



Chapter 5

Lotem 400 Quantum Calibration

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This chapter refers to the following versions:

1) Lotem PC Controller version 3.51.02

2) MCE Firmware version 1.20.02

3) Xilinx Firmware version 1.25

4) Head Firmware Th2h101c.bin

5.1 Working with the Splot

1. Open the Splot by double -clicking the Splot icon.
2. From the Menu bar, go to **Term** -> **Input Mode** and select it.
3. From the Menu bar, go to **Term** -> **Port** and select **8**.
4. From the Menu bar, go to **Term** -> **Port Setting**:

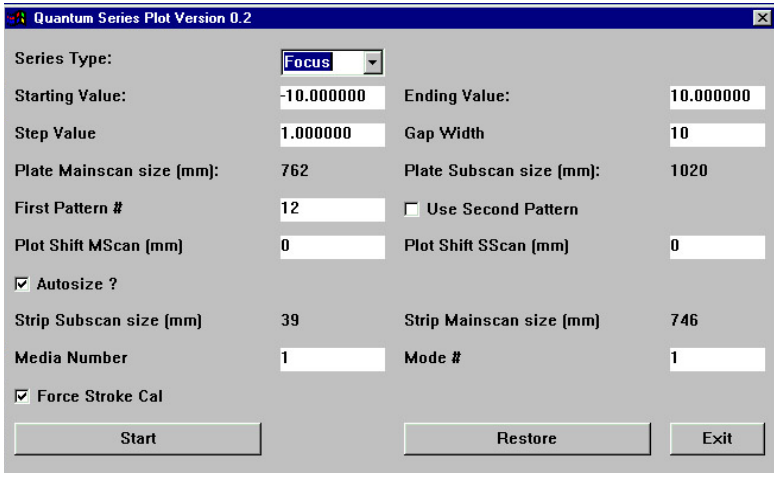
Baud rate:	57600
Parity:	none
Data bits:	8
Stop bits:	1

Quantum>> is displayed. Click **Enter**.

To display the TH2 >> prompt, type **redirect enable.**
To return to the Quantum>> prompt, type **redirect disable**.

To execute a certain script, do the following:

- File -> **C:/Tii/splot/scripts/tests/Quantum Sereis.spt**
- Go to **Exec -> Execute**. The Quantum Series Plot window is displayed.



- To submit the series, click **Start**.

To inform the TMCE that there is a plate on the drum, type the following:

Quantum>>**load “height (mm)” “width (mm)” “thickness (microns)”**



In order to expose a series test, you must load a plate.

5.2 Media Setting

Type the following commands:

1. Quantum>> **prm hazardous media enable** (Password).
2. Setting Media Parameters:
    1. Quantum>>**media**.
    A list of all media types is displayed.
    2. To change Current media type:
    Quantum >>**media #**
    3. Quantum>>**set media <media number> name <"media name">**.
    For example, **set media 3 name "Agfa P970"**.
    4. Quantum>>**set media <media number> invert <value>**,
    Enter value number of 0 or 1 according to the plate type:
    1 = positive plate.
    0 = negative plate.
    For example, **set media 3 invert 1**.
3. Setting Hdm Parameters:
    1. To get out of the head, type:
    TH2>>**redirect disable**.
    2. Quantum>>**set hdm <media number>**.
    A list of relevant parameters displayed.
    3. Make sure the Media name is correct, if no type:
    Quantum>>**set hdm** <**media number> name <"media name">**.
    For example, **set hdm 3 name "Agfa P970"**.
    4. Quantum>>**set hdm <media number> ds <value>**,
    for example, **set hdm 3 ds 450**.

    
    Drum speed should be calculated from **Media** spreadsheet.

    5. Quantum>> **set hdm <media number> wpower <value>**.

    
    Wpower should be taken from **Media** spreadsheet.

4. Setting Med Parameters:



A difference exists between the media number TH2 and the Quantum. If the media number in the Quantum is (N), then the media number in the TH2 is (N-1).

