Flanders Scientific Inc.

Monitor User Manual

Updated 12.16.2021

XM Series
XM311K

This manual is based on firmware V2.1.20.
Some selections may be unavailable or not work correctly if using a different firmware build.

Flanders Scientific, Inc.
6215 Shiloh Crossing
Suite G
Alpharetta, GA. 30005
Phone: +1.678.835.4934
Fax: +1.678.804.1882
E-Mail: Support@FlandersScientific.com
www.FlandersScientific.com

Contents

TOPIC	PAGE(S)
Safety Precautions	3 - 5
Parts & Their Functions	6 - 7
Menu	8 - 17
Dimensional Drawing	18

 © 2021 Flanders Scientific, Inc.

CAUTION
DO NOT LAY FLAT. DO NOT ROTATE OR TURN UPSIDE DOWN.

Monitor must be transported, stored, and operated upright at all times. Please ensure monitor is kept clean and free of dust. Failure to follow these guidelines may lead to dust inflow or panel damage. Panel bending, bruising, and dust inflow are not warrantable conditions. Please exercise caution with the display, especially when transporting or operating.

Connecting and Disconnecting SDI BNC Cables

To prevent damage to components from electrical discharge follow these steps:

- Connect power first on all devices.
- Power on all devices.
- Connect BNC cables.

To disconnect:

- Disconnect BNC cables.
- Power down and disconnect power from devices.

If using a wireless video receiver we strongly suggest using an SDI Video Ground Path Isolator (available at ShopFSI.com and ShopFSI.eu) and powering the receiver from a separate power source than the monitor. Use of wireless video receivers can cause dangerous ground loop issues that can damage connected equipment like monitors. Using a ground loop isolator and powering from a separate power source will help keep downstream equipment protected.

Safety Precautions

- All operating instructions must be read and understood before the product is operated.
- These safety and operating instructions must be kept in a safe place for future reference.
- All warnings on the product and in the instructions must be observed closely.
- All operating instructions must be followed.
- Do not use attachments or accessories not recommended by the manufacturer. Use of inadequate attachments may result in serious accidents.
- Do not place heavy objects on the power cord. Route power cord to prevent people from stepping on or resting objects on the cord. Check to ensure that both outlet and product connection points are properly seated and secured.
- This product must be operated on a power source as specified on the specification label or product screening. Always operate the product within the voltage range specified.
- Do not overload AC outlets or extension cords. Overloading can cause fire or serious electric shock.
- Never insert an object into the product through vents or openings as this can cause serious electric shock or damage.
- Do not expose product to water or other liquids as this can lead to electrical shock or permanent damage.
- Keep this product away from heat generating sources such as radiators, heaters, stoves, or other heat generating products.

 © 2021 Flanders Scientific, Inc.

- When mounting the product to a wall, ceiling, or within a rack/enclosure, be sure to install the product according to the instructions of both the mount and monitor manufacturer.
- Do not attempt to service the product yourself. Removing covers can expose you to high voltage and other unsafe conditions. Please seek the assistance of a qualified service professional for all service needs.
- If any of the following occur, unplug the power cord from the AC outlet and consult a qualified service professional to perform repairs:
    - Power cord or plug becomes damaged.
    - When any liquid is spilled on or in the product.
    - When the product has been exposed to rain or water.
    - When the product does not operate properly as described in the instruction manual.
    - When the product has been dropped or damaged.
- If the product requires replacement parts, make sure that the service person uses replacement parts specified by the manufacturer, or those equivalent parts having the same characteristics and performance specifications as the original parts. Use of unauthorized parts can result in fire, electric shock, and/or other damage.
- Upon completion of any service or repair work, request that the service technician perform safety checks to ensure that the product is in proper working order.
- Unplug the power cord from the AC outlet before cleaning the product.
- For proper screen maintenance please follow the guidelines below to prevent scratches, discoloration, or other damage to the panel:
    - Avoid striking the screen with any object.
    - Do not wipe screen hard. Apply only gentle pressure if cleaning.
    - Do not wipe the screen with solvents such as alcohol, paint thinner, or benzene as this can cause permanent damage to the panel.
    - Do not spray detergent or other cleaners directly on the monitor or panel.
    - Do not write on the panel with any substance or object.
    - Do not paste or stick anything to the screen as any adhesive can cause damage to the panel.
    - Screen may be cleaned by gently wiping with lint free cloth to remove dust. For more thorough cleaning use a lint free cloth that has been very lightly dampened with distilled water. Please dry any excess moisture from the monitor or panel immediately to prevent damage.
- Take care in moving this product as serious injury or death can result from the sudden shifting or falling of this object.
- The vents and openings in the product's chassis are designed for ventilation. Do not cover, block, or otherwise obstruct these vents and openings as insufficient ventilation can cause overheating and/or shorten the life of the product.
- Do not place the object on a bed, sofa, rug, or other similar surface as this can result in serious obstruction of ventilation areas. If using in enclosed space make sure to provide proper ventilation to maintain allowable operating temperature range.
- The panel used in this product contains glass and can cause serious injury if broken. If the unit is dropped or otherwise damaged take care to avoid possible injury by glass shards.
- Avoid prolonged exposure to direct sunlight as this can cause damage to the panel.

