Digital Output Unit with Relay-Isolation for USB

RRY-16CX-USB

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

This product is an USB2.0-compliant digital output unit that output signals to reed relay contacts.

This product provides up to 16 independent common reed relay contact outputs. Independent common terminal provided per channel, capable of supporting a different external power supply. High-capacity output rating is designed to be a maximum of 2A 125V (AC), 2A 30V (DC) per channel.

As there is compatible with PCI bus-compatible board RRY-16C(PCI)H and PCI Express bus-compatible board RRY-16C-PE in terms of connector shape and pin assignments, it is easy to migrate from the existing system.

Windows driver is bundled with this product. Possible to be used as a data recording device for LabVIEW, with dedicated libraries.

Features

16 independent common reed relay contact outputs (with a single make contact)

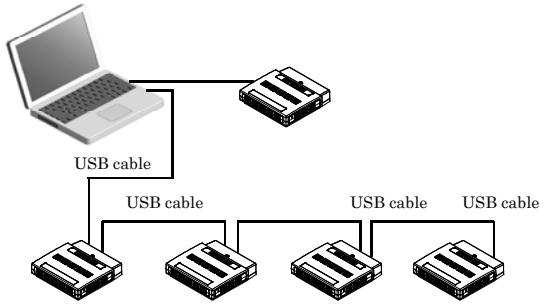
This product has 16 reed relay outputs with a single make contact. Independent common terminal provided per channel, capable of supporting a different external power supply. High-capacity output rating is designed to be a maximum of 2A 125V (AC), 2A 30V (DC) per channel.

Compatible to USB1.1/USB2.0

Compatible to USB1.1/USB2.0 and capable to achieve high speed transfer at HighSpeed (480 Mbps).

USB HUB function

This product has the USB HUB function. Max. 4 RRY-16CX-USB can be used in 1 USB port of PC. *1 When you use 4 or more RRY-16CX-USB, you can do by connecting RRY-16CX-USB to the another USB port of PC side. Also, you can connect the CONTEC's USB device other than RRY-16CX-USB to the USB port of RRY-16CX-USB. *2*3



Connectors are compatible with PCI/PCI Express bus-compatible board

As there is compatible with RRY-16C(PCI)H and RRY-16C-PE in terms of connector shape and pin assignments, it is easy to migrate from the existing system. If the system of this product is created by the digital I/O driver API-DIO(98/PC), it is required to replace it with API-DIO(WDM).

Windows compatible driver libraries are attached.

Using the attached digital I/O driver API-DIO(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 make a LabVIEW application.

*1 This product cannot be stacked up for installation.
*2 Do not connect the device other than that of CONTEC's USB to the USB port included on the RRY-16CX-USB. Otherwise, this may cause a failure or malfunction.
*3 When connecting multiple units with USB HUB function and set up them, do one at a time and complete setup for the previous unit before starting to do the next unit.

Specification

Item		Specification
No. of Output Channels		16 channels (independent common)
Output Format		Reed Relay (1a, make) Output
Relay Contact Spec.	Max. rating capacity	2A 125V(AC), 2A 30V(DC) (load resister)
	Max. permitted voltage	125V (Max.) *1, *2
	Max. Carry Current	2A (Max.)
	Contact resistance (Initial state)	30mΩ or less
	Operating time (At the time of ON)	Within 7ms
	Recovery time (At the time of OFF)	Within 6ms
	Mechanical Life Expectancy	20,000,000 operations min or more Switching times : 180/min
	Electrical lifetime	100,000 operations min or more Switching times : 20/min
	Relay Type	PCN-105D3MHZ
USB section		
	Bus specification	USB Specification 2.0/1.1 standard
	USB transfer rate	12Mbps (Full-speed), 480Mbps (High-speed) *3
	Power supply	Self-power
Common section		
	Number of terminals used at the same time	127 terminals (Max.) *4
	Dielectric strength	250Vrms
	Current consumption (Max.)	5VDC 600mA
	Operating conditions*5	0 - 50ºC, 10 - 90%RH (No condensation)
	Allowable distance of signal extension	Approx. 50m (depending on wiring environment)
	Physical dimensions (mm)	180(W) x 140(D) x 34(H) (No protrusions)
	Weight	400g (Not including the USB cable, attachment)
	Connector	37-pin D-SUB, female connector DCLC-J37SAF-20L9E(mfd. by JAE) or equivalent to it
	Attached cable	USB cable 1.8m

*1 Please exceed neither max. permitted voltage nor max. rating capacity of the use relay when using it by the voltage that exceeds 30VDC. Doing so can cause a malfunction.
*2 The potential difference between channels must not exceed 125V in the maximum. Doing so can cause a malfunction.
*3 This depends on the 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 unit.
*5 To suppress the heating, ensure that there are spaces for ventilation (about 5cm) around this product.