1. To get in the head, type:
   Quantum>>**redirect enable.**
2. TH2>>**set med <media number> name <"media name">**.
   For example, **set med 2 name "Agfa P970".**



The media number is one less than the media number chosen in step 1.2

5. Define the plate in the GUI.
   1. Restart the Lotem application.
   2. In the GUI**--> setting --> media definition**.
   3. Chose **New**.
   4. Enter a name and size of the plate.
   5. Go to **TH name** and choose the **Media name**; define the new name in the Lotem.
   6. Save plate.

5.3 Head Setting and Calibration

Make sure all connections are completed before performing calibration.

Before performing Head Setting and Calibration, you must defeat the focus laser and the motor defeater interlocks.

To determine the Head resolution , type Quantum >> **set sis.**

1. Load plate from the Loading system dialog box.
2. Set the correct media by typing:
   Quantum >> **media<media number>**.
3. Quantum >> **set media <media number>**.
4. Slightly loosen the four Allen screws that hold the Z-stage.
   See *Figure 21. on page 138*.
5. Quantum >> **zstage forward.**
6. From the PC application, move the carriage to the middle of the plate (500 mm).
   Or, from Splot, type
   Quantum >> **carriage moveto 250**.
7. From the PC application, move the drum to position **-500**.
   Or, from Splot type
   Quantum >> **drum move 250**.
8. Quantum >>**head install on.**

   Parameter results will be displayed: **State, Sum, Error**.

9. Use the 1/4 open wrench to:
   - Set error to zero (0) for 0.2 plate
   - Set error to (-130) for 0.3 plate

   To set the error, tighten / loosen the golden adjusting screw on the z-stage unit.

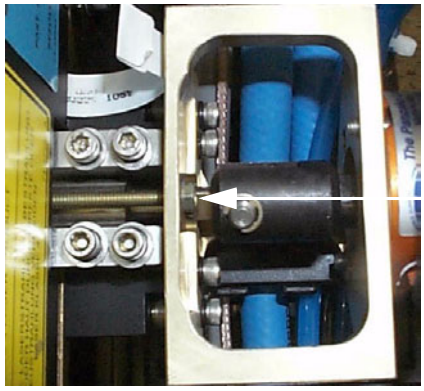


Figure 21. Z-stage, adjusting screw

If the error = 50 in both positions of the z-stage (forward and backwards), then the Head is not positioned in front of the plate.

The **SUM** parameter should be around **1200+/- 300**.
The sum is affected by the **Reflectivity** and the **rcvgain** parameters (Do not change).
If the SUM is more than 1200, increase the Reflectivity; if it is less than 1200, decrease the Reflectivity.

10. Tighten the four screws that were loosened in step 5.
11. Quantum>>**zstage back**. Check the error adjustment, the error should be around 0 for 0.3mm plate thickness.
12. Quantum>> **head install off.**
13. To find the **Reflectivity** parameter:
    - Quantum >> **Redirect enable**.
    - TH2 >> **eng.**
    - TH2 >> **foc cal reflect**.
      A reflectivity test is performed. A result parameter is displayed.

- Enter the value of the reflectivity found for SUM approx.1300 in the following directories:
  Quantum >> **set hdm <media number>sr <value>**



The media number is one less than the media number chosen in step 2.2

14. Quantum >> **media < media number>.**
    This command activates the change in reflectivity.
15. Quantum>> **head install on.** Verify the sum is approx. **1200.**
16. TH2 >> **field**. This ends the permission to perform foc cal test.



If, after having performed the **>> foc cal reflect**, the returned value of reflectivity is 0.01 (saturated), then force SR to a slightly higher value, for example 0.012 (**>> set med(#) SR 0.012**) and then proceed to step 17.

17. To find the **rcvrgain** parameter:
    - TH2 >> **foc cal rcvrgain**.
      The rcvrgain value is displayed
    - TH2 >> **set med(#) rcvrgain**.
      Change the value in steps of 0.1
    - Quantum >> **head install on**.
      Verify that the sum is close to 1200.

5.4 Edge Detection Procedure

1. In the Lotem Application move the carriage to 40.

   Make sure the laser beam is not on a vacuum groove.

