



A Comprehensive BLI Laboratory Evaluation

Sharp MX-4501N

35 PPM Colour/45 PPM Black
Copier ■ Printer ■ Scanner ■ Fax



Test duration: Two months, including a 150,000-impression durability test.



Reliability	Excellent
Multitasking	Excellent
Administrative Utilities	Excellent
Feedback to Workstations	Excellent
Ease of Network Setup	Very Good
Print Drivers	Excellent
Applications Compatibility	Excellent
Scan Functions	Excellent
Colour Print/Copy Quality	Good/Very Good
Black Print/Copy Quality	Very Good
Colour Print/Copy Productivity	Very Good
Black Print/Copy Productivity	Very Good
Ease of Use	Excellent
Feature Set	Good
Security Features	Excellent
Toner Yield	Excellent
Cost per Page (Colour/Black)	*
Value	Good

Maximum monthly duty cycle: 150,000 impressions.

BLI's recommended monthly duty cycle for peak usage: Up to 85,000 impressions.

BLI RECOMMENDATION**ALSO INSIDE**

- ▶ Test Procedures
- ▶ Specifications
- ▶ Certificate of Reliability

Ratings scale:
Excellent, Very
Good, Good, Fair
and Poor.

Offering excellent ease of use and strong productivity, the Sharp MX-4501 colour multifunctional product gave a strong overall performance in BLI's rigorous two-month lab test. Using a four-drum, single-pass engine to output at 35 ppm in colour mode and 45 ppm in black mode, it demonstrated higher speeds in most colour and black print and copy modes than most business colour models tested. This unit, which also proved to be highly reliable, tested as configured with the modified waste toner delivery tube (see "Reliability"), also stands out from its competitors in the IT-related aspects of its performance. For example, it offers outstanding scan functionality, comprehensive administrative utilities, easy-to-use print drivers, simple setup procedures and excellent feedback to end-user workstations. Equipped with standard copy, network print and scan functionality, the MX-4501N can be optionally equipped with fax and Internet

* Cost per page could not be calculated as pricing is set by dealers and was not provided by Sharp.

Please note that the following document is based on tests conducted on a Sharp MX-4501N sold in the United States. BLI has updated this report to reflect the specifications and features available on the European version of this model. Although there may be slight differences in features and pricing, both models are manufactured by the same parent company, share many of the same components, and are based upon a common engine. Tests were conducted using U.S. letter-size paper and A4 results may vary.

fax. Featuring Sharp's Open Systems Architecture, it can also be configured to integrate with customers' document management and other types of applications to automate workflow. BLI highly recommends the MX-4501N for offices in need of a colour multifunctional product for monthly volumes of up to 85,000 impressions.

PERFORMANCE OVERVIEW

+, – and ○ represent positive, negative and neutral attributes, respectively.

RELIABILITY

EXCELLENT

- + The Sharp MX-4501N proved to be highly reliable in BLI's two-month, 150,000-impression durability test. After BLI's initial early-production test unit experienced repeated problems with caked up toner in the waste toner delivery tube, a new test unit incorporating a newly designed waste toner delivery tube was installed in the lab. The toner-caking problem is believed to have been caused by the higher temperatures in this unit, which has the highest speeds of Sharp's MX models based on the same engine (Sharp's lower-speed MX models did not exhibit this problem), when run at atypically high volumes such as those products are subjected to in BLI's lab test. In addition to being wider and straighter, the new component promotes toner flow by being tapped by a gear-driven arm on a regular basis. BLI's initial test unit, configured with the modification, completed another 150,000-impression durability test without any service required and with only two misfeeds, for a misfeed rate of one per 75,000 impressions. BLI also tested a new unit incorporating the modification direct from the factory, which experienced just one service call for washed-out colour and four misfeeds throughout the 150,000-impression test. Based on these results, BLI concludes that regardless of whether a user purchases a new MX-4501N that incorporates the new design or an earlier production model retrofitted with the modification, the unit can be counted on for highly reliable performance. Buyers should note that models manufactured as of September 2006 (serial numbers beginning with a 6 and ending with a 9) have the modification. Earlier models with lower serial numbers can be configured with the modification at no charge for users who experience the problem.
- + The unit offers a competitive preventive maintenance (PM) interval and colour and black photoconductor/developer yields that are higher than most.



MULTITASKING

EXCELLENT

- + Offering excellent multitasking capabilities, the MX-4501N enables users to program a virtually unlimited number of copy jobs while another copy job or a print job is in progress, with no slowdown observed between jobs. In testing, the unit accepted 15 print and 15 copy jobs and could still accommodate additional copy or print jobs, as well as fax and scan jobs.
- Programming the next copy job can begin as soon as the pages of the previous copy job have been scanned.
- + A prompt appears on the display letting users know the system is ready to scan the next copy job.
- + The user does not have to press a key to reserve a job, although if the next job is programmed before the reset time elapses, the settings from the previous job are retained, requiring the user to press the Clear key to clear the settings.
- + The Interrupt key is touch-sensitive and is available only during copy jobs. A copy job can be interrupted to produce another copy job that can use all features, such as duplexing, stapling and the document feeder. Once the interrupt job is complete, the interrupted copy job resumes automatically.
- Jobs are processed on a first-in, first-out basis; one function cannot be established as a priority function.
- There is a period after all the pages in a scan job have been scanned during which the user cannot access any of the other function mode keys. This was not the case with copy jobs.
- + The Priority key stops the current job to allow output of a priority job and then output of the paused job continues.



