datavideo
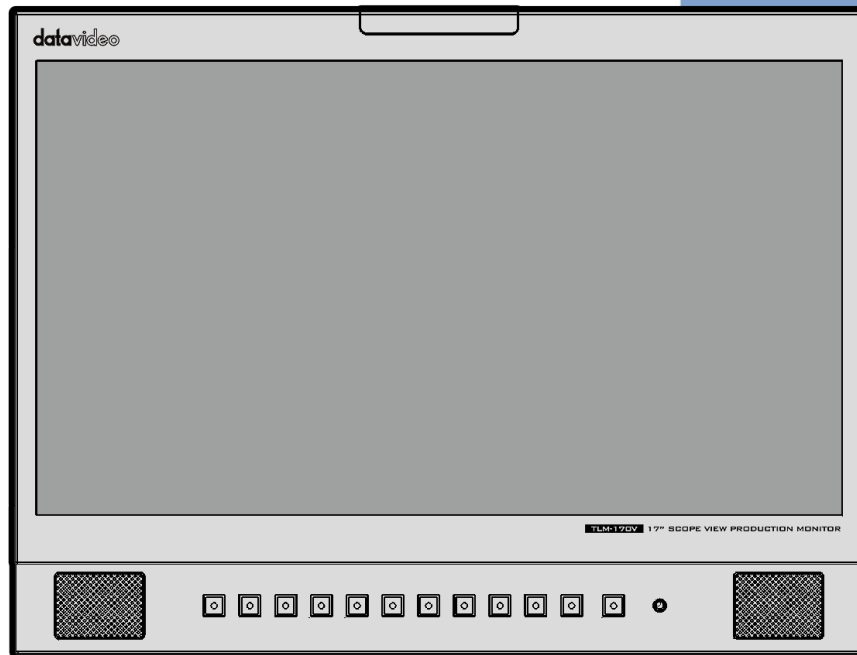
17" SCOPEVIEW
PRODUCTION MONITOR

TLM-170V / TLM-170VM
/ TLM-170VR

Instruction Manual

www.datavideo.com

Table of Contents

Disclaimer of Product & Services

The information offered in this instruction manual is intended as a guide only. At all times, Datavideo Technologies will try to give correct, complete and suitable information. However, Datavideo Technologies cannot exclude that some information in this manual, from time to time, may not be correct or may be incomplete. This manual may contain typing errors, omissions or incorrect information. Datavideo Technologies always recommend that you double check the information in this document for accuracy before making any purchase decision or using the product. Datavideo Technologies is not responsible for any omissions or errors, or for any subsequent loss or damage caused by using the information contained within this manual. Further advice on the content of this manual or on the product can be obtained by contacting your local Datavideo Office or dealer.

FCC Compliance Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Warnings and Precautions

1. Read all of these warnings and save them for later reference.
2. Follow all warnings and instructions marked on this unit.
3. Unplug this unit from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use this unit in or near water.
5. Do not place this unit on an unstable cart, stand, or table. The unit may fall, causing serious damage.
6. Slots and openings on the cabinet top, back, and bottom are provided for ventilation. To ensure safe and reliable operation of this unit, and to protect it from overheating, do not block or cover these openings. Do not place this unit on a bed, sofa, rug, or similar surface, as the ventilation openings on the bottom of the cabinet will be blocked. This unit should never be placed near or over a heat register or radiator. This unit should not be placed in a built-in installation unless proper ventilation is provided.
7. This product should only be operated from the type of power source indicated on the marking label of the AC adapter. If you are not sure of the type of power available, consult your Datavideo dealer or your local power company.
8. Do not allow anything to rest on the power cord. Do not locate this unit where the power cord will be walked on, rolled over, or otherwise stressed.
9. If an extension cord must be used with this unit, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord rating.
10. Make sure that the total amperes of all the units that are plugged into a single wall outlet do not exceed 15 amperes.
11. Never push objects of any kind into this unit through the cabinet ventilation slots, as they may touch dangerous voltage points or short out parts that could result in risk of fire or electric shock. Never spill liquid of any kind onto or into this unit.
12. Except as specifically explained elsewhere in this manual, do not attempt to service this product yourself. Opening or removing covers that are marked "Do Not Remove" may expose you to dangerous voltage points or other risks, and will void your warranty. Refer all service issues to qualified service personnel.
13. Unplug this product from the wall outlet and refer to qualified service personnel under the following conditions:
    a. When the power cord is damaged or frayed;
    b. When liquid has spilled into the unit;
    c. When the product has been exposed to rain or water;

d. When the product does not operate normally under normal operating conditions. Adjust only those controls that are covered by the operating instructions in this manual; improper adjustment of other controls may result in damage to the unit and may often require extensive work by a qualified technician to restore the unit to normal operation;

e. When the product has been dropped or the cabinet has been damaged;

f. When the product exhibits a distinct change in performance, indicating a need for service.

Warranty

Standard Warranty

- Datavideo equipment is guaranteed against any manufacturing defects for one year from the date of purchase.
- The original purchase invoice or other documentary evidence should be supplied at the time of any request for repair under warranty.
- The product warranty period beings on the purchase date. If the purchase date is unknown, the product warranty period begins on the thirtieth day after shipment from a Datavideo office.
- All non-Datavideo manufactured products (product without Datavideo logo) have only one year warranty from the date of purchase.
- Damage caused by accident, misuse, unauthorized repairs, sand, grit or water is not covered under warranty.
- Viruses and malware infections on the computer systems are not covered under warranty.
- Any errors that are caused by unauthorized third-party software installations, which are not required by our computer systems, are not covered under warranty.
- All mail or transportation costs including insurance are at the expense of the owner.
- All other claims of any nature are not covered.
- All accessories including headphones, cables, batteries, metal parts, housing, cable reel and consumable parts are not covered under warranty.
- Warranty only valid in the country or region of purchase.
- Your statutory rights are not affected.

Three Year Warranty

- All Datavideo products purchased after July 1st, 2017 qualify for a free two years extension to the standard warranty, providing the product is registered with Datavideo **within 30** days of purchase.

- Certain parts with limited lifetime expectancy such as LCD panels, DVD drives, Hard Drive, Solid State Drive, SD Card, USB Thumb Drive, Lighting, Non-PCIe Card and third party provided PC components are covered for 1 year.

- The three-year warranty must be registered on Datavideo's official website or with your local Datavideo office or one of its authorized distributors within 30 days of purchase.

Disposal
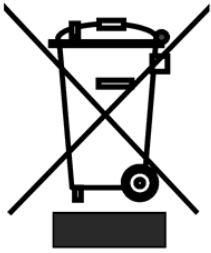
For EU Customers only - WEEE Marking

This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

CE Marking is the symbol as shown on the left of this page. The letters "**CE**" are the abbreviation of French phrase "Conformité Européene" which literally means "European Conformity". The term initially used was "EC Mark" and it was officially replaced by "CE Marking" in the Directive 93/68/EEC in 1993. "CE Marking" is now used in all EU official documents.

1. Introduction

The TLM-170V features 1920x1080 full HD resolutions and 170° wide viewing angle for outstanding viewing experience.

The TLM-170V includes various built-in functions such as waveform, vector scope and SDI/HDMI cross converter. Because of its portability, the TLM-170V can be flexibly installed in OB Van, satellite truck and central control room.

Features

- 1920 x 1080P IPS Panel Resolution
- 3G-SDI video input with loop-through output
- HDMI video input with loop-through output
- Built-in tally for live broadcast
- Supports Waveform, Vectorscope and Audio Level Meter, Peaking Focus Assist, Zoom IN/OUT, Pixel to Pixel, Underscan, Check Field and etc.
- SDI/HDMI cross format conversion
- Brightness, contrast, color saturation and LED backlight
- Selectable color temperatures
- Front panel headphone jack
- User-defined F1 / F2 / F3 / F4 shortcut keys
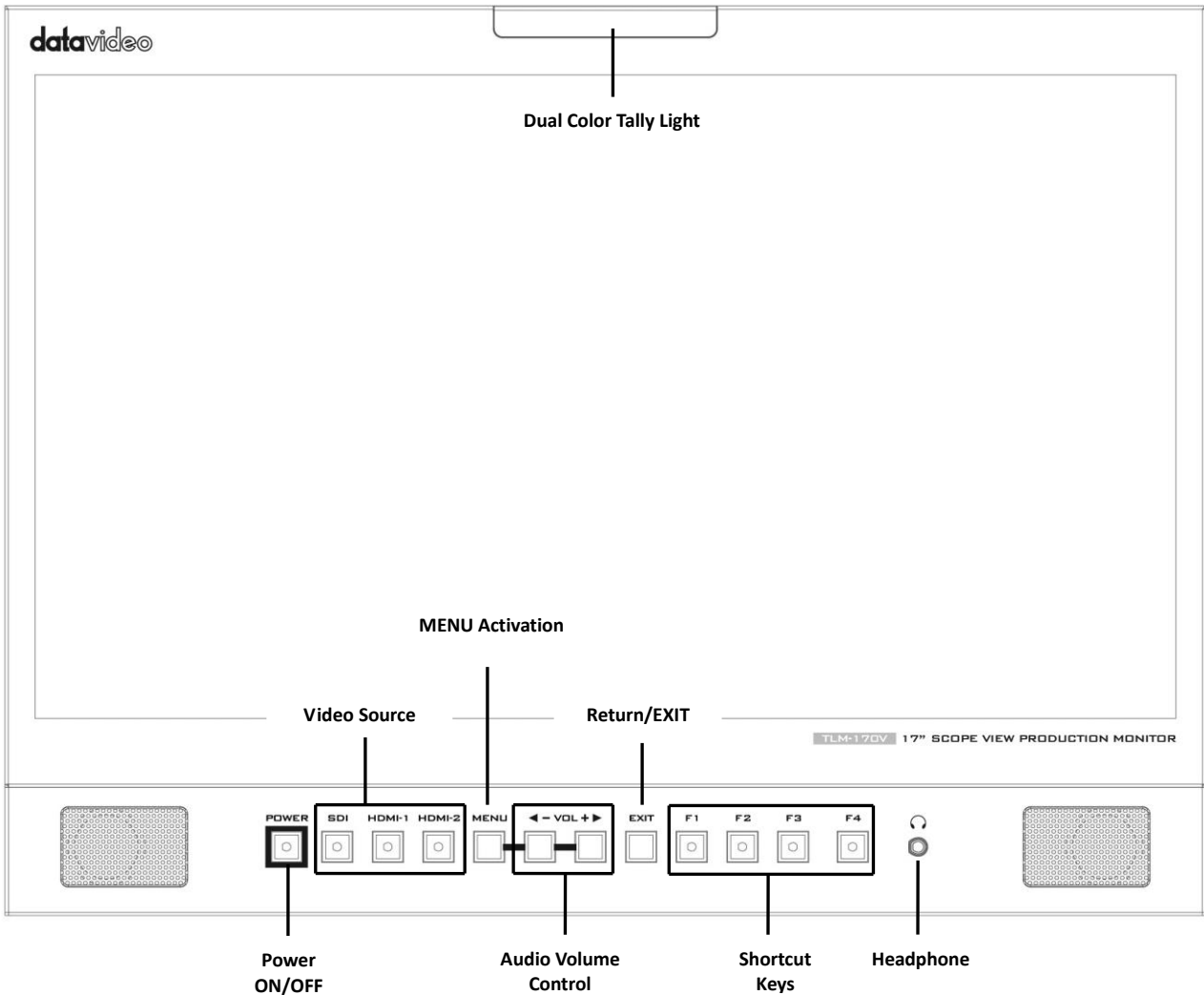- USB Firmware Upgrade

