EDIO-S003
Hardware User Manual

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http://www.epcio.com.tw

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Chapter 1 Overview

1.1 Functions

- Serial communication interface
- 64 digital input
- 64 PhotoMos Relay output
- Galvanic isolation control board
- Load-bearing box, TS32(A)/TS35(A) DIN Rail

1.2 Specifications

- Size: 107 mm x 290 mm
- DIN standard TS32(A)/TS35(A) track package
- 5EHDBV terminal (plug-in), EK500V4L terminal (screw-in) or 5EEHDV terminal (plug-in) (DINKLE)
- Work environment temperature of 0 °C ~ 55 °C
- EDIO-S003

  64 Source or Sink input Type
  - First 4 inputs can be programmed with an interrupt function
  - The input connections and COM short or open circuit determines the input
  - Source Type: Input working voltage COM requires +5~24 V
  - Sink Type: Input working voltage COM requires 0 V

  64 PhotoMos Relay output
  - Source Type: Output working voltage COM requires +5~24 V
  - Sink Type: Output working voltage COM requires 0 V
  - The largest single output is 400 mA
- Electrical source requirements:
  - E5V group (+5 V (+4.5 V ~ +5.5 V) ---500 mA)
  - Each input and output requires a COM electrical source

****If E5V voltage is insufficient (less than 4.5 V), the EDIO-S003 will be unable to function properly.**

1.3 System Connection Diagram

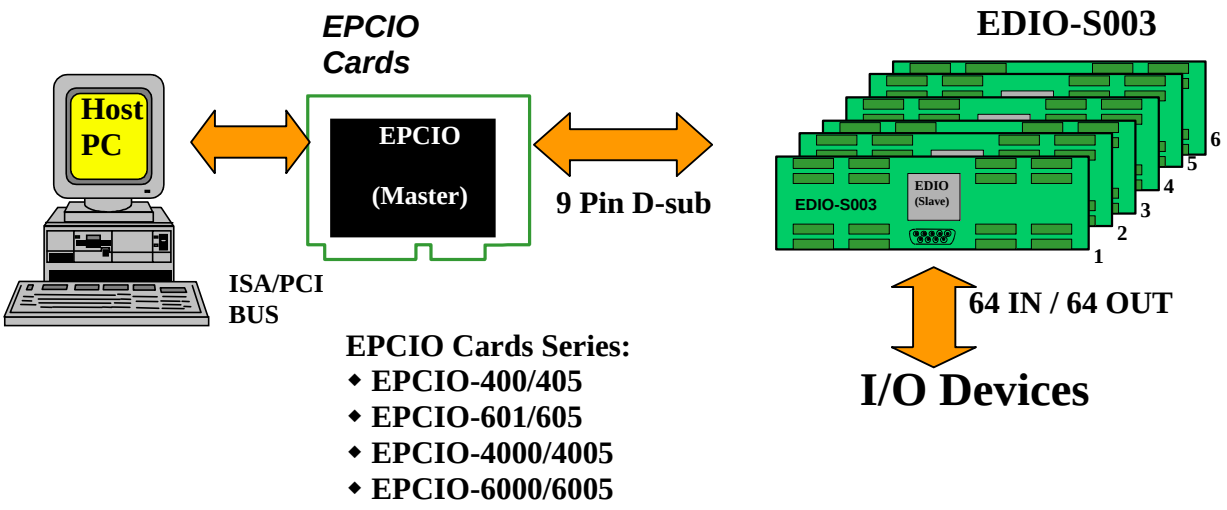


Fig. 1 EDIO input and output control module system connections

Fig. 1 is a diagram depicting the EDIO input and output control module system connections. The Host PC accesses information including input reading, output control, and interrupt signal through the ISA/PCI BUS and the EPCIO master.

Fig. 2 is a block diagram depicting the EPCIO control card. The EPCIO ASIC (Master Mode) is responsible for reading and updating the Remote Input Output (RIO) status within a given time. The output section first passes through the driver circuit to be transformed into a differential signal, and then is output from the 9 Pin connector to the RIO module. The input section accepts the differential circuit inputted from the connector and sends it to the ASIC input through the photo coupler.