ADMINISTRATIVE UTILITIES

EXCELLENT

- + Sharp's administrative utility suite includes Printer Administration Utility, the Printer Status Monitor and robust Web-based management via the device's Web page. The Printer Administration Utility enables IT managers to install, configure and monitor multiple networked printers from their desktops regardless of brand, as long as they are SNMP-compliant. Once an IP address is assigned to the unit, the Web page enables administrators to program destinations (using LDAP, if desired, which is a great convenience, not usually offered) and edit device settings from their Web browser, as well as access information regarding status, meter count, configuration and management.

- + The unit's graphical Web utility is much easier to use and provides more functionality than others tested to date.
- + Other notable features of the Web utility include the capability for an administrator to test SMTP and LDAP connections to verify that correct configuration information has been entered, view a graphical representation of the amount of hard drive space used and available (in percentages) and add customised links to outside Web sites (e.g., for a local Sharp dealer) to the utility's toolbar.
- + When auditing mode is enabled, a count is kept of the number of pages output by each account. Electronic counters also track copy, print, fax, scan, Internet fax, stapler, document feeder, full-colour, two-colour, single-colour, black and duplex usage. Account details can be viewed from the Web utility and at the control panel and can be printed and exported. Up to 200 accounts can be established.
- + Each user can be assigned to up to eight different groups, which can restrict usage by type of job that can be performed (e.g., just monochrome copy and print; or copy, print, fax and scan to all or only certain types of destinations), or by page limits.
- + The Web utility supports direct printing of TIFF and JPEG files. With the PostScript option, direct printing of PDF files is also supported. Direct printing of files is also possible via a USB drive that plugs into a USB port on the unit.

SHARP

MX-4501N

Device Status

Update(R)

Back(Q)

Login(P)

Help(I)

Top Page

Status

Device Status

Network Status

Power Reset

Address Book

Document Operations

Job Programs

User Control

System Settings

Network Settings

Application Settings

E-mail Alert and Status

Storage Backup

Job Log

Security Settings

Paper Input Tray Status

Tray	Status	Paper Size	Paper Type
Tray 1	100%	Letter	Plain
Tray 2	33%	Ledger	Plain
Tray 3	100%	Letter	Plain
Tray 4	33%	Letter	Plain
Tray 5	4%	Letter	Plain
Bypass Tray	Empty	Unknown	Plain

Output Tray Status

Tray	Status
Right Tray	Not Full
Offset Tray	Not Full
Saddle Stitch Tray	Not Full

Supply Status

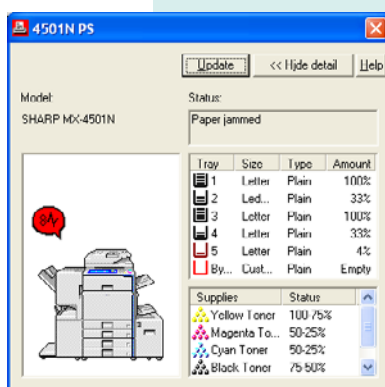
Supply Information	Status
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Sharp Web Utility Device Status Screen

- + Sharp provides plug-ins for HP Web Jetadmin so that companies who use this popular management utility can use it to manage their Sharp devices as well.
- + Via Remote E-mail Diagnostics (RED), e-mail alerts for certain error conditions and/or meter read information can be sent to up to three destinations (for example, one or more administrators as well as an authorised Sharp dealer).

FEEDBACK TO WORKSTATIONS

EXCELLENT



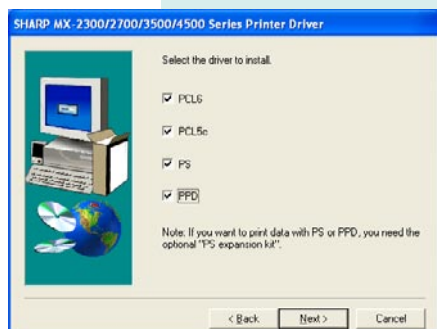
Printer Status Monitor provides pop-up error messages.

- + Very specific paper supply information is available directly from the print driver, in the Printer Status Monitor utility (which can monitor multiple Sharp devices and multiple drivers) and on the Web page.
- + Users can also receive pop-up status messages for print and scan jobs, including pop-up job completion notification and error messages.
- + Icon alerts on the taskbar, as well as audible alerts, can be enabled to notify users of error conditions before sending jobs.
- + Status information is also available by opening the Printer Status Monitor utility, the Sharp Printer Administration Utility and/or the Web page.
- + Consumables status in 25 percent increments is provided on toner from the Web page and the Printer Status Monitor utility. Information on whether the staple cartridge is full or empty is also available.

