

Feed Control Commands and Functions

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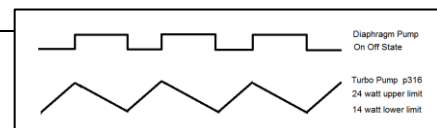
Other related files may be stored in folder "Testing".

The feed control board communicates with the Rim Box via RS-232. The board has a set of commands for monitor and control of devices in the feed. The board also passes several commands through to the Cooler Control and the Vacuum Control. Three tables of commands are shown in the pages that follow. The following notes apply.

- All commands are delivered to the Feed Control Board, but some are passed through to other controllers.
- No commands are identical among controllers. (Ackermann, Pfeiffer, Sunpower)
- All commands to the Cooler Control Board are in upper case. (Sunpower)
- On a functional terminal screen, after command entry, the response will appear on the next line below.
- We may have mislabeled or forgotten some commands.
- More cooler commands are listed in the separate Sunpower controller manual. (version etc ?)
- More vacuum commands are listed in the separate Pfeiffer controller manual. (version etc ?)
- On some commands a 0 before decimal may be needed ????
- An o in the item column indicates a change might be needed.
- An x in the item column indicates we would like to add this command.

Feed Control Board Commands (Ackermann, direct) (via RS-232)			
Item	Command	Response	Description (direct to Feed Control Board)(always lower case)
	help	big list	Display a list of supported commands. (feed control only ?)
	getfanpwm	25	Display fan power. (% on time) (pulse width modulation)
	setfanpwm 30	ok	Set new fan power. (% on time)
	getfanspeed	2420	Display current fan speed. (rpm)
o	gettemp a0	21.1	Display temperature, on control board. (°C xx.x) (near ambient)
o	gettemp a1	38.3	Display temperature, Cooler housing. (°C xx.x) (back of housing)
x	gettemp a2	31.6	Display temperature, Cooler rejection. (°C xx.x) (near to fins)
	gd -v	0.527	Display LNA diode voltage. (_-v gives)(volts x.xxx) (maybe getdiode ?)
x	name (gd maybe)	68.0	Display LNA temperature. (Kelvin xx.x) (uses equation to calculate) ($T = -67792 X3 + 1661 X2 - 1794.7 X + 899.38$ from excel)
o	gv	1.2 E-5	Display vacuum gauge. (change to mbar)(equation)(if gauge is present) ($p = 10^{(1.667 \times U - d)}$) (U volts) (d = 11.33 for mbar) (5 volts = $1.0E-3$) Similar to p340 when using Pfeifer DCU.
x	name (gr maybe)		Display vacuum ratio. (% time increasing 14 to 24w / hr) (function p316 watts or p310 amps) (function may not be needed)
X	name	?	Display accelerometer data. ???
x	name		Set Relay closed. (maybe inhibit cooler)(maybe for valve)
x	name		Set Relay open.
x	name		Return a log, time Vac system on, time cooler on, max values / whatever.
x	name		Alarm, some temp too high. (maybe several needed)
x	name		record max something is some time period.
?	prefix + name		(Should we use a prefix to allow any Pfeifer command pass thru)
?	uppercase		(always means Sunpower command pass thru)

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Vacuum Control Board Commands (Pfeiffer, passed through Feed Control Board) (prefix p) (RS-485)				
Item	Command	T	Response	Description (always lower case ?)
	p009=111111	0		Set acknowledge error, 1 = acknowledge, (data type 0 for true false)
x	p010=000000	0		Set pumping station, turbo & diaphragm. 0 = off. (setting is preserved at power down and applied at next power up) 1 = on. (Also acknowledges or clears error)
x	p023=000000	0		Set turbo on/off, for turbo motor only. (not the same as Station on/off) 0 = off. (000000) & 1 = on. (111111)
x	p024=009	7		Set Cfg D01, Output, Diaphragm Pump speed, 9 = always 0, MVP-006 pin 8 = open, high speed, 3000 rpm. 10 = always 1, MVP-006 pin 8 = 24 VDC, low speed 1000 rpm. (seasoned) 13 = follow backing mode. (see p025)(MVP-006 DIP Sw 2 set to off)
x	p025=001	7		Set operation mode backing pump. 0 = continuous. (uses p024=9 or p024=10) 1 = intermittent. (assumes p024=13) (uses settings p710 & p711) 2 = delayed switch-on. (not used for our process)
x	p035=003	7		Set Cfg Acc A1, Accessory , Diaphragm pump on, 3 = backing pump. 6 = always 0, MVP pin 3/10 = open, diaphragm pump off. 7 = always 1, MVP pin 3/10 = 24 VDC, diaphragm pump on.
x	p700=000120	1		Set value run-up time. (min) (1 to 120)
x	p710=000014	1		Set point diaphragm intermittent on. (watts)(based on turbo power p316)
x	p711=000024	1		Set point diaphragm intermittent off. (watts)(based on turbo power p316)
x	p304	0	0	Display Excess Temp Electronics. (0 = no, 1 = yes)
x	p305	0	0	Display Excess Temp Turbo. (0 = no, 1 = yes)
x	p310	2	1.83	Display Turbo current consumption. (amps) (000183 = 1.83)
x	p311	1	85	Display Station operation (hours)(0 to 65535)
x	p315	1	1500	Display Turbo speed, nominal. (Hz) (1500 Hz = 90,000 rpm)(x6)
	p316	1	22	Display Turbo power consumption. (watts)(77 max)(14 good)
	p326	1	34	Display Electronics control board temperature. (°C xx.x) (tenths ?)
x	p330	1	35	Display Turbo bottom temperature. (°C xx.x) (tenths ?)
	p342	1	39	Display Turbo bearing temperature. (°C xx.x) (tenths ?)
x	p346	1	31	Display Turbo motor temperature. (°C xx.x) (tenths ?)
	p398	1	90030	Display Turbo speed, actual. (rpm)(90,000 max nominal)

