

Application Guide – Edge Storage

A Guide to SD Card Recording with Samsung Network Surveillance Cameras

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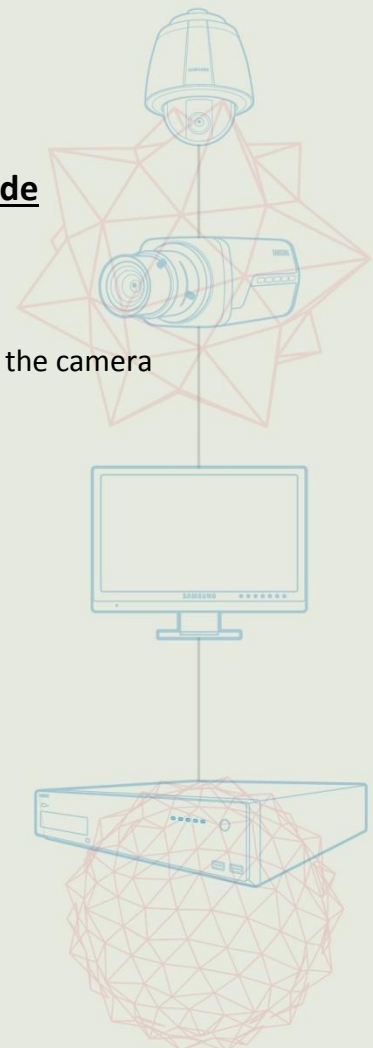
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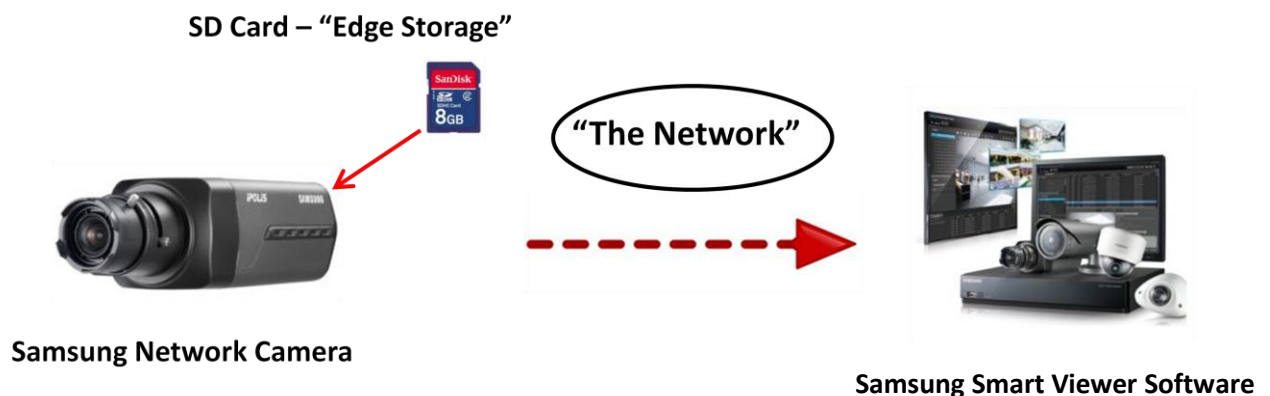
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✧ What is Edge Storage?

- Edge storage is the concept of taking video / audio from a network surveillance camera and storing this at the edge of the Ethernet network.
- The storage of video / audio at the edge of a network is typically completed by using SD cards which have been inserted into the network cameras.
- Edge storage can be utilised instead of continuously transporting the video / audio across the network to a centralised recording facility such as a Network Video Recorder (NVR). It can also be used as a backup to centralised storage to provide a level of redundancy in instances of network failure.
- Recording at the edge of a network is a decentralised approach to video / audio storage as it is spread across a number of edge storage devices (typically SD cards) as opposed to using a centralised solution such as an NVR or DVR.



✧ How Can Edge Storage be applied?

- Edge storage can be utilised in a number of different scenarios and across many different vertical markets.
- In the broadest sense, edge storage can eliminate the need and cost for a dedicated onsite DVR, NVR or PC based recording solution for storage of recorded video. This can be a great benefit in terms of reducing the overall cost of surveillance deployment in smaller installations.
- In installations where a DVR, NVR or PC based recording solution is not required, edge storage can be used to store video and audio which can then be viewed remotely using either the Samsung Smart Viewer 4.0 or SSM software (Samsung Security Manager).
- Edge storage is also very useful in the event of network failure. If a network failure occurs then the video and audio can be stored onto the network camera's SD card. This footage can then be viewed remotely from the SD card using SSM software.
- Edge storage is also useful in situations where network bandwidth is intermittent or limited. Again, the video and audio can be stored onto the network camera's SD card and viewed remotely from the SD card using SSM software.
- Edge storage can also be set up to react to events such as motion detection, audio detection or tampering and flag these alarms to SSM or via email for immediate action and review.
- Pre-alarm and post-alarm recording is also possible at the edge and can be configured to different durations as required.

✧ Benefits, Limitations, Considerations

Benefits:

- If there is a network outage for example an issue with switches or bandwidth then recording will still occur at the edge. Only live viewing and centralised recording will be affected.
- If bandwidth to a device or site is severely limited then edge storage technology eliminates the need for constant streaming of video data to a centralised storage location.
- Edge storage allows CCTV to be implemented without the need for a NVR or DVR. This can dramatically reduce the cost of installation.

Limitations:

- If a camera is stolen then the information which is housed in the camera is lost unless this has been backed up centrally on a DVR, NVR or PC based recording solution.
- If power to the local network switch is lost then cameras which are powered by PoE only will fail and edge recording will not occur. This can be alleviated by using local power supplies to the camera.

Considerations:

➤ SD Memory card write speed:

If an SD memory card data read/write speed is not up to the required specification, data loss can occur. Check the read / write speed of the SD memory card before using with your network camera.

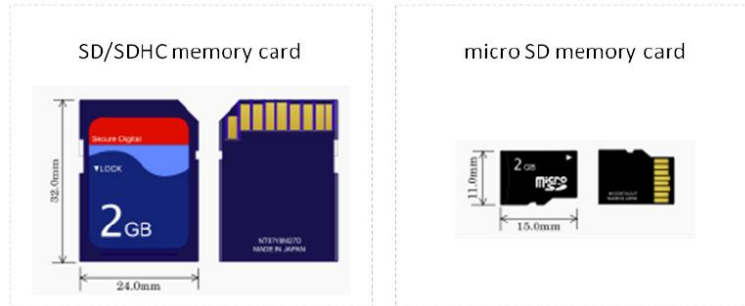
SD Memory Card
Read/Write Speed

Class	Minimum Performance
Class 2	2MB/sec = 16Mbps
Class 4	4MB/sec = 32Mbps
Class 6	6MB/sec = 48Mbps
Class 10	10MB/sec = 80Mbps

➤ **Typical storage mediums:**

The SD Memory card is a flash memory device frequently used with mobile phones, digital cameras and other small portable digital devices. Samsung Network Cameras support SD memory cards for video storage. The Samsung Network Cameras support both SD and SDHC type memory cards, some models require micro SD memory cards instead of the full sized devices. The new WN3 camera models also support SDXC (SD Extended capacity).

Size by memory card types



➤ **Inserting the Memory Card:**

When the SD memory card is working correctly, the SD indicator LED is turned on. If it blinks the memory card is not inserted properly, has insufficient free space, or is experiencing a recording failure. If the SD indicator is turned off, it means the camera is not powered/ is restarting/ there is no memory card inserted, or the camera has not been configured to record yet.

Inserting the SD Memory Card



➤ **Recommended specifications:**

SD memory cards are supported by most of Samsung Network Cameras, however before using, check whether your SD memory card satisfies the below features:

- Recommended manufacturers: SanDisk, Transcend, Samsung
- Capacity: 2 ~ 32 GB (WN3 Cameras support SDXC which enables 64 GB capacity upwards)
- Write/Read Speed: more than 10 Mbps, minimum Class 6 or higher

✧ Recording at the Edge – Step by Step Process Guide

Step 1: Connecting the Camera and Inserting the SD Card

- Connect the Camera to the network using an Ethernet cable and insert the SD card.
- The SD card can be inserted by removing the SD card cover with a small screwdriver



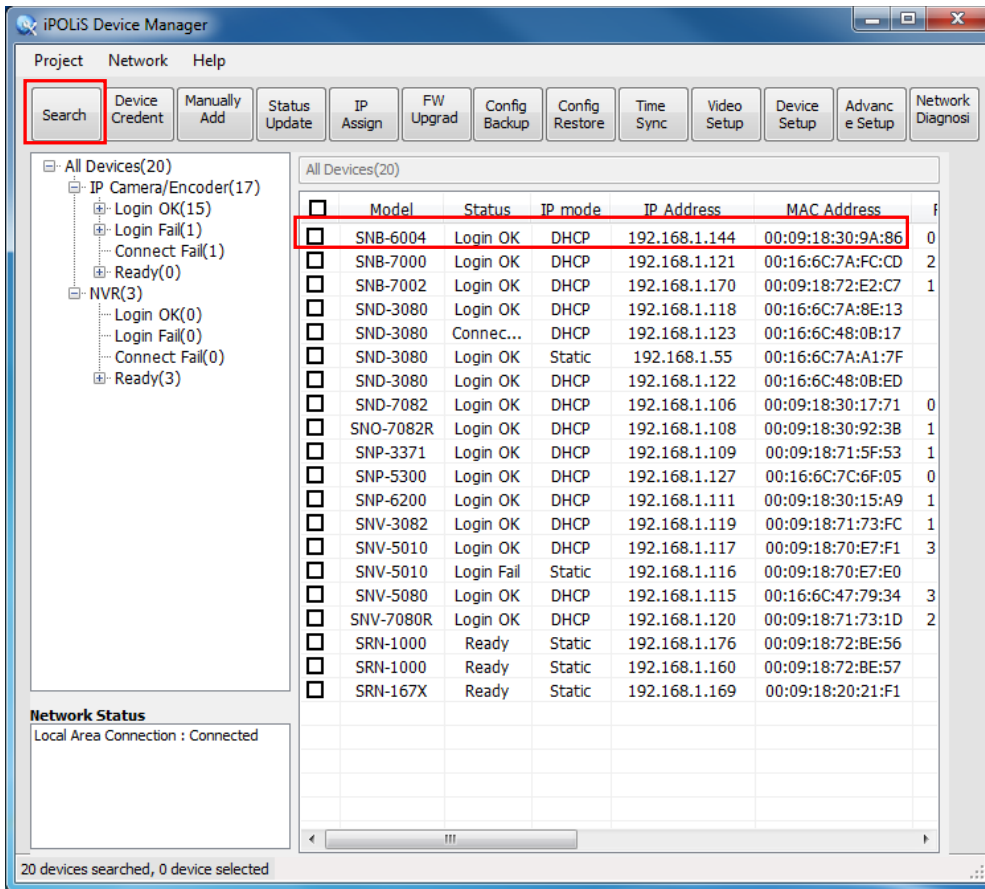
- ☞ If the data protection tab or switch is locked on the SD Card then no data can be written onto the memory card. Check if the switch is locked before using.

