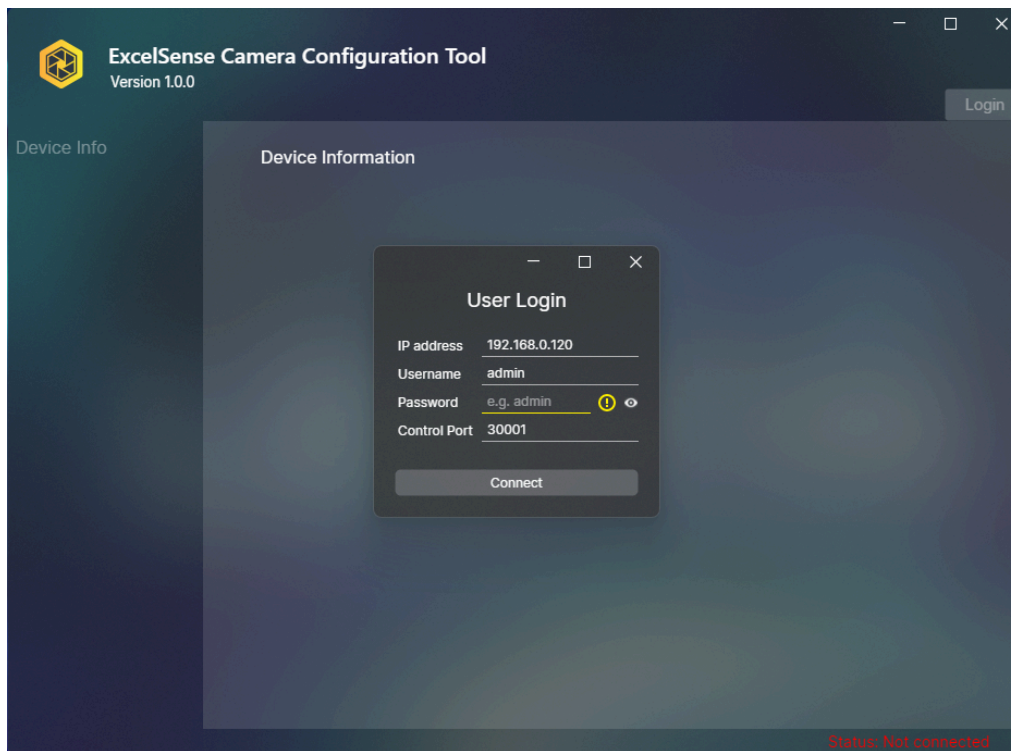




EXCELSENSE



ExcelSense Camera Configuration Tool

Desktop Application User Guide

| | |
|---------------------------|------------|
| Document Version | 1.2 |
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| Compatible App Version(s) | 1.0.x |



Table of Contents

| | |
|---|-----------|
| Table of Contents..... | 1 |
| About..... | 2 |
| Installation..... | 2 |
| User Login Window..... | 3 |
| Main Window..... | 4 |
| User Session Management..... | 4 |
| Status Bar..... | 4 |
| Camera Configuration..... | 4 |
| Device Info..... | 5 |
| Stream Settings..... | 6 |
| Sensor Settings..... | 7 |
| Image Settings..... | 8 |
| Exposure Settings..... | 9 |
| Scene Settings..... | 11 |
| Device Settings..... | 12 |
| Local Network..... | 12 |
| Device Port..... | 13 |
| Date and Time..... | 14 |
| OSD..... | 15 |
| Advanced Settings..... | 16 |
| CVBS..... | 17 |
| Trigger Settings..... | 18 |
| General Trigger Capture..... | 18 |
| Illumination Control..... | 18 |
| Self-Clean Timer Options (ToughEye-1700™ Only)..... | 19 |
| Network Services..... | 20 |
| Port Mapping..... | 20 |
| IP Filter..... | 21 |
| DDNS..... | 22 |
| User Settings..... | 23 |
| User Management..... | 23 |
| Add User..... | 24 |
| View User..... | 25 |
| Modify User..... | 25 |
| Delete User..... | 26 |
| Security - Change Password..... | 26 |
| Maintenance..... | 27 |
| Software Restart..... | 27 |
| Factory Reset..... | 28 |
| Upload Firmware to Sensor Module..... | 28 |
| Settings Manager..... | 28 |
| Export Settings..... | 28 |
| Import Settings..... | 29 |
| Application Logs..... | 29 |
| Live View Window..... | 30 |

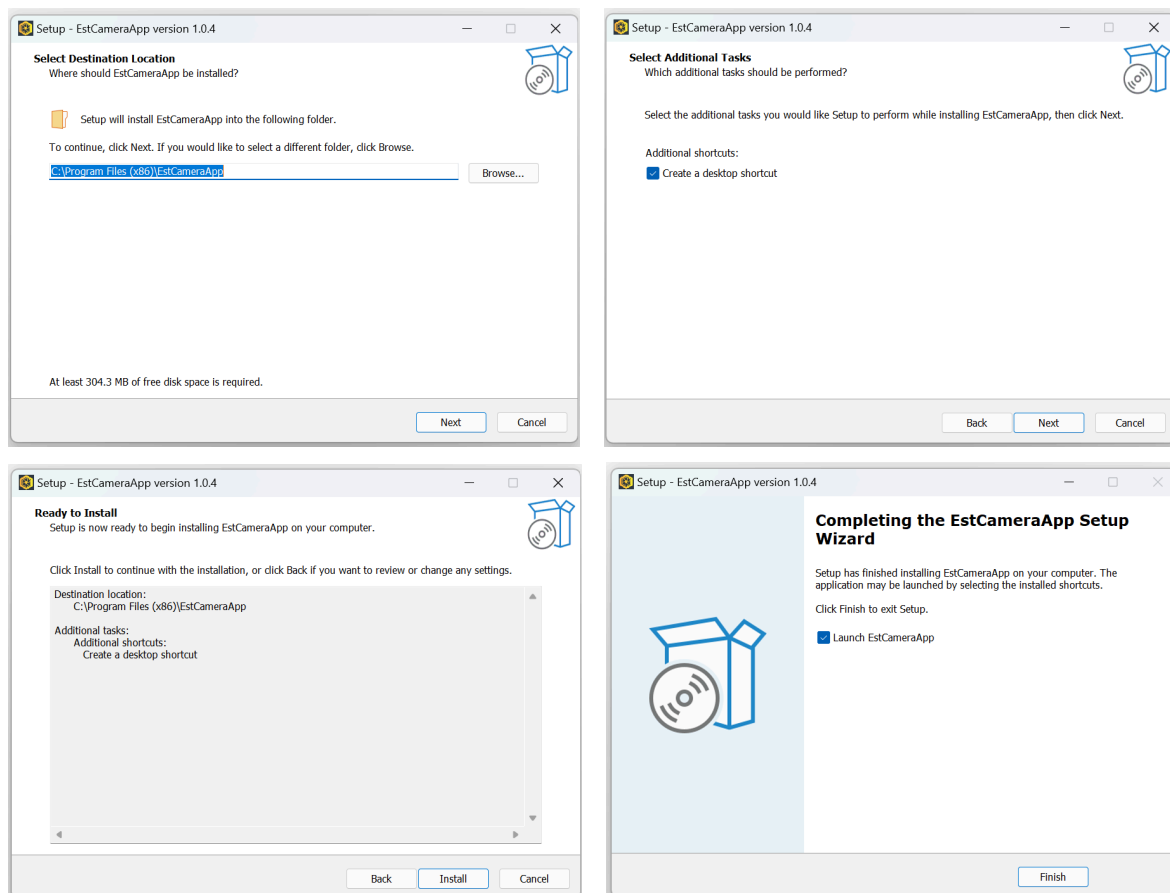
About

This document provides information and guidance on using the ExcelSense Camera Desktop Application, or EST Desktop App, intended for use with ExcelSense IP cameras, including ToughEye-1700™ and ToughCam-1000™.

For alternative options to configure camera parameters and stream video, the ONVIF Device Manager tool can be used (available [here](#)) as well as the web interface (web manuals available [here](#)).

