

VISO SYSTEMS

LabPower

User Manual

Revision: 27-05-2025



Congratulations on purchasing your new Viso Systems LabPower. Before using this product, please read the Safety Information.

This manual contains descriptions and troubleshooting necessary to install and operate your new Viso Systems product. Please review this manual thoroughly to ensure proper installation and operation.

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Safety Information

Warning! This product is not for household use.

Read this manual before installing and operating LabPower, follow the safety warnings listed below, and study all the cautions in the manual.

Preventing electric shocks



Make sure the power supply is always grounded.

Use a source of AC power that complies with the local building and electrical codes, that has both overload and ground-fault protection.

If the controller or the power supply are in any way damaged, defective, wet, or show signs of overheating, disconnect the power supply from the AC power and contact Viso Service for assistance.

Do not install or use the device outdoors. Do not spray with or immerse in water or any other liquid.

Do not remove any covers or attempt to repair the controller or the power supply. Refer any service to Viso.

Disposing of this Product



Viso Systems products are supplied in compliance with Directive 2012/19/EU on waste - electrical and electronic equipment (WEEE) together with the RoHS Directive 2011/65/EU with amendments 2015/863. Help preserve the environment! Ensure that this product is recycled at the end of its lifetime. Your supplier can give details of local arrangements for the disposal of Viso Systems products.

Introduction

About this document

These guidelines describe the installation and use of Viso LabPower.

About the LabPower

The LabPower is a combined AC power Supply and Power Analyzer (250 W, 30-270 V, 50/60 Hz).

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Contents

LabPower



2 m Power Cable (standard Schuko)



2 m Power Cable (US)



2 m Power Cable (UK)



USB Cable, 3 m



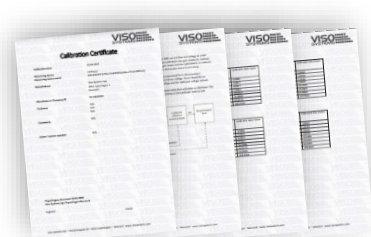
Light Source Power Cable (DUT power)



Remote Sensing Cable



Calibration Certificate



Shipping dimensions and weight

Shipping Packages	Shipping Dimensions	Shipping Volume	Weight
1. LabPower + cables	400x300x270 mm	0,0324 m ³	8,3 kg

Total shipping weight: 8,3 kg.

Total shipping CBM: 0,0324 m³

The shipment is done in a total of 1 package.

LabPower Introduction

The LabPower is a combined AC power Supply and Power Analyzer (250 W, 30-270 V, 50/60 Hz). LabPower is dedicated to working with all Viso Light Measurement Systems (LightSpion, LabPower, LabSpion) and Viso Light Inspector software, but may also work as a stand-alone unit.

LabPower will provide a pure sine wave feed to your light source while maintaining the voltage and frequency conditions.

To comply with light measurement standards (such as IES LM-79 and CIE S 025), your devices must be tested under rated conditions with specific tolerances.

Every Viso light measurement system includes a basic built-in power analyzer. The LabPower analyzer bypasses the built-in analyzer and adds more accuracy and specific features that makes the test circuit and analyzer uncertainties comply IES LM-79 and CIE S 025 requirements.

Combining a power supply with a power analyzer provides several advantages:

- Because of the optional remote sensing option, you may secure stable feed right on the light source/driver terminals with an advanced feed-back loop.
- The combined instrument is compact and will fit right next to your Viso gonio without the need of a rack
- LabPower just needs one communication cable to your PC with the Light Inspector software
- No harmonic distortion - pure sine wave
- Real-time readout of both on Voltage and Current curves
- No resonance artifacts from advanced regulation loops
- Optional remote voltage sensing for optimal accuracy

Fitting LabPower into your light lab

Because of the remote sensing option, it is an advantage to keep the LabPower close to the DUT (device under test) and not in a rack. Just place the rugged LabPower Peli case close to your goniometer.



Figure 1 LabPower with LabSpion light measurement system.

Connecting the LabPower

Connect Power

Open the LabPower lid. Before connecting power to the system, make sure that both switches ① and ② are in position zero/off.

The LabPower works with universal mains input: 90-260 VAC / 50-60 Hz. Connect to mains with the included Schuko cable ③, maybe by means of the adapters.



