VISO SYSTEMS
LightInterface

User Manual

Date of last edit: 12AUG2024

Congratulations on purchasing your new Viso Systems product. 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

Other manuals in this series (the latest version can be downloaded from www.visosystem.com):

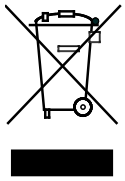
Contents

1. Safety Information

Warning! This product is not for household use.

Read this manual before installing and operating the LabInterface. 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 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.

2. 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.

3. Introduction

The special Viso accessory “LightInterface” is an accessory that can be used with all Viso light measurement systems: LightSpion, BaseSpion and LabSpion.

With LightInterface and standard software features you can regulate light sources during a test. This means that you can measure for example efficacy results, flicker or chromaticity for a lighting fixture in several settings and collect the results in one report.

LightInterface handles protocols DMX/RDM, DALI DT8 and 0-10 V. The system also allows for measuring wireless systems with some manual interaction.

LightInterface integrates seamlessly with Viso Light Inspector software

LightInterface facilitates measuring stand-by power consumption.

4. Product Dimensions

Length 180 mm
Width 75 mm
Height 52 mm

Front side:

Rear side:

LightInterface is powered by USB. 24V is optional/for future use (no DC power supply is included).

“Special” button is for internal Viso use.

5. Packages and Weight

Shipping Packages	Shipping Dimensions	Shipping Volume	Weight
1. LightInterface	200 x 118 x 77 mm	0,0018 m^3	1,00 kg

Total shipping weight: 1,00 kg.
Internal foam packaging. External cardboard packaging.
The shipment is done in a total of 1 package

6. LabInterface Package Content

- 1 LabInterface Unit

- 2 m USB Cable

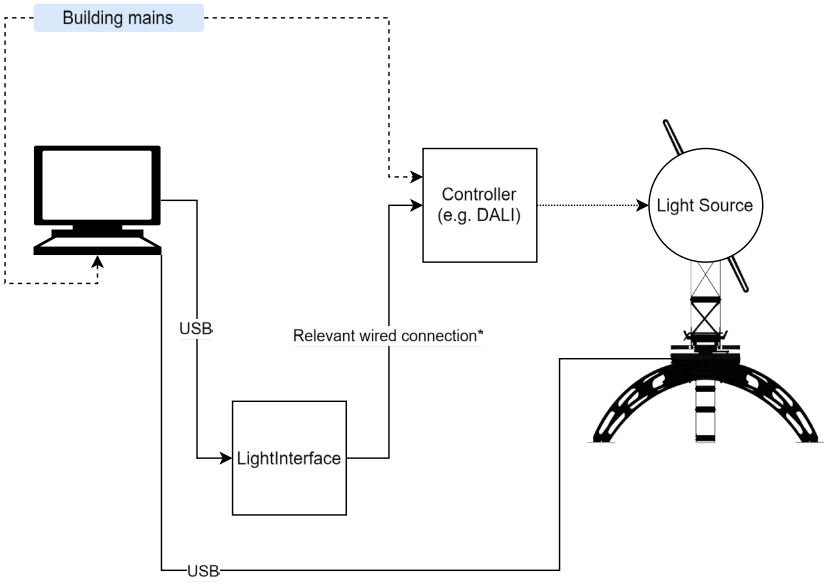
7. LightInterface Installation Procedure

7.1. Hardware setup

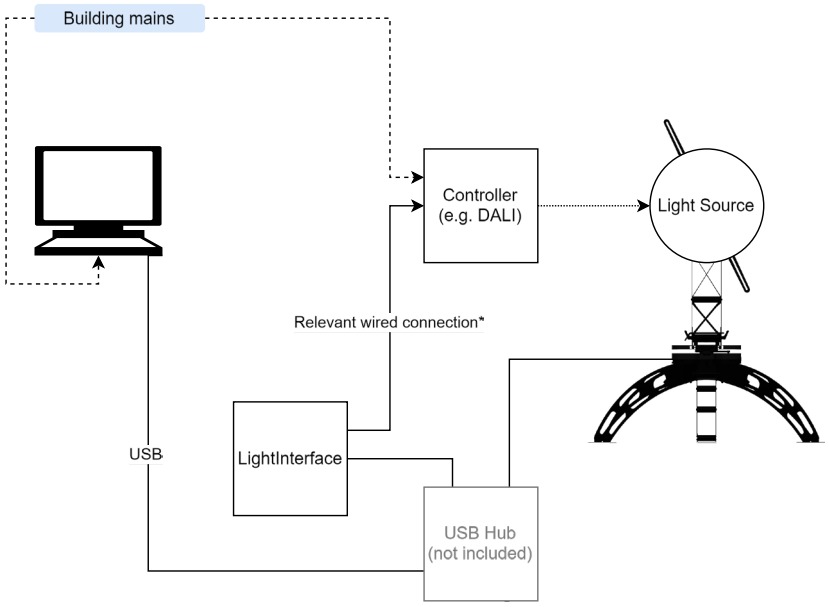
When connected you will see a small green indicator 

in the upper right corner of the Control device configurator window.

Connect like this to your measurement PC with Viso Light Inspector installed (2 USB cables):

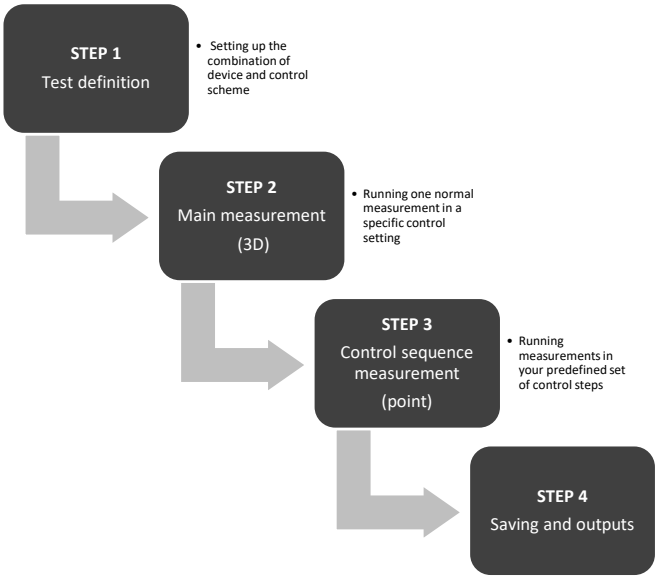


Or use as powered USB hub as intermediate (1 USB cable to measurement PC):



8. Software Setup and Measurements

8.1. Introduction and measurement principles



STEP 1: Test definition

To run a measurement including controls you need to define:

1) Device configuration
   Set up your DMX or 0-10 V light source and assign functions (e.g. Dimming, red, green, blue, white) to the available channels.
   As Dali DT8 is a predefined protocol, no setup is needed.

The system handles wired controls with protocols DALI, DMX/RDM and 0-10V.

