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User Guide

Epiphan LUMiO 12x

May 10, 2016

UG110-04

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Specifications

Go to the LUMiO 12x product page on the Epiphan website to get the most recent product specifications and additional information about LUMiO 12x.

Warranty

All Epiphan Systems products are provided with a 100% return to depot warranty for one year from the date of purchase.

Technical support

Epiphan’s products are backed by our professional support team. If you are having issues with your product, please gather details about your system and contact our team by:

- Emailing support@epiphan.com
- Live chat via the link on our support site http://www.epiphan.com/support/
- Phone toll free at 1-877-599-6581 or call +1-613-599-6581

Be sure to include as much information about your problem as possible. Including:

- Problem description
- Details of the video or audio source (type, connection, resolution, refresh rate, etc.)
- Product serial number
- Product firmware version (if applicable, from web admin interface)

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Getting started

Welcome and thank you for buying Epiphan Video's LUMiO 12x!

This user guide contains all the information necessary to successfully set up and operate your LUMiO 12x PTZ camera.

This guide helps you get started by providing identification and descriptions of your LUMiO 12x's physical features and included hardware following by a detailed breakdown of your LUMiO 12x's technical specifications. A quickstart guide is also included for those who prefer a less detailed approach.

This introductory section of the guide includes the following topics:

- Quickstart
- What is LUMiO 12x?
- What's in the box?
- Front, back and bottom views
- Technical specifications

In the rest of the guide, you'll learn how to position and connect your LUMiO 12x, set and operate your remote control and configure your LUMiO 12x using additional methods.

Let's get started!

About this guide

Warnings are depicted as follows.

Tips and Notes are depicted as follows.

Throughout this guide there are situations where more than one solution will complete a task. In those cases the guide describes the simplest or most common variation first.

Quickstart

This sections helps you get started with your LUMiO 12x. You'll learn how to position/connect your LUMiO 12x and set up and operate your remote control.

Before you begin, ensure you have the following:

- Your LUMiO 12x camera
- Your remote control (included with purchase)
- DC12V power supply (included with purchase)
- DVI-I, 3G-SDI, and/or HDMI™ cables and adapters, depending on what kind of video format you'd like your LUMiO 12x to output (not included with purchase).
- A capture appliance, such as Epiphan Pearl or AV.io SDI.

Optionally:

- Screws and mounting panels (if mounting your LUMiO 12x to a wall or ceiling – not included with purchase).

Positioning and connecting your LUMiO 12x (direct connection)

Positioning and connecting your LUMiO 12x is a simple process that involves physically placing your LUMiO 12x for the best view and connecting the required output cables to transfer video output to your capture appliance.

To position and connect your LUMiO 12x:

1. Place your LUMiO 12x in the desired location (i.e. on a flat surface, a tripod or mounted to a wall).
2. Connect your power supply cable from an electrical outlet to the back of your LUMiO 12x.
3. Connect your video output cable (i.e. 3G-SDI, DVI-I) from the back of your LUMiO 12x to your capture appliance.

Next you'll learn how to use the remote control to operate your LUMiO 12x.

Setting up your remote control

Your remote control allows you to control your LUMiO 12x movements and settings but requires a bit of initial configuration before it's ready for use.

To set up your remote control:

1. Ensure your LUMiO 12x is connected to the power supply and that the rear indicator light is a solid red (see Front, back and bottom views for exact location of indicator lights).
2. Point the remote control at your LUMiO 12x and press the **POWER** button; your LUMiO 12x powers on and performs a quick 15 second self-configuration (the front indicator light on your LUMiO 12x turns a solid blue when self-configuration is complete – see The remote control for a detailed button layout).
3. Point the remote control at your LUMiO 12x and press and hold the **SET1** button for about 4 seconds until the front indicator light on your LUMiO 12x flashes purple; your LUMiO 12x is now ready to pair to your remote control.
4. Keep your remote control pointed at your LUMiO 12x and press the **CAM1** button; your LUMiO 12x is now fully paired to the remote control.

Now you'll learn how to issue basic control commands to your LUMiO 12x using the remote control.

Controlling your LUMiO 12x with the remote control

Your remote control allows you to issue basic control commands, such as pan, tilt and zoom adjustments to your LUMiO 12x along with more advanced setting customizations.

To control your LUMiO 12x with the remote control:

1. Ensure that your LUMiO 12x is powered on (the front indicator light should be solid blue – see Front, back and bottom views for exact location of indicator lights).
2. Press the **CAM 1** button you mapped to your LUMiO 12x in Setting up your remote control.
3. Point the remote control at your LUMiO 12x and press the +/- buttons to control the focus (manual focus must be enabled) and zoom settings, and press the arrow buttons to control the pan and tilt settings.

Your LUMiO 12x is now all set up and ready to capture video content!

What's next?

Now that you've set up your LUMiO 12x, configured your remote control and learned how to control your LUMiO 12x, you can learn more about additional operation and configuration options. You can look at topics such as:

- Front, back and bottom views to learn about the visual features of your LUMiO 12x, including all ports and connectors.
- The remote control for a detailed guide on all buttons on the remote control, how to set presets and how control your LUMiO 12x.
- The OSD menu for instruction on how to change settings on your LUMiO 12x using the on screen display (OSD) menu.
- RS-232 serial port communication for an overview of how to operate your LUMiO 12x using VISCA, PELCO-P and PELCO-D serial port communication protocols.

Refer to the table of contents for a complete list of the topics covered.

What is LUMiO 12x?

LUMiO 12x is a portable and versatile HD pan-tilt-zoom (PTZ) camera that can be placed comfortably on a flat surface, secured on a wall, ceiling or mounted on a tripod. LUMiO 12x captures crystal-clear HD video at 60 fps and outputs in DVI-I, HDMI and 3G-SDI video formats.

LUMiO 12x captures the finest of details with its 12x optical zoom capability and offers true video capture flexibility with its 72.5° wide angle view and 6.3° zoom angle view.

The included remote control syncs with up to 4 different LUMiO 12x cameras and allows you to operate the pan/tilt movements and zoom/focus setting adjustments of your LUMiO 12x from a distance. You can save up to 128 unique pan, tilt and zoom settings to specific presets on your remote control and apply each preset to your LUMiO 12x with the press of a button.

Connect up to 4 LUMiO 12x cameras to a capture appliance, such as Epiphan's all-in-one live production mixer, Pearl, to create custom, multi-camera layouts and switch between layouts while streaming and recording for a dynamic, engaging and high-definition video capture experience!

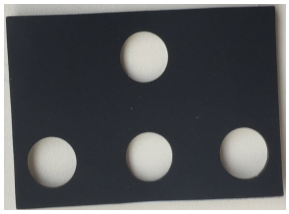
What's in the box?

Within the box you'll find the following items:

1. Your LUMiO 12x video camera
2. One infrared (IR) remote control (requires 2 AAA batteries sold separately)
3. One power supply cable (the exact cable you receive depends on your region)
4. One DC12V power adapter
5. VISCA RS-232 cable
6. Lens cap
7. Adhesive rubber mounting pad

Table 1 *Description of included purchase contents (for identification only, color and appearance of individual items may vary).*

Name	Image	Description
LUMiO 12x video camera		Your LUMiO 12x pan-tilt-zoom camera.
Infrared (IR) remote control		A remote controller to operate your LUMiO 12x manually from a distance (powered by 2 AAA batteries – sold separately).
Power cable (power cable may differ depending on region)		Connects to an electrical outlet to supply power to your DC12V power supply.
DVI-to-HDMI adapter		An adapter that is used to convert between DVI signals and HDMI signals.

