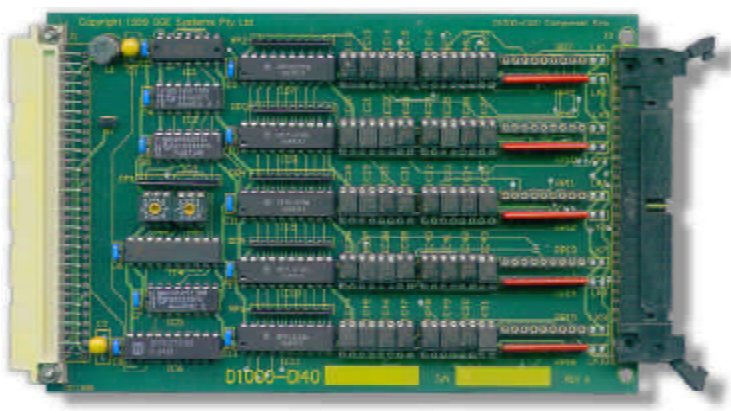


D1000-DI40**40 Line Opto-Isolated Digital Input Card
for
IEEE1000 based Eurocard Systems****Rev A
8th April 1999**

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Contents

Introduction	3
Bus Interface	3
Input Stage	4
Setting the I/O Address	6

Tables

Table 1: Input Voltage / Resistance Value	5
Table 2: I/O Address Map	6
Table 3: Connector J2 Pinout	8

Figures

Figure 1: D1000-DI40 Input Stage	4
Figure 2: D1000-DI40 Input Wiring Options	4
Figure 3: Input Resistance Value Calculation.	5
Figure 4: Component Placement Diagram	7

Appendix

Component Placement	7
Input Connector Pin Assignments	8
Specifications	9
Ordering Information	9

Introduction

The D1000-DI40 provides 40 lines of opto-isolated digital input for Eurocard systems based on the IEEE1000 format. With on-board electrical isolation, the D1000-DI40 provides a direct "Bus to Output" functionality eliminating the need for external signal isolation and conditioning.

Capabilities of the D1000-DI40 include the sensing of DC signals of either polarity. This allows positively grounded or negatively grounded signals to be applied.

Inputs are five groups of eight lines with each group independently configurable for voltage rail and common rail connection.

Card configuration is provided by numbered rotary hex encoding switches, simply 'dial' the card's I/O address. This is particularly useful for systems with multiple I/O cards.

Targeted for industrial applications, the D1000-DI40 has CMOS logic devices and optoelectronic devices rated for operation over an extended temperature range.

The D1000-DI40 is a companion to the D1000-DO40, a 40 line opto-isolated digital output card and when combined with the EC586, a compatible IEEE1000 processor card, powerful and reliable Eurocard packaged solutions for industrial applications are realised. Systems with large I/O counts are possible with multi-slot backplanes.

Features of the D1000-DI40 include:

- **40 opto-isolated digital input**
- **±DC sensing**
- **5,000Vac optical isolation**
- **Low power CMOS construction**
- **Single +5V supply**
- **Compact Eurocard format**

Bus Interface

The card is configured as five groups of eight lines. Each group occupies one I/O location. An active level at the input causes current to flow through the input LED and switches the opto transistor on. This is read as a logic 0 on the system bus.

Input Stage

Each of the five groups of eight lines is electrically independent. Each input line allows voltages of differing polarity (but of the same magnitude within the group) to be connected. Dry contact switches may also be connected

Users can derive a dry contact voltage source from the system's +5V supply. Jumpers are provided for the +5V and GND rails. Figure 1 shows a group input stage, figure 2 illustrates the wiring options.