Step 2: Finding the camera on the network and logging into the camera

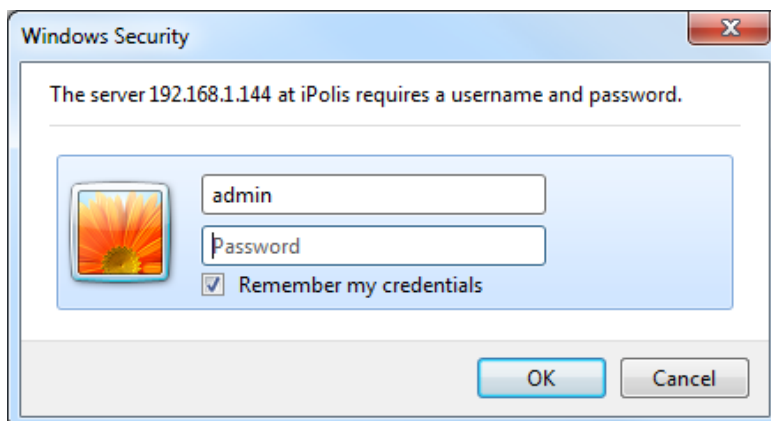
- Open the Samsung Device Manager

If you do not have the Samsung device manager installed then please download here: <http://www.samsungsecurity.co.uk/en/products/product%20selector.aspx>

- Once open, click search and then double click on the relevant camera for which you want to set up edge recording. In this example, we will be using the SNB-6004.



- Log onto the camera using the relevant credentials:

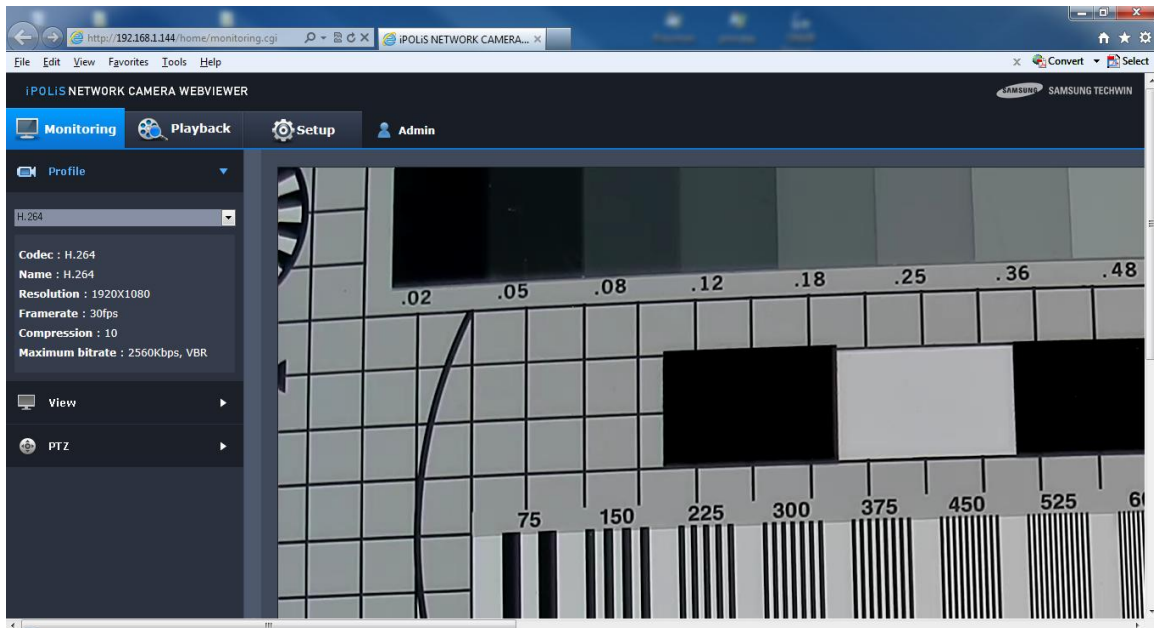


⌘ The default settings are “admin” and the password is: “4321”

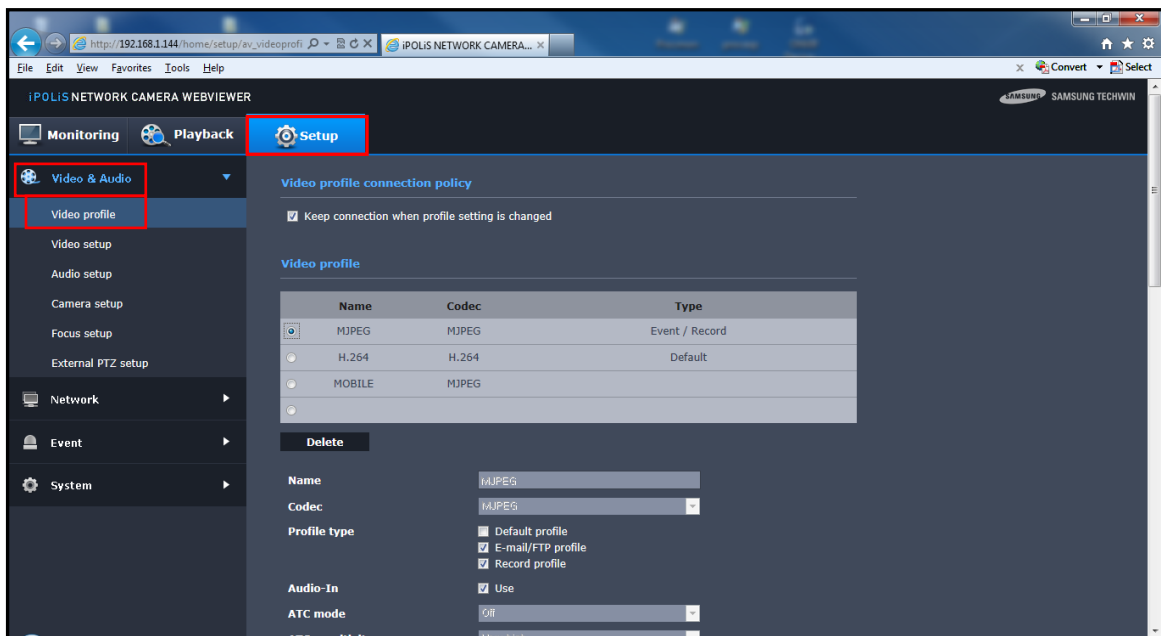
⌘ It is recommended to change the default settings for security reasons

Step 3: Setting up a recording profile

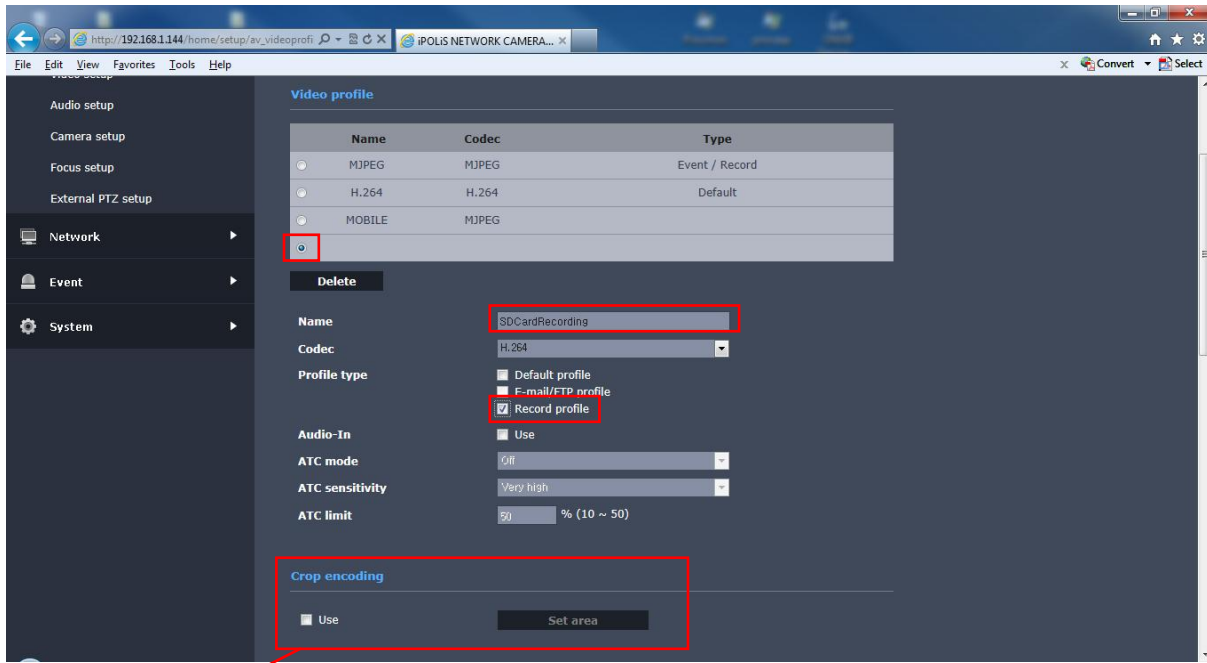
➤ You should now be logged onto the camera and have the default screen view:



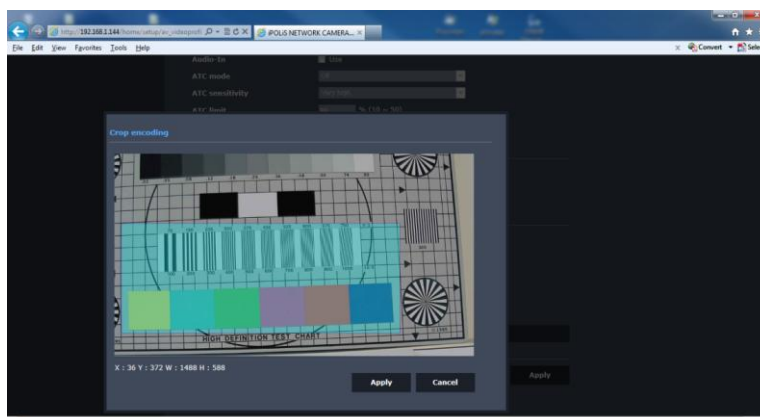
➤ Firstly we are going to set up the Edge Recording profile, so from the default screen view, click “Setup”, “Video & Audio” and “Video Profile”



- The default is set to “MJPEG”, so click as per below to set up a new video profile.
- In the example below, we have named the profile “SDCardRecording”
- The most important step is to have the “Record profile” box ticked as this assigns it as the SD card recording profile.

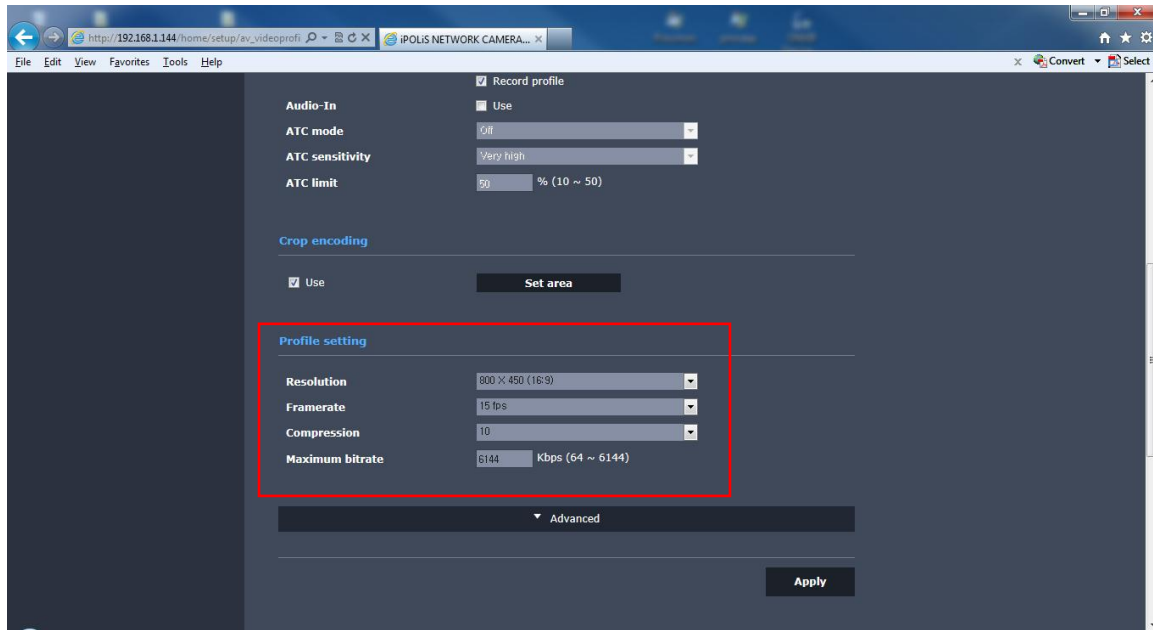


- When setting up the recording profile, you can also set crop encoding. This enables just a specific area of the viewable image to be recorded, thereby reducing the recording bandwidth and increasing the available recording capacity. (*Option applicable on WN3 cameras only)

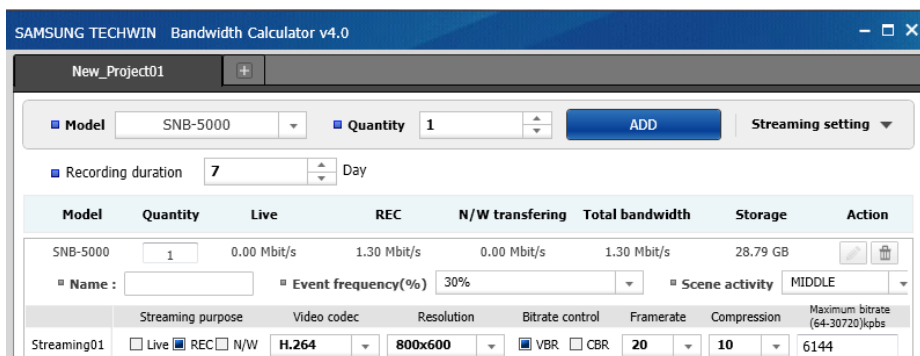


☞ The above picture shows the crop encoding area being selected

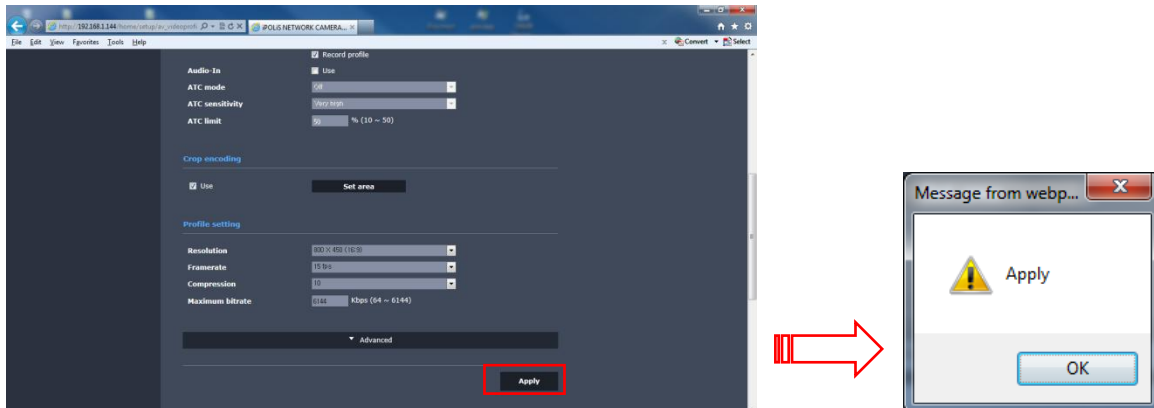
- Finally to finish setting up the recording profile; the resolution, frame record rate and compression can be set.
- For the best guide to storage calculations please use the Samsung bandwidth calculator which can be found here: <http://www.samsungsecurity.co.uk/en/products/product%20selector.aspx>



- An example of a high usage scenario: (Using the SNB-5000)
 - Resolution: 800x600 (4CIF), Framerate 20fps, Compression: 10
 - Event frequency 30%, Scene Activity: Middle
 - This recording profile would equate to roughly 0.95 GB a day.
 - Therefore **7 days** of recording on this profile would fill 28.79 GB of a 32GB SDHC card.
- An example of a low usage scenario: (Using the SNB-5000)
 - Resolution: 800x600 (4CIF), Framerate 15fps, Compression: 10
 - Event frequency 10%, Scene Activity: Low
 - This recording profile would equate to roughly 918 MB a day.
 - Therefore **31 days** of recording on this profile would fill 27.79 GB of a 32GB SDHC card.



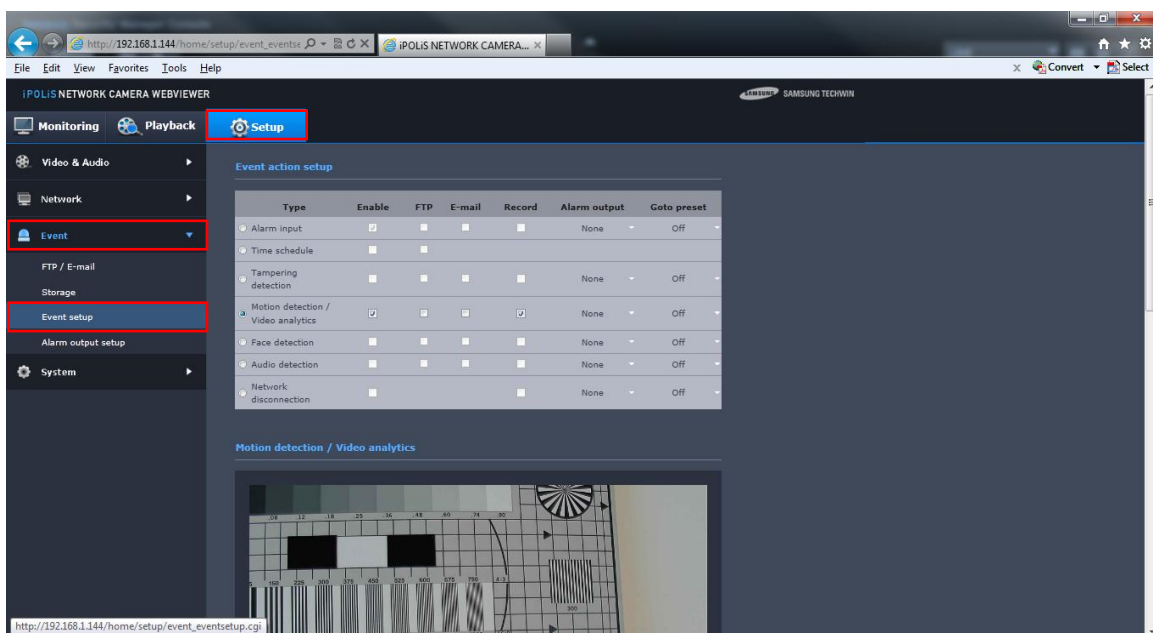
- Once the resolution, framerate and compression have been set as required, click “Apply” and then a confirmation dialogue box should appear as below.