Name	Image	Description
DC12V power supply		Connects to your power cable to convert electrical energy and supply power to your LUMiO 12x.
VISCA RS-232 cable		Connects your computer to your LUMiO 12x to allow issuing commands via serial port.
Lens cap		Rubber cap that covers and protects your LUMiO 12x's lens when not in use.
Adhesive rubber mounting pad		Sticks over the mounting holes on the bottom of your LUMiO 12x and is designed to spread the pressure of securely fastened alignment pins and/or screws.

Front, back and bottom views

In the front, your LUMiO 12x has its camera lens, the camera base, the IR receiver panel and the power indicator light. The rear panel features a series of output ports and a power input port, and the bottom of your LUMiO 12x has a dial switch and a few mounting installation holes. See below for a complete list of LUMiO 12x's physical features.

Table 2 *LUMiO 12x front view descriptions*

Label	Name	Description
1	Camera lens	Captures video content.
2	Camera base	Supports and balances the weight of the camera.
3	Indicator light	Displays a colored light to indicate the status of your LUMiO 12x and its response to commands from the remote control. Blue light (solid): LUMiO 12x is powered on. Red light (flashing continuously): LUMiO 12x is receiving commands from the remote control. Purple light (one quick flash): A setting or mode is changed via the remote control.
4	IR receiver panel	Receives signals from the remote control.

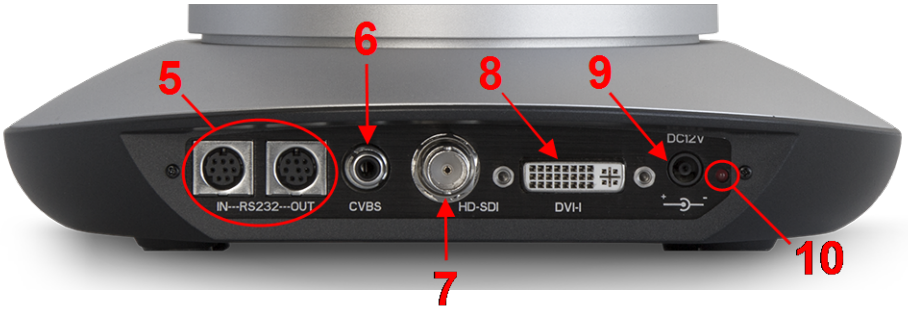


Table 3 *LUMiO 12x back view descriptions*

Label	Name	Description
5	VISCA IN/OUT (RS-232) ports	RS-232 serial port connections. Allows issuing of RS-232 commands using VISCA/PELCO-D/PELCO-P protocols.
6	CVBS output port	Not supported.
7	3G-SDI output port	Outputs SDI video signals from LUMiO 12x (3G-SDI cable not included with purchase).
8	DVI-I (HDMI) output port	Outputs DVI-I video signals (and HDMI with adapter) from LUMiO 12x (cable/adapter not included with purchase).
9	12V DC power input port	Connects to the power supply to provide power to your LUMiO 12x.
10	Power indicator light	Displays a red light to indicate your LUMiO 12x is plugged in and receiving power.

Table 4 *LUMiO 12x bottom view descriptions*

Label	Name	Description
11	Rubber pads (x4)	Lightly adheres to most flat surfaces to ensure your LUMiO 12x stays in place.
12	DIP switch	Unused.
13	Tripod mount hole	Tripod mounting connection point (accepts a 1/4"-20 UNC bolt).
14	Additional mount holes	Connection points for tripod alignment pins.

Technical specifications

Technical specifications for LUMiO 12x are included in the table below.

Model	TLC-300-S Series
Sensor	1/2.3-inch high-quality 12MP HD CMOS sensor
Output ports	DVI-I (HDMI™), 3G-SDI
Output resolutions	720p, 1080p, 720i, 1080i
Output frame rates	25, 29.97, 50, 59.94
Optical zoom	12x
Digital zoom	2x
View angle	6.3° (zoom) and 72.5° (wide)
Pan rotation angle	-170° to +170°
Tilt rotation angle	-35° to +90°
Pan rotation speed	0° to 120° per second
Tilt rotation speed	0° to 80° per second
Number of presets	128
Control port	RS-232 and RS-485
Signal-to-noise ratio (SNR)	>50 dB
Focal length	3.92 mm (zoom) to 47.32 mm (wide); 35 mm equivalent focal length: 22.3 mm (zoom) to 269.7 mm (wide)
Minimum lux	0.01 lux
White balance	Auto/Manual
Focus	Auto/Manual
Iris	Auto/Manual

Electronic shutter	Auto/Manual
Back light compensation (BLC)	Auto/Manual
Input voltage	DC 12V
Dimensions (height x width x depth)	173 mm × 220 mm × 117 mm (6.8 in. × 8.66 in. × 4.6 in.)
Net weight	1.25 kg
Country of origin	China

LUMiO 12x setup

Your LUMiO 12x comes fully assembled and is ready to connect to your capture appliance right out of the box.

Setup involves preparing your new LUMiO 12x to transmit video signals, which includes physical positioning and connecting the power supply/video output cables to your capture appliance. The remote control also requires some initial configuration to pair to your LUMiO 12x.

Before setting up your LUMiO 12x, make sure you have the following:

- Your LUMiO 12x camera
- The remote control
- DC12V power supply (included with purchase)
- DVI-I, 3G-SDI, and/or HDMI cables and adapters, depending on what kind of video format you'd like your LUMiO 12x to output (not included with purchase).
- A capture appliance, such as Epiphan Pearl or AV.io SDI.

Optionally:

- Screws and mounting panels (if mounting your LUMiO 12x to a wall or ceiling – not included with purchase).

Topics in this section include:

- Positioning and connecting your LUMiO 12x
- Setting up your remote control

Positioning and connecting your LUMiO 12x

Positioning and connecting your LUMiO 12x is a simple process that involves physically placing your LUMiO 12x for the best view and connecting the required output cables to transfer video output to your capture appliance.

To position and connect your LUMiO 12x

1. Place your LUMiO 12x in the desired location (i.e. on a flat surface, a tripod or mounted to a wall).
2. Connect your power supply cable from an electrical outlet to the back of your LUMiO 12x.
3. Connect your video output cable (i.e. 3G-SDI, DVI-I, HDMI) from the back of your LUMiO 12x to your capture appliance.

Setting up your remote control

Your remote control requires a bit of initial configuration before it can be used to control your LUMiO 12x.

To set up your remote control:

1. Ensure your LUMiO 12x is connected to the power supply and that the rear indicator light is a solid red (see Front, back and bottom views for exact location of indicator lights).
2. Point the remote control at your LUMiO 12x and press the **POWER** button; your LUMiO 12x powers on and performs a quick 15 second self-configuration (the front indicator light on your LUMiO 12x turns a solid blue when self-configuration is complete – see The remote control for a detailed button layout).
3. Point the remote control at your LUMiO 12x and press and hold the **SET1** button for about 4 seconds until the front indicator light on your LUMiO 12x flashes purple; your LUMiO 12x is now ready to pair to your remote control.
4. Keep your remote control pointed at your LUMiO 12x and press the **CAM1** button; your LUMiO 12x is now fully paired to the remote control.

