

VISO SYSTEMS Labarazzi

User Manual

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

This manual contains all the feature operating information 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

Other manuals in this series can be downloaded from www.visosystem.com

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Safety Information

Warning! This product is not for household use.

Read this manual before installing and operating the Labarazzi. Follow the safety warnings listed below and study all the cautions in the manual. If the device is in any way damaged, defective, wet, or show signs of overheating, disconnect from the mains and PC and contact Viso Systems 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 Systems.

Disposing of this Product



Viso Systems products are supplied in compliance with Directive 2002/96/EC of the European Parliament and of the Council of the European Union on WEEE (Waste Electrical and Electronic Equipment), as amended by Directive 2003/108/EC, where applicable. 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 Labarazzi

The special Viso accessory “Labarazzi” a light source with selectable modulated light waveforms of different modulation levels and shapes to emulate flicker and stroboscopic effect having various visibility and perception properties that can be used for demonstrations and test purposes of TLAs (temporary light artifacts).

Labarazzi works both as a stand-alone unit and connection with Viso Light Inspector software, that can be downloaded from www.visosystems.com.

The Labarazzi light source has several applications:

- In research projects investigating TLA and human responses
- For TLA tester calibration
- For demonstration of flickering light – in education and sales
- For test of (video-) cameras an compability with flickering light sources, e.g. in TV

About this document

These guidelines describe the installation process of the Labarazzi and how to use it with any of Viso Systems’ photogoniometers.

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Product Specifications

Dimensions, L*W*H

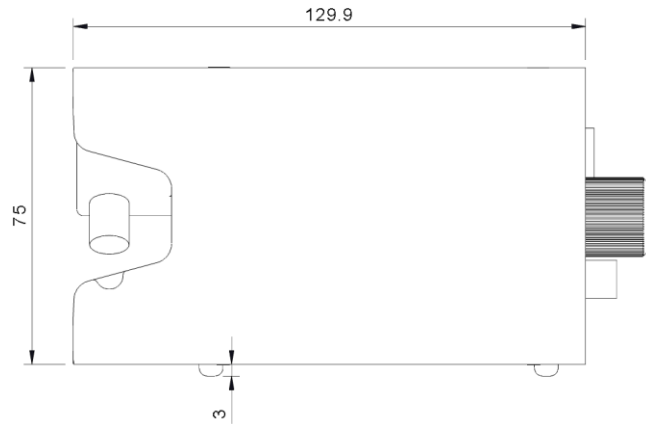
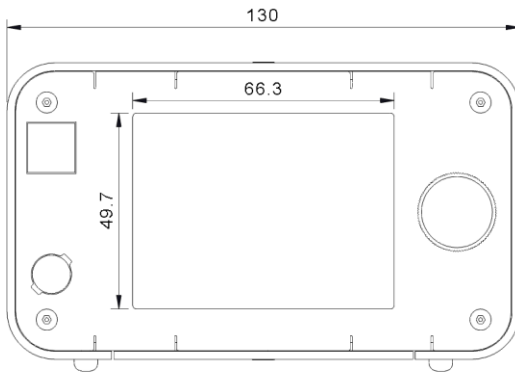
130 mm * 130 mm * 75 mm

Materials

Powder coated steel housing

Weight

Device 1.3 kg + cables



All dimensions in millimeter

Packages and Weight

Shipping Packages	Shipping Dimensions	Shipping Volume	Weight
1. Labarazzi	220 x 155 x 130 mm	0,0044 m ³	1,6 kg

Total shipping weight: 1.6 kg.

The shipment is done in a total of 1 package

Labarazzi Package Content

- 1 Labarazzi Unit
- 2 m angled power cable (Schuco)
- 2 m USB 2.0 cable



Labarazzi Installation Procedure

- Connect the power cable to the Labarazzi and mains power (85-264 VAC, 40 W).
- Turn on the Labarazzi with on/off switch next to the power plug.

