

# **How To Make Sure Your Security Camera Recordings will be the Same Quality as a DVD Movie**

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When you are researching a Security Camera System, it is easy to be fooled into buying a system that does not have the ability to produce DVD-like quality recordings. In fact, finding a system that can do this is not as easy as you would expect. This article will teach you how to look beyond the advertising hype to the underlying specifications that really matter in producing recordings that are at least equal to, or better than the standards for your regular TV, or DVD player.

The very first criteria that you need to look for is the particular compression method the DVR uses for compressing the video footage for optimum storage. This is a much easier task today than it was in years past. Why? Because there are only two compression methods that are acceptable when the goal is DVD quality video: MPEG4 and H.264.

If the recorder you are considering is MJPEG, Wavelet, or JPEG 2000, or any other outdated method, keep looking. These methodologies cannot give you the higher resolutions that are necessary for the best quality video.

The next criteria to look for, and these are sometimes much harder to find in the specifications, are the Recording Resolutions available. Many manufacturers or retailers try very hard to hide this number from you. In fact, many times they will quote the Live Display resolution up front to fool you into thinking that this is what you will end up with when viewing your recorded video footage. It is not. The Live Display resolution is almost always 720x480. This is equal to DVD resolution, and is exactly what you want as your “minimum standard” for recording, but chances are that the recorder will not be able to record the video at this higher resolution. Many DVR's out there record at CIF (320x240) or 2CIF (640x240) at best. This is not good enough. You need to find a DVR that can handle recording at DVD, or sometimes referred to as D1 (704x480) resolution. Even if it is at a reduced frame rate, as it probably will be because of the processor power it takes to record a lot of frames per second at the higher resolutions, having the ability to record at D1/DVD resolution is the most important aspect in getting quality recordings in the end. Especially for important camera views such as cash points or facial recognition.

One of the most common questions from purchasers is: “How many lines of resolution should my cameras have, in order to best utilize the resolution capabilities of my DVR?” There is a lot of confusion in the industry when it comes to how “Recording Resolution” and “Lines of Resolution” (or sometimes referred to as TV Lines), relate to each other. You will probably find that many retailers don't have a clue what they're talking about when describing the differences in these two terms, or more importantly, relating lines of resolution from a camera, to the recording resolution of a DVR. So let's set the record straight.

First, for a better understanding of recording resolutions, let's define some industry terms you will see when looking at the specs of a DVR.

CIF is a commonly used television standard for measuring resolution, and it stands for “Common Intermediate Format”. Most DVR's will list their capabilities using some variation or level of this term. Here is a list of CIF resolutions: (Note: the actual number of pixels in a CIF image may vary slightly as long as they

provide the same level of overall picture quality)

1CIF (commonly stated as just “CIF”) equals 320x240 pixels.

2CIF equals 640x240 pixels (sometimes referred to as “Field” resolution)