 © 2021 Flanders Scientific, Inc.

- For proper chassis maintenance please follow the guidelines below to avoid any potential damage:
  - Do not wipe the chassis with solvents such as alcohol, paint thinner, or benzene.
  - Do not expose the cabinet to any volatile substances.
  - Do not allow prolonged contact with rubber or plastic.
  - Apply only gentle pressure to chassis when cleaning.
  - To clean use soft, lint free cloth to remove dust. A lightly dampened cloth, as described in the screen maintenance section, may also be used to clean the chassis.

FCC (Federal Communications Commission)

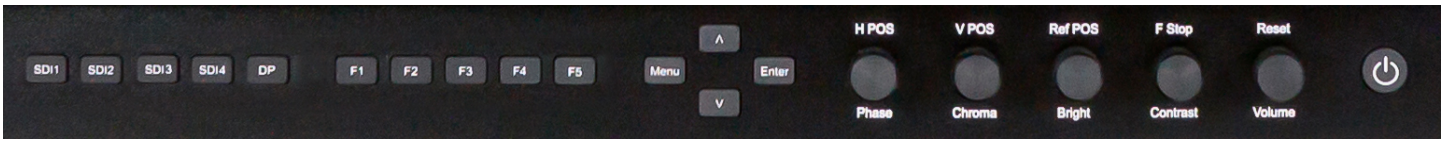
This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interface when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Warning: Changes or modifications not expressly approved by the manufacturer responsible for compliance void the user's authority to operate the equipment.

 © 2021 Flanders Scientific, Inc.

Keyboard



- **SDI 1:** Used to select SDI Input 1 as the active Input.
- **SDI 2:** Used to select SDI Input 2 as the active Input.
- **SDI 3:** Used to select SDI Input 3 as the active Input.
- **SDI 4:** Used to select SDI Input 4 as the active Input.
- **DP:** Used to select the Display Port Input. *Reserved for future use, inactive in 2.1.2*

- **F1:** Assignable function key. This key's function is selectable from the Function Menu.
- **F2:** Assignable function key. This key's function is selectable from the Function Menu.
- **F3:** Assignable function key. This key's function is selectable from the Function Menu.
- **F4:** Assignable function key. This key's function is selectable from the Function Menu.
- **F5:** Assignable function key. This key's function is selectable from the Function Menu.

- **MENU / LEFT:** Used to toggle and navigate On Screen Menu.
- **UP:** Used to navigate On Screen Menu.
- **DOWN:** Used to navigate On Screen Menu.
- **RIGHT / ENTER:** Used to navigate On Screen Menu and to confirm selections within the On Screen Menu.