Support Software

Windows version of digital I/O driver API-DIO(WDM)
[Stored on the bundled CD-ROM driver library API-USBP(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.

< Operating environment >

OS	Windows 7, Server 2008, Vista, XP, Server 2003, 2000, Me, 98
Adaptation language	Visual Basic, Visual C++, Visual C#, Delphi, C++ Builder

You can download the updated version from the CONTEC's Web site (http://www.contec.com/product/device/apiusbp/). For more details on the supported OS, applicable language and new information, please visit the CONTEC's Web site.

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

Cable (Option)
Flat cable with both-ends 37-pin D-SUB connector
: CB37P-1.5 (1.5m)
: PCB37P-3 (3m)
: PCB37P-5 (5m)
Shield cable with both-ends 37-pin D-SUB connector
: PCB37PS-0.5P (0.5m)
: PCB37PS-1.5P (1.5m)
: PCB37PS-3P (3m)
: PCB37PS-5P (5m)
Flat cable with one-end 37-Pin D-SUB connector
: PCA37P-1.5 (1.5m)
: PCA37P-3 (3m)
: PCA37P-5 (5m)
Shield cable with one-end 37-pin D-SUB connector
: PCA37PS-0.5P (0.5m)
: PCA37PS-1.5P (1.5m)
: PCA37PS-3P (3m)
: PCA37PS-5P (5m)

Connector (Option)
37pin D-SUB(male) connector Five-piece set
: CN5-D37M

Accessories

Accessories (Option)

Screw Terminal (M3 x 37P)	: EPD-37A *1*2
Screw Terminal (M3.5 x 37P)	: EPD-37 *1
General Purpose Terminal (M3 x 37P)	: DTP-3A *1
Screw Terminal (M2.6 x 37P)	: DTP-4A *1
USB I/O Unit Bracket for X Series	: BRK-USB-X
AC adapter (input : 90 - 264VAC, output : 5VDC 2.0A)	:POA200-20-2 *3
AC-DC power supply unit(input: 85 - 132VAC, output: 5VDC 3.0A)	: POW-AC13GY
AC-DC power supply unit(input: 85 - 264VAC, output: 5VDC 2.0A)	: POW-AD22GY
DC-DC power supply unit(input: 10 - 30VDC, output: 5VDC 3.0A)	: POW-DD10GY
DC-DC power supply unit(input: 30 - 50VDC, output: 5VDC 3.0A)	: POW-DD43GY

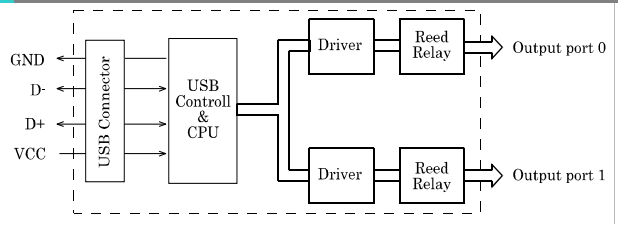
*1 PCB37P or PCB37PS optional cable is required separately.
*2 "Spring-up" type terminal is used to prevent terminal screws from falling off.
*3 It is the same as the one appended to the product. Please buy it necessary for maintenance.
* Check the CONTEC's Web site for more information on these options.

