NovoSun

CyeWeb

Extension Module

Overhead People Counter

User Manual ver. 1.0

Introduction

People counting is one of the most widely used video analytics in Intelligent Video Surveillance(IVS). It tracks the pedestrian flow by counting how many people walk through a user-definable line. The counting system can be set up at any place while at the same time has the ability to minimize interference caused by environmental factors such as noise, shadows and lighting changes, etc.

Overhead People Counter provides more accurate counting result than other video-based systems since occlusion among people is avoided when camera is mounted overhead. It is suitable for both indoor and outdoor environment such as shop, bus, mall, bank, customs, etc.

Settings

Before doing any settings, please confirm that the following requirement is met beforehand in order to get satisfactory counting result:

1) Camera angle has to be fixed.

2) Video source has to be kept as stable as possible.

3) Camera information including sensor size, focal length and camera height from ground has to be provided.

4) Dramatic change of lighting condition may reduce the counting accuracy, so avoid putting the counter on regions with severe lighting change if possible.

5) Reflection may have negative effect on the counting accuracy, it is recommended to mask regions with heavy reflection if they are not of interest.

6) Please ensure that the horizontal view of the video source must exceed 1.7 meters. For example, if the camera height is 2 meters or less such that the horizontal view does not meet the requirement, try to use a lens with smaller focal length(4mm or below) instead to broaden the horizontal view.

7) The counting line should be drawn on places where people won't stop at to avoid interference.

8) The region around the counting line(where entrance or exit located) is better to be captured completely. It is because at least 2/3 of a person has to be covered in the video in order for the person passing through a counting line gets counted.
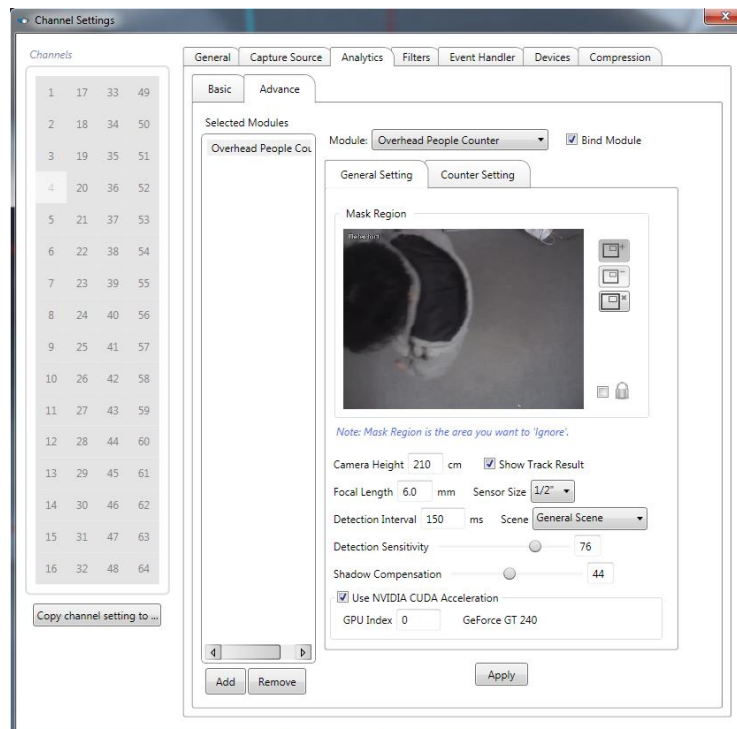
Besides, counting result will not show up on video except "Video Content Analysis Result Presenter" under "Event Handler" tab is bound.
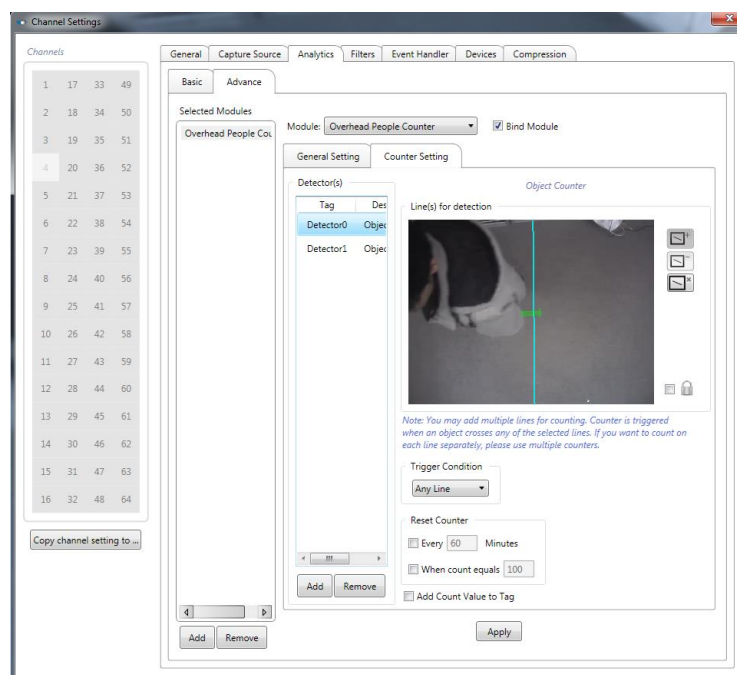
Specification:

Detectable Height from Ground:	**2m ~ 7m**
Camera Focal Length:	**4mm or above**

The settings of Overhead People Counter consist of two parts: General Setting and Counter Setting. These two settings will be explained in the following subsections.
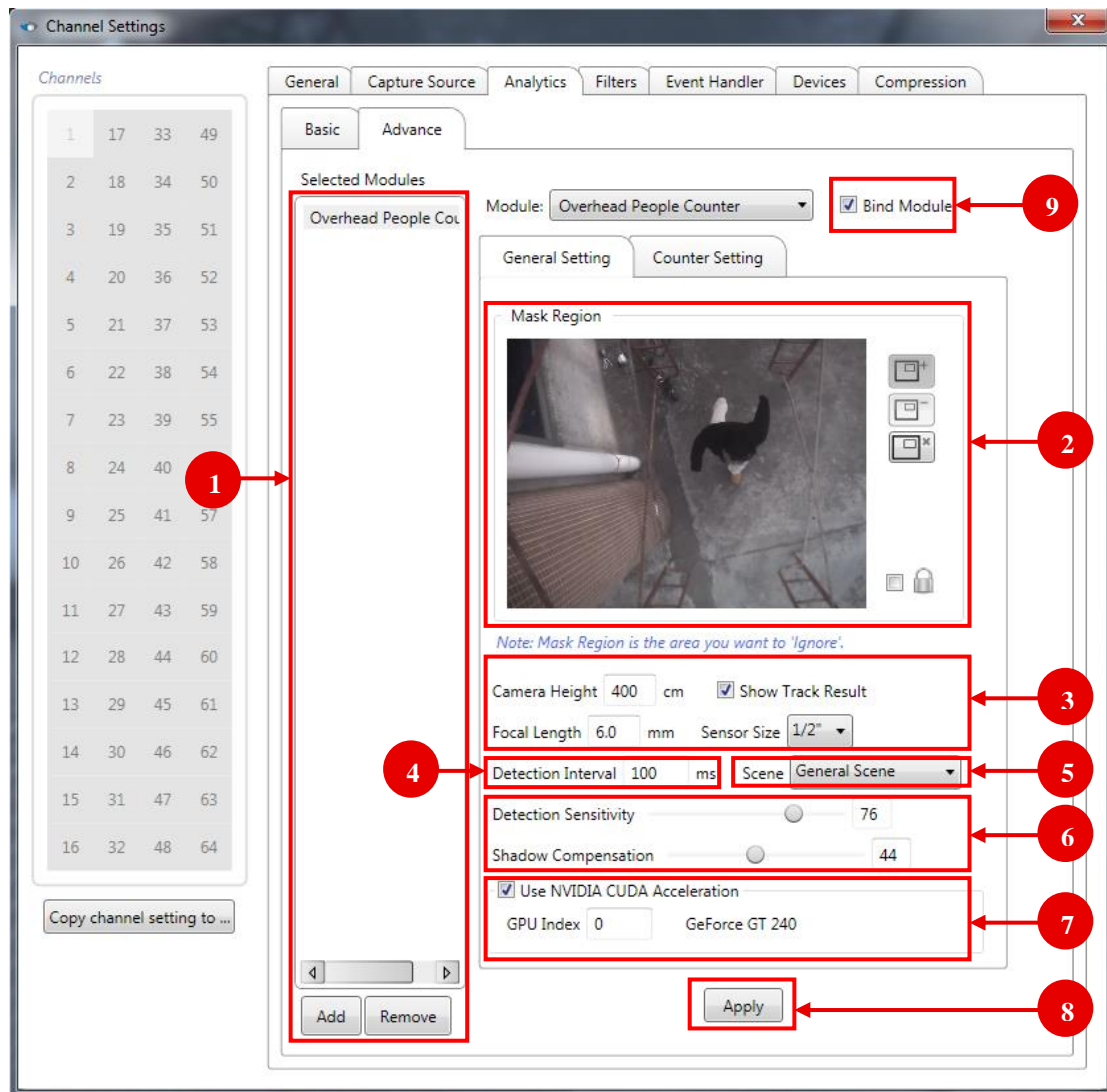
General Setting:

Counter Setting:

1. General Setting

In the page of General Setting, user has to set up environment parameters and provide camera-related information such as sensor size, focal length, etc. to the counting module. After finishing the General Setting, user can switch to Counter Setting to define counting lines and rules.

Here is the setup dialog for General Setting:

1.) **Selected Module**

Here add the "Overhead People Counter" to current video channel.

2.) **Mask Region**

Mask those regions which are not of interest to save computation and reduce interference. Only leave the regions where people walking through unmasked.

3.) Camera Information

- **Camera Height**

  Camera height from ground. *This value can be set slightly different from the actual height in order to fine-tune the estimated size of a person for the detector.*

- **Sensor Size**

  Sensor size of the camera. Please refer to the camera spec.

- **Focal Length**

  Focal length of the camera lens.

- **Show Track Result**

  Determine if the tracking result is showed on the video.

4.) Detection Interval

It is the time interval between successive processed frames. Lowering this value gets more accurate counting result at the cost of higher computation load. If the walking speed of people is fast, it is recommended to set the Detection Interval to a shorter value.

5.) Profiles

The Overhead People Counter includes three profiles which provide standard environment parameter settings for three different scenarios: General Scene, Crowd Scene, B/W Scene. User can choose one of the profiles according to the environment as basic setting and fine tune the parameters afterwards. Details of the three profiles are explained as follows:

- **General Scene**

  It is suitable to use in outdoor/indoor environment where pedestrian flow is from low to medium. It is the default profile for Overhead People Counter.

- **Crowd Scene**

  The Crowd Scene profile is specifically designed for indoor high pedestrian flow since these kinds of scenes always have different counting statistics as compared to general cases. Please use this profile for indoor crowd environment.

- **B/W Scene**

This profile is used for black and white scenes such as video sources from night mode of low light and IR cameras.

6.) Environment Parameters

- **Sensitivity**

  The parameter is used to tell the counter how sensitive it should be set for the scene. A lower sensitivity value should be set if the scene is noisy, unstable, or with fluctuating lighting condition.

- **Shadow Compensation**

  This parameter is used to tell the counter how strong the shadow is in the scene, in order for the counter to do shadow compensation. Usually crowd environment or strong sunlight will generate relatively strong shadows, please set this parameter to a higher value at these situations.

  Incorrect setting of Environment Parameters may have big degradation on counting accuracy. Therefore, parameters should be carefully tuned by professionals according to the actual applied environment, which can be done on site or off site.

7.) Use NVIDIA CUDA Acceleration

If NVIDIA graphic adapter is available on the system, user can choose to use CUDA acceleration to reduce CPU loading.

