

SILENT SENTINEL ARE SPECIALISTS IN LONG RANGE
OPTICAL SENSORS INCLUDING BOTH COOLED AND
UNCOOLED THERMAL CAMERAS



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If you need the latest version of this manual, please contact us. Silent Sentinel recommends that you use this manual under the guidance of professionals.

Version Control

Version	Author	Approver	Date
1.0	Simon Luke	Matthew Short	

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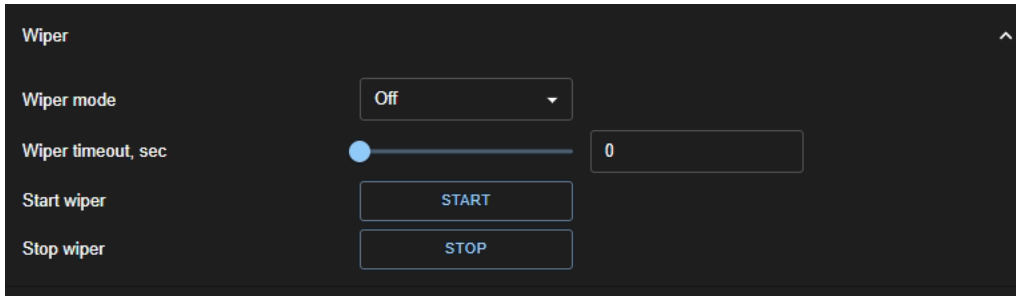
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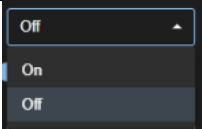
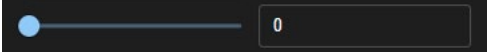
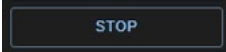
Overview

This document provides an overview of the NexOS Payload controls at a high level and aims to cover the features that are common to all systems. Therefore, it does not cover the details of specific payloads. This will be covered in the relevant Annex's.

Wiper

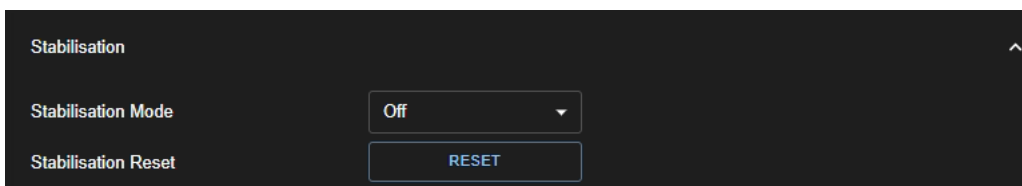
Provides the ability to control the wiper. Only applicable for systems where wiper unit is fitted.

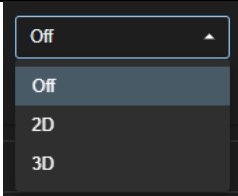


Function	Description	Image
Wiper Mode	Switches the wiper on.	
Wiper timeout	Amount of time used to wipe before stopping. If set to 0, wiper will continuously clean until the "STOP" button is pressed.	
Start Wiper	Starts the wiper.	
Stop Wiper	Stops the wiper.	

Stabilisation

Implements electronic stabilization for each video source.

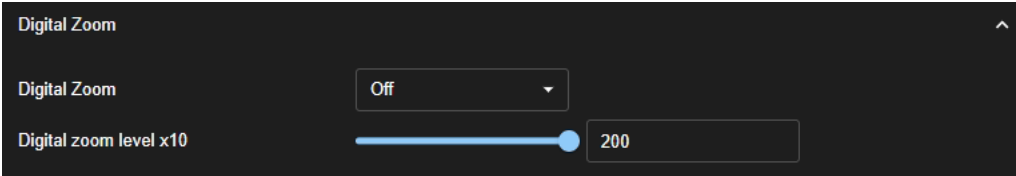


Function	Description	Image
Stabilisation Mode	Determines if enabled and type of stabilization implemented. Off – Disabled 2D – Vertical/Horizontal 3D – Vertical/Horizontal & Rotation	

Stabilisation Reset	Restarts the stabilisation function.	RESET
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Digital Zoom

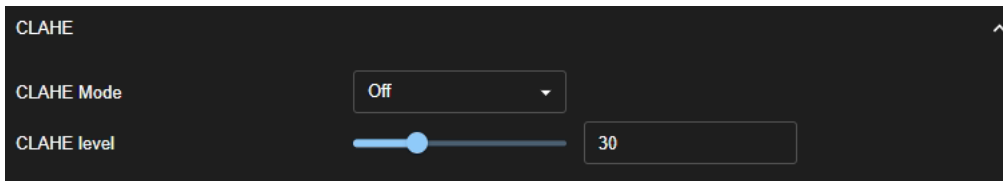
Implements up to 20x digital zoom.



