

NAME

marCryo – graphical user interface for the **Oxford Cryosystem Cryostream 700** cyo cooler

SYNOPSIS

marCryo [**OPTION**] [**DEVICE NAME**]

DESCRIPTION

marCryo is a program to control the Oxford Cryosystems cryo cooler (Cryostream 700, Cobra). It provides a graphical user interface as well as a terminal interface. The program also is a TCP/IP-server and accepts all commands from the terminal interface also on a TCP/IP-port.

The program *marCryo* allows for setting up all relevant parameters to control the cryo cooler and displays current instrument status.

The program talks to the hardware via the serial port. For properly connecting the cryo controller with the host computer there is a requirement for a serial cable with a defined wiring. Please see www.oxford-cryosystems.uk.co for details.

OPTIONS**-debug** *N*

Optional debugging flag.

Default: -debug 0

-d, --device *DEV*

Connect to device DEV. This must be a serial line interface device name. Please take care to have read/write permission on the selected device.

Default: -d /dev/ttyS0

-h, -help

Show program usage and version number. Exits immediately.

-i, --interval *N*

Update status all N secs

Default: -i 60

-l, --log *FILE*

Log hardware status into FILE.

Default: -l \$MARLOGDIR/log/marCryo.log.x (x=1,99)

-nolog Do not produce a log file

Default: produce a log file

-p, --port *NO*

Port number to use for the TCP/IP-server function.

Default: -p 7000

-q, --quiet

Do not log hardware status to standard output but only into log file

Default: log to standard output and log file

+s, ++server

Run the TCP/IP-server on selected port (7000).
Default: do not use server.

-s, --simulate

Simulate the hardware, only. No need to be physically connected.
Default: use real hardware

-v, --verbose

Increases verbosity level. May be given several times.

-V, --VERSION

Only show program version and exit

-x

Run program without GUI (X11/Motif based).
Default: +x = use GUI

PROGRAM FLOW

At startup, the program *marCryo* tries to open a serial connection to the Cryostream controller. The program optionally starts a TCP/IP-server port to listen to commands from networked hosts. After connecting to the hardware, the current hardware status will be either displayed in the GUI or on the terminal interface or written into a log file or written onto the socket.

TUI - Terminal user interface

On the command line or via a socket connection keyworded commands will be accepted. Lines starting with # or ! will be treated as comment lines and will not be processed. In Currently the following keywords are implemented. The mandatory part of the keyword is given in uppercase letters. Keywords or part of keywords in square brackets [...] are optional.
Keywords split up in 3 sections:

- program control
- hardware commands

KEYWORDS FOR PROGRAM CONTROL

The keywords for program control are:

- @file | BYE | DEBUG | DEVICE | INTERVAL | LOG | QUIT | VERBose | SHOW | UNIX

@filename

Load parameters from file <filename>.
Example: @cryo.params

BYE | CLOSE

Closes TCP/IP-socket connection.
Example: BYE

DEBUG [<value>]

Increase debug level or set to <value>.
Example: DEBUG 2

DEVIce [*<name>*]

Use **<name>** as serial interface device name

Example: DEVICE /dev/ttyS0

INTERval [*<N>*]

Update status information all **<N>** seconds. The output is either written into the log file or on the terminal or on the socket or into the GUI log area. The default is 60.

Example: INTERVAL 60

LOG [*NO*]/*TERM* [*NO*]/*SKT*

Enable or disable logging onto terminal screen or socket.

Example: LOG NOTERM

QUIT | **EXIT**

Terminate program marCryo.

Example: EXIT

SHOW | **LOG**

Print a single status information block.

Example: SHOW

VERBose [*<value>*]

Increase verbosity level or set to **<value>**.

Example: VERBOSE 0

UNIX | **%** [*<string>*]

Anything after the keyword will be treated as a shell command. The command messages produced on stdout will be sent to the network socket. **BEWARE:** if program marCryo is being run with super-user privileges, any user will be able to run any command on the PC!

Example: UNIX ls /home/marCryo/data

KEYWORDS FOR HARDWARE COMMANDS

The keywords for hardware commands are:

- RESTART | RESUME | STOP | PAUSE | HOLD | PURGE | TURBO ON/OFF | COOL | END | RAMP | PLAT | ANNEAL | STATUS

RESTART

Startup the hardware after shutdown (STOP).

RESUME

Resume the latest hardware command after PAUSE.

STOP Shutdown the hardware.

PAUSE

Pause current hardware operation.

HOLD Hold current temperature.

PURGE

Purge cryo head.

TURBO ON/OFF

Turn on/off the turbo pump.

COOL [*<target>*]

Cool to target temperature (default is 100 K).

END [*<ramp>*]

End cooling phase and warm up with *<ramp>* K/h (default is 120 K/h).

RAMP [*RATE <ramp>*] [*TEMP <target>*]

Ramp temperature by *<ramp>* K/h (default is 120 K/h) until reaching *<target>* (default is 300 K).

PLAT [*<min>*]

Keep temperature for *<min>* minutes (default is 720 min).

PLAT [*<min>*]

Keep temperature for *<min>* minutes (default is 720 min).

ANNEAL [*<sec>*]

Close the cryo shutter for *<sec>* seconds, then reopen (default is 5 secs).

GUI - Graphical user interface

The GUI offers the following pages (tabs):

- Status
- Command
- Log

STATUS PAGE

Within this page, current hardware information is displayed graphically, in particular the current temperature, the target temperature and the current program phase.

COMMAND PAGE

This page is divided into 3 areas:

Hardware command:

Here you select one of the available hardware command (typically either "Cool" or "Ramp" or "End") and press the "Go" button to start the action. There is no actual feedback for the command. A new command will automatically overwrite the previous one.

Hardware Command Parameters:

Here, you can define a couple of parameters that are relevant for certain commands, only. The following command take the following parameters:

- **Cool -> Cool to [K]** i.e. the target temperature for the cooling phase
- **End -> Ramp rate [K/h]** i.e. the ramp to use for warming up
- **Ramp -> Ramp to [K] and Ramp rate [K/h]** i.e. the target temperature to reach and the ramp to use for warming up or cooling done
- **Anneal -> Anneal [sec]** i.e. the time to close the cryo shutter in seconds

Connection:

Select device name to connect to. The button on the right hand side toggles its state automatically. I.e. if a connection is already active, it will say "Disconnect", otherwise "Connect".

LOG PAGE

On this page, all status information generated by the Cryostream controller will be dumped. In the menu bar item 'Log' you will find options to

- increase or decrease the fontsize
- clear the text area
- increase or decrease the update rate.

The update frequency defaults to 1/min and cannot exceed 1/sec. The "Clear" button will remove all text from the text area so you can start with a fresh window.

ENVIRONMENT

The following logical names must be assigned:

Name	Example	Description
MARHOME	<i>\$HOME</i>	Root directory for mar software
MARLOGDIR	<i>\$HOME/log</i>	Directory where log files will go.
MARMANDIR	<i>\$HOME/man</i>	Directory where man pages will be found.
BROWSER	<i>firefox</i>	Internet browser for displaying man page

INPUT FILES

None

OUTPUT FILES

The program produces the following output files:

\$MARLOGDIR/marCryo.lock:

Contains the version number of the latest log file.

\$MARLOGDIR/log/marCryo.log.N:

Latest log file. N ranges from 1 to 99 and is increased with each call of the program. If N > 99, N = 1. Note: The program will automatically set links \$MARLOGDIR/marCryo.log the latest files in use.

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