

# **NovoSun**

# **CyeWeb**

## **Fire & Smoke Detectors**

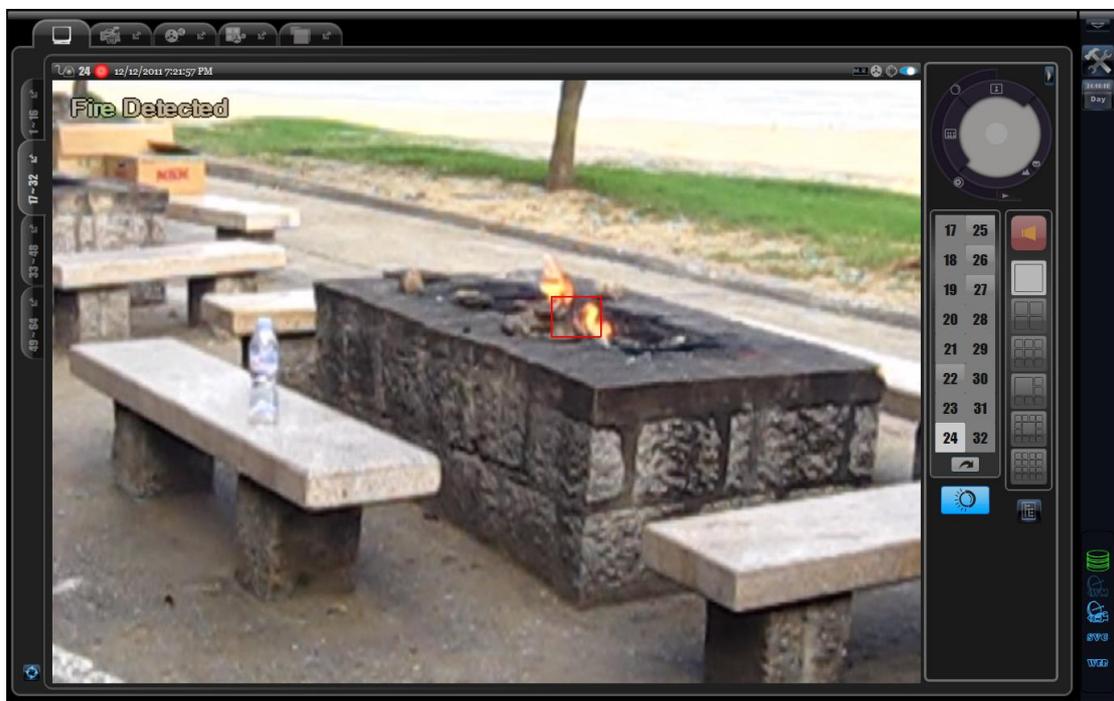
User Manual ver. 1.3



# Introduction

Fire accident is always a big problem; it not only causes severe damage but also leads to numerous legal questions of responsibility and liability. Modern buildings are installed with photoelectric or thermal type fire/smoke detectors in order to minimize destruction of life and property. However, these kinds of passive fire protection methods are always too slow to response, and they cannot be applied in large area or outdoors environment, which leads to a big constraint on detecting fire in forest or warehouse.

