

**GEN IV  
TECHNOLOGY**

H.264 Network Digital Video Recorder



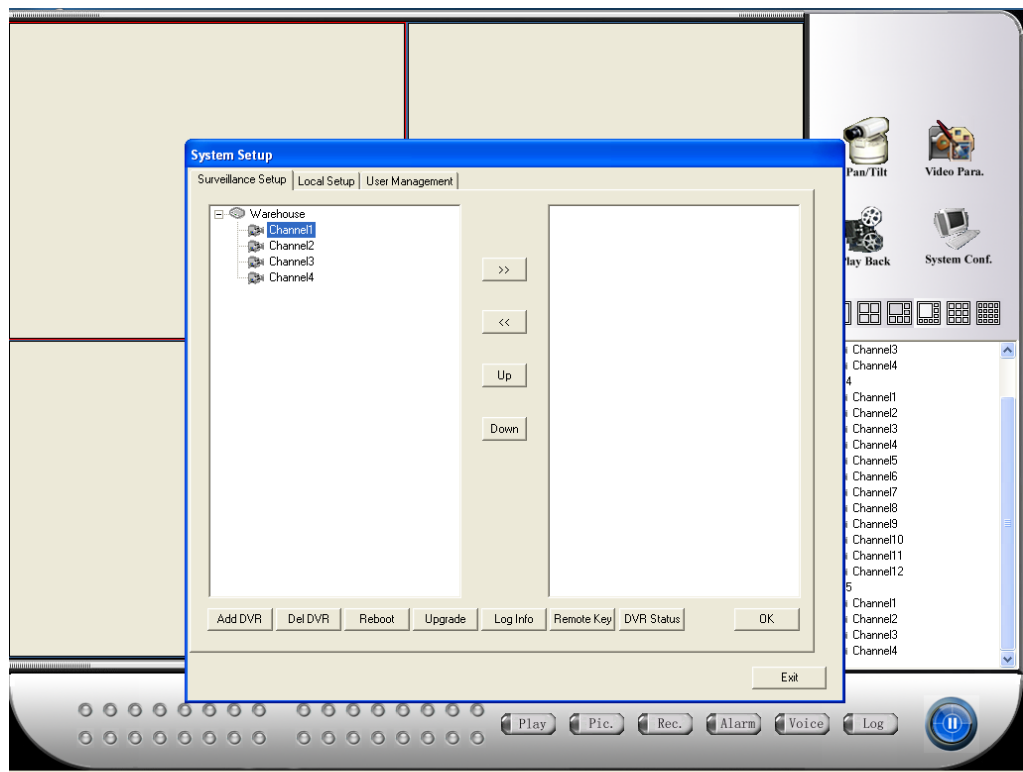
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## SUB-STREAM FUNCTION

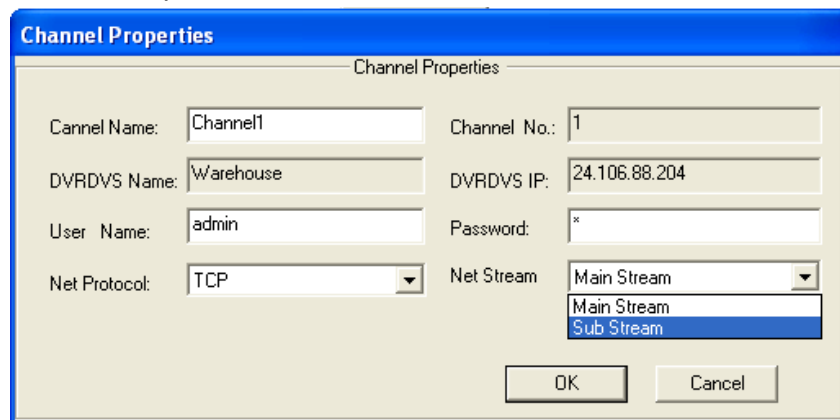
All DVRs utilizing firmware version 1.4 build 051215 and higher include a feature called "sub-streaming". This allows for high resolution recording to the unit locally (on the hard drive) and lower resolution for viewing across the Internet or LAN.

