



MICRONIX PC/104 DIGITAL IN-/OUTPUT

PV-1608
16DI/8DO, OPTO-ISOLATED
PC/104-MODULES

Users Manual & Installation Guide

VERS. 1.11

Doc: M5002DM_A4.DOC

DESCRIPTION

Micronix PV-1608 lets you handle combined I/O from one single PC/104 board. The PV-1608 module plugs into any standard PC/- 104 bus interface and provides you with 16 digital opto-isolated inputs and 8 digital high power opto-isolated outputs. Non-Stack-through or stack-through (S-versions) connectors are available. Supplied with drivers for Windows 95/98 and NT.

FEATURES AND SPECIFICATIONS

Inputs

- Number of channels: 16 opto-isolated inputs, groups of two
- Isolation: Up to 1000 Vrms
- Logic "1": $U_{in} > \pm 10V$
- Logic "0": $U_{in} < \pm 1V$
- Max input voltage: $\pm 40V$
- Input delay: ON: $< 25 \mu s$
OFF: $< 100 \mu s$
- Interrupts: Int. 5,9,10,11,15 selectable on input chn.0 and 1
- Connector: 26-pin ribbon cable connector
- Power requirement: +5V DC, 50mA

Outputs

- Number of channels: 8 opto-isolated outputs, one common GND
- Isolation: Up to 1000 Vrms
- Voltage, load: 10-50V DC
- Load current
• per channel: Max 1.0 A (NPN),
Max 0.75A(PNP)
- Load per channel: Max 30 VA
- Output on-resistance: Max 150 m Ω
- Connector: 16-pin ribbon cable connector

Physical / Environment

- Dimension: 96x90x18mm
- Temperature range: Operating: -20°C to 70°C at 1.5A
Storage: -40°C to +85°C
- Humidity: 0 to 90% RH, non-condensing
- PC/104 Stack-through connectors (S-versions)
- Optional cable for inputs: 26-pin header to DSUB-25, 30 cm
- Optional cable for outputs: 16-pin header to DSUB-15, 30 cm

Further technical information can be found at our web site:

<http://www.micro-technic.com/pv1608>

MODEL SELECTION

PV - 16 08 - X - S

Number of digital inputs

Number of digital outputs

P for PNP output,

N for NPN output

0 = Non-stack-through, S = Stack-through

AVAILABLE MODELS

Model no.	Description/Type
PV-1608-P-S	PNP output, Stack-through
PV-1608-N-S	NPN output, Stack-through
PV-1608-P	PNP output
PV-1608-N	NPN output

Accessories:

PV-C25-M: One 30 cm ribbon cable ending in a DB25 male connector

PV-C15-F: One 30 cm ribbon cable ending in a DB15 female connector

INSTALLATION GUIDE

Please refer to the schematic outline on page 4.

