

**ICOP-0101**  
**PC/104 48 Bit Digital I/O Module**  
**Quick Reference Manual**  
(Version 3.3)

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# Table of Contents

|           |                         |    |
|-----------|-------------------------|----|
| CHAPTER 0 | PACKING LIST            | 1  |
| CHAPTER 1 | SPECIFICATIONS          | 2  |
| CHAPTER 2 | JUMPER SETTINGS         | 4  |
| CHAPTER 3 | OPERATIONAL DESCRIPTION | 6  |
| CHAPTER 4 | I/O PORT PIN ASSIGNMENT | 10 |
| WARRANTY  |                         | 12 |



# Chapter 0

## Packing List

| FUNCTION  | FUNCTION                  | PACKAGE                                    |
|-----------|---------------------------|--|
| ICOP-0101 | 48 Bit Digital I/O Module | ICOP-0101 48 Bit Digital I/O PC/104 Module |

# Chapter 1

## Specifications

### Description

The ICOP-0101 is a 48-bit digital I/O module. The module can be used together with TTL level input /output circuitry. Its 48 bits are arranged in two 24-bit digital I/O groups. Each group emulates an 8255 PPI (programmable peripheral interface) mode 0, but has a higher driving capacity than the 8255 PPI. Each 24-bit group is divided into three 8-bit ports. A port can be configured to function as input or output.

- 48 digital I/O lines (2 groups)
- Group emulates 8225 PPI mode 0
- Buffered circuits for higher driving capacity than 8255 PPI
- Bit 0 of port C can generate an interrupt to IRQ 2, 3, 4, 5, 6, 7
- Interrupt trigger on rising / falling edge
- Output status readback
- Pin-compatible with OPTO-22 I/O module racks
- Transfer rate: 300 KB/sec. (typical)
- Digital output:
  - Logic level 0: 0.5 V max. @ 24 mA sink
  - Logic level 1: 2.0 V min. @ 15 mA source
- Digital input:
  - Logic level 0: 0.8 V max.
  - Logic level 1: 2.0 V min.

