Kodak

Thermal 2 Head

TH2 General Health Checklist

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Revision History

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1. OVERVIEW

Total time to complete: 30 minutes plus analysis

Use this document to check the general health of the major components of the thermal 2 imaging head.

2. CHECK AND BACKUP PARAMETERS

Time to complete: 3 minutes

		Action and Details	Link
☐	1	Run *nvsdump.spt*.	NVSDump.spt help
☐	2	Run *parmcheck.spt*. Confirm that all values are green or amber. Investigate any that are red.	parmcheck.spt help

3. WRITE LASER (LDD) & LIGHT VALVE

Time to complete: 12 minutes

		Action and Details	Link
☐	1	Run *BeamBalance.spt*. This script executes the firmware command `bbs balance` and displays the results graphically. The script output shows how much beam balance margin is left for future aging of the write laser and light valve. For more detail and sample graphs see the help file link.	BeamBalance.spt help
☐	2	Run *ContrvHV.spt.* This script graphs the contrast ratio. It measures the power at the beam balance sensor (BBS) for all pixels on and all pixels off, while changing the `hvtrim` over its full range. For more detail and sample graphs see the following help file link. For details on how to maintain the contrast ratio when the stroke profile is poor, see: Maintaining the contrast ratio on a Thermal 2 head when stroke profile is poor	ContvHV.spt help
☐	3	Run *ContvBP.spt.* This script graphs the contrast ratio. It measures the power at the beam balance sensor (BBS) for all pixels on and all pixels off, while changing the beam position over its full range. For more detail and sample graphs see the help file link.	ContvBP.spt help
☐	4	Turn on the laser at the highest laser power used by the customer. Type `>>laser on`.	
☐	5	Check the diode current. Type `>>ldd info`. • If the laser set point is near the maximum supported power, it is normal for the current to be close to the nominal current (to check, type >> `set ldd`	

		Action and Details	Link
		`nominalcurrent.)` The current can be 1.2 times the nominal current setting before the thermal head will report the error `02322 "The laser diode is over-current."` • A poor stroke profile or an incorrect `bposn` setting can contribute to an over current error. **Note**: The current increases as the diode temperature increases.	
☐	6	Type `>>ldd info` every 30 seconds. a. Monitor the diode and cold plate temperature for three minutes and confirm that it stabilizes. If the diode temperature is reading high or does not stabilize, check the chiller and coolant flow. • TH2.25 operates at around 25 ± 1°C. • TH2.5 operates at either 20 ± 1°C, or, 25 ± 1°C, based on the setting of `wlpsetpoint`. **Note:** `wlpsetpoint` is set during integration of the head and in most cases should not be changed in the field. • TH2.7 heads operate around 15 ± 1°C while idle and 17.5 ± 1°C while the laser is on. The diode on TH2.7 heads is actively cooled by the coolant from the chiller. b. Check the TEC current and cold plate temperature. If the thermal head hardware supports it, the TEC current and cold plate temperature are reported when the laser is on. • The cold plate temperature should typically remain under 30°C. If not, check the coolant system. • The TEC maximum current is 9.99A. If it reads this high, it means that the Peltier coolers are working at their maximum potential to cool the diode. This can indicate: o the case is hot (this makes it harder for the Peltiers to transfer heat from the diode) o the diode is running hot or o the Peltiers have lost some efficiency • TH2.7 heads do not have Peltier coolers.They are actively cooled by the coolant from the chiller. For these heads, it is normal for TEC current to display `not available` and the cold plate temperature to display as 0 degrees. For full details, see Appendix A: TH2.7 sample readout.	
☐	7	Type `>> laser off`	
☐	8	Capture the Service Shell monitor readout from steps 4 to 7. Paste this to a new text file. Save the file as YYYYMMDDGenHealth.txt and save it to \\ccafs6\ThermalScriptResults\Thermalhead SerialNumber\DeviceSerialNumber\. If this is the first time script results have been saved for this	

		Action and Details	Link
		head, you may need to create these folders. For example, \\ccafs6\ThermalScriptResults\T09999\MT09999\20070614GenHealth.txt **Note**: You can only store the file at this location if you are on the Creo domain.	

