Maintenance and operations manual

DICO MODULE
12 Relays Digital Outputs

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This product meets the **EMC** requirements of **EEC** Directive **89/336.**

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1. General

The 12 Relays Digital Outputs module is a standard unit to be mounted on DICO series MOTHERBOARD.

The module consists of 12 outputs, each of which is connected to a relay terminal. The terminals of the relays that are not joined to the outputs are connected, in groups of 6, to two separate common points.

The relays are protected by varistors. Each output has a rated current of 500 mA.

The main characteristics of the module are listed below:

- **Id. code:** 19H
- **No. of outputs:** 12
- **Type of output:** N.O. relays
- **Rated voltage:** 230 V AC
- **Rated output current:** 500 mA
- **Display:** 12 LEDs

2. Specifications

- **No. of outputs:** 12
- **Type of output:** N.O. relays
- **Rated voltage:** 230 V AC
- **Max voltage:** 250 V AC
- **Rated current:** 500 mA
- **Insulation:** 500 V for 1 minute
- **Excitation delay (max):** 5 ms
- **De-energizing delay (max):** 2 ms
- **Max output frequency:** 20 Hz
- **Operating temperature:** 0 - 60 °C
- **Relative humidity:** up to 85% without condensate
- **Dimensions:** 68.5 × 114.3 mm

3. Memory map and addressing

Each module comes with 4 jumpers J1, ..., J4 for selecting one of the four the module addresses (see DICO System documentation).

WARNING!

NEVER energize more than one addressing switch on the same module at the same time.

The module addresses are as follows:

BLOCK	8044	80C186	188	BUS PC
	base+	base+	base+	base+
#1	**00H/07H**	**00H/0FH**	**00H/07H**	**00H/07H**
#2	**08H/0FH**	**10H/1FH**	**08H/0FH**	**08H/0FH**
#3	**10H/17H**	**20H/2FH**	**10H/17H**	**10H/17H**
#4	**18H/1FH**	**30H/3FH**	**18H/1FH**	**18H/1FH**

Table 3.1

Note that the external terminal on the DICO 022, DICO 108, DICO 108/E modules depend on the slot they are fitted into (SLOT 0, 1, 2, 3) while the module addresses are related to the selected jumpers J1, ..., J4.

On the other hand, in DICO 028, the slots the modules are fitted into determine the address; therefore the SLOTS and BLOCKS correspond.

3.1 Memory map

Offset		Register function
8044,188,BUS PC	80C186	
0h	**0h**	**Port "A"(out1..out8)**
1h	**2h**	**Port "B"(out9..out12)**
2h	**4h**	**not used**
3h	**6h**	**not used**
4h	**8h**	**not used**
5h	**Ah**	**not used**
6h	**Ch**	**not used**
7h	**Eh**	**ID Code (19h)**

Table 3.1.1

Port “A”

Offset 00h indicates the state of the first 8 module relays:

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
Relay 8	**Relay 7**	**Relay 6**	**Relay 5**	**Relay 4**	**Relay 3**	**Relay 2**	**Relay 1**

Table 3.1.2

In particular:

- a bit at “1” means the relay is ON
- a bit at “0” means the relay is OFF

To set the output state writes at offset 00h as for read-out:

- a bit at “1” will turn the relay ON
- a bit at “0” will turn the relay OFF

Port “B”

Offset 01h (for 8044, 188 and BUS PC) and offset 02h (for 186) indicate the state of the last 4 module relays:

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
not used	**not used**	**not used**	**not used**	**Relay 12**	**Relay 11**	**Relay 10**	**Relay 9**

Table 3.1.3

In particular:

- a bit at “1” means the relays is ON
- a bit at “0” means the relays is OFF

Writing at offset 01h for 8044, 188 and BUS PC and at offset 02h for 186 the output state can be set, as for read-out:

- a bit at “1” will turn the relay ON
- a bit at “0” will turn the relay OFF

ID Code

Read offset 07h for 8044, 188, BUS PC and offset 0Eh for 186 to determine the module id. code 19H.

Writing at offset 07h for 8044, 188, BUS PC and offset 0Eh for 186 will have no effect.

4. Installation and connection

4.1 Installation

The 12 relays module come with unifilar connectors, located on the edge on the soldered side, which are to be fitted into the selected slot on the MOTHERBOARD.