Operation

Basic operation of your LUMiO 12x involves adjusting its pan (horizontal direction), tilt (vertical direction), zoom and focus settings. More advanced operation includes customizing exposure and color appearance parameters, such as brightness or contrast, and setting specific video output formats at particular resolutions and frame rates.

You can easily operate up to four different LUMiO 12x's directly using the remote control (included with purchase), through the on screen display (OSD) menu or via RS-232 serial port commands.

Topics in this section include:

- The remote control
- The OSD menu
- RS-232 serial port communication

The remote control

Your LUMiO 12x purchase includes an infrared (IR) remote control (powered by 2 AAA batteries sold separately) that allows you to control your LUMiO 12x from a distance.

Using the remote control, you can:

- Power on and off your LUMiO 12x
- Pair up to 4 different LUMiO 12x cameras to one remote
- Set, apply and clear presets
- Manually adjust focus or enable/disable automatic focus settings
- Manually adjust zoom settings
- Adjust pan/tilt settings
- Specify brightness and enable/disable backlight compensation
- Switch between different video format outputs

Using your LUMiO 12x in environments with heavy infrared interference (i.e. camera placed on a screen that has an infrared touch screen technology) can cause the remote control to malfunction.

Ensure both AAA batteries touch the battery terminals within the remote control (loosely-placed batteries will fail to provide power).

Topics in this section include:

- Setting up your remote control
- Understanding the remote control buttons
- Operation basics

Setting up your remote control

Your remote control requires a bit of initial configuration before it can be used to control your LUMiO 12x.

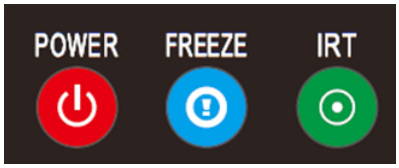
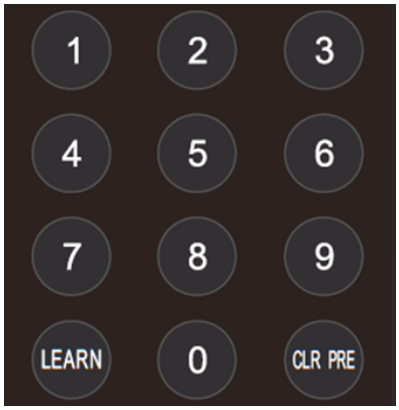
To set up your remote control:

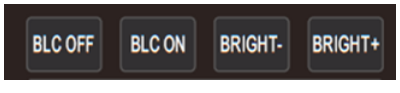
1. Ensure your LUMiO 12x is connected to the power supply and that the rear indicator light is a solid red (see Front, back and bottom views for exact location of indicator lights).
2. Point the remote control at your LUMiO 12x and press the **POWER** button; your LUMiO 12x powers on and performs a quick 15 second self-configuration (the front indicator light on your LUMiO 12x turns a solid blue when self-configuration is complete – see The remote control for a detailed button layout).
3. Point the remote control at your LUMiO 12x and press and hold the **SET1** button for about 4 seconds until the front indicator light on your LUMiO 12x flashes purple; your LUMiO 12x is now ready to pair to your remote control.
4. Keep your remote control pointed at your LUMiO 12x and press the **CAM1** button; your LUMiO 12x is now fully paired to the remote control.

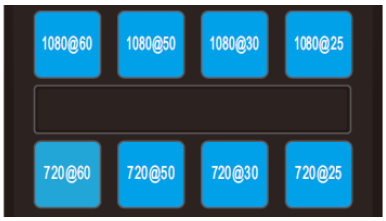
Understanding the remote control buttons

The remote control has many buttons that allow you to operate your LUMiO 12x. The table below describes in detail the function of each button on the controller.

Table 5 *Description of the remote control buttons*

Button(s)	Function(s)
	**POWER**: Turns the LUMiO 12x on or off. **FREEZE**: Unused. **IRT**: Not currently supported.
	SET1-SET4: Maps the camera to CAM1, CAM2, CAM3, or CAM4. See Setting up your remote control to learn how to map your remote control to your LUMiO 12x. **CAM1-CAM-4**: Press to select between different LUMiO 12x cameras mapped to the remote control.
	**Number keys (0-9)**: Allows you to set and select presets. See Setting and applying presets to learn how to configure presets. To set a preset (to number key "1", for example): 1. Point the remote control at the LUMiO 12x. 2. Specify camera settings (pan, tilt, zoom, focus, etc). 3. Press and hold the "1" button (about 4 seconds) until the power indicator light flashes purple; the LUMiO 12x settings are now mapped to "1". **CLR PRE**: Clears presets, either individually or all at once. See Clearing presets to learn how to erase configurations saved to your presets.

Button(s)	Function(s)
	LEARN: Not currently supported.
	Pan (left/right arrows): Press and hold to move your LUMiO 12x's lens left or right. Only usable if Manual Focus is enabled (see below). **Tilt** (up/down arrows): Press and hold to move your LUMiO 12x's lens up or down. **FOCUS** (+ and - buttons): Increases or decreases the focus distance on your LUMiO 12x. **ZOOM** (+ or -): Increases or decreases the zoom on your LUMiO 12x. **Return to default** (OK button): Returns the LUMiO 12x to its default startup position (pan, tilt and zoom settings are reset). The OK button also confirms selection when in OSD menu (see The OSD menu). **Navigation buttons** (up/down/left/right): Pans and tilts your LUMiO 12x. Also allows you to navigate the OSD menu.
	AF (auto focus): Activates automatic focusing for the LUMiO 12x's lens. Prevents manual focus adjustments, when activated. **MF** (manual focus): Allows manual focus adjustments. **RESET**: Unused. **MENU**: Enters the OSD menu (see Accessing the OSD menu).
	F1–F4: Unused.
	LIMIT L: Unused. **LIMIT R**: Unused. **LMTCLR**: Unused. **SCAN**: Unused.
	**BLC ON/BLC OFF**: Activates or deactivates backlight compensation.

Button(s)	Function(s)
	BRIGHT +/BRIGHT -: Increases or decreases video brightness (BLC must be enabled).
	**Video output options**: Changes your LUMiO 12x's output resolution and frame rate. See Setting video output resolution and frame rate to learn how to configure your LUMiO 12x's output signal.

Operation basics

Your remote control allows you to issue basic control commands, such as pan, tilt and zoom adjustments to your LUMiO 12x along with more advanced setting customizations such as preset configuration and output signal settings.

Topics in this section include:

- Controlling pan, tilt and zoom settings
- Setting and applying presets
- Clearing presets
- Setting video output resolution and frame rate

Controlling pan, tilt and zoom settings

Your remote control allows you to issue basic control commands, such as pan, tilt and zoom adjustments to your LUMiO 12x.

To control the pan, tilt and zoom settings of your LUMiO 12x with the remote control:

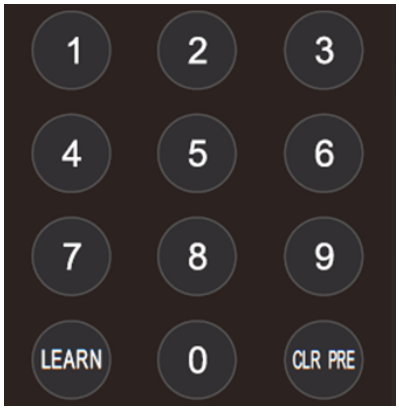
1. Ensure that your LUMiO 12x is powered on (the front indicator light should be solid blue – see Front, back and bottom views for exact location of indicator lights).
2. Press the **CAM** button you mapped to your LUMiO 12x in Setting up your remote control (CAM1–CAM4) to sync your remote with your LUMiO 12x.
3. Point the remote control at your LUMiO 12x and press the +/- buttons to control the focus (manual focus must be enabled) and zoom settings, and press the arrow buttons to control the pan and tilt settings.