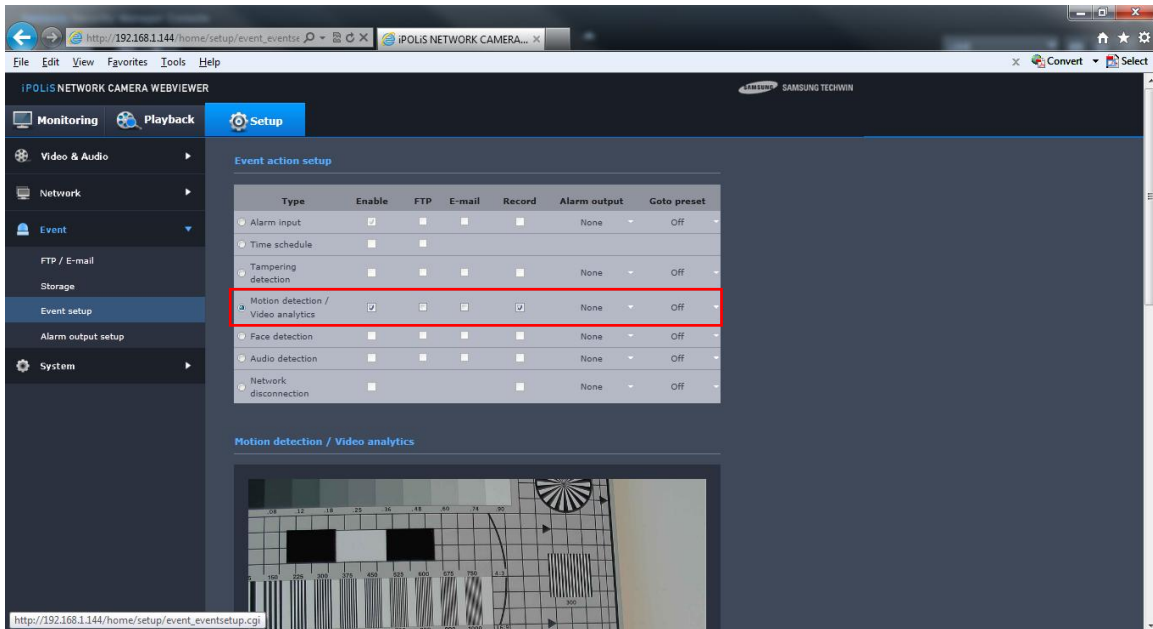
- You have now successfully set a recording profile for Edge Recording

Step 4: Setting Event Action Recording

- Now that the recording profile has been set, we are going to review the set up process of Event recording to the SD card.
- Firstly in the camera menu click “Setup”, “Event”, “Event Setup”.
- For this instance, we are going to show the set up of event recording based on motion detection:



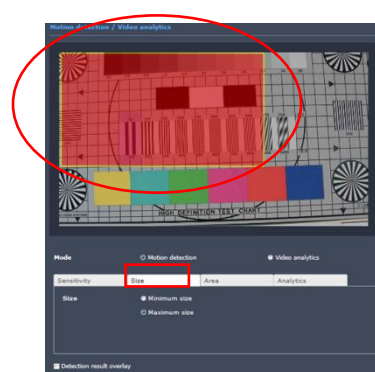
- As you can see below, the motion detection has been selected and the “enable” box has been ticked.
- Additionally, another very important box to have ticked is the “Record” box as this enables the motion detection events to be recorded to the SD Card.



- After this stage, the minimum & maximum detection area must be set to define the size of objects being picked up in the live camera view when motion is detected:

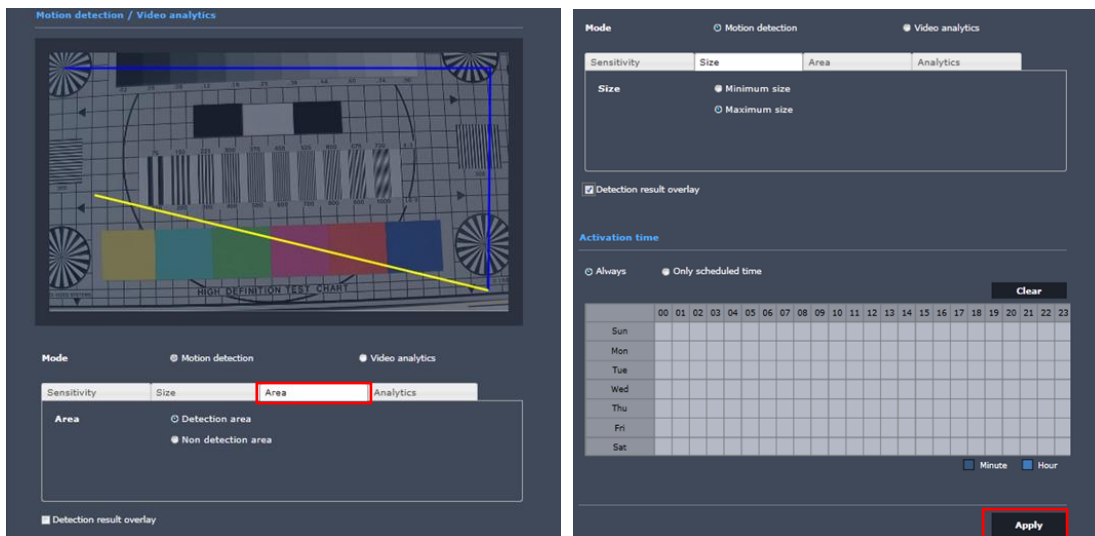


(Minimum size for detection)



(Maximum size for detection)

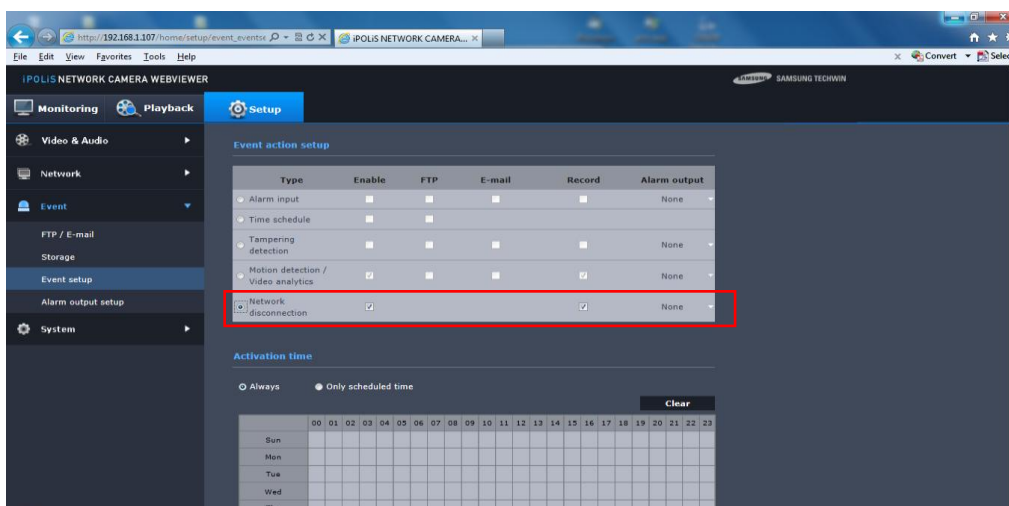
- Finally the motion detection area from the live view must be set:



☞ You can also set the activation time as seen by the image on the right which is useful for applications such as retail where you may only want to record motion events at night (for example)

☞ You are also able to set the motion detection sensitivity under the “Sensitivity” tab.