Packing List

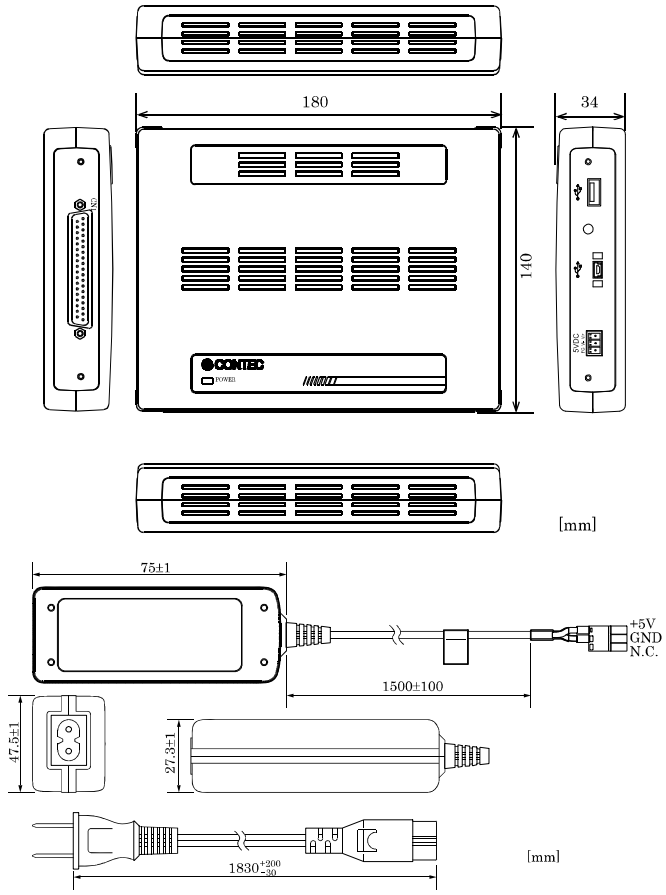
- Unit [RRY-16CX-USB] …1
- AC adapter …1
- AC Cable (for 125VAC) …1
- USB cable (1.8m) …1
- USB cable attachment on the main unit's side (For Mini B connector side) …1
- Clamps for prevention of cable on the main unit's side …1
- CD-ROM *1 [API-USBP(WDM)] …1
- First step guide … 1
- Power connector MC1,5/3-ST-3,5 …1
- Ferrite core …1

*1 The CD-ROM contains the driver software and User's Guide (this guide)

Block Diagram



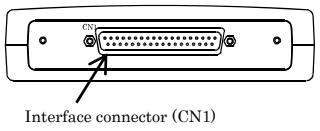
Physical Dimensions



Using the Connectors

Connecting to a Connector

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



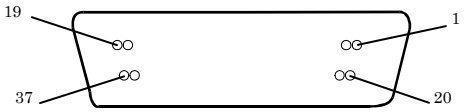
-Connector used 37-pin D-SUB connector [F(female)type]
DCLC-J37SAF-20L9E [mfd by JAE]+ equivalence to it
Lock nut UNC #4-40 (inch screw threads)
-Compatible connector 17JE-23370-02(D8C) [mfd by DDK, M(male)type]
FDCD-37P [mfd by HIROSE, M(male)type]
DC-37P-N [mfd by JAE, M(male)type]

* Please refer to the 2 page for more information on the supported cable and accessories.

Connector Pin Assignment

Pin Assignments of Interface Connector(CN1)

CN1



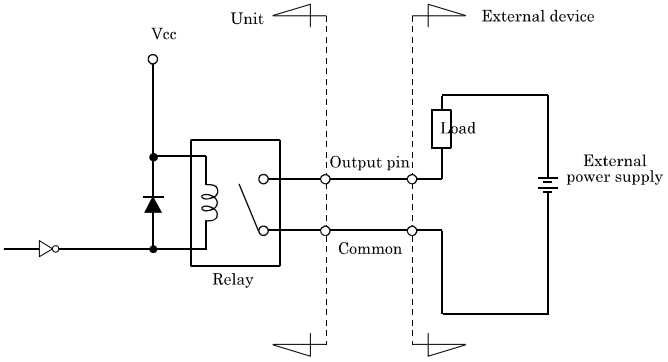
Pin No.	Signal name	Meaning	Pin No.	Signal name	Meaning
			19	N.C.	
37	N.C.		18	N.C.	
36	N 17	Common of O-17	17	O-17	+1 Output Port
35	N 16	Common of O-16	16	O-16	
34	N 15	Common of O-15	15	O-15	
33	N 14	Common of O-14	14	O-14	
32	N 13	Common of O-13	13	O-13	
31	N 12	Common of O-12	12	O-12	
30	N 11	Common of O-11	11	O-11	
29	N 10	Common of O-10	10	O-10	
28	N 07	Common of O-07	9	O-07	+0 Output Port
27	N 06	Common of O-06	8	O-06	
26	N 05	Common of O-05	7	O-05	
25	N 04	Common of O-04	6	O-04	
24	N 03	Common of O-03	5	O-03	
23	N 02	Common of O-02	4	O-02	
22	N 01	Common of O-01	3	O-01	
21	N 00	Common of O-00	2	O-00	
20	N.C.		1	N.C.	

