VISO SYSTEMS
LabAnalyzer

User Manual

Revision: 12-10-2026



Congratulations on purchasing your new Viso Systems LabAnalyzer. 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.

For news, Q&A and support at Viso Systems, visit our website at www.visosystems.com

Contents

Safety Information 3

Disposing of this Product 3

Introduction 3

Contents 4

Shipping dimensions and weight 5

LabAnalyzer Introduction 5

Fitting LabAnalyzer into your light lab 5

Connecting the cables 6

Local display 8

Software integration 9

Remote sense function 11

Sensor synchronization for flashing lights *(Note: Only sensor sync versions)* 14

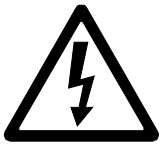
Product specifications 20

Safety Information

Warning! This product is not for household use.

Read this manual before installing and operating LabAnalyzer, 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.

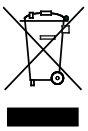
Use a source of AC power that complies with the local building and electrical codes, that has both overload and ground-fault protection.

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 LabAnalyzer.

About the LabAnalyzer

The LabAnalyzer is a Power Analyzer (2-270 V AC/DC max 16.5Amp).

© 2023 Viso Systems ApS, Denmark

All rights reserved. No part of this manual may be reproduced, in any form or by any means, without permission in writing from Viso Systems ApS, Denmark. Information subject to change without notice. Viso Systems ApS and all affiliated companies disclaim liability for any injury, damage, direct or indirect loss, consequential or economic loss or any other loss occasioned by the use of, inability to use or reliance on the information contained in this manual.

Contents

LabAnalyzer



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



RJ45 cable for sensor sync



Sensor sync versions (2027 and forward), also Auxiliary Photo Sensor:



Shipping dimensions and weight

Shipping Packages	Shipping Dimensions	Shipping Volume	Weight
1. LabAnalyzer + cables	410x310x230 mm	0,0280 m^3	5,0 kg

Total shipping weight: 3,0 kg.
Total shipping CBM: 0,0280 m^3
The shipment is done in a total of 1 package.

LabAnalyzer Introduction

The LabAnalyzer is an AC / DC Power Analyzer (10A peak, 800 VDC peak, or 270 VAC). LabAnalyzer is dedicated to working with all Viso Light Measurement Systems (LightSpion, LabAnalyzer, LabSpion) and Viso Light Inspector software, but may also work as a stand-alone unit. Note: the sensor sync version will work with LightSpion systems delivered in 2024 and later.

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. When installed and connected to the Viso Light Inspector software, the LabAnalyzer automatically 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.

Being an external integrated power analyzer, LabAnalyzer provides several advantages:

- Because of the optional remote sensing option, you may secure stable feed right on the light source/driver terminals.
- The combined instrument is compact and will fit right next to your Viso gonio without the need of a rack.
- LabAnalyzer just needs one communication cable to your PC with the Light Inspector software.
- Real-time readout of both Voltage and Current curves.
- Optional remote voltage sensing for optimal accuracy.
- Sensor Synchronization for flashing lights (some models).

Fitting LabAnalyzer into your light lab

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

As the LabAnalyzer also needs to be connected to your PC with the USB cable, it is recommended to install a powered USB hub near the goniometer.

Connecting the cables



1. Power in for the mains supply to the LabAnalyzer itself
2. Power on/off to the LabAnalyzer instrument
3. DUT power in – AC or DC. Remember polarity in DC.
4. DUT power out = AC or DC power to the DUT
5. Manual on/off DUT power.
   The setting of this switch can be overruled with the software
6. Local panel
7. Local panel navigator buttons
8. USB connection to your measurement PC (with Light Inspector software).
   You can check that LabAnalyzer connects correctly in the software help menu: Check for a new menu firmware line called “LabAnalyzer firmware”
   Your BaseSpion/LabSpion needs to be connected too.
9. Optional connection for remote sense cable
10. Some models: Sensor synchronization RJ45 connectors for measuring flashing light sources – see next page.

AC Power Supply Cable Plug 1



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:

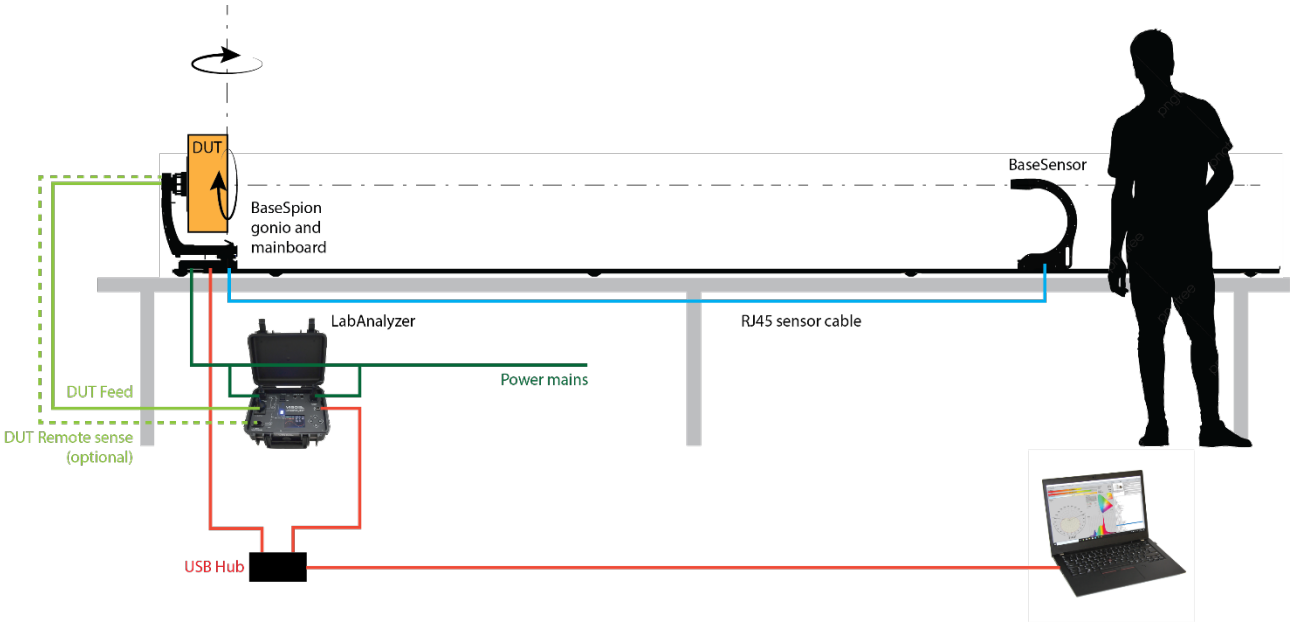
- Blue wire to neutral
- Green and yellow wire to grounding (earth)
- Brown wire to live.



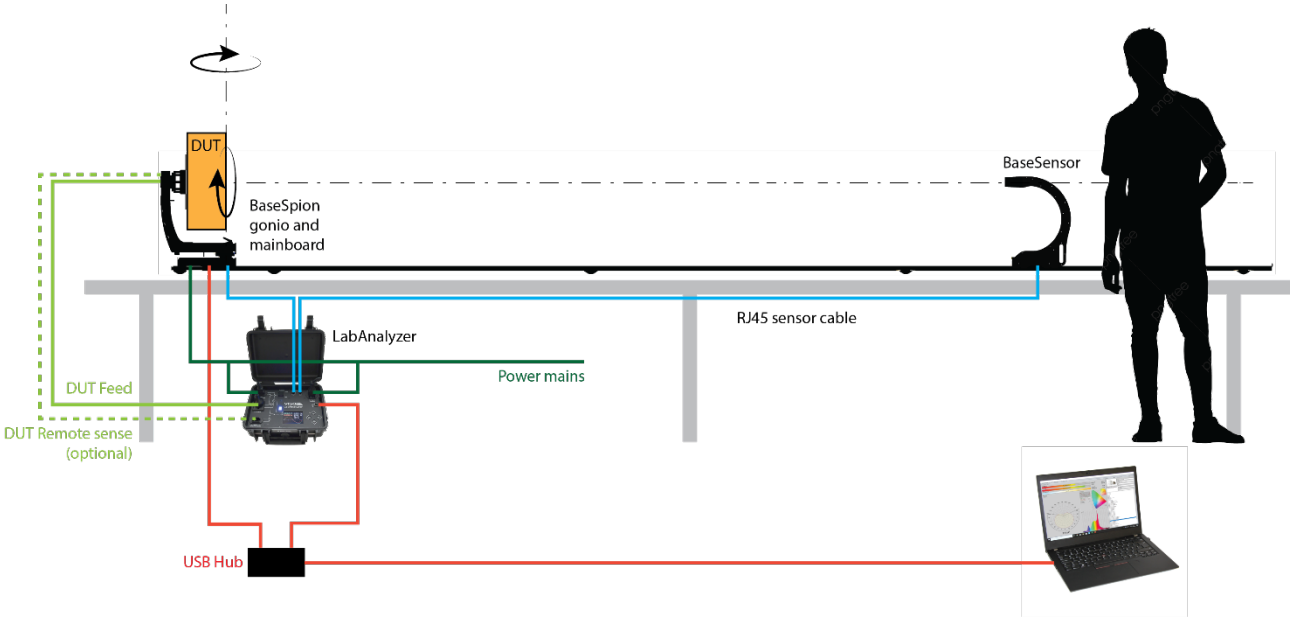
Neutral
Ground/Earth
Live

Then, turn on LabAnalyzer on switch.