- **Once complete, click “Apply” and you will now have successfully set up Event Action Recording**

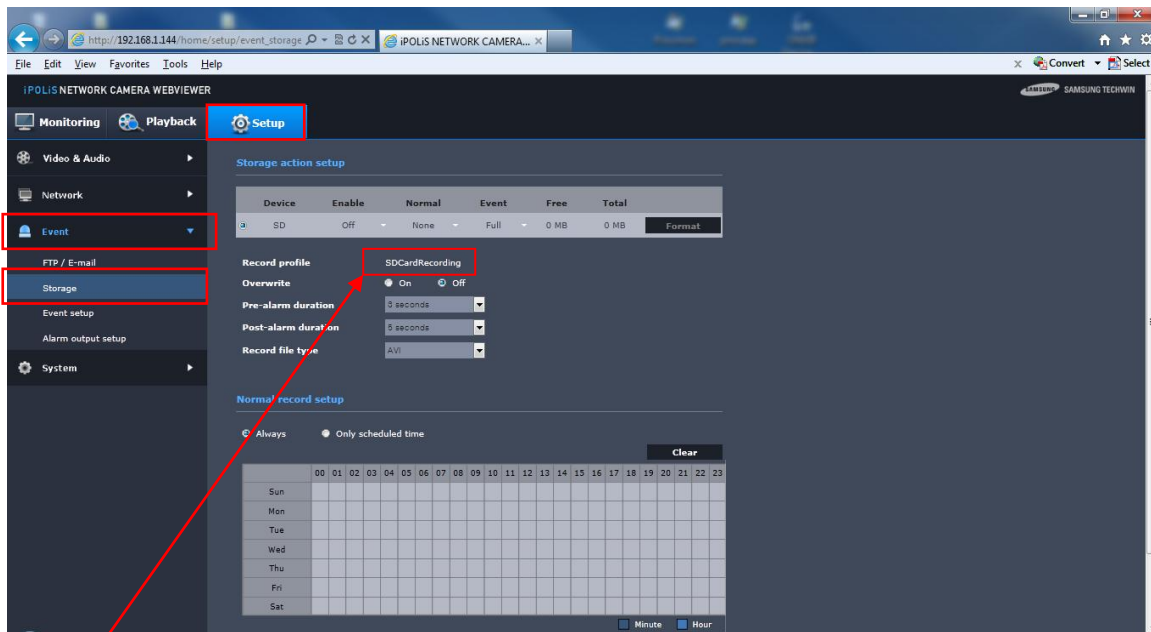


☞ Another useful setting is enabling the network disconnection event.

☞ In the event of a network camera disconnecting from the network, an event will be automatically created and recording will occur to the SD card.

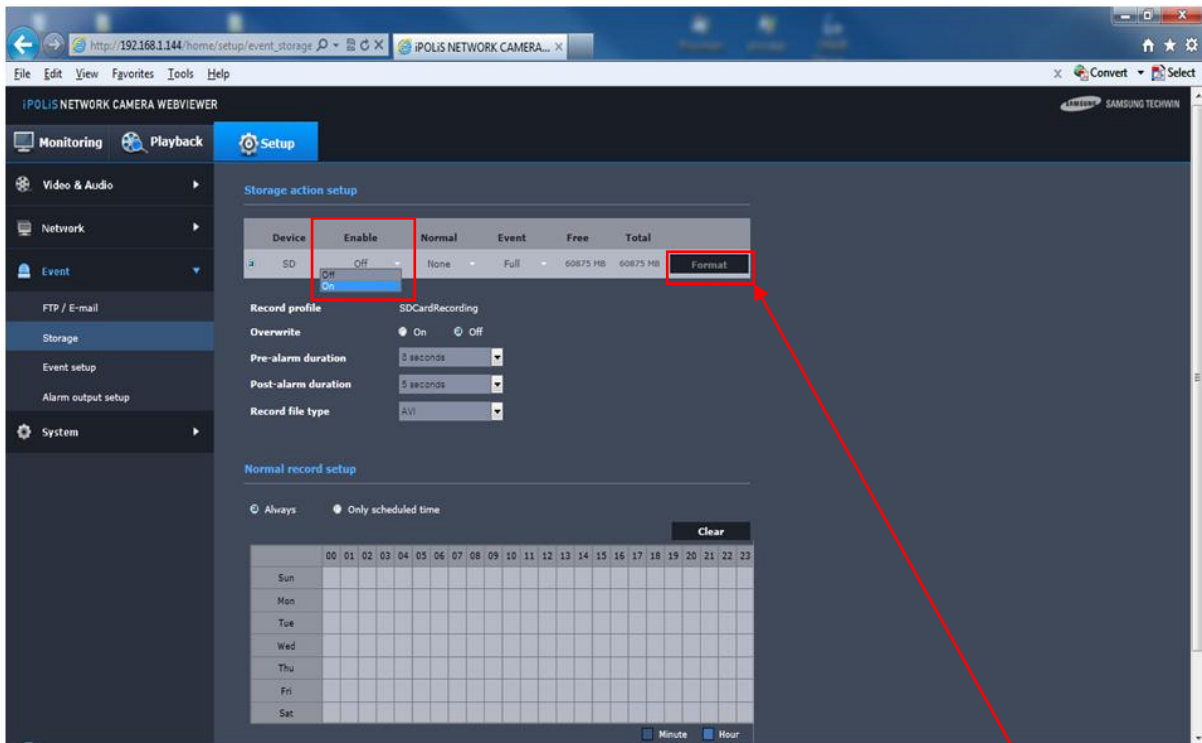
Step 5: Enabling the SD Card for Recording

- Now that we have set the recording profile and the event actions, the SD card itself needs to be enabled for recording.
- In the Samsung Device for the camera, click “Setup”, “Event” and “Storage”



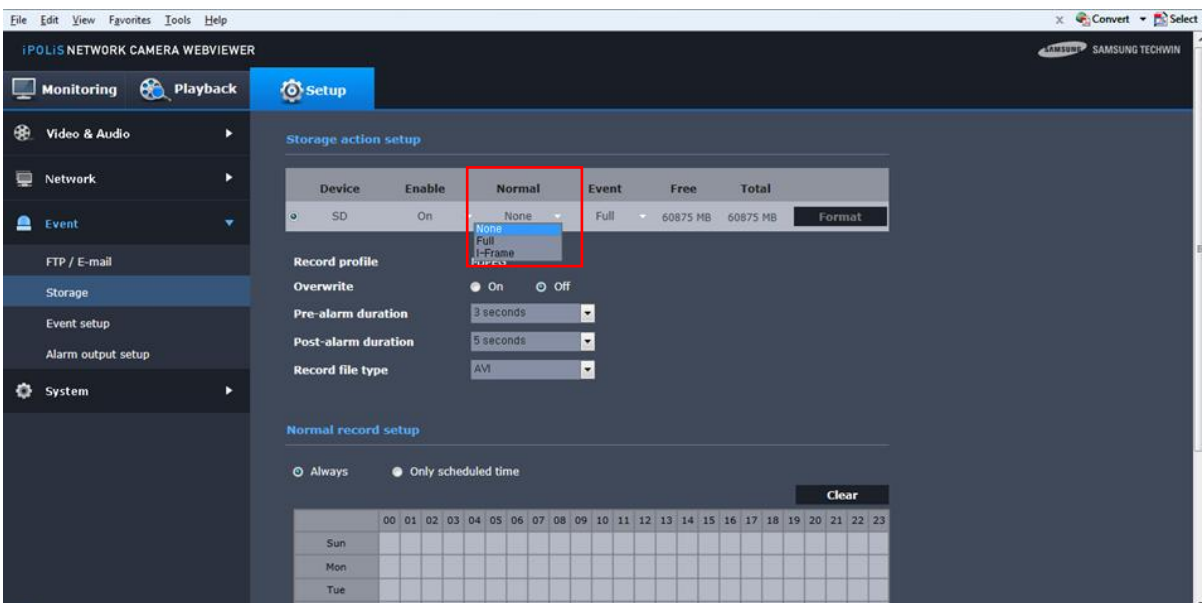
- Make sure that the Record Profile is set to “SDCardRecording” or the relevant profile which has been created.

- Enable the SD Card as per the diagram below and click on the “Apply” button at the bottom of the page.

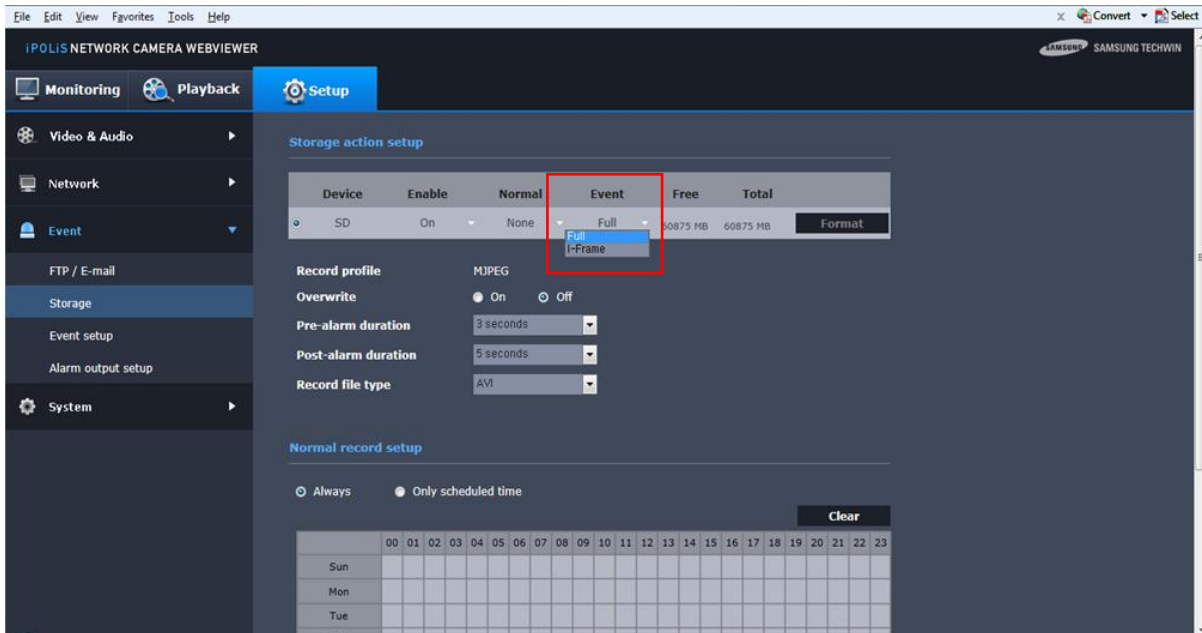


⊗ If the SD card has already been used, then you may need to format the SD Card to make sure that that the whole memory is free for recording.

