One of the biggest challenges in production document imaging applications is having a scanner that is fast, reliable and immune to the rigors of this kind of environment. The Panasonic KV-S3105C is part of an advanced generation of production scanners. We reviewed its capabilities here.

Review of the Panasonic KV-S3105C Document Scanner

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Introduction:

Generally we say that a production imaging application requires capture capabilities in excess of 6,000 pages per 8 hour shift per day. It is at that point that the requirements for hardware and software performance starts to become mission critical. Production document imaging applications, require equipment in place that is specifically designed for that purpose. Think about it this way, if the documents are not captured, the business process dependant on them is stopped. If the business process is stopped, people can't do their jobs, and the company can not conduct the business related to that process.

Tempting as it might be to go cheaper, or to investigate multiple alternatives (we'll get three, so if one breaks...), there really is only one kind of document scanner that is up to the task, and the Panasonic KV-S3105C is a brand new member of this class. As such, it aims to have capabilities, and design features that make it a "best of breed" participant in this category of document scanners. From the information we have it certainly seems like Panasonic built the machine for that purpose. We spent an afternoon putting the KV-S3105C through various paces, reviewing vendor claims and working through our own test criteria to "see for ourselves".

Physical Characteristics and Features:

Upon physical examination of the unit we were struck by two things: First the "substantial" look and feel of the machine, and second that the cabinet is in a single unit. The substantial look and feel of the

Review of the Panasonic KV-S3105C Document Scanner

machine tells us that it can take all of the abuse even the most demanding environment can dish out. That's why the machine has an unlimited daily duty cycle.

The carefully designed physical properties of the KV-S3105C Show that the engineers understand the rigors of production scanning.

A steel case, not plastic, encases the inner workings of the unit.

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Other than the straight paper path latch nothing else opens to allow dirt, dust and paper dust to enter and gum up the machinery. Previous versions had a door that opened in order to allow bulb changes. The new version has no door and the fixed lamp assembly is designed to last for 6 million page scans. That's right we said 6 million. We can live without the door if we only have to change the bulbs every 5 years (depending on volume).

The paper path too is all stainless steel and is readily accessible by opening up the mouth and rear of the feeding unit. Taking the device off line in order to clean it, is something the Panasonic engineers worked hard to minimize. To that end they have taken the additional step of sealing the CCD and bulb units , keeping paper dust from getting inside the device. This "dust resistant" design is a significant effort to reduce speckling and other image artifacts caused by the mess created when you pass thousands of paper documents through a scanner at 132 pages per minute.

Operator interaction with the machine can be done with a front panel LCD. This provides the operator with immediate controls over features necessary over-ride or other common controls A new feature providing for 3 different angled settings for feeding 1, 500, or 1,000 pages is also provided on the panel. This is an important consideration in order to reliably feed documents to the roller mechanism and eliminate jams.

As is common in some production scanners the rollers can be easily replaced by an operator. What is uncommon is that they

last for 300,000 sheets, and that there is no need to take the roller assembly apart, the whole thing snaps in and out in only a few seconds. That's pretty heavy duty, and echoes the overall design idea that places a premium on uptime.

Also significant is a new advanced paper feed roller material which provides for increased friction in feeding pages through the machine, again greatly reducing misfeeds. Equally thoughtfull is a reshaped design of the exit rollers with a concave, rather than flat shape, that lets paper exit neatly without "curling" the paper so that new page knock the previous page on the floor. This is a common issue with fast scanners where documents are passed through the device so quickly that they hit into each other on the way out. After scanning you will find that the output tray is left in a mess, and that documents are not collated in the same way they were when they went in.

The KV-S3105C also has dual, not single, ultrasonic double feed detectors. One on the top and another on the bottom. The use of dual sensors allows the machine to be even more accurate in detecting double feeds by detecting the airspace between two pieces of paper.

The KV-S3105C as well as its bitonal relative the KV-S3085 can scan in drum mode (bending the paper along the path) or a straight path mode. What is unique about Panasonic scanners is their ability to perform "long paper" scanning of documents up to 183 feet long. Green bar paper, electrocardiograms and many other long paper document types are now possible to be captured without cutting up

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the source document.

