

PALISADES RESEARCH

Large Format Scanner Buying Guide & Hints on Scanning, Scanners, and Archiving of Engineering drawings

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Planning

Most companies are concerned about their thousands of old documents. Their drawings are very old, faded, in poor condition and getting worse. Many are irreplaceable. Most just need to be in a format where they can be viewed and / or printed if needed. Some will need to be converted into CAD. Sometimes only a piece of a drawing may need to be modified. Always, finding a drawing quickly is a top priority. Since companies are now used to seeing drawings in electronic format the biggest concerns about scanning are how to start, how much will it cost, and should it be done in house.

First you must determine the number of documents that you have. Too few documents and you will not be able to justify the cost of a scanner. If you have a lot of documents, or will continue to accrue documents, purchase of a scanner is probably a good idea. Next you will have to determine how your people will search for their documents and what tools you will need. This planning may be the most important step because it will influence how easily you can find documents in the future and how easily you can add other electronic files to your index. This is where the Visual Database programs come in. They can index, search for and compare your drawings. After scanning you need to quality check your images. You may also need to edit some images to insure that each one is fully readable before writing to a CD and archiving.

The Scanning Process:

What is the condition of the document? Documents in poor condition will need special handling during scanning. We usually put them in a "slip cover" or "carrier sheet" for protection. The resulting scan may need some editing to insure that everything is readable and clear. The new scanners will actually produce images that are better than the original through the use of a process called "adaptive thresholding". But if something was too faded to see on the scan you will want to fix it while you still have a readable paper drawing.

If you scan newspaper print or any drawing with writing on the back you will want to place a black sheet of paper behind the newspaper and put both in the slipcover. This will prevent bleed through from the text and images on the back of the newspaper. ***Alert!** Not all scanners have a gentle enough feeding mechanism to be able to handle newspaper media without a protective carrier sheet. Please speak with one of our representatives to find out which scanner is currently capable of feeding newspaper and other delicate media without a carrier sheet.

Do you need color? Color scanners are more expensive than Monochrome scanners but will retain more of their value for resale and some will scan black and white at exceptionally high speed.

Do you have any special needs like oversize prints or thick media? Check to see that the scanner you select can handle your present and future needs. The extra wide scanners can reduce processing time on large drawings by scanning the wide side rather than the narrow side and not have to rotate them.

Before scanning you should determine if you might convert any of these drawings into CAD. Automatic raster to vector conversion software would require more care in the scanning process to insure that the drawings were "brightly" scanned and that the hollows in text were clearly visible. This helps insure a more accurate conversion. Scanning for conversion to CAD is normally done at 300 dpi. Scanning at 200 or less in most cases will not provide enough drawing information to the software. Scanning much over 400 dpi may provide too much information, resulting in extraneous lines.

Some scanners will produce an image that looks fine when printed but upon close inspection has line work that is porous and looks like it was drawn with chalk. This may be due to a "dither", setting on the scanner or the type of scanner purchased. We have seen this problem mostly on OCE scanners, so be sure you check the scanner output prior to purchase. These images can not be converted easily into cad drawings using an automatic process. All the scanners we carry produce sharp filled in lines. With the cost of storage rapidly dropping and the speed of computers increasing, scanning at 300 dpi rather than 200 dpi is now the norm. You need to remember that a 400 dpi scan is 4 times the size of a 200 dpi image. An architectural drawing "E" size, scanned at 300 dpi, will be about 500 kb. A contour plot will be closer to 1 MB or more. The larger the file size the longer it will take to view, edit and print. If you have something other than a line drawing (like an aerial map) you will have to scan in gray scale. This will increase your scanning time and file size significantly. If you go to color your files will be huge.

Scanner purchase, choices and pitfalls

Since you will scan your drawings only once, you will want to be sure that you have captured all of the drawing information. You must capture the most faded lines and not blotch-up the overly dark ones. Even though a scanner may be rated as fast as 10 inches per second (ips), in real life, you still must hand feed it and (optionally) electronically align the drawing. Once scanned, the image must be inspected and at some point indexed. The scanner maintenance requirements must be considered. Does the scanner have a warm-up time or is it "instant on?" How often do you need to stop your work-flow to re-calibrate or re-align it? All this takes some time so getting 50-60 large sheets through an hour would be more realistic. Usually the scanned images are saved in a very compressed tif4 format. At 300 dpi the file will be much smaller than a comparable CAD drawing file.