Function	Description	Image
Digital Zoom	Determines if enabled or disabled.	Off Off On
Digital Zoom Level x10	Determines Zoom level where 200 is 20x.	200

CLAHE

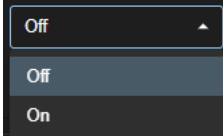
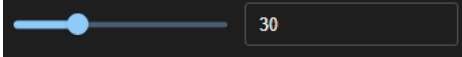
CLAHE is a post processing algorithm that can be used to improve the contrast of an image.



CLAHE

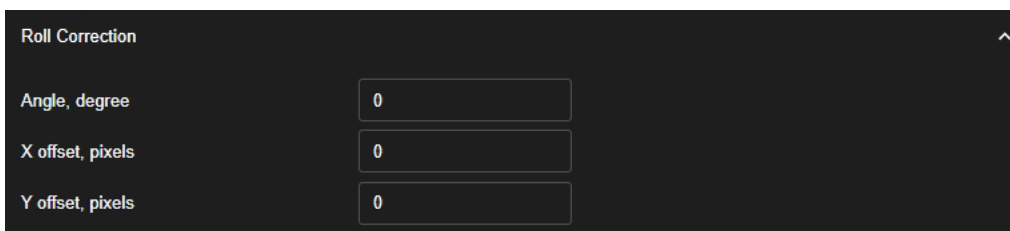
CLAHE Mode: Off

CLAHE level: 30

Function	Description	Image
CLAHE Mode	Determines if enabled or disabled.	
CLAHE Level	Level is represented as a percentage where maximum is 100%	

Roll Correction

Roll correction can be used in the event where a system is not mounted vertically/horizontally.



Roll Correction

Angle, degree: 0

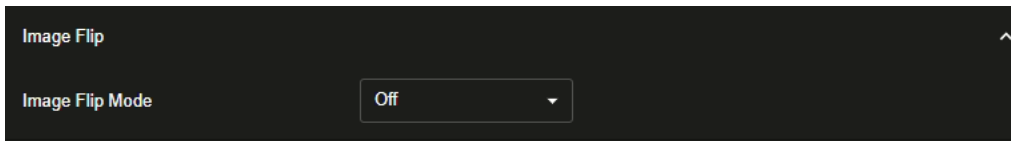
X offset, pixels: 0

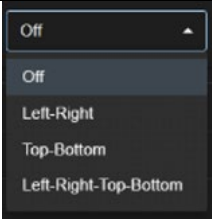
Y offset, pixels: 0

Function	Description	Image
Angle	Determines the angle of the roll in degrees.	
X Offset	Determines the horizontal offset of the image in pixels.	
Y Offset	Determines the vertical offset of the image in pixels.	

Image Flip

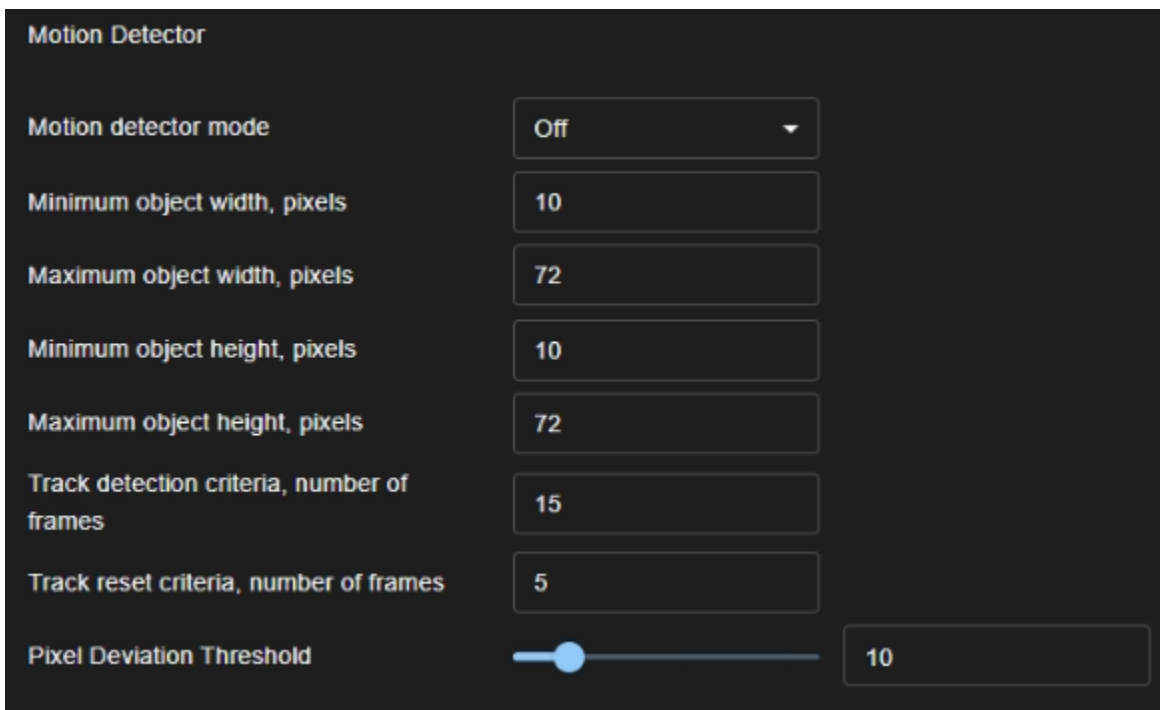
Can be used to flip the image for systems mounted in different axis.


