# PCI08

**8-bit ISA bus add-on board with 8 opto-isolated digital inputs and 8 opto-isolated digital outputs**

# Preface

### Packing List

This product is shipped as follows:

- Board
- User Manual
- Utility Disk
- PCbus Library Datasheet

If any of the above appear to be missing, please telephone Arcom on 01223 411 200.

### Utility Disk

This product is shipped with a Utility disk which contains:

- PCbus Library Datasheet
- Source Code for all PCbus I/O boards
- A test program called EXAMP-01.EXE

### Handling

This board contains CMOS devices which could be damaged in the event of static electricity being discharged through them. At all times please observe anti-static precautions when handling the board, and always unpack and install the board in an anti-static working area.

Please ensure that should a board need to be returned to Arcom, it is adequately packed and if a battery is fitted, that it is isolated.

# Product Information

Full information about other Arcom products is available via the Fax on Demand System, (Telephone numbers are listed below (FoD)), or by contacting our Website at: www.arcom.co.uk.

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# Introduction

The PCIO8 is an 8-bit ISA bus add-on board providing 8 opto-isolated digital inputs an 8 opto-isolated digital outputs. Each input channel may be individually driven by an external source or from the on-board isolated +24V supply. The outputs are configured as open collector drivers with a capability to sink up to 500mA for channels 0 to 5 and up to 300mA for channels 6 and 7.

| | |
|---|---|
| PCIO8 | Board inputs driven by external power source |
| PCIO8-DC/DC | Board fitted with +24V isolated DC/DC converter to provide excitation supply |

## Features

- CE compliant design
- 8 opto-isolated digital inputs
- 8 opto-isolated digital outputs
- Output channels 0 to 5 sink up to 500mA
  6 and 7 sink up to 300mA
- Occupies 4 bytes of address space
- Optional DC-DC converter
- RC filter providing 10mS of debounce
- Link selectable base address
- Board access LED
- Operating temperature range, +5°C to 55°C
- Power Consumption PCIO8 150mA
  PCIO8-DC/DC 500mA
- MTBF: 559,000 PCIO8
  148,000 PCIO8-DC/DC

# Getting Started

- Switch off PC
- Install board in supplied configuration
- Switch on PC
- Run EXAMP-01.EXE (supplied on the utility disk)
- An access LED should flash. If not check default link configuration.

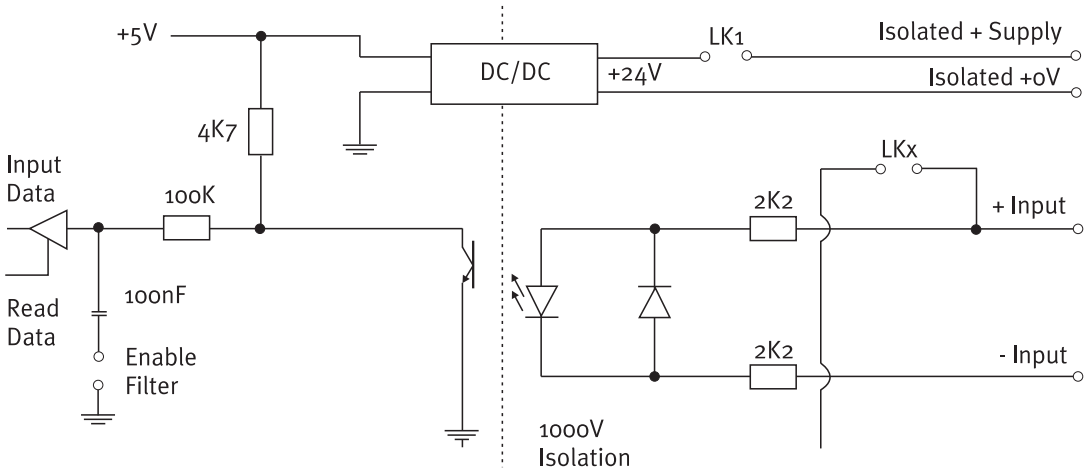
# Operation

## Reading or Writing to the Boards

Control of the PCI08 is achieved by writing to a data register to read or write the required data. Each time the board is accessed the red LED will flash momentarily.