Scanner optics: Scanner optics fall into two categories, straight through optics and folded optics. Folded optics are found in scanners that use mirrors to take the image from the focal plane to the camera lens. Depending upon the scanner manufacturer there can be a single mirror or multiple mirrors to “fold” the light as it travels to the lens. Straight through optics have no mirrors. The image goes straight from the focal plane to the lens. This is a more foolproof method since alignment is simpler and the chance of distortion is minimized. This method is called contact image sensors (CIS). This contact image sensor technology offers a number of advantages over the CCD, camera/ mirror models. In general the scanners are smaller and lighter since their optics are more compact. They have a mounted array of sensors so cameras do not have to be aligned with each other. These scanners also “instant on” so you don’t have to wait for them to warm-up like you do with CCD technology scanners. The contact image sensor scanners are not meant for irregular/ textured surfaces like oil paintings and generally handle thin media, although there is a thick media option. In our professional opinion, the Graphtec Scanner is the best example of a CIS (Contact Image Sensor) technology. The Colortrac Ci line is also a good choice with a new “single roller” feeding mechanism but we consider it to be entry level with lower volume capabilities compared to Graphtec.

Scanner maintenance: This issue depends a great deal on the type of scanning you are doing, the environment the scanner lives in and the Brand of scanner you select. Scanner maintenance can be a breeze or a headache. **Scanners with cameras require more maintenance than scanners with contact image sensors.** We have found that the Graphtec Scanners and Colortrac Ci Scanners are the most user friendly and easiest to operate scanners. The ImagePro Scanners, although they are CCD Technology and have cameras, are the next most user friendly because the CCD’s are an ultra-compact digital CCD camera unit called a DCU that is a self-contained assembly making maintenance much less of a chore than previous CCD Scanners as the DCU units eliminate the need to adjust and align the cameras as often as the more traditional design that Contex/ Vidar continues to employ.

Energy Star Compliance: CIS Technology Scanners are Energy Star Compliant and are energy efficient products.

On some brochures from Contex/ Vidar, regarding their HD line which is a CCD Technology scanner, you may notice it says, “Energy Saver Compliant.” There is no such standard as “Energy Saver” – this is a “Contex-ism”

Operating systems & Connectivity: All the large format scanners were designed to run under the Windows operating system, Windows 98 through XP and now Vista. If you are running Windows NT check to see that the scanner you purchase has a SCSI interface since NT can not use USB or Firewire. Most of the newer scanners have fire/wire, Ethernet, USB-2, Gigabit or high speed plug ‘n’ play interfaces or some combination thereof. If you have a newer MAC and have the dual platform capability, you should be able to run the scanner on the PC platform however, we still recommend you simply purchase a cheaper PC and dedicate it to the scanner. A scanner is a one-to-one ratio

(unlike a printer which is a one-to-many ratio) meaning that a human must be in front of it to make it function. 99.9% of the time, we do not recommend that you connect the scanner directly to your network. Please contact us for our minimum computer specification and connectivity recommendation.

Monochrome considerations: *(1. First consider accuracy)*

You now have many choices for your monochrome scanning. When scanning in monochrome we recommend a scanner with a true optical resolution of at least 300 dpi with 400 dpi even better. This will insure proper line separation. The often quoted interpolated or max resolution is more useful in gray scale and color images. True optical is most important for black and white line drawings, since you can't interpolate between two closely aligned lines. The three major brands (Colortrac, Graphtec and Context/Vidar) all have an adaptive thresholding feature that will automatically adjust the scanning light intensity to compensate for faded and stained areas. You must use a high enough resolution without creating files that are too large and slow. We recommend 300 dpi for most cases. Where lines are very close together or there is very fine detail etc. You may want to go to 400 dpi. You would generally only go higher if a drawing was reduced from a larger format or you needed to meet some precision criteria. However we found a dense contour plot drawing where the Graphtec IS 210 Series of scanners were able to show the separations between lines at 600 dpi, that was beyond the capabilities of some other 400 dpi scanners we had tested. However, as of this writing, the most accurate scanner is considered to be the Colortrac Ci as it utilizes a single roller feeding mechanism and bends each document around a roller for better accuracy.

The ImagePro Scanners, originally designed by Colortrac, and the new Context CIS scanners feature a true optical of 1200 dpi. Although it might be possible, we have not come across any large format drawings that would require that high of a scanning resolution. Where this might be important is on textured surfaces, artwork or GIS mapping. In those instances, you might want to have the ability to scan at a higher True Optical but in those cases, you'd also want a CCD Technology Scanner like the ImagePRO, not a CIS Technology Scanner.

Please Note - *Maximum resolution vs. True Optical: Scanner manufacturers provide both the true optical resolution discussed above and the interpolated resolution given as maximum resolution. I would not pay any attention to the maximum resolution numbers since you can resample your drawing in software (freeware) if necessary to any resolution you want, and in practice you will rarely need to go beyond the true optical of the scanner.