2) Control sequence
    a. What settings would you like to use for the main measurement step?
    b. What functions do you want to control and in which steps?
    c. Do you want to control one or two parameters (e.g., dimming and color tuning)?
    d. How much time will you reserve for stabilization in between control steps and what threshold?
    e. Should the LabSensor set the integration time for each step?
    f. Do you wish to measure flicker for each step?
3) Choose a combination of a device and a control sequence
    a. The system will verify that all the functions configured in the control sequence are available with the selected device.

It is also possible to use other control methods than what is supported by the LightInterface by selecting “Manual” device type in the configuration menu. The system will then prompt the user to change settings for each measurement step.

STEP 2: Main Measurement

In this step, the system runs a normal 3D light distribution measurement with the resolution etc. you have chosen.
The parameters configured in the “Main measurement parameters” section of the Control Sequence you have selected will be applied upon starting the measurement. If you set e.g. color temperature as one of these parameters, and the setting is then subsequently not used as one of the two configurable parameters, this setting will remain static during the control sequence measurement.

STEP 3: Control Sequence Measurement

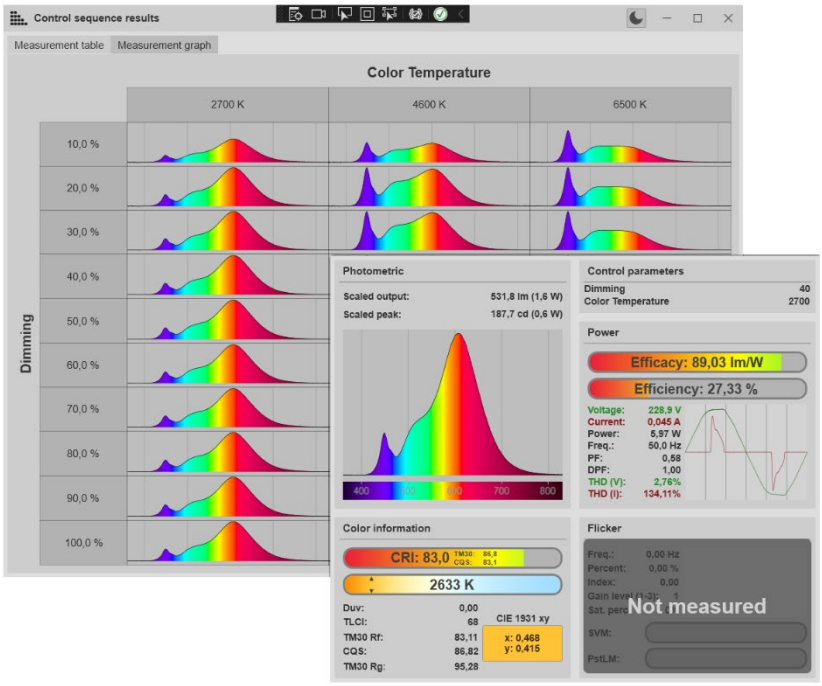
When the main measurement is finished, the system will automatically move to the position (vertical and horizontal) where the highest intensity was measured, and step through the parameters defined in the control sequence.
The system will not make distribution measurements at each step, as this would significantly slow down the measurement time. Should you require this, parameters can be set manually in the Device Configurator (window with faders for manual control), and separate distribution measurements can be performed as ordinary measurements with the control sequence disabled.

As the measurements at each step are only point measurements, spectra and color metrics for each of the steps are only measured for the peak angle as opposed to in the main measurement, where they are based on the integrated (average) spectrum for the entire distribution. This means that if the lamp has a significant spectral variation at different angles, these results should be used with caution.
Fortunately, it is possible to verify this by making a distribution measurement with the settings you wish to test and going into ‘Measurement ‘ -> ‘Measurement planes’ where you can move through the angles and planes to see the spectral and colorimetric variation.
Like the spectral variation, the relative distribution of the lamp should also be verified at relevant settings (e.g., different LEDs), as the lumen results for each step are scaled to the distribution and peak output from the main measurement. This is

easily done by making a distribution measurement of the relevant settings (e.g., red LED 100% on) and then comparing it to e.g. green LED 100% on.

STEP 4: Saving and output

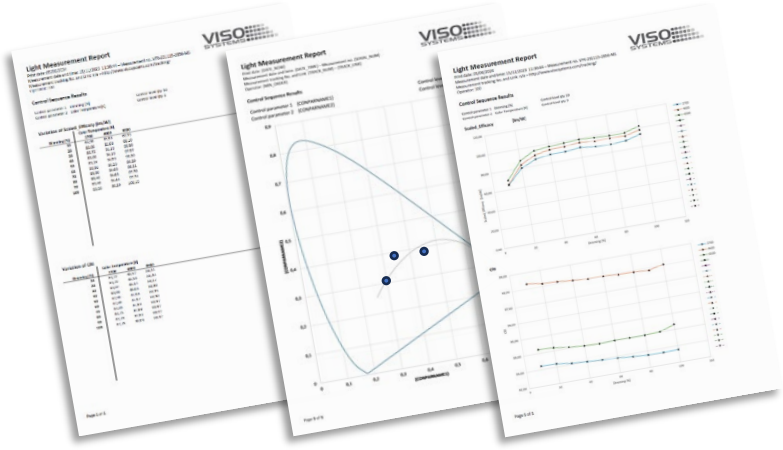
After the control sequence measurement is completed, it will present the result to you graphically. If you hover over the small spectra, you will get more measurement details:



Note: Some results will be 'NaN' until the measurement is complete.

Save the measurement. All control sequence results are stored in the same fixture file.

This also means that you can always return to the Control sequence results window and generate comprehensive result reports based on a single fixture file.



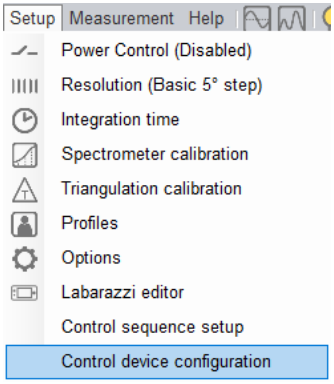
As usual, you may define custom PDF/CSV/XLS outputs that allow you to analyze or present your output in several ways.

Demo pdf report templates are available as self-installing plugins here:
https://www.visosystems.com/download-plugins/

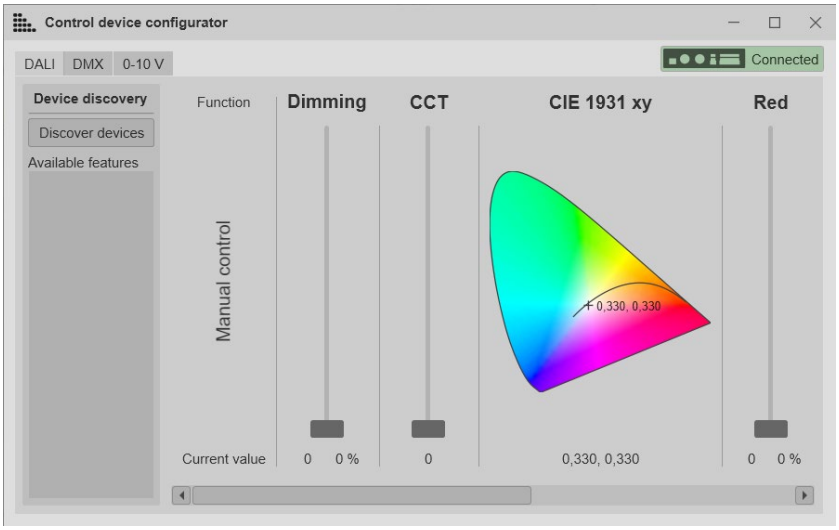
8.2. Configuring a new control device

This paragraph describes how you can prepare the software for measuring a new light source with specific settings (= a control device). If you have many devices that share the same settings/profile, this configuration can be saved as a template and reused.

