ISIO INFO

DESCRIPTION

    The ISIO is an isolated IO module that connects to a PC
parallel port. 4 isolated transistor or relay outputs are provided,
along with 8 isolated inputs.

ISOLATED I/O

    Output relay rating is 2A, 24 VDC or 1A, 115 VAC. Output
transistor rating is 1A 48 VDC max. Output transistors are wired to
the C (common) = negative and NO (Normally Open) = positive
terminal block pins. Input rating is 48 VDC maximum continuous
input with a minimum input sensitivity of 10 VDC.

POWER

    The ISIO requires +5V at ~150 mA (transistor outputs) or up to
~550 mA for relay output models. This can be supplied in 3 ways: 1.
From the parallel port (Mesa 26 pin parallel I/O connectors with
+5V on pin 26) 2. From the PC/104 connectors. (If stacked on
another PC/104 card and 3. From the 2 pin terminal block on the
ISIO. It is suggested that if power is supplied through the
parallel port connector, that the cable between the parallel port
and the ISIO be 12 inches or shorter because of the voltage drop in
the small gauge flat cable.

PRINTER CONNECTOR PINOUT

    Two 26 pin headers are provided for the host printer port
connection, P1 and P3. P1 is a .1" header and P3 is a 2mm header.
Both headers have the same pinout. The pin one location on the
headers is marked with white square on the circuit card.
    The header connector pinout is designed so that a flat cable
terminated with a female 26 pin header on one end and a male IDC
DB25 connector on the other end will match the standard PC printer
port pinout. When making this cable, wire 26 is removed from the
DB25 end of the cable.

Printer port connector pin-out is as follows:

HEADER PIN	DSUB PIN	SIGNAL
1	1	/PSTB
2	14	/PAFD
3	2	/PD0
4	15	/PERROR
5	3	PD1
6	16	/PINIT
7	4	PD2
8	17	/PSLIN
9	5	PD3
10	18	GND

HEADER PIN	DSUB PIN	SIGNAL
11	6	PD4
12	19	GND
13	7	PD5
14	20	GND
15	8	PD6
16	21	GND
17	9	PD7
18	22	GND
19	10	/PACK
20	23	GND
21	11	PBUSY
22	24	GND
23	12	PPE
24	25	GND
25	13	PSLCT
26	NC	+5V

GENERAL OPERATION

When the ISIO is first powered up it is in a locked state. In this state all transistor or relay outputs are disabled, and all readback bits are tri-stated. This state is indicated by a blinking LED on the ISIO. The ISIO can be put in this state by initial power-up or having both the /PSLCTIN and /PINIT input signals low at the same time (the same thing that resets a printer). This means that normal BIOS startup code will reset the ISIO, so that for example a control/alt/delete reboot will reset the ISIO.

To access the ISIO you must first send it a unlock code. This has two purposes. 1. It prevents BIOS and OS startup code from turning outputs on randomly during system startup and 2. It allows multiple ISIO modules to share a single parallel port.

In the following discussion, all polarities apply to the parallel port control output pins. Also the /PSTB and /PINIT strobes must be asserted and de-asserted for a minimum of 2 uSec. This is because the ISIO has a digital filter on its strobe inputs to prevent false clocking and accidental resetting.

UNLOCKING THE ISIO

To unlock the ISIO you must go through a specific sequence: first make sure that /PINIT is high and /PSLCTIN is high (note that /PSLCTIN is inverted at the parallel interface but /PINIT is not.) *The status of these pins must stay the same during the next sequence.* Next the 12 bit enable code is shifted in through the PAFD bit, clocked by the falling edge of /PSTB (note that /PSTB is inverted). The enable code is 0xEAB. Next the unit number is shifted in the same way. The unit number is a 4 bit number to select a specific ISIO module when more than one module shares a single parallel port. Valid unit numbers are 0x0,0x1,0x2,0x3.

ISIO unit numbers are selected via jumpers W1 and W2 on the ISIO card:

UNIT	W1	W2
0	down	down
1	down	up
2	up	down
3	up	up

Once the enable code and unit number have been shifted in, they are applied by setting /PSLCTIN HIGH and /PINIT low at the same time. This unlocks the ISIO whose jumpers match the select code. Finally /PINIT should be returned to its high state, as it should remain for all normal ISIO access.

When the ISIO is unlocked, its LED is turned on, The transistor or relay outputs follow the D0..D3 data bits from the parallel port and 4 of the input bits can be read at the parallel port status register. The /PSLCTIN signal determines which 4 bits of the 8 isolated inputs are routed to the parallel port status register. *If there is only one ISIO on a parallel port, there is no further need to unlock the ISIO for access, as it will remain in the unlocked state unless reset.*

MULTIPLE ISIOs

When multiple ISIO modules are used on a single parallel port, unaccessed ISIOs must be put in a idle state while other ISIO modules are accessed. When an ISIO module is put in an idle state, its transistor or relay outputs are latched so that they do not change while the other ISIO(s) are accessed. The idle ISIO's readback outputs are tri-stated so as not to interfere with the active ISIO. The idle state is indicated by the idle ISIO's LED being off.

IDLE STATE

To put an ISIO in the idle state, a idle code (0xDED) and unit number are shifted and applied to the ISIO in a manor identical to shifting in the enable code. To return an idle ISIO back to normal operation, you must shift in and apply the enable code and unit number.

ISIO.EXE

ISIO.EXE is a simple program that accesses the ISIO. For example:

ISIO 278 eab0

will enable ISIO 0 at the parallel port at 0x278

ISIO 278 ded0

would put the same ISIO module into the idle state

ISIO 3bc eab2

would enable the ISIO 2 at port 0x3bc

ISIO 278 eab0 d

would turn on outputs 3,2,0 of the ISIO 0 at port 0x278

Source code for ISIO.EXE is provided as an example of manipulating the parallel port control bits for accessing the ISIO.