ALERT! – Maps, especially contour plots generally require a higher true optical than engineering or architectural drawings. When scanning maps you should generally scan at 400 dpi going to 600 in extreme cases. With that said, our best buy recommendation would be the Graphtec or Colortrac Ci that combine a 600 True Optical dpi with contact image sensor technology with the ImagePRO/ Colortrac GX line a close second. The ImagePRO/ Colortrac GX line would actually be a better choice for those times when color richness or the conditions of the documents are severely degraded due to age, folds or wrinkles. *(As noted above when we discussed true optical 1200dpi, textured surfaces and real world applications.)*

When it comes to **precision** we look at two areas:

One is the number of dots per inch and the other is the overall accuracy over the length and width of the scan. For highest precision the ImagePro scanners combine 1200 x 600 true optical with an accuracy of .1% +/- 1 pixels. The Colortrac Ci, by using a single roller and thus keeping pressure while feeding even and constant, is considered to be extremely accurate. I believe that all the major manufactures now report their true optical specifications, making it a lot easier to compare scanners. However, please note that while all scanners tend to be quite accurate, the document may not be. Due to age, storage, shrinkage and other factors the drawing may no longer be accurate. CCD technology scanners should be calibrated fairly often to maintain accuracy.

(2. *Second consider Speed*)

****There are five areas for consideration when you consider speed.***

First and most obvious is raw listed speed. This is usually listed as time to scan a drawing or ips (inches per second). Second is the width of the scanner relative to the length of the drawing. If you can fit a drawing into your scanner so that you only have to roll across the small dimension you will scan faster. Third is the way the paper feeds. Front feeding is easier for the scanning specialist to handle, and will result in a greater total throughput. Fourth and often most important is the way the scanner focuses its light. Most scanners focus on a glass, which must be cleaned and can get scratched. You should look for scanners that have tempered or protective coatings on the glass and have an easy way to access the glass for cleaning. You might also consider a scanner that has "sealed optics" which ensures that dirt will not get under the glass. Last there is warm up time. Scanners that use florescent bulbs require long warm up periods to stabilize the bulbs. Scanners using contact image sensors and an LED Light Source have fast warm ups. Each manufacturer will try to focus on the area, or areas, that makes them look best, so consider what is most important to you and then consider it all.

Raw speed: A 6 ips scanner will not give you twice the throughput of a 3 ips scanner. It will move the paper through the scanner twice as fast, but that is only part of the total time necessary to scan the drawing. A much larger time component is human paper handling, and whether the scanned image must be rotated for alignment. Glass cleaning, warm-up times, recalibration, work flow, etc are all considerations regarding speed. In addition, consider the computer processor speed as well as the graphic rendering card speed and the scanners data throughput. This is another area where CIS and CCD Technology come into play; with a CIS Technology Scanner you have greater "up-time" vs a CCD Technology Scanner. *When you compare 6 ips to 3 ips you will save 8 seconds on a drawing but going to 8 ips from 6 ips there is much less of a difference and you will only save 2 seconds on an E size drawing.* It is important to note how the different manufactures rate their scanners for speed. Graphtec for instance gives their speeds at 400dpi (400 x 400) most other manufactures give their speeds at 200 dpi or it may say, 400 dpi-Turbo (which is actually 400 x 200 optical). The really big differences are in color.

So if speed is your most important requirement look for the fastest raw speed coupled with front loading and an LED Light Source. Then if you can afford it, look to the extra wide

models so you can run the drawings through in landscape mode. **Alert!** – as noted above, all manufacturers use different criteria to rate and measure the raw speed of their scanner and they do not tell you the criteria they used on the brochure. The best way to determine speed is to speak with one of our representatives to determine “real world speed” and if it is worth the additional expenditure for your specific project.

Alert!

Sometime during the summer of 2002, Contex, the largest manufacturer of scanners purchased Vidar, the second largest manufacturer. Vidar immediately stopped production and Contex applied the valued Vidar name to each of their existing Contex scanners, so **all Vidar scanners produced after the Summer of 2002 are Contex scanners and not original Vidar scanners.** The comments in this report regarding Vidar refer to the older, original scanners and not to the Contex/Vidar scanners. Contex scanners are now sold under the names of “HP, Ideal, Calcomp, and Vidar” as well as Contex and there may be some others. The original Vidar scanners were exceptionally well built. Many models had driving rollers both above and below the paper and were known for their reliability. We were sad to see such a high quality product disappear from the market place. Please note that if you are purchasing a used Vidar, parts are no longer being manufactured for any true Vidar scanners.

Most popular scanners for monochrome scanning:

Graphtec IS210HD^{plus} Base and Graphtec IS210HD^{plus}PRO Large Format Scanner

The IS 210's feature high speed scanning at high resolution. The Base model moves your drawings along at 4.5 ips @ 400 dpi, while the Pro scans at 9ips@ 400 dpi. Both have a 42" scan area that can take a 43" wide sheet. Both boast a 600 true optical dpi, but the Pro model can do up to 9600 max. The IS210HD^{plus} monochrome scanner is perfect for engineering and document management applications.

The Graphtec models feature contact array technology which offers many advantages if you have detailed drawings. You have easy installation, no warm up time, no re-calibration, no fluorescent bulb to replace and no cameras to get bumped out of line.