Installation

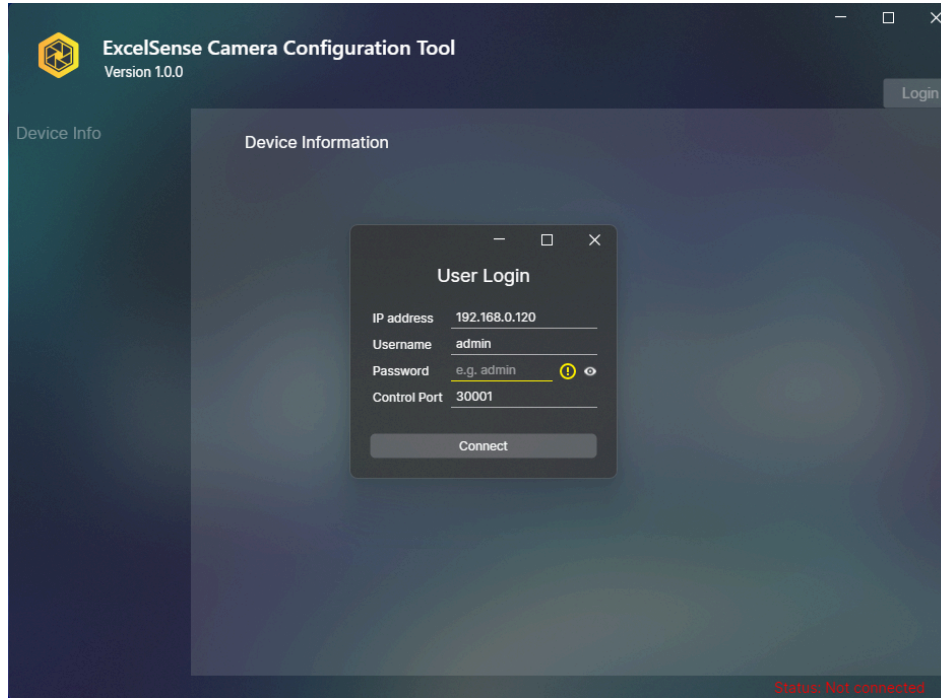
To install the latest version of the application, download the corresponding installer available [here](#). Run the installer wizard and follow the instructions as shown below.



Upon successful installation following the above steps, the application will be launched with two windows: the main application window and the user login window.

User Login Window

Once the application has been installed, the following page can be seen once it is run.



| | |
|--------------|---|
| IP address | The IP address of the camera |
| Username | The username of the account being logged into |
| Password | The password of the account being logged into |
| Control Port | The control port through which this application communicates with the camera to send and receive data |

Note: By default, the factory settings for the IP address, admin username, and control port are entered into the login screen.

The login window dynamically checks for acceptable user inputs in each field. When an invalid input is detected, a yellow warning icon appears to the right of the field with a message indicating the reason for the warning which is shown when hovering over the icon.

If an unsuccessful login attempt was made, an error pop-up will be displayed. Otherwise, upon success, the login window disappears as the main window loads the cameras' settings.

Main Window

User Session Management

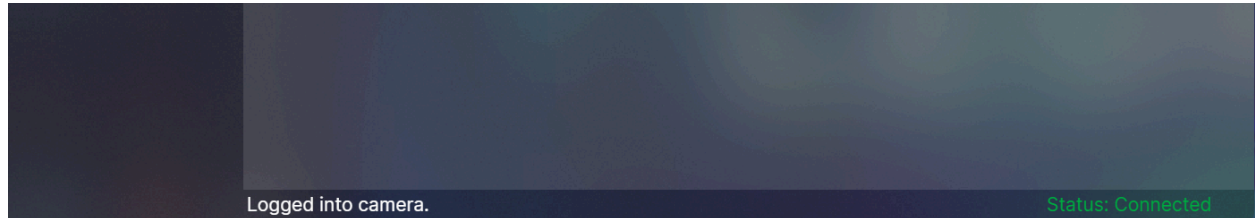
User session management on the application is handled through the Login / Logout button located on the top right corner of the main window.

As described in the User Login Window section, the login window appears on application startup. If this window is closed, it can be re-opened by clicking the Login button on the main window.

When working in a user session, the session can be logged out at any point by clicking the Logout button on the main window. This will log the user out of the current session, and open the user login window so a different session can be commenced.

Status Bar

The status bar is located at the bottom of the main window. As shown below, on the right corner the network connection status of the camera in the current session is displayed. In the left corner, the status and result of events in the current session are shown.



Camera Configuration

The application provides many configuration options for the camera, which can be managed through the settings menu tabs on the left side of the page. The privilege level of the user profile will determine which configuration and menu options will be available. Refer to the User Settings section for more information on the privilege levels of user profiles.



Device Info

The screenshot shows the 'ExcelSense Camera Configuration Tool' window. The title bar includes the ExcelSense logo, the text 'ExcelSense Camera Configuration Tool', 'Version 1.0.1', and window control buttons. The interface has a dark theme. On the left is a sidebar menu with options: 'Device Info' (selected), 'Stream Settings', 'Sensor Settings', 'Device Settings', 'Trigger Settings', 'Network Services', 'User Settings', and 'Maintenance'. The main area is titled 'Device Information' and contains a form with the following fields:

| Field | Value |
|------------------|-------------------------------|
| Device Name | <input type="text"/> |
| Camera Model | ToughEye |
| Manufacturer | ExcelSense Technologies Corp. |
| MAC Address | 00:1C:27:1C:7E:6E |
| Device ID | 1C7E6E |
| Hardware Version | V2600842 |
| Firmware Version | v3.6.16071006.272.0.7.4.5 |

At the bottom of the main area, there is a status bar with the text 'Logged into camera.' on the left and 'Status: Connected' on the right. The 'Live View' and 'Logout' buttons are located in the top right corner of the main area.

This tab provides information on the camera module connected, including its MAC address and firmware version. A device name can also be set for the camera as another way to differentiate between cameras.

Stream Settings



ExcelSense Camera Configuration Tool
Version 1.0.1

Live View Logout

Stream Settings

| Stream Label | 1 | 2 | 3 |
|--------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Video Encode Type | H265 | H264 | MJPEG |
| Video Encode Level | Mid | Mid | None |
| Resolution | 1920×1080 | D1 | CIF |
| Frame Rate | 30 | 15 | 12 |
| I-Frame | 60 | 30 | 0 |
| Bitrate Type | VBR | CBR | VBR |
| Video Quality | | | |
| Bit Rate (kbps) | 6000 | 1500 | 256 |
| | <small>Range: 500-6000 kbps</small> | <small>Range: 100-6000 kbps</small> | <small>Range: 100-1500 kbps</small> |

Refresh Apply

Stream settings applied. Status: Connected

This tab allows for receiving and applying settings related to the video of the three camera streams, including encoding, resolution, frame rate, and data rate. Depending on the camera capabilities for each substream, different options and ranges are available to be applied to the camera.

| | |
|--------------------|--|
| Video Encode Type | The video codec determines the image quality and network bandwidth required by a video. Acceptable options: H265, H264, MJPEG |
| Video Encode Level | A higher encode level has a higher performance, but requires higher processing power. Acceptable Options: <ul style="list-style-type: none"> • H265: Mid • H264: Low, Mid, High • MJPEG: None |
| Resolution | Pixel density of the image. Acceptable Options: <ul style="list-style-type: none"> • Stream 1: 1920x1080, 1280x720 • Stream 2: D1 [704x480(NTSC), 704x576(PAL)], VGA, 640x360, CIF [352x240(NTSC), 352x288(PAL)], QVGA • Stream 3: VGA, CIF [352x240(NTSC), 352x288(PAL)], QVGA |
| Frame Rate | The rate of frames displayed on the image per second. Acceptable options vary based on various settings. |



| | |
|-----------------|--|
| I-Frame | The I-Frame interval is a complete frame containing all necessary information to display the image. These frames act as reference points for subsequent frames, which only record changes from previous frames. Acceptable options vary based on various settings. |
| Bitrate Type | <p>The bit rate, or the number of bits (data) transmitted per unit of time, can be controlled in two possible ways:</p> <ul style="list-style-type: none">● CBR: Constant Bit Rate<ul style="list-style-type: none">○ The compression speed is fast; however, an improperly set bitrate may lead to loss of quality.● VBR: Variable Bit Rate<ul style="list-style-type: none">○ The bit rate changes according to the image complexity. The encoding efficiency is high and the definition of motion images can be ensured. |
| Video Quality | The image quality of the camera output. Only available when using the variable bitrate (VBR) type. Acceptable range: 1 ~ 9, where 9 is the highest video quality |
| Bit Rate (kbps) | <p>When using the variable bitrate type (VBR), this value is the maximum bitrate.</p> <p>When using the constant bitrate type (CBR), this value is the set bitrate.</p> |

Sensor Settings

The Sensor Settings tab holds all settings related to the camera image sensor. In this application, these settings are separated into three subcategories: Image, Exposure, and Scene settings.