### YOU MUST USE THE SUB-STREAM FEATURE WHEN VIEWING IMAGES VIA THE CLIENT SOFTWARE OR WEB BROWSER

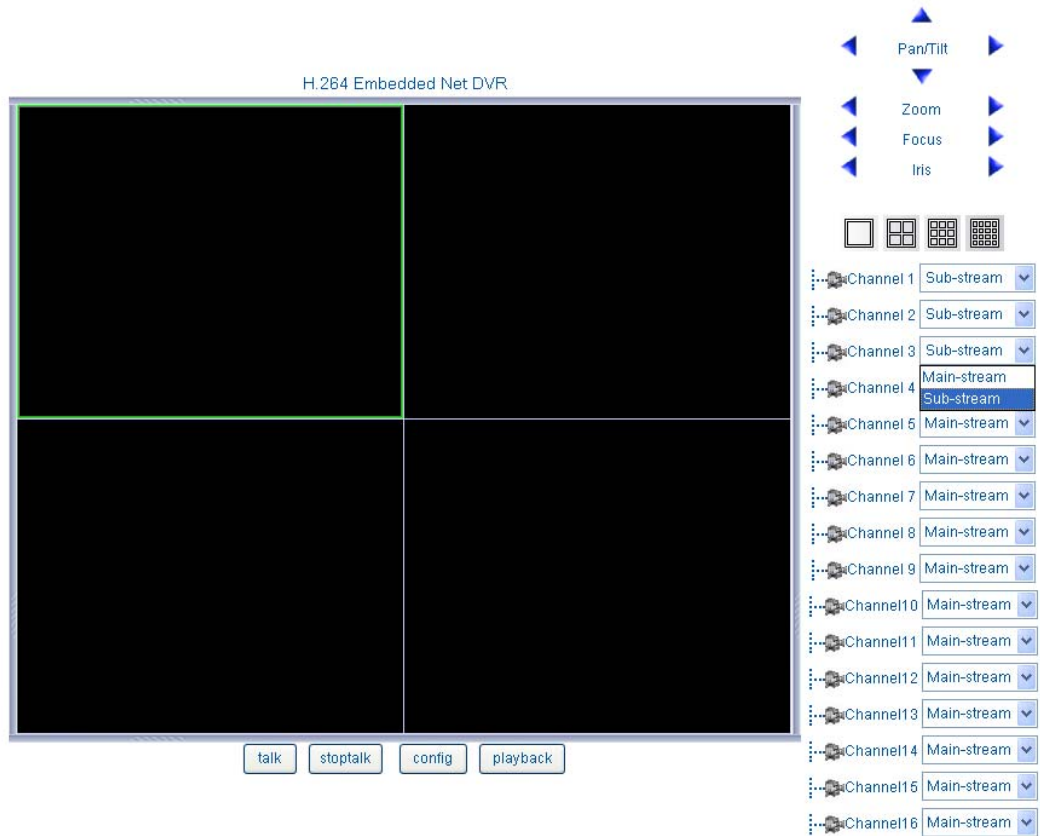
1. When viewing your DVR via the client software ensure the use of sub-streaming by following the below steps.
  - a. Add your DVR to the client software
  - b. Double-click Channel1 to open Channel Properties



- c. Ensure the Net Stream option is set to Sub Stream, click OK, repeat for all channels