### Power requirements:

- Single 5V @ 600 mA

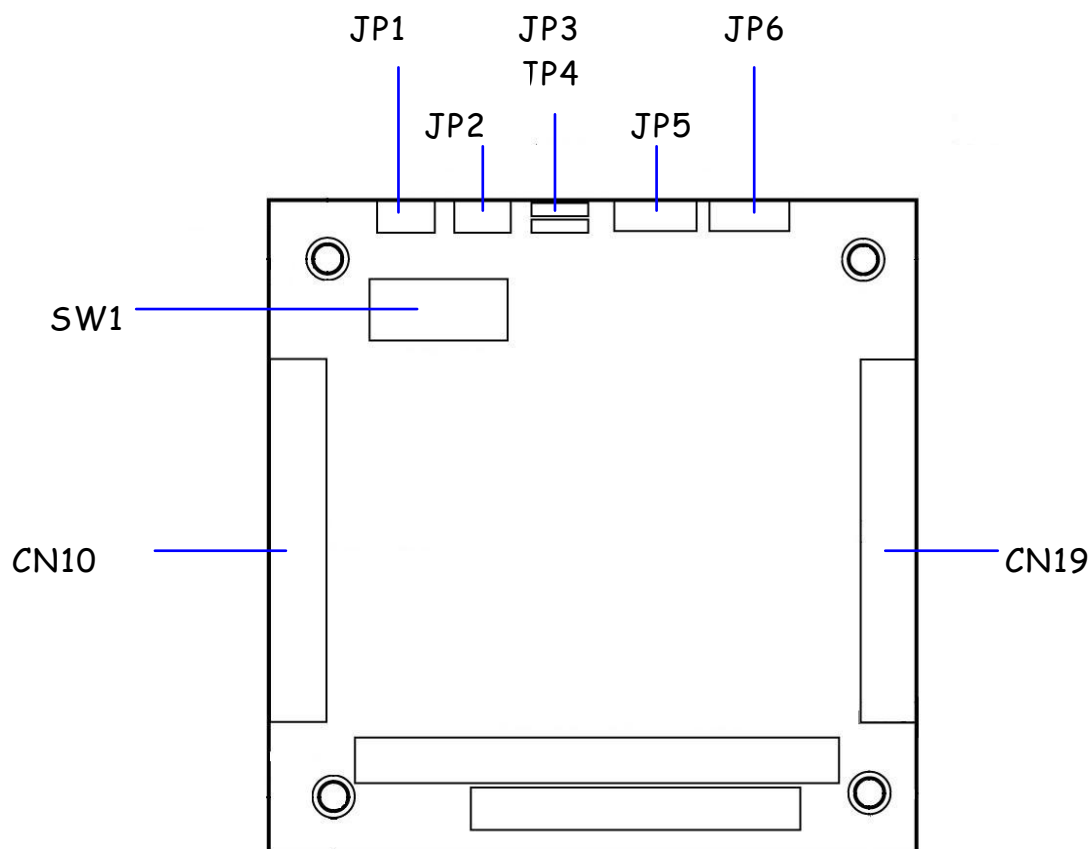
### Physical and Environmental

- Dimensions: 95 x 90 mm
- Weight: 100 gram
- Operating temperature: 0 ~ +50°C

- Storage temperature: -25 ~ +80°C
- Relative humidity: 0 ~ 90% non-condensing

## Component Location

ICOP-0101



□

JP1 ~ JP2: IRQ select

JP3 ~ JP4: IRQ Level select

JP5 ~ JP6: IRQ Mode select

SW 1: Address select

CN10: Group 1

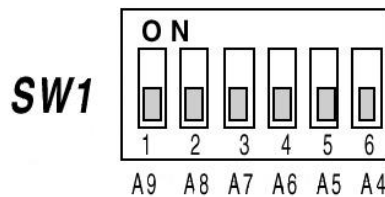
CN19: Group 2

# Chapter 2

## Jumper Setting

### Base Address Setting (SW1)

The ICOP-0101 occupies 8 consecutive I/O locations. Dip-switch SW1 sets the base address for the ICOP-0101. Be careful when selecting the base address as some settings can conflict with existing PC ports. The following table shows common examples that usually will not cause a conflict.



| Hex     | 1   | 2   | 3   | 4   | 5   | 6   |
|---------|-----|-----|-----|-----|-----|-----|
| 000-00F | ON  | ON  | ON  | ON  | ON  | ON  |
| 010-01F | ON  | ON  | ON  | ON  | ON  | OFF |
| .....   |     |     |     |     |     |     |
| 200-20F | OFF | ON  | ON  | ON  | ON  | ON  |
| 210-21F | OFF | ON  | ON  | ON  | ON  | OFF |
| .....   |     |     |     |     |     |     |
| 300-30F | OFF | OFF | ON  | ON  | ON  | ON  |
| .....   |     |     |     |     |     |     |
| 3F0-3FF | OFF | OFF | OFF | OFF | OFF | OFF |

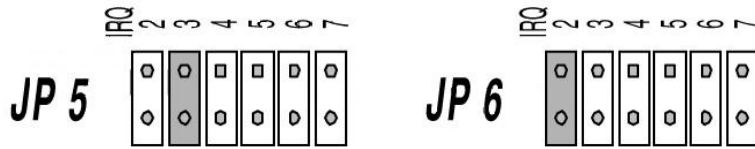
### Interrupt Setting (JP5, JP6)

Jumper 3 and 4 control the trigger edge (rising or falling) on both pin PC00 (JP3) and PC10 (JP4).

**Rising edge** : an interrupt will be generated when the the I/O line (PC00 or PC10) changes from TTL Low to TTL High.

**Falling edge** : an interrupt will be generated when the the I/O line (PC00 or PC10) changes from TTL High to TTL Low.

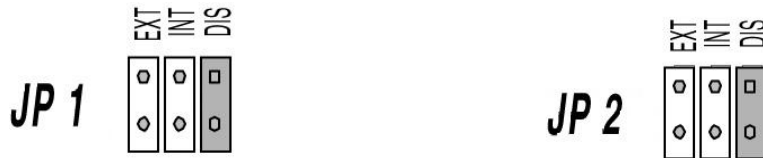
In the situation on the right the interrupt on line PC00 is set to be triggered on the rising edge. The interrupt on line PC10 is set to be triggered on the falling edge.