Image Settings



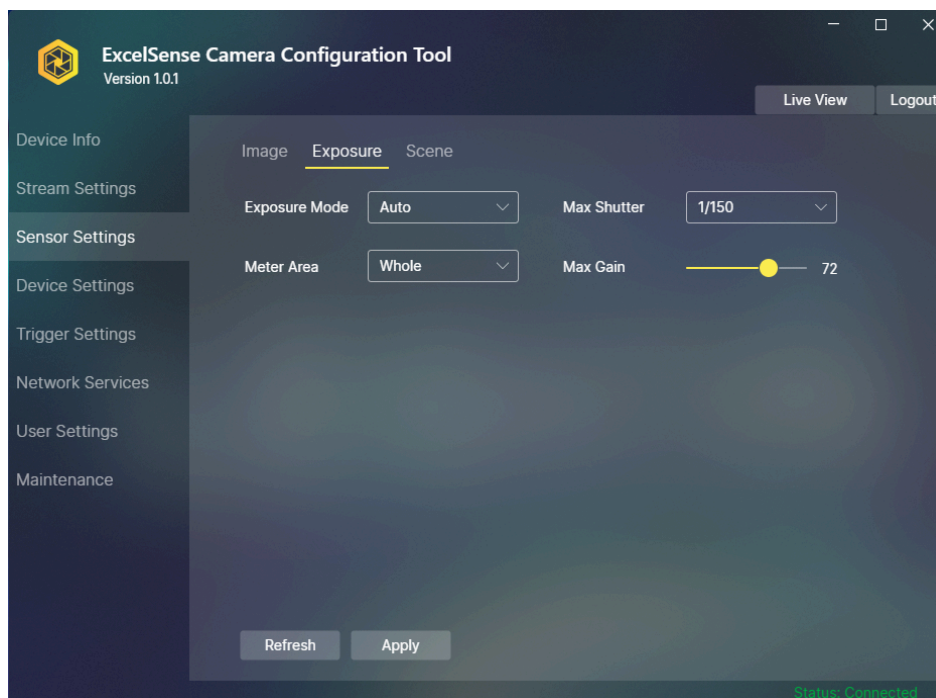
The image setting parameters are defined in the table below.

| | |
|------------|---|
| Brightness | Adjusts the brightness of the image. Acceptable Range: 0 ~ 100 |
| Saturation | Adjusts the saturation of the image. Acceptable Range: 0 ~ 100 |
| Sharpness | Adjusts the sharpness of the image. Acceptable Range: 0 ~ 100 |
| Contrast | Adjusts the contrast of the image. Acceptable Range: 0 ~ 100 |
| WDR | Wide Dynamic Range: Adjusts the ability to capture details in scenes with varying brightness levels to ensure clear visibility in both well-lit and shadowed areas, simultaneously. Acceptable Range (if enabled): 0 ~ 100 |
| HLC | High Light Compensation: Reduces overexposure in specific areas of an image, allowing for enhanced visibility and detail in bright or strongly illuminated regions. Acceptable Range (if enabled): 0 ~ 100 |



| | |
|--------------------|--|
| BLC | <p>Backlight Compensation: Improves visibility in scenes with strong backlighting by adjusting the exposure to ensure details in the foreground are adequately captured and not overshadowed by the bright background.</p> <p>Acceptable Range (if enabled): 0 ~ 100</p> |
| Defog | <p>Reduces the impact of atmospheric haze or fog in images, enhancing visibility and clarity in challenging weather conditions.</p> <p>Acceptable Range (if enabled): 0 ~ 100</p> |
| Anti-Shake | <p>Reduces the effects of camera shake during image or video capture, resulting in sharper and more stable captures.</p> |
| White-Balance Mode | <p>Adjustment of color temperatures to accurately reproduce natural colors in different lighting conditions.</p> <p>Acceptable Options: Auto, Tungsten, Fluorescent, Daylight, Shadow, Manual (Red, Blue Gain acceptable range: 1 ~ 100).</p> |

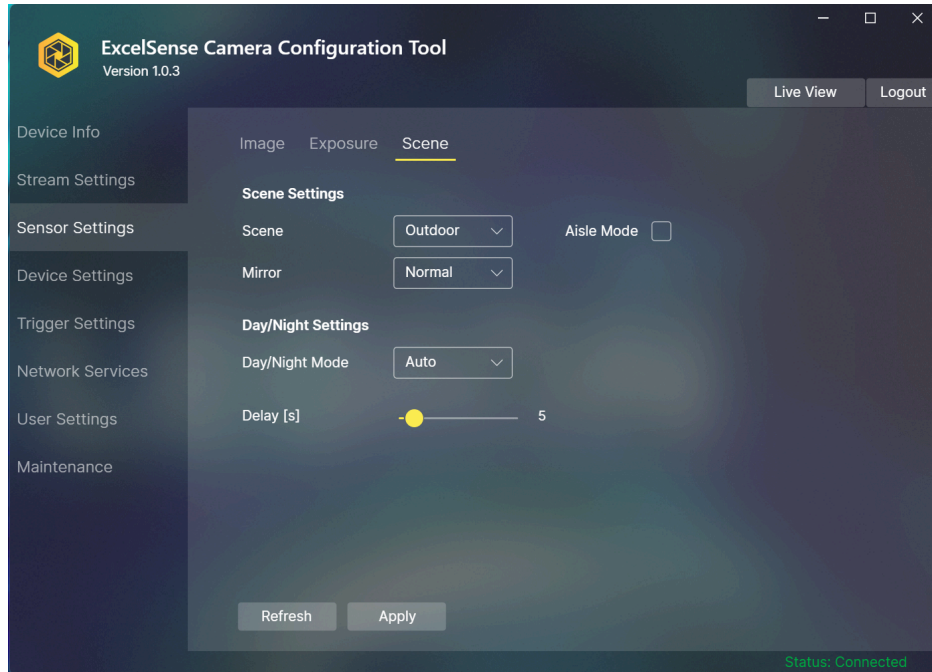
Exposure Settings



Exposure settings refer to parameters, such as shutter speed, that control the amount of light entering the camera, influencing the brightness and clarity of the captured image.

| | |
|---------------|---|
| Exposure Mode | <p>Auto: Exposure is set automatically</p> <p>Manual: Exposure is set depending on Meter Area, Shutter Setting, and Gain Setting.</p> <p>Shutter Priority: Sets the shutter speed to a fixed value, while the gain is automatically adjusted by the system.</p> |
| Meter Area | <p>Metering refers to how the camera determines the correct shutter speed and aperture.</p> <p>Whole: Uses the entire image equally to weight the calculation for shutter and aperture parameters</p> <p>Center spot: The center of the image is used in the calculation</p> <p>Center Area: The middle area is weighted higher than the rest of the image in the calculation.</p> |
| Max Shutter | <p>Shutter speed adjusts automatically based on ambient brightness. The max shutter speed can be controlled from this dropdown menu.</p> <p>Notes:</p> <ul style="list-style-type: none"> • The dropdown list of shutter options (e.g. “1/150”) refers to the <i>time that the image sensor is exposed</i>, not the shutter speed. <ul style="list-style-type: none"> ◦ This means that a max shutter setting of 1/150 indicates that the maximum time the shutter will be open for, or the image sensor will be exposed for, is 1/150s, or 6.7ms. • Additional shutter options are available when WDR is disabled. |
| Max Gain | <p>Gain adjusts automatically based on external light, up to the maximum value specified by the user.</p> |

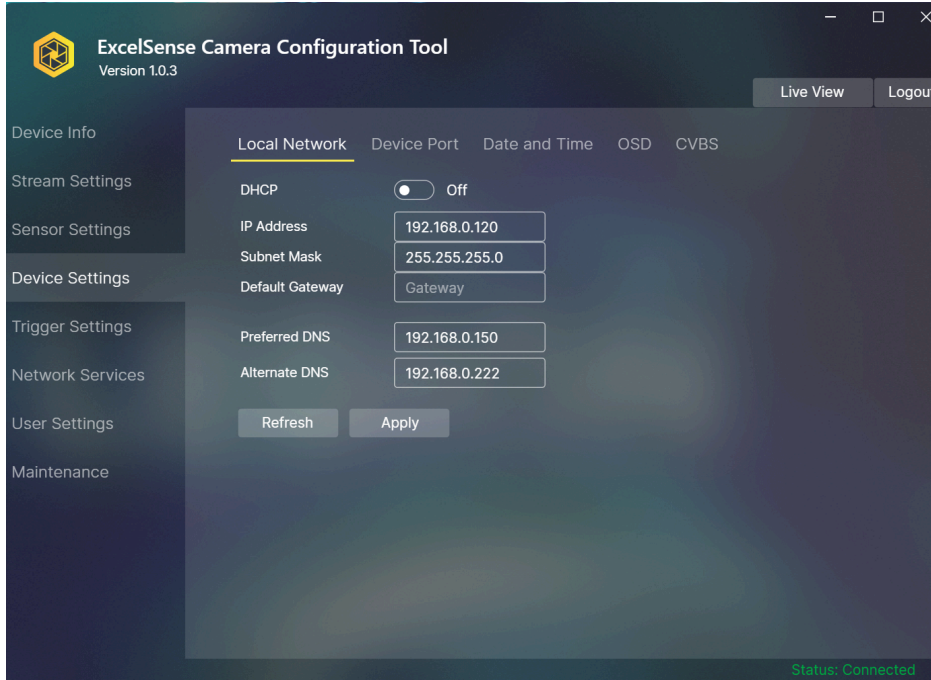
Scene Settings



| | |
|-------------|--|
| Scene | Indoor: Suited to indoor environments |
| | Outdoor: Suited to outdoor environments |
| Mirror | Normal: Default image |
| | Horizontal: Image plane is mirrored about the Y-axis |
| | Vertical: Image plane is mirrored about the X-axis |
| | Horizontal+Vertical: Image plane is mirrored about the X and Y-axis |
| Aisle Mode | Rotates the image 90 deg clockwise |
| D/N Setting | Auto: Image color is switched based on ambient brightness. In Night Mode, the stream is switched to grayscale. |
| | Day Mode: Camera is always in Day Mode. |
| | Night Mode: Camera is always in Night Mode. |
| Delay (s) | Amount of transition delay in seconds |