 A dark-themed control panel for 'Image Flip'. It features a title 'Image Flip' at the top left and an upward arrow at the top right. Below the title, there is a label 'Image Flip Mode' followed by a dropdown menu currently set to 'Off'.

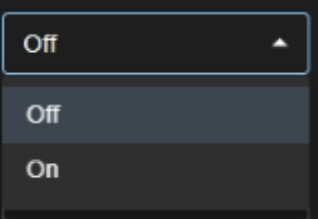
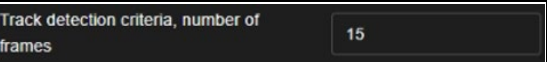
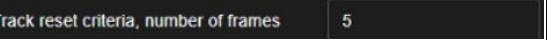
Function	Description	Image
Image Flip Mode	Determines how the image is flipped.	

Motion Detector

Motion Detection is available for each payload. It is a detection algorithm that looks for deviation in pixels in a frame. The deviation/movement of pixels will be outlined with a bounding box. Note that Motion Detector is available if tracking package is purchased.

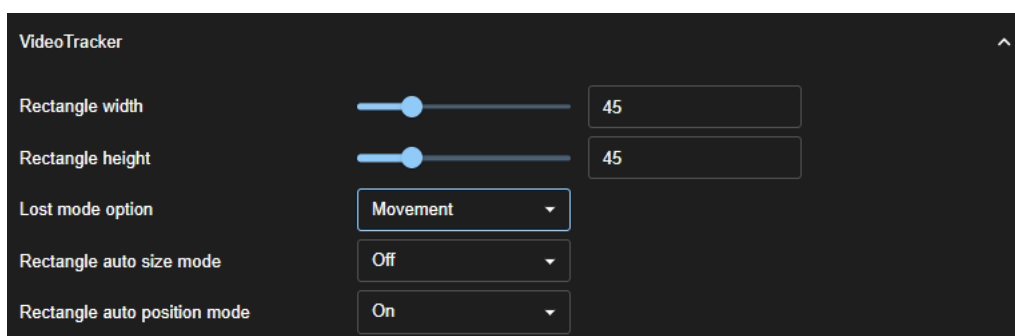

 A dark-themed control panel for 'Motion Detector'. It has a title 'Motion Detector' at the top left. Below the title, there are several settings:

- 'Motion detector mode' with a dropdown menu set to 'Off'.
- 'Minimum object width, pixels' with a text input field containing '10'.
- 'Maximum object width, pixels' with a text input field containing '72'.
- 'Minimum object height, pixels' with a text input field containing '10'.
- 'Maximum object height, pixels' with a text input field containing '72'.
- 'Track detection criteria, number of frames' with a text input field containing '15'.
- 'Track reset criteria, number of frames' with a text input field containing '5'.
- 'Pixel Deviation Threshold' with a slider control and a text input field set to '10'.