## Interrupt Mode (JP1, JP2)

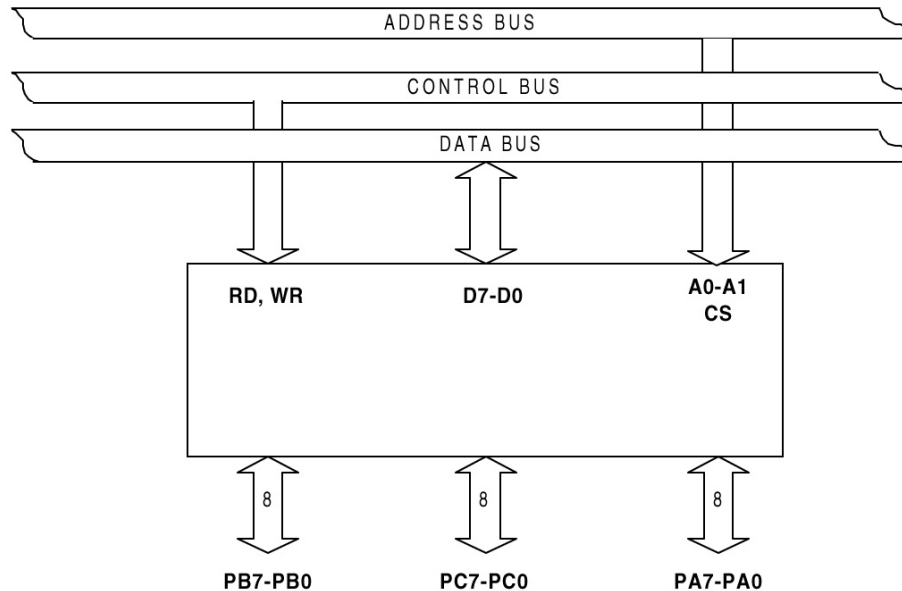
The interrupt function can be enabled (INT) or disabled (DIS) by jumper setting. A third option, a more dynamic approach, is to choose for an external device to enable/disable the interrupt function (EXT).

Although you can only make one choice for both groups, the groups interrupt function can be enabled/disabled separately when you choose for the EXT setting. Line PC04 and PC14 control the mode of interrupt for PC00 and PC10. TTL Low disables an interrupt and TTL High enables an interrupt.



# Chapter 3

## Operational Description



### Mode 0 Operation

Mode 0 operation provides simple input and output operation for each of the three ports. No handshaking is required, data is simply written to or read from a specific port.

Mode 0 Basic Functional Definitions:

- Three 8-bit ports
- Any port can be input or output
- Outputs are latched
- Inputs are not latched

## I/O port Assignments

| Location | Write                           | Read |
|----------|---------------------------------|------|
| Base+0   | A0                              | A0   |
| Base+1   | B0                              | B0   |
| Base+2   | C0                              | C0   |
| Base+3   | Mode Register for<br>A0, B0, C0 | N/A  |
| Base+4   | A1                              | A1   |
| Base+5   | B1                              | B1   |
| Base+6   | C1                              | C1   |
| Base+7   | Mode Register for<br>A1, B1, C1 | N/A  |

## 8255 Data Registers

### Base+0 Port A0 (read/write)

| Bit   | 7    | 6    | 5    | 4    | 3    | 2    | 1    | 0    |
|-------|------|------|------|------|------|------|------|------|
| Value | PA07 | PA06 | PA05 | PA04 | PA03 | PA02 | PA01 | PA00 |

### Base+1 Port B0 (read/write)

| Bit   | 7    | 6    | 5    | 4    | 3    | 2    | 1    | 0    |
|-------|------|------|------|------|------|------|------|------|
| Value | PB07 | PB06 | PB05 | PB04 | PB03 | PB02 | PB01 | PB00 |

### Base+2 Port C0 (read/write)

| Bit   | 7    | 6    | 5    | 4    | 3    | 2    | 1    | 0    |
|-------|------|------|------|------|------|------|------|------|
| Value | PC07 | PC06 | PC05 | PC04 | PC03 | PC02 | PC01 | PC00 |

**Base+4 Port A1 (read/write)**

|       |      |      |      |      |      |      |      |      |
|-------|------|------|------|------|------|------|------|------|
| Bit   | 7    | 6    | 5    | 4    | 3    | 2    | 1    | 0    |
| Value | PA17 | PA16 | PA15 | PA14 | PA13 | PA12 | PA11 | PA10 |

**Base+5 Port B1 (read/write)**

|       |      |      |      |      |      |      |      |      |
|-------|------|------|------|------|------|------|------|------|
| Bit   | 7    | 6    | 5    | 4    | 3    | 2    | 1    | 0    |
| Value | PB17 | PB16 | PB15 | PB14 | PB13 | PB12 | PB11 | PB10 |