PRECAUTIONS TO ESD

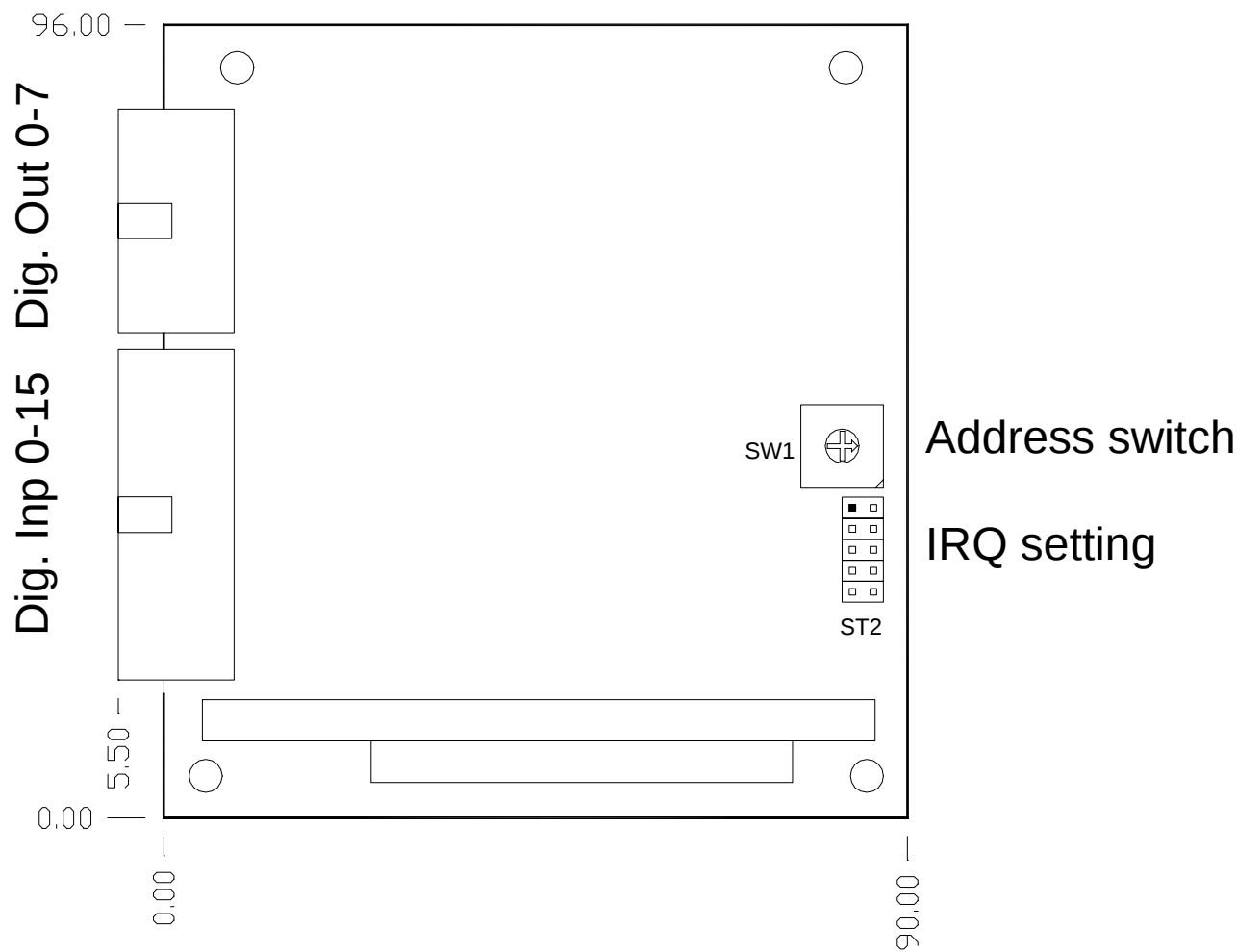
Please note, that the Micronix PV modules must be handled with respect to ESD (Electrostatic Discharge). Electrostatic Discharge to the PV modules must be avoided.

Before removing the module from the protection bag, the user must be discharged using a grounded wrist ribbon.

SETTING THE INTERRUPT NUMBER

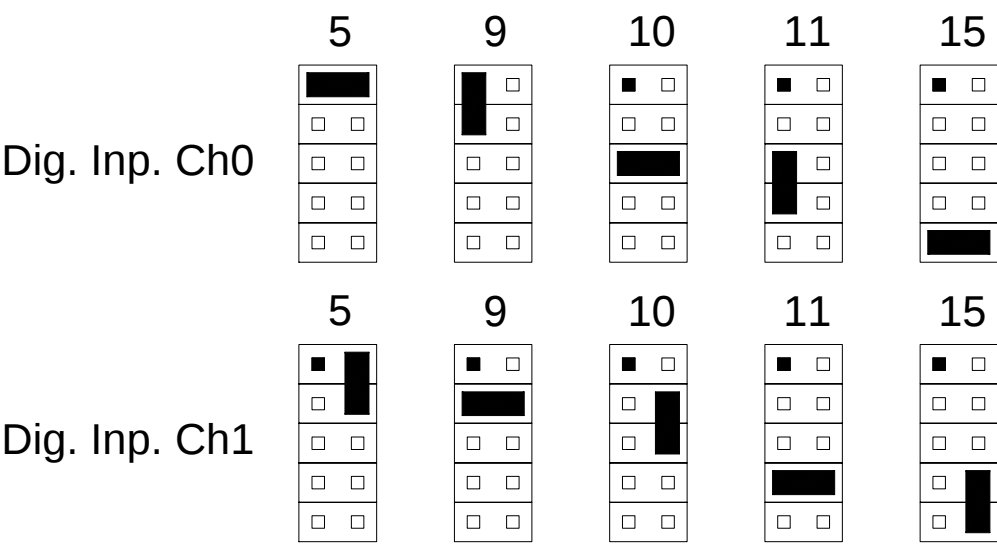
See IRQ select page 5.