The LabPower comes with a standard IEC power-in connector and with a standard euro power cable, but any power cable can be used as the LabPower supports any outlet voltage from 90-260VAC.

AC Power Supply Cable Plug 3

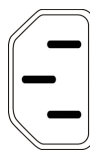


Warning: Risk of an electric shock! The plug installation shall be performed by a qualified electrician.

A grounding-type (earthed) power plug that fits the local power outlet must be used. You can acquire an IEC power cable with a suitable grounding-type plug from most consumer electronics stores.

When installing the plug connect pins as follows:

- Blue wire to neutral
- Green and yellow wire to grounding (earth)
- Brown wire to live.



Neutral
Ground/Earth
Live

Then, turn on LabPower on switch 1.

As the output the DUT is continuously regulated, LabPower does not need warmup/stabilization for accuracy.

Connect USB cable 4

The LabPower is connected to the computer using a USB connector type A to B. A 3-meter USB cable is included with the LabPower, however any USB cable supporting USB2.0 can be used.

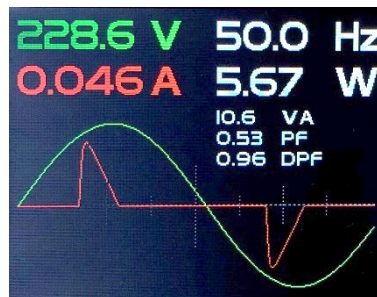
The USB provides communication from LabPower to the PC.

Setting the LabPower



The views in the built-in display and the LabPower settings can be altered with the four buttons **6**.

Use down-button (and up)-button to browse through the following displays:



Standard screen:

Live reading of output voltage, current, frequency, power, VA, power factor, and displacement factor.

Live output waveforms of voltage and current draw.

Here, the up and down buttons will cycle the detailed measurement screens. Press right arrow button to enter settings screen.

Current Harmonics		
Odd		
1	26.016 mA	21 2.982 mA
3	23.823 mA	23 2.467 mA
5	19.857 mA	25 2.394 mA
7	14.944 mA	27 2.332 mA
9	10.134 mA	29 2.055 mA
11	6.550 mA	31 1.658 mA
13	5.056 mA	33 1.392 mA
15	4.898 mA	35 1.324 mA
17	4.627 mA	37 1.300 mA
19	3.879 mA	39 1.185 mA

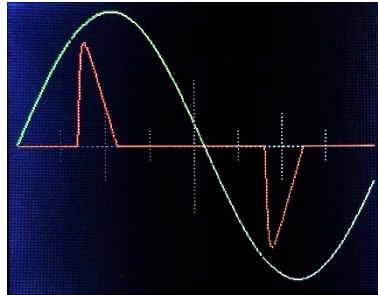
Detailed odd current harmonics in multiples of the base frequency.

In this example 1 (the base frequency) is 50 Hz, 3 150 Hz etc.

Current Harmonics		
Even		
2	0.094	mA
4	0.095	mA
6	0.077	mA
8	0.070	mA
10	0.075	mA
12	0.079	mA
14	0.085	mA
16	0.068	mA
18	0.076	mA
20	0.061	mA
22	0.061	mA
24	0.061	mA
26	0.055	mA
28	0.047	mA
30	0.040	mA
32	0.037	mA
34	0.040	mA
36	0.054	mA
38	0.048	mA
40	0.047	mA

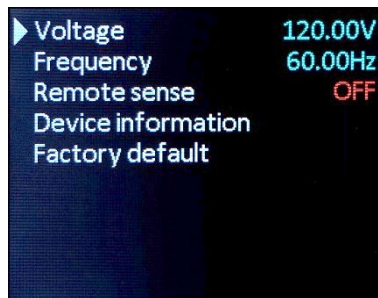
Detailed even current harmonics in multiples of base frequency.

In this example (the base frequency is still 50 Hz), 2 is 100 Hz, 4 is 200 Hz etc.

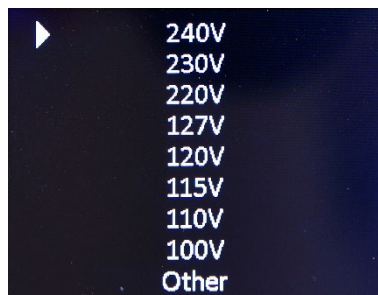


Large view of output voltage and waveform.