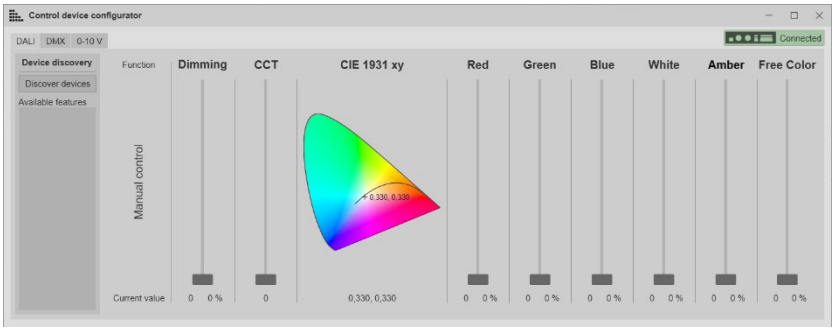
Go to *Setup → Control device configuration*



This window allows you to pick the relevant measurement protocol – DALI, DMX or 0-10V:

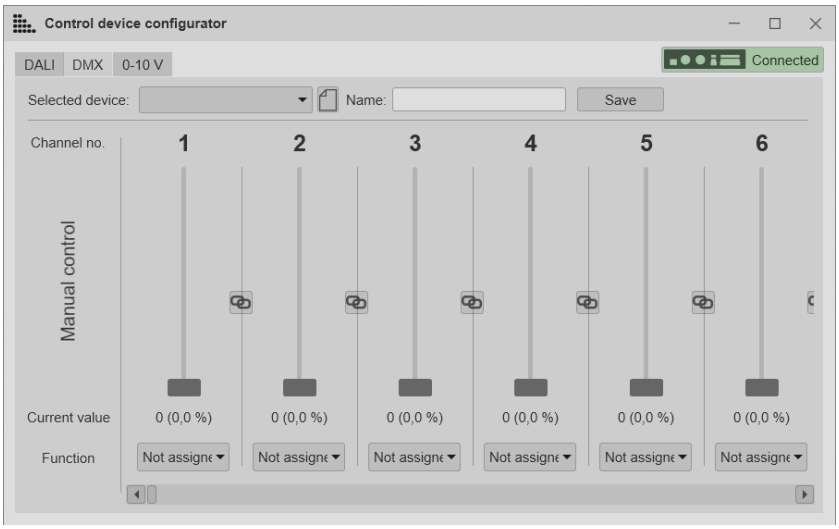


DALI devices:



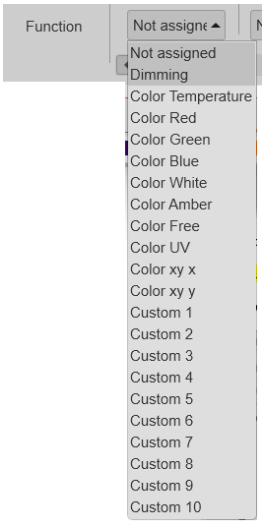
Click ‘Discover devices’ to explore the connected device and its control ranges.

DMX Devices:



You may pick your previously created devices from the drop-down list and edit them or make a new configuration by clicking  .

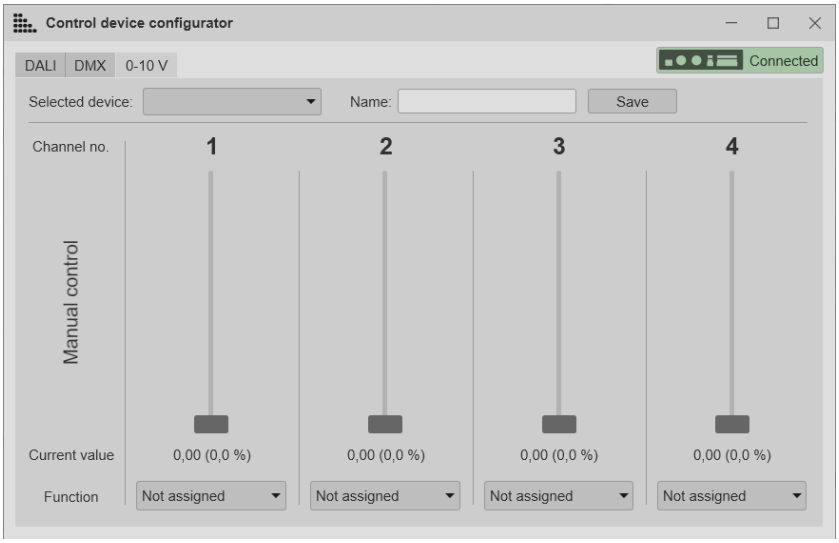
To configure a new device, assign functions to the channels of your choice. The buttons between channels are used to combine two 8-bit channels into one 16-bit channel. All 512 DMX channels are available.



Custom channels can be used to set e.g. tilt or pan of your dmx lamp, to ensure correct settings for every measurement. When assigned, add this parameter to the “main measurement parameters” in the control sequence, and type in the DMX value directly (0-255 or 0-65535).

Give the device a name and save the new device.

0 -10 V devices



There are four 0-10 V channels to work with.
Functions are assigned like with DMX.

Deleting saved devices

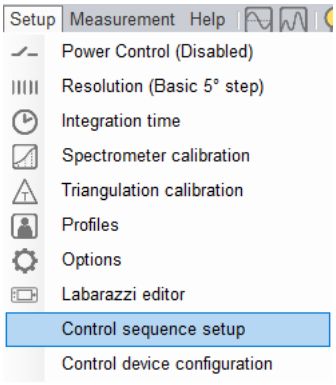
Device configurations are saved to your standard measurement folder (defined in *Setup → Options → Tab: Basic*. DMX device definition file names end with ".DmxDeviceSetup" and similar for 0-10 V devices.

To delete these device configurations, simply open a file browser and find the files that you want to delete.