The KV-S3105C color scanner and its black and white KV-S3085 counterpart (102ppm/190ipm landscape) are both duplex scanners sporting features specifically designed for the rigors of the production imaging application. The KV-S3105C runs at 105dpi /180ipm (132ppm/230ipm in landscape mode) in both monochrome and color. The KV-S3085 is upgradeable to color with an optional $7,000 color kit. We'll let Panasonic show your their competitive comparison, but from where we stand the KV-S3105 series is not just competitive with other products in its category, but superior to some in terms of features, capabilities, and cost. All scanners in this series have USB 2.0 and SCSI III interfaces for high speed connectivity.

Performance & Image Enhancement Features:

In terms of performance, there is basically nothing to complain about. Although we didn't time it exactly, the KV-S3105C we ran simply blew through the document load we tested with the ease, accuracy and precision of a fine watch. According to our informal time keeping was even a bit faster than rated, at 200DPI. There is something riveting about watching a machine perform in such a confident manner. We got the distinct impression that it could do this forever and not break a sweat, throw a roller, or experience some other kind of breakdown.

Review of the Panasonic KV-S3105C Document Scanner

We grabbed every kind of document we could get our hands on and feed it through the machine without a hiccup. We even mixed our hosts plastic health insurance card in with the batch of documents and it scanned everything flawlessly, returning an image quality that is in a word, simply outstanding.

The performance capabilities and image processing strengths make the KV- S3105C a formidable force.

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As you can see in the accompanying video we even resorted to using a gluestick to join two pieces of paper together in order to cause the dual feed. We did that because we had trouble generating a misfeed by simply throwing documents in the hopper, or even using an unfanned ream of very glossy product literature and just loading it in the hopper. Both of those are usually pretty reliable techniques to generate a double feed. We resorted to the glue, because the feeder mechanism with those new rollers is so reliable, that it simply wouldn't cause an error.

In terms of its physical performance there is nothing out of the ordinary or glitchwise that we came across. It simply performed according to expectations, and those were high.

The KV-S3105 series does not come with Kofax VRS (Virtual ReScan) built in or bundled. Kofax VRS is a widely used image enhancement technology that provides for automatic correction of common image quality issues. As you may know, Kofax VRS comes in a hardware version built into the scanner, or in a software only version that works with a variety of Kofax certified scanners. At the time of this writing, the KV-S3105C is the first machine certified for the latest version of the software. So if you want or need Kofax VRS you can get it. That aside, Panasonic has its own image enhancment software called PIE (Panasonic Image Enhancement) that in many ways echoes, and on some levels exceeds the capabilities of Kofax VRS. An argument can be made that automatic correction may in some cases not be the preferred option in order to correct poor quality images. The more time consuming task of

Review of the Panasonic KV-S3105C Document Scanner

setting parameters individually for problem documents may be a preferred option because of the high level of control over the ouput that can be achieved. This is particularly true when scanning large amounts of one or more kinds of problem documents. Panasonic's MultiColor Dropout (MCD) technology is particularly sophisticated in this regard. When scanning casually, where all different kinds may be included in a batch but are not likely to re-occur, automatic features are the most desired. That notwithstanding Panasonic's PIE does provide for most common error correction, far too many features than we can describe here. Some interesting features in the new version are:

Automatic De-Skew:

The ability to correct a tilted image, is of course a common feature available on virtually all scanners. Production scanners do the deskew onboard, rather than on the scanning workstation. De-Skew on the KV-S3105C is very fast and accurate, and works on color and black and white images.

Blank Page Removal:

Duplex scanners of course scan both sides of a piece of paper. What happens however when one side is blank? When blank page removal is turned on, the KV-S3105C simply omits the blank page.