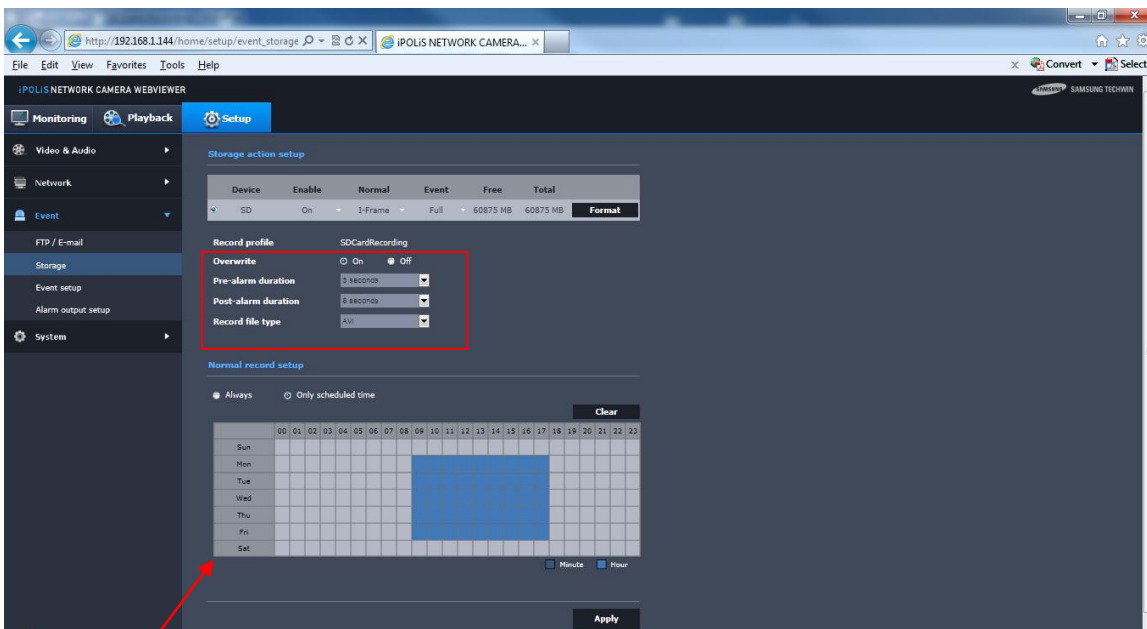
- Normal recording settings: (dictates the recording settings of the recording profile)
 None: No recording
 I-Frame: I-Frame recording only
 Full: Full stream recording



- Event recording settings: (dictates the recording settings of the event profiles)
 - Full: Full event recording
 - I-Frame: Only I-Frame Recording on events

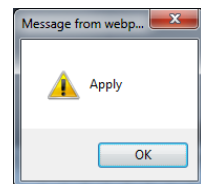
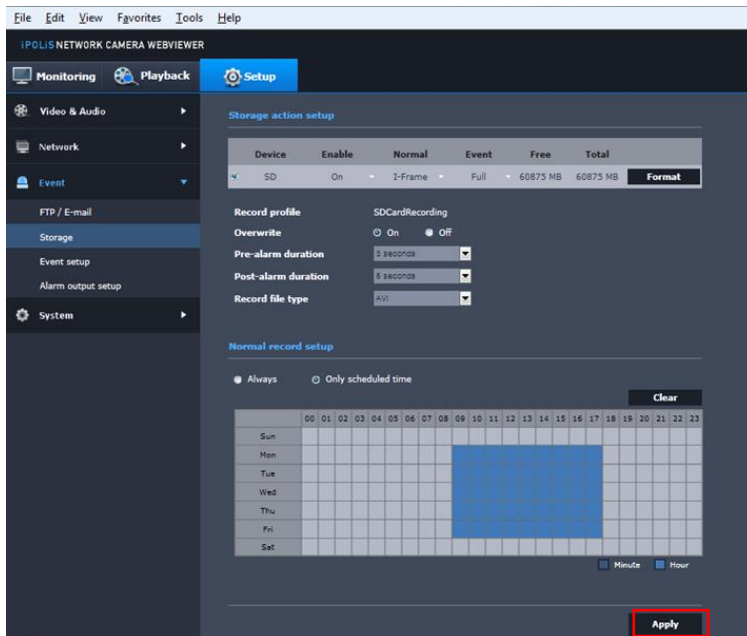


- Finally you can select whether to overwrite the memory card once it has been filled, set pre / post alarm durations and the record file type.



- ☞ You can also set the activation time for when recording takes place to the memory card – again, useful for applications such as retail where you may only want to record motion events at night when the store is empty (for example).

- Finally, click “Apply” and your settings will be saved and the SD card enabled for recording!




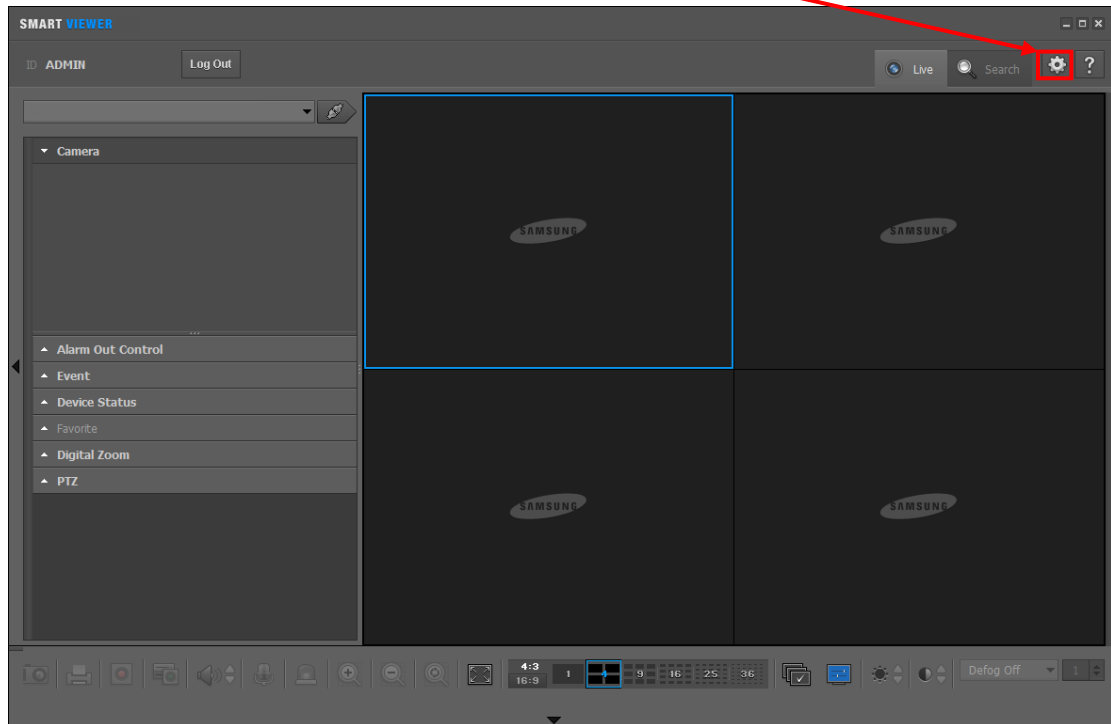
Step 6: Playback using Samsung Smart Viewer 4.0

- The best way to view recorded footage from the SD Card is through the Samsung Smart Viewer software.
- This enables recorded footage from the SD card inside the camera to be downloaded remotely over the network for review and playback.
- Firstly you will need to start Smart Viewer, if you do not have a copy then it can be downloaded here under the software tab:
<http://www.samsungsecurity.co.uk/en/products/software/video-surveillance/smartviewer.aspx>

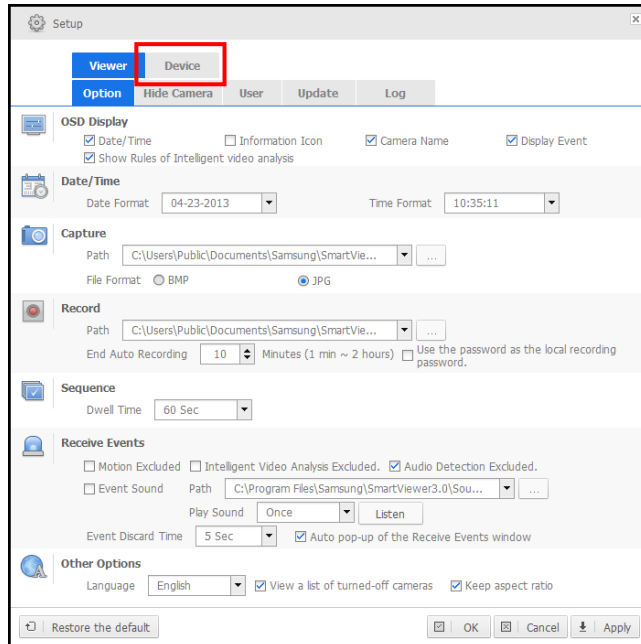


☞ Log into Smart Viewer - the default settings are “admin” and the password is: “4321”

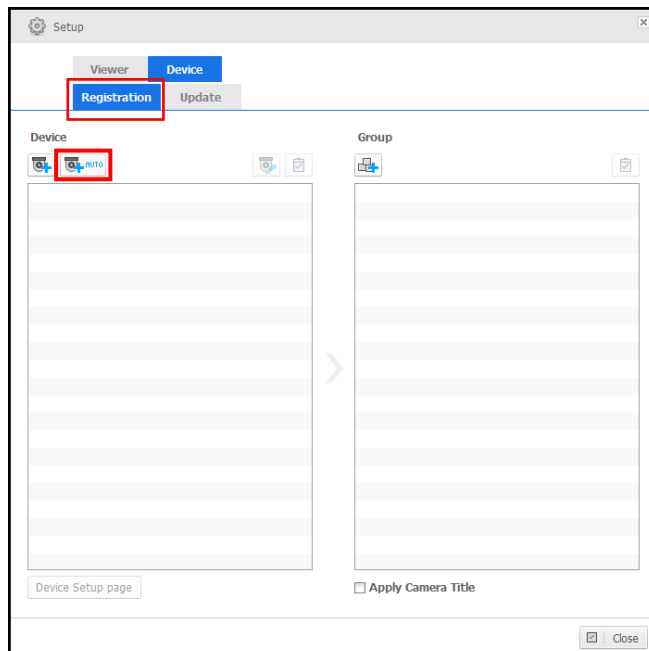
- On first start-up, the screen will look like this.
- The cameras will then need to be registered with Smart Viewer.
- To do this, firstly click settings: 