***Please contact us for our current prices, included accessories, on-site warranty information and promotional discounts**

Colortrac/ ImagePRO M Ci40 Large Format Scanner

The Colortrac Ci40 Scanner is a fourth generation CIS technology scanner that utilizes a unique single roller paper transport and bright 2D LED illumination system. The dual LED illumination means that even folded documents scan sharp and shadow free. It comes with either Plug'n'Play USB2 or fast Gigabit Ethernet connectivity. It features a 600dpi optical resolution, scans face up with a unique front exit path and is compact and portable. The feeding mechanism is gentle enough to scan newspapers! The Colortrac Ci40 is environmentally friendly: RoHS compliant, Energy Star Rated and contains recycle friendly

components. The Colortrac Ci40 includes simple to use SmartLF all-in-One Software: scans to PDF, TIFF or JPG formats and makes copies of your documents to any Windows printer. Works direct with any Windows based software supporting Windows Image Acquisition (WIA) or Still Image Interface (STI).

***Please contact us for our current prices, included accessories, on-site warranty information and promotional discounts**

ImagePro GX 42 M (Monochrome)

The ImagePro GX42 M offers a speed of 6.0 ips @ 200dpi in 8-bit greyscale & monochrome, 1200 True Optical dpi, 9600 max dpi, ultra-compact digital CCD camera unit (DCU), Scan area width 42", Max document width 48", media thickness 0.02", zero maintenance optical media sensors & automatic media size detection with center or side justified media positioning.

***Please contact us for our current prices, included accessories, on-site warranty information and promotional discounts**

ImagePro GX T 42 M (Monochrome) Thick Media

The ImagePro GX T 42 M offers a speed of 6.0 ips @ 200dpi in 8-bit greyscale & monochrome, 1200 True Optical dpi, 9600 max dpi, ultra-compact digital CCD camera unit (DCU), Scan area width 42", Max document width 48", media thickness 0.8", zero maintenance optical media sensors & automatic media size detection with center or side justified media positioning.

This is a good choice if you need thick media capabilities.

***Please contact us for our current prices, included accessories, on-site warranty information and promotional discounts**

Fastest monochrome scanner with greatest throughput would be the Graphtec IS210HD^{plus}PRO Scanner. We rate the Graphtec IS210HD^{plus}PRO Scanner as a **best value for price** when looking for high-speed monochrome scanning (and can even be upgraded to color at a later time). The only reason we rate it as a better value for price than the Colortrac Ci M is that the Graphtec, *when purchased with Palisades Research*, comes with a 3 year on-site warranty whereas the Colortrac Ci comes with a 1 year on-site warranty. The Graphtec 42" size is considered a "work-horse" high volume scanner and the Colortrac Ci is considered a lighter duty scanner. ****Graphtec has also been awarded a 4 Star Highly Recommended Rating from Bertl's Best ~ an independent technology reviewing company.**

Other considerations:

Thick, thicker and thickest: For special requirements like scanning foam board you will find that each of the major manufacturers has some models to do the job. The thin media model of the ImagePro Scanners each has a corresponding version with thickness capabilities up to 0.8". Graphtec has one model available (CS 610) that can scan a

thickness of 0.8" while most Contex scanners can do up to 0.6". For thick media, we like the thick media feeding mechanism of the ImagePRO Gx the best. From our experience, it has the lowest request for repair and is the gentlest.

Wide, wider and wides: Wide format scanners are available in 24", 36", 40", 42", 54" and 56" sizes. Size does effect price but the bigger consideration when you are considering your specific needs are budget, how easy the scanner is to operate and maintain, warranty and *total cost of ownership over the life of the scanner* that narrows your choices appreciably. Maybe you can get by with a 36" scanner but the better value for price may be in a 40" or 42" size so you should be realistic about your budget while also making sure you are getting the best "value for price" unit.

Less expensive Scanners: For those companies on a limited budget or with limited throughput or small size requirements. You should consider a used scanner however, please remember that a used scanner will most likely be from the 1990's, have no warranty, or at least a very limited warranty, and may not function with your current operating system. A used scanner has an implied, "Buyer Beware" and it may prove to be more cost effective, and less of a headache, to simply purchase a new scanner rather than take on someone else's cast off scanner.

The Color Option:

Now you can buy large format color scanners at reasonable prices. These scanners will also do black and white scans. For engineering related work the big benefit is in the scanners ability to "color map" multiple colors from the scanned images to a user defined set of colors. This can result in converting a faded color into a vivid one or just filtering through only the required information. Color image files are many times larger than black and white files so allow extra time for the scanning process.

Do you need color now or maybe in the future?

If you aren't sure you really need color now, but you don't want to lose your investment if your needs change in the future. You can now get a scanner that can be upgraded to color at a later time. Both Graphtec and ImagePRO/ Colortrac scanners have this capability.

How much color do you need?

Some scanners offer 8 bit color. This provides 256 colors and is excellent for mapping / GIS and for prints that have been marked up with colored markers or inks. These scanners are not for photographs or paintings, though they may handle the limited color of old posters very well. Full color scanners, usually referred to as 24 or 48 bit color, should be used where you need the rich color detail that you will find in photographs.

