The tm3mon Program

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Introduction

The `tm3mon` program is a daemon process that acts as a front end for the TM-3A hardware. It runs on the workstation that is connected to the TM-3A (currently tiger.eecg, August 2002).

Tm3mon opens two network TCP stream sockets, and sits waiting for connections to those sockets. On one of the sockets (the housekeeping socket) tm3mon will accept requests to change or report on the state of the TM-3A. On the other socket (the ports socket) tm3mon will accept data to be transferred to or from a user's design inside the TM-3A. See *The TM-3 Ports Package* for a description of how the ports socket is used.

A second program called `tm3` is usually used to talk to the housekeeping socket of tm3mon. The tm3 program can be run on any host, and will transfer one or more requests to tm3mon over the network. A single request can be given as the arguments to tm3. For example,

```
tm3 getdesigndir
```

will ask tm3mon for the name of the directory containing the design most recently loaded into the TM-3A.

Multiple requests can be passed to the tm3 program on the standard input by giving it a "-" argument:

```
tm3 -
getdesigndir
getdesigndate
^D
```

Starting Tm3mon

To start the tm3mon daemon, sign on to the computer that has the TM-3 or TM-3A board connected to it, and type:

```
cd /
tm3mon &
```

Tm3mon Housekeeping Socket Requests

This is a list of the requests that tm3mon understands on the housekeeping socket:

acquire P N	Ask for the TM-3A at priority P for N seconds. Returns 0 if successful, or the current priority and the number of seconds left in the current reservation if not.
capture_ff_on	Tell the Virtex readback capture blocks to save the contents of the flipflops in the user's design
capture_ff_off	Tell the Virtex readback capture blocks to stop saving the contents of the flipflops in the user's design, and hold on to the last values saved.
debug N	Set the debug level to N. Debugging output will go to tm3mon's standard output.
disable_clocks	prevents the board-wide clock generator from generating tm3_clk0
EXIT	Causes tm3mon to exit.
enable_clocks	allows the board-wide clock generator to generate tm3_clk0
enable_sram N	Enables the SRAM on FPGA N
enable_video	Enables the video input and output on FPGA3
getarch	return either TM-3 or TM-3A as a string
getdesigndate	return a string version of the date and time the current design was loaded into the TM-3A
getdesigndir	return the name of the directory containing the current design
getportlistdir	return the name of the directory containing the list of ports used in the current design
getstatus	return a string of 1s and 0s that describe the current status of the board
getstatus1	return the arguments of the last setstatus1 command
getstatus2	return the arguments of the last setstatus2 command
list_jtag	prints a human readable list of the jtag information
nib_read N	read one nibble from the nibble bus of chip N
nib_write N X	write the hex value X to the nibble bus of chip N
program_logic file N	program logic FPGA N from the bits in file

read_alert_addr	prints which temperature chip has tripped
read_jtag N	prints some Marcus only jtag information
read_jtag_id N	uses jtag to find out what kind of Virtex chips are on the board
read_xcjtag_id	read the Jtag id from the housekeeping chip
read_reg	read the value of the housekeeping register
read_smb N M	read register M from temperature chip N
read_temp	read the temperature of the board, along with the temperature of each Virtex chip
readback	get a listing of flipflop names and their contents
release	release the TM-3A so others can acquire it
reset	reset the board
reset_dev	reset the Virtex chips
setdesigndir dirname	set the name of the directory containing the design
setportlistdir dirname	set the name of the directory containing the port lists for the current design
set_clk N M	set the frequency of clock N to M Hz
setstatus1 args	set the string returned by getstatus1
setstatus2 args	set the string returned by getstatus2
step_clock N	slowly advance tm3_clk0 by N cycles
stop	reset the Virtex chips. Also kill off any ports sockets connected to programs that are talking to the current design.
write_reg N	write the hex value N into the housekeeping register

Tm3mon Ports Socket Format

The ports socket is normally used by the tm3 ports package to send data to and from a user's circuit in the TM-3A. Data is sent to the ports socket as a series of 32 bit packet header records, followed by optional data records. Each header indicates chip and port number where the data is to be transferred. The 32 bit header is sent in network byte order (most significant byte first). The most significant bit is labelled 31 in this table:

Bit Number	Meaning
31	1 for a write (data transferring to circuit); 0 for read

30-26	unused
25-24	chip number
23-22	unused
21-12	port number inside the chip
11-10	unused
9-0	number of bytes to be transferred (maximum 1023)

A header requesting a write must be followed by the number of bytes of data that were specified in the header. A read request header will cause tm3mon to block until the specified number of bytes are received from the design. The bytes read from the design will be passed back over the socket without any headers.