Fig. 3 is a diagram depicting the EDIO-S003 I/O control card. The EDIO ASIC (Slave Mode) is responsible for accepting information from the EPCIO and output and reading the actual I/O point status. The entire configuration utilizes a wire-saving remote control system, where all controlled circuits are integrated in the ASIC to increase dependability and stability.

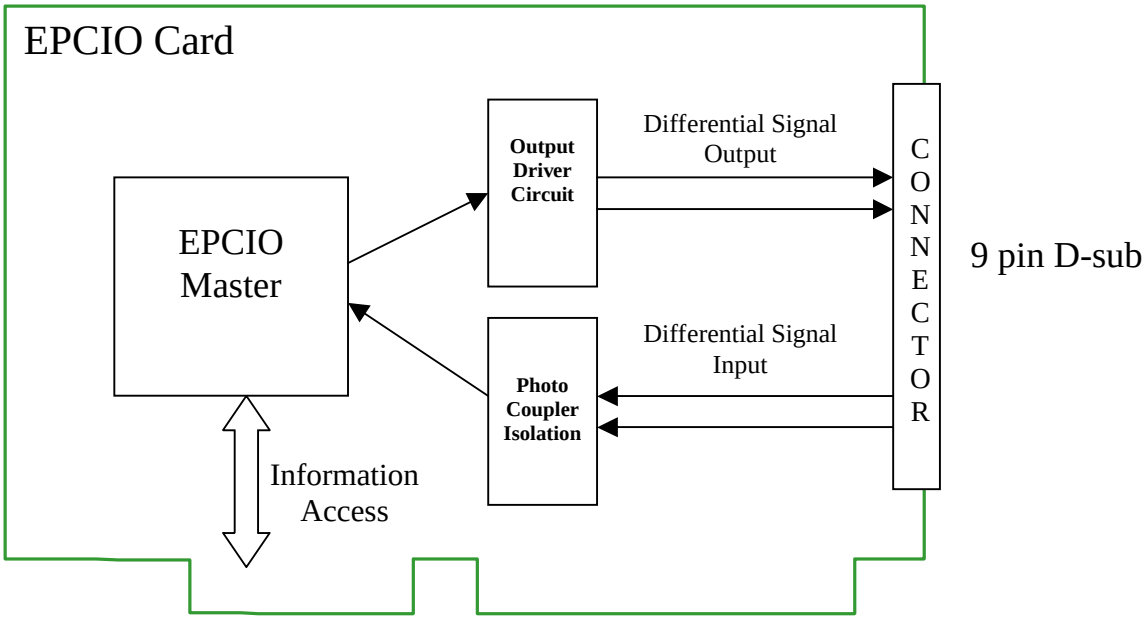


Fig. 2 EPCIO functions

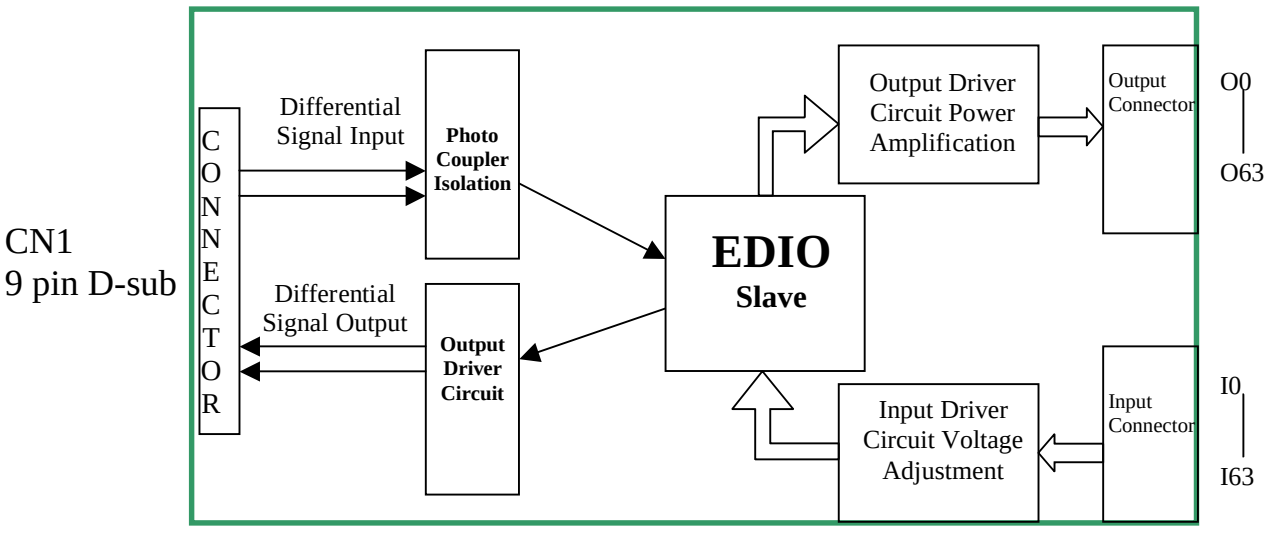


Fig. 3 EDIO-S003 functions

Chapter 2 Hardware Installation

2.1 Definition of Input and Output Pins

The input and output signal pins for the EDIO-S003 are defined in Fig. 4-1 (using the 5EHDBV terminal) and Fig. 4-2 (using the EK500V4L or 5EEHDV terminals).

O0 to O63 represent the output connections from O0 to O63 (for the 5EHDBV or 5EEHDBV terminal, DINKLE); I0 to I63 represent the input connections from O0 to O63 (for the 5EHDBV, EK500V4L, or 5EEHDBV terminal, DINKLE); The COM is a +24 or 0 voltage input provided for input and output use; E5V/EGND (CN3) is a +5 voltage input provided for ASIC use; and communication using CN1 is a D-sub connector connecting the EPCIO/EDIO control card with the EDIO-S003.