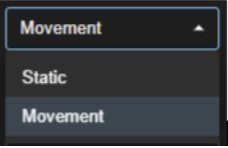
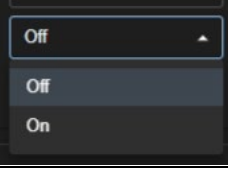
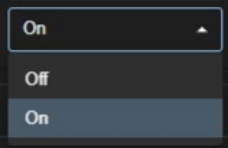
Function	Description	Image
Motion detector mode	Parameter used to enable/disable the detection algorithm.	
Minimum object width, pixels	Determines the minimum size of the object width detected in pixels. Default value of 10.	
Maximum object width, pixels	Determines the maximum size of the object width detected in pixels. Default value of 72.	
Minimum object height, pixels	Determines the minimum size of the object height detected in pixels. Default value of 10.	
Maximum object height, pixels	Determines the maximum size of the object height detected in pixels. Default value of 72.	
Track detection criteria, number of frames	Number of video frames the object should move in any direction to be detected	
Track reset criteria, number of frames.	Number of video frames of a lost detected target before it is excluded from detection list. Default value of 5.	
Pixel Deviation Threshold.	Minimum target contrast to be detected. Default value of 10. Range 0 – 255.	

Video Tracker

Provides the ability to perform closed loop video tracking of a target. The target is selected manually via the View and Control tab.



Function	Description	Image
Rectangle Width	Determines the size of the tracking window height. Applicable if Rectangle auto resize is "off".	

Rectangle Height	Determines the size of the tracking window height. Applicable if Rectangle auto resize is "off".	
Lost mode option	Movement - this mode the library does not search for an object to recapture automatically, but only updates the coordinates of the tracking rectangle based on the previously calculated velocity components of the objects. Static - This mode does not perform any calculations and the tracking rectangle coordinates remain the same as before going into this mode. This mode is necessary to "freeze" the tracking algorithm for a certain number of frames.	
Rectangle auto size mode.	When enabled, automatically adjusts the position and size of the tracking rectangle.	
Rectangle auto position mode.	When enabled, automatically corrects the position of the tracking rectangle so that the object is in the centre of the tracking rectangle.	

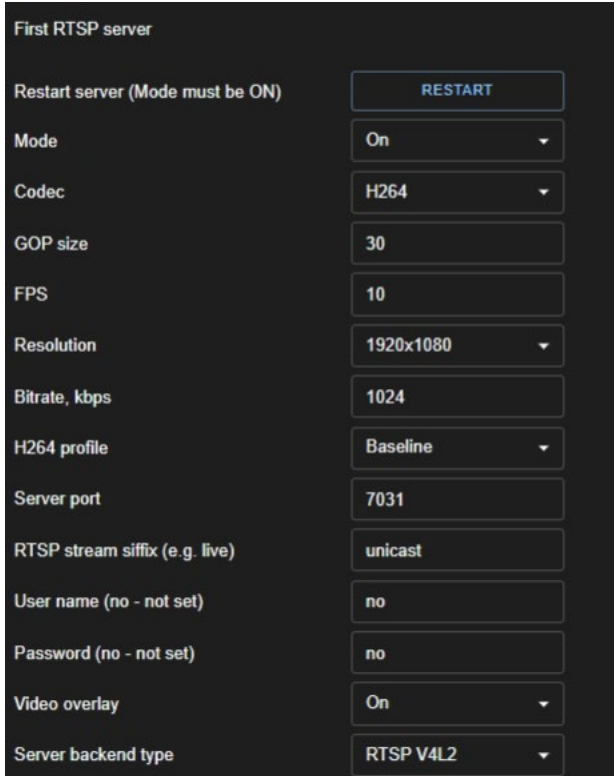
First RTSP Server

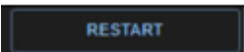
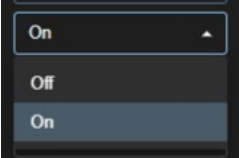
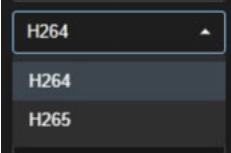
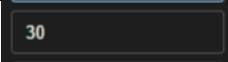
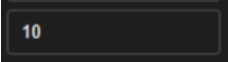
Provides the ability to stream the video source. The format of the video stream uses the following:

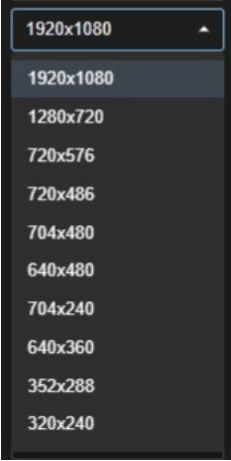
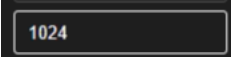
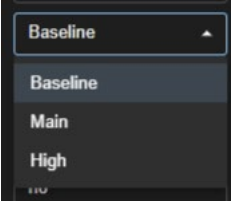
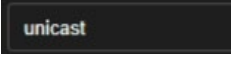
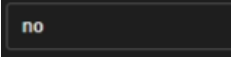
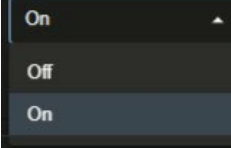
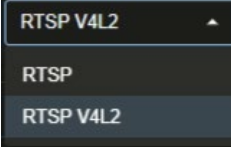
rtsp://IP_Address:PortNumber/Suffix

example:

rtsp://192.168.1.88:7031/unicast



Function	Description	Image
Restart Server	Restarts the video server. Mode must be set to "ON" to be in effect.	
Mode	Enables/Disables the video stream.	
Codec	Determines the compression algorithm used.	
GOP Size	The distance between two keyframes, measured in the number of frames.	
FPS	Defines the framerate of the video stream e.g. 10 frames per second.	

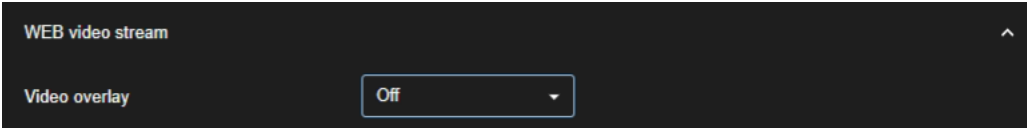
Resolution	Defines the video resolution of the stream.	
Bitrate (kbps)	The amount of data per second in the video file.	
H264 Profile	Baseline – low powered 1000:1 compression ratio. Main – Improved frame prediction algorithms. Suitable for SD resolutions. High – High powered 2000:1 compression ratio.	
Server Port	Define the video stream port number.	
RTSP Stream Suffix	Determines the name of the video stream.	
Username	Provides the ability to require a username. Default is “no” username required.	
Password	Provides the ability to require a password. Default is “no” password required.	
Video Overlay	Determines if the video stream includes overlay information. Includes Pan/Tilt position, digital zoom & Focus setting.	
Server backend type	RTSP – follows basic protocol so that typical applications e.g. VLC can open the video stream. RTSPV4L2 – uses an external library so that the stream follows the stricter RTSP protocol so that all applications can view the video stream.	

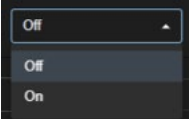
Second RTSP Server

Follows the same format as the first RTSP Server.

WEB Video Stream

Parameters to control the video stream seen on NexOS Live Viewer.



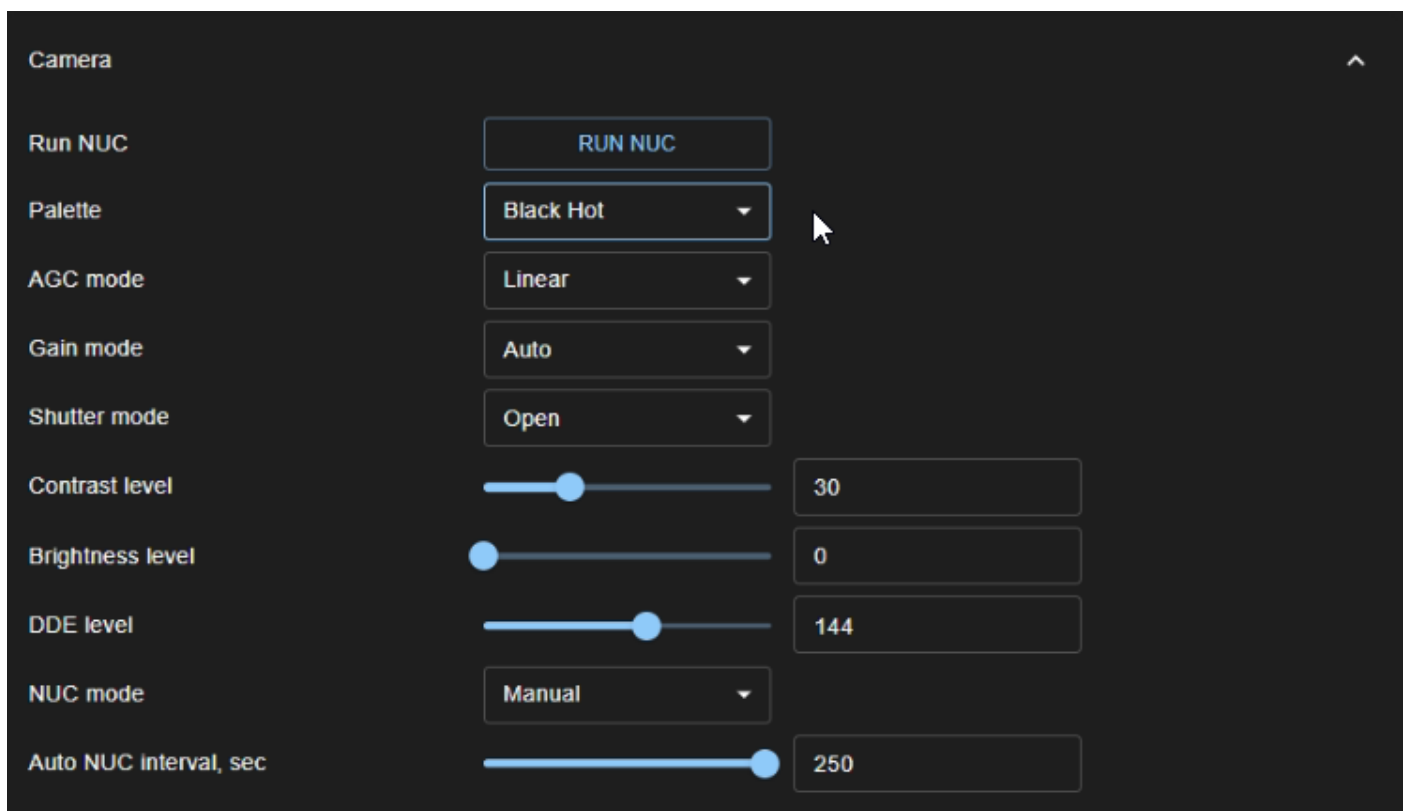
Function	Description	Image
Video overlay	Determines if the video stream includes overlay information. Includes Pan/Tilt position, digital zoom & Focus setting.	