EASE OF NETWORK SETUP

VERY GOOD

- + Network configuration settings can be programmed from the control panel as well as from the Web utility. At the control panel, although there are many screens and selections, the menu system is easy to navigate.
- Unlike with other systems, entry of a password does not require two entries. Consequently, if the administrator has made an error, he won't be aware of it until the first time he attempts to use the password he thinks he entered.
- The numeric keys on the control panel cannot be used for entering numeric portions of the configuration settings.
- + Installation of the drivers is simple. The CD-ROM, which contains all the drivers, including optional PostScript (which will not install if the system has not been configured with the option), does not auto-launch upon insertion



All the print drivers, plus a PPD, can be installed in one session.



The system detects configured accessories but requires the administrator to confirm each.

into the drive, but a setup.exe file is situated at the bottom of the list of files, where it is easily found. When selected, it launches an easy-to-follow menu-driven installation routine.

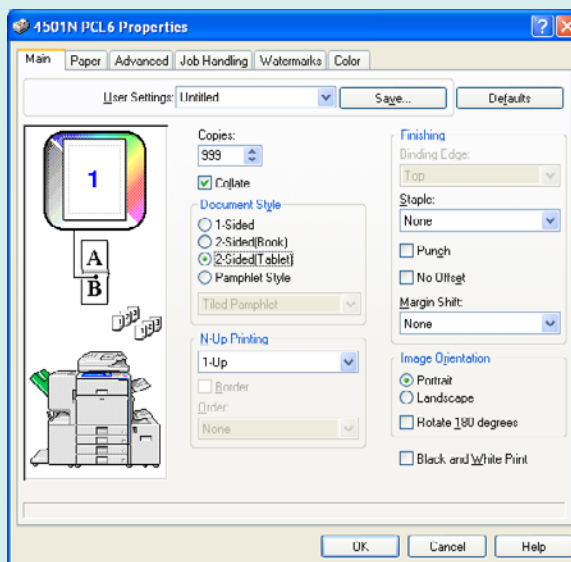
- + Though the Status Monitor utility, which is contained on the drivers CD-ROM, must be installed separately, all of the drivers—PostScript, PCL 6, PCL 5c and PPD—can be installed in one session.
- + Provided the device has been assigned an IP address, it is automatically located. In addition, the port is created automatically during installation of the drivers.
- All of the drivers may be installed using the standard installation. Using the standard installation to install PCL 6 and PostScript required 24 clicks of the mouse.
- A custom installation allows setup of SSL (Secure Sockets Layer) encryption for printing to the unit.
- Configured accessories are automatically detected, though the administrator must manually confirm each. Doing so adds 14 clicks to the process for one of the drivers and another 11 for a second driver.
- + Sharp's Printer Administration Utility allows automated distribution of print drivers. An administrator can configure the print driver and create print queues and then send an e-mail broadcast containing a link to all users who can then simply click on the link in order to install the driver on their workstations.
- + Administrators can clone device settings from one Sharp MX-4501N to others in the organisation via the USB drive.

PRINT DRIVERS

EXCELLENT

- The Sharp MX-4501N ships with PCL 5c, PCL 6 print drivers for Windows 98, 2000, NT 4.0, Me and XP operating systems, as well as Mac OS 9x and OS X (including 10.4). Other supported environments include Novell NetWare and Sun Solaris. A PostScript driver is also included on the CD, although the PostScript option must be configured in order for it to work. PostScript is standard with the optional EFI Fiery controller.
- + Also included is a full PPD driver, which is unusual. It's beneficial because rather than a user having to navigate the CD for the correct PPD for each particular application that may require use of a PPD and storing it in a specific location—a process that can require many mouse clicks—the PPD driver can be loaded on users' PCs and simply selected whenever such an application is used.

- + All the features used for typical print jobs are accessible on the main screen, eliminating the need to navigate many tabs.
- + The layout of the drivers is the same for PCL and PostScript, which makes use easier for those who switch between them.
- + The well-designed drivers are graphical, enabling point-and-click selection of paper drawers and indicating selected settings.
- + The drivers offer a good feature set that, in addition to including a detailed paper gauge, includes the ability to save the settings for frequently used jobs; secure print; proof print; tandem print; poster print; and the ability to select stock from up to six paper sources for a single job, with different features (such as simplex and duplex) selected for different page ranges.
- + Programming booklet jobs is simple, requiring eight clicks of the mouse.
- + The unit offers simultaneous RIP and print, with printing beginning while pages are still being processed.
- + File size remained the same when printing multiple sets, regardless of whether “collate” was selected from the properties screen of the driver or from the print screen within an application.



Main Screen of PCL 6 Driver



APPLICATIONS COMPATIBILITY

EXCELLENT

- + No problems were experienced with any of the test files used in the applications compatibility tests. Units are tested for compatibility on Windows XP platforms with Microsoft Word 2000, Microsoft PowerPoint 2000, Microsoft Excel 2000, Adobe PageMaker 7.0, Adobe Photoshop 6.0 and Adobe Acrobat 6.0 using 25 application test files, which contain text, graphics, halftone images, tables, etc., enabling BLI technicians to evaluate memory usage, file processing, font rendering and grayscale capability.