- The setup screen will appear – click “Device” to enter the device setup screen



- To automatically register devices to Smart Viewer, select “Auto” under the Registration tab:



- A list of available cameras on the network will then appear for selection on the screen:

Add Automatically ✕

No.	Model Name	MAC Address	IP Address	Device Port
1	SNO-6084R	00166C7D8BAD	192.168.1.110	4520
2	SNO-6084R	00166C7D8BB3	192.168.1.100	4520
3	SND-5010	00166C7BF467	192.168.1.19	4520
4	SNB-7000	00166C7AFCCD	192.168.1.78	4520
5	SNB-5000	00166C4780BE	192.168.1.109	4520

ID Password


- Select the relevant camera(s) from the list to add (in this case the SNO-6084R), enter the credentials for the camera and then click “Register” to register the camera with Smart Viewer. Once registered, click “Close” to return to the main viewing screen.

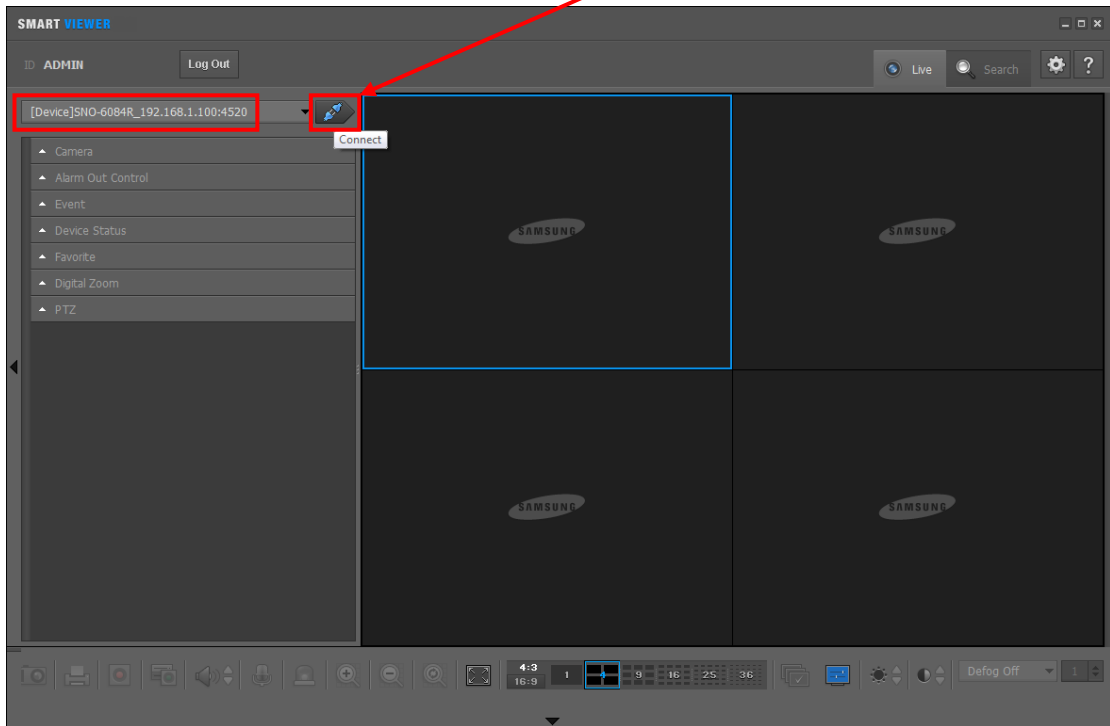
Add Automatically ✕

No.	Model Name	MAC Address	IP Address	Device Port
1	SNO-6084R	00166C7D8BAD	192.168.1.110	4520
2	SNO-6084R	00166C7D8BB3	192.168.1.100	4520
3	SND-5010	00166C7BF467	192.168.1.19	4520
4	SNB-7000	00166C7AFCCD	192.168.1.78	4520
5	SNB-5000	00166C4780BE	192.168.1.109	4520

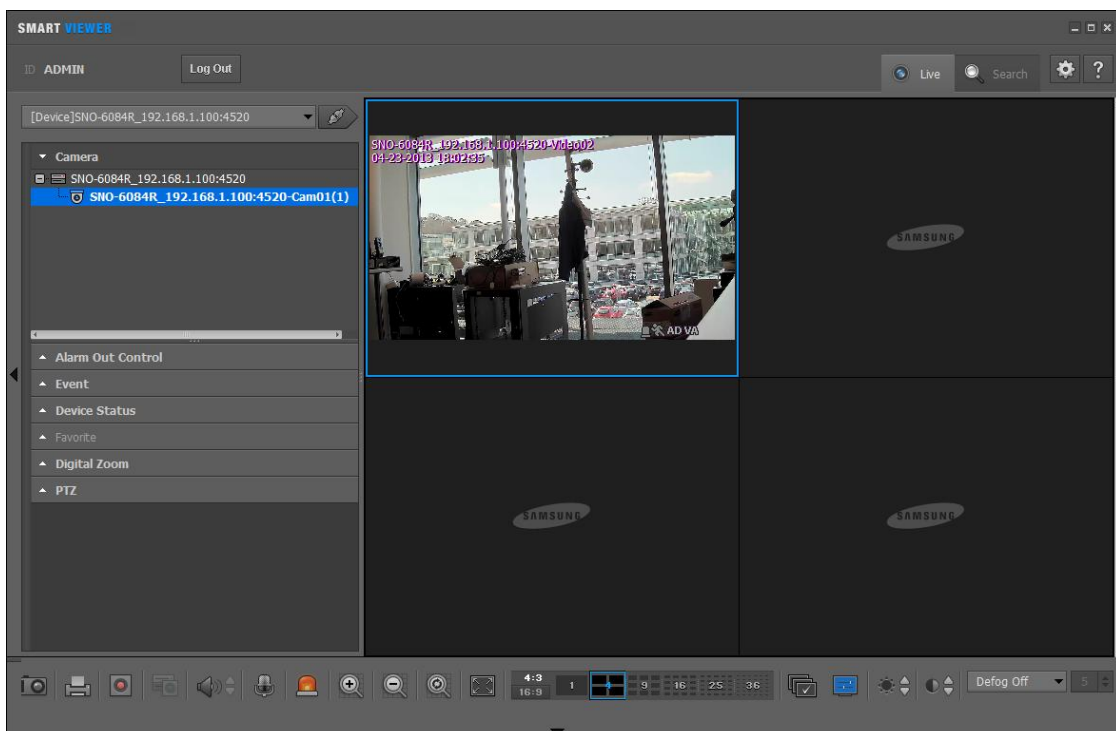
ID Password

- (Default Camera credentials – ID: “Admin” Password: “4321”)

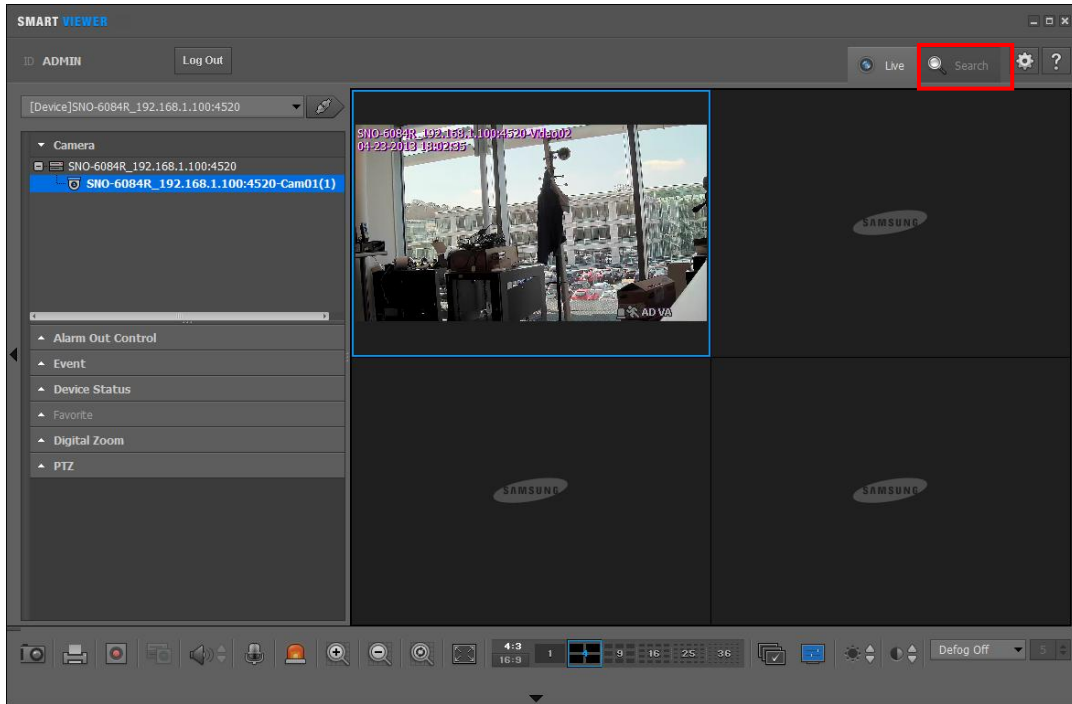
- The device will now show as registered on the left of the screen. For a live view of the camera, click “connect” 



