depends on the host PC environment used (OS and USB host controller).)

\*2 As a USB hub is also counted as one device, you cannot just connect 127 USB terminals.

## Support Software

### Driver Library API-USBP(WDM) (Bundled)

It is the library software, and which supplies command of hardware produced by our company in the form of standard Win32 API function(DLL). Using programming languages supporting Win32API functions, such as Visual Basic and Visual C++ etc., you can develop high-speed application software with feature of hardware produced by our company. In addition, you can verify the operation of hardware using Diagnostic programs. CONTEC provides download services (at <http://www.contec.com/apiusbp/>) to supply the updated drivers and differential files. Further details may be found in the help within supplied CD-ROM or the homepage of our company.

< Operating environment >

OS Windows Vista, XP, Server 2003, 2000, Me, 98  
Adaptation language Visual Basic, Visual C++, Visual C#, Delphi, C++ Builder

### Data acquisition VI library for LabVIEW VI-DAQ (Available for downloading (free of charge) from the CONTEC web site.)

This is a VI library to use in National Instruments LabVIEW. VI-DAQ is created with a function form similar to that of LabVIEW's Data Acquisition VI, allowing you to use various devices without complicated settings. See <http://www.contec.com/vidaq/> for details and download of VI-DAQ.

## Cable & Connector

### Connector (Option)

14pin Screw Terminal Connector Set(6 pieces) : CN6-Y14

## Accessories

### Accessories (Option)

Bracket for USB I/O Terminal products : BRK-USB-Y

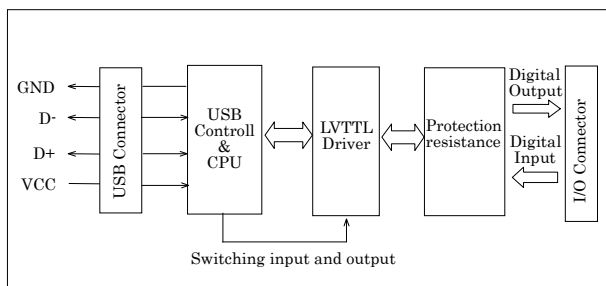
\* Check the CONTEC's Web site for more information on these options.

## Packing List

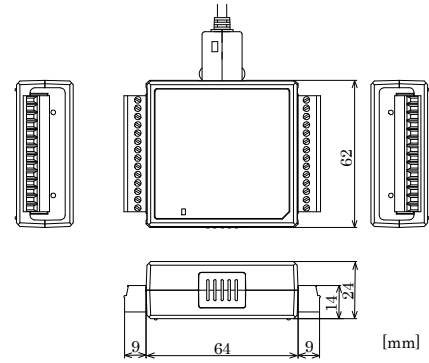
USB terminal [DIO-24DY-USB]...1  
Interface connector plugs...2  
First step guide...1  
CD-ROM \*1 [API-USBP(WDM)]...1  
USB Cable(1.8m)...1  
USB Cable Attachment...1

\*1 The CD-ROM contains the driver software and User's Guide.