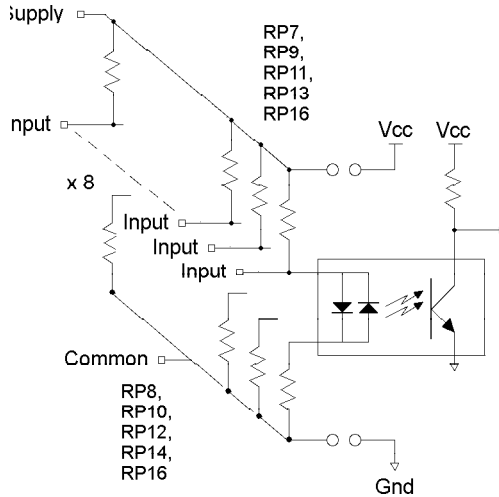


Figure 1: D1000-DI40 Input Stage

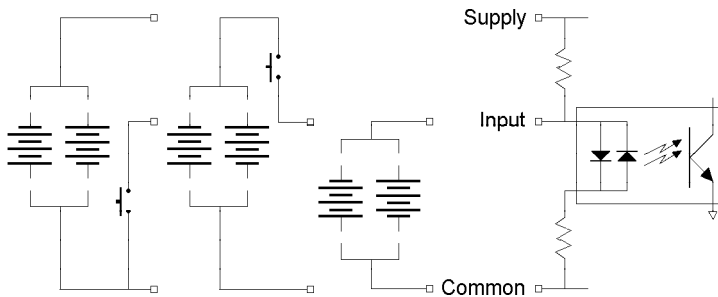


Figure 2: D1000-DI40 Input Wiring Options

The D1000-DI40 is factory fitted with 4K7 input limiting resistors for 24V dc input levels. The resistors are in a single-in-line (SIL) package which is socketed for easy replacement. They are designated RP8, RP10, RP12, RP14 and RP16 on the printed circuit board. Users may fit alternate values for other input ranges.

Figure 3 shows the relationship for calculating the resistance value and table 1 shows resistance values for various voltage levels. The input current should be 5mA. Note: For input voltages greater than 24V, SIL resistors of at least 250mW power rating are necessary. Contact our sales office for details.

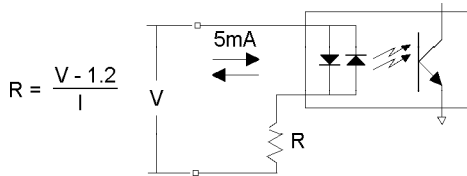


Figure 3: Input Resistance Value Calculation.

Voltage	Resistor Value
5	680R
12	2K2
15	2K7
24	4K7
48	10K *

* ¼ watt SIL resistors

Table 1: Input Voltage / Resistance Value

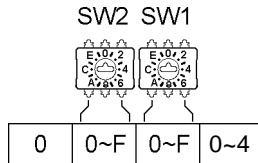
Sockets are provided for further resistor packs, these are designated RP7, RP9, RP11, RP13 and RP15. Systems configurators may find it appropriate to have all the opto-couplers conducting in the normal state and have an event "short-out" the opto-coupler.

Alternatively, for a normally closed contact, the event would remove the "short" allowing the opto-coupler to conduct. Resistance values for RP7 to RP15 should be selected to limit the opto-coupler's input current to 5mA.

Posts are provided on the D1000-DI40 for jumper connecting the systems Vcc and Gnd power rails to a group's supply and common lines. This is useful for localised switch contact sensing. Links LK1, LK3, LK5, LK7 and LK9 connect Vcc to groups A, B, C, D and E respectively. Links LK2, LK4, LK6, LK8 and LK10 connect Gnd.

Setting the I/O Address

The D1000-DI40 is a polled, read-only, peripheral card occupying eight locations in the I/O address space of which five are used. The card's base address is set by two hex-encoded rotary switches. The base address can be in the range 0000h to 0FF0h on a 16-byte boundary. The table below shows the association between the digital output card and the digital input card.



Base	Port	Card
+0	A data	D1000-DI40 Input Card Read Only
+1	B data	
+2	C data	
+3	D data	
+4	E data	
+5		
+6		
+7		
+8	A data	D1000-DI40 Output Card Write Only
+9	B data	
+A	C data	
+B	D data	
+C	E data	
+D		
+E		
+F		

Table 2: I/O Address Map

Please note that while the card has 12-bit address decoding some processor cards, particularly PC compatible types, may have 10-bit I/O addressing. This limits the highest base address to 3F0h. Under these circumstances aliasing of the base address occurs. ie address 3F0h will also be seen at BF0h and FF0h.