SCHEMATIC OUTLINE



Board Layout: PV1608

IRQ Setting (ST2)



SW 1	Base Address	SW1	Base Address
0	300	8	340
1	308	9	348
2	310	A	350
3	318	B	358
4	320	C	360
5	328	D	368
6	330	E	370
7	338	F	378 *

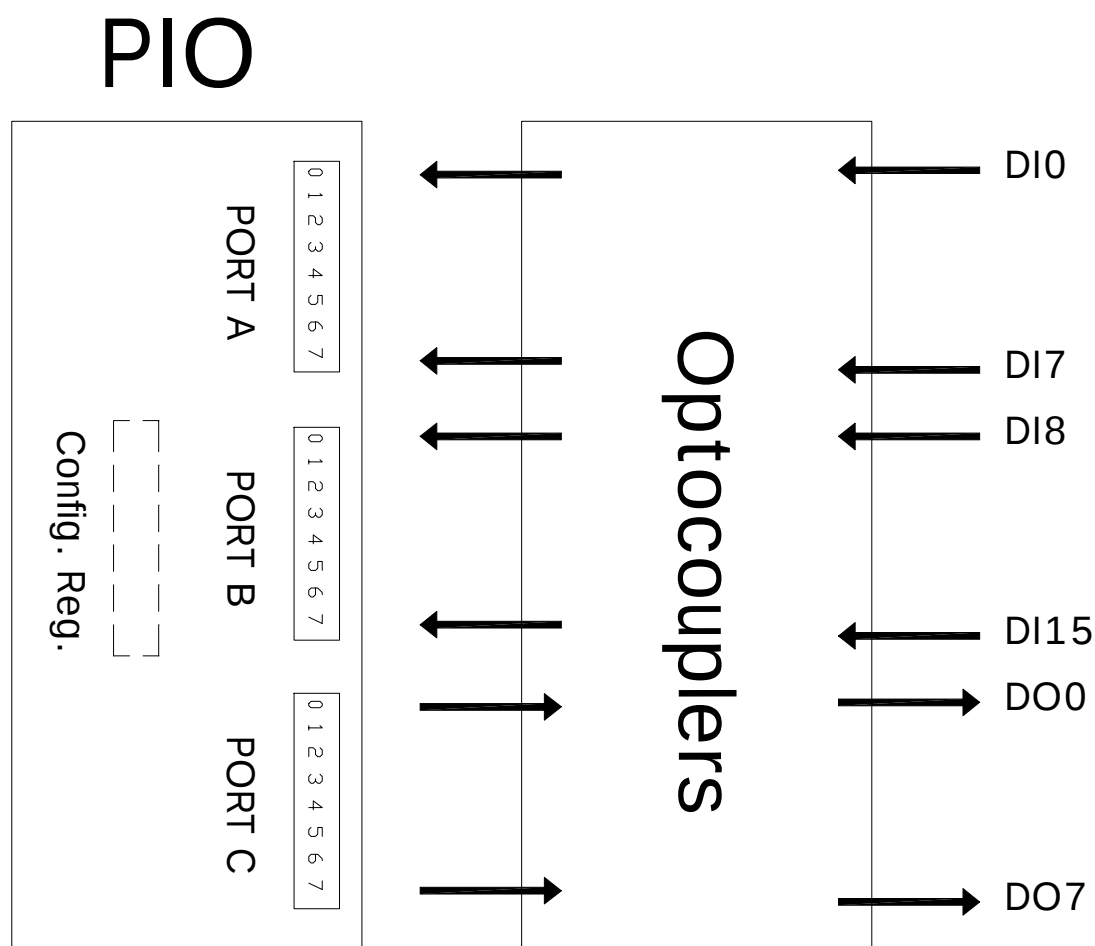
*This setting may conflict with the LPT1 port which normally is occupying this address.

Register Format And Description

The PV-1608 occupies 8 consecutive addresses of PC I/O address space. The first address or base address is determined during installation by setting the onboard rotary address switch SW1. Only the lower 4 addresses in the selected address block are used by PV-1608. The registers and their functions are listed in the following table (R = Read, W = write and Base = Base address).

