VeriFone CR 1000*i*
Frequently Asked Questions

1. What are the key benefits of check conversion with imaging for merchants?

Check conversion with imaging offers a variety of benefits. These include:

- Reduced check fraud
- Decreased NSF fees and uncollected funds because presentment can occur multiple times
- Reduced handling of checks
- Easy integration with existing check verification and guarantee services
- Lowering of check handling and processing costs compared to manual forms of payment (from a range of $2.78–$3.09 per check to $1.15–$1.47 per check)
- Improved access to funds, resulting in better cash flow
- Elimination of time-consuming trips to the bank to deposit paper checks and savings through fewer bulk deposit fees
- Consolidation of the number of depository relationships that retailers must maintain, helping to improve efficiency
- The ability to look at the electronic image of the actual check (minus some of the background elements) to find the information merchants need to collect on it.
- Gleaning of personal information that check imaging makes available to be used for more effective marketing and cross-selling.

2. What are the key benefits of check conversion with imaging for consumers?

The primary benefits for consumers are:

- Allows consumers to continue to enjoy the ease and convenience of using checks for retail purchases
- Preserves a modest amount of float (typically, about one day)
- Provides for faster checkout than with manual check handling and processing
- Decreases chance of owing “returned check fee” because an electronic check can be presented multiple times.

3. How fast does the CR 1000*i* check and document imager read checks?

The CR 1000*i* mechanism speed is approximately six inches per second. The typical time required for each check—including scanning, thresholding, mirroring, rotating, and compressing the image—is about four seconds.

4. How do you extract information from the tag fields, especially TIFF image info?

Merchants should be able to use any TIFF viewer to display check images. Appended tag fields can be viewed with the customized demo viewer on CR 1000*i* configurator CDROM. The image server would require additional software to use the information in the tag fields for purposes such as recreating the receipt and extracting the ACH debit financial data.

5. What types of data are included in a typical output file created by the CR 1000*i*?

The standard TIFF files created by the CR 1000*i* contain only two types of data—the compressed image(s) and tag fields consisting of ASCII strings. Typical tag field data could include the MICR string, transaction amount, date and time, lane number and/or terminal ID, store name or ID, and clerk ID.

6. What are the transfer times for each connection option offered by the check and document imager?

Using the RS 232 connection @ 115Kbps, a 10 Kbyte file requires approximately 3 seconds to transmit for processing or storage. With a 10BaseT Ethernet connection, the same file can be sent in approximately 0.75 second.

7. Will the CR 1000*i* affect the overall performance of an Ethernet network?

In the case of real-time transmission of check images, it is difficult to imagine that the extra load on the Ethernet network would even be noticed. For example, in a very large store with 100 terminals each processing one transaction per minute, less than 7% of the store's Ethernet bandwidth would be required.

Batch mode is more bandwidth intensive. Each terminal can use 4-5% of the available bandwidth on the network, so it would not be advisable to upload images from more than about ten terminals simultaneously. A single CR 1000*i* device can store about 120 image files (assuming 10 Kbytes each), so a batch upload would require approximately 90 seconds.
Due to protocol overhead, realistic throughput for a 10BaseT Ethernet network is probably 2 to 3 MBits/sec. Assuming the lower rate, the typical 10 Kbyte (80 KBit) transaction would require the full network bandwidth for about 40 msec.

As noted in Question 4, transmission of this transaction actually requires about 750 msec, because the processor of the CR1000*i* is not fast enough to use the entire available bandwidth. Because Ethernet is a packet-based protocol, the remaining bandwidth is available for other users. The terminal therefore uses about 5.3% of the bandwidth for .75 seconds. If a new transaction could be performed every minute, the terminal would use 5.3% * 0.75 / 60 = 0.066% of the total bandwidth.

For serial connections through the ECR at 115Kbps, the same 120 image batch upload would require approximately 13 minutes per connected CR 1000*i*. At 9600 bps, the same batch upload would require more than 2 hours per connected CR 1000*i*. Thus, it is highly desirable to use high-speed Ethernet connectivity to transport check image files.

8. Are there any limits on the size of the checks or documents that can be accepted?

The CR 1000*i* will accept any "normal" check. These range from personal checks, which are 6" by 2.75", up to business checks at 8.5" by 3.70". The limits for other documents are a width of 2" to 3.7" and a length of 4" to 8.5".

9. I understand that some other check imaging solutions image the entire check, including any written information on it such as a driver's license number. Isn't the "selective" approach of the CR 1000*i* a concern?