Setting and applying presets

Your remote control lets you save commonly used setting configurations to specific presets that can be applied using the number keys.

To set a preset (to number key "1", for example):

1. Ensure that your LUMiO 12x is powered on (the front indicator light should be solid blue – see Front, back and bottom views for exact location of indicator lights).
2. Press the **CAM** button (CAM1–CAM4) you mapped to your LUMiO 12x in Setting up your remote control to sync your remote with your LUMiO 12x.
3. Specify camera settings (pan, tilt, zoom, focus, etc).
4. Press and hold the "1" button (about 4 seconds) until the power indicator light flashes purple; the LUMiO 12x settings are now mapped to "1".



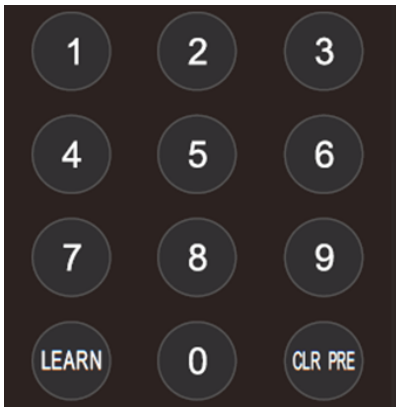
To apply a preset, simply press the number key (in this case, "1"); all of the settings you saved to the corresponding preset are immediately applied to your LUMiO 12x.

Clearing presets

Clearing a preset erases all LUMiO 12x settings saved to the specified preset on your remote control. You can clear all presets saved to your remote control at the same time, or you can clear presets individually.

To clear a specific preset ("1", for example):

1. Ensure that your LUMiO 12x is powered on (the front indicator light should be solid blue – see Front, back and bottom views for exact location of indicator lights).
2. Press the **CAM** button (CAM1–CAM4) you mapped to your LUMiO 12x in Setting up your remote control to sync your remote with your LUMiO 12x.
3. Press the **CLR PRE** button and then quickly press "**1**"; the preset "1" is now reset.



To clear **all presets** saved to your remote control, press and hold the **CLR PRE** button (about 3 seconds) until the power indicator light on your LUMiO 12x flashes purple; all presets are now reset.

Setting video output resolution and frame rate

You can change your LUMiO 12x's output signal resolution and frame rate using the blue buttons located at the very bottom of your remote control.

Using the remote control, you can set your output resolution and frame rate to the following settings:

1080p, 60 fps	1080p, 30 fps	720p, 60 fps	720p, 30 fps
1080p, 50 fps	1080p, 25 fps	720p, 50 fps	720p, 25 fps

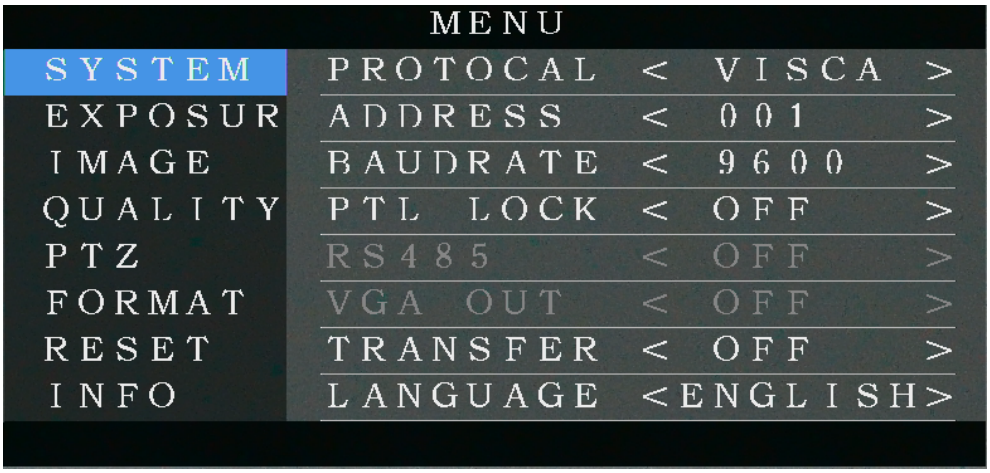
Additional output resolution and frame rate configurations are available and are set using the OSD menu. See Understanding OSD menu settings for details.

To set the video output resolution and frame rate:

1. Ensure that your LUMiO 12x is powered on (the front indicator light should be solid blue – see Front, back and bottom views for exact location of indicator lights).
2. Press the **CAM** button you mapped to your LUMiO 12x in Setting up your remote control (CAM1–CAM4) to sync your remote with your LUMiO 12x.
3. Press and hold the desired video output button until the power indicator light flashes purple (~4 seconds); the new frame rate and resolution is set.

The OSD menu

The on screen display (OSD) menu is a control panel overlay that is accessed using the remote control. The OSD menu appears in your capture application's video display and allows you to make changes to your LUMiO 12x's settings using the remote control's navigation arrow keys.

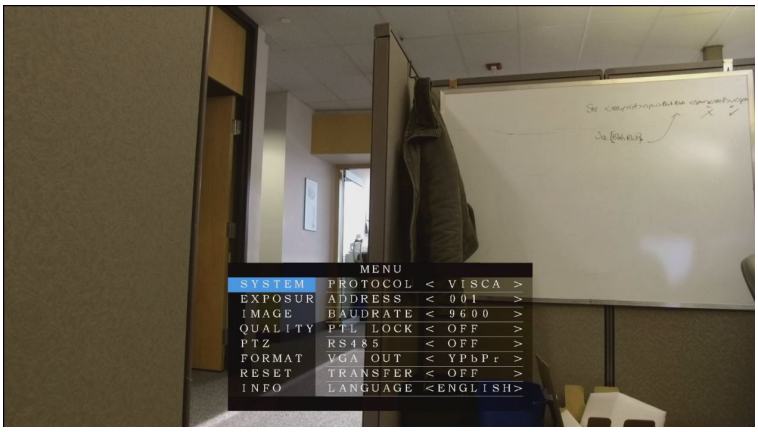


For additional information on the OSD menu, see:

- Accessing the OSD menu
- Navigating the OSD menu
- Understanding OSD menu settings

Accessing the OSD menu

Use your remote control to access your LUMiO 12x's OSD menu. Ensure that your LUMiO 12x is turned on and that its video content is shown on your capture computer's display (via a capture application).



To access the OSD menu:

1. Point the remote control at your LUMiO 12x.
2. Select your desired LUMiO 12x using the **CAM1-4** buttons.
3. Press the **MENU** button on your remote control; the OSD menu appears on your capture display.

Navigating the OSD menu

The remote control is used to move through your LUMiO 12x's OSD menu. Point the remote control at your LUMiO 12x and use the buttons described in the table below to navigate through the OSD menu and make changes to your settings.

Table 6 *OSD menu navigation buttons*

OSD menu navigation (using remote control)	
Button(s)	**Function**
Up/down navigation keys	Cycle through OSD menu headings.
Right navigation key	1. Descend into selected submenu. 2. Cycle through setting options.
Left navigation key	Cycle through setting options.
MENU	1. Return to previous submenu. 2. Trigger save prompt to leave OSD menu (when at main menu).
OK	Press to leave OSD menu (when prompted to save).

