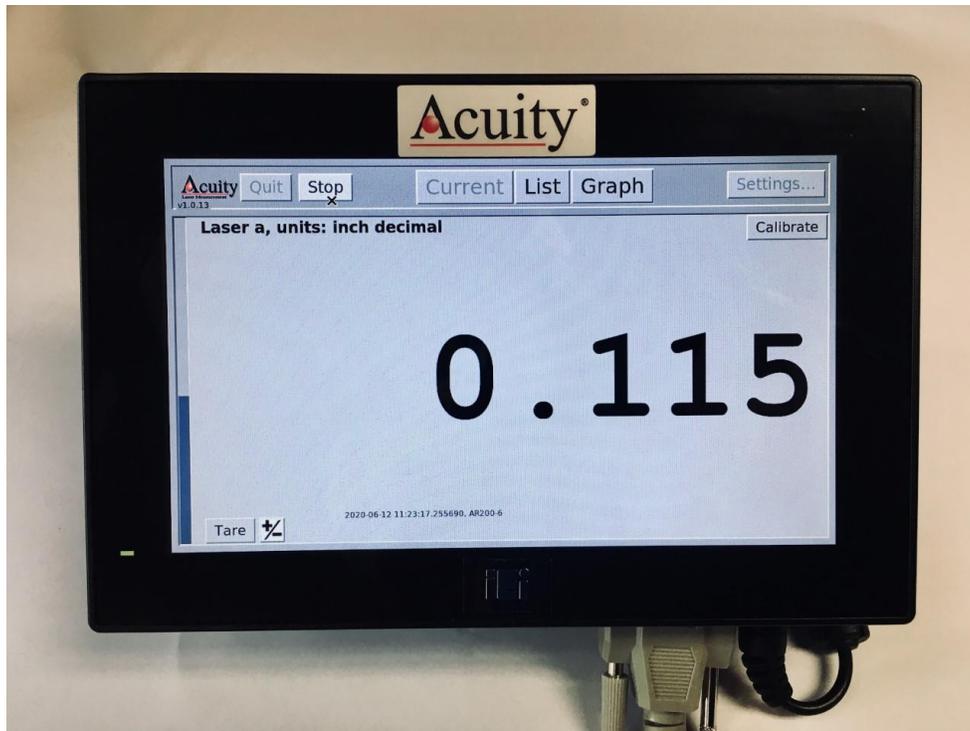




7" Touch Panel Display System

Operator's Manual

LLL009070 - Revision: 03.29.21



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Acuity Touch Panel Display Instruction Manual

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1. Setup

- 1.1. Connect the laser connection kit(s) to the port(s) on the bottom of the TPD labeled “**Port A**” or “**Port B**” with a DB-9 cable. Ensure the laser is powered up. When using a single laser, either port can be used.

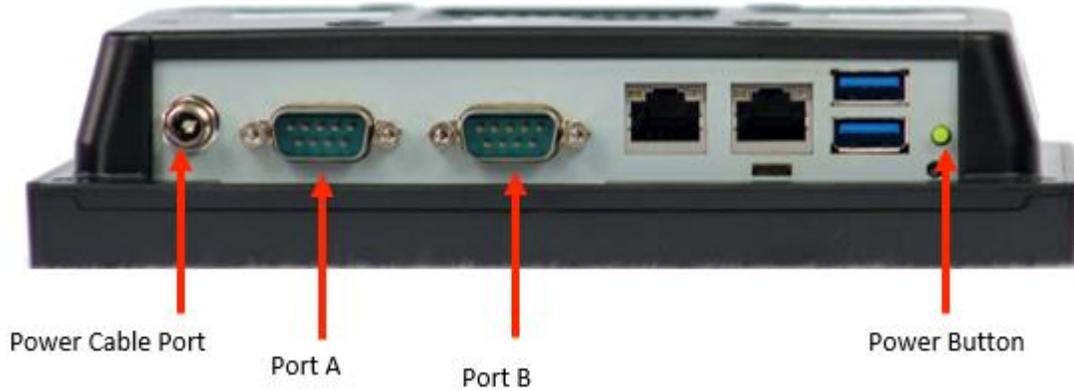


Figure 1: Identification of TPD ports and power button.

- 1.2. Connect the power cable to the TPD and a power source.
- 1.3. Power up the TPD by pushing and holding the green button on the bottom of the TPD. The power indicator on the front of the TPD will turn green. Upon initial power up, the TPD will boot into the **Settings** screen after approximately 30 seconds.