2. Quantum>>**Head Install On.**
3. In Lotem application, select:
   Utilities>Hardware>Drum System>Drum Motor Dialog.
4. From the Drum Motor dialog box, select **Position** and type (**-500**).
5. Find the beginning and the end of the groove in the drum position:
   - In the Drum Motor dialog box, select **Distance**, type (**1**), and click **Enter**.
   - Continue to enter **±1** while checking the sum value in the Splot window.
   - When the laser beam is set to the middle of the groove and the sum is equal or very close to zero, continue to step 6.

   The range of the groove is 5 mm.

6. Quantum>> **Head Install Off**.
7. Quantum>> **Drum**.
   Look at the Drum position. For example, Drum Position = 84.422.
8. Quantum>>**Set Edge Drumpos <>**.
9. Check the edge detection status:
   Quantum>> **Access Enable**.
   Make sure the status is **Enable**.
   Quantum>> Option Edgedetect Enable.
   If the status is not **Enable,** then
   Quantum **>> Option Edgedetect Enable**
   Make sure the laser beam is not on a vacuum groove. The range of the groove is 5 mm.

   <> represents the value that was found in step 8.

10. Test the edge position:

- Load plate form the Lotem GUI.
- Quantum>> **Load X Y Z** (each variable separated by space) where:
  - X = Plate size along the drum (MM)
  - Y = Plate size along the screw (MM)
  - Z = Plate thickness in microns

For example: load 791 1029 300.

11. Qauntum>> **Edge Test.**
    A test is performed, write down the value of the “edge position estimate”.

12. Run the test five (5) times. Each time check for ±10 micron error tolerance.

This Section describes the calibration procedure of the imaging head of the Lotem 400 Quantum. This procedure is performed by the service engineer at the customer's site, after the platesetter installation.

The following tests are involved in the calibration process:

- Focus Series
- Power Series
- Slop Series
- Curve Series
- TLT Series
- Plot 1 Test

The results for some of the calibration tests depend on the plate type; these tests should be repeated for different plate types.

When working with positive plates, change the invert to 0 in order to see the result. For example, set media 3 invert 1. After the series tests are performed, change it back via the Lotem application, an error message will appear, ignore it and re-define the plate.

5.5 Focus Series

Before starting the calibration, write down the **foffset** by typing: Quantum >>**set head foffset**.

To run Focus series, do the following:

1. Load a plate from the GUI.
2. Quantum>>**load**.
3. To ensure the plate is defined in the head, type:
   Quantum >> **set mds.**
4. For pos. plate, type:
   Quantum >> **set media # invert 0**.

   Reduce the wpower for the focus test by 20% for Kodak of the wpower needed to expose.
5. Quantum **>>set hdm # wpower**.
6. Quantum >> **set hdm # wpower <new power value>**,
   For example, **set hdm 2 wpower 15**.

   Wpower should be calculated from **Media** spreadsheet.
7. Open the Quantum series plot dialog in Splot by opening:
   Files/Open/Script/Test/Quantum series.Spt.
   Then:
   Exec/Execute
8. Define the following parameters:
   The focus range is between **(-60)** to **(+60)**
   - Define starting value: **(-X)**
   - Define ending value: **(+X)**
   - Define step value: **(10)**
   - Gap width: **(10)**
   - First pattern: **(15)**
   - Plot shift Mscan: **(10)**
   - Plot Shift SScan: **(10)**

- Autosize: **(X)**
- Stripe subscan: **(50)**
- Stripe mainscan: **(500)**
- Media number: **(#)**
- Mode: **(1)**
- Force stroke cal: **No**

Make sure the Force Stroke Cal is not selected.

The media number should be the media number you are currently using.

Due to the low power used for the Focus test some of the target will disappear after developing.

9. From the processed plate, choose the area with the best focus. Start focusing on a small area. With each step you should narrow in on an area until you reach the best focus.

Mark the plate before developing, The strips are not labeled. The first strip (start value) represents the lowest value of the test. The last strip (end value) represents the highest value of the test.