Not at all. It is simply not necessary to have a photographic copy of the check for efficient check conversion. In fact, devices that provide high-resolution, photo/optical images do so at a heavy price. File size and image processing time are significantly increased. And the purchase price of the solution may be twice that of the CR 1000*i*.

With VeriFone's solution, sophisticated algorithms are used to target key quadrants of the check and eliminate unnecessary graphic designs or the backgrounds from scenic checks. This results in files that are considerably smaller than those of photo/optical check imagers for more efficient and cost-effective transmission and storage. Further, if a merchant using the CR 1000*i* wants to capture a driver's license number—as well as a long list of other information—he or she can easily and quickly key this information in on an ECR. That information can then be captured in

one of up to 10 tag files that may be added to the check image. What's more, if a merchant wants to capture the customer's signature on the receipt, he or she has the option of having the customer sign the check with a readily available and inexpensive gel pen. These pens have sufficient carbon content to be picked up by the light source used by the CR 1000*i*.

10. What resources are available to retailers from NACHA?

NACHA, the not-for-profit trade association that oversees the electronic payments industry in the U.S., has a wide assortment of information and materials aimed at educating retailers and their customers on the check conversion process and the many benefits it provides. These materials can be viewed and ordered via the NACHA web site at www.nacha.org.

11. What percentage of savings from check conversion with imaging is achieved by improving the efficiency of in-store processes?

That percentage has been estimated at 68%, according to a study by BankServ, Inc.

12. What is the approximate average savings per check with conversion/imaging?

Food Marketing Institute and BankServ have estimated that check conversion with imaging saves an **average of** 10 cents/check, compared to traditional processing and handling.

13. Would any retailers want to image checks and receipts without implementing electronic check conversion?

Absolutely – it's possible that some retailers may prefer a phased adoption of check conversion and imaging. As a first step, these merchants may decide to do nothing more than image credit and check card receipts, and later move into actual check conversion. There are compelling savings associated with electronic management of receipts instead of archiving paper.

14. What major system blocks are required to support the CR 1000*i*?

For a multi-lane retail installation there are three main blocks;
- a controlling device, such as an ECR
- a local FTP server, to collect images from all *CR1000i*'s
- a remote ACH debit host to process the check conversion transaction.

For a single-lane financial installation there are two main blocks;
- a controlling device, such as a POS terminal with high-speed modem
- a remote ACH debit host to process the check conversion transaction.

15. What kind of devices can control the CR 1000*i*?

There are several choices including an ECR, a credit card POS terminal, a PC, and a telnet server.

16. What types of connectivity are supported by the CR 1000*i*?

There are three main models for connecting the CR 1000*i*:

- **Direct connect mode**, where both commands and image transfers are controlled by a single local in-lane device. Examples would be a direct connection to an ECR, PC, or POS terminal.
- **Semi-integrated mode**, where commands and image transfers are controlled by different devices. Examples would be a command interface from an ECR or PC, and an image transfer interface over Ethernet to a backroom FTP server.
- ***Server-to-CR1000i mode**, where both commands and image transfers are controlled by a backroom server. An example would be a single Ethernet connection to a backroom server running both FTP and Telnet applications for each CR 1000i connected to the LAN. This mode requires the least amount of change to the ECR application, however, the TAG FIELD data for the transaction AMOUNT should still be passed from the ECR to the backroom server, and finally to the CR 1000i for injection into the proper TIF file.*

17. What is "Keyboard Wedge" mode?

Keyboard wedge mode is used in conjunction with the "Server-to-CR 1000*i*" mode of connectivity. This mode might be used if a user currently has a non-imaging MICR reader connected between the ECR keyboard and the ECR. The same physical connection can also be used for the CR 1000*i* to pass the MICR string to the ECR for legacy authentication reasons. However, since the IBM keyboard interface can only pass data to the ECR, an Ethernet Telnet connection to the backroom server is REQUIRED in this mode to control the CR 1000*i*. The same Ethernet connection would also be used to FTP the image files.

18. What is the best way to connect the CR 1000*i*?

Several factors will determine the best approach for a specific installation. However, the relatively large image files are best transferred using the CR 1000*i*'s powerful FTP over 10BaseT Ethernet capability. As a result, the SEMI-INTEGRATED or SERVER-TO-CR 1000*i* modes of connection are preferred.

19. Do you have to write an application for the CR 1000*i*?

No, the CR 1000*i* is a configurable peripheral and doesn't require a customer-generated application. The only application work required is to add the interactive control commands into the controlling devices application. The CR 1000*i* has many options for customer-specific operation. These options are configured once prior to deployment using the CR 1000*i* Configurator.