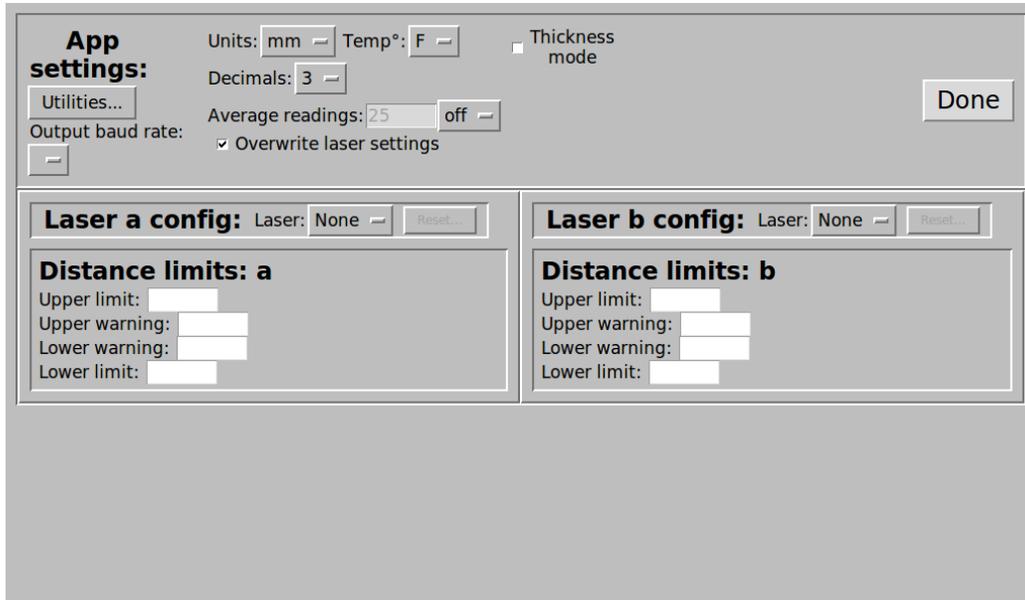


Figure 2: Settings screen at initial startup.

- 1.4. Configure the Units by selecting the desired measurement units from the **Units** dropdown. (Available display units are millimeter (mm), centimeter (cm), meter, foot decimal, foot fraction, inch decimal, inch fraction).

- 1.5. Configure the number of decimal places or smallest fraction to display from the **Decimals** or **Smallest fraction** dropdown. When using foot fraction or inch fraction units, the dropdown menu displays the smallest fraction to round to (down to 1/64 of an inch). When using foot decimal or inch decimal the dropdown will display the smallest decimal number to round to (1-9).
- 1.6. Some lasers have the capability to report their internal temperature. Set the temperature units with the **Temp°** dropdown (C or F).
- 1.7. Configure the number of readings to average in the **Average readings** field (default 25). Choose **rolling** or **batch** for the averaging function. See Averaging section for an explanation.
- 1.8. Choose the laser model from the **Laser** dropdown in the **Laser a config** or **Laser b config** panes.
- 1.9. Check **Enabled** to enable the laser interface. This will start the baud rate query. When query has completed, the status of the query will be displayed to the right of the baud rate dropdown.
 - 1.9.1. "Connected" indicates a successful query.
 - 1.9.2. "Connection failed" indicates a connection problem. See trouble shooting section.
 - 1.9.3. "Error: <specific error message>" indicates a mismatch with the connected laser model and the value in the **Laser** dropdown.
 - 1.9.4. If not using **Thickness mode**, enter the **Distance limits** (if required).
- 1.10. Repeat steps 1.7 through 1.8 for second laser (if applicable).
- 1.11. If measuring thickness with two lasers, check **Thickness mode** and choose a thickness function (**sum** or **difference**). The sum function is for applications where the subject is placed between opposing lasers. The thickness is determined by the sum of the measurements. The difference function is for applications where the subject and the zero-point surface are both in motion. One laser measures the zero point and the other laser measures the subject. The thickness is determined by the difference in the two measurements.
 - 1.11.1. Enter **Thickness limits** (if required).
- 1.12. Press the **Done** button to change to the **Measure** screen.
- 1.13. Press **Save** to save the current setup. You can now start measuring by pressing **Start**.
- 1.14. Different profiles can be stored and loaded via the **Profile** dropdown on the **Measure** screen. The user can store the current profile as a different name by choosing **Save as...** from the **Profile** dropdown and entering the new name via the soft keypad. Any stored profile can be loaded by choosing the name of the stored profile from the **Profile** dropdown. The current profile can be deleted by choosing **Delete...** from the **Profile** dropdown. A confirmation dialog is presented before deletion.