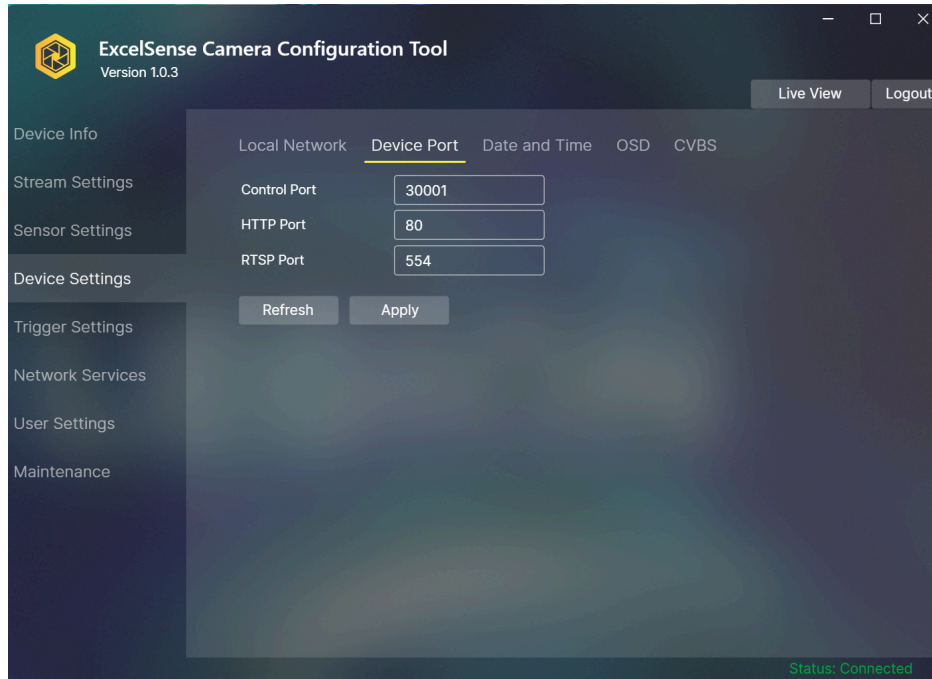
Device Settings

Local Network



| | |
|-----------------|---|
| IP Protocol | IPv4 is the IP protocol that uses an address length of 32 bits. |
| DHCP IP | IP address that the DHCP server assigned to the device. |
| IP Address | Device IP address that can be set as required. |
| Subnet Mask | Subnet mask of the network adapter. |
| Default Gateway | This parameter must be set if the client accesses the device through a gateway. |
| Preferred DNS | IP address of the preferred DNS server. |
| Alternate DNS | IP address of the alternate domain server. If the preferred DNS server is faulty, the device uses the alternate DNS server to resolve domain names. |

Device Port



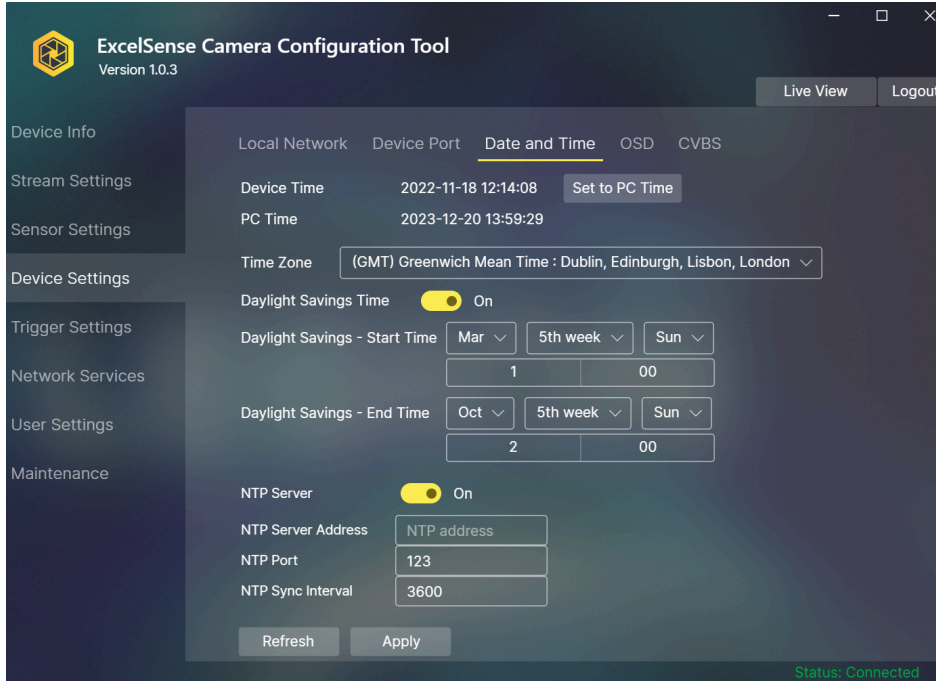
Control Port Port used for audio and video transfer and signaling interaction. Valid range of 1025-65535.

HTTP Port Port used in web access. Valid range of 1-65535.

RTSP Port RTSP protocol port. Valid range of 1-65535.

HTTPS Port Port used in secured web access. Valid range of 1-65535.

Date and Time



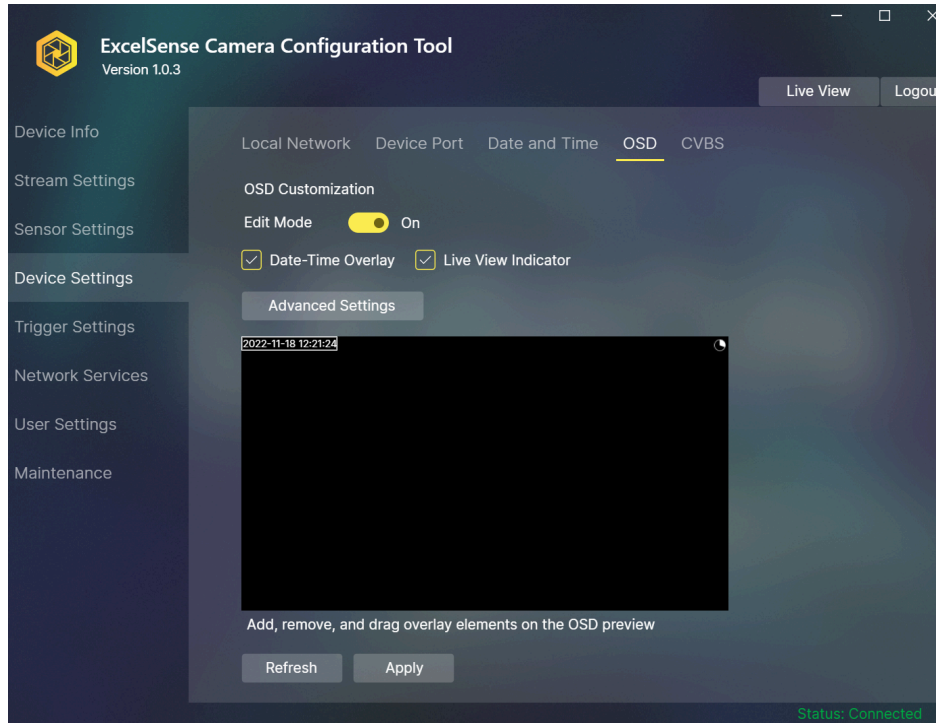
The screenshot shows the 'ExcelSense Camera Configuration Tool' window, Version 1.0.3. The 'Date and Time' tab is selected. The interface includes a sidebar with navigation options: Device Info, Stream Settings, Sensor Settings, Device Settings, Trigger Settings, Network Services, User Settings, and Maintenance. The main panel displays the following settings:

- Local Network**: Device Port
- Device Time**: 2022-11-18 12:14:08 (with a 'Set to PC Time' button)
- PC Time**: 2023-12-20 13:59:29
- Time Zone**: (GMT) Greenwich Mean Time : Dublin, Edinburgh, Lisbon, London (dropdown menu)
- Daylight Savings Time**: On (toggle switch)
- Daylight Savings - Start Time**: Mar, 5th week, Sun (dropdowns and input fields for 1 and 00)
- Daylight Savings - End Time**: Oct, 5th week, Sun (dropdowns and input fields for 2 and 00)
- NTP Server**: On (toggle switch)
- NTP Server Address**: NTP address (input field)
- NTP Port**: 123 (input field)
- NTP Sync Interval**: 3600 (input field)

Buttons for 'Refresh' and 'Apply' are at the bottom. A 'Status: Connected' indicator is in the bottom right corner.

| | |
|----------------------|--|
| Device Time | Device display time. |
| PC Time | Current time on Personal Computer. |
| Time Zone | Sets the camera time zone |
| Daylight Saving Time | When the DST start time arrives, the device time automatically goes forward one hour. When the DST end time arrives, the device time automatically goes backward one hour. |
| NTP Server | Enables usage of NTP |
| NTP Server Address | IP address or domain name of the NTP server. |
| NTP Port | Port number of the NTP server. |
| NTP Sync Interval | Interval between synchronization checks, in seconds, between the local device time and the NTP server time. Valid range of 10-3600s. |

OSD



Edit Mode

On ("Edit Mode"): Enables editing of OSD overlays over a black background

Off ("Preview Mode"): Disables further editing of overlays, and enables the live video from the base stream (stream ID 1) with the currently configured OSD overlays.