## Opto-isolated Inputs

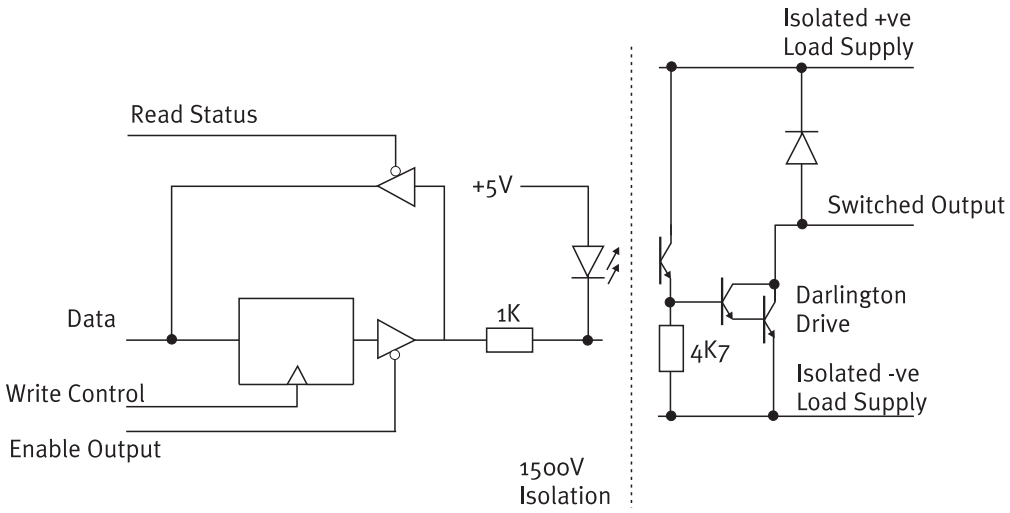
When an input channel is switched ON the value read by the host will be a ‘0’. Each input is configured as follows:




## Output Channels

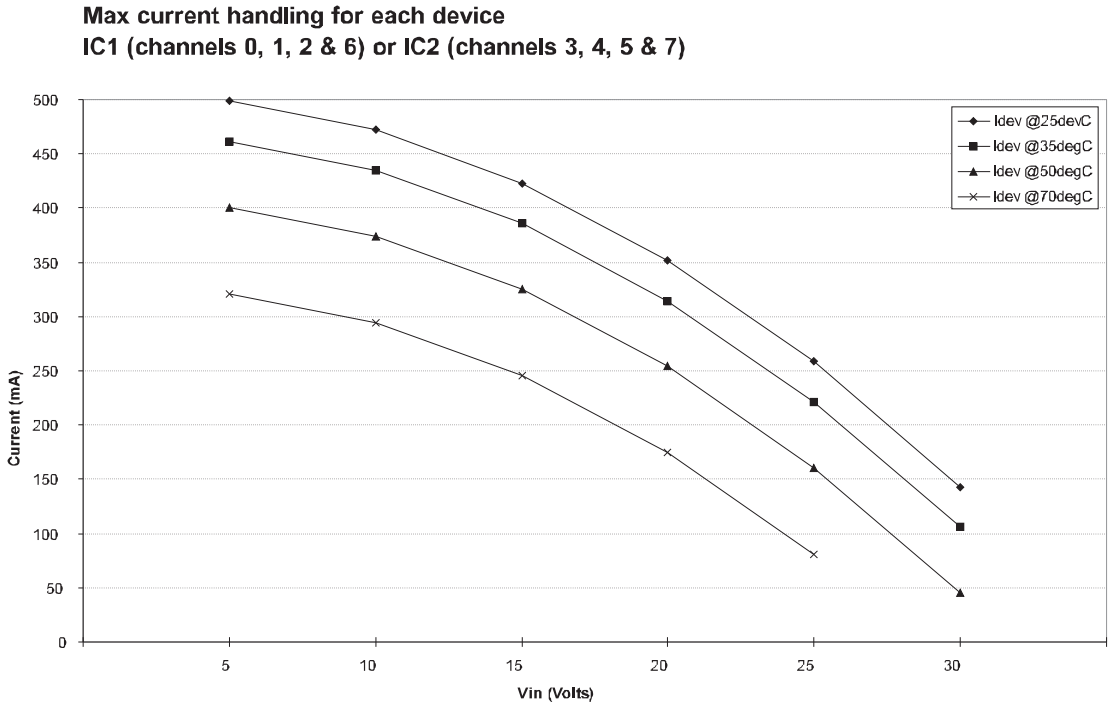
Each output channel is switched ON by writing a ‘0’ to the channel control register. The Darlington output will be sinking current when switched ON.