Connection diagram (version WITHOUT sensor synchronization)



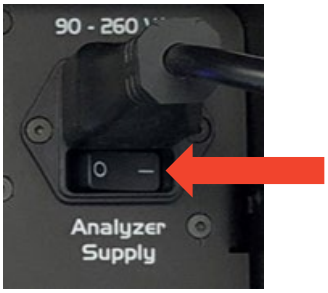
Connection diagram (version WITH sensor synchronization)



LabSpion systems are connected in a similar way.
Make sure that the mains connections are properly grounded.

Local display

Turn on the LabAnalyzer.



You should now see live readings on the local LabAnalyzer display light up.

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

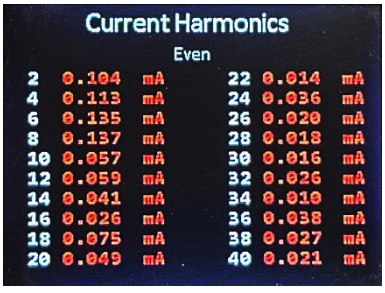


Standard screen:
Live reading of output voltage, current, frequency, power, VA, power factor, and displacement factor.
Live output waveforms of voltage and current draw.
Here, the up and down buttons will cycle the detailed measurement screens. Press right arrow button to enter settings screen.



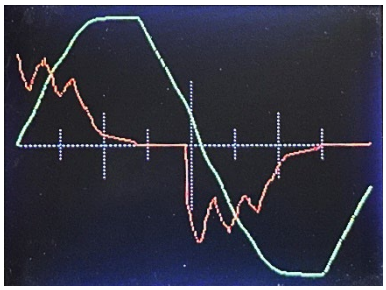
Detailed odd current harmonics in multiples of the base frequency.

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



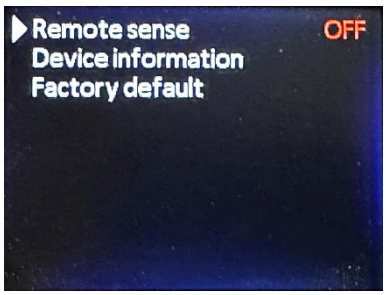
Detailed even current harmonics in multiples of base frequency.

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



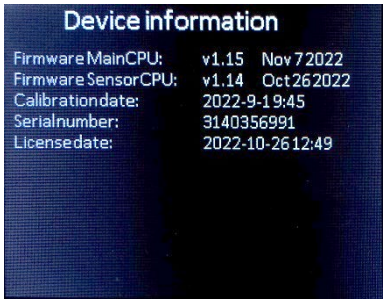
Large view of output voltage and waveform.

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.

Right-button toggles Remote Sense function on/off. When one, there is a green indicator in the standard screen.



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.

Software integration

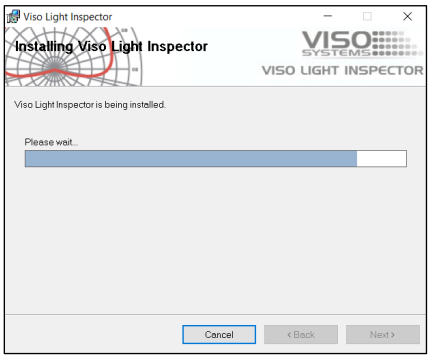
Before you can start using the LabPower, the “Viso Light Inspector” software must be installed. It is supported on all windows platforms.

Use the following link to download a version later than beta version 6.99.1:

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

1) Please make sure the LabAnalyzer is not connected to the computer during software installation.

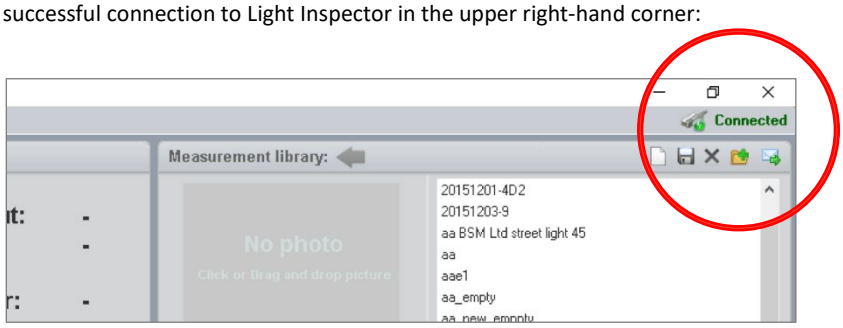
2) Run the .msi file and follow the installation instructions.



3) USB drivers are automatically installed.