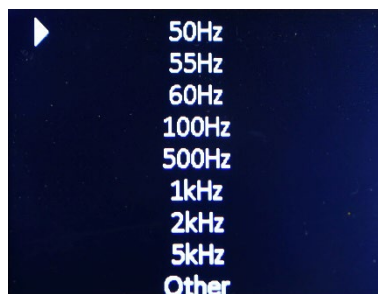
Use right/left button to open/close settings menu



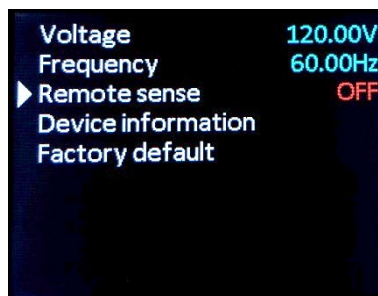
Main settings screen. Press right-button to get to this menu screen. Use up-down keys to choose desired menu point. Press right-button again to enter the menu point.



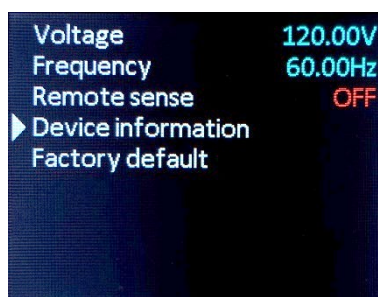
Select voltage – standard setting or custom/other (2 decimal precision) in V



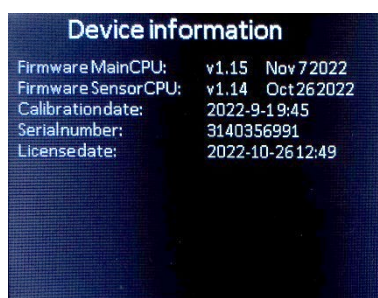
Select frequency – standard setting or custom/ other (2 decimal precision) in Hz



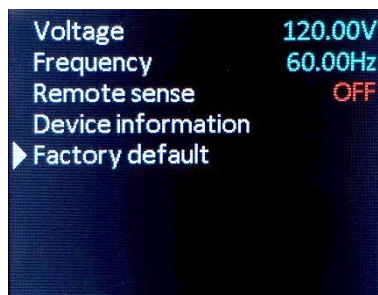
Use right-button to toggle the remote sense function on/off



Use right button to enter the device information overview



Detailed firmware info.



Remember to switch off the feed to the light source first to prevent damage. Use right-button to restart the unit in factory settings.

Connecting a light source



Plug a light source (device under test DUT) in the universal outlet **5**.



Warning: Do not turn on the switch on the light source with switch **2** before making sure that the power settings are suitable for the light source. You may damage the light source.