On power-up or when reset is asserted, all the outputs are disabled and switched OFF. If the power on the host system is switched off at any time all the outputs will be switched OFF. The outputs are enabled by writing to base +2 address.



## Power dissipation and current handling for each device IC1 and IC2

In order to prevent damage to the output darlington drivers, the **total** power dissipation for IC1 (Output groups 0, 1, 2 & 6) and IC2 (Output groups 3, 4, 5 & 7) must be below 760mW @ 25°C. This must be de-rated at 6mW/°C above 25°C. The following chart gives a guideline to maximum current handling for each device, and how this is derated with increased temperature.




Note- Output channels 0 to 5 are capable of sinking up to 500mA. Channels 6 and 7 will sink up to 300mA.

For further information regarding the output drive capability of this product, please refer to Arcom Product Notice No. 32 which may be found on the Arcom Website, or by using the Arcom Fax on Demand system.

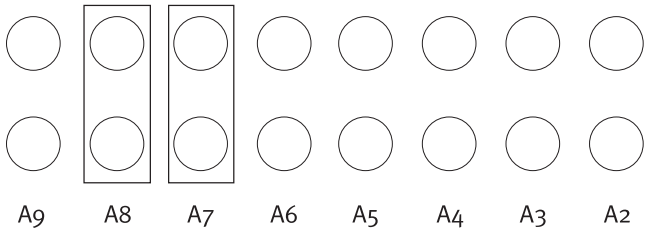
# I/O Map

## I/O Functions Registers

| Address Offset | Function | Read/Write | Register Description |
|---|---|---|---|
| 00 | Outputs | Write | Outputs |
| 00 | Outputs | Read | Read Output Control register |
| 01 | Inputs | Read | Inputs |
| 02 | Output Enable | Write | Write bit '0' for output enable (1), disable (0) |

# Links

The base address of the board is set using LK11. Inserting a jumper selects a '1'.




default address = 180h

## Power Supply Selection

LK1 fitted Use the on-board supply

**Warning**: *Ensure LK1 is removed if using an external supply.*

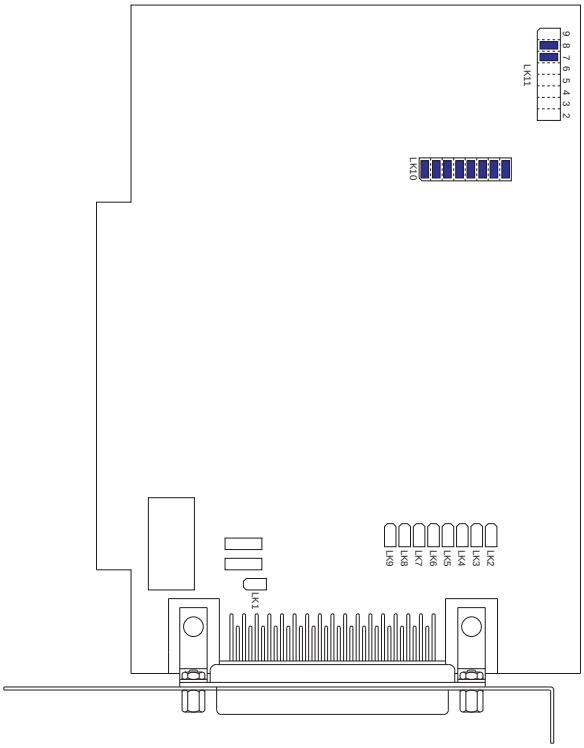
## LK2-9

These connect the positive input of each channel to the positive side of the common isolated supply by inserting a jumper.