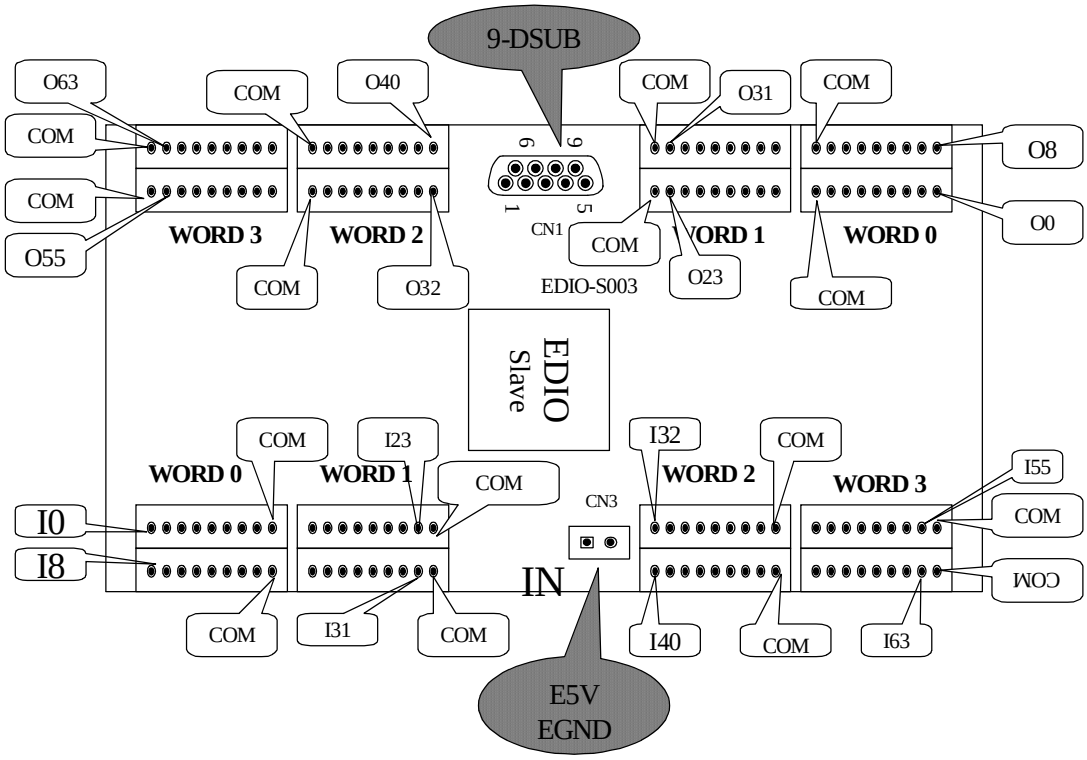


Fig. 4-1 EDIO-S003 (using the 5EHDBV terminal)

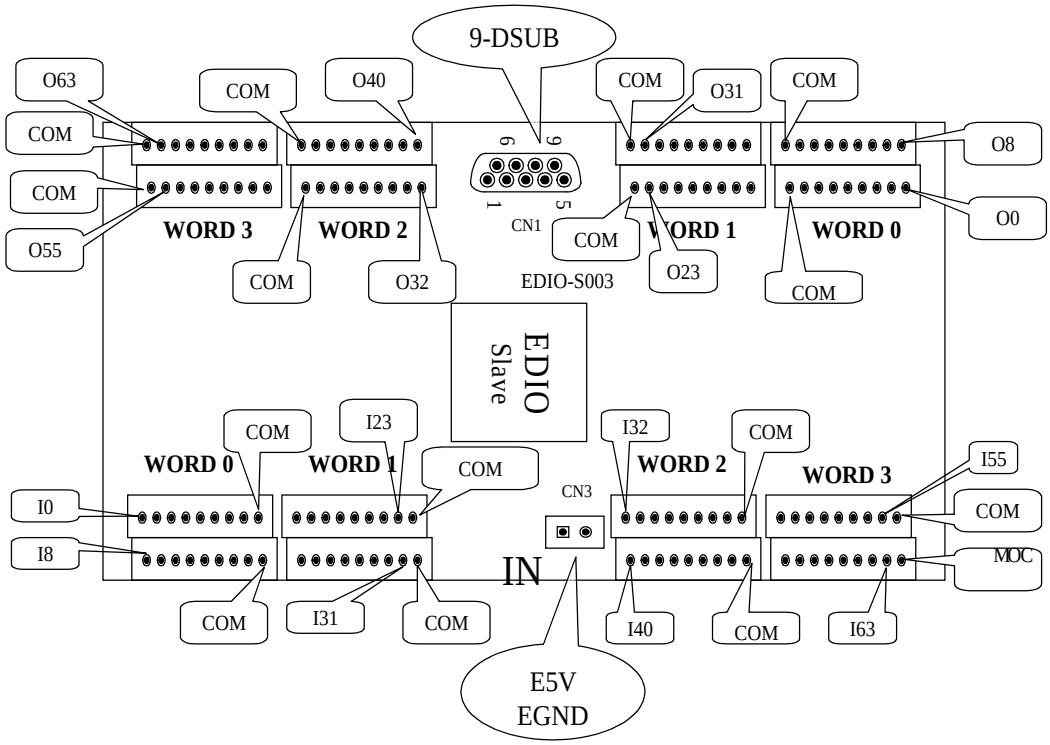


Fig. 4-2 EDIO-S003 (using the EK500V4L or 5EEHDBV terminal)

2.2 Definition of Connector Pins

CN1: Communication connector pins are defined below:

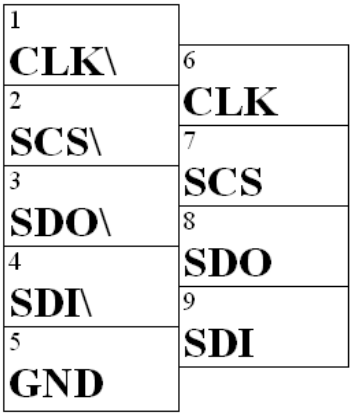


Fig. 5 CN1 Connector pin definitions

Pins 1 and 6 (CLK\, CLK) are the clock transmission differential inputs
Pins 2 and 7 (SCS\, SCS) are the module selection enabling differential inputs
Pins 3 and 8 (SDO\, SDO) are the serial data differential output signals
Pins 4 and 9 (SDI\, SDI) are the serial data differential input signals
Pin 5 (GND) is the E5V ground potential
CN1: 9 pin D-sub

CN3: Electrical supply connector pins are defined below:

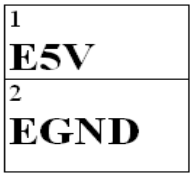


Fig. 6 CN3 connector pin definitions

Pins 1 and 2 are the +5 V electrical input
CN3: Dinkle 2-pin 5EHDV

2.3 Definition of LED Indicators

The EDIO-S003 has one green PWR (D4), one orange LNK (D6), and one red WDG (D7) indicator, which are defined below:

PWR	Green	Light on → E5V has an input, and the polarity is correct
LNK	Orange	Light Constantly on → Communication with the Master terminal is normal Flashing Light → Communication with the Master terminal is abnormal
WDG	Red	Light on → Enable WDG Light off → Disable WDG

2.4 Others

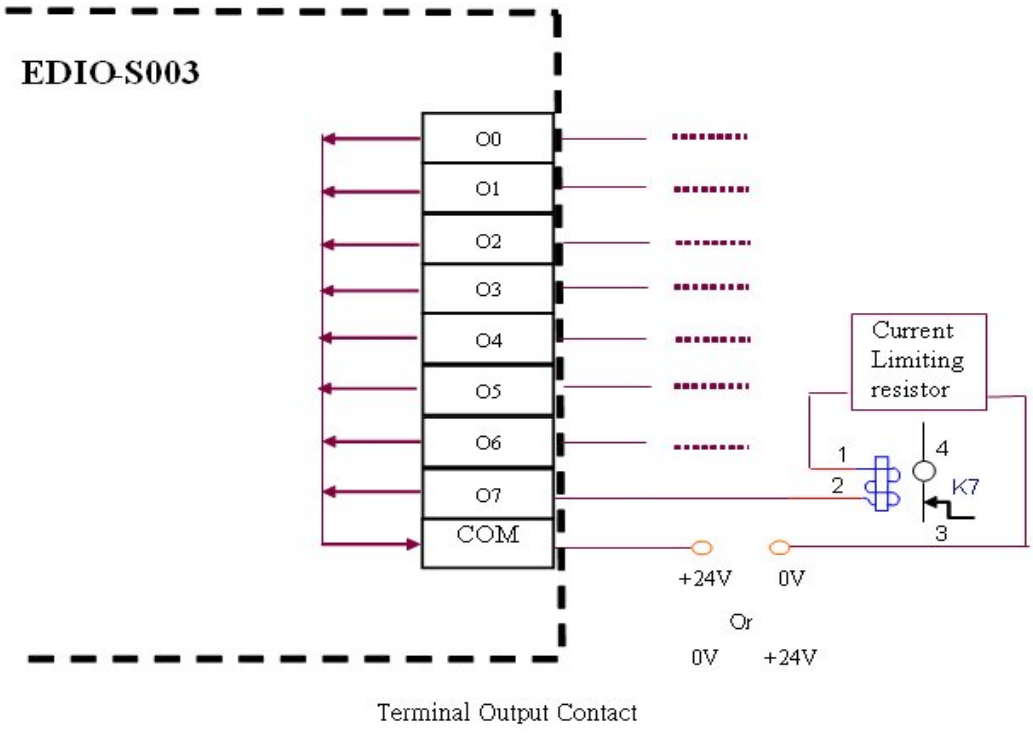
JP1—EN_WDG

----The JP1—EN_WDG short circuit can deactivate the Watchdog function (a RESET signal is not sent when communication with the Master terminal is abnormal, so RESET will never occur). If this function is required for use, the JP1—EN_WDG circuit must be opened.