Component Placement

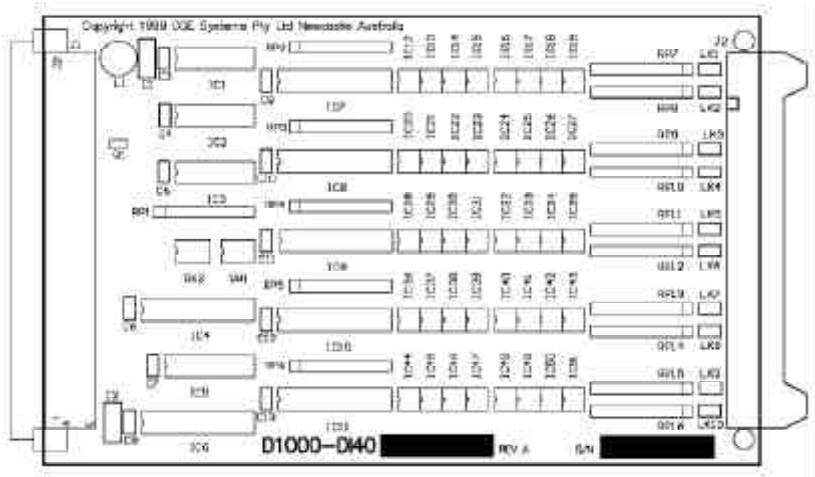


Figure 4: Component Placement Diagram

Input Connector Pin Assignments

Table 3 shows input connector J2 pinout and associated register bits. J2 is a 50 pin IDC header with ejector/latch. The pin mapping is similar to the D1000-DO40 digital output card.

Base	Bit	Signal	Pin	Pin	Signal	Bit	Base
+0	0	PA0	1	2	PA1	1	+0
	2	PA2	3	4	PA3	3	
	4	PA4	5	6	PA5	5	
	6	PA6	7	8	PA7	7	
		SUPPLY A	9	10	COMMON A		
+1	0	PB0	11	12	PB1	0	+1
	2	PB2	13	14	PB3	2	
	4	PB4	15	16	PB5	4	
	6	PB6	17	18	PB7	6	
		SUPPLY B	19	20	COMMON B		
+2	0	PC0	21	22	PC1	0	+2
	2	PC2	23	24	PC3	2	
	4	PC4	25	26	PC5	4	
	6	PC6	27	28	PC7	6	
		SUPPLY C	29	30	COMMON C		
+3	0	PD0	31	32	PD1	0	+3
	2	PD2	33	34	PD3	2	
	4	PD4	35	36	PD5	4	
	6	PD6	37	38	PD7	6	
		SUPPLY D	39	40	COMMON D		
+4	0	PE0	41	42	PE1	0	+4
	2	PE2	43	44	PE3	2	
	4	PE4	45	46	PE5	4	
	6	PE6	47	48	PE7	6	
		SUPPLY E	49	50	COMMON E		

Table 3: Connector J2 Pinout

Specifications

Specifications	
Bus Interface:	8 bit, IEEE1000 compliant
I/O Space:	Occupies 8 I/O locations within 16-byte boundary, read only
Input:	24Vdc nominal
Optical Isolation:	5,000Vrms for 1 minute
Switching Time:	
Turn On:	100 µSec
Turn Off:	100 µSec
Power Requirements:	+5Vdc
All Inputs Open:	180mA
All Inputs On:	195mA
Temperature:	
Operating:	0 to +70°C *
Storage:	-55 to +100°C
Humidity:	5% to 95% non condensing
Dimensions:	180 x 100 x 12mm (7.1 x 4 x 0.5") overall
Weight:	130g approx.

** Absolute Maximum Rating in free air. Caution is advised where extended temperature operation is considered. Thermal management strategies must ensure semiconductor components are not exposed to conditions beyond their capability. Product reliability may be compromised.*

Ordering Information

Part Number	Description
D1000-DI40	40 Line Opto-Isolated Input Card
D1000-DI40-TM	Technical Manual