

Operating Manual

Translation of the Original Instructions



PRIMES Cube App

Smartphone/tablet application for Android™

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1 General information

1.1 Application

The PRIMES Cube app is an application for smartphones/tablets with Android™ used for mobile measurement of laser power.

A bluetooth connection with the PRIMES measuring device makes it possible to read out and graphically display the measured values (laser power, pulse length, and energy per pulse) with the mobile end device. The app also shows an overview of the device status (temperature, capacity, status notifications).

Other functions: Setpoint values can be entered by the user and stored in a table as default settings. When a measurement is performed, the actual measured values of the PRIMES measuring device are added to the table, thus enabling a tabular and graphic comparison of the target and measured values as well as a graphic illustration of the percentage of deviation of the measured value from the setpoint value.

1.2 System Requirements

The PRIMES Cube app can be used on a smartphone/tablet with an Android 4.1 operating system or higher and a display resolution of HVGA 320 x 480 or higher.

1.3 Download

The PRIMES Cube app can be downloaded from the Google Play Store/Apps for free. You will need a Google account for this. Enter the search term “Primes cube app” in the search bar of the Google Play Store.



Fig. 1.1: Icon for the PRIMES Cube app

1.4 Install/uninstall

How the PRIMES Cube app is installed or uninstalled depends on the device. Please read the operating instructions of your smartphone/tablet for this.

1.5 Operation

As with any app on a smartphone, you can operate the app by tapping, swiping, and sliding along the screen.

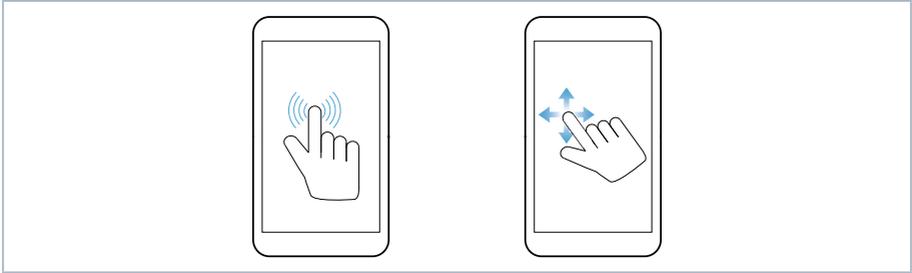


Fig. 1.2: Operating the PRIMES Cube app

2 Connect device

When you open the PRIMES Cube app, the **Devices** page will appear on the screen. Tap the **Start Device Search** button. All of the devices found will be displayed on the screen.

Tap on the device names in order to establish a connection and confirm the query with **OK**.

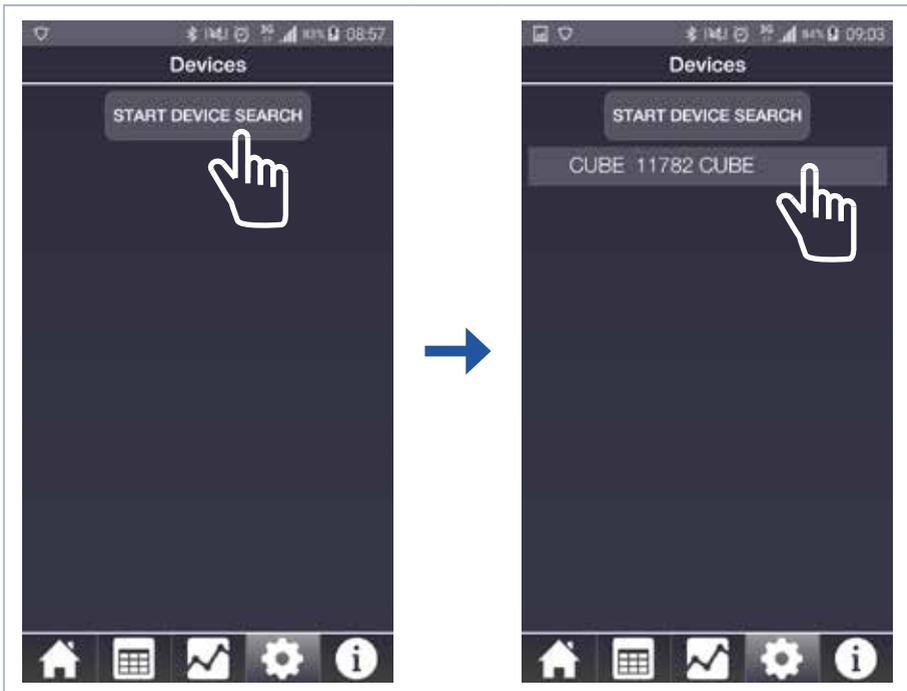


Fig. 2.1: Search for device/select

Once you have connected successfully, the connection icon  will appear to the left of the device name. The device settings now appear (see “Fig. 2.2” on page 7).