---- JP1 is default set to short

Chapter 3 System Wiring

3.1 Output Wiring



[BK1]

Fig. 8 Output contact wiring

Fig. 8 depicts the EDIO-S003 output contact solenoid valve or Relay application. The EDIO-S003 provides sink or source outputs type.

When COM connects to the 24 V input, it operates in source-output type. When one terminal of the load Relay solenoid connects to input connections O0 to O7, the other terminal connects the current limiting resistor to 24V_GND (0 V). When the output is at HIGH (1), the Relay is ON and current flows from the output connections.

When COM connects to the 0 V input, it operates in sink-output type. When one terminal of the load Relay solenoid connects to input connections O0, the other terminal connects the current limiting resistor to 24 V. When output is at HIGH (1), the Relay is ON and current flows into the output connections.

3.2 Input Wiring

The input wiring for the EDIO-S003 can receive either Source or Sink inputs type.

3.2.1 Source Input

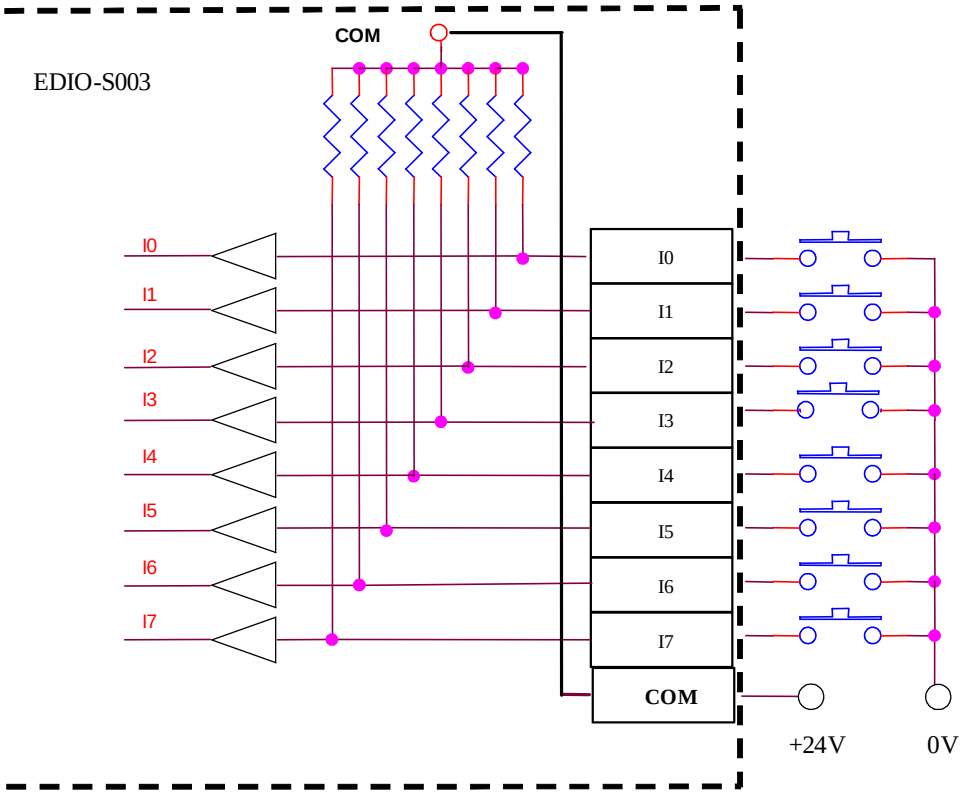


Fig. 9-1 Source-input type contact wiring

Fig. 9-1 depicts the source-input type application of the EDIO-S003 input connection wiring. When COM is connected to 24 V, it operates in source-input type and the current flows from the input connections. When one terminal of the SW Button is connected to I0-I7 and the other terminal is connected to 0 V, the control card will read the status as LOW (0); otherwise it will read the status as HIGH (1).