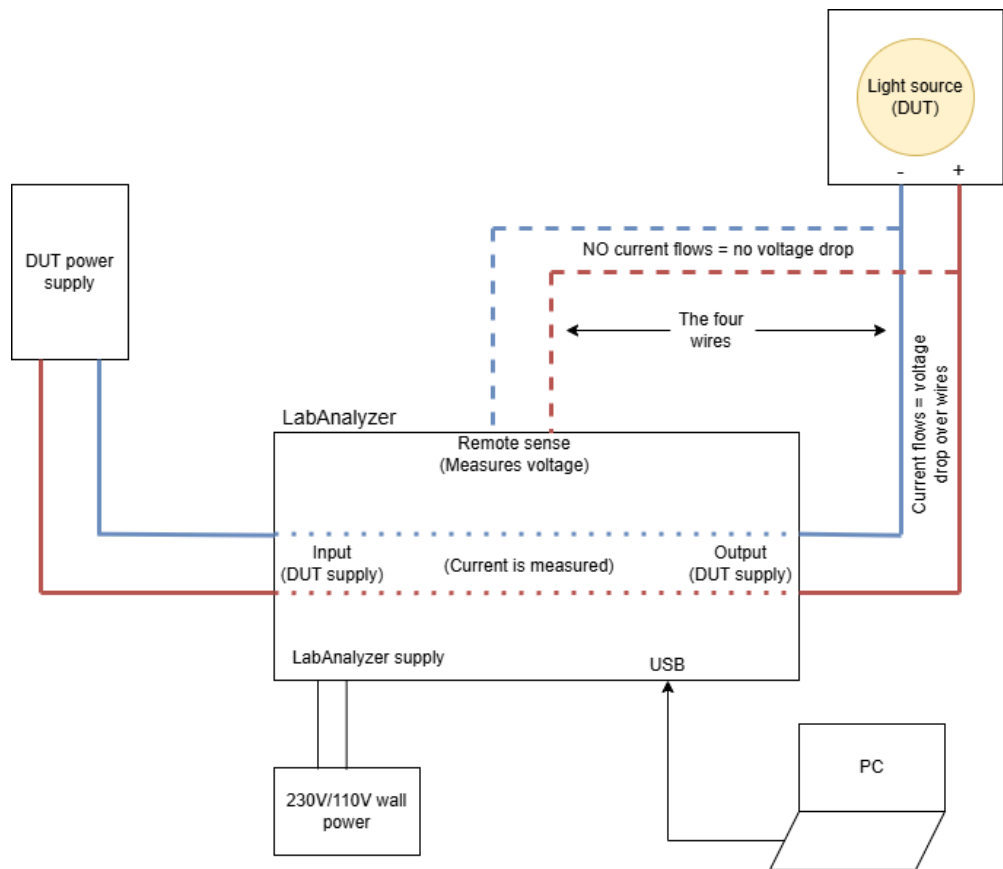
Turn on the light source with switch **2**, and the blue indicator light switches on.

Remote sense function

The remote sense system is for compensating for the power losses in the cables to the luminaire.

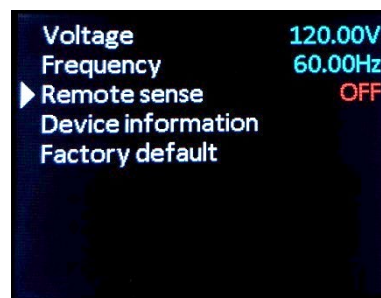
When connecting the remote sense cable, you essentially move your voltage detection point to the terminals on the primary side of the LED driver. This voltage is the most precise and replaces the voltage shown in the display and everywhere else.

The current is measured as previously. So, measuring with the remote sense cable ensures that your voltage is correct (on the driver terminals) and ensures that your power calculation doesn't include power loss in cables.



It is not possible to measure with the remote sense system on the secondary side of the driver (between driver and the LED).

In order to make the system work, you need actively to choose the remote sense function in the menu on LabPower.



Right-click to turn Remote sense on.

Requirements in standards:

Some light measurement standards require a remote sensing function applied for correct voltage measurements:

LM 79-19: "Test Circuit Requirements. To Avoid effects of voltage drops in cables or sockets, voltage measurements shall use separate sense leads connected at the point where the supply leads attach to the DUT (...)"

CIE S 025/E2015: Electrical Test Conditions: “(...) The test voltage shall be measured at the supply terminals of the DUT, not at the output terminals of power supply, to avoid errors due to voltage drop by the cables and connectors.”

Connecting the remote sense cable to the DUT

Use the cage clamp terminal blocks of the remote sense cable.

Tip: It is not dangerous to accidentally swap source and external voltage sense polarity though the voltage curve will be inverted on the display.

Remote sense functionality

LabPower will compensate for the source cable voltage drop using the external voltage sense readings. This allows more accurate voltage measurements at DUT and ensures the set voltage is accurate at the DUT input terminals.

Software

Start the “Viso Light Inspector” software after having connected the USB; the connection to the LabPower will be established automatically. A successful connection is shown with a green “Connected” icon in the upper right-hand corner of the ‘Viso Light Inspector’ software.

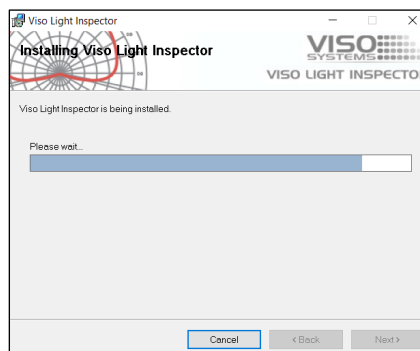
Software Installation

Before you can start using the LabPower, the “Viso Light Inspector” software must be installed. It is supported on all windows platforms.