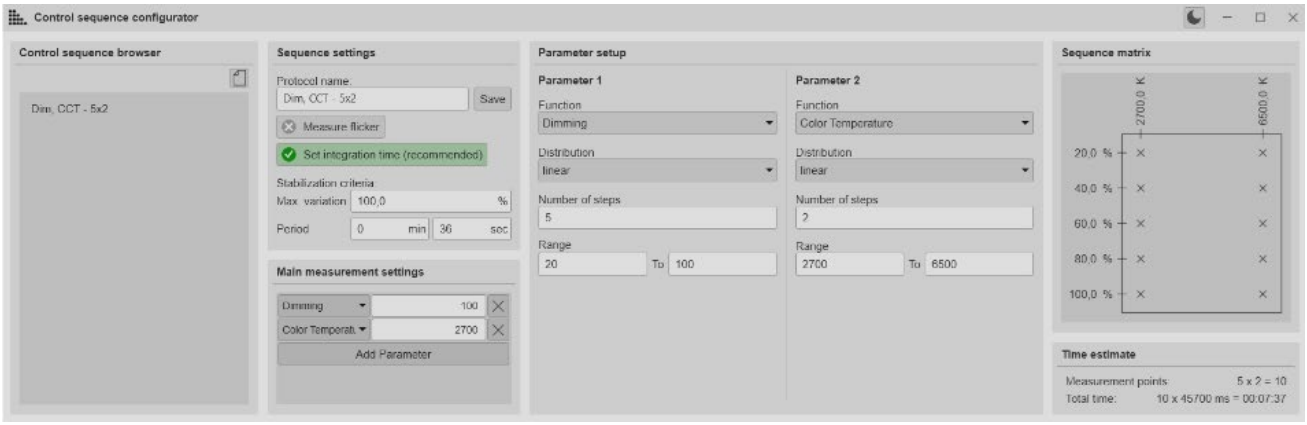
8.3. Creating a new control sequence

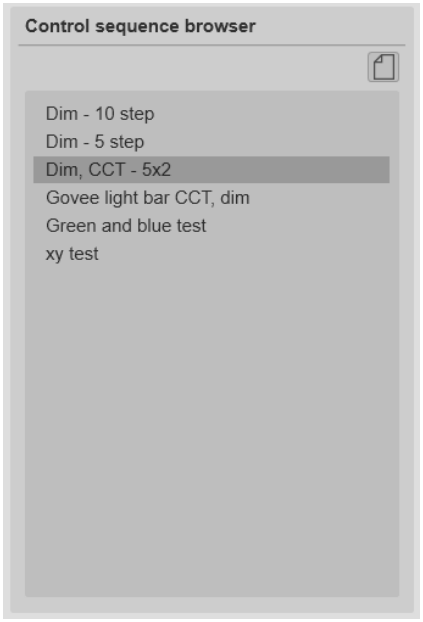
This paragraph describes how you prepare the software for measuring a new control sequence. If you want to reuse the control sequence, this configuration can be saved as a template and reused with any device that has the used functions.

Go to *Setup → Control sequence setup*:

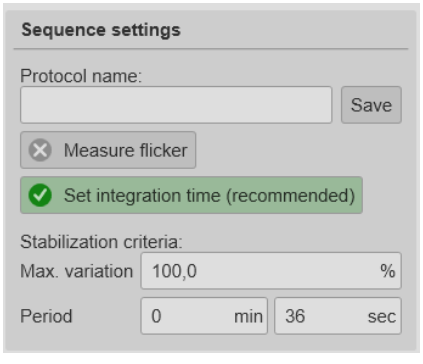


This window opens





This part of the window contains your saved control sequences.
You may pick a existing sequence from the list and edit it, or make a new by clicking 

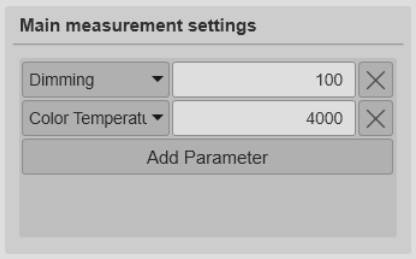


In this part of the window of you can do the following:

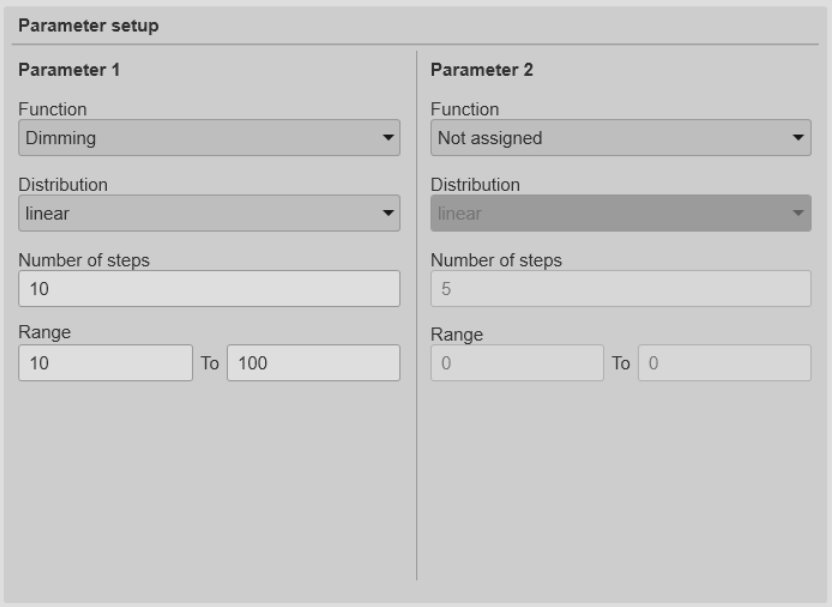
- Define your control protocol name and save it to the list above.
- Choose if you want to add flicker to your data collection by clicking the “Measure flicker” button on/off.
  See more information on page 18.
- Choose whether you want to allow the system to auto-set integration time for each step by clicking the “Auto-set integration time” button on/off.
- Choose your stabilization criteria for each step of the control sequence (stabilizing the light source before the main measurement runs independently

as a part of the standard measurement start-up procedure).
Here you can set a combination of Max. variation in % and period to check.

- If you want the step to be measured when the intensity has not changed more than 1% in the preceding 5 minutes, set to 1% and 5 minutes.
- If you want all control sequence measurements to be separated by a 10-minute stabilization period, set to 100% and 10 minutes.



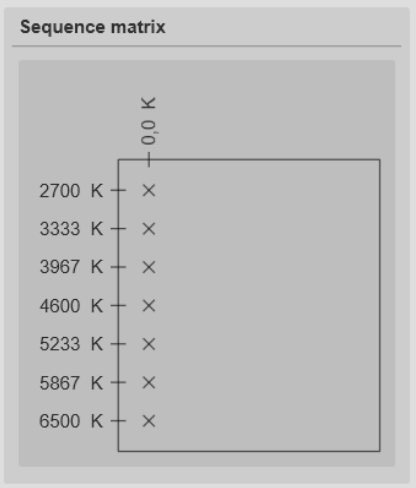
In this area you must define the control parameters that should be used in your main measurement (the distribution measurement performed before the control sequence is measured)



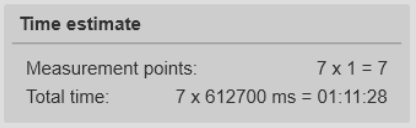
In this area, you may set up measurement steps for one or two control parameters.
Each can be set to: Dimming, CCT, Colors (red / green / blue / white / amber / Free / UV / CIEx / CIEy/ Custom 1-10) – whatever is configured in your device.

Each parameter can be measured in a range of steps. You must define the number of steps, the range, and the distribution (linear, logarithmic, or manual). Manual

distribution could be relevant if you want to test at specific color temperatures like 2700/3000/2500/4000/5000 or similar.



