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Procedure

Testing the shutter on a thermal 2 head

Background

Use this procedure when you suspect that the shutter is stuck open or closed. It applies to Lotem® Quantums, Trendsetter® NEWS, and any other device using a thermal 2 head (TH2).

Once you have performed the checks in the table below, follow the Procedure.

Problem	Symptoms	Possible causes
The shutter is stuck open	• The commands `laser on` or `stroke cal` will fail. • When you turn on the laser, `error 2318 "the laser power could not be calculated during calibration"` appears.	1. This behavior may be caused by a problem with the MCE. To verify this: a. When the head is not plotting, type the command `TH2> bbs info`. b. Check the status. • If the status is '`Open by host`', then replace the MCE. • If not, then follow the procedure *How to Test the Shutter* below. 2. Check the parameter `hvtrim` using the command `TH2> set lvd hvtrim` The value should be between 60 and 80. If the value is 0, refer to the troubleshooting item *Stroke cal fails and hvtrim has a value of 0*
The shutter is stuck closed	• Plates come out of the device totally blank. • No error messages appear. This can happen when plates are imaged from both the workstation and from a test plot (for example, Plot 1).	• Check Service Shell for errors: – If there are several focus errors, it may indicate a carriage problem. – If there are no focus errors (or only one or two), there may be a shutter problem. • Blank plates may be caused by other factors: – Processor not functioning correctly – Plate rejected due to a focus problem – Write laser disabled – Head installed correctly, too far from

		the plate – Incorrect power setting or wrong media

Procedure

To test the shutter, complete steps 1-9.

1. Run **`NVSDump.spt`** to obtain an up-to-date `PRMParms.txt` file.
2. Run **`parmcheck.spt`** and enter the path to the `PRMParms.txt` file in the results folder. The script will automatically save an HTML file in the `results` folder under `parmcheck`.
3. Look at the HTML file. If there are any variables with unusual values, contact your PSS.
4. In Service Shell, turn on the write laser with current. Type the commands:

```
TH2>redirect enable
TH2>eng
TH2>bpd mode on
TH2>lvd mode local
TH2>ldd mode current 20
```

5. Confirm that the laser is on at the requested current. Type the command:

```
TH2>ldd info
```

The following messages display in the Device Monitor:

```
LDD: Control Mode=Current
LDD: Control Status=Current
LDD: WLP Status=Normal
LDD: Last Shutdown State=None
LDD: Setpoint Current=20.000 Amps
LDD: Laser Current=19.997 Amps
LDD: Diode Temperature=25.5 C
LDD: Laser On Time=81.8 Hours
LDD: WLP Firmware Version/Revision=B/B
LDD: Cold Plate Temperature=26.7 C
LDD: TEC Current=0.0 Amps ( Not Available )
LDD: Setpoint Temperature=25.0 C
LDD: Product Model=SQUAREspot Imaging
LDD: Head Model=SQUAREspot Imaging
```

6. Set the BBS sensor for unity gain. Type the following command:

```
TH2>bbs sensor 3 374 2048
```

Note: This ensures that the sensor is calibrated for this test.

7. Type the commands in the table below. Record your results in the last column.

Note: The expected results in the table below are averages.

WARNING: You must complete steps 1 - 0 before you complete the following table. If you do not, particularly if you skip step 0, the sensor will not be properly calibrated and the results will be incorrect.

`bbs sample`: Expected Results				
Type these commands in the following order. Record the results.	**Shutter is working normally (see example 1)**	**Shutter is stuck open (see example 2)**	**Shutter is stuck closed (see example 3)**	**Results for the device you're working on**
`TH2>shutter close`				
`TH2>lvd all off` `TH2>bbs sample`	Low average value	Low average value or saturated samples*****	Low average value	
`TH2>lvd all on` `TH2>bbs sample`	High average value	Low average value or saturated samples*****	High average value	
`TH2>shutter open`				
`TH2>lvd all off` `TH2>bbs sample`	Low average value or saturated samples*****	Low average value or saturated samples*****	Low average value, similar to the value when the shutter is closed.	
`TH2>lvd all on` `TH2>bbs sample`	Low average value or saturated samples*****	Low average value or saturated samples*****	High average value, similar to the value when the shutter is closed.	
`TH2>ldd mode off`	Turns the laser off			