10. Enter the focus value under Quantum >> **set head foffset <_>**.

5.6 Power Series

To run Power series, do the following:

1. Load a plate from the GUI.
2. Quantum>>**load**.
3. For pos. plate, type:
   Quantum >> **set media X invert 0**.
4. Open the Quantum series plot dialog in Splot by opening:
   Files/Open/Script/Test/Quantum series.Spt.
   Then:
   Exec/Execute
5. Define the following parameters:
   - Define starting value: **(-X)**
   - Define ending value: **(+X)**
   - Define step value: **(0.5)**
   - Gap width: **(10)**
   - First pattern: **(12)**
   - Plot shift Mscan: **(10)**
   - Plot Shift SScan: **(10)**
   - Autosize: **(X)**
   - Stripe subscan: **(50)**
   - Stripe mainscan: **(500)**
   - Media number: **(#)**
   - Mode: **(1)**
   - Force stroke cal- **Yes**.


The media number should be the media number you are currently using.


Refer to **Media** spreadsheet for the wpower parameter.

6. From the processed plate choose the best power value.
7. Enter the value under Quantum >> **set hdm # wpower <_>**.



represents the media number

5.7 Slope Series

To run Slope series, do the following:

1. Load a plate from the GUI.
2. Quantum>>**load**.
3. For pos. plate, type:
   Quantum >> **set media X invert 0**.
4. Open the Quantum series plot dialog in Splot by opening:
   Files/Open/Script/Test/Quantum series.Spt.
   Then:
   Exec/Execute
5. Define the following parameters:
   The slope series range is between **(-16)** to **(+16)**
   - Define starting value: **(-X)**
   - Define ending value: **(+X)**
   - Define step value: **(2)**
   - Gap width: **(10)**
   - First pattern: **(80)**
   - Plot shift Mscan: **(10)**
   - Plot Shift SScan: **(10)**
   - Autosize: **(X)**
   - Stripe subscan: **(50)**
   - Stripe mainscan: **(500)**
   - Media number: **(#)**
   - Mode: **(1)**
   - Force stoke cal: **Yes)**

   
   The media number should be the media number you are currently using.
6. From the processed plate, choose the value at which the expose is clean from effects.

7. Enter the value under Quantum >> **set hdm # bmslope <_>**.



represents the media number.

8. Quantum >> **strockcal**.
   This will activate the change.

5.8 Curve Series

To run Curve series, do the following:

1. Load a plate from the GUI.
2. Quantum>>**load**.
3. For pos. plate, type:
   Quantum >> **set media X invert 0**.
4. Open the Quantum series plot dialog in Splot by opening:
   Files/Open/Script/Test/Quantum series.Spt.
   Then:
   Exec/Execute
5. Define the following parameters:
   The curve range is between **(-16)** to **(+16)**
   - Define starting value: **(-X)**
   - Define ending value: **(+X)**
   - Define step value: **(2)**
   - Gap width: **(10)**
   - First pattern: **(80)**
   - Plot shift Mscan: **(10)**
   - Plot Shift SScan: **(10)**
   - Autosize: **(X)**
   - Stripe subscan: **(50)**
   - Stripe mainscan: **(500)**
   - Media number: **(#)**
   - Mode: **(1)**
   - Force stoke cal: **Yes**



The media number should be the media number you are currently using.

6. From the processed plate, choose the value at which the expose is clean from effects.
7. Enter this value under Quantum >> **set hdm # bmcurve <_>**.
8. Perform **Stroke Cal** from the terminal.

5.9 Plot 1 Test

Each Head received from the manufacturing line includes a plate with a plot 1 image for reference.

Plot 1 represents:

- Vertical lines
- Horizontal lines.
- Slash lines
- VS (variable Dot area).

To check the Head Calibration, expose plot1 test.

1. Load a plate from the GUI.
2. Quantum>>**load**.
3. Quantum >> **plot 1 (file size along the screw) (file size along the drum).**

To shift the image, type: Quantum>>plot shift X Y.
X refers to subscan. Y refers to mainscan.