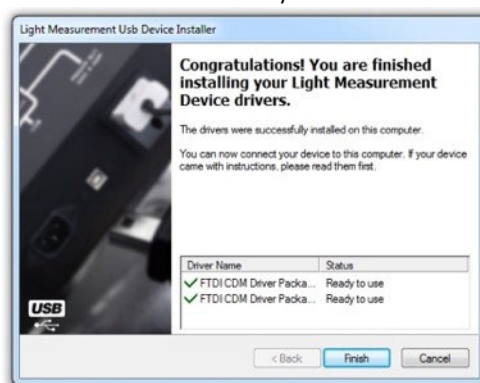
Use the following link to download a version later than beta version 6.70:

<http://www.visosystems.com/download-light-inspector/>

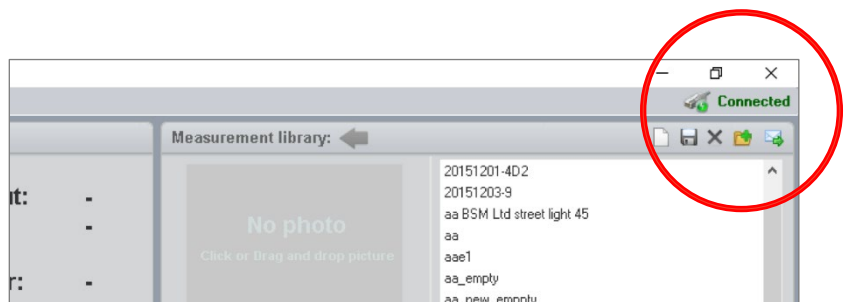
- 1) Please make sure the LabPower is not connected to the computer during software installation.
- 2) Run the .msi file and follow the installation instructions.



- 3) USB drivers are automatically installed.



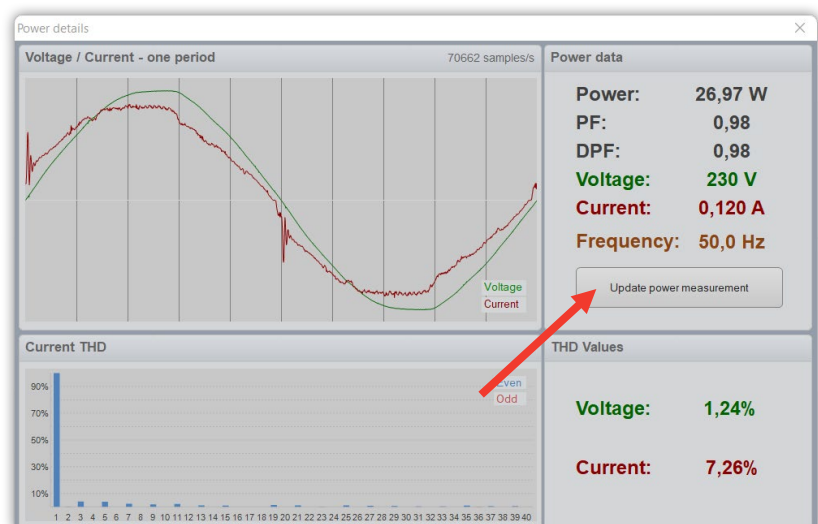
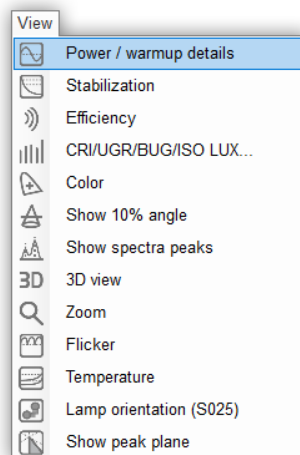
When connecting LabPower to your PC with USB, you should be able to see a successful connection to Light Inspector in the upper right-hand corner:



You can connect and disconnect the USB without restarting the “Viso Light Inspector” software, as the connection is always established automatically as soon as the USB connector is plugged in and vice versa.