- **PHASE / H POS:** Used to adjust hue higher or lower. Pressing down on the center of this button will return the hue setting to its default position.
- **CHROMA / V POS:** Used to adjust chroma higher or lower. Pressing down on the center of this button will return the chroma setting to its default position.
- **BRIGHT / Ref POS:** Used to adjust brightness higher or lower. Pressing down on the center of this button will return the brightness setting to its default position. The brightness knob should NOT be used increase the overall peak white luminance of the unit, use the Luminance setting to adjust overall luminance.
- **CONTRAST / F Stop:** Used to adjust contrast higher or lower. Pressing down on the center of this button will return the contrast setting to its default position.
- **VOLUME:** Used to adjust volume. Press down on this knob to instantly mute or unmute the volume.
- **POWER:** Used to turn power ON / OFF.

 © 2021 Flanders Scientific, Inc.

Back Panel

- **SDI In:** 4 Multi-Format 12G/6G/3G/HD-SDI Inputs.
- **SDI Out:** 4 Looped 12G/6G/3G/HD-SDI Outputs.
- **MON Out:** Processed output.
  Follows Mode Selection
- **DP In:** Display Port Input.
- **Audio In/Out:** Analog Stereo Mini-phono Audio Input & Output. Unbalanced, Audio Out delayed by exact amount of monitor video processing time to maintain sync.
- **USB Type A:** USB power, can be used to power MediaLight Bias Lights and connect other peripherals.
- **RS-485:** RS-485 Ports (In/Out) for looping remote control interface.
- **LAN:** IP Control via select programs.

 © 2021 Flanders Scientific, Inc.

Navigating the Menu
Pressing the MENU button on the monitor's keypad will call up the on screen menu. To navigate use the UP and DOWN buttons and press the ENTER button to select the highlighted sub menu. Navigate the sub menu in the same way by using the UP and DOWN buttons to highlight a particular function and press ENTER to change that function's settings. To exit the menu or back out of a sub menu press the MENU button.

Menus longer than the Main Menu may not fully display. These menus will scroll. Use the Up and Down keys to scroll up and down a menu.

Function Menu

Function
Scope
Video
Color
System
OSD

F1	Luminance Scope
F2	Vector Scope
F3	Pixel Mapping
F4	LUM Coloring
F5	Area Marker
	Safety Marker
	Center Marker
	Load Profile 0
	Load Profile 1
	Load Profile 2
	Load Profile 3
	Load Profile 4
	Load Profile 5

The Function Menu allows you to assign user selectable functions to any of the 5 function buttons (F1, F2, F3, F4, and F5) on the monitor keypad. To assign a function to a function key, highlight one of the 5 functions and press ENTER. A list of assignable functions will appear. Select the desired function with the UP and DOWN buttons and press ENTER.

Area Marker
Use the Area Marker function to select what type of marker is displayed when the marker function is active. The marker selections available from this option include most commonly used markers and more complex user designed custom markers.

Safety Marker
Use the Safety Marker function to toggle the size, in percentage, of the safety marker displayed. This option can be used by itself or in conjunction with the Area Marker function.

Center Marker
Toggles whether the center marker (cross-hair) is displayed when the marker is activated.

 © 2021 Flanders Scientific, Inc.

Function Menu

Function	F1	Luminance Scope
Scope	F2	Vector Scope
Video	F3	Pixel Mapping
Color	F4	LUM Coloring
System	F5	Area Marker
OSD		Safety Marker
		Center Marker
		Load Profile 0
		Load Profile 1
		Load Profile 2
		Load Profile 3
		Load Profile 4
		Load Profile 5

Load Profile

Saved profile configurations can now be loaded via function button. This acts as a “load” button only as opposed to a toggle, so pressing a corresponding Function button twice does not revert to previous pre-load state.

Please note: to avoid circular logic problems, loading profile configurations does NOT change function button assignments. The function buttons are independent of the profile configurations

© 2021 Flanders Scientific, Inc.

Scope Menu

Function	Luminance	Off
Scope	Lum Position	Bottom Right
Video	Lum Style	IRE
Color	Vector	Off
System	Vec Position	Bottom Right
OSD	Lum Coloring	Off

Lum & Vec Position
Use Lum & Vec Position to select in what area of the screen you would like your Scopes to be displayed.

Lum Style
Select IRE or HDR (PQ) Waveform. HDR Waveform is currently in Beta (only works with YCbCr formats).