Auto Binary/Color Distinction:

This is a very handy feature on the KV-S3105C. Typically scanners allow you to either scan in color, or scan in black and white. This means if the scanner is set to capture in color it will attempt to capture even black and white images in color. If the scanner is

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set to black and white it will render color documents in the batch as black and white. Auto Binary/Color Distinction eliminates the need to reset the scanner preference for color or black and white. When turned on, the scanner will automatically capture color or black and white depending on page content.

Automatic Cropping:

The KV-S3105C has the ability to automatically determine the image size of each document in the batch. Normally scanners will scan whatever image size you tell them to expect. So if you have a 6 x 9 card in with a batch of 8.5 x 11 documents all images, including the card, will be 8.5 x 11. With autocropping, the image size will be adjusted according to the size of the actual document.

Multistream:

The KV-S3105C also support Pixel Translations (Captiva Software) multistream technology. Multistream allows you to capture and image in color and simultaneously also output that same image in binary. Typically this is done for OCR purposes, since most OCR engines do not do as well with color images.

Dynamic Thresholding:

Dynamic thresholding is the ability to look into an image an "normalize" it according to a predetermined image processing capability that balances the white, gray and black content of an image during a binary scan. Panasonic's dynamic thresholding is a powerful algorithm that turns multicolor documents, or poor quality black and white documents into high quality digital images.

Review of the Panasonic KV-S3105C Document Scanner

Multi Color Dropout:

This is Panasonic's Image Processing (PIE) flagship capability. The user interface, and functionality have been redesigned to showcase the capabilities of this technology in the way it deserves to be presented. This is powerful powerful stuff in the world of image processing, and gives Panasonic's scanner line a significant advantage in the marketplace. While most people do not want to "play" with scanning parameter settings in a normal day-in day-out scanning environment in order to capture high quality images, we should all bear in mind that nothing "automatic" can account for very kind of scanning issue, no matter how good the technology is. Panasonic's dynamic thresholding and color distinction goes a long way to solving 90% of any imaging problems you are likely to ecounter.

Multicolor dropout is in a league of its own. In document imaging systems most technology has been geared towards image processing in black and white. This is not because black and white is better, but was because color was too expensive. The use of color however for printing and markup has increased unabated with low cost printers, stamps and marking devices in common use. This raises all kinds of problems when scanning documents in black and white, particularly if the scanner is color blind. In forms application it is common to design forms to use color for "dropout" purposes. So print the form elements in red, so that a red bulb in the black and white scanner can be used as the light source, basically eliminating the form elements at scan time when the bulb goes off. The problem comes when someone uses a yellow or pink highlighter on the form, or a blue stamp, or any

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number of marking devices. Getting rid of that is far more difficult. Well, if scanners can see in color, why not use color image processing technology to get rid of onwanted document elements? That is exactly what Multicolor dropout does, in a very powerful way.

You can either eliminate up to three RANGES of color, or keep 1 range. Obviously that would be black. So if you wanted to get rid of all problem color, and just keep the black you would select that option. If you want to elimnate several sets of colors, you use the remove option. Its hard to explain just how powerful this technology is without seeing it. You can look at the enclosed video clip to see how it works. A powerful set of controls allows you to select exactly those elements (and the range of colors they contain) that you want to remove, and save it a preset. From that point it will be removed at every scan. The controls provided are very powerful and provide even the most demanding professional with excruciatingly detailed settings to generate a perfect image. Do it once and the machine returns beautiful results everytime.

Panasonic's multicolor dropout technology is not an attempt to catch up to other image processing technologies. It might have been at one time, but with this new version it may well be significantly out front.

Review of the Panasonic KV-S3105C Document Scanner

Conclusion:

When evaluating scanners its usually doesn't take long to turn up a glitch or some kind of problem or design oversight.

According to our experience there is always something, a little annoyance, a tiny glitch, some imperfection that turns up. Not this time. If its there, its not obvious to us. The KV-S3105C is simply an outstanding performer in terms of its paper handling, production environment design, and powerful image processing technology. This machine is not just a major step forward for Panasonic as a scanner manufacturer, it may well give them the ability to take the lead in this category.

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