16-bit I/O expansion card

This card has 8 bits of opto-isolated and Darlington buffered outputs and 8 bits of opto-isolated inputs.

There is a jumper on the PC card. With the jumper fitted the ports are SA and SB and with the jumper removed the ports are TA and TB. Therefore you can have 2 cards, one mapped to S and one mapped to T.

If you are not sure which one you have here is a quick check:

HEX 55 SA OUT
SA IN X. result 0055

If the result is 00FF then try TA

The outputs are in 2 separate groups of 4 each with 1A Darlington drivers which pull down to the common ground for each group. The positive supplies must also be brought to the connectors.

The inputs are on a 25 way socket which connects to a 16 way 2 row HE14 connector J4 on the card.

<table>
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<tr>
<th>OUTPUTS (SA/TA)</th>
<th>INPUTS (SB/TB)</th>
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<td><strong>25w D skt</strong></td>
<td><strong>25w D plug</strong></td>
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SA/TA Outputs
All the outputs are open collector Darlings with their ground returns isolated from the controller. You need a separate external 12 or 24v DC supply. There are two sets of 4 outputs each with its own 0v and +v connections. Therefore, you can use two separate supplies if you wish or connect one supply to both sets. Connect the + terminal of your supply to pins 14, 18 and the – terminal of your supply to pins 15 (and/or 16, 17) and 19 (and/or 20, 21).

You can connect a load e.g. a solenoid or a relay between the output pin and your +v.

Example: 24v lamp to be operated by SA 0 would connect between pin 8 and 18 (24v).

Example: connection to other logic device or PLC via SA 4.

Depending on the instrument, you might need a pullup resistor R, e.g. 4K7

SA 4 ON – sends a 0 to the PLC
SA 4 OFF – sends a 1 to the PLC
SB/TB inputs
The inputs are likewise isolated and require an external supply. You connect your –
terminal to one of the negative pins and your load between your + terminal and an output
pin. In other words to make an input on SB bit 0 you apply a voltage to pins 8 and 21, pin 8
being the negative and 21 being positive.

The input is most easily monitored with a command similar to PP but PP only shows PB.
Instead use
SB WATCH
This continually displays the input in binary e.g.
11111111
From right to left is ascending value so bit 0 is furthest right and bit 7 is furthest left.

To change an input from 1 to 0 apply a voltage 12-24v between the two pins for that input.
For example connect a 24v supply, negative to pin 8, positive to pin 21 and you should see
11111110

All the inputs are independent opto-isolators so you can common up all the + pins if you
wish or all the – pins, or use completely independent sources of voltage.

Example: simplest form of inputs – just switch 12 or 24 volts into the inputs. A voltage
going into an input turns on the opto-isolator so is read as a 0.

SB 0 0 WAIT
The system will wait for the switch to close
SB 0 1 WAIT
The system will wait for the switch to open.
In the third diagram SB WATCH would show
11111110
Operate both the switches and you would see
11111101
SB 1 BIT? Leaves true if the switch is closed e.g.
SB 1 BIT? . <enter> 0 OK (means switch is open)
SB 1 BIT? . <enter> 2 OK (non-zero means switch is closed)
(remember the dot means print)