Optical considerations:

Color scanners are different from those of black and white. Where you want at least 300 dpi true optical for a black and white scanner you could get away with 200 dpi true optical for a color scanner since most of your color scanning will be done at 200 dpi (or less when necessary).

We can not emphasize enough the *importance of a clean glass when scanning color*. Dust specks you can't see when scanning black and white images will become unwanted flares and rainbows, when scanning color.

Another thing to watch out for is rated scanning speeds. The term TURBO refers to a scanning dpi that is twice as much in one direction as in the other. So a 400 dpi turbo actually scans at 400 dpi along the width of the scanner, but only 200 dpi across the length of your drawing.

For general purpose, line drawing color scanning, with a speed of at least 1 ips.. you would compare the following:

Graphtec IS210HD^{plus} PRO Limited Color Large Format Scanner

The Graphtec IS210HD^{plus}PRO Limited Color model features high speed scanning at high resolution with the added benefit of limited (8-bit) color. The LC model moves your drawings along at 9ips@ 400 dpi. The Graphtec models feature contact array technology which offers many advantages if you have detailed drawings. Because it's a Graphtec, you have easy installation, no warm up time, no re-calibration, no fluorescent bulb to replace and no cameras to get bumped out of line.

**It does not have a full color palette that you would require for photographs, but is excellent for drawings with limited color range like GIS mapping.

***Please contact us for our current prices, included accessories, on-site warranty information and promotional discounts**

Graphtec CS510HD^{plus} & Graphtec CS510 HD^{plus} PRO Color Large Format Scanner

The CS510HD^{plus} scanner has all the features of the IS210 but adds full 24 bit color. Both models have a true optical of 600dpi, moving your drawings along at 4.5 ips @ 400 dpi mono and 1.5 ips @ 400 dpi in color (Base) & 9 ips@400 dpi monochrome and 3ips @400 dpi color (Pro). Because it's a Graphtec, you have easy installation, no warm up time, no re-calibration, no fluorescent bulb to replace and no cameras to get bumped out of line. ****Graphtec has also been awarded a 4 Star Highly Recommended Rating from Bertl's Best ~ an independent technology reviewing company.**

***Please contact us for our current prices, included accessories, on-site warranty information and promotional discounts**

Colortrac/ ImagePRO C & E Ci40 Large Format Scanner

The Colortrac Ci40 Scanner is a fourth generation CIS technology scanner that utilizes a unique single roller paper transport and bright 2D LED illumination system. The dual LED illumination means that even folded documents scan sharp and shadow free. It comes with either Plug'n'Play USB2 or fast Gigabit Ethernet connectivity. It features a 600dpi optical resolution, scans face up with a unique front exit path and is compact and portable.

The feeding mechanism is gentle enough to scan newspapers! The Colortrac Ci40 is environmentally friendly: RoHS compliant, Energy Star Rated and contains recycle friendly components.

The Colortrac Ci40 includes simple to use SmartLF all-in-One Software: scans to PDF, TIFF or JPG formats and makes copies of your documents to any Windows printer. Works direct with any Windows based software supporting Windows Image Acquisition (WIA) or Still Image Interface (STI).

ImagePro GX Scanner Series:

At the core of the ImagePro GX Scanner Series, is a revolutionary, ultra-compact digital CCD camera unit (DCU) that 're-writes the book' of wide format scanner design.

Developed by Colortrac, **each DCU is a self-contained assembly with mirrors, 10,800 pixel quadri-linear CCD and micro lens with coated optics & IR filter.** The DCU's are capable of scanning images at 1200 x 600dpi optical resolution (max 600 x 600dpi optical output by the scanner) and capture 48-bit colour or 16-bit pan-chromatic monochrome data. The modular DCUs allow these scanners to be of smaller size and footprint, low weight, with very stable camera stitching alignment.

ImagePro GX 42 E

The ImagePro GX42 E offers a speed of 3" ips @ 200 dpi in 24-bit color and 6.0 ips @ 200dpi in 8-bit greyscale & monochrome, 48-bit primary point color image capture, 1200 True Optical dpi, 9600 max dpi , Scan area width 42", Max document width 48", media thickness 0.02", zero maintenance optical media sensors & automatic media size detection with center or side justified media positioning.

***Please contact us for our current prices, included accessories, on-site warranty information and promotional discounts**

ImagePro GX T 42 E

The ImagePro GX T 42 E offers a speed of 3" ips @ 200 dpi in 24-bit color and 6.0 ips @ 200dpi in 8-bit greyscale & monochrome, 48-bit primary point color image capture, 1200 True Optical dpi, 9600 max dpi , Scan area width 42", Max document width 48", media thickness 0.8", zero maintenance optical media sensors & automatic media size detection with center or side justified media positioning.