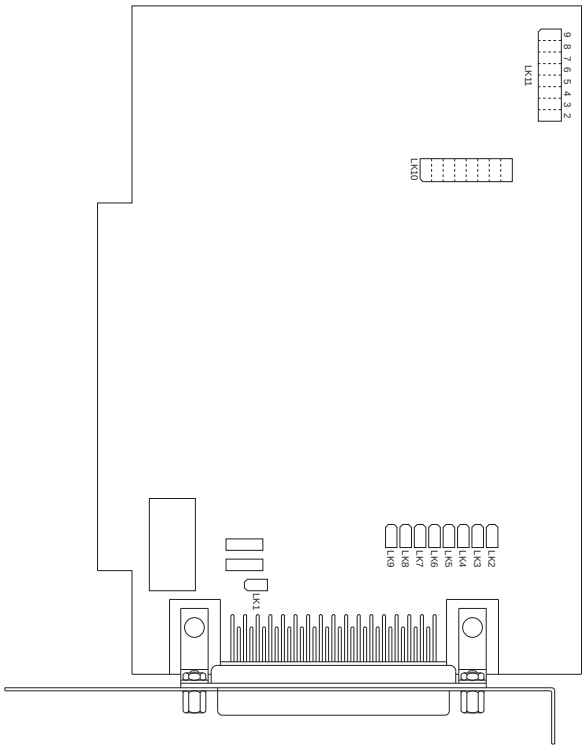
## LK10

These connect the debounce circuit to the input channels.

**Default Link Position (Default Address 180h)**




**User Configuration Record**



# Connector PL1

| Signal | D-type pin no. | RC pin no. |
|---|---|---|
| Common supply oV (Inputs only) | 1 | 1 |
| Channel 0 Negative Input | 34 | 2 |
| Channel 0 Positive Input | 18 | 3 |
| Channel 1 Negative Input | 2 | 4 |
| Channel 1 Positive Input | 35 | 5 |
| Channel 2 Negative Input | 19 | 6 |
| Channel 2 Positive Input | 3 | 7 |
| Channel 3 Negative Input | 36 | 8 |
| Channel 3 Positive Input | 20 | 9 |
| Common supply +24V (Inputs only) | 4 | 10 |
| Common supply oV (Inputs only) | 37 | 11 |
| Channel 4 Negative Input | 21 | 12 |
| Channel 4 Positive Input | 5 | 13 |
| Channel 5 Negative Input | 38 | 14 |
| Channel 5 Positive Input | 22 | 15 |
| Channel 6 Negative Input | 6 | 16 |
| Channel 6 Positive Input | 39 | 17 |
| Channel 7 Negative Input | 23 | 18 |
| Channel 7 Positive Input | 7 | 19 |
| Common supply +24V (Inputs only) | 40 | 20 |
| Not Connected | 24 | 21 |
| Common supply oV (Inputs only) | 8 | 22 |
| Common supply oV (Inputs only) | 41 | 23 |
| Common supply oV (Inputs only) | 25 | 24 |
| Common supply oV (Inputs only) | 9 | 25 |
| Isolated ground (Outputs only) | 42 | 26 |
| Isolated ground (Outputs only) | 26 | 27 |
| Isolated ground (Outputs only) | 10 | 28 |
| Isolated ground (Outputs only) | 43 | 29 |
| Not connected | 27 | 30 |
| Isolated ground (Outputs only) | 11 | 31 |
| Channel 0 output | 44 | 32 |
| Channel 1 output | 28 | 33 |
| Channel 2 output | 12 | 34 |
| Channel 3 output | 45 | 35 |
| Channel 4 output | 29 | 36 |
| Channel 5 output | 13 | 37 |
| Channel 6 output | 46 | 38 |
| Channel 7 output | 30 | 39 |
| Common Positive Supply (Outputs only) | 14 | 40 |
| Isolated ground (Outputs only) | 47 | 41 |
| Not connected | 31 | 42 |
| Not connected | 15 | 43 |
| Not connected | 48 | 44 |
| Not connected | 32 | 45 |
| Not connected | 16 | 46 |
| Not connected | 49 | 47 |
| Not connected | 33 | 48 |
| Not connected | 17 | 49 |
| Common Positive Supply (Outputs only) | 50 | 50 |