Fig. 2.2: Connected device and its device settings

Additional information on device settings can be found in Chapter 3.3.1, “Measuring operation” on page 11.

3 Composition of the Graphic User Interface

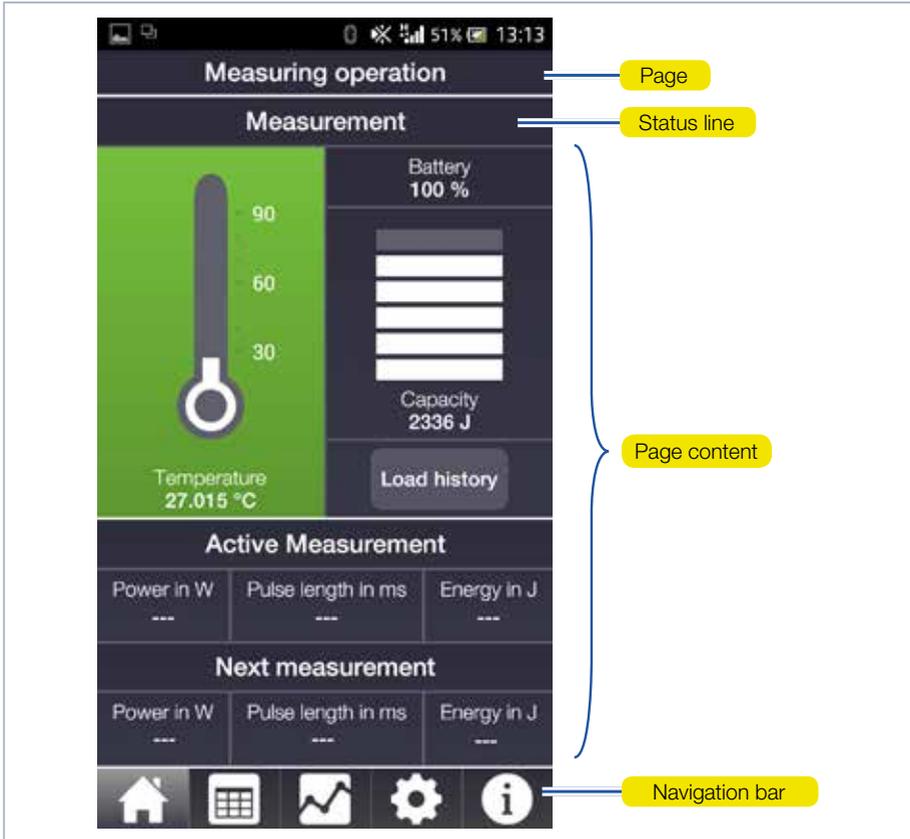


Fig. 3.1: Composition of the Graphic User Interface

The graphic user interface consists of the following pages:

- Measuring operation
- Measuring data selection
- Evaluation
- Devices/settings
- Info

3.1 Navigation

You can gain quick access to individual pages in the navigation bar. Tapping on the icon in the navigation bar will pull up the corresponding page. You can leaf through the pages by swiping horizontally. Depending on the size of your mobile device's display, you may also be able to see two pages displayed next to each other (e.g. on tablets).