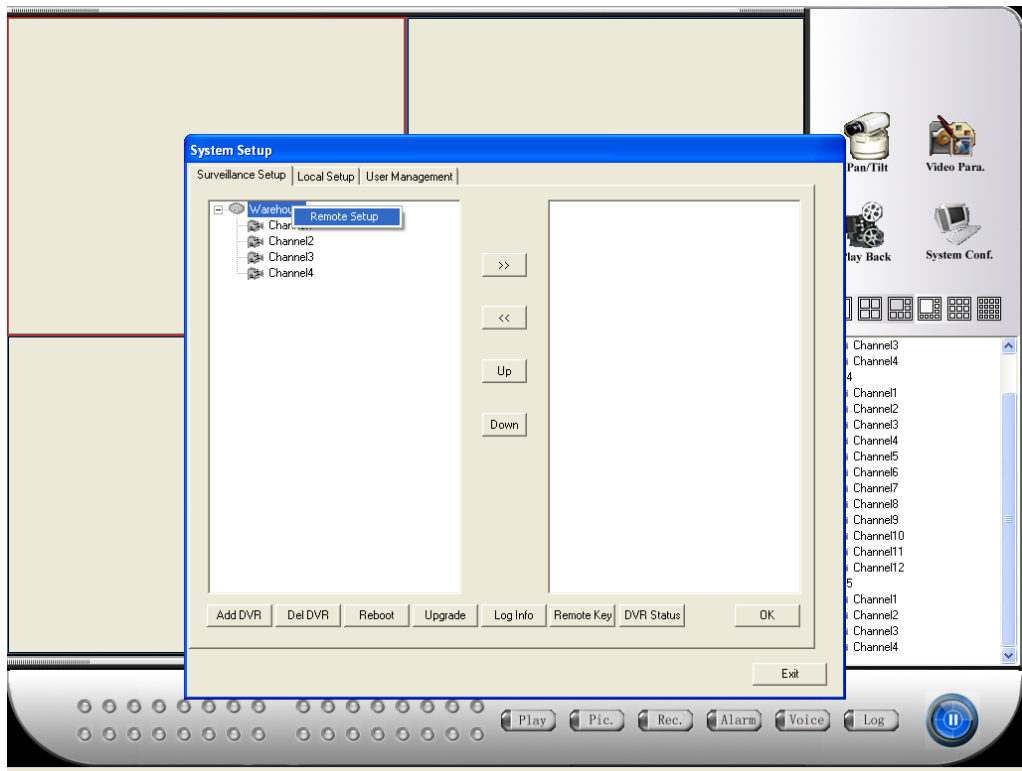
2. When viewing your DVR via Internet Explorer ensure the use of sub-streaming by following the below steps.
  - a. Simply select Sub-Stream from drop down list next to each channel name prior to viewing that camera. Do this for every channel.



## NETWORK PARAMETERS

After enabling sub-streaming for viewing, you must configure the sub-stream parameters. These sub-stream parameters will differ from your recording parameters and will only be used when viewing the images remotely.

1. When viewing your DVR via the client software configure your sub-stream network parameters by following the below steps.
  - a. Add your DVR to the client software
  - b. Select your DVR name, right-click, select Remote Setup



- c. Choose the Channel Para. Tab, edit the Sub Stream (Network) fields

Remote Config

Server Para. Channel Para. Serial Para. Alarm Para. User

Channel Setup

Channel No. Channel1 Channel Name Camera 01

Main Stream (Recording)

Resolution CIF Image Quality Common Stream Type Mix

Bitrate Type Variable Frame Rate 20 Max Bitrate 1280K 0

Sub Stream (Network)

Resolution QCIF Image Quality Common Stream Type Mix

Bitrate Type Variable Frame Rate 6 Max Bitrate 160K 0

Schedule Setup PreRec Time 5 Seconds PostRec Time 5 Seconds

Motion Detect Alarm Setup  View Tampering Alarm Setup

Private Mask Setup  Video Lost Alarm Setup

Display OSD X Position 0 Y Position 32  Display Weekday

Properties Opaque & Steady

OSD Type XXXX:XXXX (MonthDayYear)

Display Channel Name X Position 512 Y Position 416

OK Cancel Copy To All Channels Copy

Save Para. Default Para. Check Sys Time Format Disk Exit

- d. After choosing your parameters for Channel 1, click OK, select Channel 2, edit parameters, click OK, and repeat for all channels. Finally, choose Save Para to apply all settings to the DVR.

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**NOTE:** Changes to Resolution or Stream Type require a reboot after Save Para.

