5 Graphical Displays

5.1 To present measurements on a graduated scale:
1. In **Power** or **Energy** mode, tap the **Channel Options** menu icon and tap **Display Type**.
2. In the Display Type dialog, select **Bar**. The main measurement display screen returns.
3. To expand the bargraph scale ±5x of the present reading, tap **Zoom** on the bottom of the screen. Tap **Zoom** again to return the bargraph to full scale.
4. To subtract background and set current reading to zero, tap **Offset** along the bottom of the screen. Tap **Offset** again to cancel.

5.2 To simulate an analog needle:
1. In **Power** or **Energy** mode, tap the **Channel Options** menu icon and tap **Display Type**.
2. In the Display Type dialog, select **Needle**. The main measurement display screen returns.
3. To expand the needle graph ±5x of the present reading, tap **Zoom** on the bottom of the screen. Tap **Zoom** again to return the needle range to full scale.
4. To subtract background and set the current reading to zero, tap **Offset** along the bottom of the screen. Tap **Offset** again to cancel.
5. Tap **Persistence** to keep older measurements on the screen, and to display the **Min** and **Max** values measured. Tap **Persistence** again to cancel.

5.3 To graph laser output over time:
This is especially useful for fine-tuning laser power.
1. In **Power** or **Energy** mode, tap the **Channel Options** menu icon and tap **Display Type**.
2. In the Display Type dialog, select **Line**. The main measurement display screen returns.
3. Zoom and un-zoom the display by stretching and pinching the graph with two fingers, either top to bottom or side to side.
4. Pan the display by moving your finger up and down on the graph.
5. Double-tap the graph to reset the zoom and pan.
6. Tap **Autoscale Y Axis** along the bottom of the screen to scale the axis between the minimum and maximum readings.
7. Tap **Reset** to clear the Min/Max tracking and to restart the graph.

5.4 To display real-time statistics:
1. In **Power** or **Energy** mode, tap the **Channel Options** menu icon and tap **Display Type**.
2. In the Display Type dialog, select **Statistics**. The main measurement display screen returns.
3. Displayed are Maximum, Minimum, Average, Standard Deviation, Total Readings, and Number Overrange.
4. To subtract background and set current reading to zero, tap **Offset** at the bottom of the screen. Tap **Offset** again to cancel.
5. Tap **Reset** across the top of the screen to clear the statistics.

5.5 For pass/fail tracking:
1. In **Power** or **Energy** mode, tap the **Channel Options** menu icon and tap **Display Type**.
2. In the **Display Type** dialog, select **Pass/Fail**. The main measurement display screen returns.
3. Tap **Upper** and **Lower** to set tolerance limits. If reading is out of range, an appropriate warning is displayed on the screen.

6 Functions

6.1 To apply a fixed offset to measurements:
This sets the value to subtract from subsequent measurements.
1. Tap the **Channel Options** menu icon and then tap **Functions**.
2. On the Functions screen, tap the edit icon for **Fixed Offset**.
3. In the Set Fixed Offset dialog, either type in a fixed offset or select the present measurement as a fixed offset. Tap **Apply**.

6.2 To apply a scale factor to measurements:
This sets the value by which to multiply subsequent measurements.
This is useful when working with beam splitters.
1. Tap the **Channel Options** menu icon and then tap **Functions**.
2. On the Functions screen, tap the edit icon for **Scale Factor**.
3. In the Set Scale Factor dialog, type in a scale factor and tap **Apply**.

6.3 To compare against a reference measurement:
Define a baseline against which to compare subsequent measurements.
1. Tap the **Channel Options** menu icon and then tap **Functions**.
2. On the Functions screen, tap the edit icon for **Normalize**.
3. In the Set Normalize dialog, either type in a baseline value or select the present measurement as a baseline value. Tap **Apply**.