Date-Time Overlay

Indicates whether to display the time. Once selected, a sample date-time overlay will appear in the Edit Mode OSD preview, which can be dragged to a desired location.

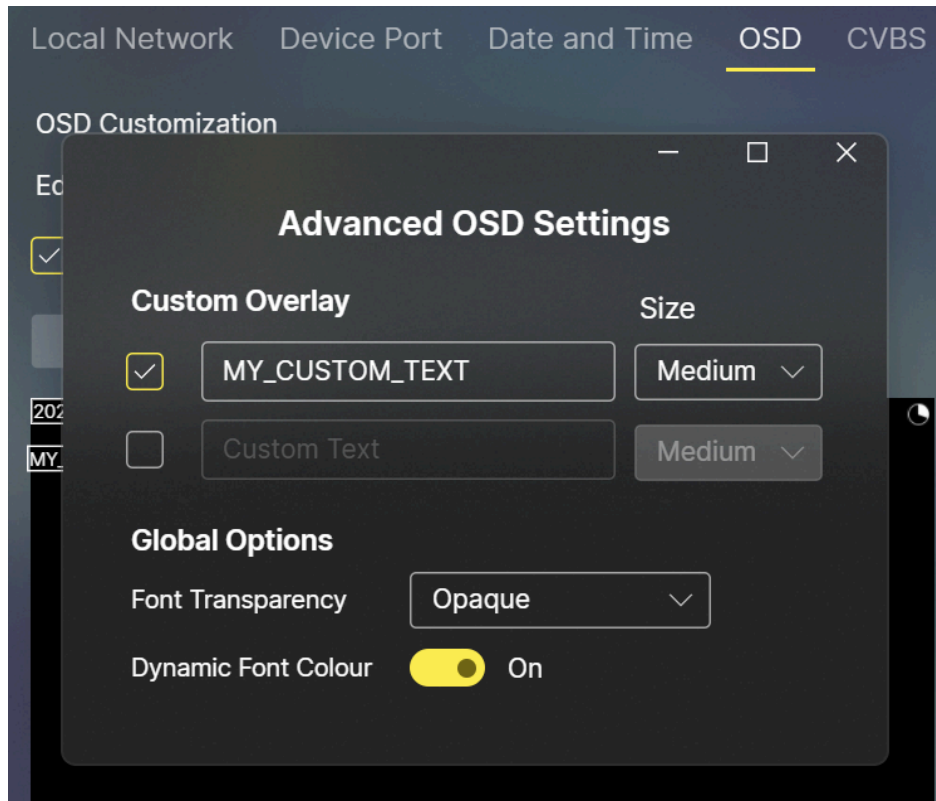
Live View Indicator

Enables or disables the live view indicator overlay, which updates as the camera displays new frames and indicates that the current stream is live.

Advanced Settings

Opens the Advanced Settings window for custom text overlays.

Advanced Settings

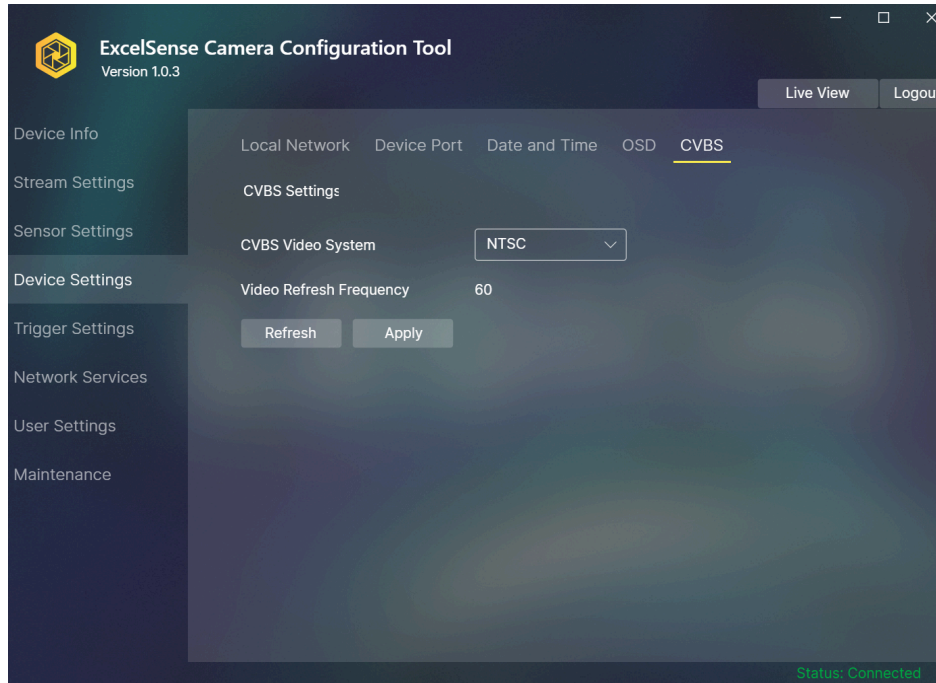


To add a custom text overlay, select the checkbox, enter the custom text in the adjacent field, and select the font from the size dropdown.

Below are the global options for the OSD overlays:

| | |
|---------------------|--|
| Font Transparency | Set the level of font transparency desired for the overlays |
| Dynamic Font Colour | If contrast between the text overlay and the background image is too low, the text colour in that section of the view will change to allow for higher contrast (i.e. from black to white if the background is too dark). |

CVBS



The camera's video system can be configured in this tab.

Video System

PAL: Used in Europe and China.

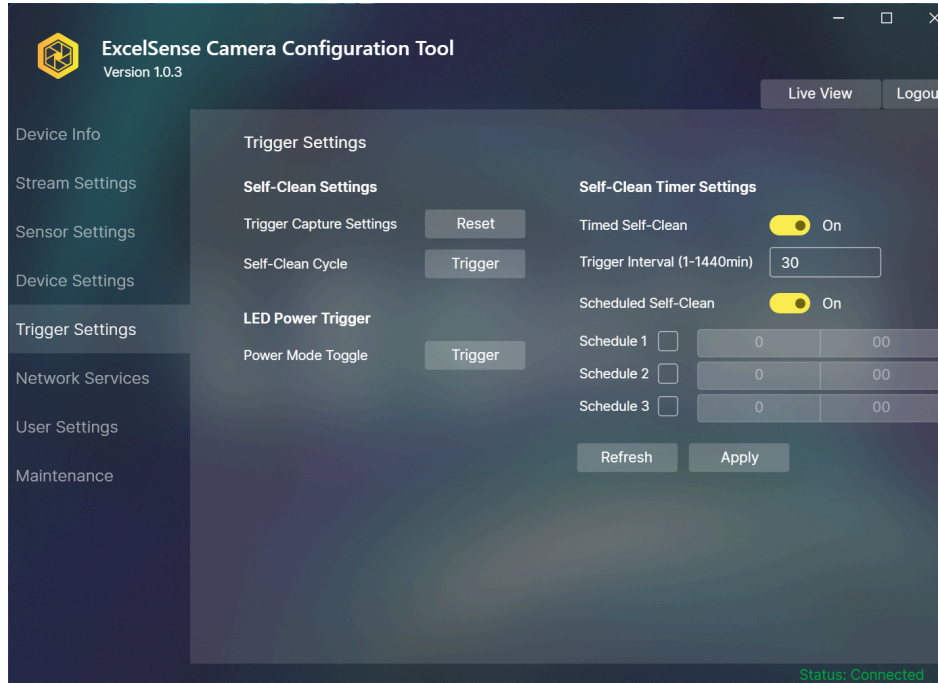
NTSC: Used in North America and Japan.

