# 4I73 MANUAL

**PC/104-PLUS CABLED BRIDGE**

PRELIMINARY V1.0

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# GENERAL

## DESCRIPTION

The 4I73 is a cabled PCI express to PCI bridge on a PC/104-PCI card.The 4I73 allows PC/104+ stacks to be driven by remote desktop or laptop CPUs with a standard 1 lane PCIE cable. The 4I73 can also allow Data Acquisition and Wireless peripheral cards to be placed in ideal locations, which may be at some distance from the host CPU. The 4I73 also allows testing of PC/104-PCI cards without powering down the host.

The 4I73 card uses a standard 1 lane PCI express cable to connect to the host CPU. Mesa makes two host adapters, the 5I71 and 6I71 (PCI and PCIE) with additional types of adapters being available from other suppliers. The 4I73 based PC/104+ remote stack can support up to 4 bus master PC/104-PCI peripheral cards. The 4I73 support 33 and 66 MHz PCI bus speeds. The remote 4I73 can be up to 5 meters from the local host adapter. The 4I73 has a built in 3.3V power supply and can provide up to 2.5 Amps of 3.3V power to the remote peripheral stack so that only a single 5V power supply is required.

# HARDWARE CONFIGURATION

## GENERAL

Hardware setup jumper positions assume that the 4I73 card is oriented in an upright position, that is, with the PC/104-PCI connectors towards the top of the card and the PCIE connector pointing to the right.

## LED OPTIONS

The bridge chip on the 4I73 has 4 GPIO bits available. Some of the on-card LEDs can be driven by the GPIO bits if desired. Alternatively the LEDS can be driven by the PC/104-PCI interrupt lines. When jumper W1 is in the up position, CR2 through CR5 display the interrupt status of INTA through INTD. When W1 is in the down position, CR2 through CR4 display GPIO bits 1 through 3, and CR5 is illuminated when any interrupt occurs.