SCAN FUNCTIONS

EXCELLENT

- + The MX-4501N comes standard with Sharp's very easy-to-use ImageSEND function, which, used in conjunction with Sharpdesk client document management software, earned BLI's Outstanding Achievement Award for "Outstanding Multifunctional Imaging Device Scan Solution," Spring, 2004. It enables users to send documents to desktops on the network, e-mail destinations, FTP, fax and Internet fax (optional), SMB (network folders), groups and to storage on the device.
- + Users can scan documents to a USB memory device using formats such as PDF, JPEG, TIFF and encrypted PDF (requires a password).
- + Send to Group enables users to send a broadcast to a mixed group of different types of destinations, such as e-mail addresses, fax numbers and Internet faxes in a single operation. Many other models have separate keys for various types of sending operations.
- + Also standard is a one-user license for Sharpdesk, a favorite of BLI technicians for its ease of use and its excellent results for OCR. Sharpdesk features include Receive (receive, open and save scans); Manage (store, organise and manage documents from a PC desktop using an intuitive thumbnail image display), Search (retrieve electronic files using search and index capabilities), Output (drag-and-drop print, fax, e-mail and applications access), View (view files in more than 200 file types in native formats), Compose (combine files created in different applications into a single document) and OCR (convert hard copy documents, images and PDF files into searchable, editable format). Additionally, a new feature called ICT lets users compress PDF files and therefore reduce their size (and bandwidth). Additional Sharpdesk licenses are available as optional upgrades.
- + The MX-4501N's compression worked well, keeping tested scan file sizes small.
- Sending a 200-dpi PDF scan job to one e-mail destination via an LDAP search required 13 keystrokes. Sending to two e-mail destinations increased the

number of keystrokes to 20, because the user must select the To key and then Next Address after selecting an additional address. And when more than one address is selected, PDF is no longer the default setting and must be selected.

- + LDAP can be used by an administrator to facilitate programming of scan destinations from the Web utility.
- + The unit supports Sharp's Open Systems Architecture, so when it is equipped with the optional application integration module, the MX-4501N can communicate with various document management applications. This capability is bidirectional; documents can be scanned from a Sharp MFP to a document management application along with index fields, and users are able to pull data from the PC to the MFP.
- When an e-mail address was entered incorrectly when scanning a document, scan status information at the control panel erroneously indicates scans have been sent.
- + The unit's tested scan speed for a black-and-white document is good, especially for two-sided documents, which, thanks to this unit's single-pass duplexing document feeder scans two-originals at a rate of 55.04 images per minute.

IMAGE QUALITY

Colour Print/Copy Quality

GOOD/VERY GOOD

- The default colour setting for the Sharp MX-4501N is for one-bit colour, but this can be changed to four-bit colour. While output is good in both modes, it is smoother using the four-bit mode. Some output using the one-bit mode appeared grainy. Note that changing the default setting to four-bit mode, results in a decrease in productivity. For example, colour job stream print efficiency dropped from 53.53 percent to 33.02 percent.
- + As tested with the Sharp print controller, colour output produced by the Sharp MX-4501N was rated Good for both colour business graphics output and for colour photographic image output in print mode, while in copy mode, colour business graphics output was rated Very Good and photographic image output was rated Good.
- + Employing a new formulation of Sharp's micro-fine toner, the MX-4501N produced output that is glossier than that of most business colour models, which gives it a richer, more lustrous appearance.
- + Technicians cited bright colour, above-average sharpness and good production of pastel shades.

- Consistency of coverage is about average for business colour models in both print and copy modes, with some light areas evident.
- Output exhibited graininess in one-bit mode. Output in four-bit mode was smooth.
- While photographic image output was good overall, flesh tones exhibited slight reddishness.
- + A range of easy-to-make colour adjustments are available from the control panel, including settings for sharpness (sharp or soft), colour balance (which can be adjusted individually for cyan, magenta, yellow and black), RGB adjust, suppress background, brightness and intensity.
- + As measured with BLI's test instruments, the MX-4501 produced a colour gamut that is larger than that of many competitive models.
- The shape of the gamut was not linear over the course of the test. In addition, of the primary colours, there was a large decrease in the size of the gamut in the yellow, magenta and cyan ranges. Of the secondary colours, there was a very large decrease in the green range and slight shifts in red and blue. The changes in colour output measured by BLI's test instruments were also detectable in a visual examination of output produced at the beginning of the test and output produced at the end of the test.
- + Buyers with more critical image quality needs may choose the optional Fiery controller, as well as a range of Fiery graphic arts utilities, that allow for precise colour management.

Black Print/Copy Quality

VERY GOOD

- + Black print output produced by the Sharp MX-4501N is very good overall in both print and copy modes. Text was rated Very Good in both modes, with BLI technicians noting dark, sharp, fully formed characters. Solids were rated Excellent in both modes, with above average darkness and consistent, solid coverage.
- + Rated Very Good in copy mode, line art was rated Excellent in print mode, with consistent line thickness and fully formed circles and no evidence of toner overspray. In addition, closely spaced fine lines remained distinct.
- Halftone output was produced over a very good range in both modes.
- The coverage within halftone levels, while rated Good in copy mode, was rated Fair in print mode.