Address	Function	Type
Base + 0	Port A - Digital Input 0-7	R
Base + 1	Port B - Digital Input 8-15	R
Base + 2	Port C - Digital Output 0- 7	R/W
Base + 3	Configuration Register	W

The relationship between the individual I/O-bits in PIO (Parallel Input Output) Chip are shown in the schematic below:



Before using the outputs, you must initialize the PIO by writing 92 hex to the Configuration Register. See the example on page 7.

Software example:

```
/* Compiler: Borland C++ 3.1 */

#include <stdio.h>
#include <dos.h> /* For inportb() and outportb() */

#define BASEADDR 0x300 /* This must match with SW1 on the PV1608 */
#define PORTA (BASEADDR+0)
#define PORTB (BASEADDR+1)
#define PORTC (BASEADDR+2)
#define PORTCTRL (BASEADDR+3)

int main (void)
{
    unsigned char value;

    /* Initialize PV1608 */
    outportb (PORTCTRL, 0x92); /* A,B = input, C = output */

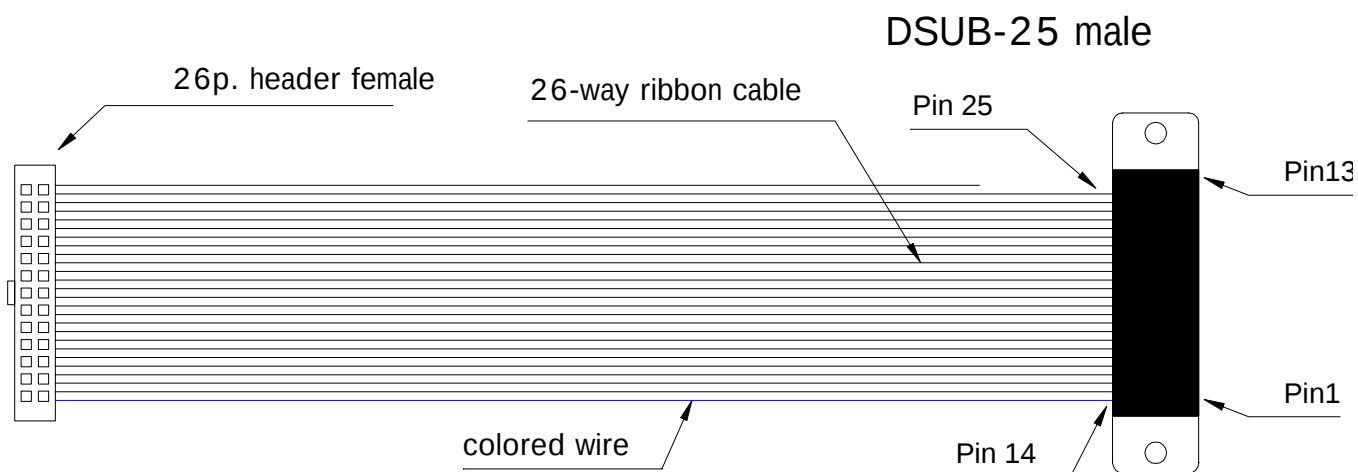
    /* Show input 0-7 */
    value = inportb (PORTA);
    printf ("Input 0 = %d\n", (value>>0) & 0x01);
    printf ("Input 1 = %d\n", (value>>1) & 0x01);
    printf ("Input 2 = %d\n", (value>>2) & 0x01);
    printf ("Input 3 = %d\n", (value>>3) & 0x01);
    printf ("Input 4 = %d\n", (value>>4) & 0x01);
    printf ("Input 5 = %d\n", (value>>5) & 0x01);
    printf ("Input 6 = %d\n", (value>>6) & 0x01);
    printf ("Input 7 = %d\n", (value>>7) & 0x01);

    /* Show input 8-15 */
    value = inportb (PORTB);
    printf ("Input 8 = %d\n", (value>>0) & 0x01);
    printf ("Input 9 = %d\n", (value>>1) & 0x01);
    printf ("Input 10 = %d\n", (value>>2) & 0x01);
    printf ("Input 11 = %d\n", (value>>3) & 0x01);
    printf ("Input 12 = %d\n", (value>>4) & 0x01);
    printf ("Input 13 = %d\n", (value>>5) & 0x01);
    printf ("Input 14 = %d\n", (value>>6) & 0x01);
    printf ("Input 15 = %d\n", (value>>7) & 0x01);

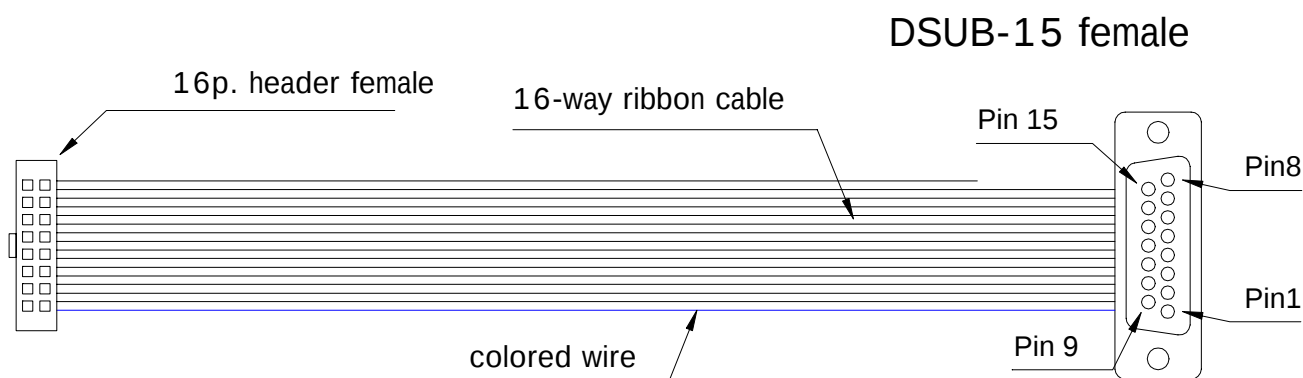
    /* Examples of output operations */
    outportb (PORTC, 0x01); /* Turn on output 0, all others off */
    outportb (PORTC, 0x02); /* Turn on output 1, all others off */
    outportb (PORTC, 0x04); /* Turn on output 2, all others off */
    outportb (PORTC, 0x08); /* Turn on output 3, all others off */
    outportb (PORTC, 0x10); /* Turn on output 4, all others off */
    outportb (PORTC, 0x20); /* Turn on output 5, all others off */
    outportb (PORTC, 0x40); /* Turn on output 6, all others off */
    outportb (PORTC, 0x80); /* Turn on output 7, all others off */
    outportb (PORTC, 0x81); /* Turn on output 0 and 7, all others off */
    return 0;
}
```