3.2.2 Sink Input

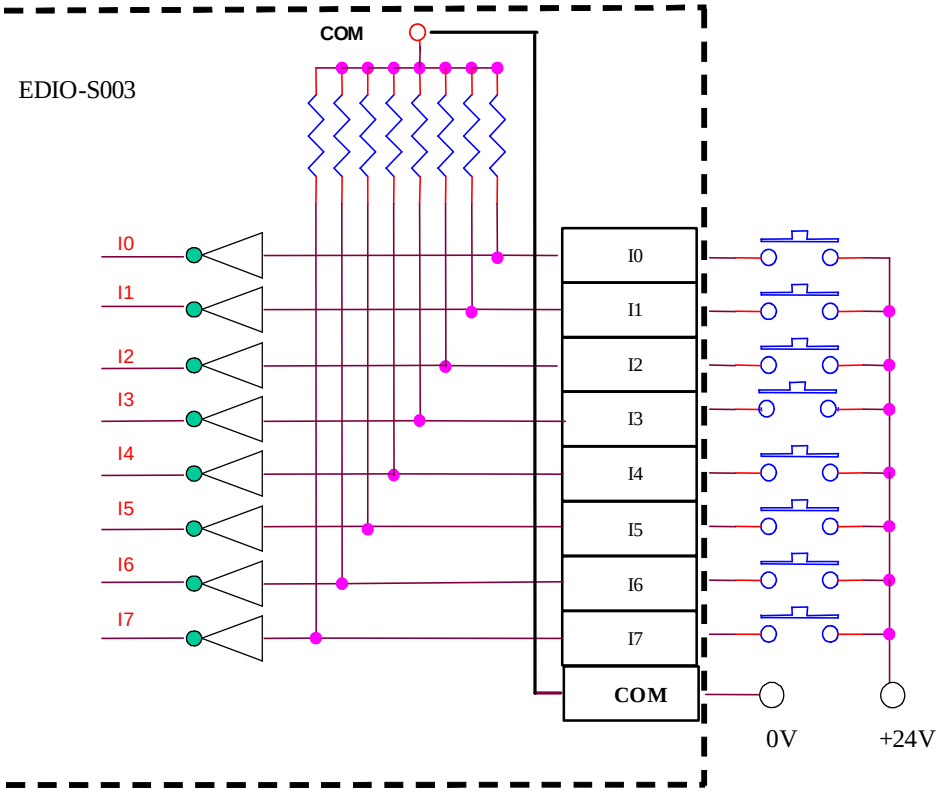


Fig. 9-2 Sink-input type contact wiring

Fig. 9-2 depicts the sink-input type application of the EDIO-S003 input connection wiring. When COM is connected to 0 V, it operates at sink-input type and current flows into the input connections. When one terminal of the SW Button is connected to I0 to I7 and the other terminal is connected to 24 V, the EPCIO/EDIO module will read the status as LOW (0); otherwise it will read the status as HIGH (1).

3.3 Transmission Distance

Test Conditions: Using the wire's product number

E146924 AWM 2464 VW-1 80C 300V 24AWG

LL101096 CSA AWM A/BI/II 80 ℃ 300V FT1 24AWG GEI TAI

9-Pin Transmission Line with an Isolated Network

A. The maximum transfer rate for a 100 m test wire is a 650 k bps ①; converted to Data Update Rate, the wire can update the 64I/64O data once approximately every 150 us
B. The maximum transfer rate for a 15 m test wire is a 3.4 M bps ②; converted to Data Update Rate, the wire can update the 64I/64O data once approximately every 30 us
C. The maximum transfer rate for a 1.5 m test wire is a 4 M bps ②; converted to Data Update Rate, the wire can update the 64I/64O data once approximately every 25 us

Note: ① bps: bits per second (HZ)

② data update rate: second/frame (one frame=96 bits)

3.4 Ground Wiring

Caution- To improve external noise resistance when grounding the wiring, use a ground terminal (J10) with a surface area greater than 3.5 mm² to connect the ground wire with the control box (the metal plate).

The position of J10 is displayed in the figure below (the red double circle):