Understanding OSD menu settings

The OSD menu contains a variety of options to allow you to change settings on your LUMiO 12x.

Table 7 *OSD menu setting list*

Main menus	Submenus	Setting options
SYSTEM	PROTOCOL	VISCA, PELCO-D, PELCO-P
	ADDRESS (sets your camera's address for RS-232 communication)	VISCA: 1-7, PELCO D/P: 1-255
	BAUD RATE	2400, 4800, 9600, 115200
	PTL LOCK (protocol lock)	ON/OFF. Locks/unlocks the PROTOCOL setting.
	RS-485	ON/OFF. Enables/disables RS-485 serial port communication.
	VGA OUT	Unused.
	TRANSFER (IR transfer/IR pass function)	USB, SERIAL or OFF
	LANGUAGE	Chinese, English, Spanish, Russian

Main menus	Submenus	Setting options
EXPOSURE	EXPOSURE MODE	AUTO, MANUAL or BRIGHT
	SHUTTER (shutter speed in seconds)	1/8–1/10000 s (only available if EXPOSURE MODE set to MANUAL)
	IRIS	CLOSE–F1.8 (only available if EXPOSURE MODE set to MANUAL)
	GAIN	0dB–28dB (only available if EXPOSURE MODE set to MANUAL)
	BRIGHT	0–15 (only available in bright priority mode)
	EC MODE (exposure compensation)	ON/OFF
	EC POSI (exposure compensation level)	000–014
	BLC (black light compensation)	ON/OFF
IMAGE	WB MODE (white balance)	AUTO, INDOOR, OUTDOOR, MANUAL, OUTAUTO, SODIUM LAMP AUTO, SODIUM LAMP
	R GAIN (red gain level)	0–255 (only available if WB MODE set to MANUAL)
	B GAIN (blue gain level)	0–255 (only available if WB MODE set to MANUAL)
	COLOR G (color gain)	0~14
	FLICK (anti-flicker)	50/60 Hz (reduces video flicker)
	FREEZE	Freezes current frame (not supported)
	DZOOM (digital zoom)	On/Off
	FOCUS	Select FOCUS mode (automatic or manual)
QUALITY	2D NR (2D noise reduction)	0~5; the bigger value, the less noise on image (at the cost of slightly lowered resolution)

Main menus	Submenus	Setting options
	3D NR (3D noise reduction)	0~3; the bigger value, the less motion noise on image
	SHARPNESS	0~4
	CONTRAST	0~6
	SATURATION	Set color saturation level
	TRACK MODE	PRECISE: Camera pans/tilts in small degrees with incremental motion FLUENT: Camera pans/tilts smoothly with unrestricted motion
PTZ	PWR ACT (action upon power-on)	OFF (no action, just power on normally), PRE1 (preset 1), PRE2 (preset 2)
	SPEEDBYZ (speed by zoom)	The bigger the zoom, the slower the speed
	MOUNT M	Mount mode: Up/Down
	FLIP HOR	Flip horizontal
	FLIP VER	Flip vertical
	PT SPD	Set pan/tilt speed
	ZOOM SPD	Set zoom speed
	MENU MIR	Turn on/off menu mirror function. Useful when navigating the OSD menu with your LUMiO 12x mounted on a ceiling.
VIDEO FORMAT	1080P 59.94	Sets the video output to 1080P (progressive) resolution at 59.94 frame rate.
	1080P 50	Sets the video output to 1080P (progressive) resolution at 50 frame rate.
	1080I 59.94	Sets the video output to 1080I (interlaced) resolution at 59.94 frame rate.
	1080I 50	Sets the video output to 1080I (interlaced) resolution at 50 frames per second.
	1080P 29.97	Sets the video output to 1080P (progressive) resolution at

Main menus	Submenus	Setting options
		29.97 frames per second.
	1080P 25	Sets the video output to 1080P (progressive) resolution at 25 frames per second.
	720P 59.94	Sets the video output to 720P (progressive) resolution at 59.94 frames per second.
	720P 50	Sets the video output to 720P (progressive) resolution at 50 frames per second.
RESET	SYS RESET	System reset.
	CAM RESET	Camera reset.
	PT RESET	Pan/tilt reset. Resets LUMiO 12x to its default position.
	ALL RESET	Performs a reset of system, camera and pan/tilt settings.
MESSAGE	IR ADDR	Camera IR control address
	FOCUS	Focus mode
	CLIENT	Client protocol (can't be changed)
	MODEL NO.	Model number
	ARM VER.	ARM version
	FPGA VER.	FPGA version
	CAM VER.	Camera version
	RELEASE	Software release date

RS-232 serial port communication

Your LUMiO 12x offers support for RS-232 communication to allow remote operation of your LUMiO 12x.

LUMiO 12x supports the following RS-232 communication protocols:

VISCA PELCO-D PELCO-P

See below for a list of RS-232 commands using each of the three support communication protocols:

- VISCA protocol command list
- PELCO-D protocol command list
- PELCO-P protocol command list

VISCA protocol command list

VISCA protocol commands are used to control your LUMiO 12x, retrieve information on camera settings and get information on command send status.

VISCA commands are separated into:

- Return commands
- Control commands
- Inquiry commands
- Camera pan/tilt, zoom and exposure values

Return commands

VISCA return commands let you know if a given command is accepted, executed or if there is an error in the command itself.

Table 8 *Ack/completion return messages*

In the table below, **z = your camera's address + 8**. To set your LUMiO 12x's address, use the **OSD menu** and navigate to **SYSTEM**, then **ADDRESS** (see **Understanding OSD menu settings**).

Ack/completion messages	
Command packet	**Note**
z0 41 FF	Returned when the command is accepted (Ack)
z0 51 FF	Returned when the command has been executed (completion).

Table 9 *Error return messages*

Error messages		
Description	**Command Packet**	**Note**
Syntax Error	z0 60 02 FF	Returned when the command format is different or when a command with illegal command parameters is accepted.

Error messages		
Description	**Command Packet**	**Note**
Command Not Executable	z0 61 41 FF	Returned when a command cannot be executed due to current conditions. For example, when commands controlling the focus manually are received during auto focus.

Control commands

VISCA control commands allow you to customize your LUMiO 12x settings and issue movement commands.

Table 10 *Control commands*

Command	Function	Command Packet	Note
AddressSet	Broadcast	88 30 01 FF	Address setting
IF_Clear	Broadcast	88 01 00 01 FF	I/F Clear
CommandCancel		8x 21 FF	
CAM_Power	On	8x 01 04 00 02 FF	Power ON/OFF
	Off	8x 01 04 00 03 FF	
CAM_Zoom	Stop	8x 01 04 07 00 FF	
	Tele(Standard)	8x 01 04 07 02 FF	
	Wide(Standard)	8x 01 04 07 03 FF	
	Tele(Variable)	8x 01 04 07 2p FF	p = 0(low)~7(high)
	Wide(Variable)	8x 01 04 07 3p FF	
	Direct	8x 01 04 47 0p 0q 0r 0s FF	pqrs: Zoom Position (0(wide) ~0x4000(tele))