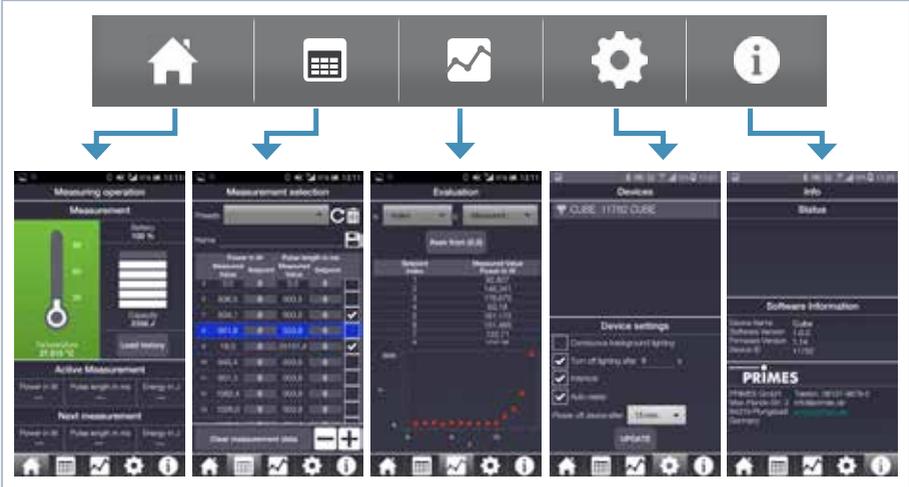


Fig. 3.2: Navigation bar

3.2 Icons

Symbol	Function
	Temperature, capacity, and measured value display Entry of setpoint values for the next measurement
	Tabular display of target and measured values Storage/loading of setpoint values
	Graphic display of target and measured values
	Process device settings
	Information on software and status information
	A current status notification can be seen on the "Information" page
	Bluetooth connection with device is active
	Save setpoint values
	Delete loaded setpoint value
	Checkbox for activating/deactivating a function
	Update default settings

Tab. 3.1 Icons and their function

3.3 Pages

3.3.1 Measuring operation



Fig. 3.3: Measuring operation

3.3.2 Measured data selection

The target and measured values given on the **Measuring operation** page are listed here in a table. Here you can edit setpoint values and then save them under a freely definable name. You can also load or delete setpoint value lists that have already been saved.

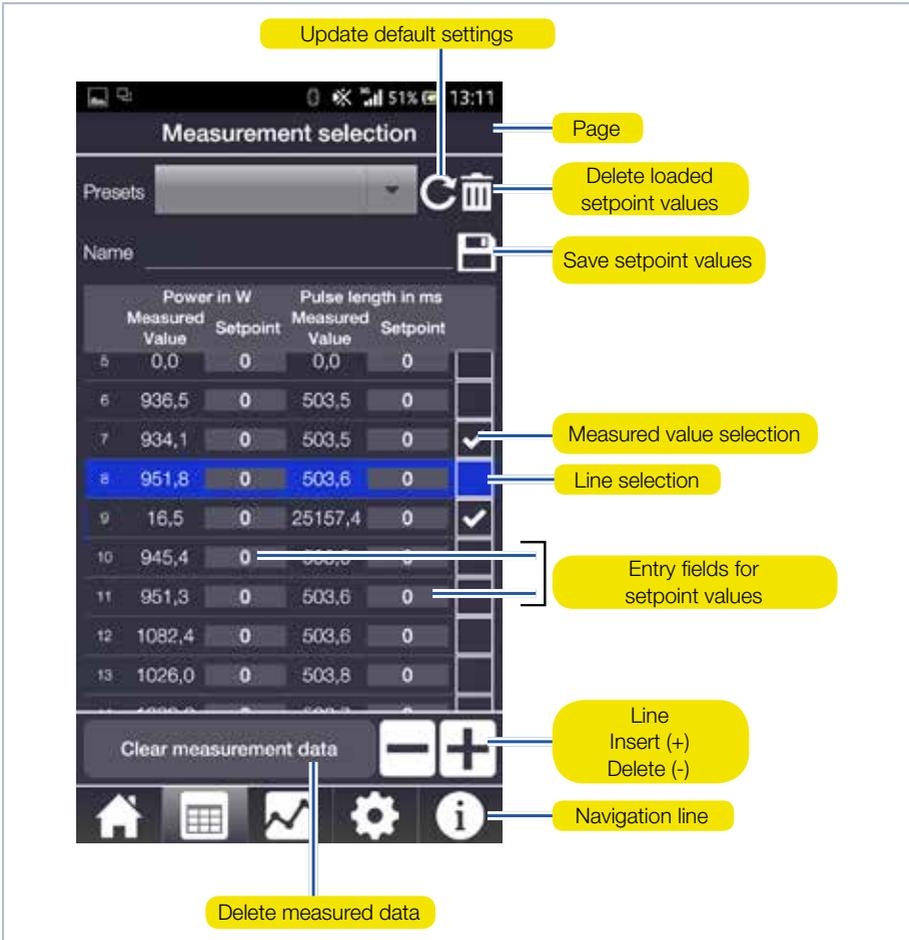


Fig. 3.4: Measured data selection

You can enter setpoint values for power and pulse length in the table. The setpoint values for the next measurement are then shown on the **Measuring operation** page under **Next measurement**.