PRODUCTIVITY

Colour Print/Copy Productivity

VERY GOOD

- + Employing four drums to output at a rated speed of 35 ppm in colour and 45 ppm in black, the Sharp MX-4501N performed very well in BLI's job stream print productivity test, in which a series of typical office documents is sent to the unit, replicating real-world network office usage. In this test using the PostScript driver, the MX-4501N demonstrated competitive efficiency and above-average tested running speed in auto colour mode. In fact, the unit is among the fastest business colour models tested to date in this important test. The unit's productivity was tested in the default one-bit colour mode. Productivity with four-bit colour mode enabled, which provides improved output quality (though average office users may not even notice the difference), is lower.
- Because of the unit's high rated engine speeds, even though overall simplex and duplex print efficiency rates when producing multiple sets of a mixed black and colour document in auto-colour mode are below average for business colour models tested, actual tested running speeds are competitive.
- + The Sharp MX-4501 is among the most productive models tested when producing booklets in auto-colour mode.
- Overall tested running speed in full-colour mode is competitive.
- + The Sharp MX-4501N offers above average productivity in 1:1 simplex and 2:2 duplex copy modes when producing sets of BLI's mixed black and colour original with the unit in auto-colour mode. While its efficiency rate in 1:2 duplex copy mode is lower than average, its actual running speed in this mode is competitive for the group.
- + Contributing to good productivity in the 2:2 mode is the unit's single-pass duplexing document feeder, which enables the unit to scan both sides of two-sided originals in a single pass.
- First-copy time in auto-colour mode is competitive from both the platen and the document feeder. The unit's manufacturer-rated warm-up time of four minutes is slower than that of most other business colour models.

Black Print/Copy Productivity

VERY GOOD

- + Equipped with a 700-MHz controller, the MX-4501N proved efficient in the job stream test in black mode, with faster tested output speed than that of most business colour models tested.

- + With a high rated black speed of 45 ppm, the Sharp MX-4501N's competitive overall efficiency enables it to produce multiple sets faster than most competitive models in both simplex and duplex print modes.
- The unit's productivity for producing booklets in print mode is competitive in both copy and print modes.
- + An efficient unit in black copy mode, the MX-4501N has above-average tested speeds in all three primary copy modes. Only one other business colour model tested offers a faster tested speed in 2:2 duplex copy mode.
- + Contributing to good productivity in the 2:2 mode is the unit's single-pass duplexing document feeder, which enables the unit to scan both sides of two-sided originals in a single pass.
- Black first-copy time from both the platen and the document feeder are below average for tested models. The unit's manufacturer-rated warm-up time of four minutes is longer than that of most competitive units.

Tests were conducted using U.S. letter-size paper and A4 results may vary slightly.

EASE OF USE

EXCELLENT

- + The Sharp MX-4501N features a well-designed control panel that incorporates a large (142.9 mm x 74.6 mm), easy-to-read LCD display that is adjustable for brightness, albeit via the menu system under the System Settings menu. It also features a large numeric keypad.
- Although there is no Help key, users are prompted to select the I (Information) key that appears on the display when there is a misfeed, for example.
- + Settings for the copy job (such as reduction/enlargement ratio, two-sided output, paper size, stapling, etc.) are indicated on the display.
- The control panel has a proof copy key (which allows a user to check one set of a job prior to releasing the entire job), although accessing it requires navigating through several screens.
- + Though not all of the features required for typical copy jobs can be programmed from the main screen, they are selectable from the main screen and, when selected, bring the user to another screen where the settings can be programmed. The keys are well-labeled and BLI test technicians found the menu system easy to navigate.



Sharp MX-4501N Control Panel

- + The job list on the control panel offers extensive information on print, copy, fax, Internet fax, completed jobs and jobs currently being processed.
- Access to the control panel is blocked during automatic colour calibration.
- Unlike most business colour models, which are defaulted to auto-colour mode (in which the system detects which originals contain only black and which contain colour and automatically produce the copies in the correct mode) so that users don't have to select the appropriate mode for their jobs, the MX-4501N requires users to select either the colour button or the black button to produce copies. When the colour button is pressed, several additional selectable options are displayed, including full-colour mode (the default setting, though it can be changed), auto-colour mode and single-colour mode. Users may be confused by these choices.
- BLI recommends that the default colour mode be changed to auto-colour mode, because if walk-up users select the colour button to copy a document that contains a mix of colour and black originals with full-colour as the default setting, the entire document, including the black pages, will be output in colour mode (black pages will be produced in process black using all four toner colours), resulting in wasted toner.
- + The control panel is customisable in that up to three frequently used functions that are not on the main screen can be moved to the main screen. Moreover, using the system's accounting mode, the features that appear on the display can be customised to a particular department or user group. For example, the unit's card shot feature, which is a useful feature for offices that need to copy customers' ID or health insurance cards, could be displayed on the main screen for certain users, while other users could have another feature on the main screen.
- The job build function was simple to use, but the job can use only one size of paper and different sections of a job cannot have different features.
- + The procedure for programming booklet copy jobs on the MX-4501N is the easiest for products tested, requiring just four keystrokes.

