

## Getting started programming the TAMS 71622 card

This document contains information that may be useful to a user getting started programming a 71622 card under HP-UX. It is targeted at 10.2, but later OS releases should be similar.

### 1) Installing the driver

It is important to identify the correct drivers for the code. The TAMS I/O Libraries (PN N2091) contain a fileset called SICL GPIO Card Driver. This fileset does not directly support the 71622 card, although the package does contain essential SICL support. These Libraries must be loaded on the system first, and then the 71622 drivers must be loaded to provide support for the 71622 card. The Agilent I/O Libraries (PN E2091F) may be used instead of the TAMS Libraries.

After the 71622 drivers are loaded, the hwconfig.cf file is edited to enable support of the card. Note that the product is referenced as t61622 in that file. There is a statement in the file that the 61622 is compatible with the E2074 and 60622 products. This compatibility is not at the driver level, only at the user interface level.

To start off, configure the card by uncommenting the default line in hwconfig.cf. This will use Compatibility Mode rather than Enhanced Mode:

```
22 gpio t61622 1 0 0b00000 0x00 0x00 2
```

The following examples use sicl commands. The card defaults to 8 bit transfers, so a transfer is just one byte or one character of data. The card is capable of 16 bit transfers, but that mode of operation is not available from the command line with iread and iwrite commands.

### 2) Exercising the card

With nothing attached to the card, it is not possible to do iwrite or iread commands.

```
echo "12345678\c" | iwrite -s 3 gpio      # hangs due to no handshake
iread -c 50 > testfile                  # hangs due to no handshake
```

It's easy to perform transactions if a test connector is added. Connect pin 19 (PCTL) to pin 44 (PFLG).

```
echo "12345678\c" | iwrite -s 3 gpio      # does 3 data transfers
iread -c 50 > testfile                  # still hangs
```

The iread command requires that the polarity of either PCTL or PFLG be inverted to allow data to be read. Modify the hwconfig.cf line as follows:

```
22 gpio t61622 1 0 0b00001 0x00 0x00 2
```

Note that no recompile or reboot is required after modifying the line, the file is re-read each time the device is opened. Now, both the iread and iwrite commands complete successfully. You can connect the data-in bits to the data-out bits to loop data back.

```
echo "012345678\c" | iwrite -s 3 gpio      # does a 3 byte transfer, leaves "8" on the output lines.
                                           # approx 1 us per transfer on a B180
iread -c 50 gpio > testfile                # transfers 50 characters at highly variable data rate.
                                           # averages 1.6 us per transfer on a B180 over very large transfers
```

If the data-out lines are connected to the respective data-in lines, then the last character output to the card can be read back in. In this example, testfile ends up with 50 characters of the ascii character "8".

Additional functionality in the card can be accessed by function calls in a user program. See the appropriate reference manuals for details.

For use in an application, appropriate cabling must be provided. An unterminated cable can be ordered from TAMS as PN 5061-4209. If a cable is custom built, a 50 pin ribbon connector (Centronics style) must be used. One suitable part is NorComp 110-050-103-001. Bail lock clips would need to be added to the board in order to secure this connector.

#### References:

HP Standard Instrument Control Library Installation and User's Guide for HP-UX HP PN E2090-90023

HP Standard Instrument Control Library Reference Manual HP PN E2090-90025

TAMS Standard Instrument Control Library Manual

GPIO Theory of Operation, [www.tamsinc.com/support/gpio/theory.htm](http://www.tamsinc.com/support/gpio/theory.htm)