In this area, you can see the steps that will be measured graphically. The matrix illustrates your sequence – choice of parameter setpoints and combinations. Each 'x' represents a measurement.



In parallel, this window illustrates the estimated total measurement time estimates based on the sequence settings.

When all of the above is defined, please remember to save the protocol.

Deleting saved protocols

Go to *Setup → Control sequence setup*. Right-click on the line in the control sequence browser on the line that you want to delete, and click 'Delete'.

Alternative:

Protocol definitions are saved to your standard measurement folder (defined in *Setup → Options → Tab: Basic*. File names end with ".ControlSequence".

To delete these definitions, simply open a file browser and find the files that you want to delete.

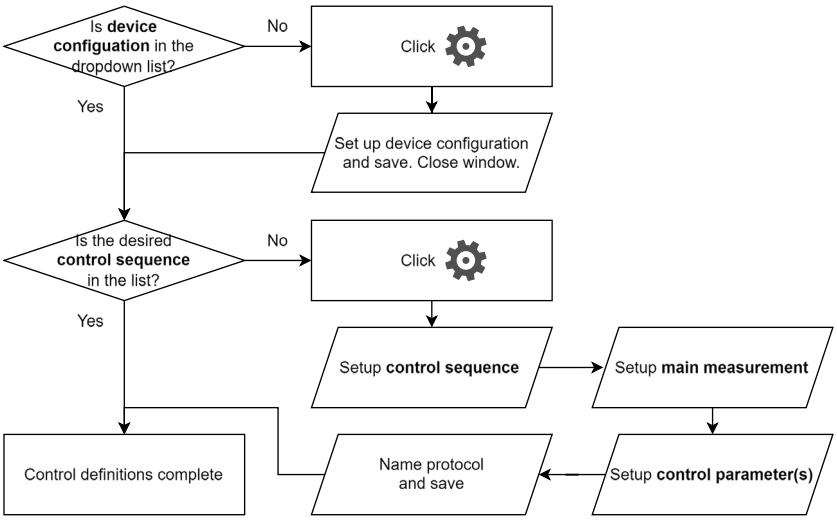
8.4. Starting a new measurement including a control scheme

Open the Light Inspector software (beta version 7.14 or later).

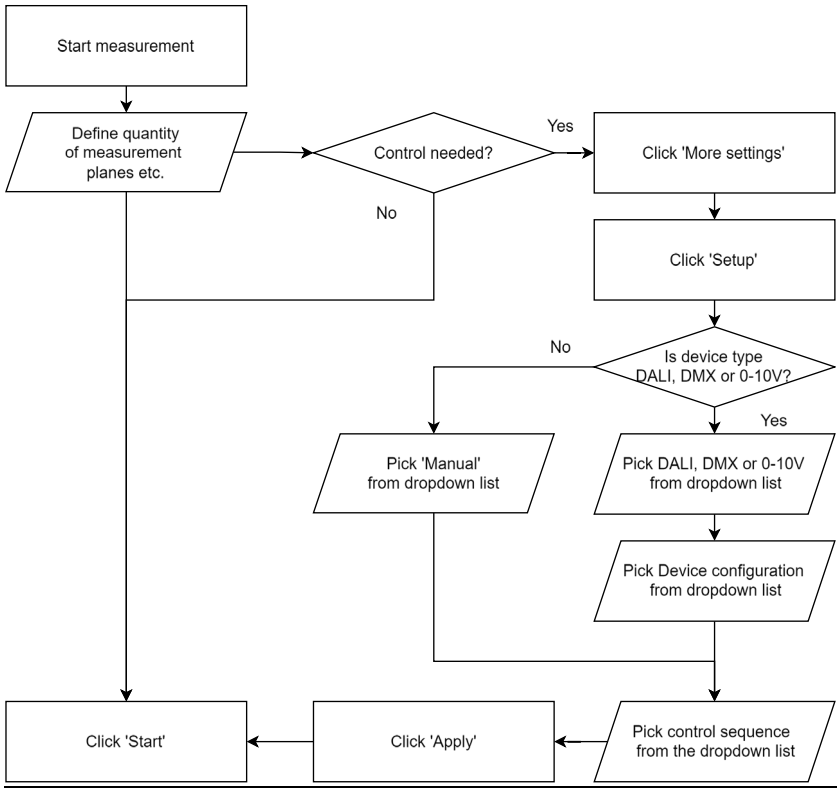
You may set up your controls first, or set everything up when starting a new measurement.

The following explains the first of these approaches.

Defining a device and a control sequence



Starting a new measurement with controls



9. Adding TLA measurements

TLA measurements with Viso LabFlicker can be part of your control sequence results. In this way, you can also investigate how dynamic control influences TLA metrics such as Flicker Frequency, Percent Flicker, Flicker Index, SVM, and PstLM.

As opposed to the spectrometer sensor, LabFlicker has a limited dynamic range, and is therefore dependent on being in a suitable distance. If one of your control parameters is dimming or if the parameter significantly changes the output of the lamp, it is necessary to find a distance that is suitable for both ends of your dimming range before starting your measurement. Further, the LabFlicker must be placed in a position that ensures that is not casting a shadow on the sensor - no matter how the light source is turned during measurement, LabFlicker should not obstruct any light from hitting the sensor.

With newer model of LabFlicker (that have a higher dynamic range), the ideal position is often directly on LabDisc:

In this way, the LabFlicker stays close to the photometrical axis without casting shadows.

If the signal was too low or too high during the control sequence, the software will either give a result with a warning or no result at all.

9.1. Optimizing the LabFlicker position

Before starting a control sequence measurement, please optimize the LabFlicker position:

- Move your sensor to the optimal distance (Go to *Help → Sensor Distance Guide*): Minimum distance or slightly above.
- Turn on the light source and adjust the output to the minimum dimming output of your control matrix. You may have to adjust both color and dimming to find the minimum.
- If you own a LabDisc, attach LabFlicker to the front of the stem with the original rubberized magnet and/or with tape, and check whether the signal is strong enough. If not, proceed to the next step.
- Put your LabFlicker on a tripod and move it to a spot in the vicinity of the luminaire where the signal is “ok” = slightly over minimum. Make sure that LabFlicker is not in the sensor field of view, i.e., shading light in any position also when the light source is rotating.
- Proceed to measuring.

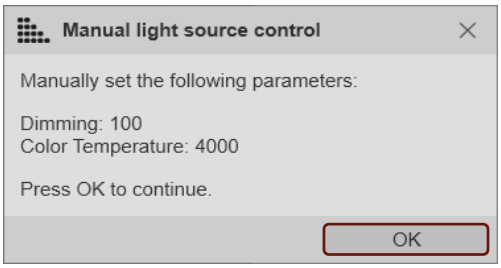
10. Wireless protocols – manual mode

This feature is available even if LightInterface is not connected. It allows users to use control sequences (following normal measurement) by manually regulating the device in between measurement steps.

