

Spectrum San Diego, Inc.

Technical Note: Compression, Image Quality, and Storage

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Introduction

The primary goal of this technical note is to understand the effects on image quality and storage for each of the four compression settings offered by SentryScope™.

This note assumes knowledge of how SentryScope operates and captures images (See the Technology Primer for more details).

SentryScope is designed primarily as an after the fact investigative tool. Images are stored in such high resolution that they can be reviewed after the fact and be used to recognize people, read license plates, identify objects of interest, and view general activity over large areas. Therefore, image quality is the overriding concern when considering compression and how much storage is used over a given period of time.

SentryScope offers the following four compression settings with their associated storage usage:

Highest Image Quality	≈ 100 Gbytes per day, continuous recording
Recommended Setting	≈ 70 Gbytes per day, continuous recording
Longer Storage	≈ 40 Gbytes per day, continuous recording
Maximum Storage	≈ 30 Gbytes per day, continuous recording

Figures 1 and 2 show the effects of each compression setting. In all cases, the images were taken with the 85mm lens configuration from a distance of 60 feet. Figure 1 shows images taken directly from the camera with no image enhancement. Note that there is little observable difference between the four compression settings in the quality of the image. Figure 2 shows these images sharpened according to SentryScope's normal setting. Observe the following differences in the sharpened image column:

At the *Highest Image Quality* setting there are no observable differences between this setting and the *Recommended Setting* in well-lighted conditions. Differences will be noticed and image quality will improve in poorer lighting conditions or when viewing areas in shadow.

At the *Recommended Setting* there are little or no observable compression artifacts in the face or the license plate. Details in the license plate, such as state and month of registration expiration, can be read.

At the *Longer Storage* setting the face and license plate are still clearly identifiable, but compression artifacts can be observed around the face and some of the license plate details become unreadable.

At the *Maximum Storage* setting, the face is still recognizable but compression artifacts can be clearly seen. The license plate number can be read but some objects of interest may not be distinguishable.

Without Sharpening

Highest Image Quality



Recommended Setting



Longer Storage



Maximum Storage



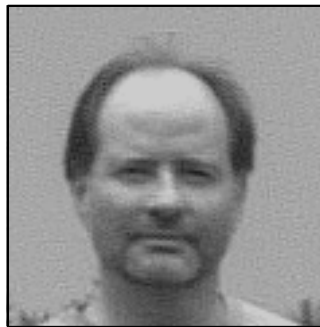
Figure 1. The compression setting makes only a slight difference when viewing unsharpened images. (All images taken at 60 feet using an 85mm lens)

With Sharpening

Highest Image Quality



Recommended Setting



Longer Storage



Maximum Storage



Figure 2. The images from SentryScope are usually *sharpened* before display. This improves the image quality, but also makes the compression artifacts more apparent.

Assuming 250 Gbyte hard drives, the following table (Table 1) shows the approximate number of days of storage with continuous recording:

	Highest Image Quality	Recommended Setting	Longer Storage	Maximum Storage
One hard drive	2.5 days	3.5 days	6 days	7 days
Four hard drives	10 days	14 days	24 days	28 days

Table 1

Factors you may want to consider in deciding which compression setting to use include:

- The anticipated time between an incident occurring and the time the incident is reported and/or investigated
- The need to retain or backup images
- The availability of mass storage for image backup
- The number of *SentryScope* cameras installed and the degree of overlap
- The need to recognize faces and license plates at a large distance (150 - 250 feet) from *SentryScope*

SentryScope PCs come standard with two Fast Ethernet Network Interface Cards (NICs). One NIC is dedicated to the camera. The other NIC can be used to connect the PC to a Local Area Network (LAN) which can be utilized to periodically backup images to a network storage device. Alternatively, the PC could be directly connected to a mass storage device through a number of different buses (SCSI as an example) for image backup.