- Programming a copy job with 2:2 duplex mode and stapling required seven keystrokes.
- + Loading paper into the drawers is easy.
- + The paper drawers have sliding width and length guides, which are easy to adjust. In addition, the bypass tray and the paper drawers automatically detect the size of paper loaded. Consequently, after changing paper size, users do not have to enter the new size.
- + Procedures for replacing the toner are among the best seen in business colour models tested to date. Though they can't be replaced while the unit is running, the cartridges are accessible from the front and slide out easily. The waste toner container is also very easy to replace. The drums are service-replaceable.
- + Although the user will need to slide away the optional LCT to access the right side panel to access most misfeeds, removing misfeeds from the unit is easy, with good access to misfeed areas and job recovery after a misfeed is cleared. The user does not have to press the Start key to resume the job after a misfeed is cleared.
- + Graphical help indicating the location of misfeeds, along with text instructions, is accessible on the control panel display by pressing the Information key. The display is dynamic, changing as misfeeds are removed. The user presses the Next key to view more instructions.
- + Customers have access to MySharp, a unique and very useful training Web site customised to the customer's specific configuration, which enables end users to access information (including video clips) on how to use certain features at any time.

FEATURE SET

GOOD

- The Sharp MX-4501N offers a competitive standard paper capacity of two 500-sheet drawers, plus a 100-sheet bypass.
- + Paper capacity can be expanded to a maximum of 5,600 sheets—which is a higher capacity than nearly all business colour units on the market—from six sources, which is also more than offered by most competitive units.
- Though the unit's bypass tray, which has a competitive capacity of 100 sheets, can accommodate up to 209 gsm, the standard drawers can accommodate only up to 105 gsm. Some competitive models accommodate heavier-weight stock from the drawers.

- The unit is equipped with 768 MB of copier RAM, 640 MB of printer RAM and a 80-GB hard drive that is shared among functions.
- + Buyers can choose between the standard Sharp controller and the optional Fiery controller, which was mentioned before.
- + The unit's standard duplexing single-pass feeder, which is hinged to accommodate books, has a capacity that, at 150 sheets, is above average for business colour models. This feeder enables scanning of two-sided documents without having to invert the originals, which enhances productivity.
- + In addition to the features that would be expected for a unit in this range, the MX-4501N offers stamping, card shot (which makes it easy to copy both sides of a card onto one copy), the ability to save the settings for up to 48 frequently used jobs, 1,000 copy control codes and tandem copy/print, which enables output to two devices simultaneously.
- Options include a 1,000-sheet saddle-stitch finisher, which was configured on BLI's test unit. It can staple up 30 sheets per set and fold and booklet staple up to 10 sheets to make 40-page booklets. Also available is a 500-sheet inner finisher that staples up to 50 sheets per set in three positions.
- + An optional keyboard can be attached to the unit via its USB port, which is a great convenience for scanning.
- + Other noteworthy features include OSA and a customisable control panel.

SECURITY FEATURES

EXCELLENT

- + In addition to secure print, standard security features of the Sharp MX-4501N include network user authentication; SSL (Secure Sockets Layer) encryption; IP and MAC address filtering, which restrict PC and user access to the device over the network; protocol enablement/disablement; port management; and scanning to the USB drive in encrypted PDF format (requires a password to access it).
- + The accounting mode enables an administrator to assign users to certain groups in order to restrict access to certain types of features (for example, colour output or any of the unit's functions, such as scan to USB key) or by page limits.
- + A copy of every outbound e-mail, along with the identity of the sender, can be sent to a specified e-mail address or folder.
- + Sharp's Optional Data Security Kit for this model first encrypts image data and then overwrites it up to seven times. It also gives the MX-4501N the abil-

ity to put an unobtrusive mark on copy or print output, which will prevent that document from being copied by another Sharp MX product.

- + Also available are third-party auditing and document rights solutions, including Equitrac Office and AirZip's FileSECURE. The latter is an application that protects sensitive documents throughout their life.
- + The password for administrative access to the system may be up to 32 alphanumeric characters. In addition, access is blocked after three incorrect entry attempts.



ACCESSIBILITY FEATURES

NOT RATED

- The MX-4501N lacks a tilting display, which would make viewing easier for those in wheelchairs.



TONER YIELD

EXCELLENT

- + The tested toner yield of the Sharp MX-4501N is well above average for black and for all colour toners than that for business colour models.



VALUE

GOOD

- + The Sharp MX-4501N is priced competitively with most comparably equipped business colour multifunctional products that have similar rated black and colour speeds. Supplies cost per page could not be calculated as pricing is set by dealers and was not provided by Sharp. Value analysis is based on U.S. price structures and prices vary according to country where the device is purchased.

SUPPORTING TEST DATA

Test Environment

This product was tested in BLI's 10,000-square-foot test lab, in an environment monitored by a Honeywell Temp/RH chart recorder, which replicates typical office conditions.

Test Equipment

BLI's dedicated test network, consisting of Windows 2000 and Microsoft Exchange 2000 servers, Windows 2000 and XP workstations, 10BaseT/100BaseTX network switches and CAT5 cabling.

Test Duration

Products are tested for two months, five weeks of which consists of a durability test during which the product is run at its manufacturer-rated maximum monthly duty cycle, with 50 percent of the test volume comprised of copy jobs and 50 percent comprised of print jobs. BLI's daily test usage is designed to replicate real-world use over an eight-hour workday, and as such includes a mix of various-size documents, simplex and duplex modes, and a mix of short, moderate and long run lengths, and on/off cycles, throughout the day. The durability evaluation also includes testing of the document feeder/scanner for an additional 10 percent of the monthly maximum volume, evenly divided over the course of the test.