8.) Apply

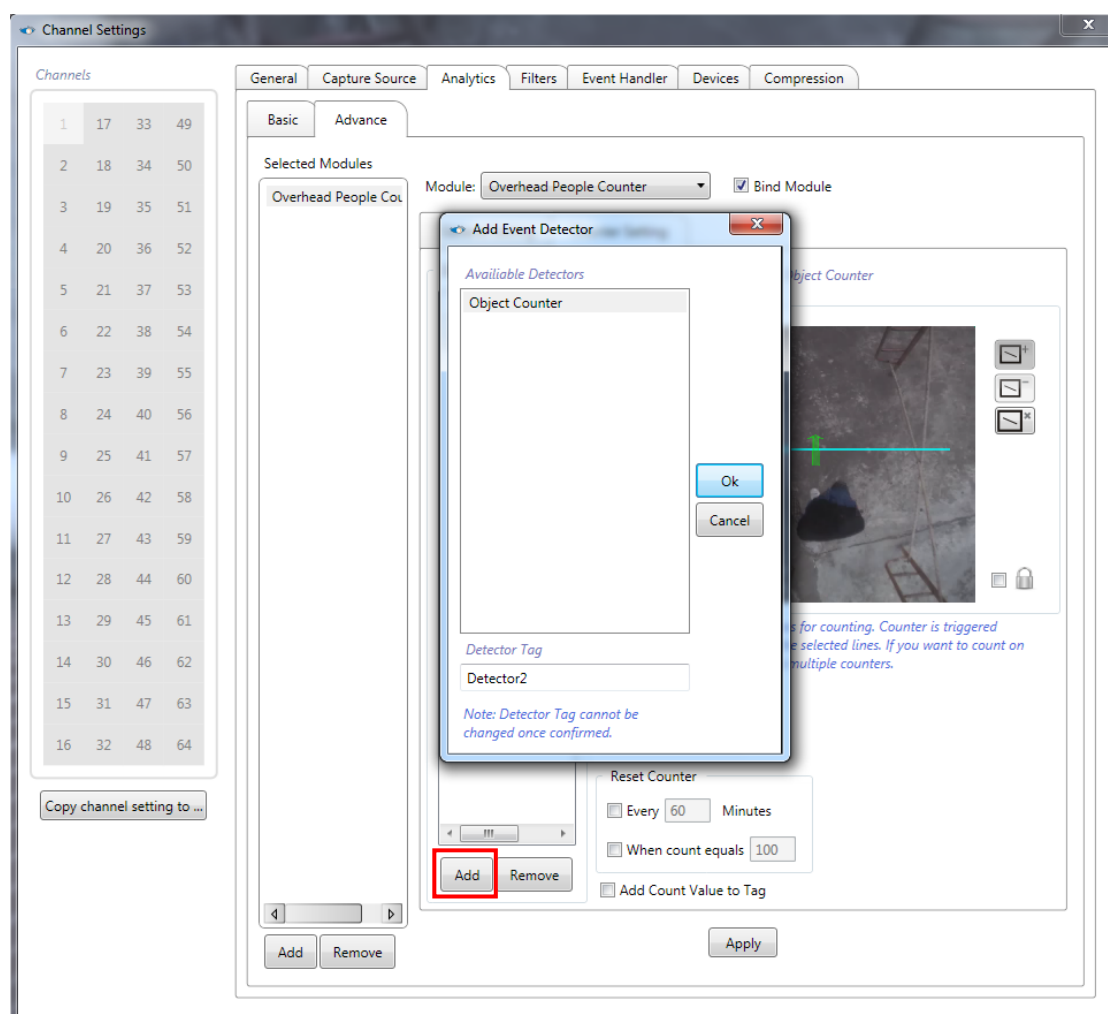Click on this button to apply if any setting is changed in this dialog.