20. What is the CR 1000*i* Configurator ?

The CR 1000*i* Configurator is a Windows utility tool that can be used to select and configure the control variables required to operate the CR 1000*i* in a specific mode. Each CR 1000*i* feature has a specific "check box" which can be selected or edited. When all options have been selected the Configurator tool creates a unique ".CMD" file for the user. The ".CMD" file is then downloaded into Flash memory of the CR 1000*i, which* will enable the selected features. The ".CMD" file can also be modified after deployment, as required.

The Configurator utility also provides;

- A DEMO mode for passing images from a CR 1000*i* to a PC.
- A Command terminal window for development use.
- An "Explorer" window for "drag and drop" file exchange from CR 1000*i* to PC.

18. What is a typical command level exchange for a basic CR 1000*i* transaction ?

In the simplest interactive exchange, the modifications required to the controlling devices' application are limited to adding only four new commands:

- The **FEED** command, to inform the CR 1000*i* that a check is about to be inserted
- The **IMAGETAG** command, to pass any required transaction-specific data to the CR 1000*i*
- The **IMAGESAVE** command, to compress the TAG data and image into a standard TIF file
- The **IMAGESEND** command, to transfer the TIF image file out of the CR 1000*i*'s memory.

18. Does the CR 1000*i* support legacy authentication processes?

Yes, the CR 1000*i* transmits the MICR string to the controlling device in real-time for each transaction. The CR 1000*i* also embeds the MICR string in a TAG field with each TIF image file.

19. What released documentation is available for the CR 1000*i*?

- Document 22209 CR 1000*i* Programmer's Reference Manual
- Document 22263 CR 1000*i* Installation Guide
- Document 22264 CR 1000*i* Reference Manual

18. Should I operate the CR 1000*i* in batch or real-time transfer mode?

This answer depends on several factors, such as the speed of the interface used for transferring images, the number of images collected daily, and the transaction levels in a given 24 period.

For a large multi-lane store, real-time transfer over a fast Ethernet connection is optimal. For a single lane installation, the CR 1000*i* can batch upload all collected image files on a daily basis.

19. What are CR 1000*i*'s power requirements?

The CR 1000*i* can be powered from a 12VDC, 1A power pack or from the controlling device, if applicable. The Tailgate and USB (future) ports both provide for controlling device power.

20. Does the CR 1000*i* require cleaning?

The CR 1000*i* is designed to NOT require periodic cleaning. However, liquid spills or excessively dirty documents could require the CR 1000*i* to be cleaned. Instructions for cleaning are included in the Installation Guide.

21. Should I use 1-pass or 2-pass operation?

The best MICR read rates are generated using 2-pass operation. In 2-pass mode, the MICR digits are read both in the forward and reverse direction, then compared for consistency. This is a unique feature of the linear transport mechanism used in the CR 1000*i*. Other "horseshoe-style" mechanisms only read once in the forward direction and cannot offer this added level of performance. CR 1000*i* MICR mis-read rate improves from 10basis points (0.1%) to 5 basis point (0.05%) error rate from 1-pass to 2-pass mode. There is no difference in imaging performance between the two modes.

22. What IF my MICR read rate seems to be lower than expected?

The largest dependency for a good MICR read is a properly aligned insertion of the check. The check must be aligned to the right-most wall of the insertion slot and remain parallel to this wall for the entire MICR read. The tolerance for mis-insertion angle is approximately 5 degrees. The CR 1000*i* is programmed to automatically "kick-back" grossly mis-aligned insertions. When reasonable care is taken to train operators in proper insertion techniques, the CR 1000*i* has a proven MICR reject read rate of less than 2%.

23. How can I pass binary image files through my ECR Tailgate interface?

Although the IBM tailgate is designed to pass ASCII style (7-bit) data using VISA II protocol, the CR 1000*i* is also capable of using IBM's "Direct Connect" tailgate protocol. Direct Connect protocol uses 8-bit packets and is a much more optimized protocol for transferring large binary files through an IBM ECR. CR 1000*i* supports both protocol standards, VISA II and Direct Connect.

24. What are "Scaleable Quadrants"?

For users who do not require the image of the entire document, the CR 1000*i* can be configured to reduce the full image to any rectangular portion of the full image. An example would be to save only the upper left-most quadrant of the check image in order to keep only the name and address block of the check writer. This would result in a much smaller image file for transfer, archive and retrieval purposes. "Scaleable Quadrants" are different from "snippets" in that the region of interest is pre-determined manually instead of using optical character recognition techniques.