Note:

- These settings affect various camera settings including:
 - Analog output (only available on ToughEye-1700™)
 - Effective video resolution (D1, CIF)
 - Shutter speed options

| | |
|-------------------------|--------------------------------------|
| Video Refresh Frequency | 50 Hz: corresponds to the PAL system |
| | 60 Hz: corresponds to NTSC system |

Trigger Settings



The camera's trigger settings can be modified in this tab.

General Trigger Capture

| | |
|--|---|
| Trigger Capture Settings Reset | Resets the camera's settings for receiving and capturing external trigger signals, which are used to command various actions such as self-cleaning cycles for all ToughEye-1700™ products. |
| Self-Clean Cycle Trigger (Test Trigger) | Sends a single trigger command to the device. On the ToughEye-1700™, this corresponds to a self-clean trigger command. Note: If this feature is not working, it may be due to the camera's Trigger Capture Settings. Click the Reset button next to Trigger Capture Settings, and perform the self-clean trigger again. |

Illumination Control

| | |
|-----------------------|--|
| LED Power Mode Toggle | Perform on-demand LED toggle trigger command sequence on ToughEye-1700™ visible-light units. See the ToughEye-1700™ user manual, found here , for more information on this feature. Note: If this feature is not working, it may be due to the camera's Trigger Capture Settings. Click the Reset button next to Trigger |
|-----------------------|--|



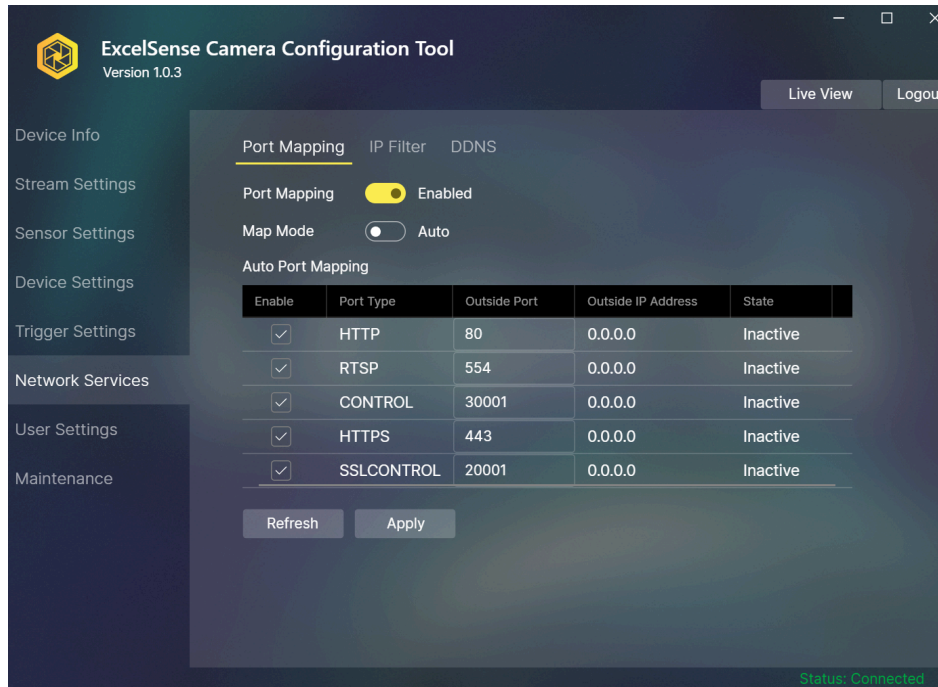
Capture Settings, and perform the illumination trigger again.

Self-Clean Timer Options (ToughEye-1700™ Only)

| | |
|----------------------|---|
| Timed Self-Clean | Sets whether or not the unit will perform automatic self-clean cycles based on an internal timer. |
| Trigger Interval | If Timed Self-Clean is enabled, this value sets the interval between consecutive self-clean cycles, in minutes. Valid range: 1 - 1440 minutes |
| Scheduled Self-Clean | Sets whether or not the unit will perform automatic self-clean cycles at specific times each day. Up to three times in a span of 24 hours can be configured. |

Network Services

Port Mapping

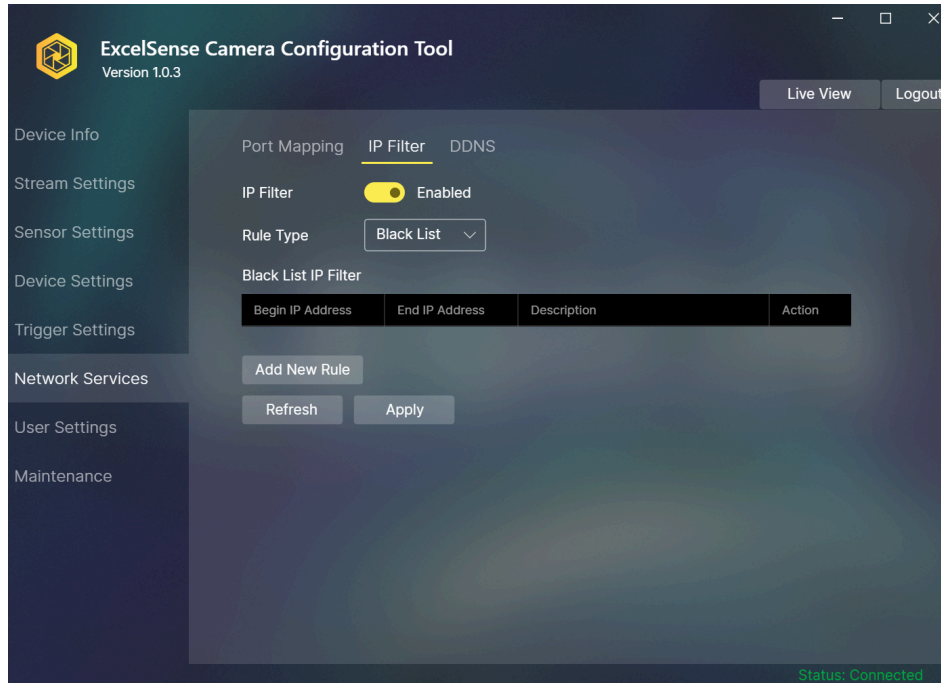


With port forwarding, the user can set up the connection between private and public networks. Enable port forwarding to access the private network devices from a public network.

| | |
|--------------------|---|
| Port Mapping | Indicates whether to enable the Port Mapping service. |
| Map Mode | Mode of port mapping, includes auto and manual. To modify the port mapping configurations, toggle to manual mode. |
| Port Type | Port Type includes: HTTP, RTSP, CONTROL, HTTPS, and SSLCONTROL |
| Outside Port | Port of outside network. |
| Outside IP Address | IP address of outside network. |
| State | Mapping status |



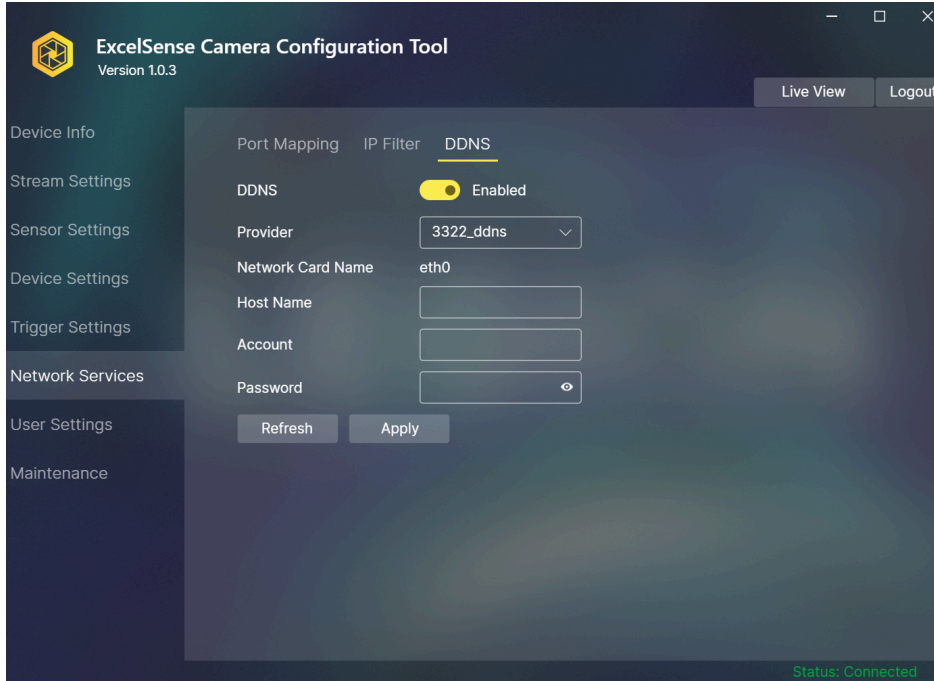
IP Filter



Set the IP address in the specified network segment to allow or prohibit access.