**Base+6 Port C1 (read/write)**

|       |      |      |      |      |      |      |      |      |
|-------|------|------|------|------|------|------|------|------|
| Bit   | 7    | 6    | 5    | 4    | 3    | 2    | 1    | 0    |
| Value | PC17 | PC16 | PC15 | PC14 | PC13 | PBC2 | PC11 | PC10 |

**8255 Mode Registers****Base+3 Port A0, B0, C0 (write)**

|       |   |   |   |     |                |   |     |                |
|-------|---|---|---|-----|----------------|---|-----|----------------|
| Bit   | 7 | 6 | 5 | 4   | 3              | 2 | 1   | 0              |
| Value | 1 | 0 | 0 | PA0 | PC0<br>(upper) | 0 | PB0 | PC0<br>(lower) |

PA0=0 → Port A0 is oupput

PA0=1 → Port A0 is input

PB0=0 → Port B0 is oupput

PB0=1 → Port B0 is input

PC0=0 → Port C0 is oupput

PC0=1 → Port C0 is input

**Base+7 Port A1, B1, C1 (write)**

| Bit   | 7 | 6 | 5 | 4   | 3              | 2 | 1   | 0              |
|-------|---|---|---|-----|----------------|---|-----|----------------|
| Value | 1 | 0 | 0 | PA1 | PC1<br>(upper) | 0 | PB1 | PC1<br>(lower) |

PA1=0 → Port A1 is oupput

PA1=1 → Port A1 is input

PB1=0 → Port B1 is oupput

PB1=1 → Port B1 is input

PC1=0 → Port C1 is oupput

PC1=1 → Port C1 is input

**Note:**

After power-on or reset of the module the A0, B0, C0, A1, B1 and C1 ports are default set to input mode!

For more information, please refer to NEC 82C55 Datasheet, or e-mail to [info@icop.com.tw](mailto:info@icop.com.tw)

## Chapter 4

### I/O Port Pin Assignment

#### Group 1 (CN 10)

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | PC07        | 2   | GND         |
| 3   | PC06        | 4   | GND         |
| 5   | PC05        | 6   | GND         |
| 7   | PC04        | 8   | GND         |
| 9   | PC03        | 10  | GND         |
| 11  | PC02        | 12  | GND         |
| 13  | PC01        | 14  | GND         |
| 15  | PC00        | 16  | GND         |
| 17  | PB07        | 18  | GND         |
| 19  | PB06        | 20  | GND         |
| 21  | PB05        | 22  | GND         |
| 23  | PB04        | 24  | GND         |
| 25  | PB03        | 26  | GND         |
| 27  | PB02        | 28  | GND         |
| 29  | PB01        | 30  | GND         |
| 31  | PB00        | 32  | GND         |
| 33  | PA07        | 34  | GND         |
| 35  | PA06        | 36  | GND         |
| 37  | PA05        | 38  | GND         |
| 39  | PA04        | 40  | GND         |
| 41  | PA03        | 42  | GND         |
| 43  | PA02        | 44  | GND         |
| 45  | PA01        | 46  | GND         |
| 47  | PA00        | 48  | GND         |
| 49  | +5V         | 50  | GND         |

**Group 2 (CN 19)**

| <b>Pin</b> | <b>Description</b> | <b>Pin</b> | <b>Description</b> |
|------------|--------------------|------------|--------------------|
| 1          | PC17               | 2          | GND                |
| 3          | PC16               | 4          | GND                |
| 5          | PC15               | 6          | GND                |
| 7          | PC14               | 8          | GND                |
| 9          | PC13               | 10         | GND                |
| 11         | PC12               | 12         | GND                |
| 13         | PC11               | 14         | GND                |
| 15         | PC10               | 16         | GND                |
| 17         | PB17               | 18         | GND                |
| 19         | PB16               | 20         | GND                |
| 21         | PB15               | 22         | GND                |
| 23         | PB14               | 24         | GND                |
| 25         | PB13               | 26         | GND                |
| 27         | PB12               | 28         | GND                |
| 29         | PB11               | 30         | GND                |
| 31         | PB10               | 32         | GND                |
| 33         | PA17               | 34         | GND                |
| 35         | PA16               | 36         | GND                |
| 37         | PA15               | 38         | GND                |
| 39         | PA14               | 40         | GND                |
| 41         | PA13               | 42         | GND                |
| 43         | PA12               | 44         | GND                |
| 45         | PA11               | 46         | GND                |
| 47         | PA10               | 48         | GND                |
| 49         | +5V                | 50         | GND                |

## Warranty

This product is warranted to be in good working order for a period of one year from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster. Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party. Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.