In manual mode, the system will prompt the user to regulate the device by any means, such as wireless control (Bluetooth, WIFI, Zigbee, etc.):

- Click ‘Start Measurement’
- Choose number of planes etc.
- Click ‘More settings’
- Click ‘Setup’
- Under Device type, select ‘Manual’
- Under control sequence, pick a predefined control sequence from the drop-down list, or define a new sequence with
- Click ‘Apply’
- Click ‘Enable’

The system will then perform a normal measurement followed by a control sequence where the user is prompted to make regulations with pop-up windows like this:

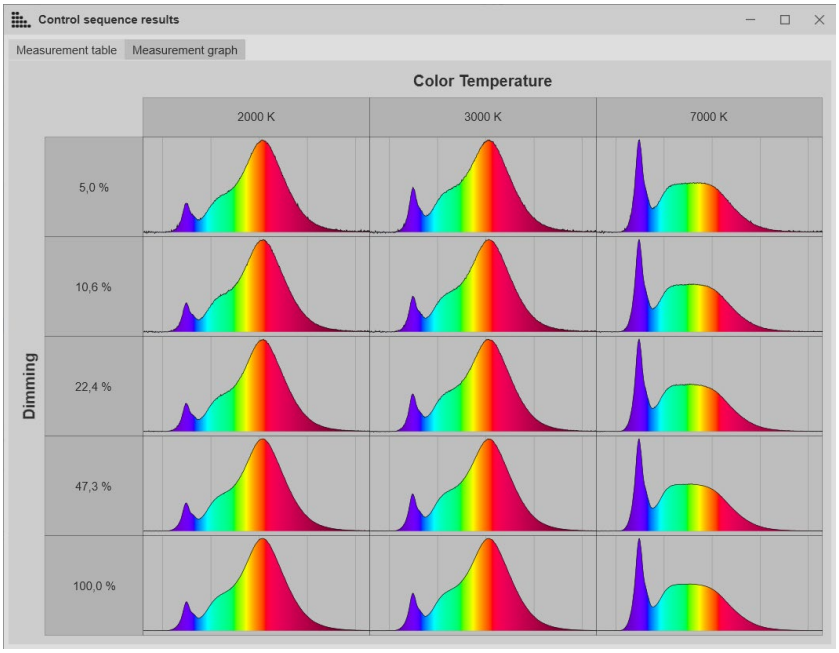


11. Results presentation in the software

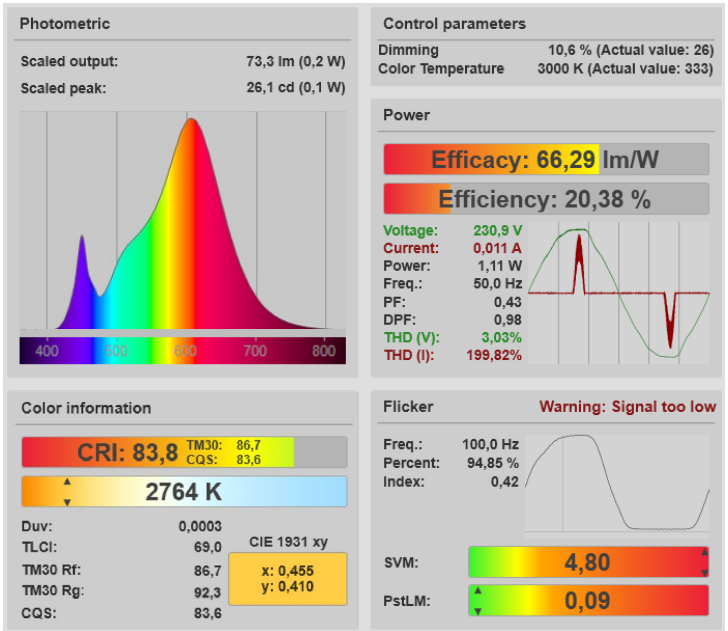
To see all control results, go to *View → Control sequence results*

11.1. Measurement table view

Click *View → Control sequence results →Tab: Measurement table:*

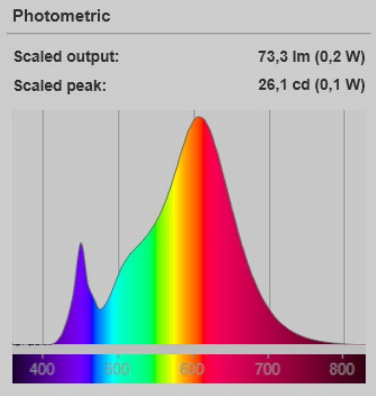


This window displays the number of control steps that were performed as a matrix (2-dimensional or single). In this view, you will just see a small spectrum image that represents each control step.
As during the live measurements, you can see more detailed results by hovering over the cells in the matrix:



Explanations to each section of this window:

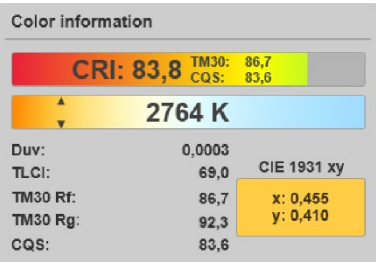
The control settings for the particular step. "Actual value" is the value sent to the device (e.g., DMX value 255 or Dali value 254)



Photometric properties:
The scaled luminous flux (light source total) can be scaled using the peak intensity:

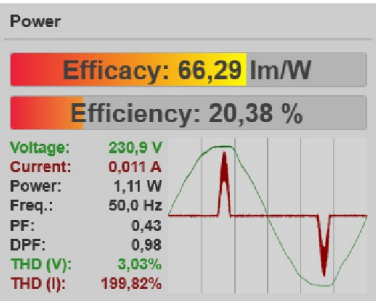
$$Scaled\ lumen_{step} = Flux_{main} \frac{Intensity_{step}}{Intensity_{Peak,main}}$$

Below you will see an image of the spectral intensity distribution in the peak intensity direction at the specific control step[1]



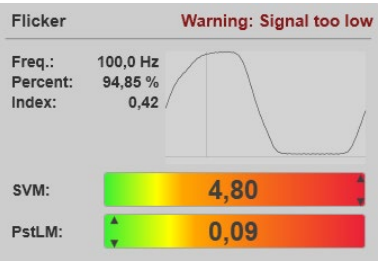
Color properties[1]:

CRI – Color Rendering Index
TLCI – Television Lighting Consistency Index
TM30 Rf – IES TM30 fidelity index
TM30 Rg – IES TM30 gamut index
CQS – NIST Color quality scale
CIE 1931 x,y – CIE color coordinates



Power properties:

Efficacy and Efficiency
Voltage and Current
Power
Frequency
Power Factor (PF)
Displacement Factor (DPF)
Total harmonic distortion: THD (V) and THD (I)



Flicker properties (only if LabFlicker was connected, and flicker selected in the protocol):

