TIO 16
Test Input Output 16 lines

TECHNICAL MANUAL
It is a test and/or didactis module provided of: standard I/O ABACO® interface, on 20 pins low profile connector. Size: 155x55x15 mm with mounting holes. 16 keys for digital inputs simulation. 16 LEDs for digital outputs status display. Keys and LEDs are colored to fastly recognize the connected port. One power supply LED. Wide range of demo programs for all the control cards and for each programming languages.
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SYMBOLS DESCRIPTION

In the manual could appear the following symbols:

- !: Attention: Generic danger
- ⚡: Attention: High voltage

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TIO 16 DOCUMENTATION

In the following pages are reported all the informations necessary to correctly use the Test Input Output 16 module.

GENERAL FEATURES

The TIO 16 module is a test and/or didactis card that can be used to check parallel interface functionality. The main purpose of the card is to provide the user of the necessary hardware to test the management procedures of two 8 bit I/O ports. The TIO 16 is provided with a comfortable standard connector that can be directly connected to GPC® xxx control cards. The 16 I/O lines are connected to keys for digital input simulation and to LEDs for digital outputs status display. A wide range of demo programs based on this card, explain how to manage the I/O lines.

- Standard I/O ABACO® interface, on 20 pins low profile connector.
- Size: 155x55x15 mm with mounting holes.
- 16 keys for digital inputs simulation.
- 16 LEDs for digital outputs status display.
- Keys and LEDs are colored to fastly recognize the connected port.
- One power supply LED.
- Wide range of demo programs for all the control cards and for each programming languages.
CN1 - DIGITAL I/O LINES CONNECTOR

CN1 is a 20 pins, male, 90°, low profile connector with 2.54 mm pitch. On CN1 connector are available 16 I/O digital lines and it can be used to connect the module to all external control card; all these signals follow TTL standard and I/O ABACO® standard.

**FIGURE 1: CN1 - CONNECTOR FOR DIGITAL I/O LINES**

Signals description:

- **PPI PA.n** = I/O - Port A digital line n.
- **PPI PC.n** = I/O - Port C digital line n.
- **+5 Vdc** = I - Line for +5 Vdc power supply
- **GND** = Ground signal
- **N.C.** = Not connected
**LEDS AND KEYS CONNECTIONS**

The following table reports the correspondence between the 16 LEDs and 16 keys of **TIO 16** module and the signals of CN1 connector.

<table>
<thead>
<tr>
<th>SIGNAL</th>
<th>CN1 PIN</th>
<th>LED</th>
<th>KEY</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA.0</td>
<td>2</td>
<td>LD1</td>
<td>T1</td>
</tr>
<tr>
<td>PA.1</td>
<td>1</td>
<td>LD2</td>
<td>T2</td>
</tr>
<tr>
<td>PA.2</td>
<td>4</td>
<td>LD3</td>
<td>T3</td>
</tr>
<tr>
<td>PA.3</td>
<td>3</td>
<td>LD4</td>
<td>T4</td>
</tr>
<tr>
<td>PA.4</td>
<td>6</td>
<td>LD5</td>
<td>T5</td>
</tr>
<tr>
<td>PA.5</td>
<td>5</td>
<td>LD6</td>
<td>T6</td>
</tr>
<tr>
<td>PA.6</td>
<td>8</td>
<td>LD7</td>
<td>T7</td>
</tr>
<tr>
<td>PA.7</td>
<td>7</td>
<td>LD8</td>
<td>T8</td>
</tr>
<tr>
<td>PC.0</td>
<td>15</td>
<td>LD9</td>
<td>T9</td>
</tr>
<tr>
<td>PC.1</td>
<td>16</td>
<td>LD10</td>
<td>T10</td>
</tr>
<tr>
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<td>13</td>
<td>LD11</td>
<td>T11</td>
</tr>
<tr>
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<td>T12</td>
</tr>
<tr>
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<td>11</td>
<td>LD13</td>
<td>T13</td>
</tr>
<tr>
<td>PC.5</td>
<td>12</td>
<td>LD14</td>
<td>T14</td>
</tr>
<tr>
<td>PC.6</td>
<td>9</td>
<td>LD15</td>
<td>T15</td>
</tr>
<tr>
<td>PC.7</td>
<td>10</td>
<td>LD16</td>
<td>T16</td>
</tr>
</tbody>
</table>

*Figure 2: Table for LEDs and Keys Connections*
COMPONENTS LIST

C1 - 100 KpF multi layered capacitor.
C2 - 22 µF 6,3V tantalum capacitor.
R1, R2, R3, R4, R5, R6, R7, R8 - 680 Ω, 1/4 W resistor.
R9, R10, R11, R12, R13, R14, R15, R16 - 470 Ω, 1/4 W resistor.
R17 - 1 KΩ, 1/4 W resistor.
LD1, LD2, LD3, LD4, LD5, LD6, LD7, LD8 - 3 or 5 mm red LED.
LD9, LD10, LD11, LD12 - 3 or 5 mm yellow LED.
LD13, LD14, LD15, LD16 - 3 or 5 mm green LED.
LD17 - 3 or 5 mm red LED.
P1, P2, P3, P4, P5, P6, P7, P8 - Normally open push button red key.
P9, P10, P11, P12 - Normally open push button yellow key.
P13, P14, P15, P16 - Normally open push button green key.
P1 - 0 Ω resistor.
CN1 - 20 pins, vertical, male, low profile connector.
FIGURE 3: TIO 16 ELECTRIC DIAGRAM