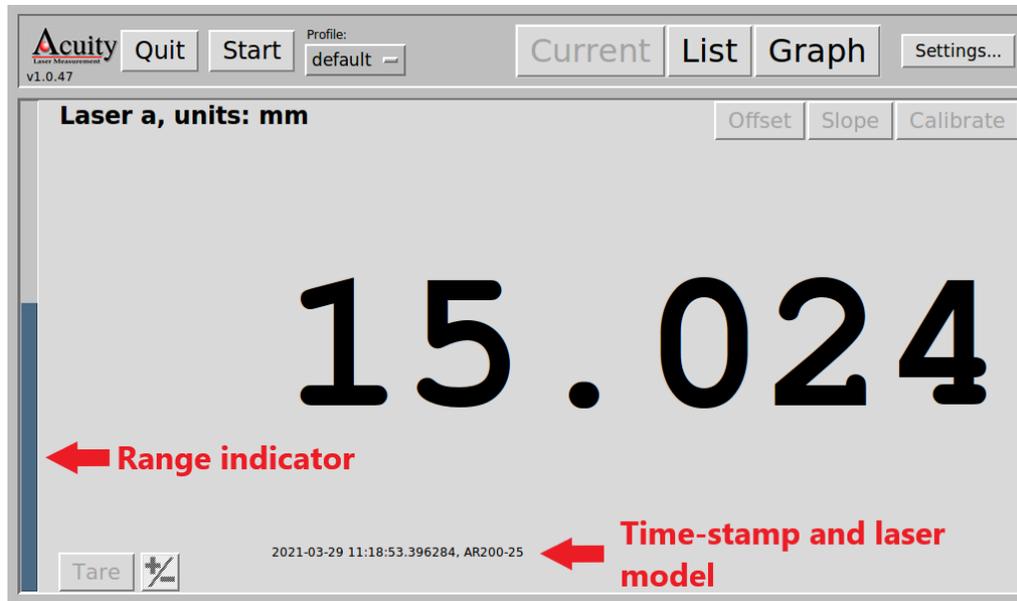


Figure 3: Measure screen during active measuring.

2. Settings Explanation

- 2.1. **Averaging:** Averaging will steady the display of measurements. The default setting is a rolling average of 25 measurements. The rolling average will add the latest reading to the back of the averaging list and remove the first reading from the front of the averaging list so that the averaging list always contains the latest 25 measurements. These measurements are then averaged before display. The batch average will average measurements in groups of 25 before display. Averaging can delay the display of the latest average value as the averaging list is queued and de-queued. To reduce this effect, lower the average readings value. To turn off averaging, set the mode to 'off'.
- 2.2. **Thickness mode:** Thickness mode uses two lasers to measure the thickness of a target. It operates in two modes, sum and difference. In sum mode, the thickness is calculated by summing the values of two laser measurements pointed at opposite sides of the target. In difference mode one laser is used to track the zero-point of the target (e.g.: roller surface or conveyor belt), the other laser is used to track the measurement of the target on top of the zero-point. The thickness of the target is determined by the difference in the target measurement and the zero-point measurement.
- 2.3. **Output baud rate:** The TPD is capable of outputting measurement data to a different computer via a serial connection. Set the **Output baud rate** dropdown to the desired baud rate. Connect the TPD to another computer via the following serial cable setup,: TPD USB port -> USB/Serial adapter -> null modem adapter -> other computer serial port.
- 2.4. **Distance and Thickness limits:** Distance limits (non-thickness mode) or Thickness limits (thickness mode) can be specified to change the color of the measurement display in four scenarios:
 - 2.4.1. Upper limit (Upper lim): When measurement is equal or greater than upper limit, the measurement color will be red.

- 2.4.2. Upper limit (Upper warn): When measurement is equal or greater than upper warn, the measurement color will be orange.
- 2.4.3. Upper limit (Lower warn): When measurement is equal or less than lower warn, the measurement color will be orange.
- 2.4.4. Upper limit (Lower lim): When measurement is equal or less than lower limit, the measurement color will be red.