For integration with Viso software (and for firmware updates):

- Connection to PC with USB cable, and install Light Inspector software from <https://www.visosystems.com/download-light-inspector/> (software development finalised 2021/11)

When using the Labarazzi to feed a control signal to other devices

- Connect to other devices with Sync cable BNC (not included).

Put the Labarazzi

- on the desk lying down – light source facing backwards e.g., on a wall.



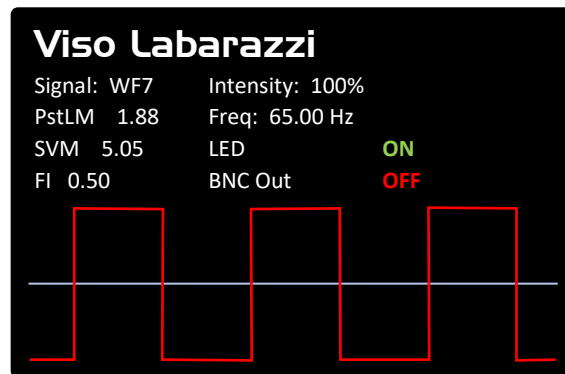
- on the desk standing up – light source facing downwards on the table.



Using Labarazzi in stand-alone mode

When turning on the Labarazzi, the built-in display briefly indicates the firmware and bootloader version.

As the unit per default starts in preset Waveform no. 7, and light source at full load, the display initially shows:



Interpretation:

Signal:	Waveform (flat = DC/sine/square/triangle/saw/cosine/PWM)
PstLM:	Flicker metric, short term light modulation – see more details in section Flicker Metrics .
SVM:	Stroboscopic visibility measure – see more details in section Flicker Metrics .
FI:	Flicker Index – see more details in section Flicker Metrics .
Freq:	Frequency – all Labarazzi signal are periodic with a defined frequency
LED:	Indicates whether the built-in LED is currently ON or OFF
BNC:	Indicates whether the built-in external signal is currently ON or OFF
Bottom red line:	Three cycles of the selected signal (in image: flat/no signal chosen)

Flicker Metrics

Flickering light is a problem at low frequencies and can trigger headaches, fatigue, and migraine attacks at higher frequencies - even if the effect is not visible. There are huge differences in how much people are affected by flickering light.

Flicker and stroboscopic effects are only found to a negligible degree in incandescent bulbs, as the filament does not get cold between each 50 Hz pulse from the power supply. Many LED solutions, however, are unsatisfactory in this regard - not because of the LEDs, but because of poor drivers/power supply electronics. Particularly dimmed LED luminaires and some screw-base LED light sources can be very flickering.

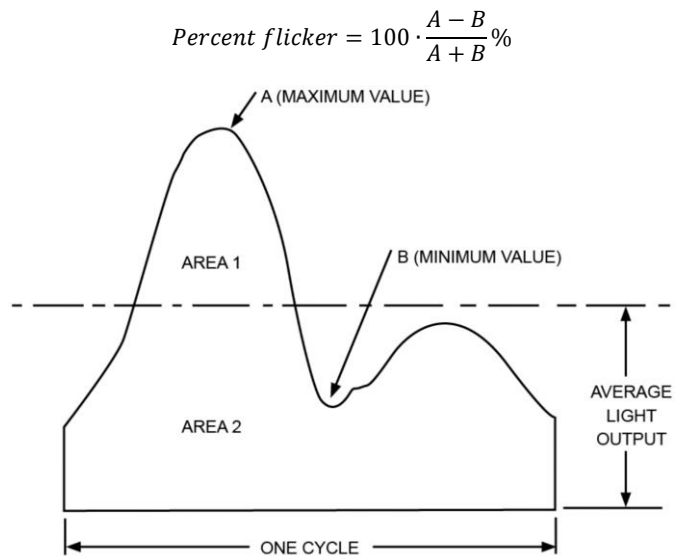
CIE Technical note CIE TN 012:2021 (“Guidance on the Measurement of Temporal Light Modulation of Light Sources and Lighting Systems”) provides a lot of valuable information on the topic and is free to download.

Flicker Frequency

Flicker Frequency is the flicker frequency of lamp typically caused by the driver and supplied AC current.