OPTIONAL CABLES, 30 CM

INPUT CABLE (PV-C25-M)

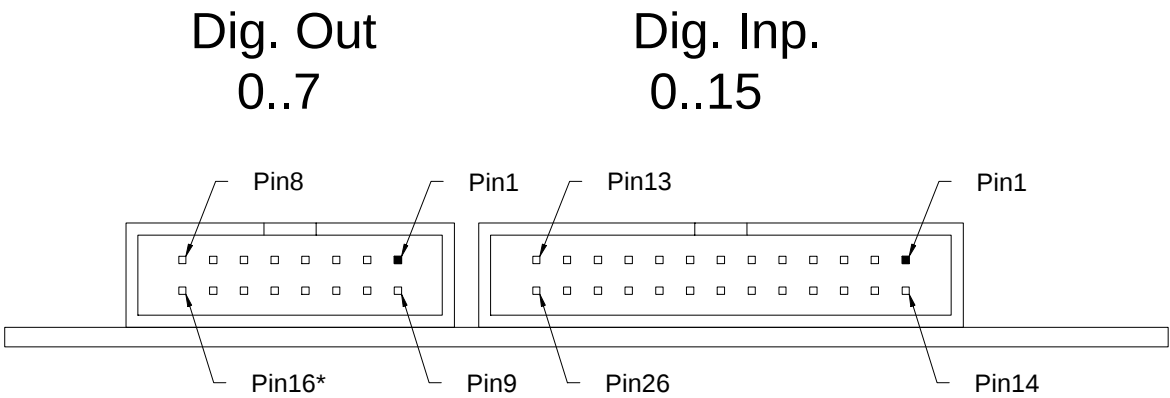


OUTPUT CABLE (PV-C15-F)



