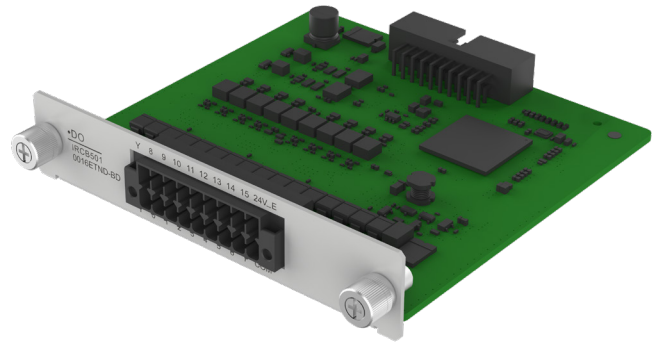




IRCB501 Series 16-Channel

NPN Output I/O Expansion Card User Guide



19012413A00

Preface

Thank you for purchasing the Inovance IRCB501 series expansion card. The IRCB501 series expansion cards are developed specifically to expand resources for robot control systems. This series includes encoder expansion cards and I/O expansion cards. This guide describes how to correctly use your card. Before use (installation, wiring, operation, maintenance, and inspection), please read this guide carefully and make sure to understand the safety precautions. If you are an equipment manufacturer, make sure to send this guide along with your equipment to end users for future reference. During the use of this product, you may need to consult the following guides:

Doc Name	Data Code
IRCB501 Series Robot Control Cabinet User Guide	PS00010914
IRTP80 Series Teach Pendant User Guide	19012261

User guides may be updated without prior notice. You may download the latest version at www.inovance.com.

1. Product Information

Expansion Card

Name	Model	Function
16-channel NPN output I/O expansion card	IRCB501-0016ETND-BD	General-purpose 16-channel NPN output I/O expansion card

Installation Dimensions

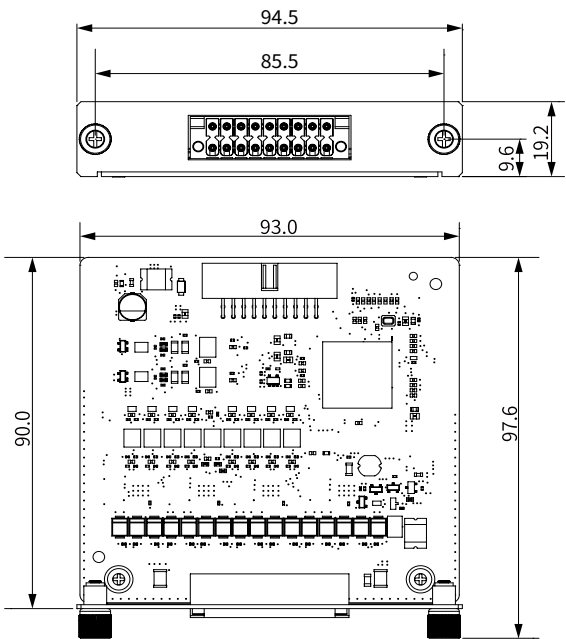
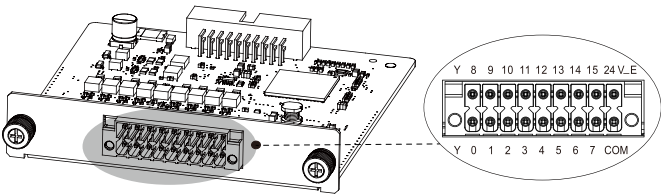


Figure 1 General-purpose 16-channel NPN output I/O expansion card (unit: mm)

Terminal Assignment



Pin	Function Description
Y0	Sink (NPN) output 0
Y1	Sink (NPN) output 1
Y2	Sink (NPN) output 2
Y3	Sink (NPN) output 3
Y4	Sink (NPN) output 4
Y5	Sink (NPN) output 5
Y6	Sink (NPN) output 6
Y7	Sink (NPN) output 7
Y8	Sink (NPN) output 8
Y9	Sink (NPN) output 9
Y10	Sink (NPN) output 10
Y11	Sink (NPN) output 11
Y12	Sink (NPN) output 12
Y13	Sink (NPN) output 13
Y14	Sink (NPN) output 14
Y15	Sink (NPN) output 15
COM	Power ground, used to connect to an external power supply
24V_E	24 V power supply, used to connect to a 24 V±20% power supply

Product Specifications

Item	Specifications
Output channels	16
Output connection mode	Crimping terminal
Output type (connection mode)	Sink (NPN)
Y0 to Y15 input voltage range	0 VDC to 29 VDC
Maximum drive current per channel	0.4 A
Y-COM voltage at ON (V _{Y-COM})	< 1 V
Maximum leakage current at OFF	< 200 μA
Maximum output switching frequency	1 kHz (resistive load)
Isolation mode	Photocoupler isolation
Protection	Current limiting protection
Hardware response time (ON/OFF)	35 μs (OFF to ON)/35 μs (ON to OFF)
Ambient temperature and humidity	Temperature: 0° C to 45° C; humidity: 20% to 95% RH (30° C), non-condensing
Storage temperature and humidity	Temperature: -10° C to +60° C; humidity: < 95% RH (30° C), non-condensing

Note: The ambient temperature and humidity range of the expansion card matches all robot control cabinets.