Once the measurement is completed, the measured values for power and pulse length are displayed in the active line of the table as measured values. If you don't want the measured values to be included in the graphic evaluation, you must remove the check from the checkbox in the corresponding line by tapping on the box.

The **Clear measurement data** button will delete all measured values in the table. The measured data in the PRIMES measuring device is not deleted in the process.

Once you tap on a setpoint value window, a numeric keyboard will appear. Enter the setpoint value and confirm with **OK**.

You want to...	Action
...select a line	Tap on a measured value (the line will be highlighted in blue)
...add a line	Tap the (+) button
...delete a line	Select the line, it will be highlighted in blue. Tap on the - button
...insert a line at a certain location	Tap on a measured value at the desired location (the line will be highlighted in blue) and then tap on (+), a new line will be created under the selected line
...Enter a setpoint value	Tap on a setpoint value field (the numeric keyboard will appear) and enter the desired value. Confirm with OK

Tab. 3.2 Entries in the table

If no line is marked, the +/- buttons can be used to expand the table on the bottom or delete lines one by one starting from the bottom.

3.3.3 Evaluation

This page graphically displays select measured values or entire measurement series. Selected setpoint values are displayed on the x-axis and measured values or the percentage of deviation of the measured values from the setpoint values are displayed on the y-axis.

If setpoint values aren't entered ahead of time, the measured values will also be entered into the setpoint value list for graphic illustration. You can select either the power, pulse length, or energy on both axes.

You can enlarge/shrink the view in the graph by pulling with two fingers.

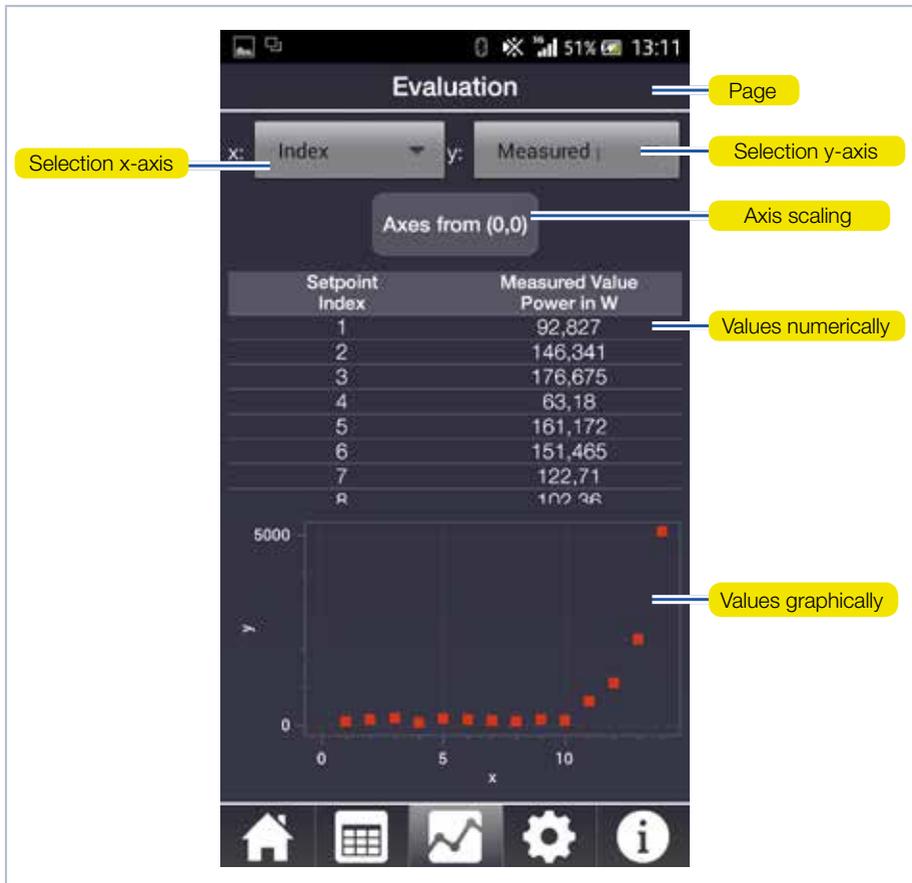


Fig. 3.5: Evaluation



If the minimum values are located in the upper or right part of the graph, you can use the **Axes from (0,0)** button to shift the origin of the coordinate system in order to optimize the display.