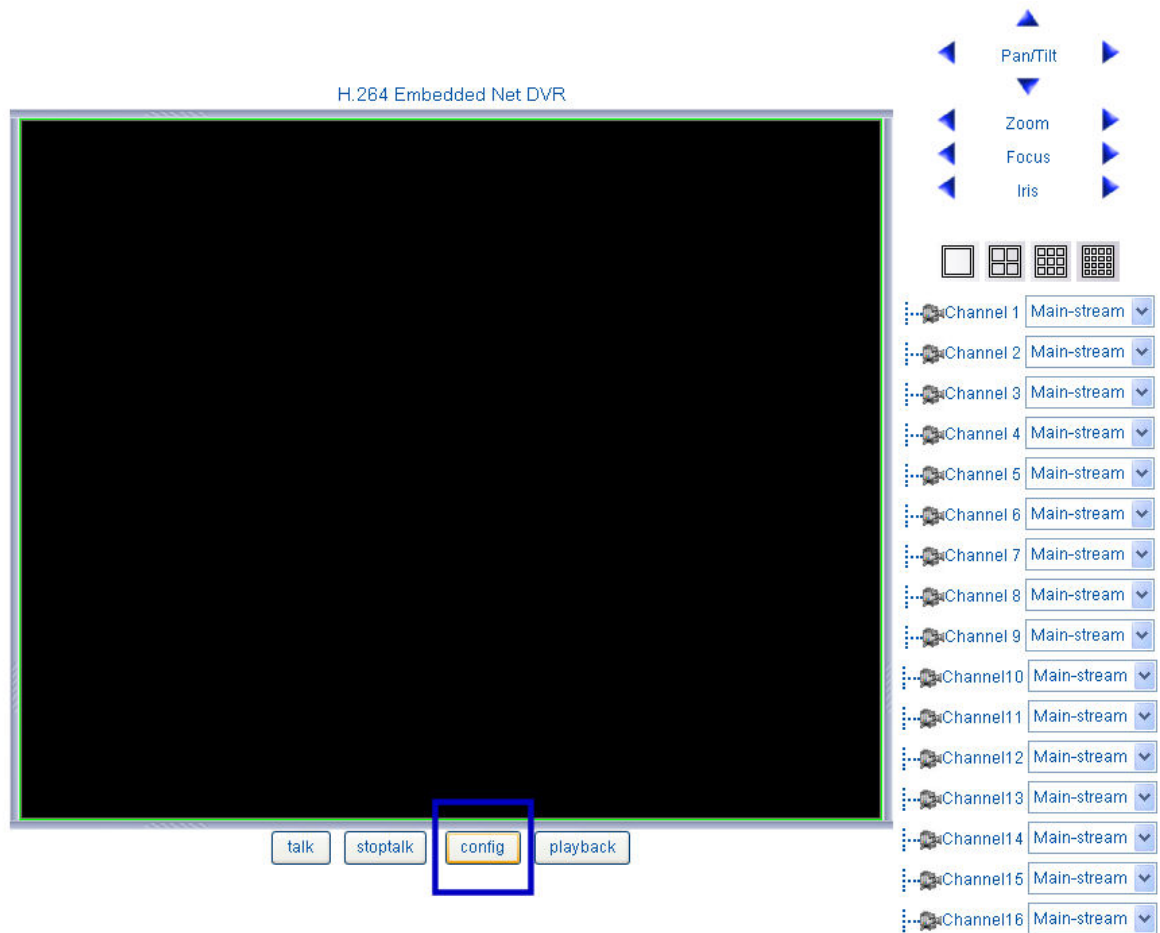
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**NOTE:** Review the optimization section for recommended settings

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2. When viewing your DVR via the client software configure your sub-stream network parameters by following the below steps.

a. Access your DVR and select the Config option



- b. Choose the Channel Para. Tab, edit the Minor Stream (Net) fields

Remote Setup

Server Para. Channel Para. Serial Para. Alarm Para. User Transaction Exception

Chan Para

Channel No. Channel1 Channel Name Camera 01

Major stream(Record)

Image Quality Average Stream Type Audio&Video Resolution CIF

Bit Rate Type Variable Frame Rate 20 Max Bit Rate 1280K 0 bps

Minor stream(Net)

Image Quality Average Stream Type Audio & Vide Resolution QCIF

Bit Rate Type Variable Frame Rate 6 Max Bit Rate 128K 0 bps

Enable Rec Setup Record Delay 5S Pre Record Time 5S

Sensitive Area Shelter Setup  Spiteful Mask Alarm Setup

Motion Detect Setup  Video Lost Alarm Setup

Osd X Loc. 0 Y Loc. 32  Display Weekday

Properties Untransparent & Untwinkle OSD Type XXXXXX (MonthDayYe

Display Channel Name X Pos. 512 Y Pos. 416

Copy to All Channels Copy OK Cancel

Reboot Default Para. Save Para. Exit

- c. After choosing your parameters for Channel 1, click OK, select Channel 2, edit parameters, click OK, and repeat for all channels. Finally, choose Save Para to apply all settings to the DVR.

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NOTE: Changes to Resolution or Stream Type require a reboot after Save Para.

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NOTE: Review the optimization section for recommended settings

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It is *critical* to set your sub-stream network parameters to an optimized state. In order for the user to enjoy the power of H.264, the sub-stream parameters must be appropriate for your Internet connection at the DVR installation site. Please follow the below hints to help optimize your system for the best possible remote viewing experience.