Model Types

Model	TLM-170V	TLM-170VR	TLM-170VM
Image			
System	Desktop	7U Rack Mount	1U Mobile Tray Rack Mount
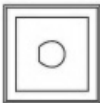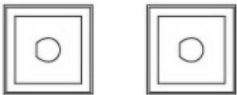
Compatible Resolutions and Formats
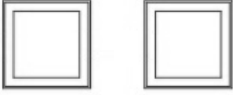
Resolutions and Formats	TLM-170V Interface	
	HDMI	SDI
1920x1080P @ 59.94	v	v
1920x1080P @ 60	v	v
1920x1080P @ 50	v	v
1920x1080P @ 29.97	v	v
1920x1080P @ 25	v	v
1920x1080P @ 30	v	v
1920x1080P @ 23.98	v	v
1920x1080P @ 24	v	v
1920x1080i @ 59.94	v	v
1920x1080i @ 60	v	v
1920x1080i @ 50	v	v
1280x720P @ 59.94	v	v
1280x720P @ 60	v	v
1280x720P @ 50	v	v
1280x720P @ 23.98	v	v
1280x720P @ 24	v	v
720 x 480i (NTSC)	v	v
720 x 576i (PAL)	v	v

Front Panel

Buttons	Descriptions
POWER	**Power ON/OFF** This button powers the monitor ON/OFF. The main power switch is located at the rear of the TLM-170V.
SDI	**SDI Button** The SDI video source is enabled when the LED indicator is turned ON.
HDMI-1 HDMI-2	**HDMI 1/2 Button** The HDMI video source is enabled when the LED indicator is turned ON. **Note: The two video sources cannot be enabled at the same time.**

MENU	**MENU Button** Press the **MENU** button to open the OSD menu. Once in the OSD menu, press the **MENU** button to make a selection.
◄ − VOL + ►	**Audio Volume Adjustment Buttons** **Once in the OSD menu**, navigate the menu or increase/decrease parameter values using the audio volume adjustment buttons. **While NOT in the OSD menu**, pressing either one of the audio volume adjustment buttons will open a **Volume** slide bar at the bottom of the screen. Then press the **MENU** button to switch to other setting options as listed below: • **Volume** • **Brightness** • **Contrast** • **Saturation** • **Tint** • **Sharpness** • **Exit** To adjust the parameter values, simply press the **Vol-** arrow button to decrease the value and the **Vol+** arrow button to increase the value.
EXIT	**EXIT Button** Return/Exit button
F 1 **F 2** **F 3** **F 4**	**F1 – F4 Shortcut Keys** Press the F1-F4 shortcut keys to access the corresponding function setting menus. The default function setting menus are shown as follows: F1: Scan F2: Waveform F3: Aspect F4: Aspect Marker **Customization of Button Functions** The user is allowed to customize or re-assign function setting menus to the F1-F4 shortcut keys. The customization steps are outlined as follows: 1. First press and hold one of the shortcut keys (F1-F4) for approximately 3-5 seconds until a pop-up function list appears on the monitor. 2. Press the left and right arrow keys of the audio volume adjustment buttons to move between options in the pop-up function list. 3. Press the menu button to assign the highlighted function

setting menu to the shortcut key selected at step 1.
4. Press the EXIT button to close the pop-up function list.

The pop-up function list is shown below:
- **Center Marker**
- **Aspect Marker**
- **Marker Color**
- **Underscan**
- **Scan**
- **Aspect**
- **DSLR**
- **Freeze**
- **Check Field**
- **Focus Assist**
- **False Color**
- **Exposure**
- **Bar**
- **Histogram**
- **Waveform**

Button Reset
To reset F1-F4 buttons to factory defaults, follow the steps outlined as follows:

1. Open the **OSD** menu, and navigate to **SYSTEM**.
2. Press the **MENU** button to enter the **SYSTEM** sub menu.
3. Move down to the **RESET** option which is selected by pressing the **MENU** button.
4. Press either the **VOL+** or **VOL-** button to enable the reset.

Note: The reset function resets all TLM-170V settings.

Headphone Jack
Once the 3.5mm headphone jack is connected, the **internal speaker will be automatically muted**.

Rear Panel

Ports	Descriptions
3.5mm Tally Light Input	Tally light input socket can be used to connect Datavideo's RMC or TB series devices as well as the intercom system's beltpack.
HDMI Output	HDMI video output
HDMI Input 1/2	Connects HDMI video and audio source devices.
USB 2.0 Port (SERVICE)	For firmware upgrade only; see the chapter on **Firmware Update** for details of firmware upgrade.
SDI Input / Output	1 HD/SD-SDI input/output
DC IN 12V	12 V power input
Power ON/OFF Switch	TLM-170V's main power ON/OFF switch

3.   OSD MENU

The TLM-170V can be set up using an OSD menu system. To display the **OSD menu** press the **MENU** button. This menu system is navigated using the **Left / Right** buttons. The **Left / Right** buttons are also used to change parameter values. Press the **MENU** button to select an option and the **EXIT** button to close the **OSD menu**.

Main Options	Sub Options	Parameters		
Picture	**Brightness**	0 – 100		
	Contrast	0 – 100		
	Saturation	0 – 100		
	Tint	0 – 100		
	Sharpness	0 – 100		
	HDMI RGB Range	0 – 255		
		16 – 235		
	Color Space	EBU		
		Rec709		
		SMPTE-C		
		Native		
	Gamma	Off		
		1.8		
		2.0		
		2.2		
		2.35		
		2.4		
		2.6		
		2.8		
	Back Light Mode	Standard		
		Outdoor		
		Custom		
	Back Light	0 – 100		
	Color Temperature	5500°K		
		6500°K		
		7500°K		
		9300°K		
		User Color	**Red Gain**	0 – 255
			Green Gain	0 – 255
			Blue Gain	0 – 255
			Red Offset	0 – 511
			Green Offset	0 – 511
			Blue Offset	0 – 511
Marker	**Center Marker**	ON		
		OFF		
	Aspect Marker	OFF		
		16:9		
		1.85:1		

		2.35:1	
		4:3	
		3:2	
	Safety Market	OFF	
		95%	
		93%	
		90%	
		88%	
		85%	
		80%	
	Marker Color	Red	
		Green	
		Blue	
		White	
		Black	
	Marker Mat	OFF	
		1	
		2	
		3	
		4	
		5	
		6	
		7	
	Thickness	1	
		2	
		3	
		4	
		5	
		6	
		7	
Function	**Scan**	Zoom	
		Aspect	
		Pixel to Pixel	
	Aspect	Full	
		16:9	
		1.85:1	
		2.35:1	
		4:3	
		3:2	
	Underscan	OFF	
		ON	
	H/V Delay	Off	
		H	
		V	
		H/V	
	Check Field	OFF	
		Red	
		Green	
		Blue	

	Zoom	90%	
		80%	
		70%	
		60%	
		50%	
		40%	
		30%	
		20%	
		10%	
	Freeze	OFF	
		ON	
	DSLR	OFF	
		5D2	
		5D3	
Waveform	**Waveform**	Multi	
		Y	
		YCbCr	
		RGB	
		OFF	
	Waveform Trans.	50%	
		25%	
		OFF	
	Peaking	OFF	
		ON	
	Peaking Color	Red	
		Green	
		Blue	
		White	
	Peaking Level	0 – 100	
	False Color	OFF	
		ON	
	Exposure	OFF	
		ON	
	Exposure Level	0 – 100	
	Histogram	Y	
		RGB	
		Color	
Audio	**Volume**	0 – 100	
	Level Meter	ON	
		OFF	
System	**Language**	Chinese	
		English	
	HDMI/SDI Convert	OFF	
		ON	
	Color Bar	OFF	
		100%	
		75%	
	OSD Timer	10s	
		20s	

		30s	
	Image Flip	OFF	
		H	
		V	
		H/V	
	Color Calibration	OFF	
		ON	
	Power Mode	OFF	
		Standby	
	Reset	OFF	
		ON	

Picture

The TLM-170V allows you to adjust the basic image settings such as the **brightness**, **contrast**, **saturation**, **tint** and **sharpness**.

Advanced settings are **HDMI RGB range**, **color space**, **gamma correction**, **back light mode**, **back light level**, and **color temperature**.

Brightness
Adjust the brightness of the screen from 0 – 100.

Contrast
Adjust the contrast of the screen from 0 – 100.

Saturation
Adjust the saturation of the screen from 0 – 100.

Tint
Adjust the tint of the screen from 0 – 100.

Sharpness
Adjust the sharpness of the screen from 0 – 100.

HDMI RGB Range
This set the HDMI RGB Range.

0-255 (RGB Full): PC Monitor

16-235 (RGB Limited): Standard or HD TVs

Color Space
Select an option from the list below to provide details of the color primaries for interpretation of XYZ color space.

- EBU

- REC709

- SMPTE-C

- Native

Gamma
This sets the gamma correction for the source of input.

- OFF
- 1.8 (MAC OS)
- 2.0
- 2.2 (Windows)
- 2.35
- 2.4
- 2.6
- 2.8

Back Light Mode
Select an appropriate back light mode according to your application.

- Standard
- Outdoor
- Custom (Adjust the back light level in the **Back Light** option)

Back Light
Adjust the back light level from 0 – 100.

Color Temperature
Select a color temperature for your scene. Color temperatures available on the TLM-170V are listed as follows:

- 5500°K (Desktop publishing or printing)
- 6500°K (Usually for ordinary PC use)
- 7500°K
- 9300°K (TV pictures)
- User Color

Note: Selection of the User Color mode allows you to manually set the color temperature by adjusting the Red Gain, Green Gain, Blue Gain, Red Offset, Green Offset and Blue Offset.

Marker

Aspect ratio is a crucial element in video shooting and it is defined as the proportion of the width and height of any image. You can use different aspect ratios in your video. Therefore, in order to know what will be in frame at different aspect ratios, during shooting, you can turn on the TLM-170V's aspect marker (a.k.a. guide frame) so that you can record the entire screen while still knowing where the cut-off will be by putting a mat over it.