Thermal Camera

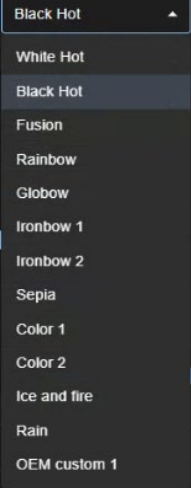
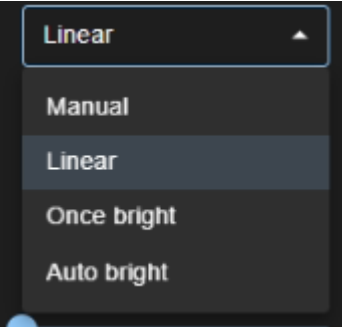
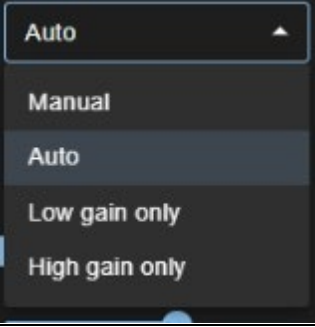
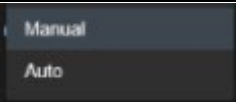
The following describes the available settings for the Thermal Camera. If multiple thermal cameras are connected to the system, each section will be labelled i.e. NexOS SWIR, NexOS MWIR & NexOS LWIR. Note each depending on the camera, not all settings are available. A profile can be created to save these settings by using the “Settings Profile” option.

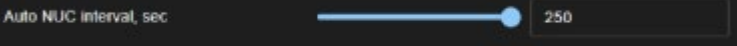
Camera

Under the Camera drop-down menu, the following settings are available.