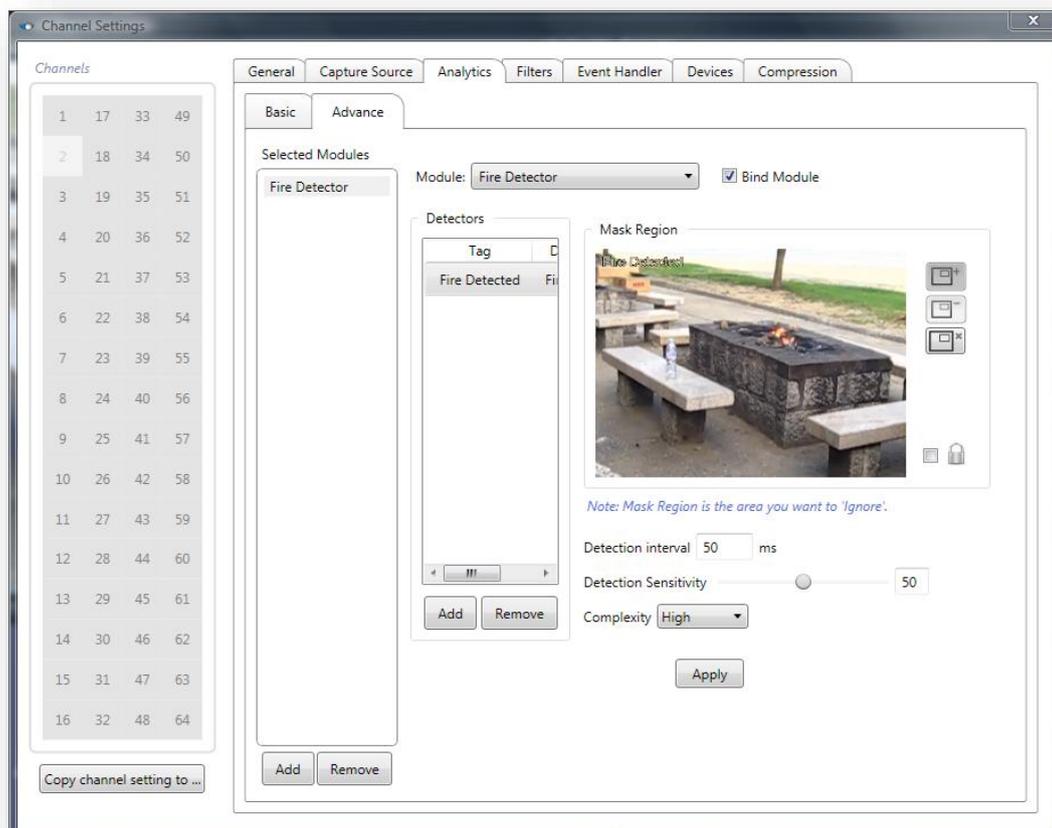
NovoSun's fire/smoke detector provides an effective solution to enable CyeWeb to be equipped with fire and smoke detection ability through video content analysis. The detector can recognize fire/smoke in both indoors and outdoors environment with high sensitivity. Since it is overlaid on existing surveillance system for detection, both purchasing and installation cost of physical fire/smoke detector can be reduced as well.



# Settings

## Fire Detector

Add the “Fire Detector” module under “Analytics” tab; you will see the following dialog:



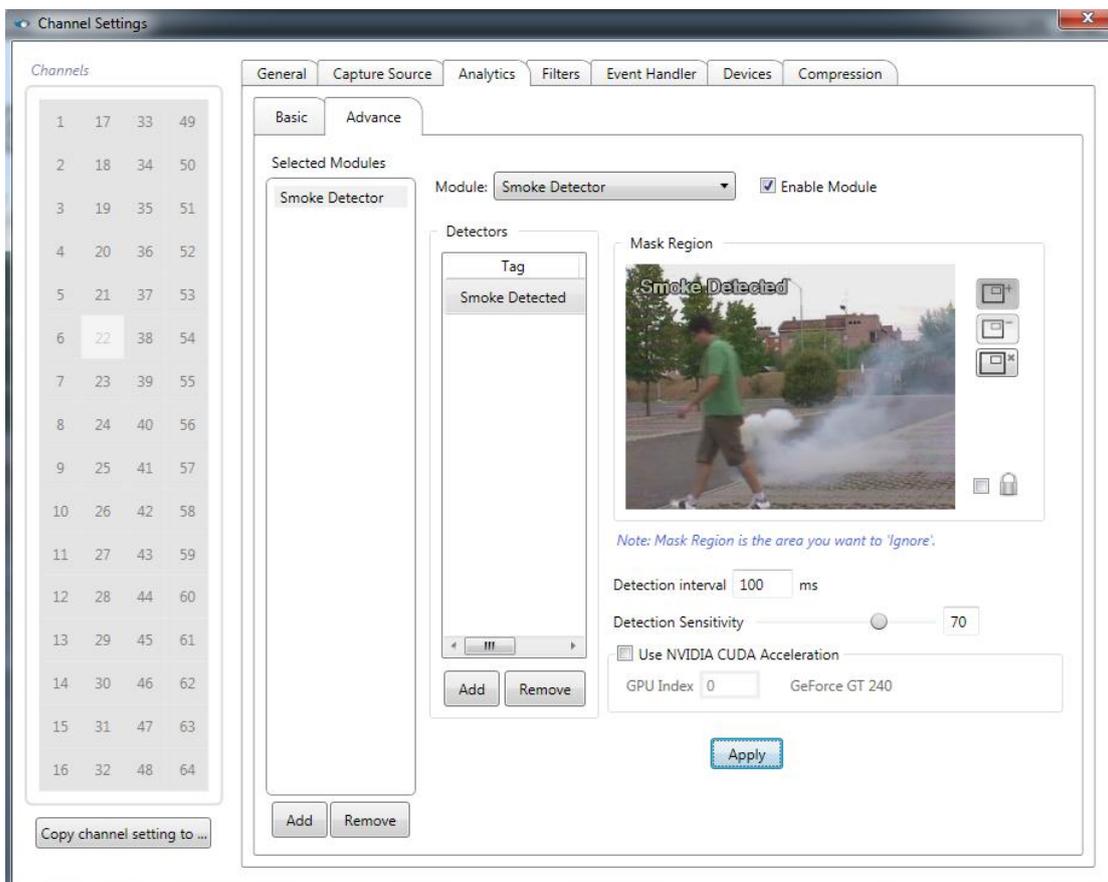
- **Detection Interval** – The time interval between 2 succeeding frames processed by the detector. Lower value would produce positive effect on accuracy but consumes more computation power.
- **Detection Sensitivity** – The sensitivity of the detector for fire detection. Please note that this value should be properly set according to your environment. A high value does NOT mean to produce better result, it may also increase false alarm rate.

