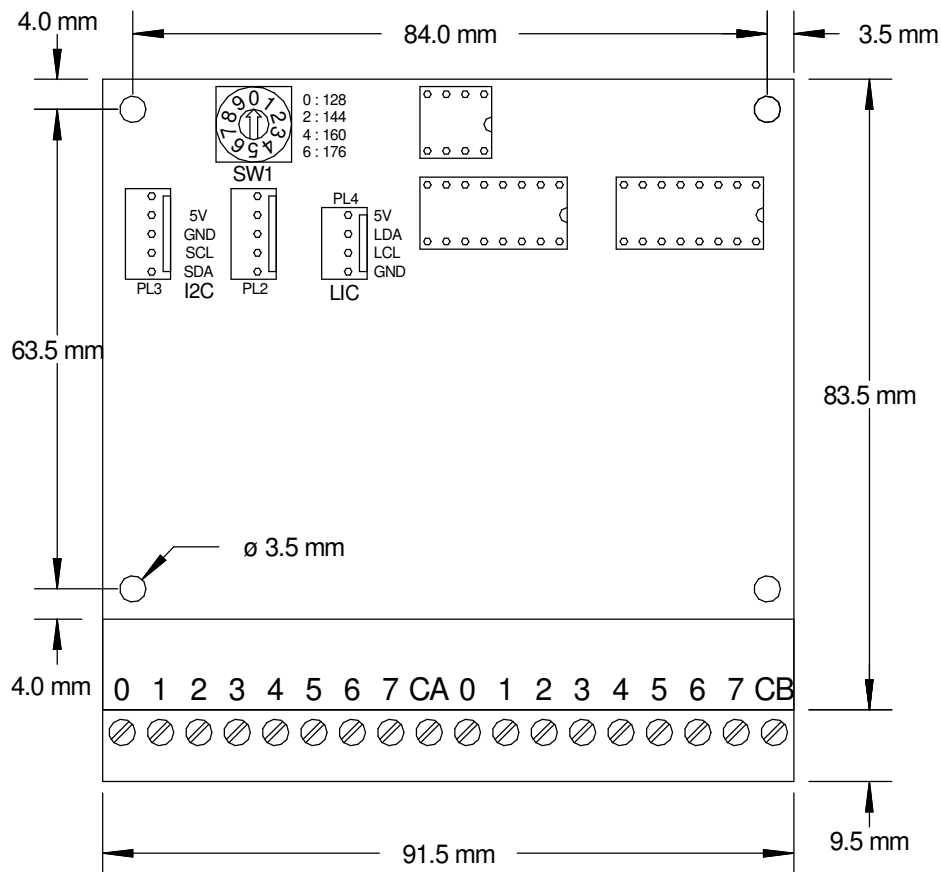# Digital Input Card Datasheet

Introduction

The 16-channel opto-isolated digital input card reads inputs at a nominal 24V DC. The input circuit detects both pull-up and pull-down signals. The inputs are arranged in two banks of eight, each with a separate common terminal. Pull-up and pull-down signals may be mixed on the same card by separating the signals between the two banks. LED's are provided for a visual indication of input state.

The unit links to the I^{2}C Bus connector on a VM-1 Application Board. Up to four of these cards may be attached to the bus (depending on how many other digital-channel-based cards are also used). Another four may be attached if appropriate driver devices are substituted. See *More than one card* below for more information.

Copyright 2002-2006 Micro-Robotics Ltd
The Old Maltings
135 Ditton Walk
Cambridge
CB5 8QB

tel: +44 (0) 1223 523100
fax: +44 (0) 1223 524242
sales@microrobotics.co.uk
www.microrobotics.co.uk

Unpacking

The package should contain:

- 1 off Digital Input Card
- 1 off 150mm 5 way daisy chain cable
- This set of instructions

Installation

- Mount the card using the four M3 screw holes on the PCB. Note that the mounting pillars under the board should be less than 7mm diameter. Each input and common terminal has a spark gap. These are intended to dissipate excess energy from input transients in abnormal conditions. The spark gaps are earthed to the front two mounting holes on the card. If this facility is to be used then these mounting holes should be connected to the equipment chassis.
- Plug the 5-way cable between the card and the I^2C Bus connector on the Application Board - you may need to refer to the manual for the controller to find the correct connector.
- Check that the rotary switch on the card is in the "0" position. This puts the 16 inputs onto digital channels 128 - 143. The other switch positions give channel groupings as printed on the card and in the table.
- Turn the power supply on and get to the '-->' prompt in the controller. Refer to the Tutorial Guide if you have any difficulties with this.
- The command `PRINT net` may be used to confirm that the card is present on the I^2C Bus. See 'I^2C Bus' in the Venom-SC Help File for an explanation of the print output.

Use only the cables supplied by Micro-Robotics Ltd for the I^2C Bus connections unless you make sure that the total length of the I^2C Bus does not exceed 2 metres and that the capacitance of each signal line in the bus is less than 400 pF in total.

This card is fitted with a socket for P82B715 IC, allowing the I^2C Bus to be extended to 20m. In order to use this facility you will need to plug a P82B715 into the eight way socket and drive the card from a 'long' II^2C Bus via the four way connector. Also see *More than one card* below.

Input Connections

Connections are made to the 16 inputs on the card via plug-in screw terminals on 5.08mm pitch. Each bank of eight inputs is separately isolated with its own common terminal (labelled 'CA' and 'CB'). The input terminals are labelled 0 - 7 on each bank. The bank of terminals to the left of the connector (set A) is associated with the lower eight channels.

Driving an input terminal 24V either positively or negatively relative to its common terminal will cause the input to be asserted, and the indicator LED to light up.

Reading the Inputs

The command below will create an object that represents the first input on the card. This need only be done once, normally in the init procedure.

```
-->MAKE input_zero Digital (128)
```

The following command will print out the status of the input.

```
-->PRINT input_zero
OFF-->
```

For some applications it may be useful to read several inputs at the same instant. It is possible to do this by defining some or all of the 8 inputs in a bank as being one digital port. For more detailed information about digital inputs, see 'Digital' in the Venom-SC Help File.

Trouble Shooting

If the card does not seem to be working, first check all the connections. Make sure that you are using the correct input voltage level. Check that the switch on the card is set correctly. If the card still does not work then contact your supplier.

More Than One Card

If you wish to connect more that one Digital Input Card the I^2C Bus cables can be 'daisy-chained' using the dual I^2C Bus connectors on the card. The switch setting determines which set of 16 Digital channels the card responds to, as in the table.

In order to gain an extra 64 channels, two PCF8574A chips may be substituted for the PCF8574 devices supplied as standard. Using 'A' devices adds 64 to the channel numbers selected by the switch.
Note that other cards may also use digital channels in the range 128 - 191. If you are using other cards that map onto digital channels, then make sure the switch is set so as to avoid collisions.

If you are using the Long I^2C Bus facility then additional cards should be plugged in either to the normal I^2C Bus connector on the controller, or daisy chained off the remote card using the normal I^2C Bus connectors.

Channel selection switch

The channel ranges selected by each setting of the switch are given below.

0: 128 - 143   2: 144 - 159   4: 160 - 175   6: 176 - 191

Specification

Current drawn from I2C bus	10mA
Capacitance added to I2C bus	10pF
Input Voltage	Nom 24V (16V - 35V)*
Input Resistance	Nom 5KΩ
Isolation voltage	Max 1KV
Operating Temperature	0 - 70℃

*The 4K7 input resistor packs may be replaced in order to alter the input voltage range. E.g. for nominal 12V inputs use 2K2 resistor packs.