Command	Function	Command Packet	Note
CAM_Focus	Stop	8x 01 04 08 00 FF	
	Far(Standard)	8x 01 04 08 02 FF	
	Near(Standard)	8x 01 04 08 03 FF	
	Direct	8x 01 04 48 0p 0q 0r 0s FF	pqrs: Focus Position
	One Push AF	8x 01 04 18 01 FF	
CAM_ ZoomFocus	Direct	8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF	pqrs: Zoom Position (0(wide)~ 0x4000(tele)) tuvw: Focus Position
CAM_WB	Auto	8x 01 04 35 00 FF	
	Indoor	8x 01 04 35 01 FF	
	Outdoor	8x 01 04 35 02 FF	
	OnePush	8x 01 04 35 03 FF	
	Manual	8x 01 04 35 05 FF	
	Outdoor Auto	8x 01 04 35 06 FF	
	Sodium Lamp Auto	8x 01 04 35 07 FF	
	Sodium Auto	8x 01 04 35 08 FF	
CAM_RGain	Reset	8x 01 04 03 00 FF	Manual Control of R Gain
	Up	8x 01 04 03 02 FF	
	Down	8x 01 04 03 03 FF	
	Direct	8x 01 04 43 00 00 0p 0q FF	pq: R Gain (0~0xFF)
CAM_Bgain	Reset	8x 01 04 04 00 FF	Manual Control of B Gain
	Up	8x 01 04 04 02 FF	
	Down	8x 01 04 04 03 FF	
	Direct	8x 01 04 44 00 00 0p 0q FF	pq: B Gain (0-0xFF)

Command	Function	Command Packet	Note
CAM_AE	Full Auto	8x 01 04 39 00 FF	Automatic Exposure mode
	Manual	8x 01 04 39 03 FF	Manual Control mode
	Bright	8x 01 04 39 0D FF	Bright mode(Manual control)
CAM_Shutter	Reset	8x 01 04 0A 00 FF	Shutter Setting
	Up	8x 01 04 0A 02 FF	
	Down	8x 01 04 0A 03 FF	
	Direct	8x 01 04 4A 00 00 0p 0q FF	pq: Shutter Position (0~0x15)
CAM_Iris	Reset	8x 01 04 0B 00 FF	Iris Setting
	Up	8x 01 04 0B 02 FF	
	Down	8x 01 04 0B 03 FF	
	Direct	8x 01 04 4B 00 00 0p 0q FF	pq: Iris Position (0~ 0x11)
CAM_Gain	Reset	8x 01 04 0C 00 FF	Gain Setting
	Up	8x 01 04 0C 02 FF	
	Down	8x 01 04 0C 03 FF	
	Direct	8x 01 04 0C 00 00 0p 0q FF	pq: Gain Position (0~0x0E)
CAM_Bright	Reset	8x 01 04 0D 00 FF	Bright Setting
	Up	8x 01 04 0D 02 FF	
	Down	8x 01 04 0D 03 FF	
	Direct	8x 01 04 4D 00 00 0p 0q FF	pq: Bright l Positon ()

Command	Function	Command Packet	Note
CAM_ExpComp	On	8x 01 04 3E 02 FF	Exposure Compensation ON/OFF
	Off	8x 01 04 3E 03 FF	
	Reset	8x 01 04 0E 00 FF	Exposure Compensation Amount Setting
	Up	8x 01 04 0E 02 FF	
	Down	8x 01 04 0E 03 FF	
	Direct	8x 01 04 4E 00 00 0p 0q FF	pq: ExpComp Position (0~0x0E)
CAM_BackLight	On	8x 01 04 33 02 FF	BackLight On
	Off	8x 01 04 33 03 FF	BackLight Off
CAM_Aperture	Reset	8x 01 04 02 00 FF	Aperture Control
	Up	8x 01 04 02 02 FF	
	Down	8x 01 04 02 03 FF	
	Direct	8x 01 04 42 00 00 0p 0q FF	pq: Aperture Gain (0~0x04)
CAM_Memory	Reset	8x 01 04 3F 00 0p FF	p: Memory Number(=0 to 127)
	Set	8x 01 04 3F 01 0p FF	Corresponds to 0 to 9 on the Remote Commander
	Recall	8x 01 04 3F 02 0p FF	
CAM_LR_Reverse	On	8x 01 04 61 02 FF	Image Flip Horizontal ON/OFF
	Off	8x 01 04 61 03 FF	
CAM_PictureFlip	On	8x 01 04 66 02 FF	Image Flip Vertical ON/OFF
	Off	8x 01 04 66 03 FF	
CAM_ MountMode	UP	8x 01 04 A4 02 FF	Mount Up
	Down	8x 01 04 A4 03 FF	Mount Down
CAM_ColorGain	Direct	8x 01 04 49 00 00 00 0p FF	(0~0x0E)
CAM_2D	Direct	8x 01 04 53 0p FF	(0~0x05)

Command	Function	Command Packet	Note
Noise reduction			
CAM_3D Noise reduction	Direct	8x 01 04 54 0p FF	(0~0x03)
FLICK	50HZ	81 01 04 23 01 FF	
	60HZ	81 01 04 23 02 FF	
Freeze	Freeze On	81 01 04 62 02 FF	Freeze On Immediately
	Freeze Off	81 01 04 62 03 FF	Freeze Off Immediately
	Preset Freeze On	81 01 04 62 22 FF	Freeze On When Running Preset
	Preset Freeze Off	81 01 04 62 23 FF	Freeze Off When Running Preset
VideoSystem Set		8x 01 06 35 00 pp FF	pp: 0~18 Video format 0:1080P60 1:1080P50 2:1080I60 3:1080I50 4:1080P30 5:1080P25 6:720P60 7:720P50 8:720P30 9:720P25 10:1600*900@60(USB OUTPUT) 11:1440*900@60HZ(USB OUTPUT) 12:1366*768@60HZ(USB OUTPUT) 13:1280*800@60HZ(USB OUTPUT) 14:1024*768@60HZ(USB OUTPUT) 15:800*600@60HZ(USB OUTPUT) 16:800*600@30HZ(USB OUTPUT) 17:640*480@60HZ(USB OUTPUT) 18:640*480@30HZ(USB OUTPUT)
CAM_IDWrite		8x 01 04 22 0p 0q 0r 0s FF	pqrs: Camera ID (=0000 to FFFF)

Command	Function	Command Packet	Note
SYS_Menu	Menu On	8x 01 06 06 02 FF	Turn on the menu
	Menu Off	8x 01 06 06 03 FF	Turn off the menu
	Menu Back	8x 01 06 06 10 FF	Menu step back
	Menu Ok	8x 01 7E 01 02 00 01 FF	Menu ok
IR_Transfer	Transfer On	8x 01 06 1A 02 FF	Receive IR (remote commander) CODE from VISCA communication ON/OFF
	Transfer Off	8x 01 06 1A 03 FF	
IR_Receive	On	8x 01 06 08 02 FF	IR (remote commander) receive ON/OFF
	Off	8x 01 06 08 03 FF	
	On/Off	8x 01 06 08 10 FF	
IR_ ReceiveReturn	On	8x 01 7D 01 03 00 00 FF	IR (remote commander) receive message via the VISCA communication ON/OFF
	Off	8x 01 7D 01 13 00 00 FF	
Pan_tiltDrive	Up	8x 01 06 01 VV WW 03 01 FF	VV: Pan speed 0x01 (low speed) to 0x18 (high speed)
	Down	8x 01 06 01 VV WW 03 02 FF	WW: Tilt speed 0x01 (low speed) to 0x14 (high speed)
	Left	8x 01 06 01 VV WW 01 03 FF	YYYY: Pan Position (TBD)
	Right	8x 01 06 01 VV WW 02 03 FF	ZZZZ: Tilt Position (TBD)
	Upleft	8x 01 06 01 VV WW 01 01 FF	
	Upright	8x 01 06 01 VV WW 02 01 FF	
	DownLeft	8x 01 06 01 VV WW 01 02 FF	
	DownRight	8x 01 06 01 VV WW 02 02 FF	
	Stop	8x 01 06 01 VV WW 03 03 FF	

Command	Function	Command Packet	Note
	AbsolutePosition	8x 01 06 02 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	
	RelativePosition	8x 01 06 03 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	
	Home	8x 01 06 04 FF	
	Reset	8x 01 06 05 FF	
Pan-tiltLimitSet	Set	8x 01 06 07 00 0W	W:1 UpRight 0:DownLeft
		0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	YYYY: Pan Limit Position(TBD)
	Clear	8x 01 06 07 01 0W 07 0F 0F 0F 07 0F 0F 0F FF	ZZZZ: Tilt Limit Position(TBD)

Inquiry commands

VISCA inquiry commands return information on your LUMiO 12x's settings.