9.) Bind Module

"Bind Module" button should be checked in order for the Overhead People Counter to work.
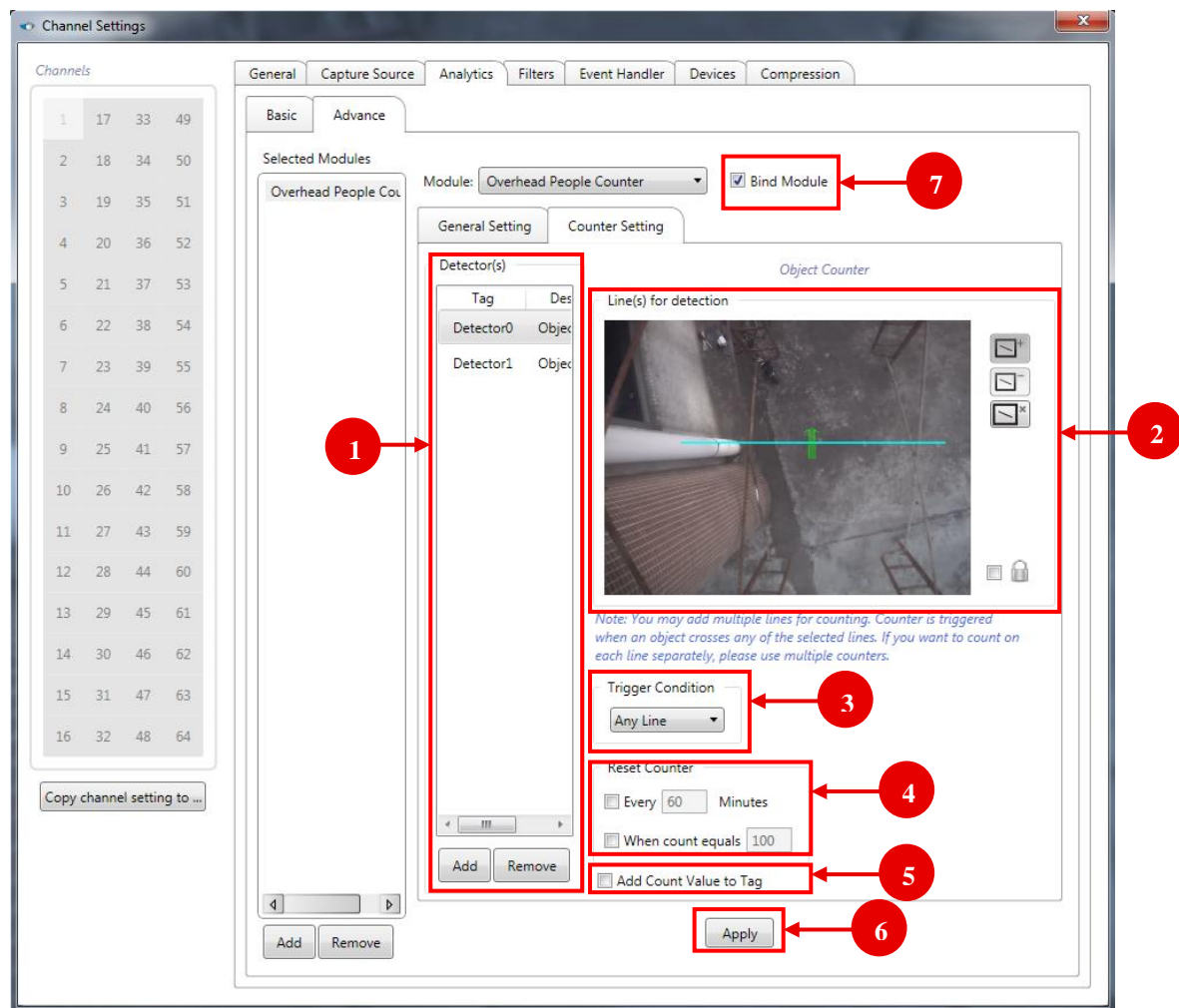
2. Counter Setting

In the Counter Setting page, user can add unlimited numbers of counters for a single video channel, and define different counting lines for each counter.

To add a counter, click on the "Add" button in the Counter Setting page and key in a Detector Tag for this counter. When the counter triggers a count event, the tag will be automatically inserted to the video, such that user can search back events and videos with the tag afterwards.

Here is the setup dialog for Counter Setting:

1.) Detector List

Here list all the counters for current video channel, with corresponding tags.

Clicking on a counter in this list will switch the setting page to that counter.

2.) Drawing Region

Multiple counting lines can be drawn in this region with different direction.
Drawing a line from left to right will generate a counting line which counts
upward flow, while drawing a line from right to left will generate a counting line
which counts downward flow instead.

3.) Trigger Condition

Two options are available here: "Any Line" and "All Line".

"Any Line" implies that the counter will count up when an object passing through
any of the counting lines of this counter, while "All Line" implies that it will count
up only when an object passing through all of the counting lines of this counter.

4.) Reset Counter

Here user can determine to reset counter after every finite minutes or when the counting number exceeds some pre-defined threshold.

5.) Add Count Value to Tag

Checking this box allows CyeWeb to attach current counting number to tag. It's useful when searching back video where specific count happens.

6.) Apply

Click on this button to apply if any setting is changed in this page.

