Fabry Perot Temperature/ Vacuum Controller

Command Vocabulary

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General system information/status----------

RID	Read controller ID. Useful for locating the controller's COMS port. If preceded by "#" the string "Q_MKC" is returned.
SAV	Save controller setup to non-volatile memory.
SYS	Returns a binary string with system status bits.
GSS n	Returns a binary string with status bits for servo n.
LED n	Enable or disable front panel LEDS and LCD backlight. n=1 switches on light sources, n=0 switches them off.
LCD n	Select LCD info page n (these are listed in the appendix. Screen blanked by n=0.
DEV	Select DEV mode. This unlocks some commands.
SET TIM d m y h m s	Set the controller real time clock.
(GET) TIM	Read the controller RTC. "GET" is optional.
PSU	Read Power supply voltage.
SUT	Read the time and date when the controller was last powered on.
AUX	Read auxiliary analogue input (not implemented).

Controller data memory----------

SET RSI n	Set the record save interval to n seconds. Setting n=0 stops any data recording.
GET RSI	Read back the record save interval.
MEM	Read amount of record memory installed.
RWF	Read back the "Record Wrapped Flag". If this flag is 1 then it means that the circular record memory is full and that the oldest record is being overwritten by the newest record.
RST	Reset the record memory.
RECS	Read the number of records in memory.
DMP	Dump all of the records via the serial interface in a single block. A header is automatically included. This can take up to 50s if the memory is full. During this time the controller will not respond to any commands. Any received character will abort the dump.
DM20 n	Dump a block of 20 records starting at record n. This is the maximum number of records that can be transmitted at a time without blocking additional commands.
DLR	Read just the last record that was written to memory.
HED	Read the record data header (includes column headings and controller ID).
FRT	Read time stamp of earliest record in memory.

Temperature sensors----------

KEL n	Read the temperature in Kelvin of channel n. n=1,2,3,4 refer to the external temperature channels, n=5 refers to the preamplifier temperature and n=6 refers to the instrument case temperature. Returns "n/c" if sensor not connected.
NOI n	Read RMS temperature noise in sensor channel n over the last 10s. Alternatively if n=A,B or C the command returns the servo noise in Watts RMS.
SET MAP n m	Map the external sensor on channel n to the calibration curve m. Calibration curves present are: m=1: Pt100 RTD m=2: IN4148 diode m=3: Lakeshore DT470 diode This command is only available in Dev mode. Other curves can be supplied on request. This version of the controller is configured to allow diode sensors to be used on CH1,2,3 and Pt100 sensors on CH4. Other combinations are possible upon request.
GET MAP n	Read back calibration curve number used by external sensor on channel n.
STH n	Read RMS temperature noise in sensor n over the last hour (not available for case sensor).
STD	Read RMS temperature noise in sensor n over the last day (not available for case sensor).

Pumping Control----------

PRE	Read Thyracont VSP63MV pressure sensor. Returns pressure in mBar.
VLV n	Activate electro-valve, where n="open" or "shut".
PMP n	Activate vacuum pump, where n="on" or "off".
SET PTG n	Set pressure trigger to n mBar. This is the pressure at which the pump activates when in threshold mode.
GET PTG	Get pressure trigger value in mBar.
SET PDU n	Set pump duration to n seconds. This is the time for which the pump remains on after being triggered automatically.
GET PDU	Get pump duration in seconds.
SET PHR m,n,o,p,q,r	Set hours (24hour system) at which pump will be triggered in Scheduled mode. Up to six hours can be entered (separated by spaces or commas).
GET PHR	Get hours at which pump is scheduled to come on.
SET PMO n	Set pump mode to n. n=0 is Manual mode (operated by front panel buttons, GUI buttons or using the "PMP" command). n=1 is Threshold mode. n=2 is Scheduled mode. n=3 is Hourly mode. Changing pump mode will immediately close the valve and then stop the pump 1s later. Pump mode cannot be changed from manual if there is no valve connected.

GET PMO	Get pump mode.
SET VDL n	Set Valve delay to n seconds. This is the time between the pump starting and the valve opening in one of the automatic pumping modes. Gives pump enough time to evacuate vacuum hose and reach operating speed.
GET VDL	Get Valve delay.
PTR	Read pump time remaining in seconds when pumping in one of the automatic modes.
MPH	Read maximum pressure in current hour.
MPD	Read maximum pressure in current day.

Servo loops----------

ENA n	Enable servo n (A,B or C). Since servo C controls the preamp oven it can only be enabled/disabled in Dev mode.
DIS n	Disable servo n (A,B or C). Since servo C controls the preamp oven it can only be enabled/disabled in Dev mode.
SET TAR n m	Set target temperature of servo n (1,2,3,4) to value m. Units are Kelvin.
GET TAR n	Get target temperature in Kelvin of servo n.
SET SEN n m	Select sensor m (1,2,3,4) for use with servo n (A or B). Servo should be disabled prior to changing sensor (except in Dev mode).
GET SEN n	Get sensor used for servo n.
SET PRO n m	Set proportional coefficient of servo n (A,B,C) to value m. Servo C is used by the preamplifier oven

	and can only be modified in Dev mode. m must be between 0 and 15.
GET PRO n	Get proportional coefficient for servo n .
SET INT n m	Set integral coefficient of servo n (A,B,C) to value m. Servo C is used by the preamplifier oven and can only be modified in Dev mode. m must be between 1e-5 and 0.05.
GET INT n	Get integral coefficient for servo n.
SET SLO n m	Set maximum slope of servo n to value m. Units are Kelvin per minute. Range is 0 to 100. Servo C is used by the preamplifier oven and can only be modified in Dev mode.
GET SLO n	Get maximum slope for servo n.
SET HLP n m	Set heater low-power range for servo n (A,B,C). m=1 to select low power, 0 for high power. Selecting low power restricts the servo heater voltage to approx. 8.0V. In the default high-power setting, the maximum heater voltage is 14.9V.
GET HLP n	Get power-range setting for servo n.
SET LIM n m	Set temperature limit of servo n (A or B) to value m Kelvin. Both servos A and B are disabled if the chosen sensor for servo n exceeds this temperature.
GET LIM n	Get temperature limit for servo n.
SET FLW n m	Set flash window of servo n (A,B or C) to value m Kelvin. The front panel LEDs will flash if the servo temperature error exceeds m.
GET FLW n	Get flash window for servo n.

SET FIL n m	Apply single pole low-pass IIR digital filter with 3dB point = m Hertz. If n=1,2,3 or 4 it applies to the temperature input channels. If n=5 it applies to the preamplifier temperature sensor. If n=6 it applies to the instrument case temperature. If n=A,B or C it applies to the power demand output of the servos. Must be below 0.5Hz.
GET FIL n	Get digital filter frequency currently used by channel n.
HVO n	Read the voltage on servo output n.
HCU n	Read the current output by servo n (Amps).
HPO n	Read the power output by servo n (Watts).
GST n	Get current temperature of servo . Returns “n/c” if sensor has been disconnected.