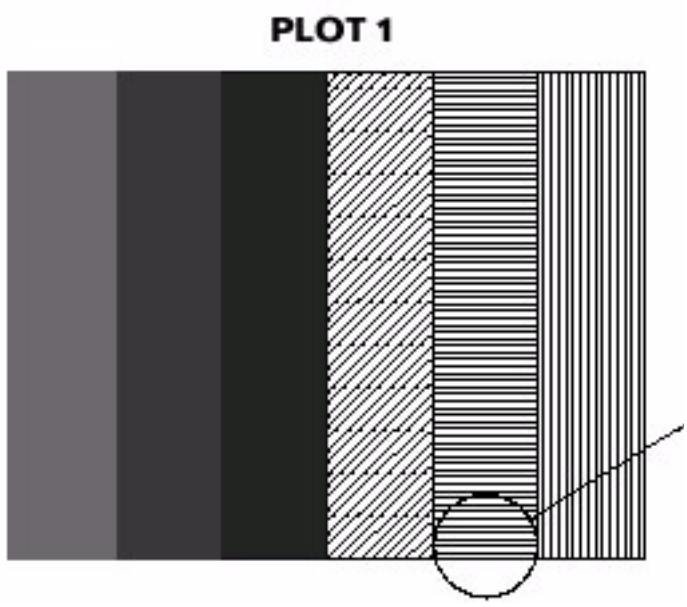
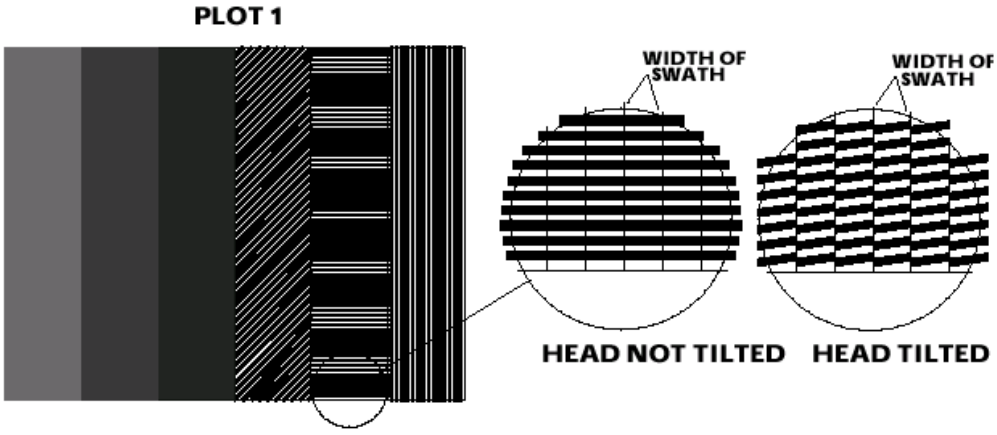


Figure 22. Plot 1 image

5.10 TLT Setup Procedure

1. Check the tilt with a powerful microscope.
2. Inspect the 3 x -3 horizontal lines of the plate imaged by the plot 1 command.
3. Make sure that the pixels line up.



Use the following diagram to determine the Head tilt.

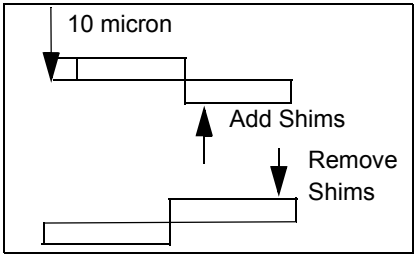


Image as appears under microscope.

Actual image is inverted

Tools and parts needed for the adjustment.:

- Microscope (100x * 200x)
- Crescent wrench
- Shims

1. Estimate the height difference in microns at the swath boundary. That number is the tilt error.
2. Determine how many shims are needed according the following table.

Tilt Error (measured in micron)	**Shims Thickness** (in microns)	**# of shims req'd -240 channel Head**
1	50.8	1
2	50.8	3
3	50.8	4
4	50.8	5
5	50.8	7
6	50.8	8
7	50.8	9
8	50.8	11
9	50.8	12
10	50.8	14

3. Remove the head.
4. Use the crescent wrench to unscrew the tilt button.
5. Add the appropriate amount of shims and screw in the tilt button.
6. Tighten the 0 Nm torque wrench.
7. Install the head.

5.11 Excurve /Tone reproduction Test

Additional calibration tests are described in the chapters 2 and 4 of Output Devices for Brisque User Guide.