7.) Bind Module

"Bind Module" button should be checked in order for the Overhead People Counter to work.

Counting Statistics can be represented and showed in graph, or exported to database format. Please refer to the "Object Counter Statistics Module" section in CyeWeb User Manual.
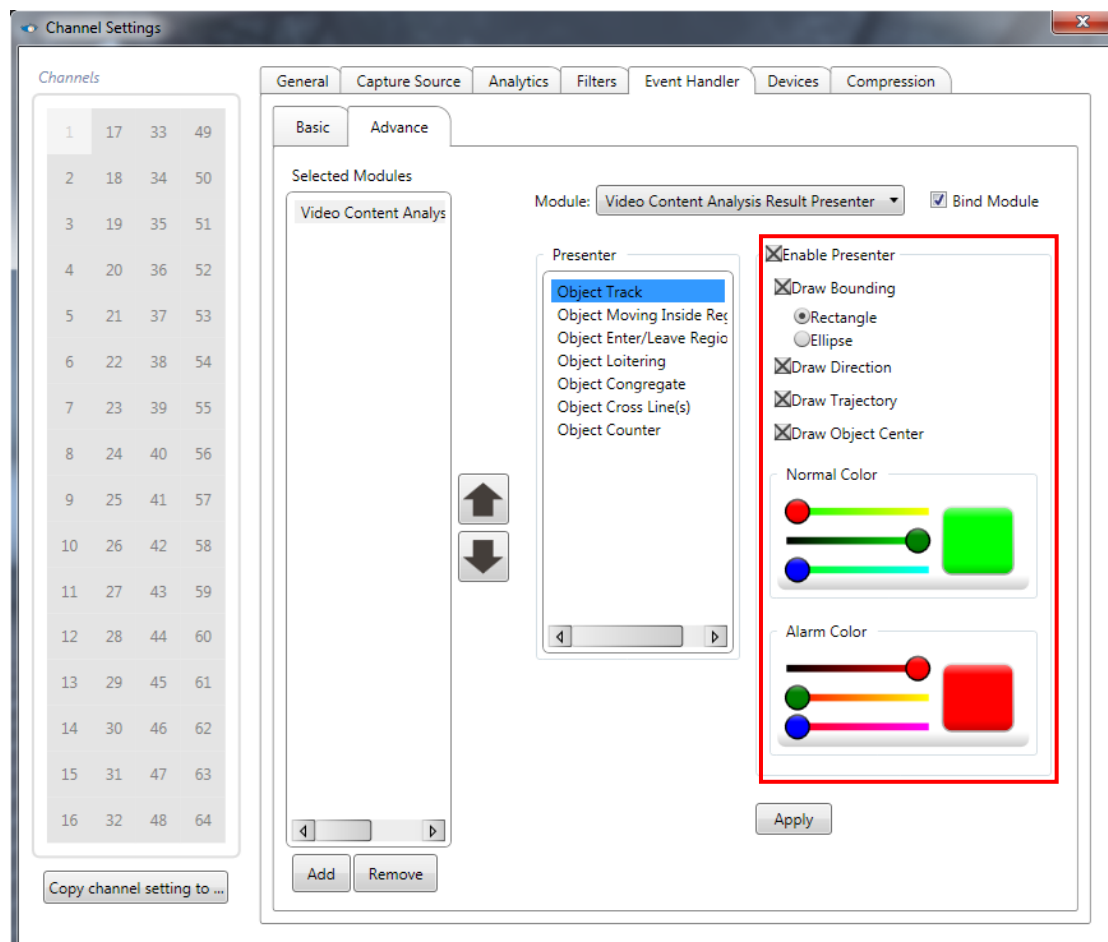
Video Content Analysis Presenter

The presentation of the counting result on videos can be configured in the "Video Content Analysis Result Presenter" under "Advance" of "Event Handler" tab; it contains presentation settings for object tracker and event detectors.

For Overhead People Counter, "Object Track" presenter is used to show track results and "Object Counter" is used to show counting results, respectively.

"Object Track" Presenter

In this presenter, user can configure whether to show object boundary, object trajectory, object center and alarm color, etc. on videos.

"Object Counter" Presenter

This presenter shows the counting information on videos. User can configure whether to show visual alarm or sound alarm on screen, and define font size and display position for counting numbers.