Center Marker
The Center Marker, if turned on, will place a crosshair in the middle of the screen.
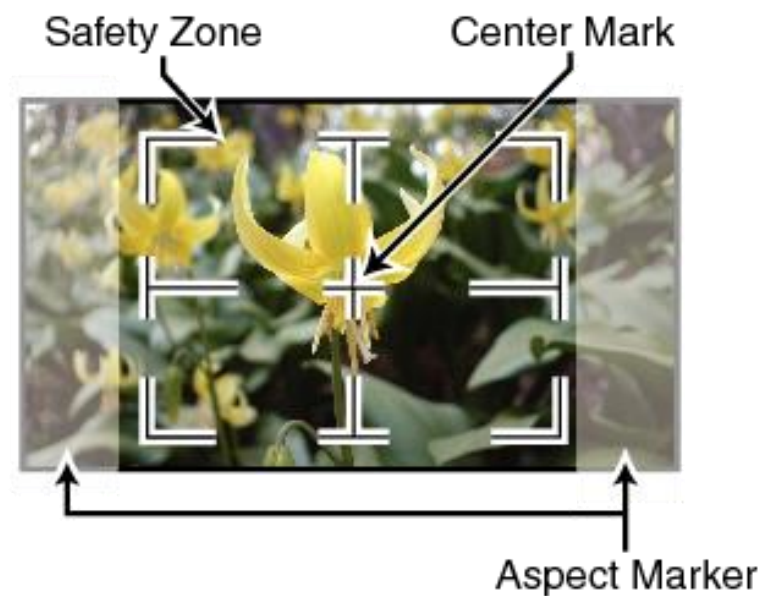
Aspect Marker
Sets the aspect marker display at the aspect ratio selected from the list below:

- OFF
- 16:9
- 1.85:1
- 2.35:1
- 4:3
- 3:2

Safety Marker

This sets the safety zone display, which is the standard viewing range of the recorded video.


The options are listed as follows:

- OFF
- 95%
- 93%
- 90%
- 88%
- 85%
- 80%

Marker Color

The user is also allowed to apply different colors to the aspect marker. The five available marker colors are **Red**, **Green**, **Blue**, **White** and **Black**.

Marker MAT

This sets the transparency of the mat placed over the cutoff at the select aspect ratio. Select from 0 to 7 with 7 being an opaque mat and 0 offering the highest transparency.

| MAT 7 | MAT 6 | MAT 4 | MAT 2 | MAT 0 |
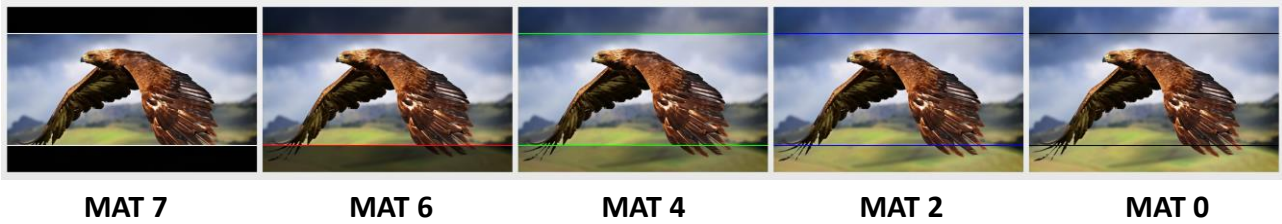
Thickness

This sets the aspect marker thickness ranging from 1 to 7.

Function

This allows the user to set advanced settings for the TLM-170V, such as the scan mode, the aspect ratio, underscan mode, H/V delay, check field, zoom, and etc. Details of how these functions can be configured are described as follows:

Scan

This sets the Scan mode of the TLM-170V.

Zoom: Enlarge the original image according to the zoom ratio of the TLM-170V.

Aspect: Display the image according to the aspect ratio of the TLM-170V.

Pixel to Pixel: Display the original image resolution without scaling to match a certain resolution or an aspect ratio. For example, when the resolution of the input video is 1920x1080 but the monitor's resolution is only 1280x800, only area equivalent to 1280x800 out of 1920x1080 will be displayed.

Aspect

The aspect control allows you to manually set the aspect ratio of the monitor. You should choose the aspect ratio of your screen to match that of the input video in order to achieve the best viewing experience. Views of different aspect ratios on the TLM-170V are shown in the diagram below.

Note: Aspect ratio control is disabled if the scan mode is set to pixel to pixel.

full screen

2.35:1

1.85:1

16:9

4:3

3:2

Underscan

If enabled, the image rendered on the display will be smaller than the physical area of the screen. This creates a border around the image.

H/V Delay

Used to monitor the blanking area for H sync and V sync.

In **H delay mode**, the horizontal sync is delayed so that the horizontal blanking period is displayed on the screen.

In **V delay mode**, the vertical sync is delayed so that the vertical blanking period is displayed on the screen.

In **H/V delay mode**, both horizontal and vertical syncs are delayed, resulting in both horizontal and vertical blanking periods being shown on the screen.

Note: H/V Delay is disabled if the scan mode is set to pixel to pixel.

Check Field

The check field function offers the user Red-Only, Green-Only and Blue-Only modes for screen calibration should you require them.

First turn on the color bar, then turn on the single color mode in the check field as this allows you to do the screen calibration by adjusting the brightness, contrast, saturation, tint and sharpness.

Zoom

The zoom function allows you to enlarge the image by a certain percentage (10 – 90%).

Note: Zoom control is disabled if the scan mode is set to pixel to pixel.

Freeze

The monitor's screen freezes once enabled.

DSLR

This option is useful if Canon **5D2** or **5D3** cameras are connected to the TLM-170V.

Waveform

The TLM-170V also allows the user to display the image alongside with different monitoring waveforms such as the waveform, vector scope, histogram and audio level meter.

Image quality can be improved using tools such as peaking filter, false color and zebras.

Waveform

The TLM-170V offers users different waveform options listed as follows:

- Muilt (Vector scope, YCbCr waveform monitoring, histogram and audio meter)
- Y (Y Waveform monitoring)

- YCbCr (YCbCr Waveform monitoring)

- RGB (RGB Waveform monitoring and histogram)

- Off

Note: If **Waveform** is set to **Multi**, the **Histogram** is enabled by default.

Vector Scope

The vectorscope is used to measure the color information such as **Hue** and **Saturation** in a video image.

Note: For color bars, the vector scope works with 100% color bars and 75% color bars with a 75% white level.

Hue: The color markers are red, magenta, blue, cyan, green, and yellow. The proximity a signal to one of the markers tells you what color it is.

Saturation: A vectorscope shows you how saturated your color is and how far away the signal is from the center indicates how saturated the color is. For example, if the color is close to one of those boxes, then that means that color in the image is very saturated.

Intersecting lines: The line going up towards the yellow and red colors is the skin tone line on which the skin color should fall regardless of the person's race.

Waveform Monitoring
Waveform monitoring consists of RGB and YCbCr waveforms which are used to measure the brightness, luminance and chroma of a video signal as shown in the diagram below.
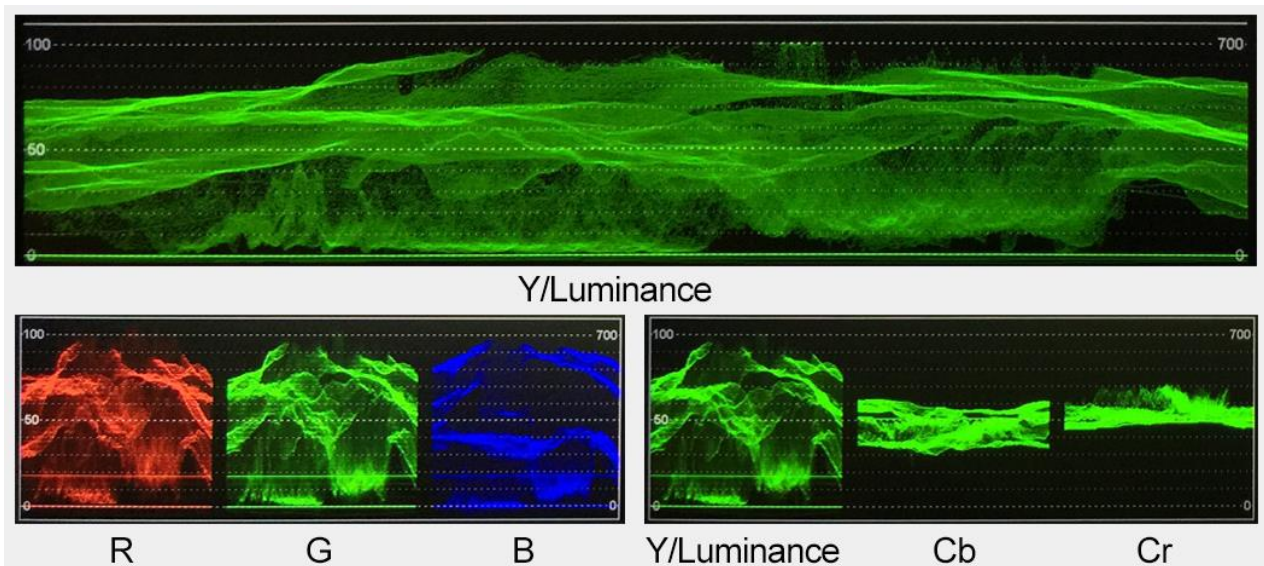
Waveform monitoring not only warns the user of out-of-range conditions such as overexposure but also serves as a good tool for color correction and white and black balance.

Waveform Trans.
This selects the transparency of the waveform and vector scope.

- 50% blend effect

- 25% blend effect

- Off: Opaque

Peaking filter

The peaking filter, once enabled, will place color lines on edges of the subject of the focus in the image. This function works well if the subject of the focus is correctly exposed for high contrast. **Red**, **Green**, **Blue** and **White** are the four available outline colors on the TLM-170V.

The **Peaking Level** determines the sensitivity of the filter. Setting the peaking level to a high value means more areas will be highlighted including lower contrast areas. If the peaking level is set to a low value, then only areas of high contrast will be highlighted.

The diagram below illustrates images with peaking filter applied to the subject of the focus. Note the different colors of the outline in each picture.


False Color

Also known as the exposure assist, once enabled, the false color feature will change colors of the elements of the image based on the brightness value. This allows the user to use the monitor's exposure function to achieve proper exposure without the use of costly external equipment.