# Installation for CE Compliance

To maintain compliance with the requirements of the EMC directive (89/336/EEC), this product must be correctly installed. The PC in which the board is housed must be CE compliant as declared by the PC manufacturer. The type of external I/O cable can be chosen according to the notes below.

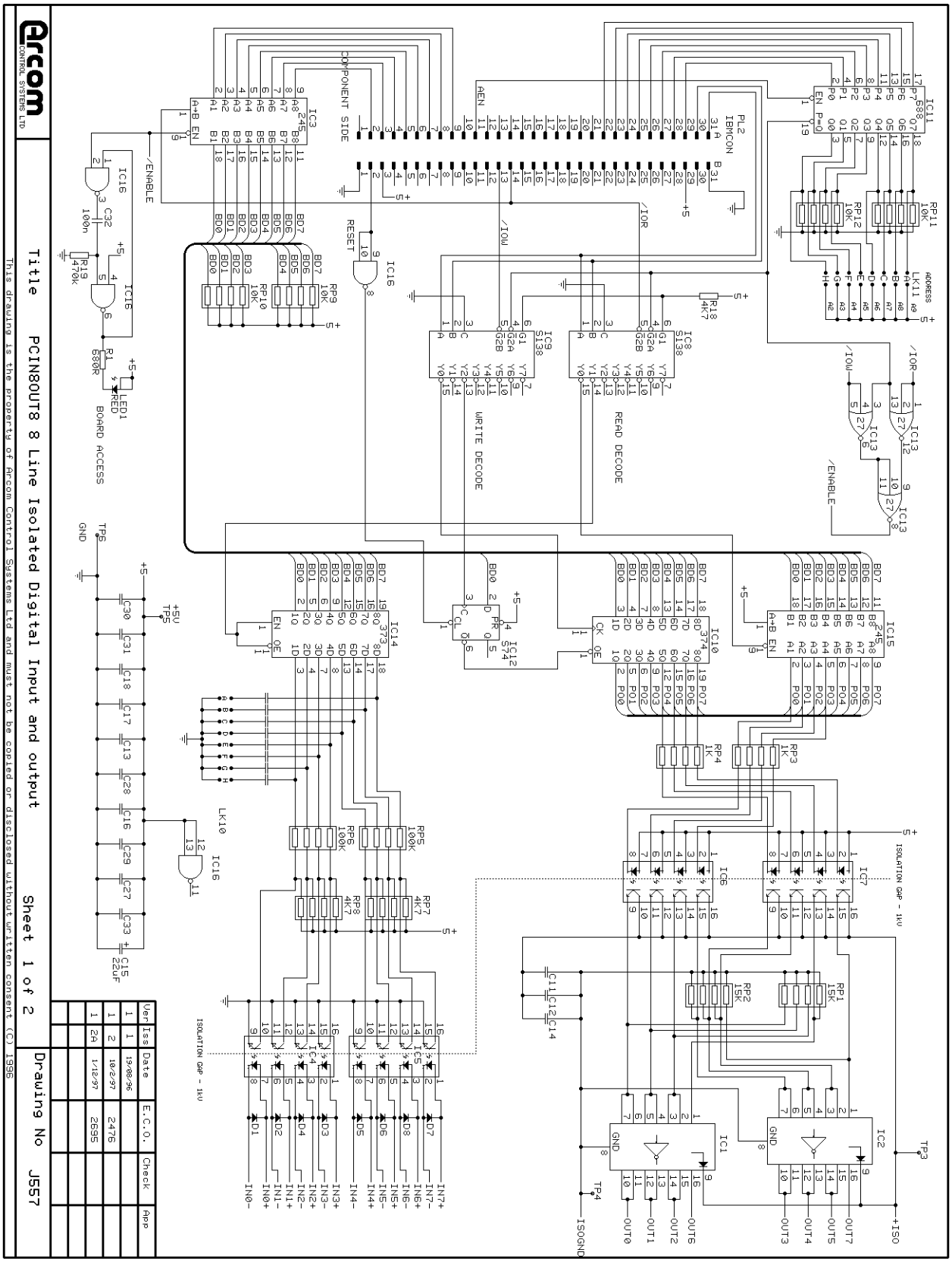
1. Remove the cover of the PC observing any additional instructions of the PC manufacturer.
2. Locate the board in a spare ISA slot and press gently but firmly into place.
3. Ensure that the metal bracket attached to the board is fully seated.
4. Fit the bracket clamping screw and firmly tighten this on the bracket.
   Note: Good contact of the bracket to the Chassis is essential.
5. Replace the cover of the PC observing any additional instructions of the PC manufacturer.

