Bi-Directional Digital I/O Terminal for USB2.0

DIO-24DY-USB

This product is a USB 2.0 compliant terminal that allows your PC to expand the bidirectional I/O functionality of digital signals. The terminal comes with 24 channels of non-insulated LVTTL-level inputs/outputs. Inputs and outputs can be switched in blocks of eight by software. Its compact case makes it suitable for PC application. In addition, no external power supply is required, as the terminal operates on the USB bus power.

Windows/Linux device driver is supported with this product.

* The contents in this document are subject to change without notice.
* Visit the CONTEC website to check the latest details in the document.
* The information in the data sheets is as of April, 2024.

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

Features

Non-insulated LVTTL-level inputs/outputs (Positive)

The product is provided with 24 non-insulated LVTTL-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.

Input and output can be selected by software.

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

Compatible to USB2.0/USB1.1 and capable to achieve high speed transfer at High Speed (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/Linux support device driver

Using the device driver API-TOOL makes it possible to create applications of Windows/Linux. In addition, a diagnostic program by which the operations of hardware can be checked is provided.

Included Items

Product [DIO-24DY-USB] ...1
Please read the following ... 1
Interface connector plugs ...2
USB Cable (1.8m) ... 1
USB Cable Attachment ... 1

Optional Products

Product Name	Model type	Description
14pin Screw Terminal Connector Set	CN6-Y14	6 pieces
Bracket for USB I/O Terminal products	BRK-USB-Y	

* Visit the CONTEC website for the latest optional products.

Specifications

Function Specifications

Item		Specifications
I/O	Type	LVTTL-level (Positive logic)
	Number of Channels	24ch
	Input resistance	33Ω
	Output rating	3.3VDC 8mA
	Response time	200nsec within *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	Allowable distance of signal extension	Approx. 1.5m (depending on wiring environment)
	Number of terminals used at the same time	127 terminals (Max.) *2
	Current consumption	5VDC 250mA (Max.)
	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

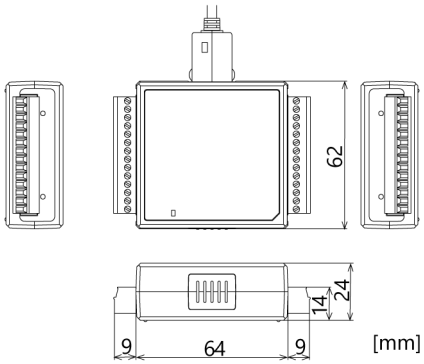
*1 Actual throughput is hundreds of □ seconds (This depends on the host PC environment used (OS and USB host controller).)

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

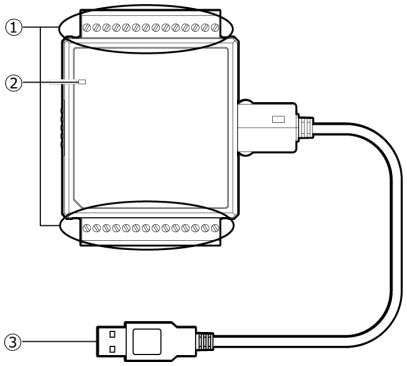
Installation Environment Requirements

Item	Specifications
Operating ambient temperature	0 - 50°C
Operating ambient humidity	10 - 90%RH (No condensation)
Floating dust particles	Not to be excessive
Corrosive gases	None
Standard	VCCI Class A, FCC Class A, CE Marking (EMC Directive Class A, RoHS Directive), UKCA

Physical Dimensions



Component Name



No.	Name	No.	Name
1	Interface Connector	3	USB Type-A connector
2	LINK Status		

Link Status

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

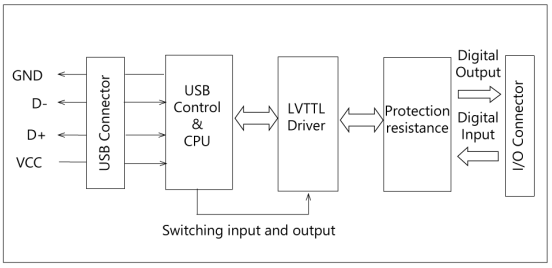
Support Software

Name	Contents	How to get
Windows Version Digital I/O Driver software API-DIO(WDM)	The Windows device driver is provided as a form of Windows API functions. Various sample programs such as C# and Visual Basic .NET, Visual C++, Python etc. and diagnostic program useful for checking operation is provided.	Download from the CONTEC website *1
Linux Version Digital I/O Driver software API-DIO(LNX)	The Linux device driver is provided as a shared library. The software includes various sample programs such as gcc (C, C++) and Python programs, as well as a configuration tool to configure the device settings.	Download from the CONTEC website *1
Software Development Tool Kits (SDK) and Support Software	In addition to the device drivers, we offer many software programs for using CONTEC devices in an easier manner.	Download from the CONTEC website *2

*1 Download the files from the following URL.
https://www.contec.com/download/

*2 For supported software, search the CONTEC website for this product and view the product page.
https://www.contec.com/

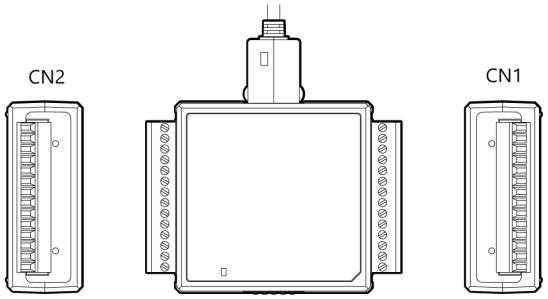
Circuit Block Diagram



Using the On-terminal Connectors

Connecting a terminal to a Connector

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



Connector Pin Assignment

CN2			CN1	
DGND	1		14	DGND
PB07	2		13	PA00
PB06	3		12	PA01
PB05	4		11	PA02
PB04	5		10	PA03
PB03	6		9	PA04
PB02	7		8	PA05
PB01	8		7	PA06
PB00	9		6	PA07
PC07	10		5	PC00
PC06	11		4	PC01
PC05	12		3	PC02
PC04	13		2	PC03
DGND	14		1	DGND

Signal name	Description
PA00 - PA07	Digital I/O signals.
PB00 - PB07	Digital I/O signals.
PC00 - PC07	Digital I/O signals.
DGND	Common digital ground for digital I/O signals.

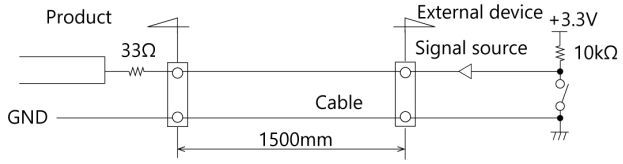
Input/Output Signal Connection

As I/O signals are LVTTL (3.3V) level signals, the total cable length should be within 1.5 m.

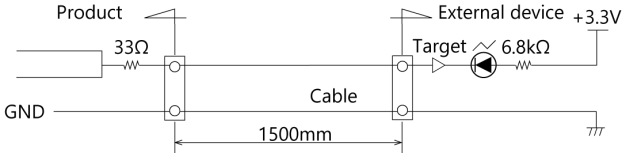
The input is provided with an input protective resistor (33Ω).

GND is common to all I/O pins.

Input Circuit



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 LVTTL-level active high signals. When the external input signal is LVTTL 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.