Tested Configuration

Base unit, plus optional booklet finisher with optional two-/three-hole punch, PostScript 3 and Internet fax and fax.

Test Procedures

The test methods and procedures employed by BLI in its lab testing include BLI's proprietary procedures and industry-standard test procedures, including a BLI-developed variation of ASTM's 1318-90 Test Method for Determination of Productivity using Electrostatic Copy Machines. In addition to a number of proprietary test documents, BLI uses an industry-standard Katun test original for evaluating black image quality and test suites from Quality Logic to evaluate applications compatibility. In addition to a visual observation, colour print quality is tested using the ANSI standard IT8 Colour Test Target, which is read using the Minolta CM503I Spectrophotometer, and samples are analyzed using the CIE XY Chromaticity Diagram. In addition, density of black and colour output is measured using an X-Rite 428 Densitometer. Georgia-Pacific Spectrum DP 20-lb. bond is used in the tests, 10 percent of which is recycled paper containing 30 percent post-consumer content. Image quality is tested using Georgia-Pacific Printing Paper. Tests are conducted using U.S. letter-size paper and A4 results may vary slightly.

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RELIABILITY

Impressions PMs/Malfunctions	Service Required	Meter Count (Impressions)	Impressions Between Service
Meter count (beginning of test)			0
End of test period			150,000 impressions
Total Misfeeds/Misfeed Rate		2/1 per 75,000 impressions	
Service Calls		0	
PMs		0	
Total Service Calls (including PMs)		0	

PMs are scheduled every 150,000 impressions

Note: The results above are for a test unit that underwent a retest after being retrofitted with a newly designed waste toner delivery tube. The modification was developed to address a toner caking problem in BLI's original test unit. Another test unit, which came direct from the factory with the modification already installed also underwent the test and demonstrated similarly good performance. It experienced just one service call for washed-out colour images, and four misfeeds.

MULTITASKING

MULTITASKING EVALUATION

Primary Function	Secondary Function	PRINT	SCAN	COPY
PRINT		Yes	Yes	Yes
SCAN		Yes	Yes	Yes
COPY		Yes	Yes	Yes

A "Yes" indicates that the user can initiate the secondary function while the primary function is taking place and that no further user intervention will be required for the secondary function to take place.

In addition to a single-user multitasking test, which evaluates a unit's ability to initiate or perform one function while another function is already in progress (see chart above), BLI also tests a multifunctional product's ability to handle multiple jobs that would be likely to stack up in a multi-user networked environment.

IMAGE QUALITY

Print Quality

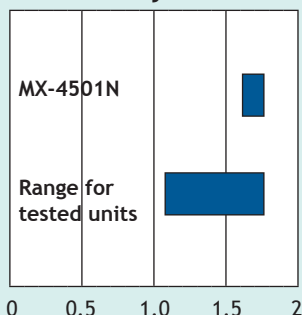
Text	Very Good
Line Art	Excellent
Halftone Pattern	Fair
Halftone Range	Very Good
Solids	Excellent
Colour Business Graphics	Good
Colour Photographic Images	Good

Colour DENSITY READINGS

Colour	Cyan	Magenta	Yellow
Print Density	1.40	1.42	1.00

Density of a printed image with blocks of all solid colours (based on the average of two readings for each colour).

Print density



Print density:

1.62 to 1.78

Density for units in this class tested to date:

1.08 to 1.78

Halftone range:

2% to 98%, with distinct transitions between most levels.

Measurements are based on four readings corresponding to four different solid black locations on the output. The higher the density reading, the darker the image.

Copy Quality

Text	Very Good
Line Art	Very Good
Halftone Pattern	Good
Halftone Range	Very Good
Solids	Excellent
Colour Business Graphics	Very Good
Colour Photographic Images	Good

Colour DENSITY READINGS

Colour	Cyan	Magenta	Yellow
Original Density	1.49	1.44	1.12
Copy Density	1.45	1.10	.94

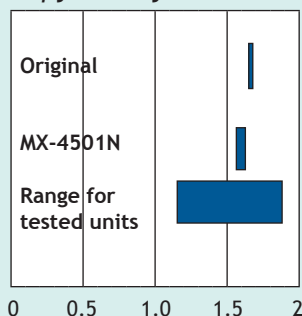
Density of copied image when tested in "Full Colour" copy mode using a KATUN test original containing blocks of all solid colours (based on the average of two readings for each colour).

Colour FIDELITY READINGS

Colour	Yellow	Magenta	Cyan	Red	Green	Blue	Black
Fidelity	4.31	6.92	4.83	11.15	14.71	17.66	2.70

Colour fidelity of a copy to its original (using a KATUN test original containing blocks of all solid colours: tested in walk-up mode using the machine default settings in "Full colour" mode and auto exposure settings); average of two readings for each colour. Measurements are taken with a Minolta CM-503i spectrophotometer. The closer the number is to 0, the closer the copy's colour fidelity is to the test original (based on the average of two readings for each colour).