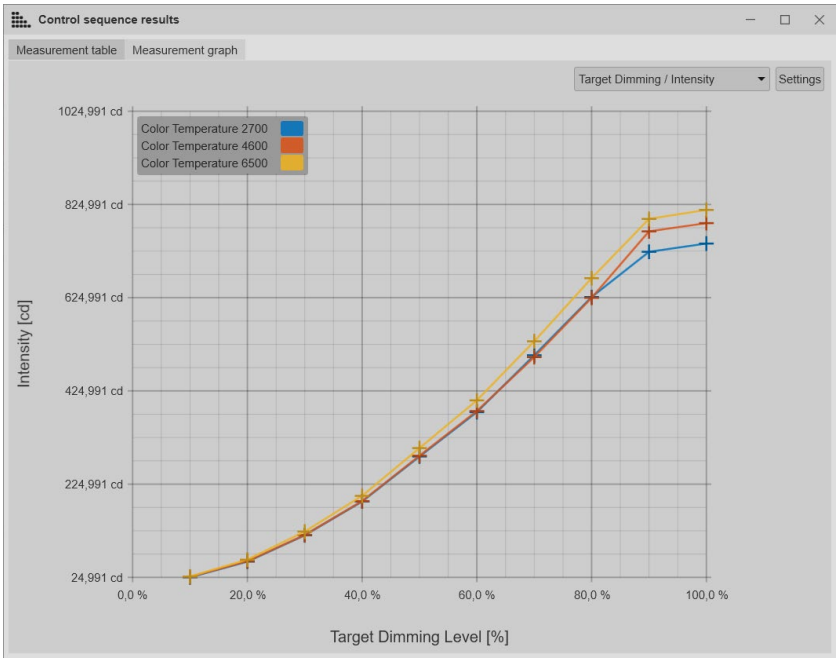
Frequency
Percent Flicker
Flicker Index
SVM (stroboscopic effects 80 < 2000 Hz)
PstLM (visible flicker < 80 Hz)

As the distance between the light source and LabFlicker is critical, you may get a warning that the signal was either too low (bad signal-to-noise ratio) or too high (oversaturated). Also see page 18.

[1] Please note that color properties may vary from the integrated spectrum (weighted average spectrum for all directions).

11.2. Measurement graph view.

Click *View → Control sequence results -> Tab: Measurement graph:*



In this view you can see graphical representations of the control sequence data. The default graph shows the measured intensity versus the target dimming level.

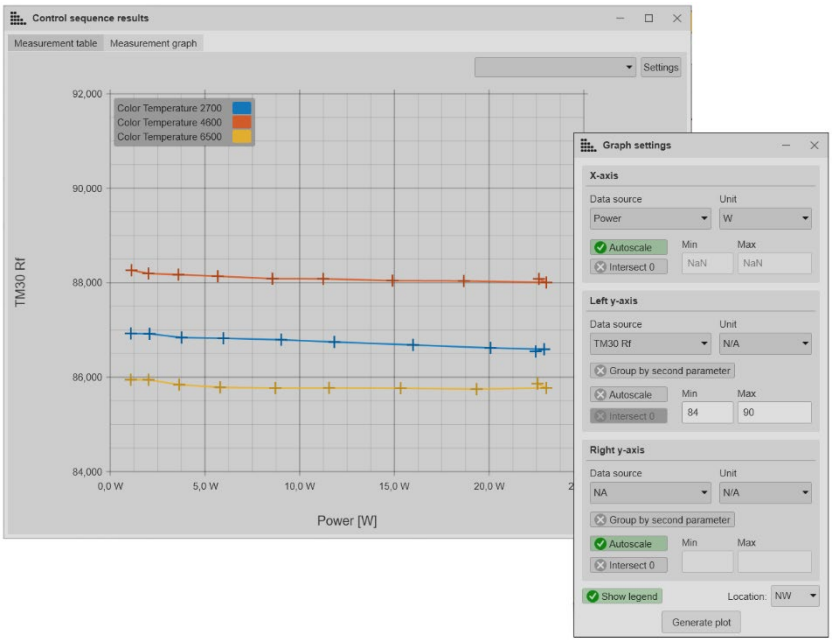
Hover-over effect: Try mouse hovering over the "+" data markers and you will find more results.

Other standard options can be found in the drop-down list:

Click *Settings*, and you will have the option to change

- Data selection
- Legend location
- Scaling on axes

To see the effect of your selections, click "Generate plot".
The in-software graphical tools are for analysis only and cannot upon launch be printed or saved directly from here. See more details in the next section.

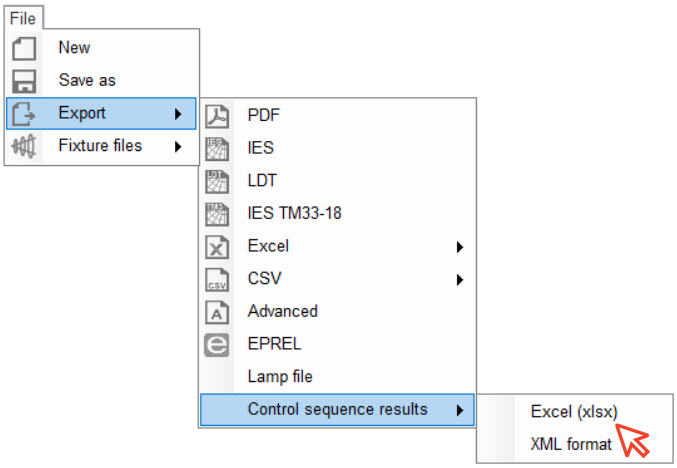

Control sequence results
Measurement table
Measurement graph
Settings
92,000
90,000
88,000
86,000
84,000
Color Temperature 2700
Color Temperature 4600
Color Temperature 6500
TM30 Rf
0,0 W
5,0 W
10,0 W
15,0 W
20,0 W
Power [W]
Graph settings
X-axis
Data source
Power
Unit
W
Autoscale
Intersect 0
Min
Max
NaN
NaN
Left y-axis
Data source
TM30 Rf
Unit
N/A
Group by second parameter
Autoscale
Intersect 0
Min
Max
84
90
Right y-axis
Data source
NA
Unit
N/A
Group by second parameter
Autoscale
Intersect 0
Min
Max
Show legend
Location:
NW
Generate plot

12. Reporting

All results can be exported both as Excel and XML reports and in customizable PDF reports.

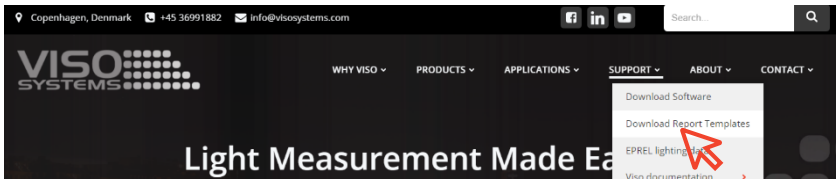
Standard control sequence output in Excel/XML

Go to File → Export → Control sequency results → Excel (xlsx) (or XML) to get all control sequence data outputs collected in a spreadsheet or data format.