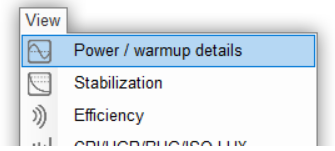
When connecting LabAnalyzer to your PC with USB, you should be able to see a successful connection to Light Inspector in the upper right-hand corner:

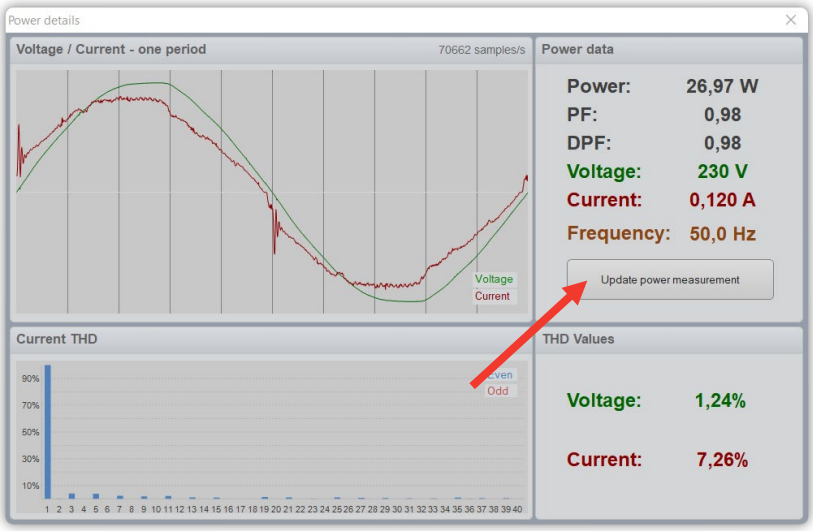


You can connect and disconnect the USB without restarting the "Viso Light Inspector" software, as the connection is always established automatically as soon as the USB connector is plugged in and vice versa.

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 LabAnalyzer.

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.

To start working with the software integration, make sure that all relevant software and firmware is up to date. Start the Light Inspector software and go to the Help menu:

→ Update: Check that your software version is minimum version 6.99.1.

→ Firmware (Base): Click Update Firmware, and update if necessary.

→ Firmware (Sensor): Click Update Firmware, and update if necessary.

→ Firmware (LabAnalyzer): Click Update Firmware, and update if necessary.

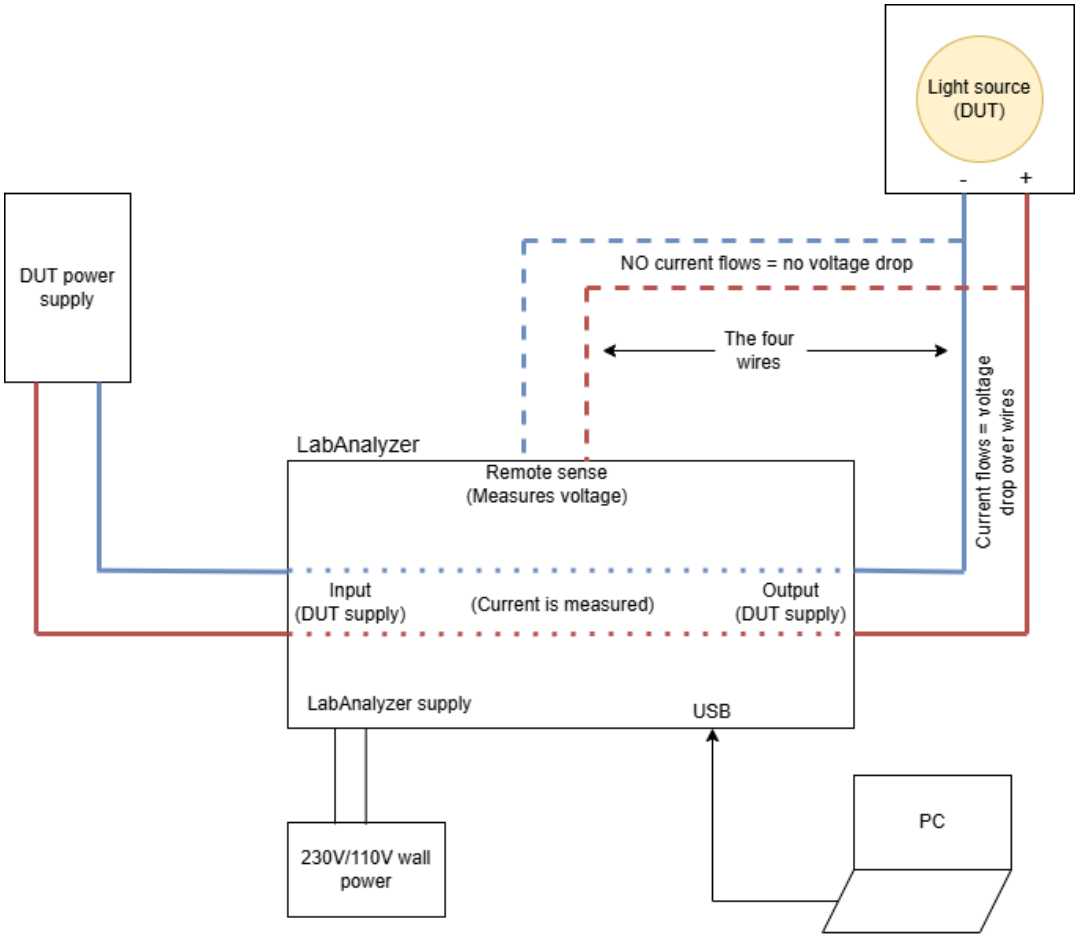
Now, LabAnalyzer replaces the built-in power analyzer’s data as long as LabAnalyzer is connected.