O-00 - O-17	16 output signal pins. Connect these pins to the input signal pins of the external device.
N00 - N17	Common pin corresponding to each output pin.
N.C.	No connection to this pin.

Output Signal Connection

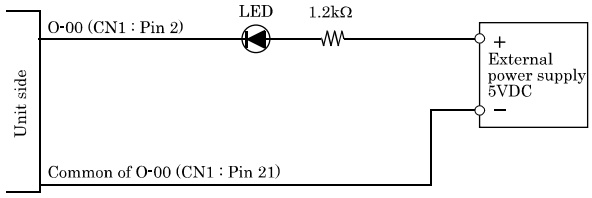
Figures shows the output circuit at the interface section of the board. The signal output section uses a relay contact method to send signals to the external device.

Output Circuit



⚠ CAUTION
When the power turned on, all outputs are reset to OFF.

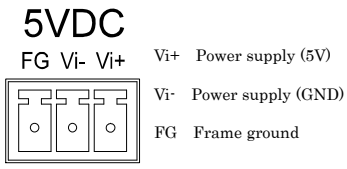
Example of Connection



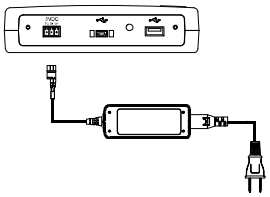
Output a "1" to a bit will light the LED that is connected to the related relay output. On the other hand, output a "0" to the bit will switch the LED off.

Connection with 5VDC Power Supply for Self-power

This product must be connected with 5VDC power supply (in a self-powered state). Connect with 5VDC power supply by using +5VDC input pin.



When using the attached AC adapter [POA200-20-2], please connect directly to the input terminals. When the accompanying power connector (MC1,5/3-ST-3,5, suitable cable: AWG28 - 16) is used to supply power to this unit, strip the end of the suitable cable and insert it to the power connector before firmly securing it using a screw.



⚠ CAUTION
- Connect 5VDC power supply to the main unit. Next, connect the USB cable to the PC. Do not turn it on or off when using. If you remove, USB cable is first and then 5VDC power supply.
- When the USB module is not used, leave the AC adapter unplugged.
- Continuously using the AC adapter heated affects its life.
- Use the AC adapter not in a closed place but in a well-ventilated place not to be heated.
- Do not remove the power connector [MC1,5/3-ST-3,5] attached to the AC adapter.

Difference from RRY-16C-PE and RRY-16C(PCI)H

Item	RRY-16CX-USB	RRY-16C-PE	RRY-16C(PCI)H
Max. rating capacity	2A 125V(AC), 2A 30V(DC) (load resister)		None
Max. permitted voltage	125V (Max.) *1, *2		125V(AC), 30V(DC)
Current consumption (Max.)	5VDC 600mA	3.3VDC 1100mA	5VDC 550mA
Bus specification	USB Specification 2.0/1.1 standard	PCI Express Base Specification Rev. 1.0a x1	PCI(32bit, 33MHz, Universal key shapes supported)
Physical dimensions (mm)	180(L) x 140(D) x 34(H) (No protrusions)	121.69(L) x 110.18(H)	121.69(L) x 105.68 (H)
Weight	400g (Not including the USB cable, attachment)	120g	

*1 Please exceed neither max. permitted voltage nor max. rating capacity of the use relay when using it by the voltage that exceeds 30VDC. Doing so can cause a malfunction.
*2 The potential difference between channels must not exceed 125V in the maximum. Doing so can cause a malfunction.