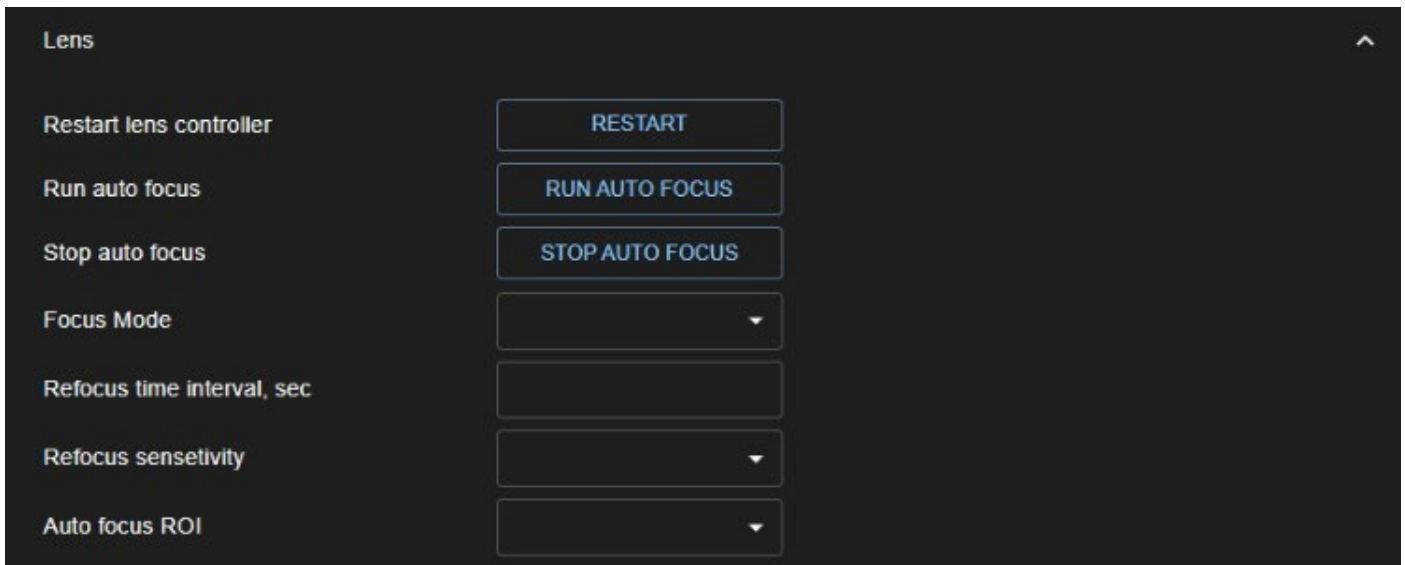
Function	Description	Image
Run NUC	Non-uniformity correction (NUC) adjusts for minor detector drift that occurs as the scene and environment change.	

Palette	Colour Palettes are used to change the appearance of a scene and highlight areas of an image without making any changes to temperature data.	
AGC Mode	AGC (Automatic Gain Control) is used to artificially amplify pixels in the scene so that objects can be seen more clearly.	
Gain Mode	This parameter determines the state of the Gain, the following options available are:	
Contrast Level	The contrast level compares the colour and brightness of features within an image to make features more distinguishable. This is implemented in NexOS as a slider between 0 - 100.	
Brightness Level	Determines the brightness of the image.	
DDE Level	DDE (Digital Detail Enhancement)	
Run NUC Mode	This allows the customer to determine whether NUC should be automatically run or manually.	

Auto NUC interval	Defines the time between NUC activations. This is represented as a slider from 0 - 250 seconds.	 Auto NUC interval, sec 250
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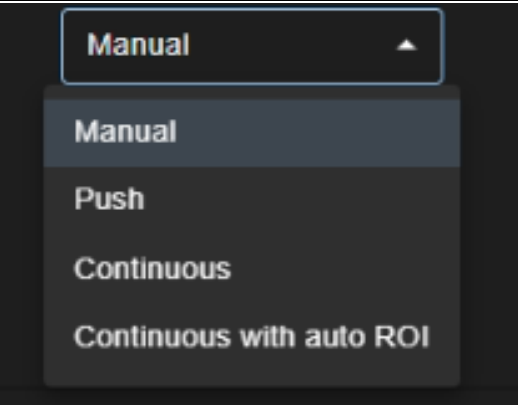
Lens

NexOS allows the user to have full control over the lens attached to the sensor. The available parameters and options are listed below.



The screenshot shows the 'Lens' control panel. It includes the following controls:

- Restart lens controller**: A button labeled 'RESTART'.
- Run auto focus**: A button labeled 'RUN AUTO FOCUS'.
- Stop auto focus**: A button labeled 'STOP AUTO FOCUS'.
- Focus Mode**: A dropdown menu.
- Refocus time interval, sec**: A text input field.
- Refocus sensitivity**: A dropdown menu.
- Auto focus ROI**: A dropdown menu.

Function	Description	Image
Restart Lens Controller	Restarts the lens controller.	
Run Auto Focus	Selecting this runs Auto Focus	
Stop Auto Focus	Selecting this stops Auto Focus	
Focus Mode	NexOS provides the user with ability to change the way that the lens focuses. The following options are: Manual – No automatic focus, the user will need to focus far/near manually. Push – One time focus on a selected object.	