***Please contact us for our current prices, included accessories, on-site warranty information and promotional discounts**

Vidar HD4230 - 42" Wide Format Color Scanner

Expand your business opportunities with VIDAR's versatile HD4200 scanners featuring advanced technology and quality imaging for color and monochrome scanning.

The 42" imaging area is designed to facilitate archival and reprographic tasks with a wide variety of large technical documents, detailed maps and drawings, or color posters and architectural sketches – all at the highest resolution and speed. You get exceptional

professional-grade performance with 600dpi optical resolution with speeds of up to 12 inch/second.

***Please contact us for our current prices, included accessories, on-site warranty information and promotional discounts**

Vidar HD4250 - 42" Wide Format Color Scanner

VIDAR's versatile HD4200 scanners feature advanced technology and quality imaging for color and monochrome scanning.

The 42" imaging area is designed to facilitate archival and reprographic tasks with a wide variety of large technical documents, detailed maps and drawings, or color posters and architectural. Whether you are a private business, government or print-for-pay, VIDAR's range of HD4200 scanners is the right solution for improved efficiency and productivity.

***Please contact us for our current prices, included accessories, on-site warranty information and promotional discounts**

It depends on your specific needs as to which one is the best color scanner. The best way to describe the difference between the two is that a CIS Technology Scanner (Graphtec, Colortrac Ci, Vidar SD) is a line drawing scanner that can scan graphics while a CCD Technology Scanner (ImagePRO/ Colortrac Gx and Contex/ Vidar HD) is a color graphics scanner that can scan line drawings. It really depends on your focus. The CIS Technology is lower maintenance but has a smaller color gamut and does not color match as well while CCD can do high end graphic scanning but requires more calibration and maintenance to keep it in top working order.

Please note: The Contex/ Vidar HD line would fall into the category of a graphics scanner, as does the ImagePro, however, the Contex/ Vidar does not have the benefit of DCU's which means that it would require the most maintenance of these three.

The Vidar SD is a CIS Technology Scanner but unlike the Graphtec and Colortrac Ci, it is not upgradeable and it's a first generation product.

***Graphtec has also been awarded a 4 Star Highly Recommended Rating from Bertl's Best ~ an independent technology reviewing company.*

For high speed service bureau scanning.

Service bureaus get to scan everything and need to keep their scanners busy. We would first recommend the ImagePRO/ Colortrac GX Line with our second recommendation being for the Contex/ Vidar line for Service Bureaus. However, for certain service applications like on site scanning, the Graphtec or Colortrac Ci would be the better choice because they are the only choice that is portable.

Aperture card scanners:

There is really only one player in this field. The ACS 4200 / 4600 however, Contex stopped making these scanners in 2006. These models are available on the used market

and, although the feed mechanisms aren't the greatest, the optics are reliable. Please contact us if you need an Aperture Card Scanner.

Combined Scanner and Plotter in one machine

There are a number of manufacturers of this combination machine, but it is not always a recommended option. These combinations fall into two groups, the **flexibly combined**, which can easily be separated and used independent of each other and the **rigidly combined**. The flexible combination can provide several advantages versus the rigidly combined units. The rigid combos are not to our liking. The rigidly combined unit is more than twice as complex with more to go wrong. With a rigidly combined unit, if the scanner or plotter needs to be shipped back for repair you are not only out the use of the other component, but also must pay the extra cost of shipping the workable part back along with the defective one! Since a rigidly combined machine is quite heavy, you will pay much more for shipping. Rigidly combined machines also tend to come without a warranty. Instead, you must negotiate a "per click" or "per square foot" monthly maintenance contract therefore you must not only purchase the initial machine but you also pay a monthly fee to maintain the machine. If you go over your negotiated contract amount, you are subject to a hire price (like a cell phone plan when you go over your allotted minutes).

A flexibly combined machine generally eliminates the four main problems that all-in-ones have posed, which are:

Having to settle with an inferior component

The inability to print to alternate printers

Having to replace the entire machine when your printing needs to be replaced

Ongoing service fees

*Please note – not all loosely linked units allow for non-proprietary printers to work with the scanner or software. Be sure to do your homework and ask if the unit will function with alternate printers that are of different brands; the best ones will.

Our first choice for color combination units would be the Express Image Stations available in 36" and 42" widths. With the EIS systems, you get the best of both worlds in a single footprint. You get a Graphtec Scanner, with 600 true optical dpi, ultra fast scanning, and CIS technology combined with the high speed and beautiful print quality of the Canon printer or the flexibility to combine the unit with your own existing printer. It also allows you to print to other devices by providing you with a driver package compatible with most printers on the market and, as your business grows and needs change, you can simply upgrade the printer rather than being forced to replace the entire machine. ***The EIS Supra System was awarded a 5 Star Best Buy Award by Bertl's Best. The EIS Supra is considered a "Best Value for Price" for color multi-function systems.***

If you have extremely low volume and the scanner/ printer is not expected to undergo heavy use, for the extremely budget conscious, we must mention the EIS Quatra Series. This series is not our first recommendation but is meant only to fill a gap while your business grows.