**Cable**

| | | |
|---|---|---|
| Cable length 1 Metre of less | : | Ribbon cable satisfactory |
| Cable 1 Metre to 3 Metres | : | Commercial screened cable gives the protection required |
| Longer cable or noisy environment | : | Use fully screened cable with metal backshells<br>e.g. Arcom CAB50CE |

**The following standards have been applied to this product:**

BS EN50081-1: 1992 Generic Emissions Standard, Residential, Commercial, Light Industry
BS EN50082-1: 1992 Generic Immunity Standard, Residential, Commercial, Light Industry
BS EN55022: 1995 ITE Emissions, Class B, Limits and Methods.


Arcom CONTROL SYSTEMS Ltd
Title PCIN80UT8 8 Line Isolated Digital Input and output
Sheet 1 of 2
Drawing No J557
Ver Iss Date E.C.O. Check App
1 1 19-08-96
1 2 18-2-97 2476
1 2A 1-12-97 2695
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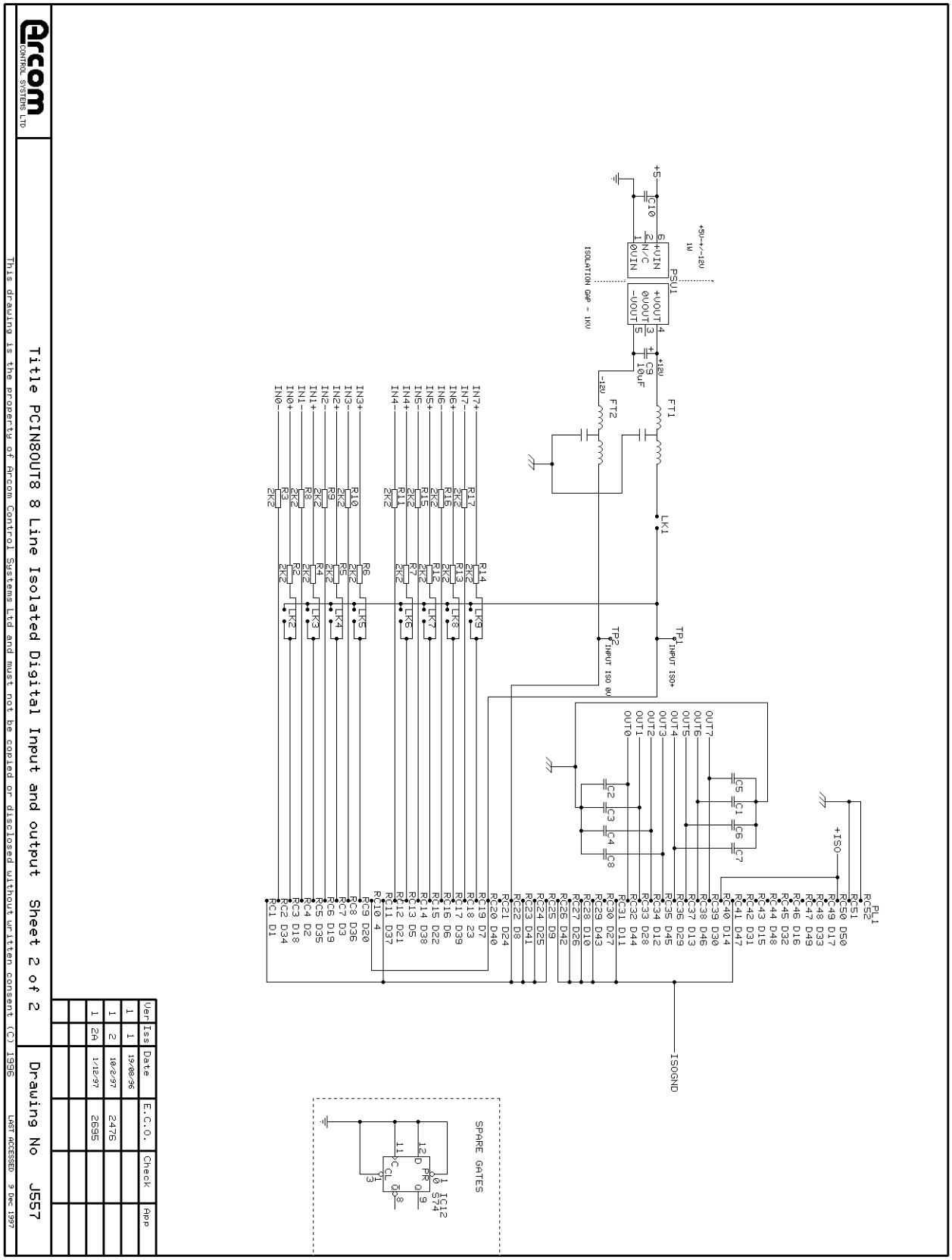
COMPONENT SIDE
PL2 IBMCON
AEN
/IOR
/IOW
RESET
/ENABLE
BOARD ACCESS