Lum Coloring (Customizable Exposure Check) - BETA
Generates an artificial luminance map of the incoming source that can be particularly useful in identifying overexposed areas in any given shot. An onscreen scale helps indicate what artificial color corresponds to what luminance from 0 to 100 percent.

You can change the range of these color coded regions to any preferred setting by using the monitor's rotary knobs. The H POS rotary knob will adjust the lower limit of the lower color coded region. The V POS rotary knob will adjust the upper limit of the lower color coded region. The Ref POS rotary knob will adjust the lower limit of the upper color coded region. The F Stop Rotary knob will adjust the upper limit of the upper color coded region. These color coded ranges are retained in memory so you can exit and reenter Lum Coloring Mode without having to reset your desired threshold levels.

Note: Scopes only work in Normal LUT Mode. Scopes will not operate in Advanced LUT Mode.

 © 2021 Flanders Scientific, Inc.

Video Menu

Function	Input	SDI 1
Scope	Mode	AUTO
Video	SDI Format	AUTO
Color	Pixel Mapping	OFF
System	Deinterlace Mode	Mode 2
OSD		

SDI Format
Select the correct incoming signal format. SDI Format selection overrides payload ID if not set to AUTO.

Mode
The mode selection allows you to set the SDI input configuration as well as the processed monitor output configuration. Please note that the output configuration only impacts the outputs labeled MON, the standard OUT connections are always clean loop throughs of whatever is being received by the display. Note that when using a down-conversion configuration UHD will be down-converted to HD and 4K will be down-converted to 2K. All 2K and HD down-converted signals will be output to all 4 MON outputs so the down-conversion may be accessed from any of these connections.

Available MODE options
AUTO: attempts to automatically identify signal type, particularly useful if simply switching between single link 1.5Gbps, 3Gbps, 6Gbps, and 12Gbps SDI signals formats.
6G_IN: single-link 6Gbps SDI input, single-link 6Gbps SDI output
6G_IN HD_OUT: single-link 6Gbps SDI input, 1.5Gbps HD output
6G_DL_IN: dual-link 6Gbps SDI input, dual-link 6Gbps SDI output
6G_DL_IN 3G_OUT: dual-link 6Gbps SDI input, single-link 3Gbps SDI Level A output
12G_IN: single-link 12Gbps SDI input
12G_IN 3G_OUT: single-link 12Gbps SDI input, single-link 3Gbps SDI Level A output
3G_DL-IN: dual-link 3Gbps SDI input, dual-link 3Gbps SDI output
3G_IN: single-link 3Gbps SDI input scaled full screen
HD_IN: single-link 1.5Gbps SDI input scaled full screen
3G_INx4: quad 3Gbps SDI input from inputs 1,2,3,4 to form UHD/4K signal on screen
HD_INx4: quad 1.5Gbps input from inputs 1,2,3,4 to form UHD/4K signal on screen

4K and UHD over 3G dual-link, 3G quad-link, and 1.5G quad-link should be formatted as Square Division (SQ). Two Sample Interleave (2SI) support is planned for a future release.

Deinterlace Mode
Mode1: Combines fields and displays as progressive scan image.
Mode2: Shows on screen as interlaced with correct field order.

 © 2021 Flanders Scientific, Inc.

Video Menu

Function	Input	SDI 1
Scope	Mode	AUTO
Video	SDI Format	AUTO
Color	Pixel Mapping	OFF
System	Deinterlace Mode	Mode 2
OSD		

Pixel Mapping

Pixel Mapping toggles between various available pixel mapping options including:

OFF

With Pixel Mapping set to OFF the incoming source is scaled to fill as much of the screen as possible while preserving aspect ratio. If the incoming source and panel share the same resolution then there will be no difference between OFF and the other pixel mapping modes.

Center

Maps the signal 1:1 with the center of incoming video in the middle of the screen.

Top Left

Maps the signal 1:1 with the top left incoming video in the top left of the screen.

Top Right

Maps the signal 1:1 with the top right of incoming video in the top right of the screen.