There is no polarization or guide for plugging in the connector, therefore make sure:

a) the connector pins are inserted into the respective female fittings

b) the module is properly positioned in relation to the MOTHERBOARD by referring to the connector numbering and the reference mark, as shown below:

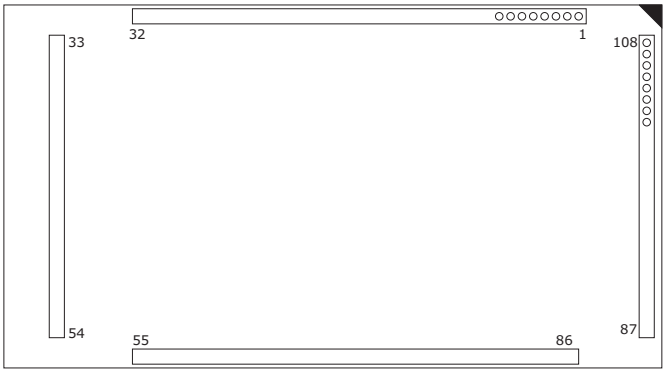

Figure 4.1.1 Module positioning.

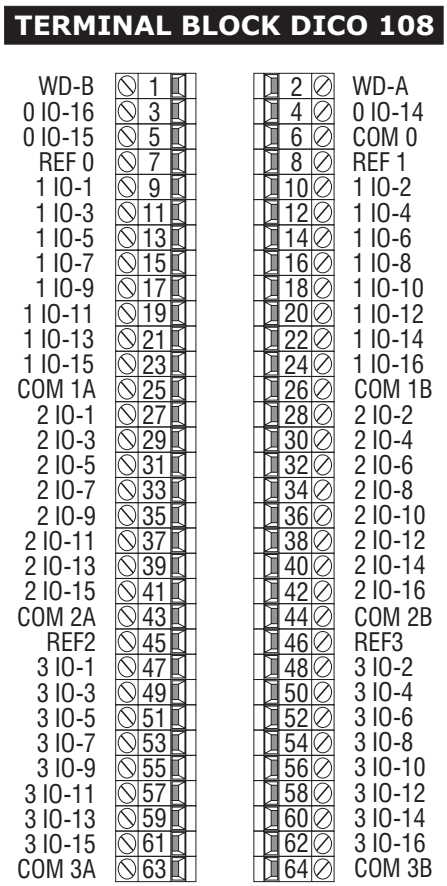

Figure 4.1.2 Terminal Block DICO 108.

TERMINAL BLOCK 028

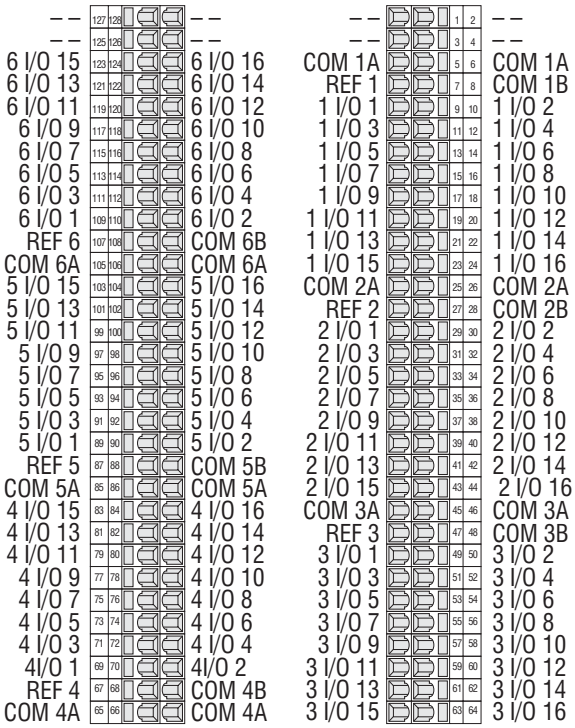

Figure 4.1.3 Terminal Block DICO 028.

All the terminals shown the figure are indicated with the following notation:

<N> IO - <n>

where:

N number of slot (shown on the MOTHERBOARD, from 1 to 3 for 64-pin terminal blocks and from 1 to 6 for 128-pin terminal blocks) the terminal in question is connected to;

n output index related to the module fitted into slot N.

The relays module uses the first 12 outputs of the terminal block to connect the respective relays.

The first 6 relays each have a terminal connected to a common point which is located on the terminal block at COMA and COMB, while the other contacts are connected to the first 6 output terminals (<N> IO-1, ..., <N> IO-6)

The other 6 relays each have a terminal connected to a common point in the terminal block at <N> IO-13, <N> IO-14, <N> IO-15, <N> IO-16, while the other contacts are connected to the first 6 output terminals (<N> IO-7, ..., <N> IO-12).

EXAMPLE:

With a 12 relays output module fitted into slot #4 of DICO 028, notation 4 IO-6 indicates the free contact of the 6th relay of that module.

REF <N> is disconnected.