6.4 To display as power/energy density:
1. Tap the **Channel Options** menu icon and then tap **Functions**.
2. On the Functions screen, tap the edit icon for **Density**.
3. In the Set Density Parameters dialog, select the beam shape and then enter the size. Tap **Apply**.
Measurements are shown as W/cm².

Centauri
Quick Reference

1 Getting Started

1.1 Introduction
The Centauri is equipped with a 7" full color touch screen. Sensor parameters can be updated with a few taps on the screen.

In addition, the **Channel Options menu**, reached by tapping the three-dot icon ( ), enables access to additional features.
The **Settings menu** can be accessed by tapping the cog icon ( ).

1.2 To connect a single sensor to the Centauri meter:
Insert the 15 pin D type connector of the measuring sensor cable into the socket marked **Sensor Input** on the **Channel A** section of the upper panel of the meter.

1.3 To switch the Centauri on:
Briefly press the **Power** button on the top of the instrument and wait a few seconds for the measurement display screen to appear.

1.4 To switch the Centauri off:
Press the **Power** button for a few seconds until it turns off.

1.5 To set general instrument settings:
1. Disconnect the sensor. The **Settings** screen is displayed.
2. Tap **Instrument Settings**.
   The Instrument Settings screen is displayed. On this screen, set the following:
• **Line Frequency:** Set to 50Hz or 60Hz, depending on the electrical power grid in your area.
• **Date and Time:** Tap the current date to update the date. In the dialog, roll the month/date/year to the desired date. Tap **OK** to exit. Tap the current time to update time. In the dialog, roll the hour and minutes to set time according to the 24 hour clock. Tap **OK** to exit.

1.6 To zero instrument:
1. Disconnect the sensor.
2. Make sure instrument is not in an electrically noisy environment and is undisturbed.
3. Tap **Instrument Settings**.
4. From the Instrument Settings screen, tap **Zero** at the top of the screen. The Zeroing Instrument dialog is displayed.
5. Tap **Start**. Zeroing takes about 30 seconds. Wait until "Zeroing completed successfully" appears.
6. Tap **Save** to save Zero values, and then tap **Exit**.

1.7 Logging measurements
1. From the **Settings menu** select **Log Settings** to select log file destination, either to internal memory or external USB Flash disk
Use USB Flash Drives of up to 32GB storage capacity, formatted as a FAT32 file system only. (Not exFAT nor NTFS formats).
Larger capacities or differently formatted USB Flash Drives will not work with the Centauri.

1.8 PC Connectivity
1. Use the supplied USB cable to connect Centauri to PC and run StarLab.

2 Thermal Sensors

2.1 Using Centauri with Thermal Sensors
1. Plug in the thermal sensor. Centauri reconfigures itself to work with the attached sensor.
The sensor's measurement parameters are shown on the main screen.
2. Tap the parameters to select any new values.
Centauri saves the changes automatically for its next power-up.

Warning:
Do not exceed maximum sensor limits for power, energy, power density and energy density as listed in the main manual. Otherwise, there is a risk of damaging the absorber.

2.2 Using Centauri to Measure Laser Power
1. Set **Measuring Mode** to **Power**.
2. Set **Range** to AUTO or one of the manual ranges. The correct manual range is the lowest one that is larger than the expected maximum power of the laser.
3. Set **Wavelength** to the appropriate laser wavelength.
4. Set **Average** to the period you wish to average power over, or set to NONE to disable.

2.3 Using Centauri to Measure Single Shot Energy
1. Set **Measuring Mode** to **Energy**.
2. Set **Range**. In Energy mode there is no autoranging. The correct range is the lowest one that is larger than the expected maximum pulse energy of the laser.
3. Set **Laser** to the appropriate laser wavelength.
4. Set **Threshold** if you wish to change the energy threshold.
5. When the Centauri screen flashes READY, fire the laser.

3 Photodiode Sensors

3.1 Using Centauri with Photodiode Type Sensors
1. Plug in the photodiode sensor. Centauri reconfigures itself to work with the attached sensor.
The sensor's measurement parameters are shown on the main screen.
2. Tap the parameters to select any new values.
Centauri saves the changes automatically for its next power up.