Bottom Left

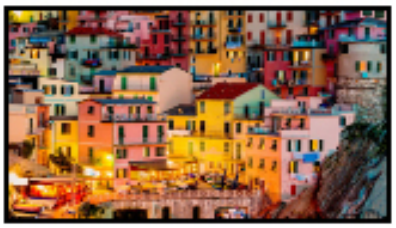
Maps the signal 1:1 with the bottom left of incoming video in the bottom left of the screen.

Bottom Right

Maps the signal 1:1 with the bottom right of incoming video in the bottom right of the screen.

 © 2021 Flanders Scientific, Inc.

HD Signal

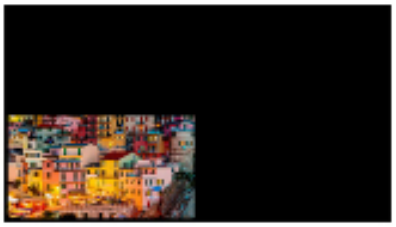


Off

Center

Top Left

Top Right



Bottom Left

Bottom Right

© 2021 Flanders Scientific, Inc.

Color Menu

Function	ColorSystem	User
Scope	LUT Mode	Normal
Video	Range	SMPTE Full 4-1019
Color	Gamut	BT.709
System	Temperature	Default
OSD	EOTF	Gamma 2.4
	Luminance Mode	100
	Luminance Custom	45

ColorSystem
Default - Default selection where XM311K factory calibration LUTs are stored.
GaiaColor - *Reserved for future use.*
LightSpace / CalMAN - Open slots for use with LightSpace and CalMAN

LUT Mode
Does not apply to GaiaColor Color System.
In Default, LightSpace, or CalMAN modes select Normal or Advanced.

In Normal Mode 6 LUT positions are accessible as follows:
Front DIT 1D LUT -> DIT 3D LUT -> Post DIT 1D LUT-> Front Calibration 1D LUT -> Calibration 3D LUT -> Post Calibration 1D LUT

In Normal Mode all 1D LUTs are 4096 entry point using 12bit values in the Flanders.lut format and all 3D LUTs are 17x17x17.cube format using only the header LUT_3D_SIZE 17.

The DIT LUT positions should be used for technical transforms or look LUTs, calibration LUTs should normally only be stored in the Calibration LUT positions.

In Advanced Mode 3 LUT positions are accessible as follows:
Front Calibration 1D LUT -> Calibration 3D LUT -> Post Calibration 1D LUT

In Advanced Mode all 1D LUTs are 4096 entry point using 12bit values in the Flanders.lut format and the 3D LUT is 33x33x33.cube format using only the header LUT_3D_SIZE 33.

LUTs can be saved to the display using the IP Remote Utility.
Application Note: LUTs are applied within the range active on the monitor's color menu.

 © 2021 Flanders Scientific, Inc.

Color Menu

Function	ColorSystem	User
Scope	LUT Mode	Normal
Video	Range	SMPTE Full 4-1019
Color	Gamut	BT.709
System	Temperature	Default
OSD	EOTF	Gamma 2.4
	Luminance Mode	100
	Luminance Custom	45

Gamut
Select from available options to instantly change the active color space.

Luminance Mode
Select from 100, 200, 400, 800, 1000 or Custom. When set to Custom the Luminance menu item above Luminance Mode will allow you to specify your preferred custom peak luminance setting.

Luminance Custom
When Luminance Mode is set to Custom the Luminance Custom slider becomes active allowing for a static backlight setting between 40 and 1000 and 5 step increments.

Range
Video Range 64-940
Extended Video Range 64-1019
SMPTE Full Range 4-1019
Full Range 0-1023

Temperature - Only Active in GaiaColor Mode
Allows for variable correlated color temperature selection. In most modes (e.g. Rec709, Rec2020) ‘default’ will be the same as the 6500K selection. In all DCI P3 selections ‘default’ will yield a DCI P3 white balance, but 6500K may be manually selected to yield a P3 gamut with D65 white point.

EOTF - Only Active in GaiaColor Mode
The EOTF setting allows you to set the desired gamma response / EOTF.

Red / Green / Blue Gain and Bias settings
White balance may be adjusted / customized from one of the Temperature selection presets using the custom Red, Green, Blue Gain and Bias settings.