☐	9	Type
		`>> bpd mode on`
		`>> lvd mode local`
		Run *M8Measure.spt*.
		The M8 sensor is used to maintain the laser power during imaging. M8Measure graphs the measurement of the M8 sensor versus laser current. It is important that the M8 sensor does not saturate and that the readings increase as laser current increases. For more detail and sample graphs see the help file link.
			M8Measure.spt help

4. FOCUS LASER (FOC)

Time to complete: 2 minutes

		Action and Details	Link
☐	1	Run *FocusPI.spt.* This script measures the power of the focus laser versus current. It can be used to verify the health of the focus laser and to check for focus laser diode damage. The graph should be close to a straight line. If the line has any stair steps, or if the maximum focus laser current is higher than 100mA, the focus laser is damaged and the head requires replacement. For more detail and sample graphs see the help file link.	FocusPI.spt help
☐	2	Load a plate and then check the head installation. Type >> `head install on`. Confirm the sum and error: • Sum: 1200±100 • Error: 0±70 **Note:** This is the general rule but there are exceptions. For example, sites that use multiple media thicknesses, or media that has large reflectivity variation.	

5. FOCUS ACTUATOR (FOC)

Time to complete: 7 minutes

		Action and Details	Link
☐	1	Run *Lposstatsvlpos.spt.* This script monitors the focus actuator movement using hall effect sensors. • The Response LPos StDev in the Response LPOS StDev vs Set LPOS graph should be less than 0.5 between Set LPos ±150 microns. • The focus actuator movement in the Response LPOS vs Set LPOS graph should be linear between Set LPos ±150 microns. For more detail and sample graphs see the help file link.	LposStatsvLpos.spt help
☐	2	Run *Forceping.spt.* This script graphs the lens position versus focus actuator current. It is used to determine the range of motion of the actuator and to find the point of inflection. The script tunes the focus actuator and fails if the focus actuator movement cannot be calibrated. When the script runs successfully it prompts you to save the parameters. Type y for yes. For more detail and sample graphs see the help file link.	forceping.spt help

6. SHUTTER (BBS)

Time to complete: 1 minute

		Action and Details	Link
☐	1	Run *ShtrGlitch.spt.* This script monitors the M8 sensor while opening and closing the shutter. If the shutter is not in good condition it can interfere with the M8. • If the shutter is not in good condition the shutter open or close response graphs display a test failure in the bottom right. • The maximum allowable deviation is 1.73%.	Download this script from: http://techplanet.creo.com/output/heads/thermal_2/nav/downloads.htm#scripts

7. BEAM POINTING (BPD)

Time to complete: 5 minutes

		Action and Details	Link
☐	1	Run *BPDNoise.spt.* This script is used to measure the noise on the beam pointing sensor. If the noise is too high then the BP servo is not accurate. BPDNoise.spt tests the bp sensor at various laser currents. At each chosen write laser current, the script turns on the bp servo, allows it to settle and then turns it off (this corresponds with 0 seconds on the graph.) • Any noise in the graph should be less than 0.5%. • Ignore any noise in the 15A results as this is common. For more detail and sample graphs see the help file link.	BPDNoise.spt help
☐	2	Run *BPMeasure.spt.* The BP sensor is responsible for maintaining the write laser beam position. BPMeasure graphs the DAC measurement of the BP sensor versus laser current. • It is important that the BP sensor does not saturate and that the readings increase as laser current increases. For more detail and sample graphs see the help file link.	BPMeasure.spt help

APPENDIX A: TH2.7 SAMPLE READOUT

```
TH2 > ldd info
LDD: Control Mode=Off
LDD: Control Status=Off
LDD: WLP Status=Normal
LDD: Last Shutdown State=None
LDD: Laser Current=0.00 Amps
LDD: Diode Temperature=18.5 C
LDD: Laser On Time=218.8 Hours
LDD: WLP Firmware Version/Revision=C/C
LDD: Cold Plate Temperature=0.2 C (meaningless on a TH2.7)
LDD: TEC Current=0.0 Amps ( Not Available ) (meaningless on a TH2.7)
LDD: Setpoint Temperature=22.0 C
LDD: Product Model=SQUAREspot Imaging
LDD: Head Model=SQUAREspot Imaging
*** Command Success ***
```