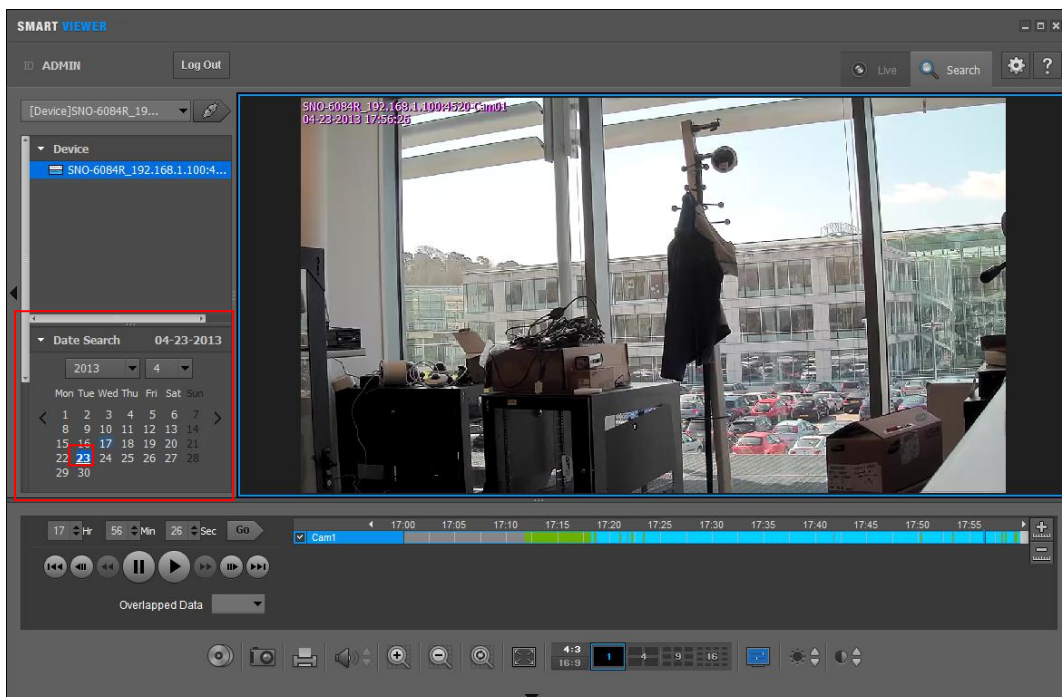
- This will now provide you with a live view of the camera in Smart Viewer.



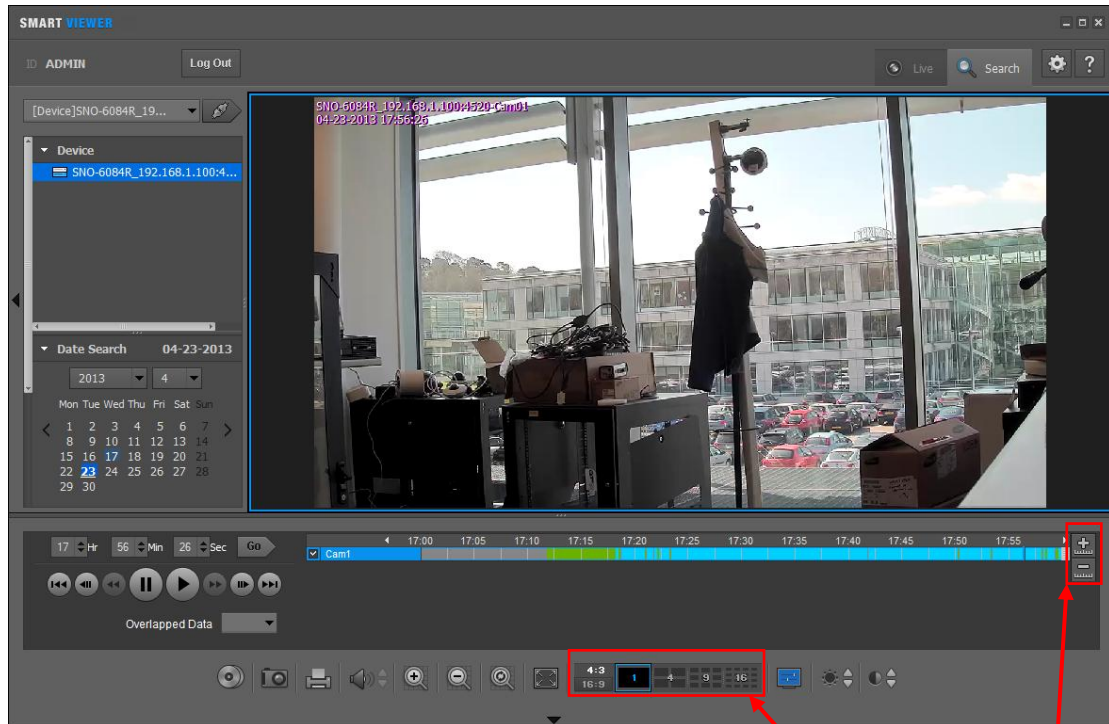
- To view recorded footage from the SD Card, select search from the menu:



- Select the date to view the recorded footage, dates highlighted blue in the calendar denote days when edge recording has occurred. The 23rd has been selected below.

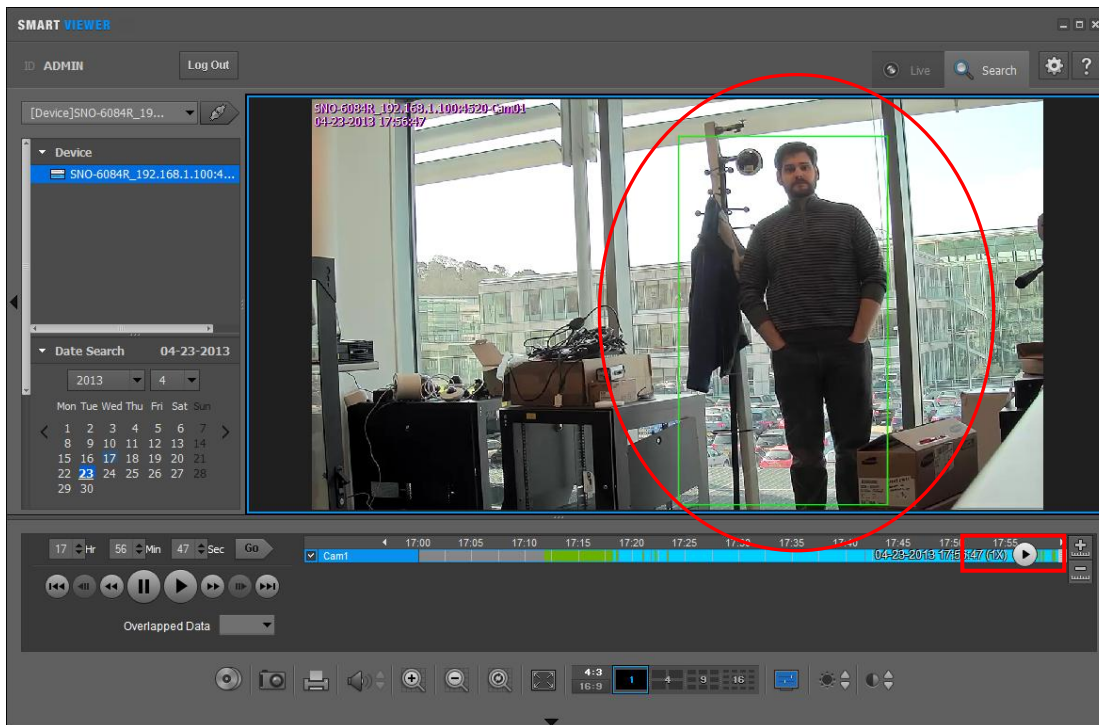


- You have now successfully downloaded the recorded video footage for playback.
- The recorded footage can be seen in the timeline below:



- The viewing pane can be changed to a number of split screen options
- There are also zoom in and zoom out buttons to change the timeline view.
- During playback you can play, pause, skip forward and skip back through footage.
- With the WN3 cameras you can also play or rewind at 4 different playback speeds.

- Light green areas on the timeline denote footage being recorded normally.
- Light blue areas indicate footage where an event has been registered; in this instance motion has been detected as per the picture below:



- An SD card player is currently being developed for playback of recorded footage from an SD card once it has been removed from the network camera.
- The SD card player will be useful in situations where evidence has been recorded onto an SD card which can be passed onto the relevant authorities for playback and review.

Supported SD Memory Card by Models (As of April 2013):

Network Camera	Micro SD/SDHC/SDXC Supported by	SNB-6004, SNB-6003 SND-6084, SND-6083
	SD/SDHC Supported by	SNB-7002, SNB-7000, SNB-5000, SNB-3002, SNZ-5200 SNO-7082R, SNO-7080R, SNV-7080R, SNV-5080R SND-7082(F), SND-7080(F), SND-5080(F), SND-3082(F), SND-3080(F) SNV-7082, SNV-7080, SNV-5080, SNV-3120, SNV-3082 SNP-6200(H), SNP-5300(H), SNP-5200(H), SNP-3371(H/TH), SNP-3302(H), SNP-3120(VH) * SNO-7082R, SNO-7080R, SND-7080(F) – Includes 4GB SD Memory Card.
	Mini SD Supported by	SNB-1001 SNV-1080R, SNV-1080 SND-1080, SND-1011
	SD Memory Not supported	SNB-7001, SNB-5001 SNO-5080R, SNO-1080R SND-7011, SND-7061, SND-5011, SND-5061, SND-5010, SNV-5010
Encoder		SPE-100 SPE-400

- Functions and specifications contained within this document are subject to change without prior notice for improved performance and quality.



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