- **Complexity** – The complexity level of the detector. Higher complexity leads to smaller detectable fire size but consumes more computing power instead.

## Smoke Detector

This module will trigger an alarm when smoke is detected.

Add the “Smoke Detector” under “Analytics” tab; you will see the following dialog:



- **Detection Interval** – The time interval between 2 succeeding frames processed by the detector. Lower value would produce positive effect on accuracy but consumes more computation power.
- **Detection Sensitivity** – The sensitivity of the detector for smoke detection. Please note that this value should be properly set according to your



environment. A high value does NOT mean to produce better result, it may also increase false alarm rate.

- **Use NVIDIA CUDA Acceleration** – This option allows smoke detector to use NVIDIA GPU to assist the computation. GPU Index represents which GPU to use, the index starts from 0(ex: If there are 3 graphic adapters on a PC, the GPU index will be 0, 1 and 2, respectively). If the graphic adapter on the PC does not support CUDA, CPU will be used instead. Besides, when CUDA is enabled in multiple channels, please confirm that the total GPU usage does not exceed 90%(which can be monitored by [AIDA64](#) or [NVIDIA System Monitor](#)) in order to avoid GPU overheated.

## Q & A

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### 1.) What kind of capture devices should I need in order to use Fire/Smoke Detectors?

Since NovoSun Fire/Smoke Detectors are back-end video analytics, video sources coming from IP camera, capture card, compression card, streaming media or even local video files will work. However, video source has to be kept as stable as possible in order to get high detection accuracy, which means that it is better to minimize factors such as noises, camera vibration or dramatic change of lighting condition.

### 2.) What is the resolution and frame rate requirement of source videos for Fire/Smoke Detectors?

The minimum resolution requirement is CIF and the minimum frame rate requirement is 20 fps and 10 fps for Fire/Smoke Detectors, respectively.



**3.) What is the required lighting condition for Fire/Smoke Detectors? Can the detectors be used at night?**

Fire and Smoke Detectors can be used at black and white scenes such as video sources from low light or IR cameras. General speaking, the detectors are able to detect fire/smoke as long as the flame or smoke in the video can be seen by human (different parameters should be set for day/night modes). According to our test, Fire/Smoke Detectors are able to work at as low as 0.1 lux.

**4.) What kind of environment is suitable for Fire/Smoke Detectors?**

Fire/Smoke Detectors are suitable for both indoor and outdoor environments such as warehouse, parking lot, exhibition center, mall, etc.

**5.) What about the accuracy of Fire/Smoke Detectors, respectively?**

The accuracy of Smoke Detector is about 93%, while it is about 95% for Fire Detector. *(In order to get high accuracy, parameters such as sensitivity and detection interval should be adjusted according to actual environment).*

**6.) What are the effective detection distances for Fire/Smoke Detectors?**

Effective detection distances for Fire/Smoke Detectors are 50 meters and 200 meters, respectively. The detectors are able to work at longer distance, at the cost of performance drop though.

**7.) Does any restriction exist for Fire/Smoke Detectors?**

**Fire Detector:**

Fire Detector mainly uses physical characteristics of combustion under an oxidizing element such as oxygen or fluorine to recognize fire. Therefore, the accuracy may be reduced for man-made burning sources such as lighters, bunsen burners, gas cookers and blowtorches, etc., especially for those flames which look more like light than fire. Please note that a moving flame source won't trigger Fire Detector and therefore a stationary camera should be used. It is better to



test and adjust the parameters according to the actual environment in order to get good performance.

**Smoke Detector:**

Smoke Detector is designed to detect the moment when smoke occurs. Therefore, Smoke Detector won't work if the smoke has been existing for a period of time (especially in indoor environment) since it looks more like fog than smoke. As a result, Smoke Detector is more suitable for outdoor or large indoor space such as large warehouse or parking lot, etc.