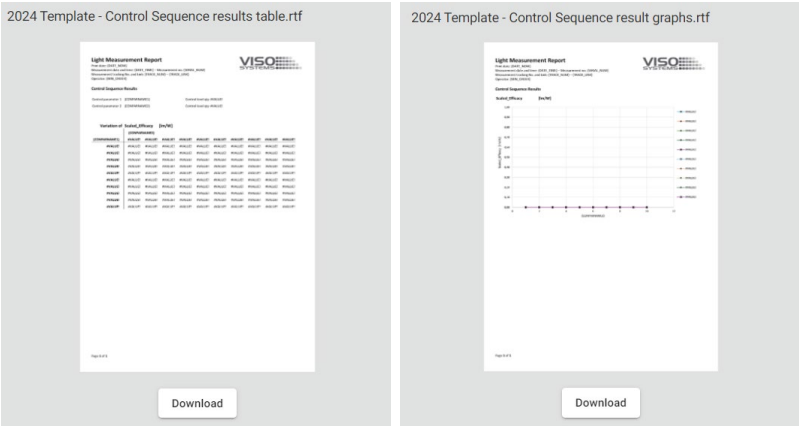
Standard PDF reports

You may find PDF templates that you can work with in https://www.visosystems.com/download-plugins/ .



These templates self-install: Download the plugin, and double-click on the plugin file in your file browser, and the plugin self-installs to become available as a standard PDF report in Light Inspector:

There are two templates available:



Building your own customized reports

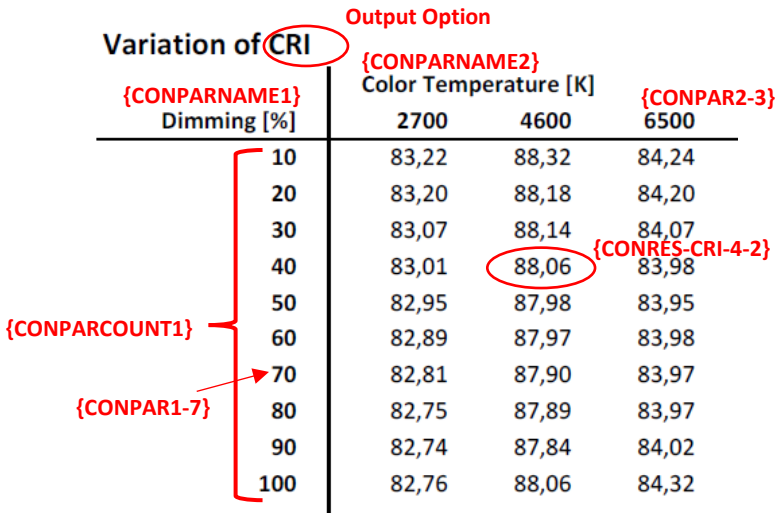
It is possible to build you own customized PDF, Excel and CSV reports using the following {KEYWORDS}:

Keyword	Use	Example
{CONPARNAME#}	Control sequence parameter name and unit (if any). # is a number, 1 or 2. To get the name and unit of Parameter 1, write {CONPARNAME1}	If you have chosen to (1) control dimming and (2) color temperature, using {CONPARNAME1} will output **"Dimming (%)".**
{CONPARCOUNT#}	Renders the total number of steps for each control sequence parameter. # is a number, 1 or 2. To get the number of values for parameter 1, write {CONPARCOUNT1}	If you have chosen to measure in e.g., five dimming steps (20%, 40% ,60%, 80% and 100%), using {CONPARCOUNT} will output **"5"**
{CONPAR#}	Control sequence parameter value. # is a set of two numbers. To get the third value of parameter 1, write {CONPAR1-3}	If you have chosen to measure in e.g., five dimming steps (20%, 40% ,60%, 80% and 100%), using {CONPAR1-3} will output **"60%"**
{CONRES#}	Control sequence results. Formatted so that one can get e.g, the light intensity in position 2,4 in the measurement matrix by writing {CONRES-OutputOption-2-4}. Find the complete list of **OutputOptions** below.	If you have chosen to measure in e.g., five dimming steps (20%, 40% ,60%, 80% and 100%), and e.g., three CCT steps (2700, 4000, 6500), using {CONRES-Intensity-4-2} will output e.g. "**368**" being the intensity measured in that specific control setting (80% dimming, 4000 K).

Output Options (also listed directly in the software in the Help menu)	
Parameter_1_value	Intensity
Parameter_2_value	Scaled_Lumen
Target_Dimming_Level	Color_Temperature
Target_Color_Temperature	x_coordinate
Target_x_coordinate	y_coordinate
Target_y_coordinate	Duv
Target_R	CRI
Target_G	TM30_Rf
Target_B	TM30_Rg
Target_W	CQS
Target_A	Power
Target_F	Voltage
Target_UV	Current
Target_Custom_1	Power_Factor

	Target_Custom_2	THD_Voltage
	Target_Custom_3	THD_Current
	Target_Custom_4	Scaled_Efficacy
	Target_Custom_5	Scaled_Efficiency
	Target_Custom_6	Flicker_Frequency
	Target_Custom_7	Percent_Flicker
	Target_Custom_8	Flicker_Index
	Target_Custom_9	SVM
	Target_Custom_10	PstLM

Output example – table (report template syntax in red):

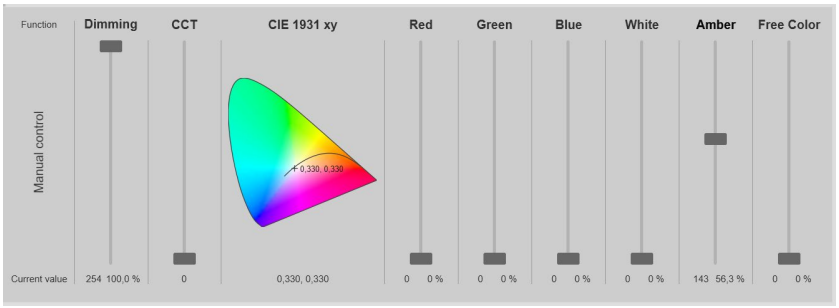


13. Using LightInterface for manual experimentation

When you have LightInterface installed, you may also use the Light Inspector software for manual inspections and experiments: Once the communication with your device is established, the software offers means of adjusting your light source in any way that you wish using sliders. You will see the effect of your manipulations directly on the light source.

Starting live readings with the spectrometer sensor with the 'Start spectra scan' button  , means that you can also get live reading of intensity (in cd or W/sr), color metrics CCT, CRI, etc.

Hence you can use the system for instance check which color mix that will provide a given CIE x,y, or how much amber color you need to add to bring the CRI up to 85.


Function
Dimming
CCT
CIE 1931 xy
Red
Green
Blue
White
Amber
Free Color
Manual control
0.330, 0.330
Current value
254 100,0 %
0
0,330, 0,330
0 0 %
0 0 %
0 0 %
0 0 %
143 56,3 %
0 0 %

14. Technical Specifications

Power and data	USB B data and power connection
Dimensions L*W*H	180 mm * 75 mm * 52 mm
Materials	Powder coated steel housing
Weight	600 g
Connections	DMX/RDM RJ45 DMX/RDM 3-pin DMX/RDM 5-pin DALI DT8 0-10V (4-channel)

At Viso Systems we design, develop and manufacture OEM- and customer-specific goniophotometer solutions. Our mission is to support customers with powerful and yet easy to use control measurements solutions. Products are developed and manufactured in Copenhagen, Denmark.

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Light measurement made easy