To best utilize this feature, you must first understand the color chart below.

|	
	110%
	100%
	90%
	80%
	70%
	60%
	50%
	40%
	30%
	20%
	10%
	0%
	-10%
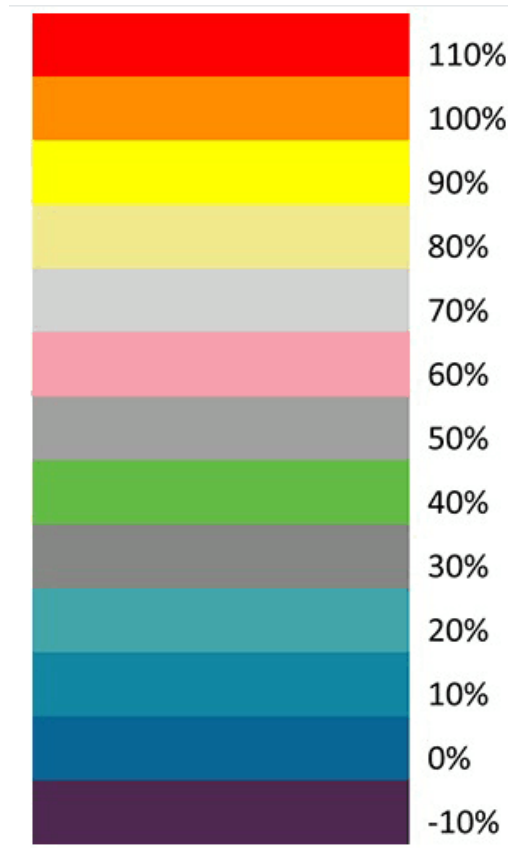
For example, areas with exposure level of 56IRE when applied the false color will be shown as pink color on the monitor. Therefore, as you increase the exposure, that area will change color to grey, then yellow and finally to red if overexposed. Blue indicates underexposure.

An example of an original image with the false color applied is shown on the left of the image below.
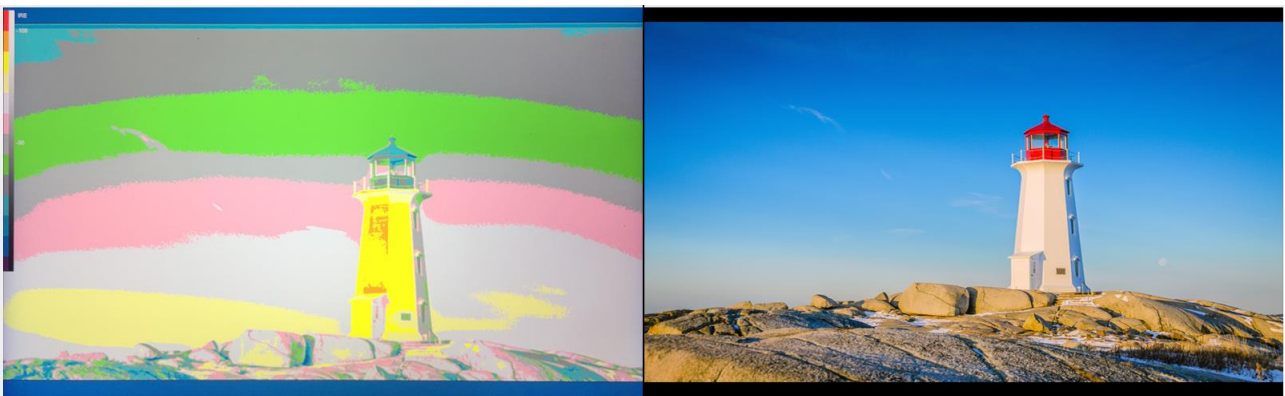
Exposure

Once the exposure function is turned ON, you will be able to see a zebra pattern superimposed over parts of the image that are exposed to a specific level. In this way, the exposure of the image displayed on the screen can then be adjusted accordingly on the monitor by changing the exposure level (0 – 100).

exposure level 50

exposure level 0
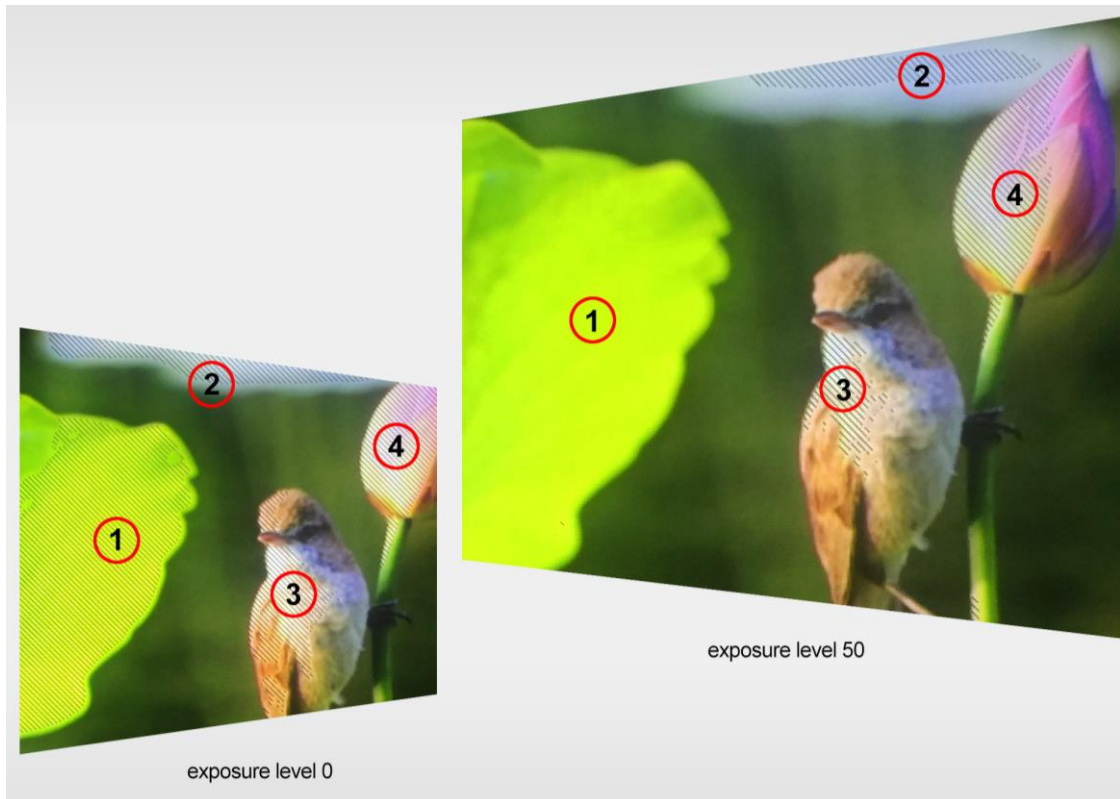
Histogram

The histogram is a great tool that helps you to improve the overall exposure of the image.

Y (Luminosity)

The Y or luminosity histogram is a graph that describes the human-eye perceived brightness distribution within an image.

To produce the luminosity histogram, first break an image into individual pixels, then each pixel is converted so that it becomes a luminosity based on a weighted average of the three colors at that pixel. The green, red, and blue channels account for 59%, 30% and 11% of the perceived luminosity respectively. This is because human eye is more sensitive to green light than it is to blue or red light. Finally the luminosity histogram is produced by counting how many pixels are at each brightness level as shown in the diagram below.
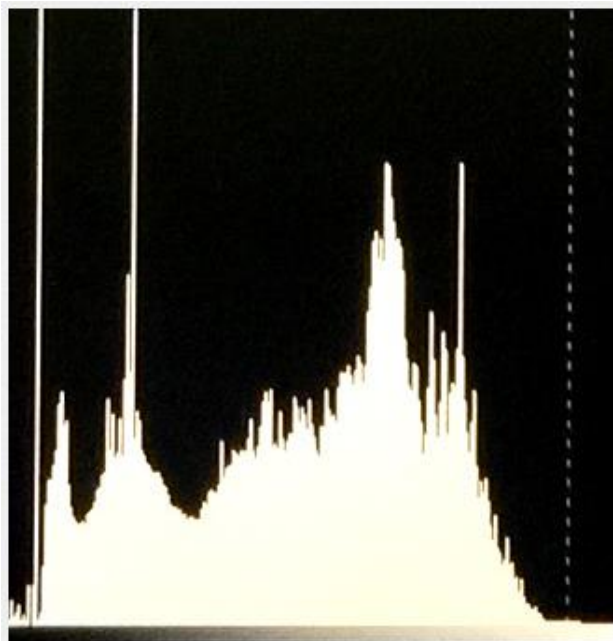
RGB

The RGB histogram is a graph that represents the overall brightness of the entire image.

In any digital image, each individual color is made by combining red, green and blue lights with each light represented by its brightness level ranging from 0 to 255. Therefore every color produced in this way has a specific brightness value based on mixes of red, green and blue throughout the image and these brightness values of all the different colors in an image are represented in a histogram which is known as the RGB histogram.

On the TLM-170V, the RGB histogram is shown with the color overlay as depicted in the diagram below.
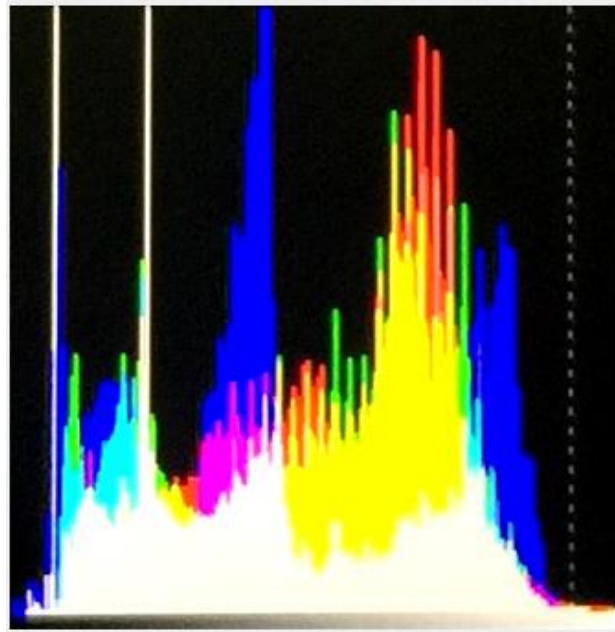

Color

By setting the histogram to color, you will see one red histogram, one green histogram and one blue histogram. Each color histogram is basically a representation of how that color's intensity is distributed throughout an image, allowing you to evaluate the brightness and exposure of that individual color channel. See the diagram below for an example of the color histogram.
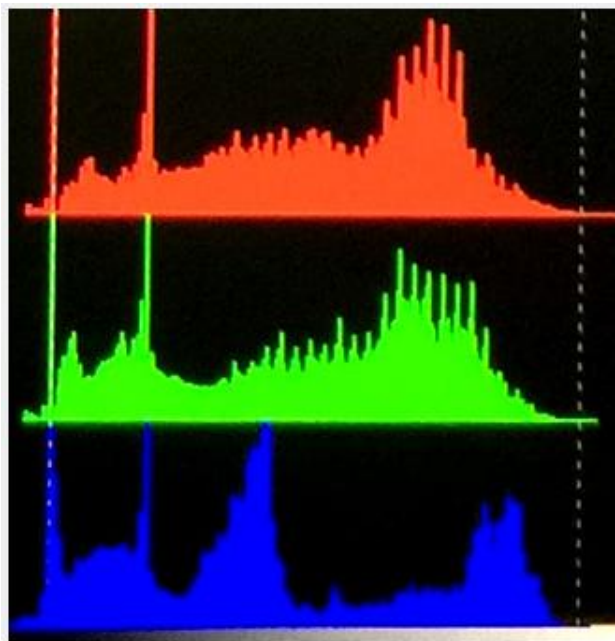
Audio