Data Type. (Column "T" in the table above)

Type 0 for true false, 000000 or 111111.

Type 1 positive 6 place integer. 000000 to 999999

Type 2 positive 6 place integer, 001571 is 15.71 , decimal 2nd & 3rd place.

Type 4 symbol chain 6 places, TC_400

Type 7 positive 3 place integer. 000 to 999

Vacuum Control Board Commands related to DCU 002				
	p794=001	7		Set extended parameter set. (0 = basic, 1 = extended set, like p710 etc)
	p738=PKR2xx	4		Set type of gauge. (PKR251 Combined Pirani & Cold Cathode)(DCU page 8)
	p340	7	1.2 E-4	Display pressure from gauge. (mbar)(only from Pfeiffer DCU) (p738 gauge type)

Cooler Control Board Commands (Sunpower, passed through Feed Control Board) (via RS-232)			
Item	Command	Response	Description (always upper case ?)
	SET SSTOPM=1 *1	1	Set Soft Stop Mode. (0 = stop via SSTOP , 1 = stop via pin 5)
	SET SSTOP=1 *1	1	Set Soft Stop. (0 = restart motor, 1 = stop motor)
	SET MAX=210 *1	210	Set Max user defined power. (watts) Not PWOUT. Factory < 240.
	SET MIN=100 *1	80	Set Min user defined power. (watts) Not PWOUT. Factory > 70.
	SET PID=0 *1	000.00	Set control to power mode. (0 = power, 2 = temp)
	SET TTARGET=65 *1	065.00	Set cold-head temp target to number. (Kelvin) (risk if below 60)
	SET PWOUT=200 *1	200.00	Set power target to number. (watts) (while in PID mode 0)
o	TC	65	Display Temperature Coldhead. (°C xx.x) (risk if below 60)
	P	210	Display current power. (watts)
	E	120	Max allowable power. (watts) (varies with cold, usually 240)
		70	Min allowable power. (watts) (never less than 70)
		120	Current power. (watts) (usually < 240 during regulation)
	SHOW MX	80 210	Display Min & Max. (watts)
	STATE	list	Display status list of 14 commanded states.
	RESET=F	RESETTING	Resets all parameters to factory default.
	ERROR	000 001	Display error messages. (both LEDs are flashing repeatedly)
		000 010	1 LED Flash, Over Current
		000 100	2 LED Flashes, Jumper Error
		001 000	3 LED Flashes, Serial Error (Baud 4800, None, Data 8, Stop 1)
		010 000	4 LED Flashes, Non-volatile Memory Error
		100 000	5 LED Flashes, Watchdog Error.
		100 001	6 LED Flashes, Temperature Sensor Error.
			Multiple Errors, Over Current & Temp Sensor.
			*1 To display current value for most commands, type the command without an " =number". Example: SET TTARGET displays 065.00
			*2 PID means proportional, integral, differential, a control method.

Cryo Cooler Notes		
	Operation	Cooler should start within 11 seconds of power on for SSTOP=0.
	Conditions	Needs 48 VDC +/- ? Needs 6 watts minimum load. Needs 100 cu-ft/min air. achieve 1.0E-4 or better vacuum.
	LED on Red	Unit in cool down mode above Set Point Temp.
	LED on Green	Unit regulating within 0.5 Kelvin of Set Point Temp. (pin 4 high)
	Inhibit motor on/off	see feed control board relay. (maybe)(pin 10 at 5 VDC to pin 5 soft stop)