- **KNOW YOUR UPLOAD RATE.** Do an Internet speed test at the site of the DVR installation to confirm the upload rate from which you will base your DVR sub-stream configuration. You must be well aware of this upload rate as this is the limiting factor in your remote viewing experience. There are many Internet speed test sites, but [www.dslreports.com/speedtest](http://www.dslreports.com/speedtest) is popular. Run a speed test that will display the **UPLOAD** speed (download speed does not matter at the DVR installation site, **UPLOAD** is critical to remote viewing).
- There is no minimum upload rate required for remote viewing to work, but lower the upload rate, the slower your video will refresh. We recommend a connection with no less than 256 Kbps upload, but even a dial-up connection will allow remote viewing, albeit at a very slow refresh rate.
- The **Resolution** and **Max Bit Rate** settings are the most significant when trying to achieve the highest quality image. Refer to the recommendations below for various upload rates.
- **There is always a trade-off between speed and image quality.** For most cases, the frame rate can be dropped to 1-6 FPS to accommodate slow connections and higher quality images can be achieved. With low speed upload rates for Internet connections, there is no way possible to have high quality at real-time frame rates, since the bottleneck is the upload Internet connection and never the DVR. For DVR performance, use a local connection for evaluation.
- For low speed connections, it may be preferred to access 1 or 2 cameras simultaneously, rather than all cameras. In this case, you can set high quality and speed parameters if only 1 or 2 are access at the same time. In this case, the low upload bandwidth is being used for just one channel rather than trying to squeeze 4 video streams through that small connection, this allows for higher quality and speed settings if you're using 1 camera for that entire upload bandwidth.
- The chart on the next page can be used as a guideline and as a starting point. Increase parameters only if your upload rate can support it. Dial-up speed is 56 kbps for reference.

Upload (kbps)	Configuration
128 - 256	<p>Minor stream(Net)</p> <p>Image Quality <input type="text" value="Average"/> Stream Type <input type="text" value="Audio &amp; Vide"/> Resolution <input type="text" value="QCIF"/></p> <p>Bit Rate Type <input type="text" value="Variable"/> Frame Rate <input type="text" value="6"/> Max Bit Rate <input type="text" value="128K"/> <input type="text" value="0"/> bps</p>
257 - 384	<p>Minor stream(Net)</p> <p>Image Quality <input type="text" value="Average"/> Stream Type <input type="text" value="Audio &amp; Vide"/> Resolution <input type="text" value="QCIF"/></p> <p>Bit Rate Type <input type="text" value="Variable"/> Frame Rate <input type="text" value="6"/> Max Bit Rate <input type="text" value="160K"/> <input type="text" value="0"/> bps</p>
385 - 512	<p>Minor stream(Net)</p> <p>Image Quality <input type="text" value="Average"/> Stream Type <input type="text" value="Audio &amp; Vide"/> Resolution <input type="text" value="QCIF"/></p> <p>Bit Rate Type <input type="text" value="Variable"/> Frame Rate <input type="text" value="6"/> Max Bit Rate <input type="text" value="192K"/> <input type="text" value="0"/> bps</p>
513 - 1024	<p>Minor stream(Net)</p> <p>Image Quality <input type="text" value="Average"/> Stream Type <input type="text" value="Audio &amp; Vide"/> Resolution <input type="text" value="CIF"/></p> <p>Bit Rate Type <input type="text" value="Variable"/> Frame Rate <input type="text" value="10"/> Max Bit Rate <input type="text" value="256K"/> <input type="text" value="0"/> bps</p>
1024 +	<p>Minor stream(Net)</p> <p>Image Quality <input type="text" value="High"/> Stream Type <input type="text" value="Audio &amp; Vide"/> Resolution <input type="text" value="CIF"/></p> <p>Bit Rate Type <input type="text" value="Variable"/> Frame Rate <input type="text" value="20"/> Max Bit Rate <input type="text" value="320K"/> <input type="text" value="0"/> bps</p>

NOTE:

- QCIF resolution is best used for split screen view (4, 8, or 16 channel view)
  - Use QCIF for low speed connections if accessing all cameras simultaneously
- CIF resolution is best used for all views
  - Use CIF for higher speed connections or if accessing 1 or 2 cameras on low speed connections
- If a mosaic effect (smearing) is apparent during movement in picture, increase the Max Bit Rate
- Reducing frame rates allow for high image quality via the Max Bit Rate or Resolution setting
- Reducing Max Bit Rate or Resolution settings allow for higher frame rates
- Use a low bit rate if there is little motion in the picture.