The Volume option sets the audio level of the input video, which can be viewed visually on the TLM-170V by enabling the **Embedded Audio Level Meter**.
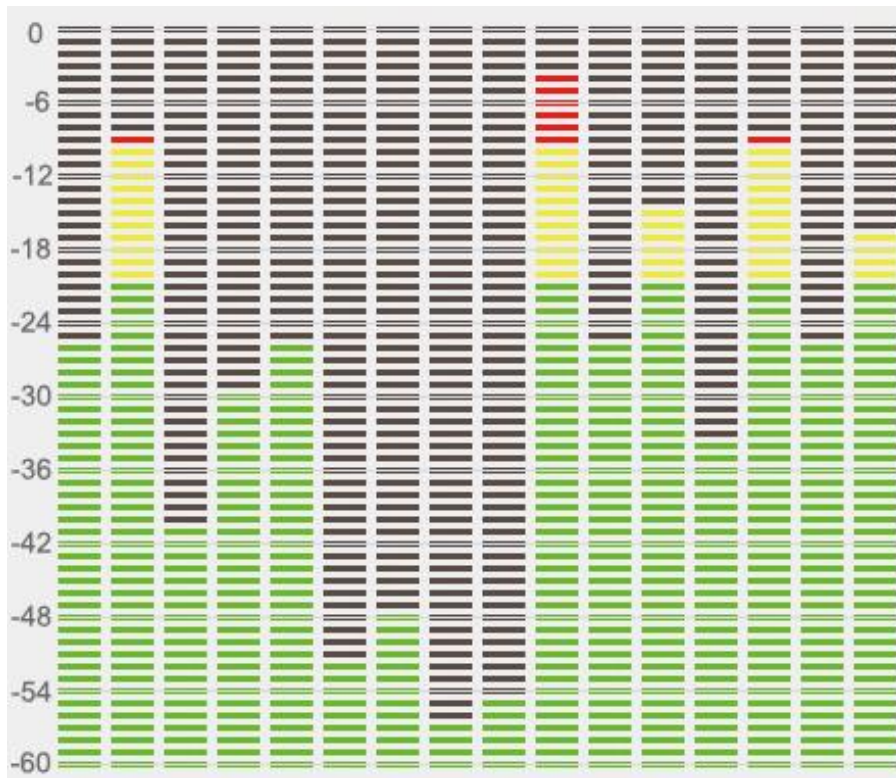
Note: If the monitor is in SDI mode, you will see 16 channels; in HDMI mode, there will only be 2 channels.

System

In the System sub menu, you will be able to do the following:

1. Change the language of the OSD menu

2. Enable cross conversion

3. Turn on the color bar

4. Set the OSD ON time

5. Flip the image

6. Select color calibration

7. Switch the standby power mode

8. Reset the entire device's settings

Language
Switch between **Chinese** and **English.**

Cross Conversion
HDMI/SDI Convert once enabled allows the **HDMI Input** to be delivered to the **SDI Output** or the **SDI Input** to be delivered to the **HDMI Output**.

See the table below for different I/O mappings while the HDMI/SDI Converter is enabled/disabled.

HDMI/SDI Converter ON		
Front Panel Buttons	**SDI OUT Port**	**HDMI OUT Port**
SDI button enabled	SDI IN video	SDI IN video
HDMI - 1 button enabled	HDMI IN 1 video	HDMI IN 1 video
HDMI - 2 button enabled	HDMI IN 2 video	HDMI IN 2 video
HDMI/SDI Converter OFF		
Front Panel Buttons	**SDI OUT Port**	**HDMI OUT Port**
SDI button enabled	SDI IN video	HDMI IN 1 video
HDMI - 1 button enabled	SDI IN video	HDMI IN 1 video
HDMI - 2 button enabled	SDI IN video	HDMI IN 2 video

Note: While the converter is activating, certain functions such as freeze, color bar and H/V delay may not be available.

Color Bar
Available options are listed as follows:

OFF: disables the color bar

75% or 100% color bar

OSD Timer
This sets the OSD's ON time; the OSD menu will be automatically turned off after the timer times out.

- **10s**

- **20s**

- **30s**

Image Flip
The Image Flip allows viewing of the image in different orientations. Selection of **V mode** turns the image upside down. The **H mode** flips the image laterally. To enable the vertical and horizontal image flip at the same time, simply select the **H/V mode**.

The diagrams below provide illustrations of the orientations described above.

Image Flip OFF

V Mode

H Mode

H/V Mode

Color Calibration

To use this feature, you will need an additional purchase of Light Illusion's LightSpace Color Management System (CMS) which includes a calibration probe and CMS software. The TLM-170V works with CAL, PRO and XPT versions only. Visit https://www.lightillusion.com/lightspace.html.

See the ***CMS Color Calibration Process*** in the subsequent chapter.

Power Mode

This enables/disables power **standby** mode.

Reset

Select **ON** to reset the device entirely.

This Chapter will introduce the use of Light Illusion's CMS software for color correction. Before starting the calibration process, you need to install and register the CMS software first. Connect the calibration device to the PC or the laptop then install its driver. After the calibration environment has been properly set up, follow the steps below to start color calibrating your monitor.

1. Open CMS software

Double click the CMS software icon to open the CMS software.
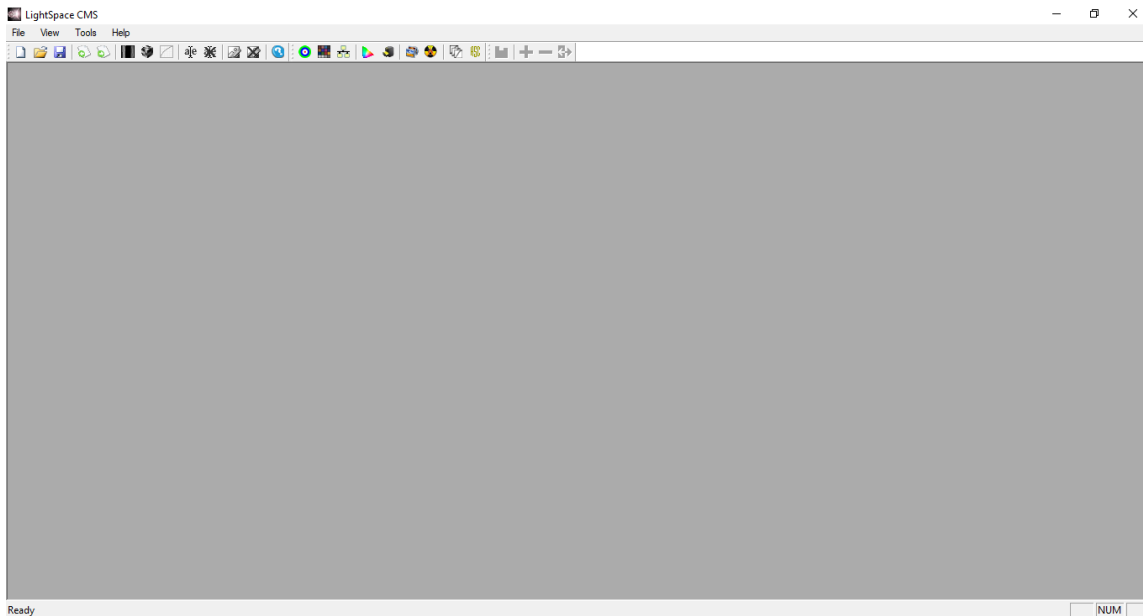
2. Select the connected "Probe"

Color calibration devices supported by the CMS are listed in the drop-down menu of "**Tools** → **Discoverable Probes**". Select the color calibration device that is connected to the PC or the laptop. Also, deselect the device that you do not need (click the selected device again to cancel).
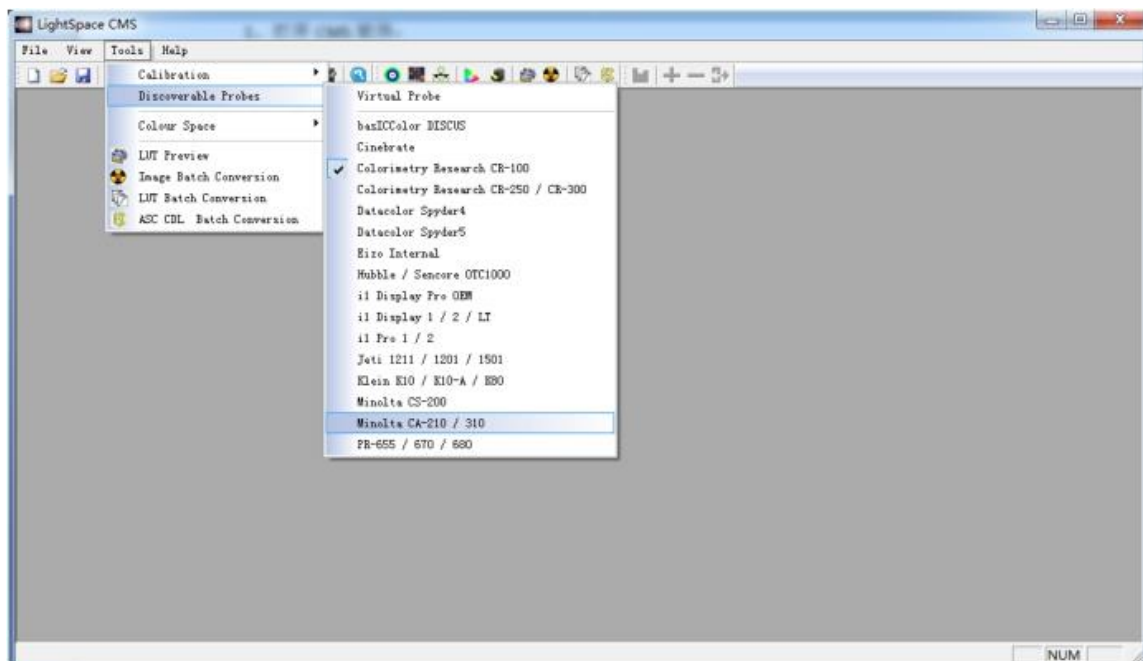
3. Establish communication with the "Probe"

After selecting the color calibration device at the second step, we must manually establish communication between the Probe and the PC.