New Scanners to Avoid:

There are other reasons to avoid some scanners besides being bundled with a computer and/ or plotter. If you are archiving you want to be sure you can read every little line. 300 dpi true optical is generally considered a minimum for this type of work. If you are doing color 200 dpi would normally be the minimum. If you have a large archive project I would recommend a scanner with the fastest throughput with the most up-time (easiest to use/ maintain). If you need "full" color then avoid the 8-Bit color scanners, although lower in price these scanners are good for spot color like posters and GIS maps, but can reproduce only 256 colors so they can not be used for flesh tones etc.

If you are looking to purchase a new or used Widecom scanner we suggest you check out the manufacturer's ability to support the scanner after it is sold. Widecom generally has its dealers provide tech support and repairs directly while other manufactures have a centralized support location.

Because we carry all the main brands of scanners, we rely not only on our own experience and expertise; we rely on the feedback we receive from our clients. Some scanners have ZERO complaints and nothing but positive feedback, while others receive very negative feedback. We've been in business since 1983 and we make every effort to recommend best of breed technology therefore, please feel free to call us for our recommendations.

Used Scanners to Avoid.

These are only hints. If you find one of these scanners working and at a very attractive price you might want to consider it.

1. Scanners that can not work with the operating system you are using. You may, however, find that it is worth while to use a separate computer with a compatible operating system if you get a good deal on the scanner.
2. Very heavy scanners. If you need a fork lift truck to move the scanner- watch out! If it is used, it will probably have to be repaired at some time in the future and shipping costs will be excessive.
3. Contex DOS based scanners. These scanners used a proprietary interface card that is no longer available. So although the scanners can still be repaired, if the card failed you would have to find someone who could repair the interface card at the component level.
4. Contex 8300 **plus** series. These early high-speed scanners had a high rate of repair and were discontinued early. The regular 8300 model was fine, but is a back feed scanner.

5. If you can find a used Vidar scanner made between 1995 and June 2002 they are exceptionally good work horses. These scanners were very well made and if you get a good price will represent a good deal however, these scanners stopped being supported as of mid 2007 which means no replacement parts are being made. These scanners and older used scanners will probably not run under Windows XP, due to lack of supporting drivers.

Reliability and Warranty:

Alert!: Buying the first model in a new technology is often risky. It is usually better to wait for the reviews and user comments. Another good indicator of quality is the length of the manufacturer warranty. The longer the better, since it tells you how much faith the manufacturer has in its product.

Each manufacturer has a different warranty. The basic manufacturers warranty is usually a return to factory warranty where the buyer pays one way shipping and the manufacturer pays the way back *if the problem is caused by a manufacturer defect*. Some dealers have either a similar return to depot warranty, only include the manufacturers warranty or offer an on-site warranty for all or part of the machine. The best warranty is an on-site warranty, with phone support included and a response time of about 48 hours or better. In general, the worst time for a scanner is during transportation. If it works when it arrives it should continue to do well for a long time. All of the three top scanner manufacturers make reliable scanners. Relate the warranty to the type of use you will give the scanner under the time periods involved. All of these scanners were meant to work hard. So check into the warranty and find the best one for you.

***Alert! – Not all dealers are the same. If a warranty does not specify on-site and include phone support then you are probably getting a return to depot or manufacturers warranty. While this makes the initial purchase price cheaper, who will you call if you have a question or problem?**

How the manufacturers price their scanners.

Each manufacturer prices their scanners a little differently, which can be a big concern for the unwary. Context for instance, often does what is called “a la carte quoting” which means the quote may not include all components such as software or stand - your total scanner price could increase by another \$890 or more! Or one brand may have a 3 year on-site warranty but the comparable brand only has 1 year of on-site warranty. Add the additional two years of warranty and your scanner price could increase by over \$4,000! So check before you buy and make sure you are comparing “apples to apples.”

Selecting a dealer. Dealer selection is important. Some dealers sell only one brand, others can offer you a choice of manufacturers and suggest the best brand for your application and budget. Make sure the dealer you choose is knowledgeable about the products they sell. Since these scanners represent a sizeable investment you will want to be sure that the dealer will stand behind the product and support you if your scanner should arrive damaged or if you have any problems. Most dealers will be able to give you

references. An established dealer should also be able to give you a reference or two of clients that had some type of problem to see how it was resolved. Generally if a dealer has been selling scanners for a long time they know what they are doing and can get you a good price as well. How a dealer treats you before you purchase is just as important as how they will treat you after your purchase. You should be comfortable with your dealer and ask what phone support they offer and if it is included in your warranty.

Brand names

A number of companies carry scanners under their own brand name. Context scanners are also sold under the names of Ideal, Calcomp, HP and Vidar. ImagePro scanners were designed by Colortrac but feature enhanced software packages.

