

## **Security Management System Camera Configuration Guidelines**

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**Note** – ‘Camera’ in this document related to all video streaming devices like video cameras, encoders etc.

Security Management System software supports several camera makes and models.

This document describes the guidelines to configure the cameras, for optimized processing in the Security Management System software.

## (A) Using dual/multiple streams from the camera

Many cameras support dual/multiple streaming feature – where the camera can stream two (or more) streams simultaneously. Security management System is designed to intelligently make use of dual streaming feature and lower the resources utilization (bandwidth, processing power and memory) per camera. This helps in managing more number of cameras per server computer and per client / work-station computer, still keeping the hardware requirements to lower levels.

Dual streaming can be configured while adding cameras to Security management System server software for monitoring. Or after the camera is added, it can be edited to change the configuration to use dual streaming.

The Security management System server software allows the administrator users to add the cameras one by one or to add multiple / all cameras together.

The settings describes below are same in both cases – when cameras are added one by one or when multiple cameras are added together.

The screenshot displays the 'Video devices' configuration window. On the left, a sidebar contains a menu with 'Channels' highlighted. The main area shows a table of channels with the following data:

Sr ...	Channel Name	Channel ID	Description	Video Stream Ty...	Paramete
1	Cam001	VC_Cam001	Cam001 d...	Quaddrix IP Devi...	192.168.0
2	Cam093	VC_Cam093	Cam093 d...	Http Stream	127.0.0.1(

At the bottom of the window, there are radio buttons for 'List view' (selected) and 'Video view'.

Note – If the camera is already added to the Security Management System server software. It can be selected, and 'Edit' button can be clicked to update the configuration. The steps remain the same, as described below.

Channel Name:

Channel ID:

Channel Description:

Video Source Type:

IP address:

User name:

Password:



Audio support:

**Display stream 1**  
Stream type:

**Display stream 2**  
Select stream:   
Stream type:

**Recording stream**  
Select stream:   
Stream type:

**Motion detection and video analytics stream**  
Select stream:   
Stream type:

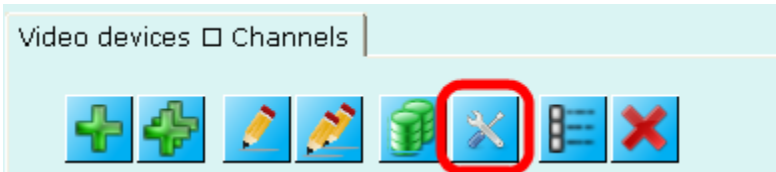
 

1. For 'Display stream 1', set 'Stream type' as 'Minor stream', which indicates low resolution video stream
2. For 'Display stream 2', set 'Select stream' as 'Use different stream' and set 'Stream type' as 'Major stream', which indicates high resolution video stream
3. It is important to select different streams for 'Display stream 1' and 'Display stream 2'. Security Management System has ability to use the dual streams for resource optimizations. Intelligent usage of camera streams ensures minimum possible resources utilization.
4. 'Recording stream' can be set to 'Use display stream 1' or to 'Use display stream 2' depending on the recording requirements for the specific project.
5. 'Motion detection and motion detection stream' should always be set to low resolution video stream. As per the steps mentioned above, 'Motion detection and motion detection stream' should be set to 'Use display stream 1'.

## (B) Setting parameters for camera video streams

[1]. SDKs of some cameras support changing camera streaming parameters from 3<sup>rd</sup> party softwares like the Security Management System software. For such cameras, the dual streaming support can be configured from Security Management System server software user interface.

- (a) Execute Security Management System server software.
- (b) Add the camera(s) for monitoring using 'Add Camera' or 'Add Multiple Cameras' buttons. (Please refer to "Section A - Using dual/multiple streams from the camera", from this document which describes recommended configuration with dual stream usage.
- (c) Click on the 'Edit multiple video channel camera parameters..' button.