Select "**Tools → Calibration → Calibration Interface** or **Display Characterization**"
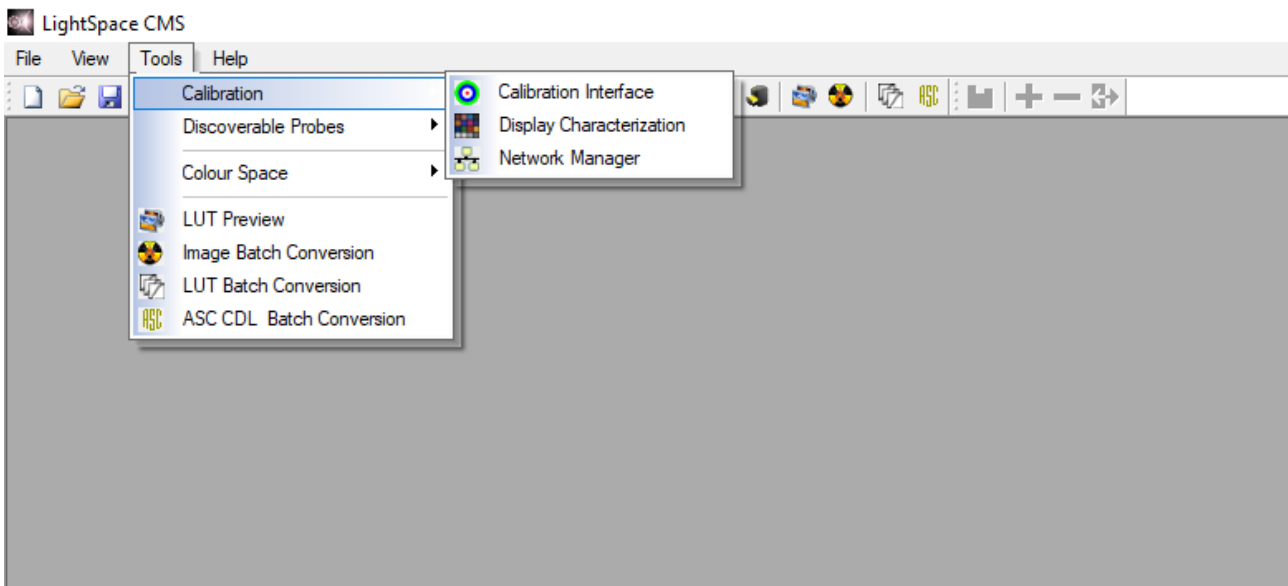
The CMS should detect the probe and a dialogue box for COM port selection will pop up. In the example below, the probe's model number is CR-100.
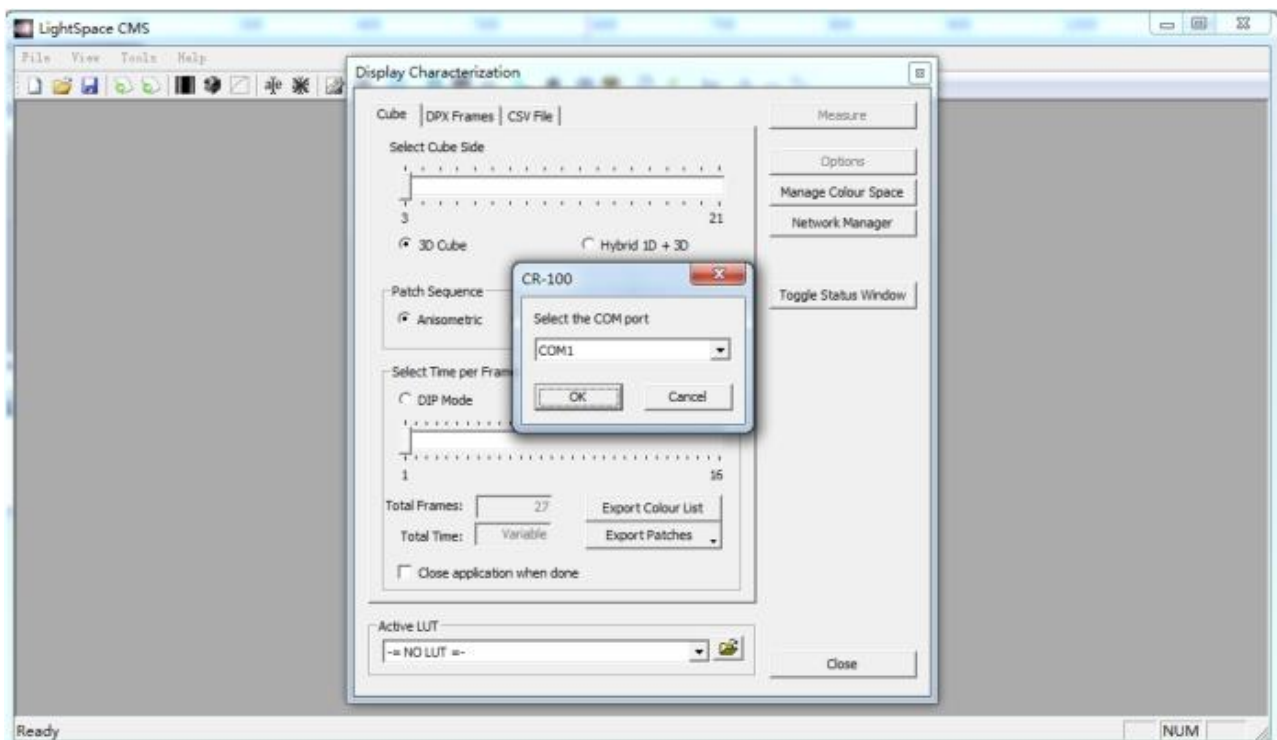
Select a COM port number for establishing connection with the PC.

4. Connect the TLM-170V monitor.

Connect the TLM-170V to the HDMI port of your PC or laptop, power ON the monitor and set the computer output to the extended output mode. Then open the graphics control panel and set the PC's HDMI output to RGB full-range.

5. Set the HDMI RGB range on the TLM-170V.

Select **Picture → HDMI RGB Range → 0 – 255**

6. Warm up the monitor before calibration.

Make sure the monitor and the color calibration device are turned ON and leave them running for about 30 minutes.

7. Enable color calibration mode on the TLM-170V monitor.

Open the TLM-170V's OSD menu, then go to **System → Color Calibration** and select ON.

 8. Luminance calibration (adjust the backlight).

On the LightSpace CMS UI, click **Tools → Calibration → Display Characterization** to open the **Display Characterization** window.
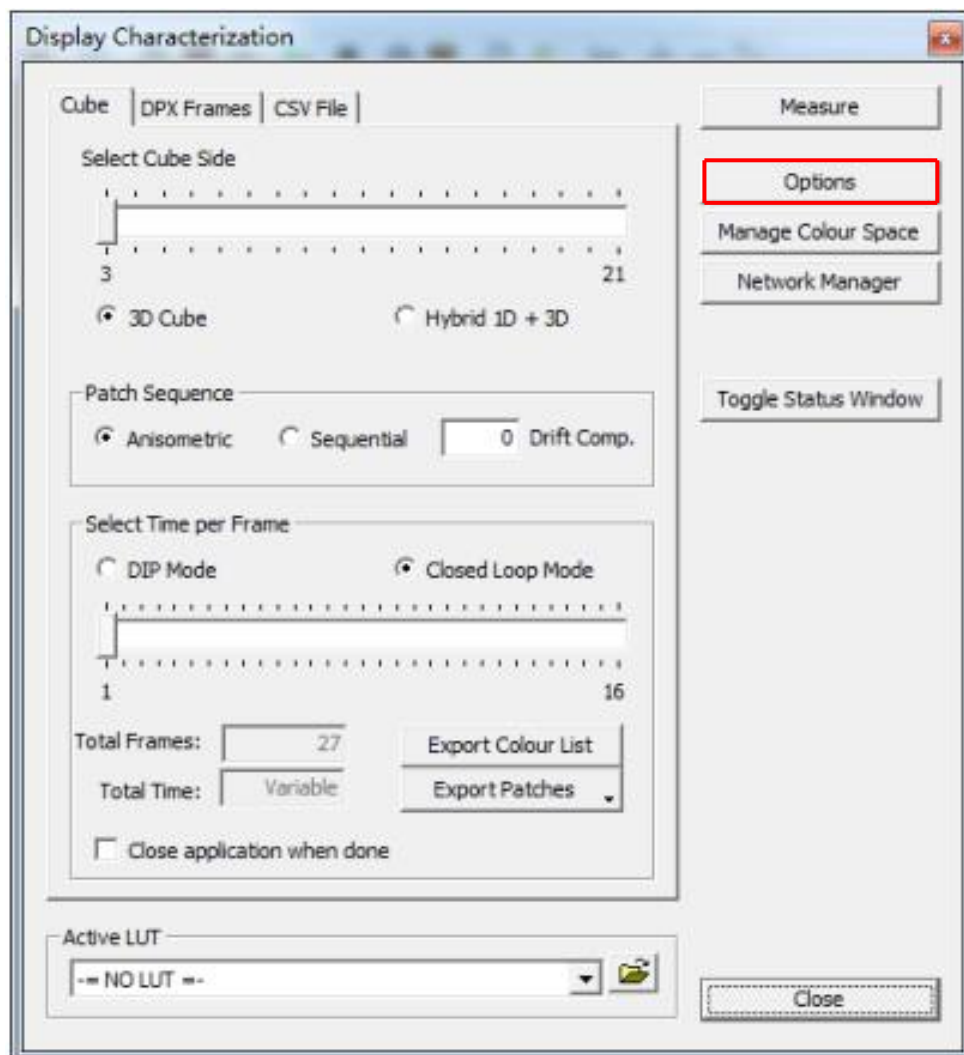
Locate and click the **Options** button to open the window shown below:
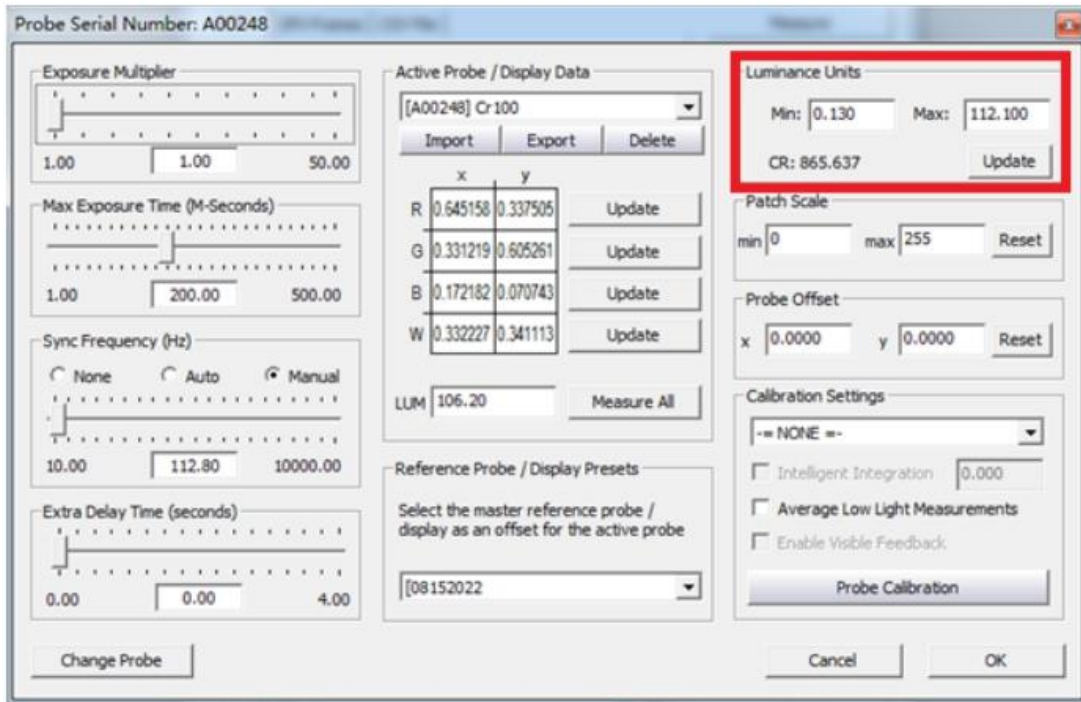
Adjust the monitor's backlight value and click the **Update** button in the **Luminance Units** pane located at the top right of the window above.