Table 11 *Inquiry commands*

In the table below, **y = x + 8, where x = the camera's address**. To set your LUMiO 12x's address, use the **OSD menu** and navigate to **SYSTEM**, then **ADDRESS** (see **Understanding OSD menu settings**).

Command	Command Packet	Return Packet	Note
CAM_PowerInq	8x 09 04 00 FF	y0 50 02 FF	On
		y0 50 03 FF	Off (Standby)
CAM_ZoomPosInq	8x 09 04 47 FF	y0 50 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_FocusModeInq	8x 09 04 38 FF	y0 50 02 FF	Auto Focus
		y0 50 03 FF	Manual Focus
CAM_FocusPosInq	8x 09 04 48 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Position

Command	Command Packet	Return Packet	Note
CAM_WBModeInq	8x 09 04 35 FF	y0 50 00 FF	Auto
		y0 50 01 FF	Indoor mode
		y0 50 02 FF	Outdoor mode
		y0 50 03 FF	OnePush mode
		y0 50 04 FF	ATW
		y0 50 05 FF	Manual
CAM_RGainInq	8x 09 04 43 FF	y0 50 00 00 0p 0q FF	pq: R Gain
CAM_BGainInq	8x 09 04 44 FF	y0 50 00 00 0p 0q FF	pq: B Gain
CAM_AEModeInq	8x 09 04 39 FF	y0 50 00 FF	Full Auto
		y0 50 03 FF	Manual
		y0 50 0A FF	Shutter priority
		y0 50 0B FF	Iris priority
		y0 50 0D FF	Bright
CAM_ShutterPosInq	8x 09 04 4A FF	y0 50 00 00 0p 0q FF	pq: Shutter Position
CAM_IrisPosInq	8x 09 04 4B FF	y0 50 00 00 0p 0q FF	pq: Iris Position
CAM_GainPosiInq	8x 09 04 4C FF	y0 50 00 00 0p 0q FF	pq: Gain Position
CAM_ BrightPosiInq	8x 09 04 4D FF	y0 50 00 00 0p 0q FF	pq: Bright Position
CAM_ ExpCompModeInq	8x 09 04 3E FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ExpCompPosInq	8x 09 04 4E FF	y0 50 00 00 0p 0q FF	pq: ExpComp Position
CAM_ApertureInq	8x 09 04 42 FF	y0 50 00 00 0p 0q FF	pq: Aperture Gain
CAM_MemoryInq	8x 09 04 3F FF	y0 50pp FF	pp: Memory number last operated.

Command	Command Packet	Return Packet	Note
SYS_MenuModeInq	8x 09 06 06 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_LR_ReverseInq	8x 09 04 61 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_PictureFlipInq	8x 09 04 66 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_IDInq	8x 09 04 22 FF	y0 50 0p 0q 0r 0s FF	pqrs: Camera ID
CAM_VersionInq	8x 09 00 02 FF	y0 50 ab cd	
		mn pq rs tu vw FF	
VideoSystemInq	8x 09 06 23 FF	y0 50 pp FF	pp: 0~18 Video format 0:1080P60 1:1080P50 2:1080I60 3:1080I50 4:1080P30 5:1080P25 6:720P60 7:720P50 8:720P30 9:720P25 10:1600*900@60(USB OUTPUT) 11:1440*900@60HZ(USB OUTPUT) 12:1366*768@60HZ(USB OUTPUT) 13:1280*800@60HZ(USB OUTPUT) 14:1024*768@60HZ(USB OUTPUT) 15:800*600@60HZ(USB OUTPUT) 16:800*600@30HZ(USB OUTPUT) 17:640*480@60HZ(USB OUTPUT)

Command	Command Packet	Return Packet	Note
			18:640*480@30HZ(USB OUTPUT)
IR_Transfer	8x 09 06 1A FF	y0 50 02 FF	On
		y0 50 03 FF	Off
IR_Receive	8x 09 06 08 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
IR_ReceiveReturn		y0 07 7D 01 04 00 FF	Power ON/OFF
		y0 07 7D 01 04 07 FF	Zoom tele/wide
		y0 07 7D 01 04 38 FF	AF On/Off
		y0 07 7D 01 04 33 FF	CAM_Backlight
		y0 07 7D 01 04 3F FF	CAM_Memory
		y0 07 7D 01 06 01 FF	Pan_tiltDrive
Pan-tiltMaxSpeedInq	8x 09 06 11 FF	y0 50 ww zz FF	ww: Pan Max Speed
			zz: Tilt Max Speed
Pan-tiltPosInq	8x 09 06 12 FF	y0 50 0w 0w 0w 0w	wwww: Pan Position
		0z 0z 0z 0z FF	zzzz: Tilt Position

Camera pan/tilt, zoom and exposure values

The VISCA values provided in the tables below specify the pan/tilt, zoom and exposure settings that will help you adjust and control your LUMiO 12x.

Table 12 *VISCA pan/tilt absolute position values*

Pan Angle	VISCA Value	Tilt Angle	VISCA Value
-170	0xF670	-30	0xFE50
-135	0xF868	0	0x0000
-90	0xFAF0	30	0x01B0
-45	0xFD78	60	0x0360
0	0x0000	90	0x510
45	0x0288		
90	0x0510		
135	0x0798		
170	0x0990		

Table 13 *VISCA pan/tilt speed values*

Setting value	Pan (degree/second)	Setting value	Tilt (degree/second)
0	0.3	0	0.3
1	1	1	1
2	1.5	2	1.5
3	2.2	3	2.2
4	2.4	4	3.6
5	2.6	5	4.7
6	2.8	6	6
7	3.0	7	8
8	3.2	8	10
9	3.4	9	12
10	3.8	10	15
11	4.5	11	18

Setting value	Pan (degree/second)	Setting value	Tilt (degree/second)
12	6	12	23
13	9	13	30
14	15	14	39
15	19	15	48
16	25	16	59
17	32	17	69
18	38	18	80
19	45		
20	58		
21	75		
22	88		
23	105		
24	120		

Table 14 *VISCA exposure values*

Value	Shutter speed (in seconds)	Value	Iris	Value	Gain
21	1/10000	0	close	0	0dB
20	1/6000	1	f32	1	2dB
19	1/4000	2	f28	2	4dB
18	1/3000	3	f24	3	6dB
17	1/2000	4	f22	4	8dB
16	1/1500	5	f18	5	10dB
15	1/1000	6	f14	6	12dB
14	1/725	7	f11	7	14dB

Value	Shutter speed (in seconds)	Value	Iris	Value	Gain
13	1/500	8	f9.6	8	16dB
12	1/350	9	f6.8	9	18dB
11	1/250	10	f5.6	10	20dB
10	1/180	11	f4.8	11	22dB
9	1/125	12	f4.0	12	24dB
8	1/100	13	f3.4	13	26dB
7	1/90	14	f2.8	14	28dB
6	1/60	15	f2.4		
5	1/30	16	f2.0		
4	1/15	17	f1.8		
3	1/8				
2	/				
1	/				
0	/				

Table 15 *VISCA zoom values*

Zoom level	Value
x1(wide)	0x0
x1.2	0x8D0
x1.5	0x1194
x2	0x1A58
x3	0x2610
x5	0x31D4
x5.8	0x34BC

Zoom level	Value
x6.9	0x37A4
x8.2	0x3A98
x9.9	0x3D8C
x11.8(tele)	0x4000

PELCO-D protocol command list

You can communicate with your LUMiO 12x using the following PELCO-P protocol commands.