Flicker Percentage (PF) ≈ Modulation Depth (MD)

Flicker percent is a relative measure of the cyclic variation in the output of a light source (i.e., percent modulation). Sometimes this is also referred to as the “modulation index” (as a fraction between 0 and 1, not percent). From the figure¹ below:



Flicker Index (FI)

According to CIE S 017:2020, 17-22-094 (CIE 2020) the flicker index (symbol I_f) is the quotient of the above-average luminous energy to the total luminous energy over a period of time.

Hence, the Flicker Index is a “relative measure of the cyclic variation in the output of various sources at a given power frequency. It considers the waveform of the light output as well as its amplitude”¹. The flicker index assumes values from 0 to 1.0, with 0 for steady light output. Higher values indicate an increased possibility of noticeable lamp flicker, as well as stroboscopic effect. Again, from the figure above:

$$\text{Flicker Index} = \frac{\text{Area 1}}{\text{Area 1} + \text{Area 2}}$$

New flicker metrics

Flicker Index and Flicker Percent are not suitable to describe the effect of light modulations of human perception. E.g., 100% flicker at 1,000 Hz flicker frequency will result in a very high flicker index but at 1,000 Hz humans will generally not be affected by flicker, so ‘Percent Flicker’ and ‘Flicker Index’ will not describe human perception of stroboscopic effects. The latest research in what is collectively referred to as ‘Temporal Light Artifacts’ distinguishes three different effects: **flicker** (static light sources), **stroboscopic effects** (moving light sources) and **phantom array effects**

¹ The IESNA Lighting Handbook, 9th Edition, Mark S. Rea, 2000

(eyes moving relative to the light source). For the first two, good metrics for the effect on people has been established: the two indices P_{st}^{LM} and SVM.

SVM - 'Stroboscopic visibility measure'

Invisible flicker / stroboscopic effects typically occur in the frequency range from 80 Hz to 2,000 Hz and are measured by the SVM measurement method (the abbreviation stands for "Stroboscopic Visibility Measure"). SVM quantifies the strobe effect that may occur in connection with moving objects and a light modulation. Above 2000 Hz there is usually no risk of strobe effects. SVM is based on several parameters like: Intensity, flicker Index, frequency etc.

The SVM value can be read as:

- SVM < 1 Not Visible
- SVM = 1 Just Visible
- SVM > 1 Visible

P_{st}^{LM}

Visible flicker typically occurs when the frequency is from 0.3-80 Hz. In this area the metric P_{st}^{LM} is used (the abbreviation comes from "short term light modulation"). The details are described in IEC / TR 61547-1 and IEC 61000-4-15.

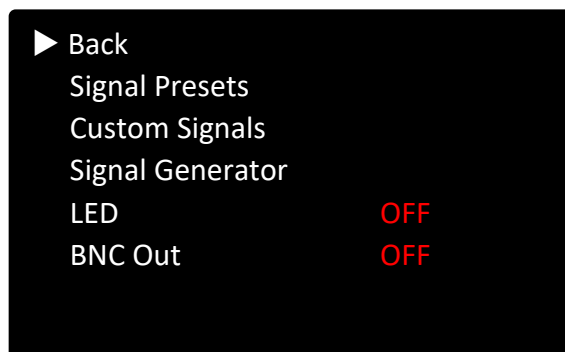
The P_{st}^{LM} values in general can be read as:

- $P_{st}^{LM} \leq 1$ Good
- $P_{st}^{LM} = 1$ 50% detection level
- $P_{st}^{LM} > 1$ Bad

Using the menus

Main menu

Press the multifunction button/dial once to enter the main menu:



Press once again to go back

Turn button right to scroll down/left to scroll up and to move the arrow to other menu point, the press the button once to choose a particular menu point:

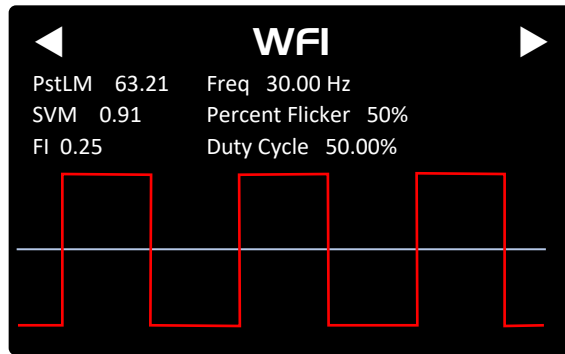
- **Signal Presets** – allows you to choose between 26 preset signals, see section

- **Custom Signals** – allows you to work with custom signals designed in Viso Light Inspector, see page 11.
- **Signal Generator** – allows you to make a custom signal directly on the unit (stand-alone)
- **LED** – turns the built LED on/off
- **BNC Out** – turns the external signal to the SYNC port ON/OFF

Signal Presets

The Labazzi includes 26 signal presets. Turn button right and left to pick signal. Press selector to select and start.

The bottom of the display shows three cycles of the selected signal.



List of selectable signals:

	Waveform	Frequency Hz	Percent Flicker %	Flicker Index	Duty Cycle %	PstLM	SVM
WF1	Square	30	50	0,25	50	63,21	0,91
WF2	Square	100	50	0,25	50	0,36	2,48
WF3	Square	15	5	0,30	50	11,83	0,06
WF4	Square	50	5	0,03	50	0,53	0,19
WF5	Square	60	100	0,50	50	3,27	4,77
WF6	Square	60	15	0,07	50	0,49	0,72
WF7	Square	65	100	0,50	50	1,88	5,05
WF8	DC	None	0	0,00	None	0,00	0,00
WF9	Saw	50	100	0,25	50	5,27	1,97
WF10	Sine	50	5	0,25	50	0,41	0,15
WF11	Square	50	100	0,02	30	0,41	0,15
WF12	Square	50	100	0,70	95	14,35	5,48
WF13	Square	100	100	0,50	50	0,72	4,96
WF14	Square	400	100	0,50	50	0,00	2,06
WF15	Square	100	25	0,13	50	0,18	1,24
WF16	Square	10	0,33	0,00	50	0,99	0,00
WF17	Rect. sine	100	100	0,21	50	0,00	1,83
WF18	Sine	100	100	0,32	50	0,08	3,89
WF19	Square	100	100	0,70	30	2,50	6,75
WF20	Square	100	100	0,05	95	0,89	0,44
WF21	Sine	100	35	0,11	50	0,03	1,36

	Waveform	Frequency Hz	Percent Flicker %	Flicker Index	Duty Cycle %	PstLM	SVM
WF22	Sine	100	10	0,03	50	0,01	0,39
WF23	Square	8,8	0,3	0,00	50	0,88	0,00
WF24	Square	33,3	1	0,01	50	1,00	0,02
WF25	Square	0,3	1,3	0,01	50	1,01	0,00
WF26	Square	100	100	0,50	50	0,72	4,96

Software Setup and Custom Signals

Software development pending (finalization 2021/11).

Specifications

Physical dimensions

Dimensions (L x W x H)	130 x 130 x 78 mm
Weight	1300 g
Shipping Dimensions (L x W x H)	220 x 155 x 130 mm
Shipping weight	1600 g

Signals

Signal types	flat = DC / sine / square / triangle / saw / cosine / PWM
Modulation depth	0-100%
Frequency bandwidth limitation	0 Hz to 10,000 Hz

Photometric

Light source, output	0 to 1100 lumen (@300 mA)
Light source type:	Bridgelux BXRC-30E1000-D-73
Light quality	CRI 80, CCT 3000 K

Electric

Connection	Schuco mains cable
Power	85-264 VAC, 40 W

Warranty

Warranty period	2 years from delivery date
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Ordering information

Labarazzi product number	P/N LABARAZ
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At Viso Systems, we design, develop and manufacture OEM- and customer-specific goniophotometer solutions. Our mission is to support customers with powerful, yet easy-to-use control and measurement solutions. Products are developed and manufactured in Copenhagen, Denmark.



Light measurement made easy