2. External Wiring

Cable Preparation

Wire pin structure:

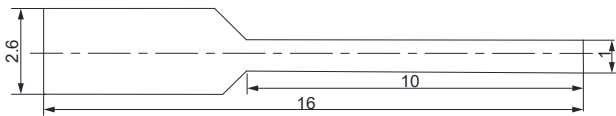


Figure 2 Dimensions of the GETV05010 wire pin (unit: mm)

Item	Description
Part code	15074039
Applicable cable size	20 AWG to 24 AWG
Color	Orange
Packing unit	Approx. 120 pcs/pack
Materials	Oxygen-free copper alloy and PVC
Surface treatment	Tin-plated
Current carrying capacity	Maximum 8 A

Recommended crimp tool: Hoop-type manual crimp tool (10 AWG to 28 AWG)



Cable preparation procedure:
Step 1: Strip off 10 mm of the wire insulation.
Step 2: Thread the cable through the cable marking sleeve.
Step 3: Thread the cable conductor through the round hole of the wire pin. Crimp the wire pin with the crimping pliers recommended by the wire pin manufacturer.
Step 4: Insert the wire pin into the corresponding hole on the I/O port terminal block. Pull back the wire pin to ensure that it is securely locked by the spring in the terminal block.

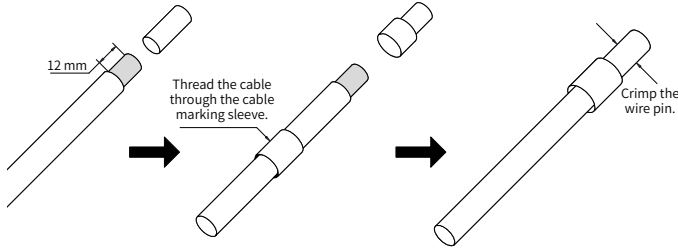


Figure 3 Cable preparation procedure

Sink Output and Source Output

1) Sink output (negative common terminal)
When the load current flows into the output (Y) terminal, the output is called sink output (or NPN output), which is low-level output.

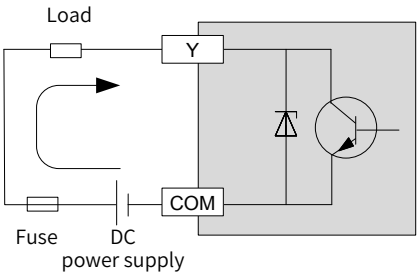


Figure 4 Sink output

2) Source output (positive common terminal)
When the load current flows out from the output (Y) terminal, the output is called source output (or PNP output), which is high-level output.

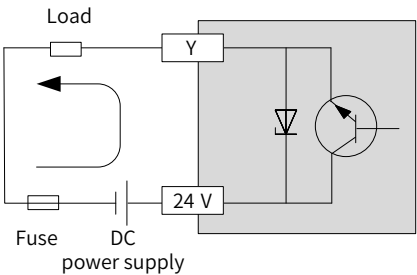


Figure 5 Source output



NOTE

An NPN output provides a low level, while a PNP output provides a high level.