As soon as the **Update** button is clicked, the **Calibration Status** window will appear along with the **Calibration Area** and a dialogue box. Drag the **Calibration Area** onto the TLM-170V. Finally point the probe at the calibration area as close as possible then click the **OK** button in the dialogue box to start calibration. Repeat the process until the **MAX** value in the **Luminance Units** pane is in the range of 80 – 120. **Note that the closer the MAX value to 100, the better the TLM-170V is calibrated**.
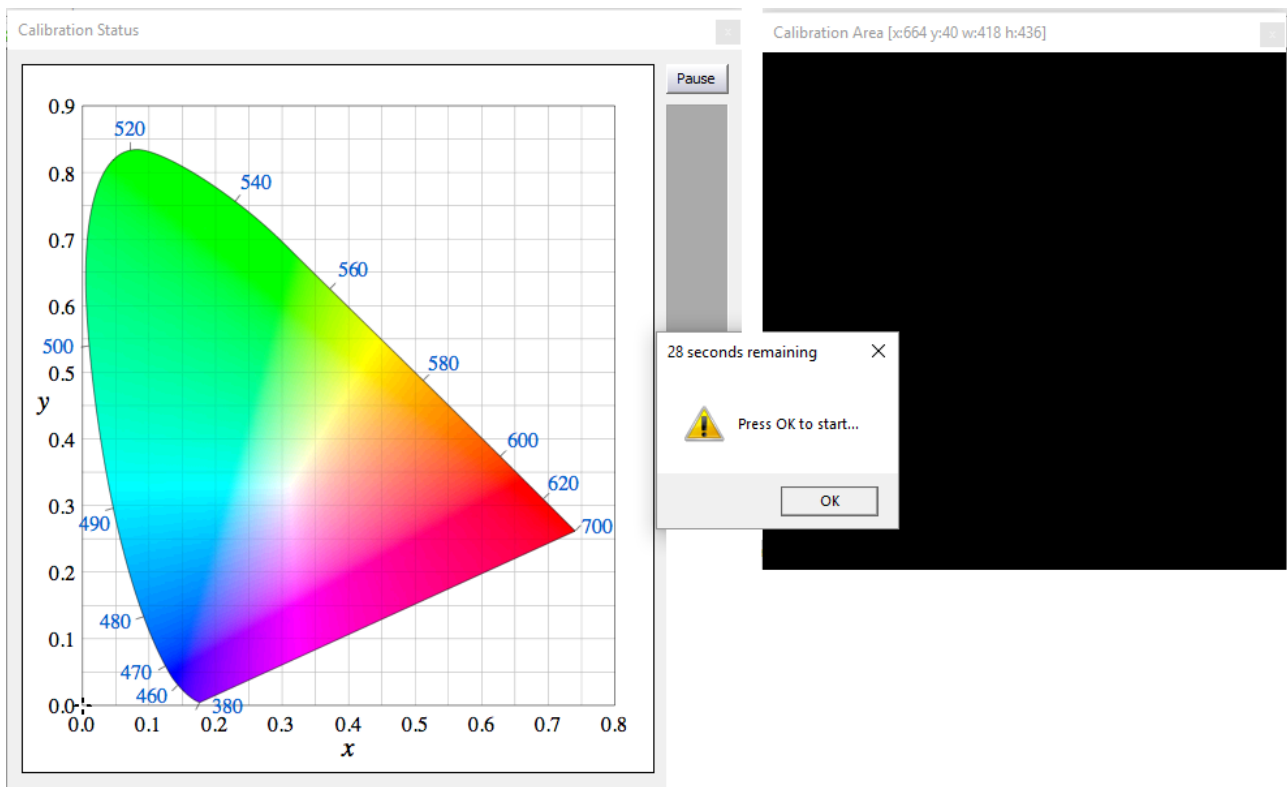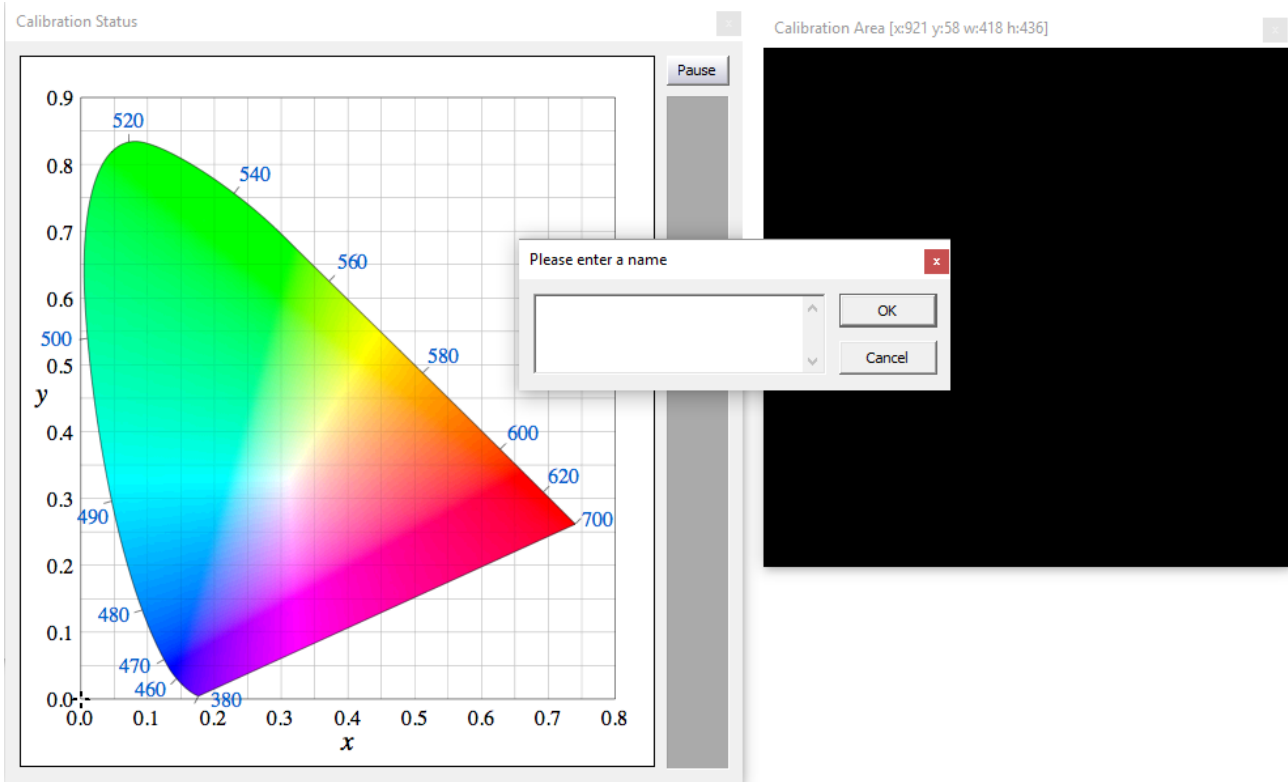
9. Color calibration

On the Display Characterization window (**Tools → Calibration → Display Characterization**), slide the **Select Cube Side** slider to 21 so that the Total Frames measured are 9261. Set **Patch Sequence** to **Sequential** and **Select Time per Frame** to **Closed Loop Mode**.
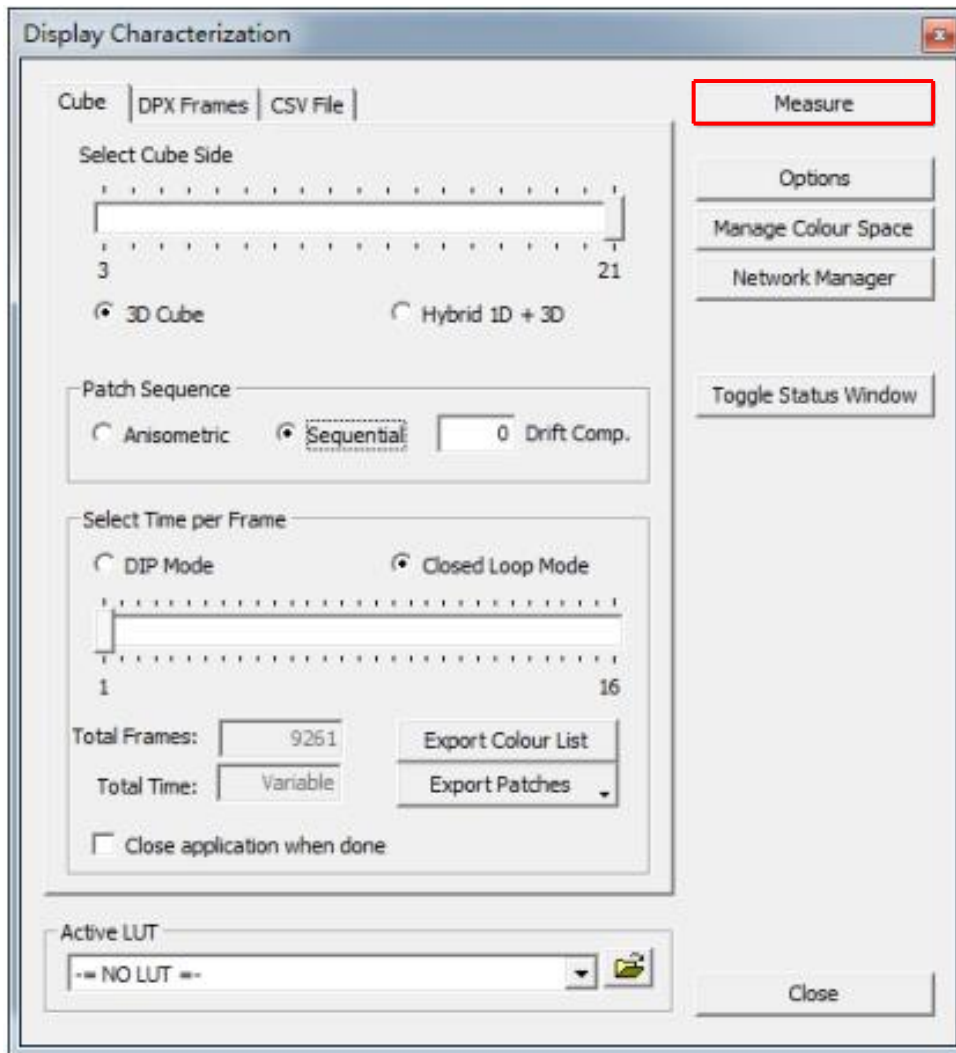
Click the **Measure** button, the **Calibration Status** window will appear along with the **Calibration Area** and a dialogue box. Drag the **Calibration Area** onto the TLM-170V. Finally enter a name for this particular calibration in the dialogue box, point the probe at the calibration area as close as possible then click the **OK** button to start calibration. **Note that it takes approximately one hour to perform 9261 point measurements**.