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 DUT/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 DUT/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 an LED driver (between driver and the LED).

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."

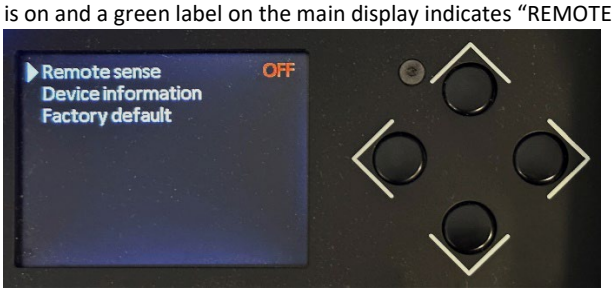
Connecting the remote sense cable to the DUT

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.

To activate the remote sense function

On the LabAnalyzer, press the right-hand key twice. Now the remote sense function is on and a green label on the main display indicates “REMOTE SENSE”



To deactivate, just press the right-hand key twice again.

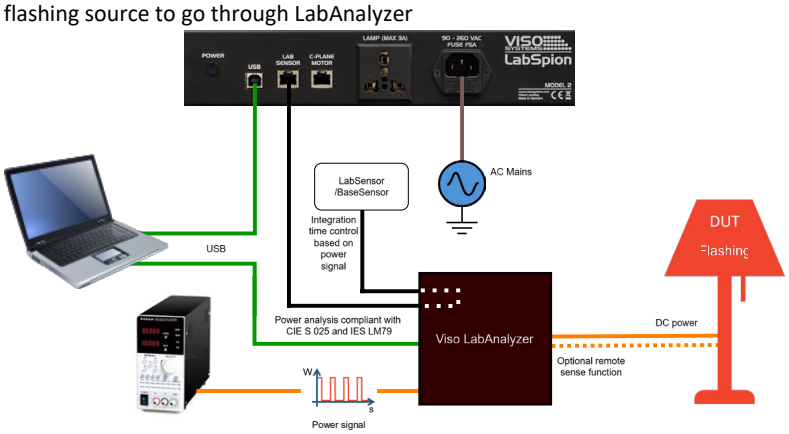
Sensor synchronization for flashing lights

(Note: Only sensor sync versions)

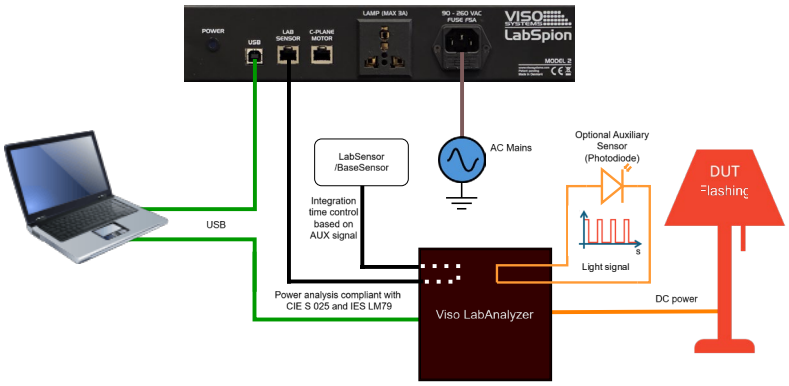
The LabAnalyzer Sensor Sync versions can synchronize power pulses as fast as 10 Hz with the LabSensor. This makes it possible to make accurate measurements of lamps, which are continuously flashing.

The system ascertains that the sensor light acquisition time (= the integration time) is synchronized with the flash periods by measuring the timing of the power throughput to the DUT. It automatically sets the integration time from flash onset (= trigger level 50%) to flash offset (= trigger level 50%/readout).

- **For DC light sources**, simply connect the power feed to flashing source to go through LabAnalyzer
- For **some AC sources** that **do not contain capacitive effects** in between LabAnalyzer DUT Out Supply and the DUT, simply connect the power feed to flashing source to go through LabAnalyzer



- For **some AC sources** that **do contain capacitive effects** in between LabAnalyzer DUT Out Supply and the DUT, use a small photosensor to provide a small DC current that the LabAnalyzer can work with instead of the AC throughput. Contact Viso Systems to a get an auxiliary photosensor and more instructions. A small workaround is needed to capture the AC power data for the source: After the measurement, pull of the auxiliary photosensor, connect AC mains and put your strobe into the outlet. Then click the “Update Power button” in the software and save.