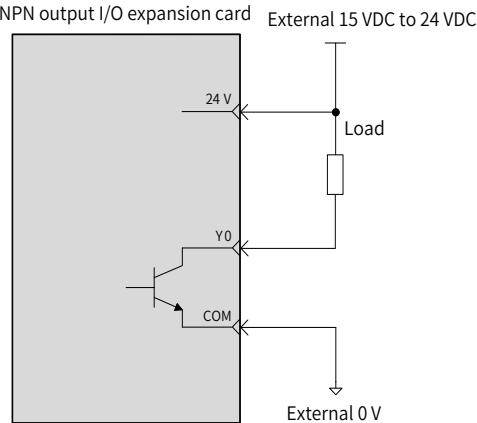
Wiring Diagram



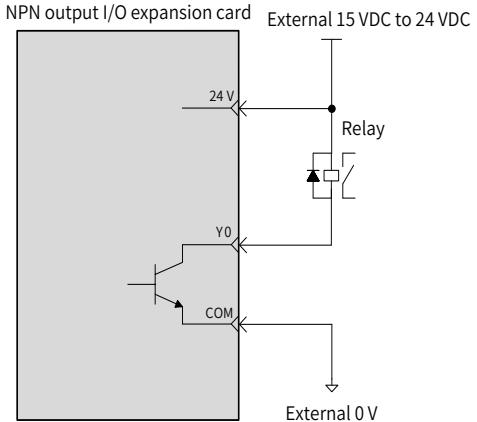
- ◆ Do not short-circuit the Y0 to Y15 outputs directly to the +24V terminal.
- ◆ Do not connect the Y0 to Y15 outputs to the 0V terminal of the power supply, or COM_GND to the +24V terminal of the power supply.
- ◆ The load voltage connected to the Y0 to Y15 outputs must be less than 29 V.

The following diagrams take Y0 as an example (Y1 to Y15 follow the same principle).

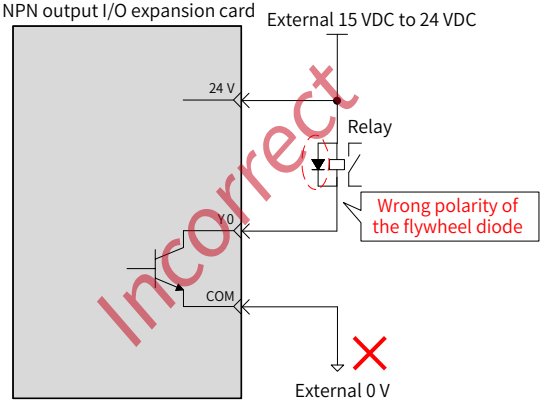
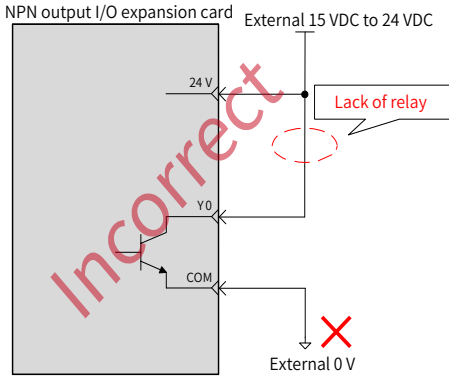
1) Driving a resistive load:



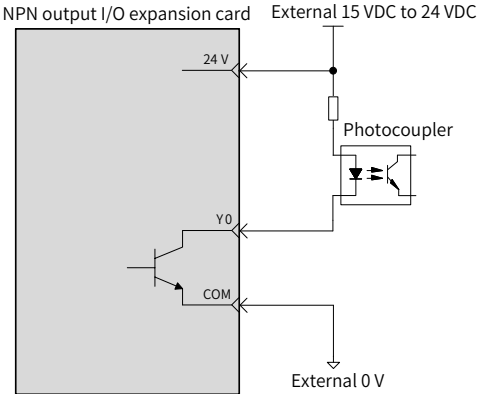
2) Driving a relay load:



Incorrect wiring:



3) Driving a photocoupler load:



INOVANCE Warranty Agreement

- ◆ Inovance provides a 12-month free warranty service to the product from the date of factory shipment. The free warranty service covers free repairs and replacements in the case of product failure or damage caused by defects of the product under normal use conditions.
- ◆ Paid warranty service will be provided in the following scenarios:
 - a) The warranty period for the product on site has expired.
 - b) Damage is caused by improper operations violating the user guide of the product.
 - c) Damage is caused by inadequate protection measures in harsh environments, such as severe dust, humidity, and high temperatures.
 - d) Damage is caused by natural disasters, such as lightning, fire, floods, and earthquakes.
 - e) Damage is caused by peripheral equipment faults, such as poor wiring, water ingress, and abnormal voltages.
 - f) Additional support is required for equipment commissioning and installation.
 - g) New features, modifications, program changes, application issues, and selection errors.
- ◆ If the equipment is faulty or damaged, fill in the Warranty Card correctly and in detail.
- ◆ The maintenance fee will be charged according to the latest Maintenance Price List of Inovance.
- ◆ The Warranty Card is not re-issuable. Keep the card well and present it to the maintenance personnel during maintenance.
- ◆ If there is any problem during the service, contact Inovance's agent or Inovance directly.
- ◆ Inovance reserves the rights for explanation of this agreement.

INOVANCE Robot Warranty Card

Customer info.	Company add.:	
	Company name:	Contact:
	Post code:	Tel.:
Product info.	Product model:	
	Barcode (paste the barcode here):	
	Agent:	
Fault	Fault description:	
	Recorded by:	

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