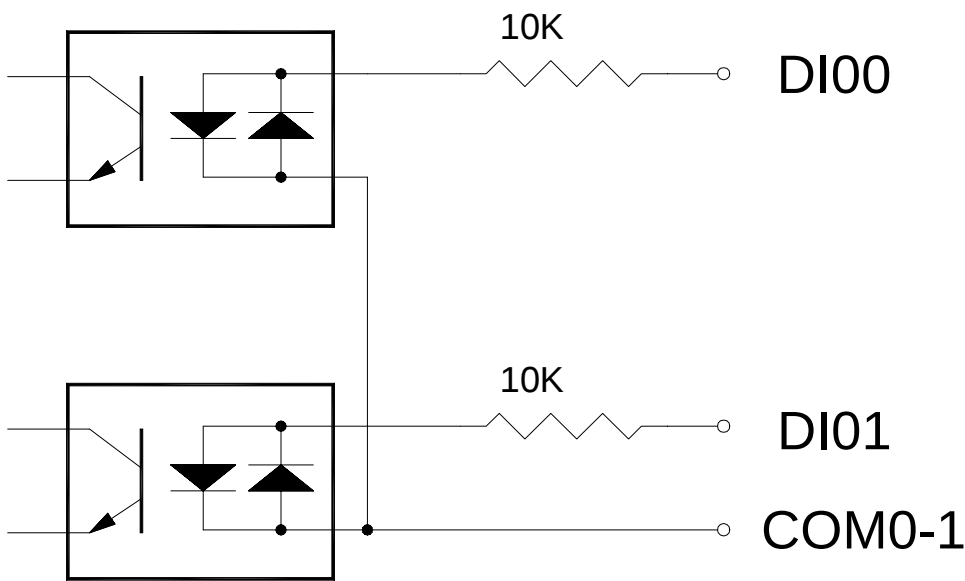
I/O – connector layout

16 digital input		8 digital output	
Ref. on PC104	DSUB25-M / 26 pin Box Header	Ref. on PC104	DSUB15 –F / 16 pin Box Header
+DI0	14	+DO0	9
+DI1	15	+DO1	10
+DI2	16	+DO2	11
+DI3	17	+DO3	12
+DI4	18	+DO4	13
+DI5	19	+DO5	14
+DI6	20	+DO6	15
+DI7	21	+DO7	8
+DI8	22	Ext. 0V(NPN) / +24V(PNP)	1,2,3,4,5,6
+DI9	23	Ext.+24V(NPN) / 0V(PNP)	7
+DI10	24		
+DI11	25		
+DI12	13		
+DI13	1		
+DI14	2		
+DI15	3		
COM0-1	5		
COM2-3	6		
COM4-5	7		
COM6-7	8		
COM8-9	9		
COM10-11	10		
COM12-13	11		
COM14-15	12		

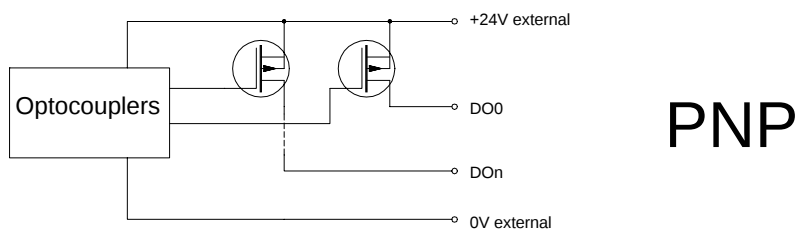


*In the silkscreen on the PCB, this pin is incorrectly labeled as pin9. The correct pin no is 16.

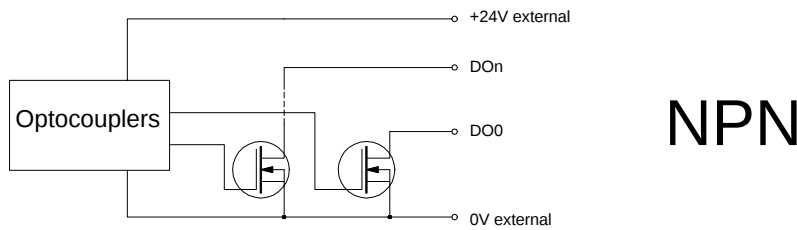
INPUT CIRCUITRY SCHEMATIC



OUTPUT CIRCUITRY SCHEMATIC



Due to exitation of the power FET's, 0V external MUST be connected.



Due to exitation of the power FET's, +24V external MUST be connected.