Relation to power window in software

Open the power details window in Light Inspector with View → Power / warmup details:



Click the “Update power measurement” button to capture the immediate power readings from LabPower.

During a full measurement cycle, the power reading will be captured when light source stabilization has been automatically completed, i.e., at the start of every light measurement. This means that the power reading that will be saved with your light measurement will be taken just before the light measurement starts. You can override after measurement by clicking the “Update power Measurement” button and manually resaving the whole light measurement.

Product specifications

Physical dimensions

Dimensions (L x W x H)	270 x 220 x 180 mm
Weight	8 kg

Power input specifications

Input voltage	90 – 260 VAC 50/60 Hz
Maximum input power	350 W

Power Output Specifications

Voltage Range	30 – 270 VAC RMS $\pm 0,1\%$
Set AC RMS voltage tolerance.	+/- 0,2V
Current Range	1.4 A RMS max at >140 V 2.2 A RMS max at <140 V
Current crest factor capability (DUT <220 V)	>10
Waveform	45 - 500 Hz Sinusoidal
RMS summation of harmonic components	<3% of fundamental frequency
Dynamic response time, typical	<25 μ s
Voltage THD*	<1,5%
Frequency	45 - 500 Hz $\pm 0.1\%$
Output impedance	30-140 VAC 7.9 Ω / 140-270 VAC 1.5 Ω
Auto output voltage maintenance	Included
Maximum power output @ 200-260 VAC	250 VA (Volt-Amps) 250 W @ PF (1.0 - 0.9) 225 W @ PF (0.9 - 0.8) 200 W @ PF (0.8 - 0.7) 175 W @ PF (0.7 - 0.6) 150 W @ PF (0.6 - 0.5)
Maximum power output @ 90-140 VAC	200 VA (Volt-Amps) 200 W @ PF (1.0 - 0.9) 180 W @ PF (0.9 - 0.8) 160 W @ PF (0.8 - 0.7) 140 W @ PF (0.7 - 0.6) 120 W @ PF (0.6 - 0.5)
Maximum power output @ 30-90 VAC	65 VA (Volt-Amps) 65 W @ PF (1.0 - 0.9) 58 W @ PF (0.9 - 0.8) 52 W @ PF (0.8 - 0.7) 45 W @ PF (0.7 - 0.6) 39 W @ PF (0.6 - 0.5)

Prerequisites for power analyzer accuracy

Device Under Test Voltage	30 – 270 V RMS
Device Under Test Current	< 3A RMS
Device Under Test Frequency Range	50/60 Hz
Device Under Test Max Power	250 W
Ambient Temperature	25 \pm 1.2 C

Power Analyzer Specifications

Basic Power Accuracy (50/60 Hz)	0.5%
Analyzer Frequency Range	up to 100 kHz

Calibration uncertainty, voltmeter/ammeter	<0,2%
Calibration uncertainty, power meter	<0,5%
Voltage Accuracy	0.2% of reading + 0.2% of range
Current Accuracy	0.3% of reading + 0.3% of range
Voltage AC peak ranges (Crest factor = 3 dB)	6V / 12V / 25V / 51V / 103V / 206V / 413V / 826V
Current AC peak ranges (Crest factor = 3 dB)	3mA / 7mA / 15mA / 30mA / 60mA / 128mA / 257mA / 515mA / 1A / 2A / 4.1A / 8.2A / 16.5A
Measurement Bandwidth	200 kHz
Sample rate	2 MS/s
Output curve sample rate	125 KS/s
Measurement Parameters	Voltage, current, active power, apparent power, power factor, displacement factor.
Current sense series resistance	0.1 Ω
Voltage internal sense parallel impedance	3 M Ω
Voltage external sense parallel impedance	3 M Ω
Remote sensing function	Included (Max. test circuit resistance <0,5 Ω , Max. test circuit capacitance <1,5 nF)

Software

Connection	USB connection to Viso Light Inspector software
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At Viso Systems we design, develop and manufacture OEM and customer-specific light measurement solutions. Our mission is to support customers with powerful, yet easy-to-use control and test solutions. Products are developed, manufactured, test and calibrated in Copenhagen, Denmark.



Light measurement made easy