3. Calibration

- 3.1. From the **Measure** screen, press the **Start** button to begin measuring.
- 3.2. Single or dual laser non-thickness mode calibration:
 - 3.2.1. Press the **Calibrate** button in the appropriate measurement pane.
 - 3.2.2. Point the laser to the zero position and press **OK**.
 - 3.2.3. Place an object of know measurement value under the laser and press **OK**, then enter the known value.
 - 3.2.4. Repeat steps 2.2.1 through 2.2.3 for the other laser (if applicable).
- 3.3. Dual laser thickness mode calibration:
 - 3.3.1. Sum function mode
 - 3.3.1.1. Press the **Calibrate** button in the measurement pane.
 - 3.3.1.2. Place a calibration block between the lasers and press **OK**. Then enter the known thickness.
 - 3.3.1.3. You will then be asked **“Would you like to sample an additional calibration block?”**. Choose **Yes** to sample another calibration block. Choose **No** to accept the value of the first calibration block. Typically sampling a single calibration block is sufficient. If greater accuracy is required, sample two calibration blocks.
 - 3.3.2. Difference function mode
 - 3.3.2.1. Press the **Calibrate** button in the measurement pane.
 - 3.3.2.2. Point the both lasers at the zero position and press **OK**.
 - 3.3.2.3. Place an object of known value on top the zero position and under only one laser and press **OK**. Then enter the known value.
- 3.4. Slope and offset can be used to fine tune calibrated or non-calibrate setups. Offset (default 0) will adjust the measurements up or down in an absolute manner by the number specified. Slope (default 1) will adjust the rate of change between the raw laser values and measurement value.
- 3.5. After calibration, press **Stop**, then press **Save** to save the current setup.

4. Measuring

- 4.1. Press and hold the green button on the bottom of the TPD to power up the unit. It will boot into the **Measure** screen.
- 4.2. Press **Start** to start measuring.
- 4.3. Use the **Tare** button to set the zero point if necessary.
- 4.4. Use the **+/-** button to change the sign of the measurement value if necessary.
- 4.5. Press **List** to display a rolling list of the last 50 measurements.
- 4.6. Press **Graph** to display a rolling graph of the last 50 measurements.

5. Utilities

5.1. From the **Settings** screen, press the **Utilities** button to enter the **Utilities** screen.



Figure 4: Utilities screen.

5.2. Reset utility:

5.2.1. To erase all application settings, press **Reset**. A warning dialog will be displayed. If accepted, the TPD will shut down. After restarting, it will be ready to re-configure.

Note: internal laser settings will not be reset.

5.3. Update utility:

Information regarding each version can be viewed with a smart phone by scanning the barcode. Version number, new features and bug fixes will be displayed in a text file. After deciding if the current version is appropriate to install, it can be installed via two methods.

Updating via the internet:

5.3.1. Connect the TPD unit to a wired network with access to acuitylaser.com.

5.3.2. Press **Update**, then choose the update method: **Internet**.

5.3.3. If a newer version is available, instructions will be displayed regarding how to update, otherwise a message will be displayed indicating the software is up to date.

Updating via USB drive:

5.3.4. Download the Acuity Laser UI software from the Acuity website.

Download link: <https://acuitylaser.com/acuity-laser-ui/acuity-laser-ui.tar.gz>

5.3.5. Copy file **acuity-laser-ui.tar.gz** to the root level of a USB drive.

5.3.6. Press **Update**, then choose the update method: **USB drive**.

5.3.7. Follow the on-screen instructions regarding connection and disconnection of the USB drive.

5.4. Copy data utility:

- 5.4.1. Press **Copy data** to copy all measurement data logs, application logs and the settings file to a connected USB thumb drive.
- 5.4.2. Instructions will be displayed regarding when to connect and disconnect the USB thumb drive. Warning! Do not disconnect the USB thumb drive until instructed to do so. Otherwise damage could occur to the USB thumb drive.
- 5.5. Set clock utility:
 - 5.5.1. Press **Set clock** to set the system clock. This is useful when using measurement data logs to plot time vs measurement in a spreadsheet application.
- 5.6. Press **Back** to return to the **Settings** screen.

6. Troubleshooting

- 6.1. A range error indicates the subject is beyond the lasers range. Adjust the position of the laser relative to the subject and zero point. Use the range indicator to ensure that maximum subjects and the zero point are well within the lasers range.
- 6.2. Various errors displayed to the right of the **Baud rate** dropdown indicate a likely mismatch between the **Laser** dropdown and the actual laser model. Change the **Laser** dropdown to match the actual laser model. If errors persist after ensuring a match, power down the laser unit, wait 5 seconds, then power up the laser unit.
- 6.3. Application logs (*out.log*) and settings file (*default.json*) can be useful in diagnosing other issues. Use the **Copy data** utility to copy *out.log*, *out_<n>.log* and *default.json* to a USB thumb drive then send the files to customer support.