4CIF equals 640x480 pixels

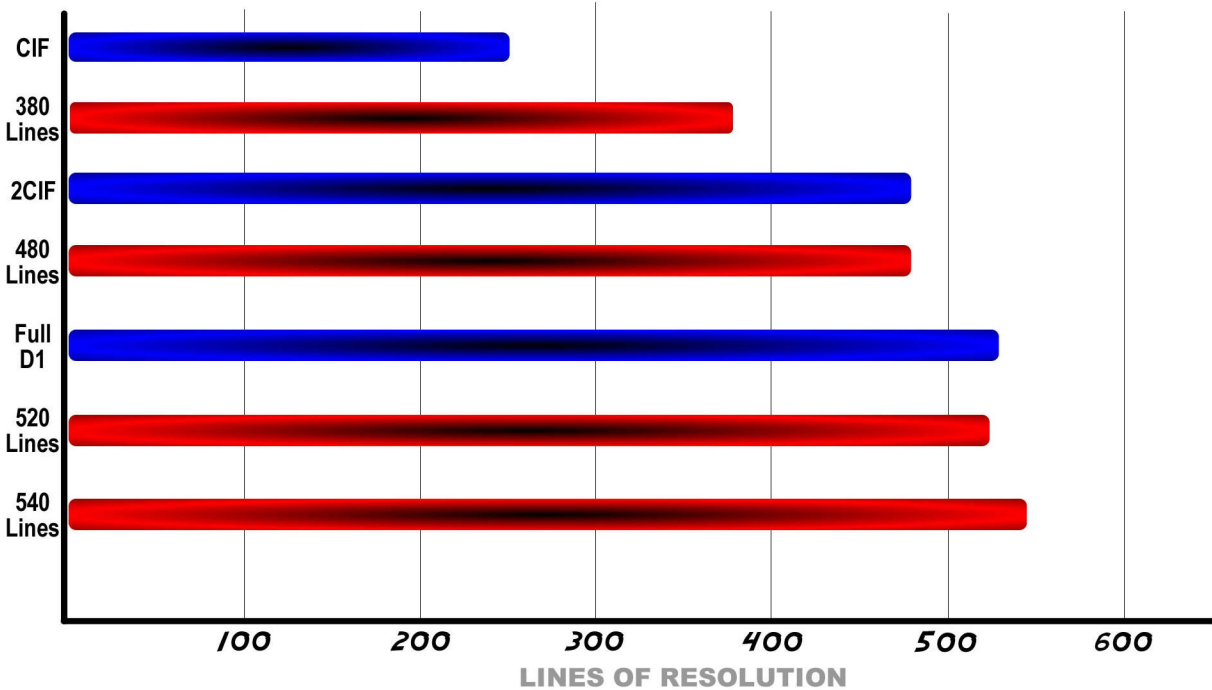
D1 or DVD equals 704x480 (sometimes referred to as “Full” resolution, or 740x480)

Anything 4CIF and above can get a little confusing because some manufacturers list 4CIF as 704x480, and D1 as 740x480, but these resolutions are very close, so it shouldn't matter that much. The important spec to remember is that the highest recording resolution capability of a DVR should be no lower than 704x480. That is the number you need to look for.

Why are you lumping the top three most commonly used resolutions of 640x480, 704x480 and 740x480 together? Isn't each higher number better than the one below it? The answer is: No, not really. Let me explain. Most DVR's on the market can only see 720 pixels on any single scan line. Of those 720 pixels, the first 8 pixels and the last 8 pixels are black. They do not contain picture elements. Since the black pixels are irrelevant, we don't include them. We subtract the 16 black pixels, and the remaining 704 pixels are all we use. Other manufacturers subtract the first and last 40 pixels on each line because, on some hardware platforms, (particularly the PC-based systems), the pixels on the edges are not as stable as they are on our platform. Thus, they use the 640x480 standard. Hopefully you see now how all these resolutions basically equal the same picture. Our DVR's are optimized for 704x480, and thus, we give you the highest resolution available, while showing you all of the picture that is possible.

Now, let's take a look at the following chart to see how the “Lines of Resolution” of a particular camera equates to the “Recording Resolution” of a particular DVR:

## RECORDING RESOLUTION VS. CAMERA LINES



### **Above Comparison for RUGGED CCTV DVRs**

As you can see from the chart above, recording your pictures at the CIF (320x240) resolution means that you are capturing at a much lower resolution. Some users record less important camera views at this resolution to save hard drive space, thus giving them longer recording durations and smaller files to transmit over the Internet to your Remote Software. However, important camera locations such as cash points and facial recognition views will suffer at this resolution because there is less information to work with. When trying to view these small size pictures at full screen size, the system will generate extra pixels to increase the physical size of the picture, but since these are not “captured” pixels, the quality of the entire image suffers.

A camera image captured at 640x480 resolution is 4 times as large as 320x240. An example of how much more useful the larger size is, is displayed below:



The larger picture was captured at 704x480. The smaller picture in the lower right corner was captured at 320x240. The advantages of the larger picture size are evident. Your hard drives will fill up quicker using the higher resolution, but hard drives are cheap. The message here is to record important camera views at the highest resolution, and set lesser camera views to the smaller size. This optimized type of setup is what we recommend to most of our customers.

Most DVR's that you will find on the market will not be able to record at the higher settings at all. In our case, the processor that we build into our DVR's will enable you to record at any of the resolutions listed here, (albeit at lower frame rates when recording at the highest resolutions).

Call our Design Engineers if you have additional questions about how to choose a DVR that will do what you need it to. But above all, look very carefully at the specifications of any DVR before you purchase it. Then, make sure that it is really easy to use, and is backed by a reputable manufacturer.