## Block Diagram

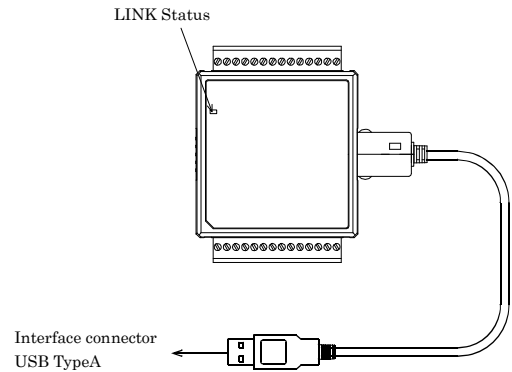


## Physical Dimensions



## Name of each parts

### LED indicator



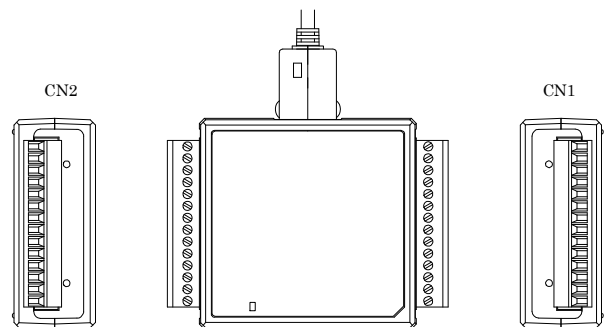
### List of Status LED Functions

Name	Function	Indicator color	LED indicator
LINK Status	USB communication status	GREEN	ON : Communication established OFF : Communication unestablished
	PC connection status		ON : PC communication established OFF : PC communication unestablished

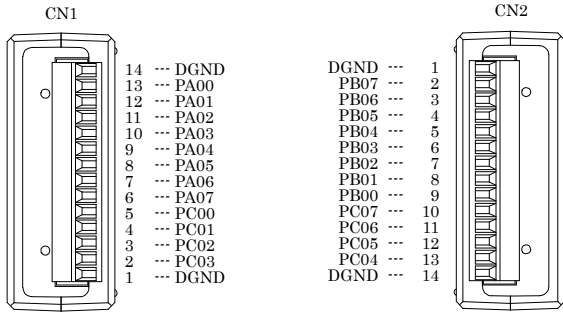
## How to connect the connectors

### Connecting a terminal to a Connector

To connect an external device to this terminal, plug the cable from the device into the interface connector (CN1, CN2) shown below.



## Connector Pin Assignment

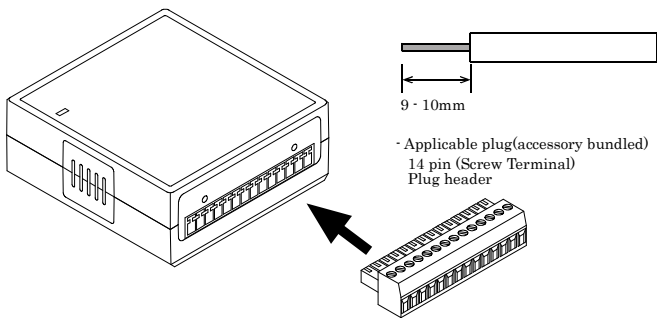


PA00 - PA07, PB00 - PB07, PC00 - PC07	Digital I/O signals
DGND	Common digital ground for digital I/O signals

## Cable connection

When connecting the product to an external device, you can use the supplied connector plug. For wiring, strip off approximately 9 - 10mm of the covered part of a wire rod and then insert it to the opening. After the insertion, secure the wire rod with screws. Compatible wires are AWG 28 - 16.

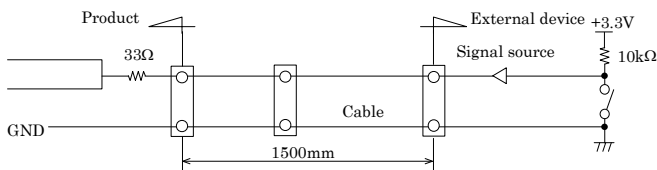
**CAUTION**  
Removing the connector plug by grasping the cable can break the wire.



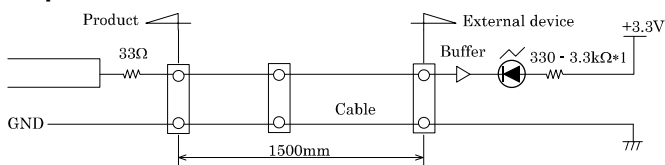
## Input/Output Signal Connection

### Input Circuit

As I/O signals are LVTTTL (3.3V) level signals, the total cable length should be within 1.5 m. The input is provided with an input protective resistor (33Ω). GND is common to all I/O pins.



### Output Circuit



If the signal source is affected by noise or distant from the product, the product may fail to input accurate data depending on the connection.

I/O signals are LVTTTL-level active high signals. When the external input signal is LVTTTL level, the Low level represents logic 0 and the High level represents logic 1. When the program outputs 0 and 1, the product outputs the Low and High level signals, respectively.