Isolated Digital I/O Terminal for USB2.0 DIO-0808LY-USB



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

Features

Opto-coupler isolated input (supporting current sink output) and opto-coupler isolated open-collector output (current sink type) This product has the 8ch of opto-coupler isolated input (supporting current sink output) and 8ch of opto-coupler isolated open-collector output (current sink type) whose response time is 300µsec. Common terminal provided per 8channels, capable of supporting a different external power supply. Supporting driver voltages of 12 - 24 VDC for I/O. 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.

Opto-coupler bus isolation

As the USB (PC) is isolated from the input and output interfaces by optocouplers, this product has excellent noise performance.

Zener diode for surge voltage protection and the circuit for overcurrent protection

Zener diodes are connected to the output circuits to protect against surge voltages. In addition, the output circuit, it attaches the overcurrent protection circuit at the output 8-channel unit. The output rating is max. 35VDC, 100mA per channel.

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.

This product is a USB 2.0 compliant terminal that extends the digital signal I/O functions of a PC.

This product can input and output digital signals at 12 - 24VDC. This product features 8 opto-coupler isolated inputs (for current sinking output) and 8 optocoupler isolated open-collector outputs (current sinking type).

In addition, output transistor protection circuit (surge voltage protection and overcurrent protection).

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

Function Specifications

	Item	Specifications
Input	Туре	Opto-isolated input (Compatible with current sink output) (Negative logic *1)
	Number of Channels	8 points (1 common)
	Input resistance	4.7 kΩ
	Input ON current	2.0mA or more
	Input OFF current	0.16mA or less
	Response time	300µsec within *2
Output	Туре	Opto-isolated open collector output (current sink type) (Negative logic*1)
	Number of Channels	8 points (1 common)
	Output rated voltage	35VDC (Max.)
	Output rated current	100mA (per point) (Max.)
	Residual voltage with output on	0.5V or less (Output current≤50mA), 1.0V or less (Output current≤100mA)
	Surge protector	Zener diode RD47FM(Renesas) or equivalent
	Response time	300µsec within *2
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	Allowable distance of signal extension	Approx. 50m (depending on wiring environment)
	Number of terminals used at the same time	127 terminals (Max.) *4
	Dielectric strength	1000Vms
	External circuit power supply	12 - 24VDC (±10%)
	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
	Compatible wires	AWG28 - 16

*1 Data "0" and "1" correspond to the High and Low levels, respectively.

*2 The opto-coupler's response time comes

- *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.

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, CE Marking (EMC Directive Class A, RoHS Directive), UKCA, KC

Physical Dimensions



Included Items

Product [DIO-0808LY-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	

* Information about the option products, see the Contec's website.

Component Name



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

List of Status LED Functions

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

Support So	oftware	
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/

Using the On-terminal Connectors



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.



Connector Pin Assignment





Signal name	Description
I-00 - I-07	8 input signal pins. Connect output signals from the external device to these pins.
O-00 - O-07	8 output signal pins. Connect these pins to the input signal pins of the external device.
I-PC	Connect the positive side of the external power supply. These pins are common to 8 input signal pins.
O-PC	Connect the positive side of the external power supply. These pins are common to 8 output signal pins.
O-NC	Connect the negative side of the external power supply. These pins are common to 8 output signal pins.
N.C.	These pins are left unconnected.

Connecting Input and Output Signals

Input Circuit

Connect the input signals to a device which can be current-driven, such as a switch or transistor output device.

The connection requires an external power supply to feed currents. The product inputs the ON/OFF state of the current-driven device as a digital value.



The signal inputs are isolated by opto-couplers (ready to accept current sinking output signals).

The product therefore requires an external power supply to drive the inputs. The power requirement for each input pin is about 5.1 mA at 24 VDC (about 2.6 mA at 12 VDC).

Connecting a Switch



When the switch is ON, the corresponding bit contains 1. When the switch is OFF, by contrast, the bit contains 0.

Output Circuit



The output circuit of this product is illustrated the image above. The signal output section is an opto- isolated, open-collector output (current sink type). Driving the output section requires an external power supply.

The rated output current per channel is 100 mA at maximum. The output section can also be connected to a TTL level input as it uses a low-saturated transistor for output. The residual voltage (low-level voltage) between the collector and emitter with the output on is 0.5 V or less at an output current within 50 mA or at most 1.0 V at an output current within 100 mA.

A zener diode is connected to the output transistor for protection from surge voltages. A PolySwitch-based over-current protector is provided

for every eight output transistors. When the over-current protector works, the output section of the product is temporarily disabled. If this is the case, turn of the power to the PC and the external power supply and wait for a few minutes, then turn them on back.

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

Example of Connection to LED



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.

Example of Connection to TTL Level Input



Connecting the Sink Type Output and Sink Output Support Input

The following example shows a connection between a sink type output (output side) and a sink output support input (input side). Refer to this connection example when you connect such products to each other.

