Digital I/O Terminal for USB2.0

DIO-0808TY-USB

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

This product is a USB2.0-compatible terminal that expands the input or output function of a PC for digital signals.   Being bus-powered, it does not need an external power supply.

DIO-0808TY-USB has the 8ch of unisolated TTL level input and 8ch of unisolated open-collector output.   In addition, it uses a protection circuit (surge protection) as its I/O circuit as well as an easily-wired terminal connector.

Windows/Linux 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 January, 2023.

Features

Unisolated TTL level input, unisolated open-collector output

DIO-0808TY-USB has the 8ch of unisolated TTL level input whose response speed is 200nsec and 8ch of unisolated open-collector output.   The output rating is max. 28VDC, 40mA per ch.

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

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

Surge absorption diodes are built in the I/O circuit for surge voltage protection.

DIO-0808TY-USB has a surge absorption diode connected to the +5V output pin at each I/O point to protect against surge voltages.

Windows compatible driver libraries are supported.

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

Terminal connector facilitating wiring

Wiring is easy as the terminal connector (screw type) is used.

Specification

| Item		Specifications
Input section		
Number of input signal points		8 points (1 common)
Input format		TTL-level input (Negative logic *1)
Input resistance		10kΩ (1 TTL load)
Surge protector		ESD Noise-Clipping Diodes NNCD6.8J (NEC) or equivalent
Response time		200nsec within *2
Output section		
Number of output signal points		8 points (1 common)
Output format		Unisolated open-collector output (Negative logic *1)
Output rating	Output voltage	28VDC (Max.)
	Output current	40mA (per point) (Max.)
Residual voltage with output on		0.5V or less (Output current≤50mA), 1.0V or less (Output current≤100mA)
Surge protector		Diodes for Surge Absorption HZC30 (RENESAS) or equivalent
Response time		200nsec within *2
+5V output section		
Output voltage		4.75 - 5.25V
External supply capable current (Max.)		5VDC 100mA
Surge protector		ESD Noise-Clipping Diodes NNCD6.8J (NEC) or equivalent
USB		
Bus specification		USB Specification 2.0/1.1 standard
USB transfer rate		12Mbps (Full-speed), 480Mbps (High-speed) *3
Power supply		Bus power
Common		
Connector		14 pin (screw-terminal) plug header
Number of terminals used at the same time		127 terminals (Max.) *4
Current consumption (Max.)		5VDC 300mA
Operating conditions		0 - 50ºC, 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
Standard		VCCI Class A, FCC Class A, CE Marking (EMC Directive Class A, RoHS Directive), UKCA

*1 Data "0" and "1" correspond to the High and Low levels, respectively.
*2 Response time of the input/output IC
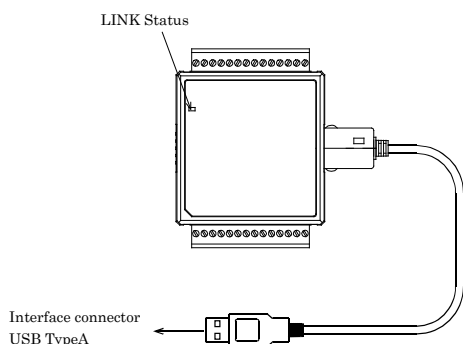*3 This depends on the host PC environment used (OS and USB host controller).
*4 As a USB hub is also counted as one device, you cannot just connect 127 USB terminals.

Physical Dimensions

62

14
21

9   64   9   [mm]
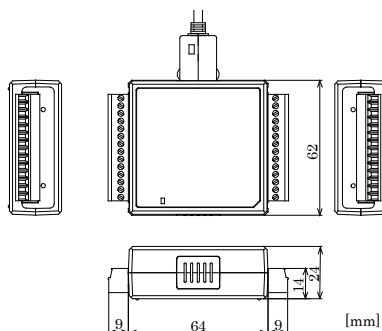
Component Locations

LED indicator

LINK Status

Interface connector
USB TypeA

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

Support Software

**Windows Version Digital I/O Driver software
API-DIO(WDM)**

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.

Cable & Connector

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

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

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-0808TY-USB] …1
Interface connector plugs …2
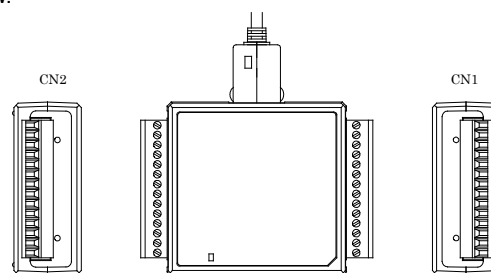Please read the following …1
USB Cable (1.8m) …1
USB Cable Attachment …1

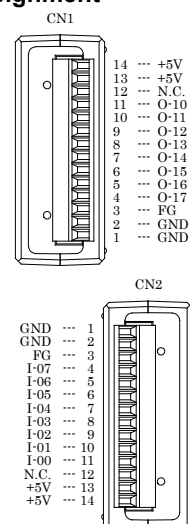*1   The CD-ROM contains the driver software and User's Guide.

Using the On-terminal 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.