Factory Alignment Reset
This setting deletes the Factory AWB calibration. Do not use this setting unless you have the proper equipment to redo the factory AWB calibration.

 © 2021 Flanders Scientific, Inc.

Color Menu

Function	ColorSystem	User
Scope	LUT Mode	Normal
Video	Range	SMPTE Full 4-1019
Color	Gamut	BT.709
System	Temperature	Default
OSD	EOTF	Gamma 2.4
	Luminance Mode	100
	Luminance Custom	45

Recommended XM311K Configurations Using Firmware 2.1.2

Basic settings for the two most commonly used configurations on the XM311K are provided below.

For P3 D65 PQ HDR

Color System: Default
Gamut: P3-ST2084
Luminance Mode: 1000

*Please note that in the DEFAULT Color System if factory LUTs have not been overridden the gamut option DCI P3 will target a DCI white balance of x=0.314, y=0.351 while the P3-ST2084 option will target a white balance of x=0.3127, y=0.3290.

For Rec709 2.4 SDR

Color System: Default
Gamut: BT.709
Luminance Mode: 100
LUT Interpolation: Tetrahedral

 © 2021 Flanders Scientific, Inc.

System Menu

Function	Update Firmware	Allow	
Scope	Current IP	192.168.1.100	
Video	Version	2.1.20	
Color	Serial Number	XM310A0000	
System	Payload ID	0000	
OSD	Profile Load		
	Profile Save		
	Set Static IP	192.168.1.100	192.168.1.100
	IP Reset	DHCP	255.255.255.0
	Fan Speed	Normal	192.168.1.1
			Apply Settings

Update Firmware
When left to Allow (default) allows firmware to be remotely updated using the FSI IP Remote Utility. When set to Block prevents firmware from being remotely updated.

Current IP
Shows monitor's current IP address.

Version
Displays the current firmware version.

Serial Number
Displays the unit's serial number.

Profile Load
Load a saved configuration by selecting it from the list. Configurations 1 through 5 are user adjustable using the the Profile Save menu item. The Default Configuration returns settings to factory default of:

Color System: Default
LUT Mode: Normal
Range: Full 0-1023
Gamut: P3-ST2084
Luminance: 1000
Gain/Bias Adjustments: 0 (neutral)

Profile Save
Select a configuration position to save all current monitor settings to that configuration slot.

 © 2021 Flanders Scientific, Inc.

System Menu

Function	Update Firmware	Allow	
Scope	Current IP	192.168.1.100	
Video	Version	2.1.20	
Color	Serial Number	XM310A0000	
System	Payload ID	0000	
OSD	Profile Load		
	Profile Save		
	Set Static IP	192.168.1.100	192.168.1.100
	IP Reset	DHCP	255.255.255.0
	Fan Speed	Normal	192.168.1.1
			Apply Settings

Set Static IP
Allows you to set a static IP address, subnet mask, and gateway address.

While setting an IP using the on-screen keyboard, use the monitor's Up, Down, Menu, and Enter keys to navigate the keyboard. You can also use the H Pos and V Pos rotary knobs. Pressing the H Pos or V Pos rotary knobs will make a selection of the highlighted on-screen key.

IP Reset
Re-enable DHCP after a static IP address has been used.

Fan Speed
Normal, Medium, High

 © 2021 Flanders Scientific, Inc.

OSD Menu

Function	Time Code	Off
Scope	Status Position	Top Left
Video	Status Set	5s
Color	Menu Position	Top Left
System	Menu Set	5s
OSD	Area Marker	Off
	Safety Marker	Off
	Center Marker	Off

Time Code
Allows you to select whether to display Time Code on screen pulled from an SDI signal. *Reserved for future use, inactive in 2.1.2*

Menu & Status Position
Changes position of on-screen menu and signal status display.

Menu Set
Set menu to automatically disappear after 5s, 10s, or to stay On until manually cleared.