| | |
|------------|---|
| IP Filter | Indicates whether to enable the IP Filter. |
| Rule Type | IP filter type, includes black list and white list. |
| Black List | Specified network segment to prohibit access |
| White List | Specified network segment to allow access |

DDNS

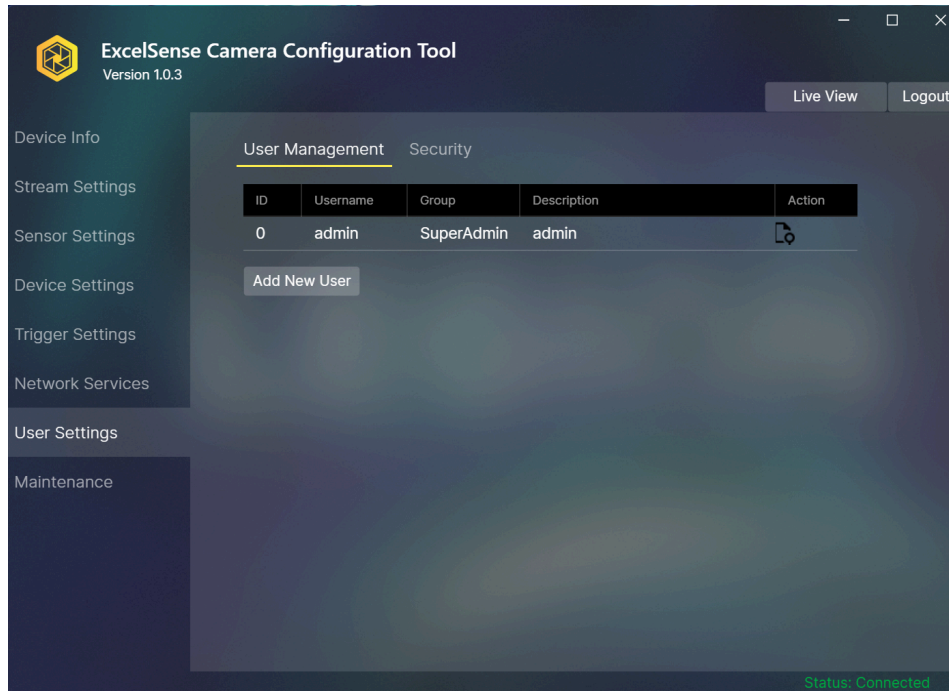


Connect the specified camera to the Internet, and obtain the user name and password for logging into the DDNS server.

| | |
|-------------------|---|
| DDNS | Indicates whether to enable the DDNS service. |
| Provider | DDNS service provider. Currently, only 3322 and DynDns are supported. |
| Network Card Name | Name of network card |
| Host Name | Host name customized by a user. |
| Accounts | User name for logging in to the DDNS server. |
| Password | Password for logging in to the DDNS server. |

User Settings

User Management

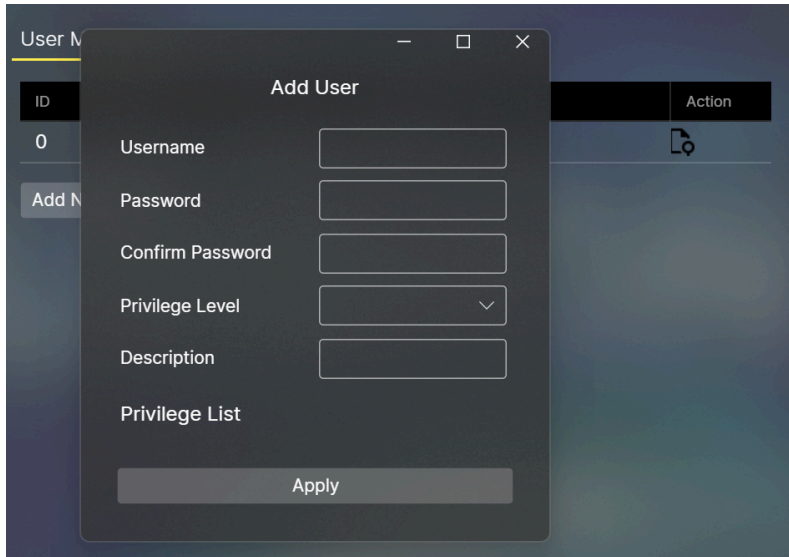


User access to the camera interface can be configured within the User Management tab. Privilege levels and credentials can be set for multiple users.

Add User

A user's level will determine which parts of the camera web interface functionality they have access to.

To add a new user, click Add New User and enter the user information in the new window, shown below. Once entered, click Apply to apply the changes or close the window to cancel the changes.




| | |
|-----------------|---|
| Privilege Level | Once the desired privilege level is selected from the corresponding dropdown menu, the available permissions for the particular level are shown. Individual permissions can be selected and deselected to further customize the user privilege level. |
|-----------------|---|

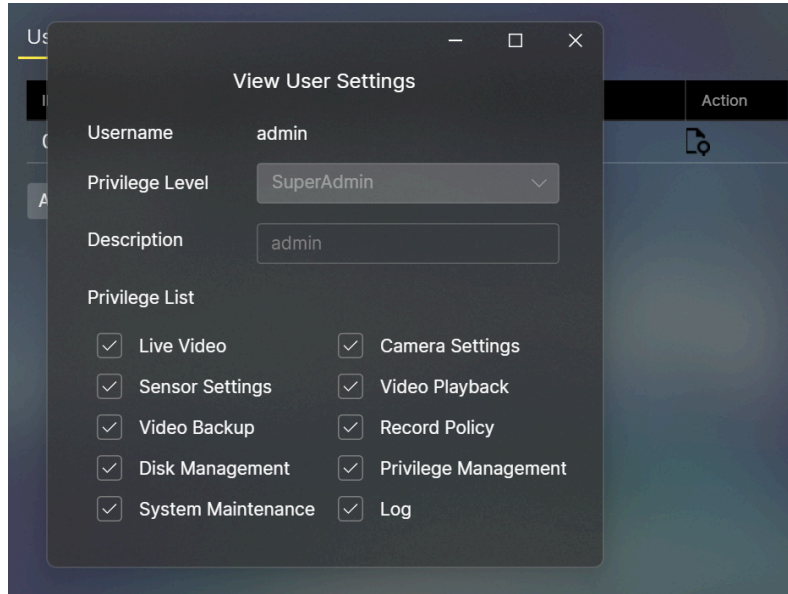
| | |
|-------------|------------------|
| Description | User description |
|-------------|------------------|




View User

The admin user account's privilege settings are read-only, and can therefore only be viewed.

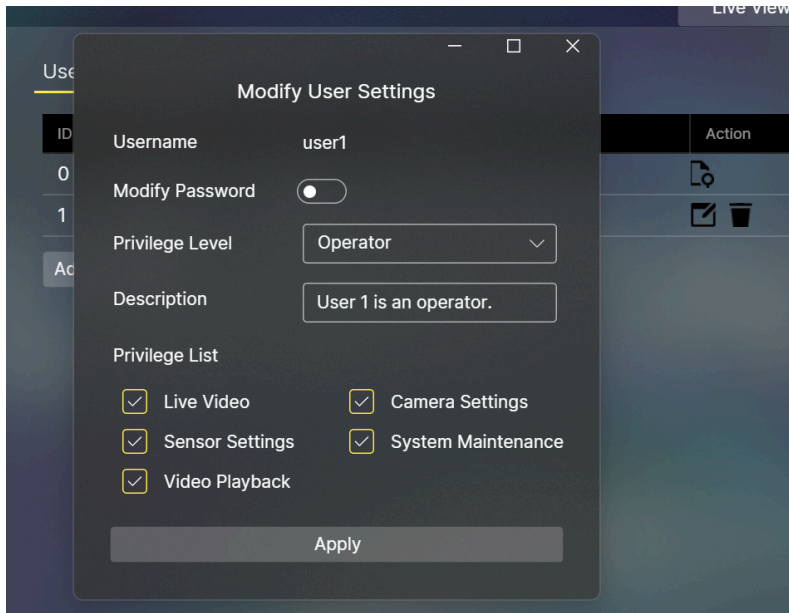
Click the  icon on the admin user line item to view its privilege settings in through the window shown below.



Modify User

To modify a user, click the  button on the desired user line item. This will open the Modify User window, shown below.

Make the desired modifications, and click Apply to save the changes or close the window to cancel the changes.