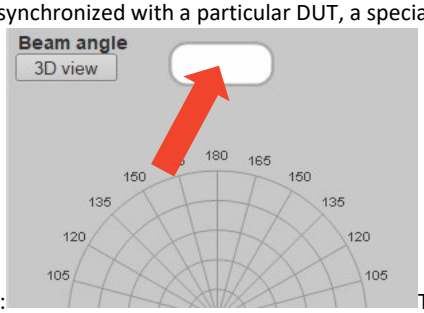
- Viso Auxiliary Photosensor (“Aux Sensor”) is available in all LabAnalyzers December 2026 and forward). This is intended for measuring e.g., lamps with

internal, capacitive control systems.



It is important to remember that during the integration time light is simply accumulated in the sensor. This also means that if the integration time contains more than one burst, the intensity will be averaged. To capture the peak intensity instead of the average, manually adjust the integration time – see description later.

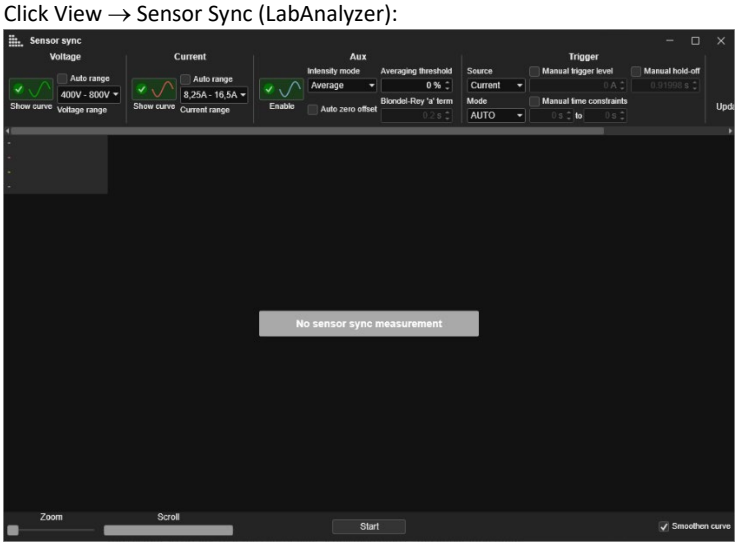
When the LabAnalyzer is synchronized with a particular DUT, a special indicator appears in the dashboard:



The indicator flashes with the same pattern as the light source. The indicator is also a short-cut button to the sensor sync window.

To activate the synchronization function

1. If you have an Viso Auxiliary Photosensor, plug it into LabAnalyzer (model w/ sensor sync) and mount it close to the light source in a way that minimizes shadowing effects. When plugged in, this accessory can be used to measure the flash waveform directly on the light output.
   Without the Aux Sensor, LabAnalyzer will use the current feed as proxy for light.
2. Turn on the flashing DUT (light source).
3. Click View → Sensor Sync (LabAnalyzer):

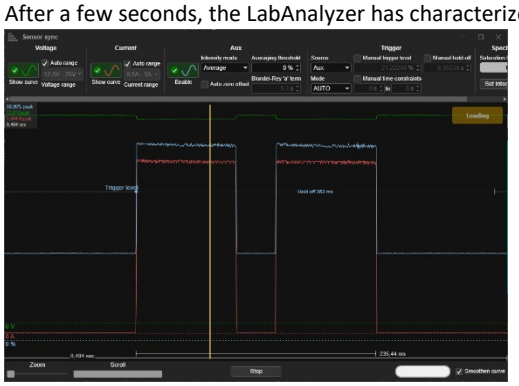


4. Check that both Voltage and Current are set to ‘Auto Range’, and that Source is set to ’Aux’



5. Click the Start button.

6. After a few seconds, the LabAnalyzer has characterized the signal:



In this example, we see a flash with two bursts per period. The total period length is 0,498 seconds and the two bursts and the pause in between are 237,01 s.

The text in the upper left corner indicates:

In blue: The relative light input to the Auxiliary Photosensor. A good level is 30-90%. If the level is low or high, consider adjusting the photosensor position or adjusting the gain level directly on the sensor switch.



In green: The light source feed voltage

In red: The light source feed current

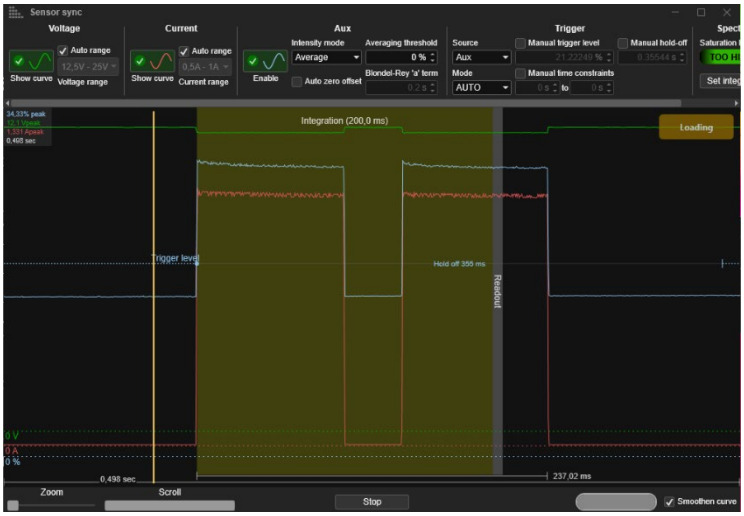
In grey: the flash waveform period length

Now the integration time is locked in with the flash period so that measurements will only be taken when the flash is on.