3.3.4 Devices

In the lower part of the page, you can configure various device settings, mainly to conserve power.

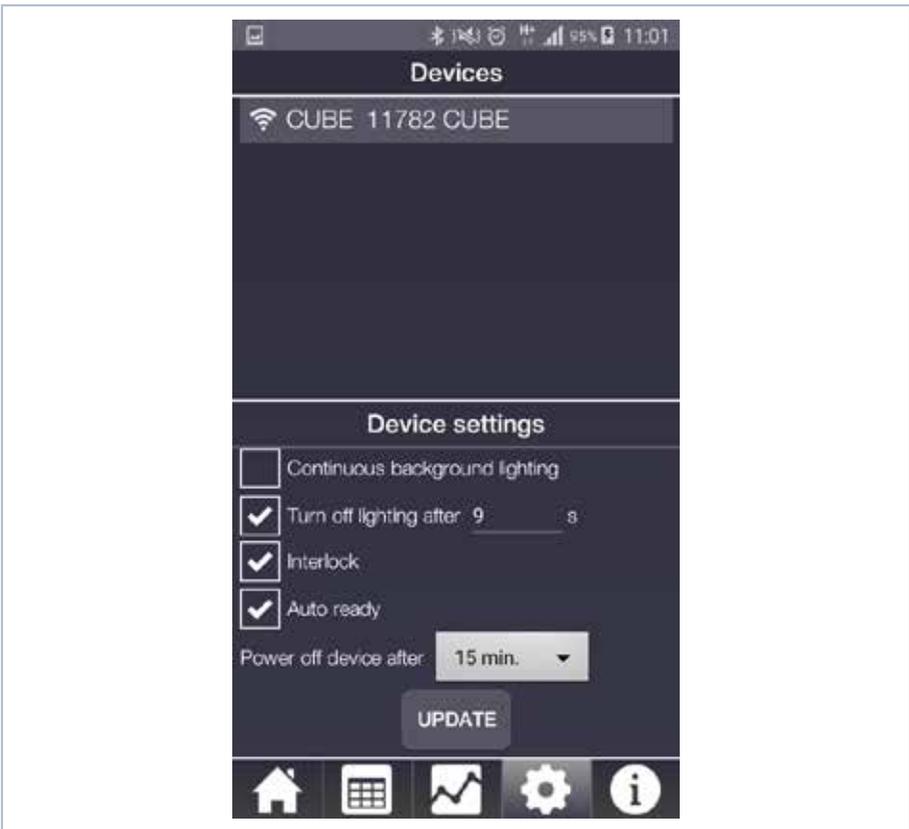


Fig. 3.6: Devices

Function	Possible settings
Auto ready	The device will automatically switch to be ready for the next measurement by default. If you remove the check mark, you will have to put the device back into ready mode after each measurement by quickly pressing the activation button.
Energy-saving features	Continuous background lighting on/off.
	Turn off lighting after(in s). The set time only applies when continuous background lighting is turned off.
	Turn interlock on/off. For security reasons, it is not recommended that you turn interlock off.
	Turn the device off after a specified period of time.

Tab. 3.3 Functions

Every time you change the settings, you must tap on the **Update** button in order to save the desired settings on the device (it may take a few minutes for the device to accept the settings).

3.3.5 Info

This page gives information, among other things, on the firmware and software versions used on the PRIMES measuring device. In the status area you will find any error messages and warning notices or information on the status of the connection with the device.

Regardless of which page you have selected, the navigation bar will alert you when a status report has been released by displaying an exclamation point in the info icon . At the same time, the temperature display and info symbol on the *Measuring operation* page will be shown in red.