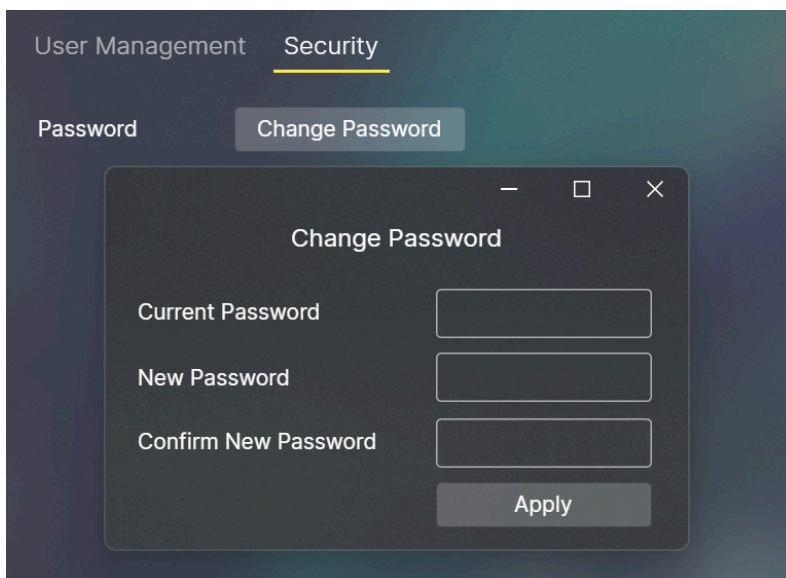


Delete User

To delete a user, click the  button on the desired user line item.

Security - Change Password

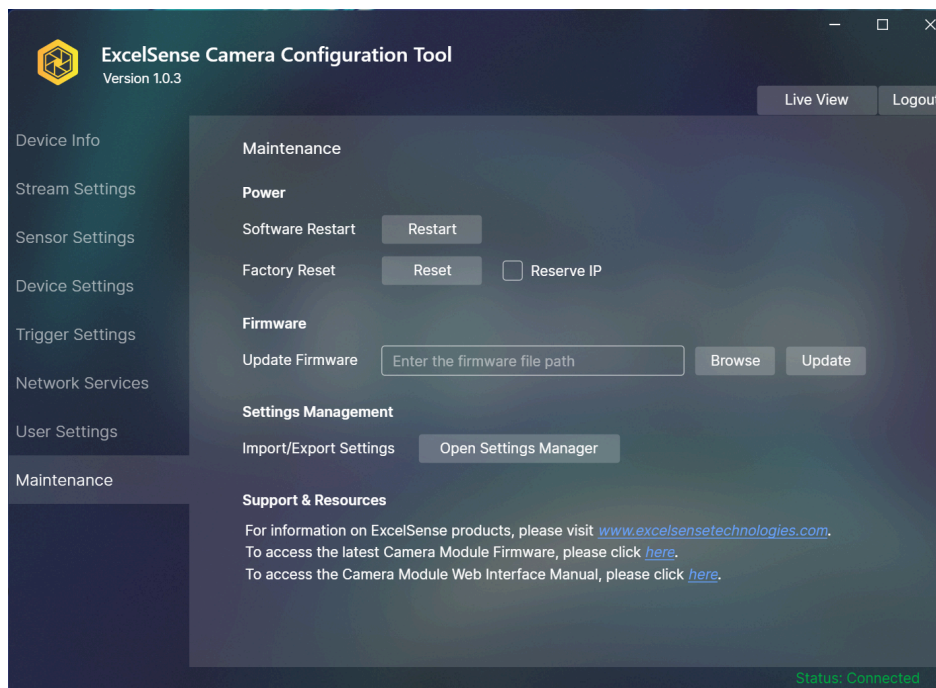
The password of the current user session can be modified by clicking the corresponding button and entering the new credentials into the Change Password window.



Note: The login window dynamically checks for acceptable user inputs in each field. When an invalid input is detected, a yellow warning icon appears to the right of the field with a message indicating the reason for the warning which is shown when hovering over the icon.

If an unsuccessful attempt was made to change the password, an error pop-up will be displayed. Otherwise, upon success, a window will appear instructing the user to log back into the session with the new password. The current session will subsequently be logged out, and the login window will appear so the user can login with the new credentials.

Maintenance



Common functions related to camera operation can be completed from the Maintenance tab.

Software Restart

A restart can be applied in the following scenarios:

- The device needs to be restarted remotely
- Settings have been changed and a reset is required to make the changes take effect
- Device settings have been incorrectly set and the device is not working properly

Note: Restarting the camera typically takes up to 2 minutes. During this time, this application can be left open. The app will automatically log into the camera once the camera is online again.

Factory Reset

To reset the device configurations to their factory settings, click the Factory Reset button. This process will take a few minutes, as the camera will also perform a software restart.

During this time, this application can be left open. The app will automatically log into the camera once the camera is online again.

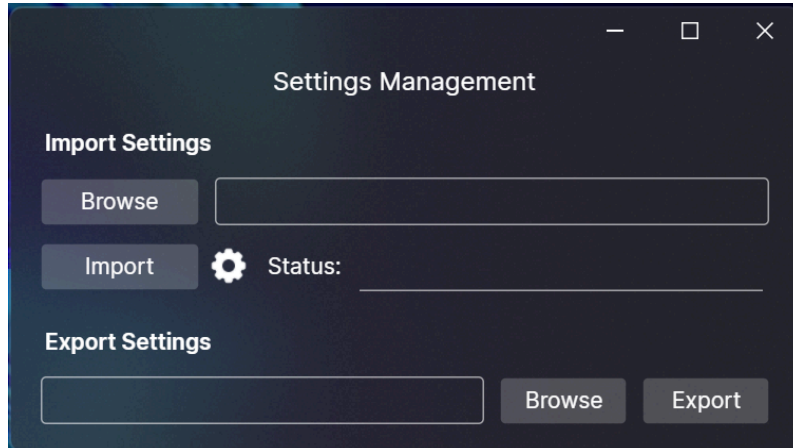
Upload Firmware to Sensor Module

To upload firmware to the camera sensor module, browse for and select an appropriate firmware file and click the Update button.

Depending on the generation of the sensor module, this process can take about 2 minutes (1st Gen) or 5 minutes (2nd Gen).

The camera sensor module will go through the installation, upgrade, and reboot steps. During this time, this application can be left open. The app will automatically log into the camera once the camera is online again.

Settings Manager



Click the Open Settings Manager button to open the above window.

Export Settings


The camera configurations can be exported into a json file by first browsing for a directory on the local disk, and then clicking the Export button.

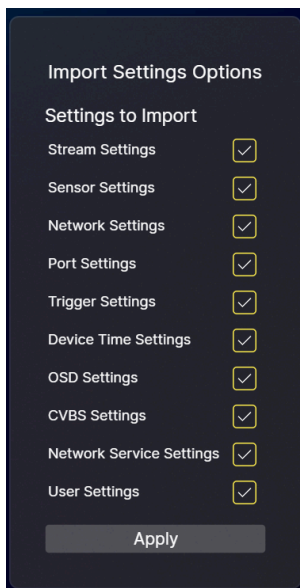
This will export a json file which holds most of the settings configurable on the camera sensor module. This json file can then be imported into a camera using this application by following the instructions below.

Import Settings

Camera settings can be applied simultaneously by importing the settings json file, which was previously exported using the Export feature described above.

Note: This application does not accept a binary configuration file that was exported using the Export Configuration feature in the web interface of the 2nd Gen sensor module. To ensure the camera settings are imported correctly, the imported file must be a json file that was previously exported from this application.

To configure the specific settings to be imported, click the  button to open the configuration window shown below.



The dialog box titled "Import Settings Options" contains a section "Settings to Import" with a list of settings and checkboxes. All checkboxes are checked. At the bottom is an "Apply" button.

| Settings to Import | Checkbox |
|--------------------------|-------------------------------------|
| Stream Settings | <input checked="" type="checkbox"/> |
| Sensor Settings | <input checked="" type="checkbox"/> |
| Network Settings | <input checked="" type="checkbox"/> |
| Port Settings | <input checked="" type="checkbox"/> |
| Trigger Settings | <input checked="" type="checkbox"/> |
| Device Time Settings | <input checked="" type="checkbox"/> |
| OSD Settings | <input checked="" type="checkbox"/> |
| CVBS Settings | <input checked="" type="checkbox"/> |
| Network Service Settings | <input checked="" type="checkbox"/> |
| User Settings | <input checked="" type="checkbox"/> |

Apply

Select only the desired settings to be imported, and click Apply. Browse for the json settings file, and click Import.

Note: This process may take several minutes and involve multiple camera sensor module reboot sequences. Leave the application open and wait for the process to finish. Once the settings are imported and the camera is back online, the app will automatically log into the camera again and indicate the final status of the import process.

Application Logs

This application generates diagnostics logs under the file name "ESTCameraApp.txt". This file is located in the "%APPDATA%/logs" directory.

Live View Window



The application allows for the user to view the live video of the base stream (stream 1), so long as the user profile privilege level permits. To open the live view window, click the Live View button located on the top menu bar.

If the user privilege level is too low, the Live View button will not be visible. Refer to the User Settings Tab section for more information on user privileges.

The self-clean button at the bottom right corner of the window can be used to initiate a self-clean cycle on ToughEye-1700™ devices.