- (d) Select the 'Video source type' to match with the make of the cameras being used

Video stream type: Infinova IP Camera N Series

Configured channels:

Sr ...	Video channel	Parameter1

Parameter type: Video

**Major stream**

Resolution: D1

Frame rate: 25

Bit rate: 1M

Input rate: 25

QoS: Max reliability

**Minor stream**

Resolution: CIF

Frame rate: 20

Bit rate: 256K

Input rate: 20

**MJPEG stream**

Resolution: Minor stream

Frame rate: 15

Please note that the camera video stream configuration parameters will be different for different type of 'Video source'.

- (e) Click on the 'Search' button to select the cameras for which streaming configuration needs to be changed.
- (f) The dual streaming cameras provide 2 streams –
  - i. Major stream – high resolution stream
  - ii. Minor stream – low resolution stream
- (g) Specify the parameters for the major stream. Typically for major stream, the 'video resolution' is set to 'D1' or '4CIF', FPS is set to '25' or '30' and bit-rate is

set to '1 mbps'. If higher resolution video is available from the camera and the project requires the same; major stream can be configured accordingly.

- (h) Specify the parameters for the minor stream. For minor stream, the 'video resolution' should be set to 'CIF', FPS should be set as per project requirement and bit-rate should be set to '256 kbps'.
- (i) Security Management System also provides 'Recommended settings' button, clicking on which the recommended parameters for the selected video source are updated in the user interface elements. One or more of these parameters can then be modified as per project requirement and applied to the selected cameras.

[2]. SDKs for some cameras do not support changing video streaming parameters from 3<sup>rd</sup> party softwares like the Security Management System software. For such cameras, the video stream parameters, need to be configured from the web browser (eg Internet Explorer browser) interface provided by the cameras.

The configuration guidelines, remain the same, as mentioned in the above sub-section [1] which describes steps for setting camera video stream parameters from Security Management System server software user interface.

After the configuration is done, it is recommended to access the camera from web browser interface and to check the video quality for both the streams – major stream as well as minor stream.

**Guidelines for selecting 'bit-rate' for a video stream:**

- (a) It is recommended to use 'constant bit-rate (CBR)' for both the streams, if such configuration is available. Constant bit-rate is recommended, as it allows precise calculation of resources (network bandwidth, memory and processing power).
- (b) 'Variable bit-rate (VBR)' is typically used where the camera video does not have any objects in it normally; and objects are visible in the video only some times. In case VBR is used, and if the camera configuration supports; the maximum bit-rate should be specified.
- (c) Most of the cameras streaming H264 format video, provide above average video quality in normal viewing conditions (camera angle and zoom used in typical video surveillance applications) with following parameters –
  - i. Video resolution – 720 pixels X 576 pixels
  - ii. FPS – 25
  - iii. Bit-rate – 1 mbps
- (d) These values can be used as 'initial benchmark' for selecting bit-rate for any video stream – major or minor. To get same video quality for different video resolution and FPS, directly proportional relationship can be used –

	<b>Video size</b>	<b>FPS</b>	<b>Bit rate</b>	<b>Comment</b>
01	720X576 = 414720 pixels	25	1024 kbps	Initial benchmark
02	352X288 = 101376 pixels	25	1024 / 4 = 256 kbps	
03	352X288 = 101376 pixels	12	1024 / 4 / 2 = 128 kbps	

- (e) Same initial benchmark and calculations can be used for MPEG4 video streams
- (f) Please note that these are only approximate guidelines. Depending on the camera model, video compression advanced parameters used inside the camera (eg basic profile, advanced profile etc), the actual bit-rates to be used may change. Though this change is not large.
- (g) Check the actual visible video quality, and change the bit-rate, if required.
- (h) Important point is to get end-customer's acceptance on the video quality, starting from this approximate calculation.
- (i) The bit-rate is the most important parameter, which decides video quality and resources requirements (network bandwidth, storage space, processing power and

memory). Hence it needs to be finalized carefully, depending on the project specifications.