7. The next step is to make sure that the integration time is adapted to the intensity and shape of the signal waveform. Move the sensor sync window a bit to the side on the screen.

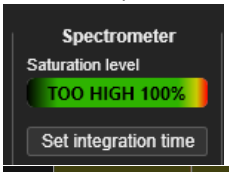
Note: The sensor sync window must be open (e.g. in the background) throughout the measurement.

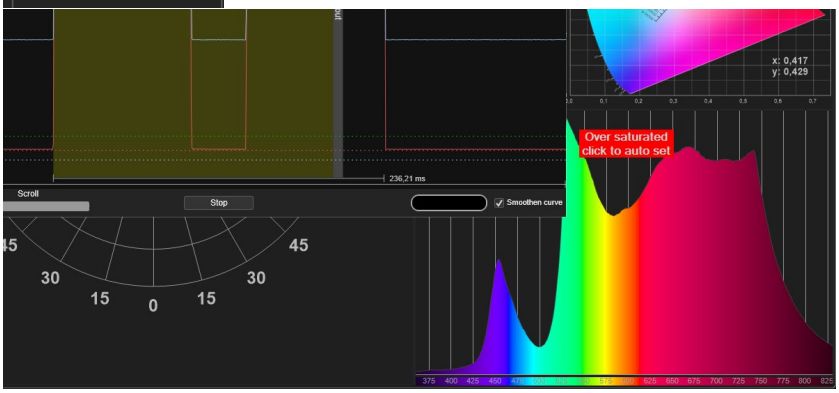
8. Start the Spectra Scan with the button . Now the system will try to set an adequate integration time represented by a yellow overlay and the actual integration time marked with write text in the top.



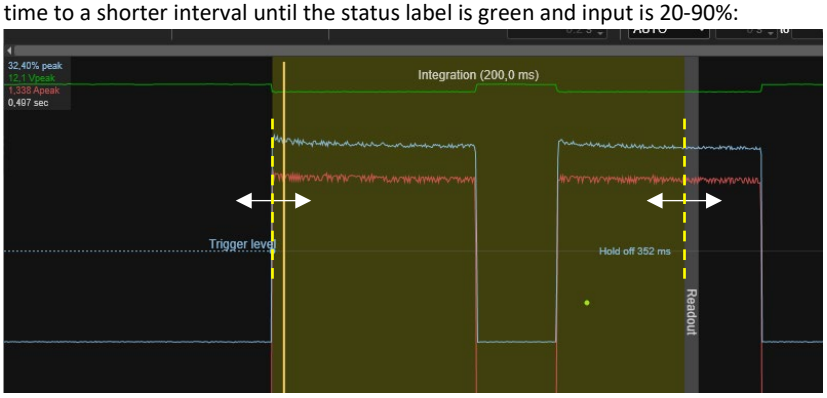
If the integration covers more than one burst, the measurement will average in the intensity within this range. If this is not ok, manually adjust the integration time as described below.

9. Watch the Spectrum image in the dashboard. If this looks normal you may continue to point 10. If the sensor oversaturates you will see this message:

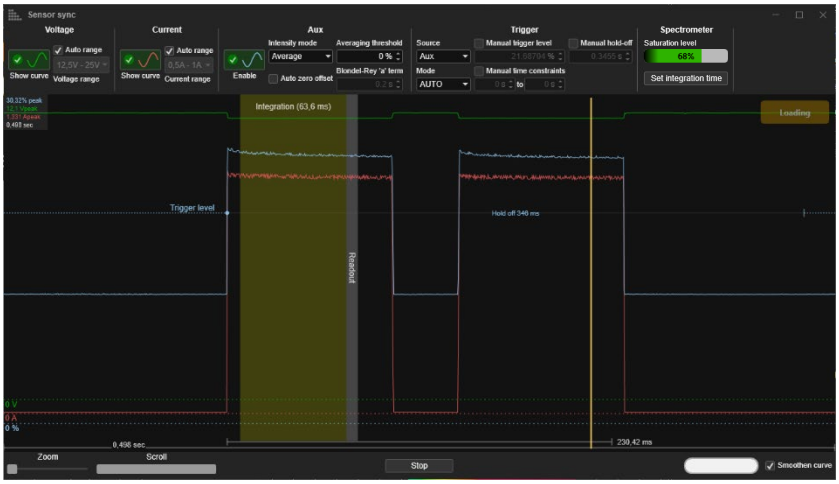




Do not click to auto-set, but use your mouse to manually pull the integration time to a shorter interval until the status label is green and input is 20-90%:



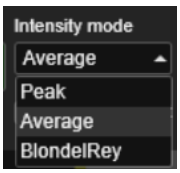
Adjust with lower and lower integration times until the status indicator shows a recommended Saturation level of 60-80%. The higher, the better signal. However, close to 100% will increase the risk over oversaturation during measurement:



10. Stop the Spectra Scan with the button . **Leave the Sensor sync window open throughout the measurement.**
11. Turn the DUT direction manually on the gonio to the correct start position.
12. Then start a new measurement with the play button  as normally.