# CONNECTORS

## CONNECTOR LOCATIONS AND DEFAULT JUMPER POSITION
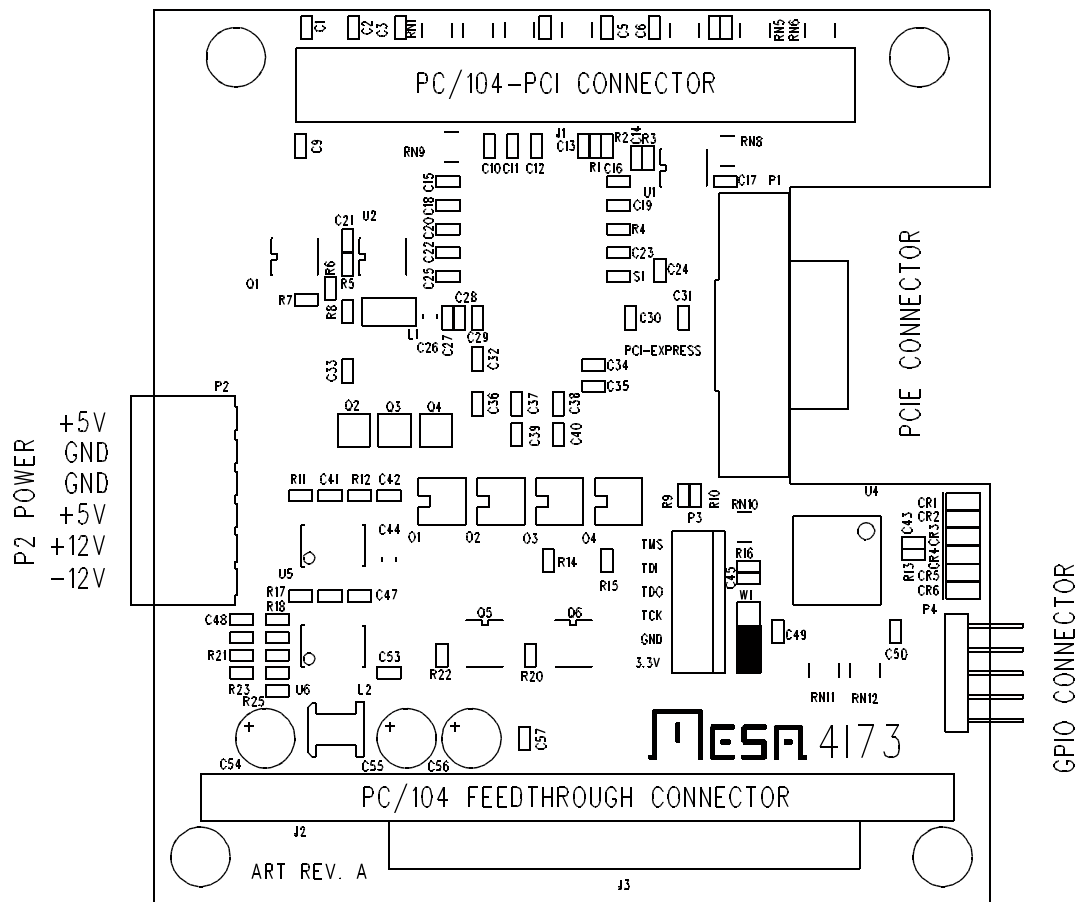
# CONNECTORS

## POWER CONNECTOR

In PC/104 systems it is expected that the CPU will supply power to the stack. The 4I73 replaces a CPU so it has a power input connector in order to power the stack. P2 is the 4I73's power input connector. P2 pin-out is as follows:

**PIN    FUNCTION**

1       +5V

2       GND

3       GND

4       +5V

5       +12V

6       -12V

Note that +12 and -12 are not needed by the 4I73, the connections are provided to supply +12V and -12V to the bus if required. All power is switched so that when there is no PCIE cable connection, all PC/104 power is off.

## GPIO CONNECTOR

The P4 connector gives access to the bridge chips GPIO pins. P4 pinout is as follows:

**PIN    FUNCTION**

1       GPIO 0

2       GPIO 1

3       GPIO 2

4       GPIO 3

5       GROUND

Note:  with the current CPLD configuration these are all output bits

# CONNECTORS

## PCIE CONNECTOR

P1 is the cabled PCIE connector, P1 pinout is as follows:

| PIN | FUNCTION | DIRECTION |
|-----|----------|-----------|
| A1 | PERN0 | TO 4I73 |
| A2 | PERP0 | TO 4I73 |
| A3 | NC | |
| A4 | SB_RTN | FROM 4I73 |
| A5 | CREFCLKN | TO 4I73 |
| A6 | CREFCLKP | TO 4I73 |
| A7 | NC | |
| A8 | CPERST# | TO 4I73 |
| A9 | GND | |
| B1 | GND | |
| B2 | NC | |
| B3 | CWAKE# | FROM 4I73 |
| B4 | CPRSNT# | FROM 4I73 |
| B5 | GND | |
| B6 | NC | |
| B7 | CPWRON | TO 4I73 |
| B8 | PETN0 | FROM 4I73 |
| B9 | PETP0 | FROM 4I73 |

# OPERATION

## POWER UP

The 4I73 has local power switching and will power up only when requested by the host side PCIE device. All power supplies to the PC/104-PLUS stack are switched including the +12V and -12V. This allows live insertion/removal of the PCIE cable. The power up sequence is as follows:

On inserting the PCIE cable or on a host controlled power up cycle, the 4I73 senses the active high CPWRON signal from the host and turns on its local power supplies. When these power supplies are stable the 4I73 signals the host with the active low CPRSNT. The host them removes the reset signal CPERST and starts link communication.

## LED STATUS INDICATORS

Five LED status indicators are used, CR1 through CR5. LEDs CR2 through CR5 have different meanings depending on the position of the option jumper. With the current CPLD configuration these LEDs indicate:

| LED | OPTION1 | OPTION2 |
|-----|---------|---------|
| CR1 | PWR OK | PWR OK |
| CR2 | GPIO1 | INTA |
| CR3 | GPIO2 | INTB |
| CR4 | GPIO3 | INTC |
| CR5 | ANY IRQ | INTD |
| CR6 | LINK OK | LINK OK |

The LINK OK LED is especial important. If it is not illuminated, there is no link between cards.

## PC/104 FEEDTHROUGH

A optional PC/104 feedthrough connector is available on the 4I73. This connector is not active electrically, but does have switched 5V and ground available for stack-through applications.

# SPECIFICATIONS

|  | MIN | MAX | UNITS |  |
|---|---|---|---|---|
| POWER SUPPLY | 4.5V | 5.5V |  |  |
| POWER CONSUMPTION: |  |  |  |  |
| 5V SUPPLY CURRENT | ---- | 200 | mA | No external load |
| 5V MAXIMUM STACK CURRENT | ---- | 5 | A |  |
| 3.3V SUPPLIED TO STACK | ---- | 2500 | mA |  |
| +12V MAXIMUM STACK CURRENT | ---- | 500 | mA |  |
| -12V MAXIMUM STACK CURRENT | ---- | 500 | mA |  |
| OPERATING TEMP. | 0$^o$C | +70 | $^o$C |  |
| OPERATING TEMP. (-I version) | -40$^o$C | +85 | $^o$C |  |
| OPERATION HUMIDITY | 0 | 95 | % | Non-condensing |