***Saturated samples**: Occur when there is either excessive signal or no signal at all.

8. Compare your results to the Expected Results in the table above to determine if the shutter is working normally, stuck open, or stuck closed.
9. Use the table below to determine your course of action:

Shutter is working normally	**Shutter is stuck open**	**Shutter is stuck closed**
Troubleshoot any remaining errors.	Make sure that the problem is not being caused by a problem with the MCE. To verify this: 1. When the head is not plotting, type the command `TH2> bbs info`	Replace the head.

	2. Check the status. • If the status is 'Open by host', then replace the MCE. • If not, then replace the head.	

Sample Code: BBS sensor values

Example 1: Values when the shutter is working normally

```
TH2 > shutter close
*** Command Success ***

TH2 > lvd all off
*** Command Success ***

TH2 > bbs sample
BBS: Number=128, Average=26, Maximum=27, Minimum=26
*** Command Success ***

TH2 > lvd all on
*** Command Success ***

TH2 > bbs sample
BBS: Number=128, Average=516, Maximum=517, Minimum=516
*** Command Success ***

TH2 > shutter open
*** Command Success ***

TH2 > lvd all off
*** Command Success ***

TH2 > bbs sample
BBS: Number=128, Average=6, Maximum=7, Minimum=6
*** Command Success ***

TH2 > lvd all on
*** Command Success ***
```

```
bbs sample
TH2 > bbs sample
BBS: Number=128, Average=6, Maximum=7, Minimum=6
*** Command Success ***

TH2> ldd mode off
```

Note: If the shutter is working correctly, the average value for `lvd all on` when the shutter is closed is more than 3 times the average value for `lvd all off`. When the shutter is open the average `bbs` values for `lvd on` and `lvd off` are very similar: low or saturated.

Example 2: Values when the shutter is stuck open

```
TH2 > shutter close
*** Command Success ***

TH2 > lvd all off
*** Command Success ***

TH2 > bbs sample
BBS: Number=128, Average=6, Maximum=7, Minimum=6
*** Command Success ***

TH2 > lvd all on
*** Command Success ***

TH2 > bbs sample
BBS: Number=128, Average=6, Maximum=7, Minimum=6
*** Command Success ***

TH2 > shutter open
*** Command Success ***

TH2 > lvd all off
*** Command Success ***

TH2 > bbs sample
BBS: Number=128, Average=6, Maximum=7, Minimum=6
*** Command Success ***
```

```
TH2 > lvd all on
*** Command Success ***

TH2 > bbs sample
BBS: Number=128, Average=6, Maximum=7, Minimum=6
*** Command Success ***

TH2> ldd mode off
```

Note: When the shutter is stuck open, the average `bbs` values are low or saturated for both the `shutter close` and the `shutter open` command.

Example 3: Values when the shutter is stuck closed

```
TH2 > shutter close
*** Command Success ***

TH2 > lvd all off
*** Command Success ***

TH2 > bbs sample
BBS: Number=128, Average=26, Maximum=27, Minimum=26
*** Command Success ***

TH2 > lvd all on
*** Command Success ***

bbs sample
TH2 > bbs sample
BBS: Number=128, Average=518, Maximum=519, Minimum=518
*** Command Success ***

TH2 > shutter open
*** Command Success ***

TH2 > lvd all off
*** Command Success ***

TH2 > bbs sample
BBS: Number=128, Average=26, Maximum=27, Minimum=26
*** Command Success ***
```

```
TH2 > lvd all on
*** Command Success ***

TH2 > bbs sample
BBS: Number=128, Average=518, Maximum=519, Minimum=518
*** Command Success ***

TH2> ldd mode off
```

Note: When the shutter is closed the average `bbs` values for both commands (`shutter close` and `shutter open`) are very similar.

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