Flash intensity metrics

As the Aux Sensor monitors the actual flash waveform (sample rate 2 Ms/s), this detailed shape and timing can be used for various intensity metrics:



Before or after measurement, choose between Peak, Average and Blondel-Rey intensity:

Average: The intensity is the average intensity measured within the Trigger range including off-periods

Peak: The intensity is the peak intensity measured within the Trigger range including off-periods

Blondel-Rey: Calculates the effective intensity on the human visual system I_{eff} as per the empirical Blondel-Rey formula:

$$I_{\text{eff}} = \frac{\int_{t_1}^{t_2} I(t)dt}{a+(t_2-t_1)}$$

where

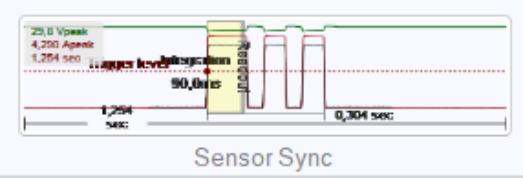
- I(t) is the measured intensity as a function of time

- t2- t1 is the flash duration in seconds
- a is the Blondel-Rey constant, typically set to 0,2 seconds (cam be adjusted).

Outputs – getting result into reports

It is possible to include sensor sync results in PDF reports:

- Find the drag-and-drop synchronization graph in the Template Tool Box graphics list:



Sensor Sync

- Use the special keywords from the Template Toolbox text list:

{FLASH_PERIOD} The total flash period in seconds.
This only returns a value if a measurement was made using sensor sync mode with the LabAnalyzer.

{FLASH_TIME} The time of the flash inside the flash period. If the flash consists of multiple bursts, this keyword willreturn the time from the beginning of the first flash to the end of the last flash.
It only returns a value if a measurement was made using sensor sync mode with the LabAnalyzer.

{FLASH_PERIOD_PWR} The electrical power of the complete flash period.
Returns the complete average electrical power in the whole flash period.

{FLASH_CUR_PEAK} The peak electrical current in ampere during the flash period.

{FLASH_PWR_PEAK} The peak electrical power in watt during the flash period.

{FLASH_BURST_COUNT} If a flash contains a burst of subflashes this keyword will return the number of subflashes within each flash.

{FLASH_BURST_TIME#} Returns the time in seconds of a specific flash burst pulse. The index of the pulse must be specified like: FLASH_BURST_TIME1 for the first burst pulse.

{FLASH_BURST_TIME_TO_NEXT#} Returns the time in seconds from a burst pulse until the next burse pulse. The index of the pulse must be specified like: FLASH_BURST_TIME_TO_NEXT1, which will give the time in seconds between burst pulse 1 and 2.

Product specifications

Physical dimensions

Dimensions (L x W x H)	270 x 220 x 105 mm
Weight	2 kg

Power supply (Display and analyzer circuit)

Input supply voltage	AC: 90-280 VAC 50/60 Hz
Power draw	10 W

Power Analyzer Specifications

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)	6 V / 12 V / 25 V / 51 V / 103 V / 206 V / 413 V / 826 V
Current AC peak ranges (Crest factor = 3 dB)	3 mA / 7 mA / 15 mA / 30 mA / 60 mA / 128 mA / 257 mA / 515 mA / 1 A / 2 A / 4.1 A / 8.2 A / 16.5 A
Voltage range	2-500 V RMS AC / 2-700 V DC
Power range AC	0.05 W to 1700 W @240 VAC / 850 W @120 VAC
Power range DC	0.05 W to 1700 W @240 VDC / 850 W @120 VDC / 170 W @24 VDC / 85 W @12 VDC
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	0.05 Ω
Voltage internal sense parallel impedance	2 MΩ
Voltage external sense parallel impedance	2 MΩ
Remote sensing function	Included (Max. test circuit resistance 0.5 Ω, Max. test circuit capacitance 1.5 nF)

Prerequisites for power analyzer accuracy

Device Under Test Voltage	5 – 280 VAC /5 – 380 V DC
Device Under Test Current	<14A peak and 1mA – 7A RMS
Ambient Temperature	25 ± 1.2 C

Sensor-sync version

Prerequisites	Strobe waveform frequency <10 Hz
AC feed	Use auxiliary photosensor as waveform indicator signal

Software

Connection	USB connection to Viso Light Inspector software

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