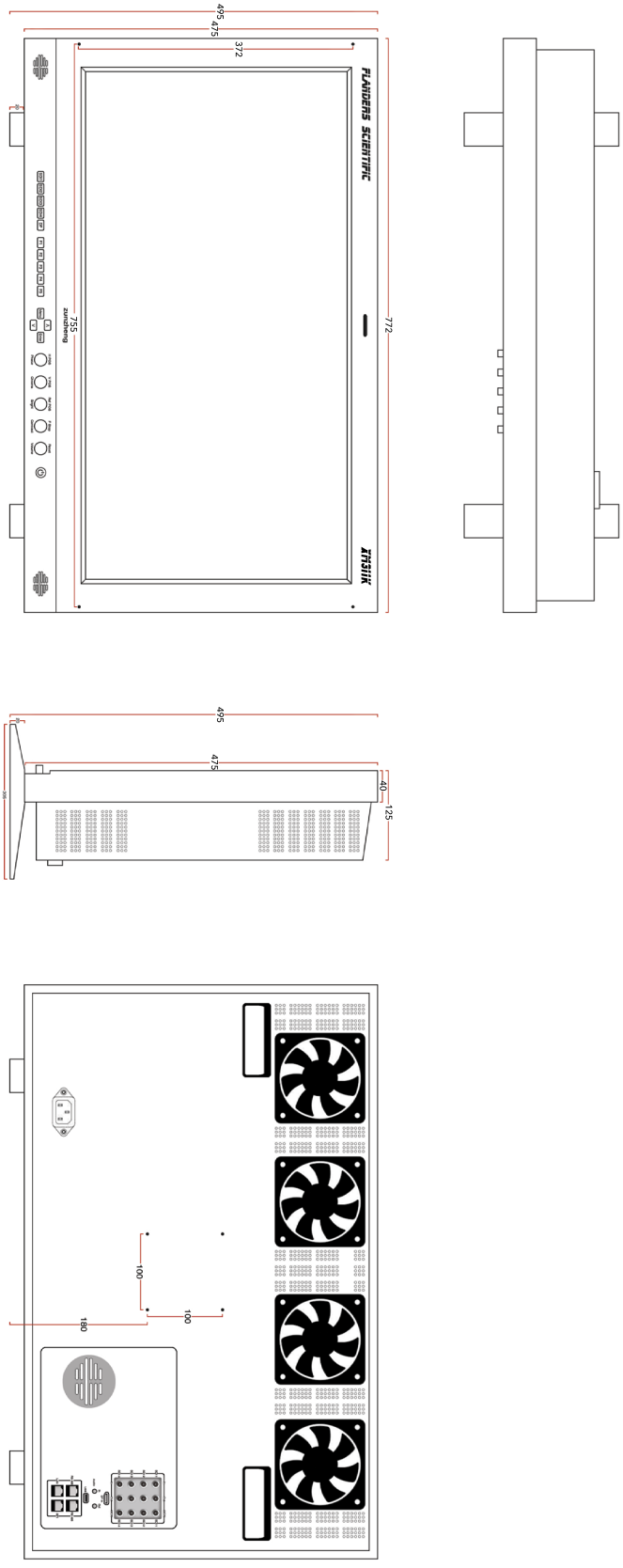
Status Set - Signal Status ID window
Select from On, Off, or 5 second display. When set to 5 second display the monitor will display signal status ID window for 5 seconds whenever an input button is pressed or signal format is changed.

The first line of the signal status ID window shows the user selected primary input and video mode (default is Auto).

The second line shows the primary input's detected bandwidth (e.g. 12G), resolution (e.g. 3840x2160), and scan type (e.g PsF). Please note that if your video mode is set to something besides a single wire format (e.g. Quad Link SDI) this second line will only show the detected bandwidth and resolution of the primary (selected) input. A quad link SDI UHD signal will therefore only indicate the resolution of the primary quadrant (HD) whereas a single 12G-SDI UHD signal will show 3840x2160 resolution.

The third line indicates the frame rate, whether the signal is RGB or YCbCr, and the signal bit depth. Please note that this information is based on received VPID. If VPID is incorrect or missing you may manually override using the Video Menu's SDI format selection, but this line will continue to reflect signal type as indicated by VPID.

 © 2021 Flanders Scientific, Inc.



© 2021 Flanders Scientific, Inc.