Writing Bid Specs

Most experienced dealers will tell you what you will need and assist you in writing BID specifications, but government and large corporate buyers should beware when writing your purchase spec to include all items necessary to operate the scanner, including a stand if that is what you want. All quoted prices with Palisades Research include software, cables and interface. If a stand is optional we will let you know. When writing bid specifications, make sure you get what you want. For example: If you require specific software or if you have an optical dpi requirement be sure to specify the software or that the dpi is "*true optical*". Not all dealers carry the same software so be sure to specify what software you want or you may end up with the right scanner, wrong software!

The Resale market...used scanners

The used scanner market is changing with the introduction of new models. It is wise to buy a new scanner with resale-value in mind. Buying a scanner with a width less than 36" or a monochrome scanner with a true optical of under 300 dpi will severely limit the number of potential buyers when it is time to sell it. Color scanners will be easier to sell than monochrome. Eventually they may only make color scanners, just as monochrome has disappeared from the small scanner line up. It is best to get some sort of warranty with your used scanner, at the very least get it in writing that the scanner will arrive in working condition.

Rental:

Scanner rental could work for you if you just need the scanner(s) for a short time. It can help if you need addition scanners for a short period. Finding a color scanner to rent may be difficult. See if you can get a portion of your rental costs applied to the purchase price of a new scanner or towards the purchase of the scanner you are renting. Also remember you will be responsible for shipping two ways and that can be a significant amount.

Post Processing

One way to save on time and labor costs is to utilize our post-processing software, VB-Clean, it allows you to despeckle, deskew, rotate and do other image adjustments in a

batch process after hours without operator intervention, instead of having the scanner operator do it one at a time.

Indexing

The fastest way to scan utilizes the scanners automatic name assignment for each scan where the file names increment, 001, 002, 003 etc. But you probably want the actual drawing number to be the file name. Our *VB-Index* can automatically zoom in on the title block of each drawing and allowing you to assign the file name and directly enter it into the Indexing fields.

Setting up your database:

You will need to implement the database criteria you will use to search for your drawings, like; drawing name, project name, type of drawing, draftsman, date drawn, etc. VisualBase software, with built in *VB-View* is a very good choice for your graphic database it links to your scanner for failsafe file logging. It allows indexing and viewing of your files. *VB-View* will let you redline your raster images with both lines and text and it keeps those comments in a separate file so as not to mark up your originals, but lets you view them together. *VisualBase* also lets you compare drawings so you can spot the changes in drawing revisions. You can link your drawings to your database as you scan, or you can scan your drawings using an incremental number and later link them to you database. Another good option is *VB-Index* which makes capturing index data from scanned engineering drawings easy. The split screen lets you view the title block as you type in the data with a Microsoft database link. It's very easy to learn and has a Multi user format.

Editing and rubber sheeting

Since you are archiving your drawings in a raster format you will need to quality check each drawing for readability and make sure the drawing file name is correct. This is easily done while indexing with *VB-Index*. One very handy feature is rubber sheeting. Most scanners have an error of .1% or .05% over the length of the scan so if you need a higher accuracy you will need to rubber sheet your drawing back to specifications.

Conversion to Vectors when needed:

A scanner scans in Rasters thus, you will always save your drawings in raster format for archiving. Sometimes you may need to edit those drawings which means you will need to convert the Rasters (little dots) to Vectors (line and arcs). We suggest the best way is with the *Draftsman 2002* program. The *Draftsman 2002* program can convert all or part of an image (even a color image). If you just need to change one part you can window that section and convert it. You can then make any changes to that one portion and save the combined images as either a hybrid "raster and vector" image or a pure raster image that might later go on another CD-ROM. Both formats can be plotted through the *Draftsman*

program. The conversions to a Vector format usually take under 2 minutes on a modern computer and a batch conversion utility is available so that they may run overnight and unattended. There is almost always some cleanup of these images needed to make them perfect or more useful. Even when no cleanup is needed you will be able to quickly check the conversion for accuracy since it will appear on screen over your raster image in another color. Most files can use the automatic conversion process, but when a drawing is too dirty or has other problems the Draftsman can still do a fine job with its built in full set of heads-up digitizing tools.

Although it seems to make sense to use OCR as part of your archiving process, this is very difficult to do with engineering drawings. Since many drawings are hand drawn, have text of various size and drawn at angles, OCR is time consuming and not very accurate for this type of work. It is often easier to link the drawing number to keywords in a database or specifically annotate the drawing using a redline process that adds words that can be optionally viewed with the drawing but are stored separately.

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Palisades Research sells all major brands of large format scanners: ImagePRO/Colortrac, Graphtec, Contex/Vidar, Seiko and Canon & HP printers. We have been selling large format scanners for over 25 years. Also be sure to check with us for your large format printing & multi-function needs.

Thanks for reading. I hope this information has been helpful. Check back for updates. The scanners discussed are popular models but there are other models and other manufacturers and the scanner world is changing faster than ever. Give us a call and we will help you find the scanner that's right for you.

Best Regards,
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