Function	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
Up	0xFF	Address	0x00	0x08	Pan Speed	Tilt Speed	SUM
Down	0xFF	Address	0x00	0x10	Pan Speed	Tilt Speed	SUM
Left	0xFF	Address	0x00	0x04	Pan Speed	Tilt Speed	SUM
Right	0xFF	Address	0x00	0x02	Pan Speed	Tilt Speed	SUM
Upleft	0xFF	Address	0x00	0x0C	Pan Speed	Tilt Speed	SUM
Upright	0xFF	Address	0x00	0x0A	Pan Speed	Tilt Speed	SUM
DownLeft	0xFF	Address	0x00	0x14	Pan Speed	Tilt Speed	SUM
DownRight	0xFF	Address	0x00	0x12	Pan Speed	Tilt Speed	SUM
Zoom In	0xFF	Address	0x00	0x20	0x00	0x00	SUM
Zoom Out	0xFF	Address	0x00	0x40	0x00	0x00	SUM
Focus Far	0xFF	Address	0x00	0x80	0x00	0x00	SUM
Focus Near	0xFF	Address	0x01	0x00	0x00	0x00	SUM
Set Preset	0xFF	Address	0x00	0x03	0x00	Preset ID	SUM
Clear Preset	0xFF	Address	0x00	0x05	0x00	Preset ID	SUM
Call Preset	0xFF	Address	0x00	0x07	0x00	Preset ID	SUM
Query Pan Position	0xFF	Address	0x00	0x51	0x00	0x00	SUM
Query Pan Position Response	0xFF	Address	0x00	0x59	Value High Byte	Value Low Byte	SUM
Query Tilt Position	0xFF	Address	0x00	0x53	0x00	0x00	SUM
Query Tilt Position Response	0xFF	Address	0x00	0x5B	Value High Byte	Value Low Byte	SUM
Query Zoom Position	0xFF	Address	0x00	0x55	0x00	0x00	SUM

Function	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
Query Zoom Position Response	0xFF	Address	0x00	0x5D	Value High Byte	Value Low Byte	SUM

PELCO-P protocol command list

You can communicate with your LUMiO 12x using the following PELCO-P protocol commands.

Function	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Up	0xA0	Address	0x00	0x08	Pan Speed	Tilt Speed	0xAF	XOR
Down	0xA0	Address	0x00	0x10	Pan Speed	Tilt Speed	0xAF	XOR
Left	0xA0	Address	0x00	0x04	Pan Speed	Tilt Speed	0xAF	XOR
Right	0xA0	Address	0x00	0x02	Pan Speed	Tilt Speed	0xAF	XOR
Upleft	0xA0	Address	0x00	0x0C	Pan Speed	Tilt Speed	0xAF	XOR
Upright	0xA0	Address	0x00	0x0A	Pan Speed	Tilt Speed	0xAF	XOR
DownLeft	0xA0	Address	0x00	0x14	Pan Speed	Tilt Speed	0xAF	XOR
DownRight	0xA0	Address	0x00	0x12	Pan Speed	Tilt Speed	0xAF	XOR
Zoom In	0xA0	Address	0x00	0x20	0x00	0x00	0xAF	XOR
Zoom Out	0xA0	Address	0x00	0x40	0x00	0x00	0xAF	XOR
Focus Far	0xA0	Address	0x00	0x80	0x00	0x00	0xAF	XOR
Focus Near	0xA0	Address	0x01	0x00	0x00	0x00	0xAF	XOR
Set Preset	0xA0	Address	0x00	0x03	0x00	Preset ID	0xAF	XOR
Clear Preset	0xA0	Address	0x00	0x05	0x00	Preset ID	0xAF	XOR
Call Preset	0xA0	Address	0x00	0x07	0x00	Preset ID	0xAF	XOR
Query Pan Position	0xA0	Address	0x00	0x51	0x00	0x00	0xAF	XOR
Query Pan Position Response	0xA0	Address	0x00	0x59	Value High Byte	Value Low Byte	0xAF	XOR
Query Tilt Position	0xA0	Address	0x00	0x53	0x00	0x00	0xAF	XOR
Query Tilt Position Response	0xA0	Address	0x00	0x5B	Value High Byte	Value Low Byte	0xAF	XOR
Query Zoom Position	0xA0	Address	0x00	0x55	0x00	0x00	0xAF	XOR

Function	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Query Zoom Position Response	0xA0	Address	0x00	0x5D	Value High Byte	Value Low Byte	0xAF	XOR

Support

This section includes supplementary information that helps support your technical understanding of your LUMiO 12x and includes instructions on contacting Epiphan's support team.

Topics covered include:

- Customer support

Customer support

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- **Email**: support@epiphan.com
- **Online chat**: www.epiphan.com/support (Monday to Friday between 9am and 5pm Eastern)
- **Call**: 1-877-599-6581 / 613-599-6581

Be sure to include as much information about your problem as possible. Including:

- Problem description
- Details of the video source (connection, resolution, refresh rate, etc.)
- Product serial number

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October 6, 2016

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Environmental Information

The equipment that you bought has required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment. In order to avoid the dissemination of those substances in our environment and to diminish the pressure on the natural resources, we encourage you to use the appropriate take-back systems. Those systems will reuse or recycle most of the materials of your end life equipment in a sound way. The crossed-out wheeled bin symbol invites you to use those systems. If you need more information about collection, reuse and recycling systems, please contact your local or regional waste administration. You can also contact us for more information on the environmental performance of our products.

Important Safety Warnings

WARNING: This product has no user-serviceable parts and the battery used in this device is not replaceable. Do not attempt to disassemble. Return the device for service.

CAUTION, RISK OF ELECTRIC SHOCK: This device may have multiple AC power cords installed. All power sources shall be disconnected before servicing to avoid shock hazard.

ATTENTION: Cet appareil ne contient aucun composant pouvant être entretenu ou réparé par l'utilisateur. En cas de panne, retourner l'appareil pour réparation.

ATTENTION, RISQUE DE CHOC ÉLECTRIQUE: Cet appareil peut être équipé de multiples cordons d'alimentation en courant alternatif. Pour placer cet appareil hors tension, débrancher tous les cordons d'alimentation sans exception.

FCC & CE 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
2. This device must accept any interference received, including interference that may cause undesired operation.

Marking by the symbol CE indicates compliance of this device with EMC directive of the European Community and meets or exceeds the following technical standard.

EN 55022 - Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment.

FC CE

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