Warning:
Do not exceed maximum sensor limits for power, energy, power density and energy density as listed in the main manual. Otherwise, there is a risk of damaging the absorber.

3.2 Setting the Measurement Parameters
1. Set **Range** to the appropriate manual range, AUTO or dBm (logarithmic scale). Note that when selecting a manual range, the correct range is the lowest one that is larger than the expected maximum power of the laser.
2. Set **Laser** to the correct laser wavelength. If the wavelength you want is not among the wavelengths listed, select one and tap the edit icon that is next to it to open the **Modify Laser** dialog. Using the keyboard displayed, type in the wavelength you want. Tap **Apply**.
3. Set **Filter** to IN or OUT as physically configured on the sensor.
4. Set **Average** to the period to average power over, or set to NONE to disable.

4 Pyroelectric or Photodiode Energy Sensors

4.1 Using Centauri with Energy Sensors
1. Plug in the pyroelectric/photodiode energy sensor. Centauri reconfigures itself to work with the attached sensor.
The sensor's measurement parameters are shown on the main screen.
2. Tap the parameters to select any new values.
Centauri saves the changes automatically for its next power-up.

Warning:
Do not exceed maximum sensor limits for power, energy, power density and energy density as listed in the main manual. Otherwise, there is a risk of damaging the absorber.

4.2 Zeroing the Meter with the Sensor
For most accurate calibration, zero the energy sensor against the Centauri it is being used with.
1. Make sure the sensor is in a quiet environment and not subject to pulsed radiation.
2. Tap the **Settings** icon at the top of the screen. The Settings screen is displayed.
3. Tap **Instrument Settings**.
4. On the Instrument Settings screen, tap **Zero** on the top line.

5. In the **Zeroing Instrument** dialog, tap **Start**. Zeroing takes about 30 seconds. Wait until "Zeroing completed successfully" is displayed.
6. Tap **Save** to save the zero values. Tap **Exit**.

4.3 Setting the Measurement Parameters
1. Set **Range** to the lowest one that is larger than the expected maximum pulse energy of the laser.
2. Set **Laser** to the correct laser wavelength. If this sensor is a metallic type and if the wavelength you want is not among those listed, select one and tap the edit icon next to it to display the **Modify Laser** dialog. Using keyboard displayed, key in the wavelength you want. Tap **Apply**.
3. Set **Pulse Width** to the shortest time that is longer than the expected pulse length.

Warning:
Incorrect readings will result if pulse length is not set up correctly.
4. For sensors with the diffuser option, set **Diffuser** to IN or OUT as physically set on the sensor.
5. Set **Threshold** as necessary to screen out false triggers due to noise.
6. Set **Average** to the period you wish to average power over, or set to "NONE" to disable.

4.4 Energy, Average Power or Exposure Measurement
With the pyroelectric sensor, you are supplied a test slide with the same coating as on your pyroelectric detector. You can also obtain this slide from your dealer. You should use this slide to test the damage threshold with your laser pulses. If the slide is damaged, then either enlarge your beam or lower the laser energy until damage is no longer seen.

To measure energy:
1. Set **Measuring Mode** to **Energy**.
2. Set measurement parameters as described above.
Energy is displayed on the screen along with the laser's frequency.

To measure average power:
1. Set **Measuring Mode** to **Power**.
2. Set measurement parameters as described above.
Average power is displayed as a function of Energy x Frequency, along with the laser's frequency.

To measure energy exposure:
1. Set **Measuring Mode** to **Exposure**.
2. Set measurement parameters as described above.
3. Along the bottom of the screen, set the Stop Mode to **Manual**, **Timeout,** or **Pulses**.
4. To start or stop energy exposure, tap the start/stop icon at the bottom of the screen.
Accumulated energy exposure is displayed on the screen, along with the elapsed time and number of pulses measured.