WRITE DECODE
READ DECODE
ADDRESS
ISOLATION GAP - 1kV
ISOGND
+ISO
OUT0
OUT1
OUT2
OUT3
OUT4
OUT5
OUT6
OUT7


Arcom CONTROL SYSTEMS LTD
Title PCIN8OUT8 8 Line Isolated Digital Input and output Sheet 2 of 2
Drawing No J557
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LAST ACCESSED 9 Dec 1997
Ver Iss Date E.C.O. Check App
1 1 19/08/96
1 2 10/2/97 2475
1 2A 1/12/97 2695
PSU1
+5V+-12V 1W
ISOLATION GAP - 1KV
+5
+12V
-12V
FT1
FT2
LK1
TP1 INPUT ISO+
TP2 INPUT ISO 0V
+ISO
ISOGND
SPARE GATES
IC12 S74

# Revision History

| Manual | PCB | Comments | |
|---|---|---|---|
| Issue A | V1 I1 | 960927 | First Published in this format. |
| Issue B | V1 I1 | 970106 | [ECO2460] |
| Issue C | V1 I1 | 970130 | [ECO2466] |
| Issue D | V1 I2 | 970408 | [ECO2468, 2476] |
| Issue E | V1 I2 | 970603 | Edits to page 7 |
| Issue F | V1 I2A | 971208 | [ECO2695] |
| Issue G | V1 I2A | 980129 | [ECO2684] |

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