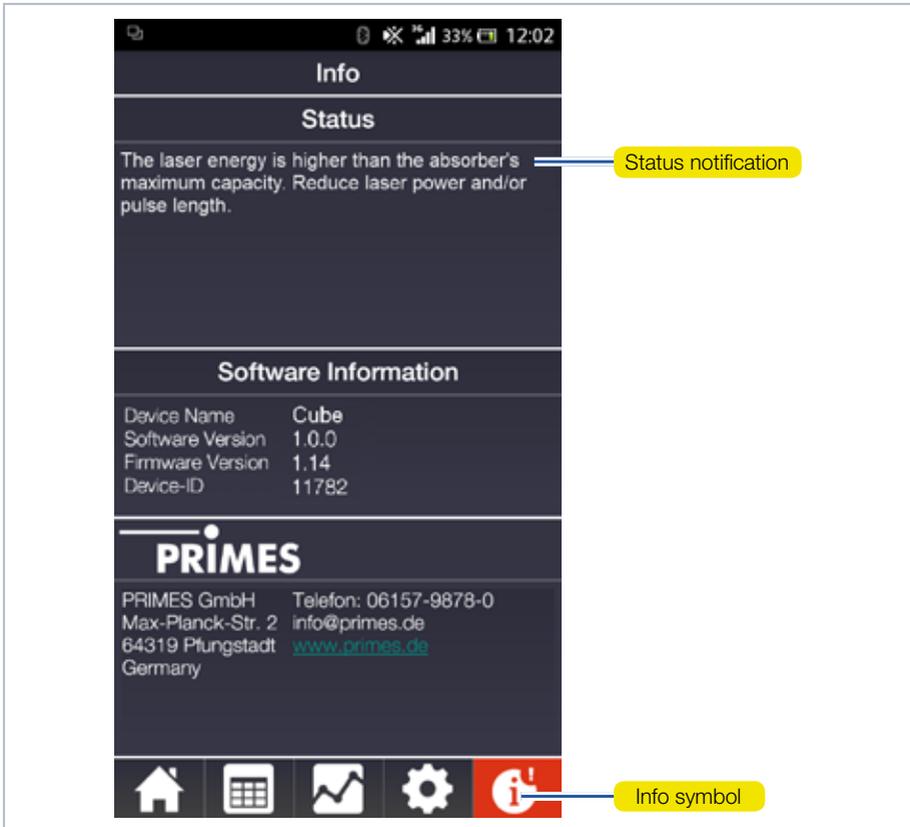


Fig. 3.7: Info

Status reports

In order to prevent damage to the absorber, power levels and pulse lengths can be no more than 8000 W and 2000 ms.

The energy input exceeds the maximum capacity of the absorber. Reduce the power and/or pulse length.

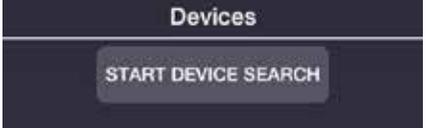
The energy input exceeds the remaining capacity of the absorber. Reduce the power and/or pulse length or wait until the absorber has cooled.

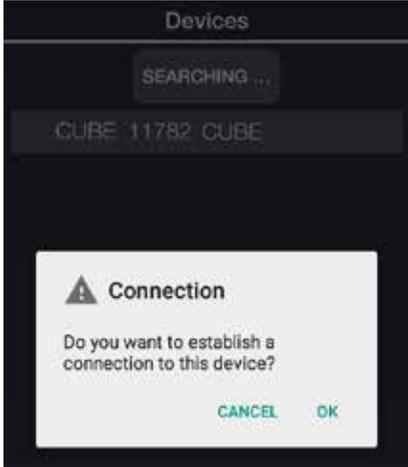
The current absorber temperature is over 70 °C, wait until the absorber has cooled down before you make another measurement.

The energy input is too low to obtain a reliable measuring result. Increase the power and/or pulse length.

Tab. 3.4 Status reports

4 Prepare Measurement

<ul style="list-style-type: none"> ▶ Tap the Cube icon to start the app. 	
<ul style="list-style-type: none"> ▶ The Devices page is opened. ▶ Tap the Start Device Search button. 	
<ul style="list-style-type: none"> 👁 The devices found are displayed. 	

<ul style="list-style-type: none"> ▶ Tap on the desired device in order to establish a connection and confirm the query with OK. 	
<p> The bluetooth connection to the device is displayed .</p>	
<ul style="list-style-type: none"> ▶ Configure the desired device settings and tap on Update. 	
<ul style="list-style-type: none"> ▶ Switch to the Measuring operation page. 	
<ul style="list-style-type: none"> ▶ Enter the desired power and pulse length under Next measurement. 	
<ul style="list-style-type: none"> ▶ Set the desired power and pulse length on the laser. 	<p>Note: The PRIMES measuring device and PRIMES Cube app WILL NOT transfer any data to the laser!</p>

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