10. Create a 3D Cube Color Calibration File

Click **Tools → Colour Space → Convert Colour Space** to open the **Convert Colour Space** window. In the **Source** and **Destination** panes, select **Rec709** for the color space.

In the **Name** textbox enter the name of the 3D cube color calibration file. The rest of the settings should be configured as shown in the diagram on the left. Click **Create New** button to generate the color conversion data.

Now click "**File → Export**" then select the "**[3D] Lillput 17 (*.cube)**" format. Finally click the Export button to export the 3D Cube file to a USB thumb drive.
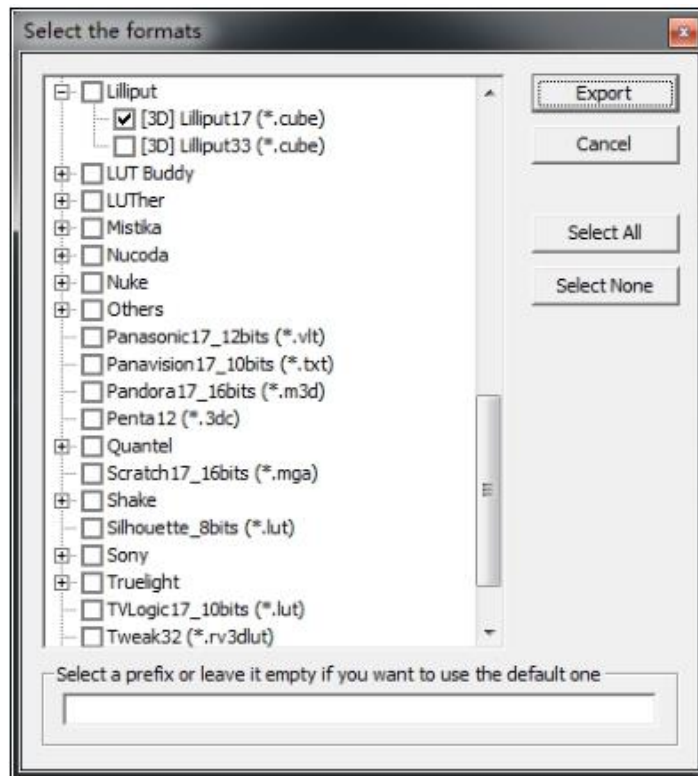
11. Import the 3D Cube file to the monitor

Rename the exported 3D cube file to **"lcd.cube"** and save it on a USB thumb drive. Insert the USB thumb into the **SERVICE** port of the TLM-170V and you will be prompted whether to write the 3D CUBE file to the monitor. The color calibration process is complete after the 3D CUBE file has been written to the monitor successfully.

5. Firmware Update

Datavideo usually releases new firmware containing new features or reported bug fixes from time to time. Customers can either download the TLM-170V firmware as they wish or contact their local dealer or reseller for assistance.

This section outlines the firmware upgrade process which should take **approximately 20 minutes to complete**.

The existing TLM-170V settings should persist through the *firmware upgrade process, which should not be interrupted once started* as this could result in a non-responsive unit.

Successful firmware upgrade on TLM-170V requires:

➢ Latest TLM-170V firmware version
➢ USB 2.0 Portable Drive (Max. 16GB)
➢ USB A Cable
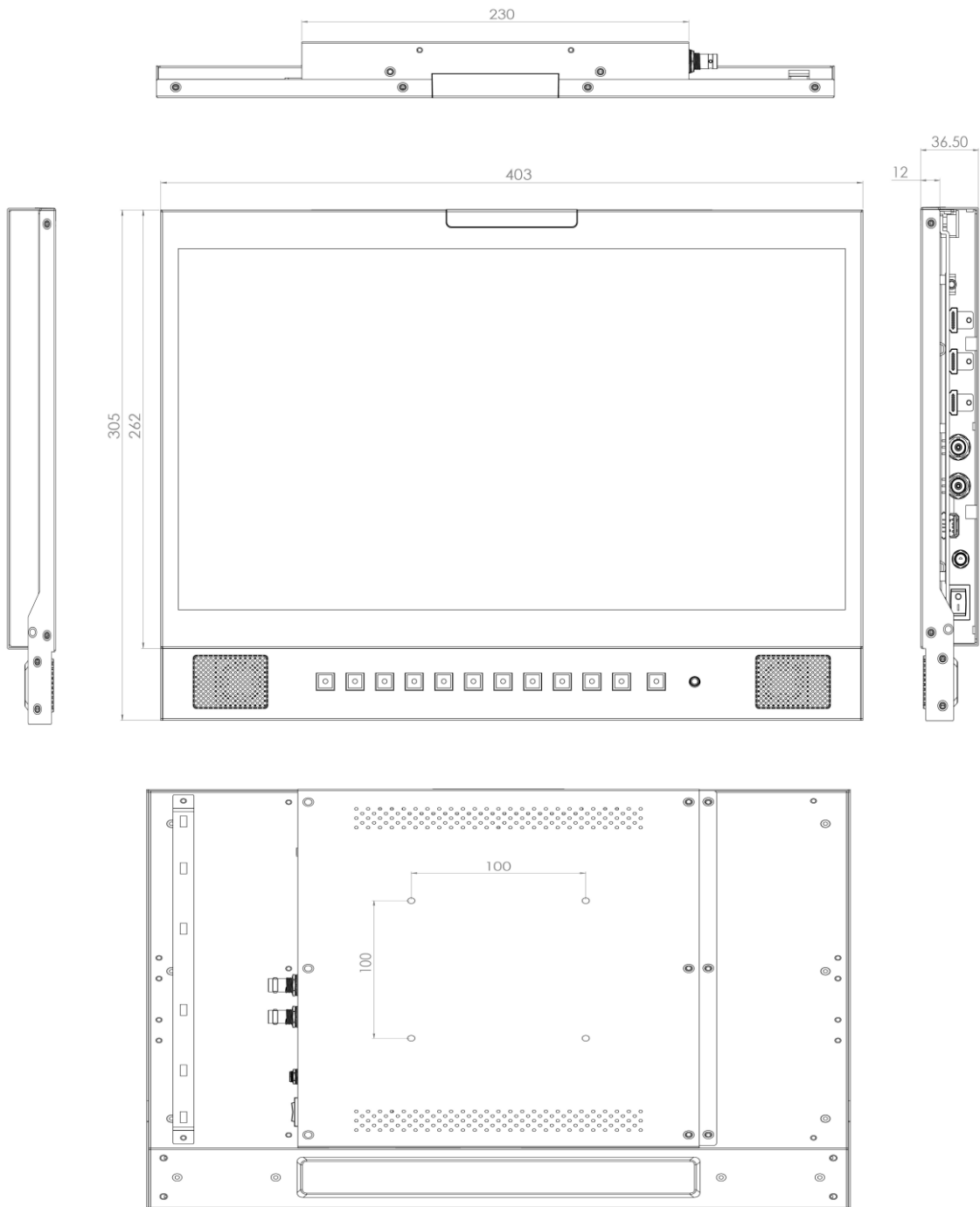
To update the TLM-170V firmware

MCU

1. Unzip / extract the firmware file.

2. Rename the bin file to "mcu.bin".

3. Delete the contents of the USB 2.0 pen drive so it is empty.

4. Copy mcu.bin to the USB 2.0 pen drive.

5. Power off the TLM-170V (On/Off Switch at the back of the monitor)

6. At the back of the monitor, plug the USB 2.0 pen drive into the USB 2.0 port labelled **SERVICE**.

7. Power ON the TLM-170V while pushing down the EXIT key.

8. The power button LED should flash while the firmware is being updated and the TLM-170V should reboot automatically after the update is complete.

9. To check the firmware versions, push down the EXIT key for 3 seconds then release; push down the MENU key for another 3 seconds then release; push down the EXIT key for another 3 seconds again to show the firmware versions on the OSD menu.

FPGA

1. Unzip / extract the firmware file.

2. Delete the contents of the USB 2.0 pen drive so it is empty.

3. Copy the fpga.bit to the USB 2.0 pen drive.

4. Plug the USB 2.0 pen drive into the USB 2.0 port labelled **SERVICE** on the back of the monitor.

5. "Load FPGA…" appears on the screen as soon as the **TLM-170V** detects the fpga.bit file.

6. fpga.bit is automatically loaded on the **TLM-170V**.

7. The **TLM-170V** reboots itself after fpga.bit is successfully loaded.

8. The firmware update is complete if the **TLM-170V Monitor reboots successfully**.

6.   Dimensions

All measurements in millimeters (mm)

7. Specifications

LCD	Size	17.3''
	Resolution	1920 x 1080
	Contrast Ratio	700:1
	View Angle (Typ.)	178° (Horizontal) / 178° (Vertical)
	Brightness	300 cd/m²
Video Input	HDMI x 2 SDI x 1 (Level A / Level B)	
Video Output	HDMI x 1 SDI x 1	
SDI Video Format	SMPTE-425M-A/B	1920x1080p 50/59.94/60
	SMPTE-274M	1920x1080p 23.98/23.98sf/24/24sf/25/25sf/29.97/29.97sf/30/30sf
	SMPTE-292M	1920x1080i 50/59.94/60
	SMPTE-296M	1280x720p 23.98/24/25/29.97/30/50/59.94/60
	SMPTE-259M	720x480i (NTSC), 720x576i (PAL)
HDMI Video Format	1920x1080p 50/59.94/60 1920x1080p 23.98/24/25/29.97/30 1920x1080i 50/59.94/60 1280x720p 23.98/24/25/29.97/30/50/59.94/60 720x480i (NTSC) 720x576i (PAL)	
Audio Input	SDI/HDMI Embedded Audio, 48 kHz sampling	
Audio Output	Analog stereo (Phone Jack) Speaker x 2 (3W x 2)	
Tally Input	Tally Port x 1	
Power	DC 12V/21.9W (12V/2A)	
Power Consumption	≤32 Watts	
Operating Temperature	0°C to 40°C (32°F to 104°F)	
Humidity	10 – 80%	
Weight	TLM-170V: 4.5 kg TLM-170VM: 6.7 kg TLM-170VR: 4.1 kg	

Notes

Notes

Notes

Service & Support

It is our goal to make owning and using Datavideo products a satisfying experience. Our support staff is available to assist you to set up and operate your system. Contact your local office for specific support requests. Plus, please visit www.datavideo.com to access our FAQ section.

Please visit our website for latest manual update.

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