	Continuous – The lens will focus automatically when there is a change in zoom.	
Refocus Time Interval	Defines a period between each focus session. Value is defined in seconds.	Refocus time interval, sec
Refocus Sensitivity	Sets the focus rate. NOTE: this is only applicable for Focus Mode “Manual”.	Normal Off Low Normal High
Autofocus ROI	Sets the percentage of the image of which the lens will focus on. The available options are the following: Centre 70% Centre 50% Centre 30% Centre 10%	Center 30% Center 70% Center 50% Center 30% Center 10%

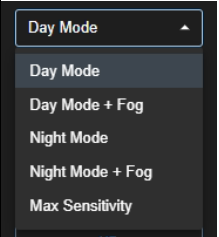
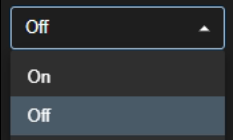
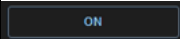
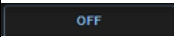
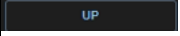
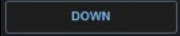
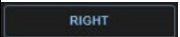
Daylight Camera

The following describes the available settings for the Daylight Camera. If multiple A profile can be created to save these settings by using the “Settings Profile” option.

Camera

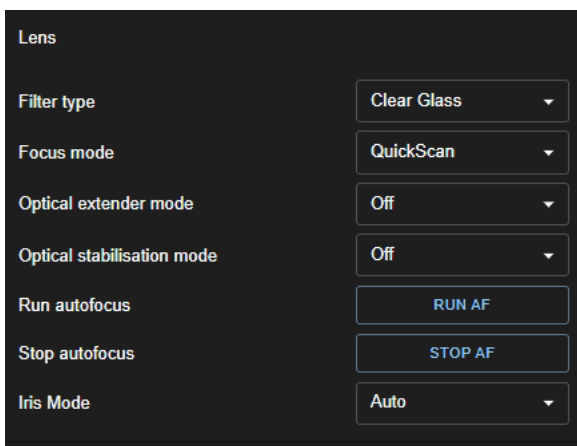
Under the Camera drop-down menu, the following settings are available.

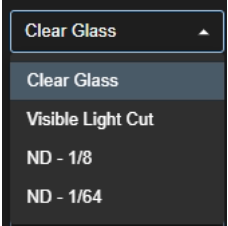
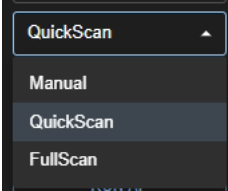
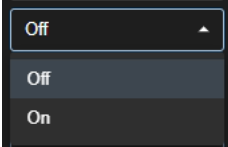
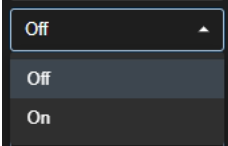
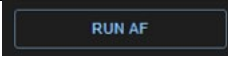
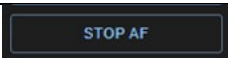
Scene Modes	Night Mode
Camera OSD menu	Off
OSD menu On	ON
OSD menu Off	OFF
OSD menu Set	SET
OSD menu Up	UP
OSD menu Down	DOWN
OSD menu Left	LEFT
OSD menu Right	RIGHT

Function	Description	Image
Scene Modes	Provides different display settings: Day Mode – Standard mode. Day Mode + Fog – Standard mode with fog filter. Night Mode – Converted to greyscale image. Night Mode - Converted to greyscale image with fog filter. Max Sensitivity – Night Mode with sensitivity set to maximum.	
Camera OSD Menu	Used to display the daylight camera settings.	
OSD Menu On	Display the Daylight camera settings menu.	
OSD Menu Off	Switch off the Daylight camera settings menu.	
OSD Menu Set	Used to select a camera setting.	
OSD Menu Up	Navigate up.	
OSD Menu Down	Navigate down.	
OSD Menu Left	Navigate left	
OSD Menu Right	Navigate right.	

Lens

NexOS allows the user to have full control over the lens attached to the sensor. The available parameters and options are listed below.



Function	Description	Image
Filter type	Provides different colour filters to the image: Clear Glass – No post processing setting (default) Visible Light Cut – Removes some visible light. ND (1/8) – Reduces the intensity of all wavelengths by 1/8th. ND (1/64) - reduces the intensity of all wavelengths by 1/64th.	
Focus Mode	Determines focus type. Manual – manually focus in/out. QuickScan – Performs small range focus. FullScan – Performs a full range focus.	
Optical Extender Mode	Provides 2x magnification.	
Optical Stabilisation	Provides stabilisation.	
Run Autofocus	Start autofocus.	
Stop Autofocus	Stop autofocus.	
Iris Mode	Sets the iris mode. Auto – provides automatic iris. Manual – One time iris on power-up.	