CN2   CN1

Connector Pin Assignment

CN1

14	+5V
13	+5V
12	N.C.
11	O-10
10	O-11
9	O-12
8	O-13
7	O-14
6	O-15
5	O-16
4	O-17
3	FG
2	GND
1	GND

CN2

GND	1
GND	2
FG	3
I-07	4
I-06	5
I-05	6
I-04	7
I-03	8
I-02	9
I-01	10
I-00	11
N.C.	12
+5V	13
+5V	14

I-00 - I-07	8 input signal pins. Connect output signals from the external device to these pins.
O-10 - O-17	8 output signal pins. Connect these pins to the input signal pins of the external device.
+5V	This pin outputs power at +5 V.　Max. electrical current is 100mA.
GND	This pin is connected to the USB-pin's GND.
FG	This pin is connected to the Frame Ground of PC.
N.C.	This pin is left unconnected.

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.
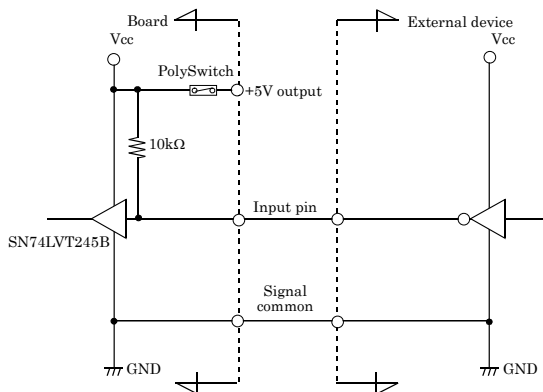
⚠ CAUTION

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

When connecting the connector plug to the product, be sure to insert it in the interior.

9 - 10mm

- Applicable plug(accessory bundled)
  14 pin (Screw Terminal)
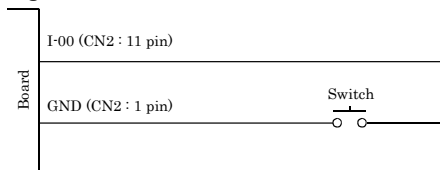 Plug header
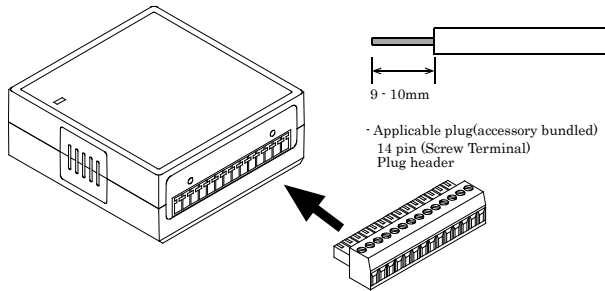
Connecting Input Signals

Input Circuit

*   Input pin represent I-xx.
*   One PolySwitch is connected to all of the +5V output pins.

The input circuit of this product is illustrated in the above figure.

External digital signals given to signal inputs are TTL levels.

The individual input signals are passedto the personal computer as active low signals.   As each of the signal inputs is pulled up internally, theoutput of a relay contact or semiconductor switch can be connected directly between the signal inputand the signal common pin.

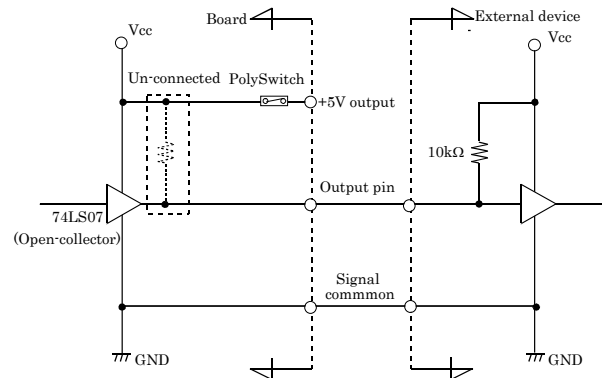Surge absorption diodes are connected to the input circuit.

Connecting a Switch

I-00 (CN2 : 11 pin)

GND (CN2 : 1 pin)   Switch

When the switch is ON, the corresponding bit contains 1.

When the switch is OFF, by contrast, the bit contains 0.

Output Circuit

Output Circuit

*   Output pin: O-xx
*   One PolySwitch is connected to all of the +5V output pins.

The output circuit of this product is illustrated in the above figure.

Signal outputs are open-collector outputs; individual output signals are sent to the external device as active low signals.

Note that each signal output must be pulled up at the external device as it is not pulled up internally.

Surge absorption diodes are connected to the output circuit.

⚠ CAUTION

When the PC is turned on, all output are reset to OFF.

Example of Connection to LED

+5V (CN1 : 14 pin)

2kΩ

LED

O-10 (CN1 : 11 pin)
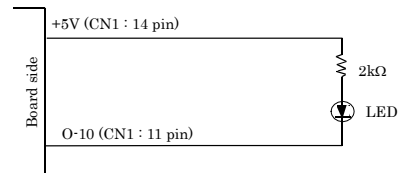
When "1" is output to a relevant bit, the corresponding LED comes on.

When "0" is output to the bit, in contrast, the LED goes out.

A Protection Function of the +5V Outputs

A protection function, which prevents excessive current flow from the +5V outputs, is attached to thisterminal.   In case of accidental short of the +5V output and GND, for example, the function works, andthe terminal operation may become impossible temporarily.   In such a case, you should turn the PC offand wait for several minutes before you use the terminal again.

Block Diagram