

DI001 Octal Digital I/O Device

8 Channels, 5 V Sinking/Sourcing, Individually configurable

Product Description

The DI001 device is a versatile and easy-to-use octal, bidirectional digital I/O module. Every of the eight channels can individually be configured for input or output.

Custom timers, counters, pulse generators, logic analyzers, functional tests or digital communication protocols like the widespread SPI bus system can easily be implemented. Digital control loops and custom serial or parallel protocols can be realized in software and modifications are done in a much more comfortable way compared to equivalent hardware solutions.

The versatility and the straightforward usability make the device ideal for industrial applications as well as for scientific experiments.

Features

- ▶ Connected to 10/100BASE-TX Ethernet over RJ45 jack
- ▶ Eight independent general purpose I/O channels
- ▶ Increased voltage input hysteresis
- ▶ Internal pull-up resistors
- ▶ Nominal output impedance of $47\ \Omega$
- ▶ Sink and source capability of up to 20 mA
- ▶ Every channels is individually configurable for input or output
- ▶ Short-circuit and continuous over-voltage protection of up to $\pm 30\text{V}$
- ▶ Internal +5V / 200 mA fused power supply for arbitrary use
- ▶ Surveillance of all voltages and board temperature
- ▶ Powered via PoE (Power over Ethernet)
- ▶ Idle power consumption of less than 1.2W
- ▶ Compatible with all modern Ethernet standards
- ▶ Drivers for Microsoft® Visual C++™, MathWorks® MATLAB™, Python and National Instruments® LabVIEW™ programming environment

Transducer Connection

The figure on the next page shows the recommended pin configuration of the DI001 device. All I/O channels (D1 to D8) referenced to GND are

protected against continuous short-circuit and over-voltage of up to $\pm 30\text{V}$. Clamping diodes to ground and to +5V protect the device from damage. Only one channel should be in an over-voltage condition at a time. The nominal output impedance of each channel is $47\ \Omega$ at room temperature. In case of increased ambient temperature or in short-circuit or over-voltage condition the impedance is subject to rise. After some seconds the impedance automatically returns to its nominal level when the fault condition vanishes.

When a channel is configured for input, an internal pull-up resistor of $100\text{k}\Omega$ is internally connected to +5V which allows direct connection of open-collector signals or manual switches to the DI001 device. Moreover unused inputs may be left unconnected and reliably show logic high.

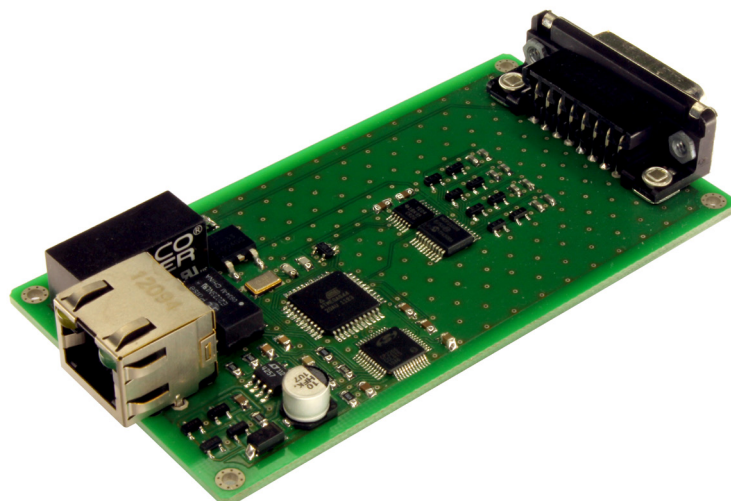
For improved noise immunity in harsh environments and in order to avoid switch bouncing the DI001 device uses larger hysteresis than the usual TTL / CMOS specifications. For logic low the input voltage should not exceed +1.0V and the logic high state is detected when the input voltage is above +4.0V. When a channel is configured as output, it is able to sink and source current up to 20 mA.

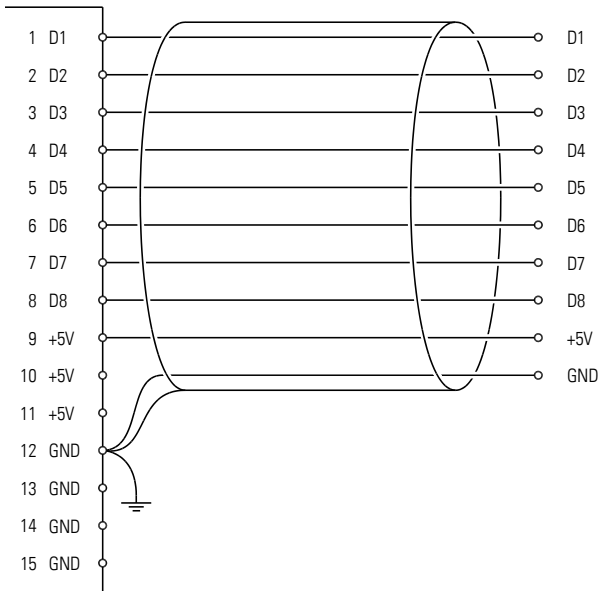
Gold-plated connectors ensure reliable and low impedance transducer connectivity. Do not connect or disconnect wires unless power has been switched off in order not to endanger the sensitive electronics.

+5V Power Supply

The DI001 device allows the operator to use the internal +5V power supply (pins 9, 10 and 11) for arbitrary applications. The ground signal pins 12, 13, 14 and 15 serve as reference for the power supply and the I/O channels. No external power supply is needed to serve attached analog components like sensors or digital components like light barriers or threshold switches.

The +5V power supply can source current up to 200 mA, sink current up to 100 mA and is over-current protected by the means of a automatically resetting fuse.





Shielding and Grounding

For lowest error-proneness the transducers should be connected to the DIO01 device by using a single shielded cable with multiple leads or multiple coaxial cables. Since pins 12 to 15 represent the ground signal of the printed circuit board and are connected internally, any shield must be connected to one of these pins.

Physical Specifications

Dimensions: 100 mm x 54 mm x 18 mm (3.94 in x 2.13 in x 0.71 in)

Mounting: 4 holes \varnothing 2.2 mm (0.087 in) at a distance of 94 mm x 48 mm (3.70 in x 1.89 in), intended for the use with metric M2 screws

PCB operating temperature: 0 °C to 70 °C (32 °F to 158 °F), ambient operating temperature depends on the case and its thermal isolation

Weight: 42 g (1.48 oz)

This product is not authorized for use as a critical component in life support devices or systems without the express written approval.