Copy density



Density of original:

1.66 to 1.69

Density of copy:

1.54 to 1.63

Range for units in this class:

1.16 to 1.89

Halftone range:

15% (which is the minimum coverage level on the original) to 100%, with distinct transitions between most levels.

Measurements are based on four readings corresponding to four different solid black locations on the output. The higher the density reading, the darker the image.

PRODUCTIVITY

Productivity was tested with the unit in one-bit colour mode, with the exception of the job stream test, which was conducted both in one-bit colour mode and four-bit colour mode. Tests were conducted using U.S. letter-size paper and A4 results may vary slightly.

Job Stream

Auto colour mode (PostScript, in default 1-bit mode)

The unit completed the job stream in 1 minute and .85 seconds, running at 18.73 ppm, which translates to an efficiency rate of 53.53%.

Auto colour mode (PostScript, 4-bit mode)

The unit completed the job stream in 1 minute and 38.56 seconds, running at 11.56 ppm, which translates to an efficiency rate of 33.02%.

Auto colour mode (PCL, in default 1-bit mode)

The unit completed the job stream in 1 minute and 9.12 seconds, running at 16.49 ppm, which translates to an efficiency rate of 47.11%.

Black mode (PostScript)

The unit completed the job stream in 47.12 seconds, running at 24.19 ppm, which translates to an efficiency rate of 53.76%.

Black mode (PCL)

The unit completed the job stream in 41.25 seconds, running at 27.63 ppm, which translates to an efficiency rate of 61.4%.

BLI's job stream includes Word documents, Outlook e-mail messages, Excel spreadsheets, PowerPoint, HTML and Acrobat PDF files, totaling 19 pages. This test simulates the type of traffic a typical device might experience in a real-world, multi-user environment. All of the files are sent to the printer as a group, at which time the stopwatch begins; timing ends when the last page of the last file exits the device. Job stream efficiency is determined by the percentage of the rated speed at which the unit operates when producing real-world jobs. The closer the rate is to 100%, or if it exceeds 100%, the more efficient the unit.

First-copy time (auto colour):

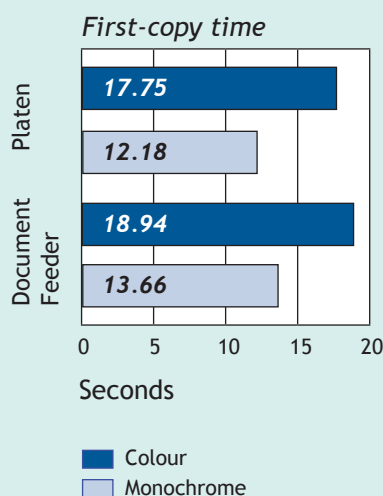
17.75 seconds from the platen.

18.94 seconds from the document feeder.

First-copy time (black):

12.18 seconds from the platen.

13.66 seconds from the document feeder.



Booklet Print

Booklet Print (Auto Colour)

The unit printed, folded and saddle-stitched 10 sets of a 16-page PDF file output in booklet mode from the PostScript driver in 7 minutes and 43.79 seconds, running at 20.70 ppm, which translates to an efficiency rate of 59.14%. The closer the efficiency rate is to 100%, or if it exceeds 100%, the more efficient the unit.

Booklet Print (Black)

The unit printed, folded and saddle-stitched 10 sets of a 16-page PDF file output in booklet mode from the PostScript driver in 6 minutes and 37.12 seconds, running at 24.17 ppm, which translates to an efficiency rate of 53.72%. The closer the efficiency rate is to 100%, or if it exceeds 100%, the more efficient the unit.

Booklet Copy (Auto Colour)

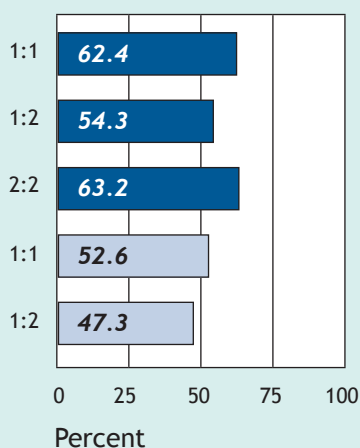
The unit copied, folded and saddle-stitched 10 sets of a 16-page copy job in 9 minutes and 22.14 seconds, running at 17.08 ppm, which translates to an efficiency rate of 48.79%. The closer the efficiency rate is to 100%, or if it exceeds 100%, the more efficient the unit.

Booklet Copy (Black)

The unit copied, folded and saddle-stitched 10 sets of a 16-page copy job in 6 minutes and 38.04 seconds, running at 24.12 ppm, which translates to an efficiency rate of 53.60%. The closer the efficiency rate is to 100%, or if it exceeds 100%, the more efficient the unit.

Tests were conducted using U.S. letter/ledger paper and A4/A3 results may vary slightly.

Overall Efficiency



BLI obtains the overall efficiency for each copy/print mode by averaging the efficiency ratings (derived by dividing the tested speed of the device by the rated speed, and then multiplying by 100) for each run length (1,5 and 10 sets in copy mode and 1 and 5 sets in print mode).

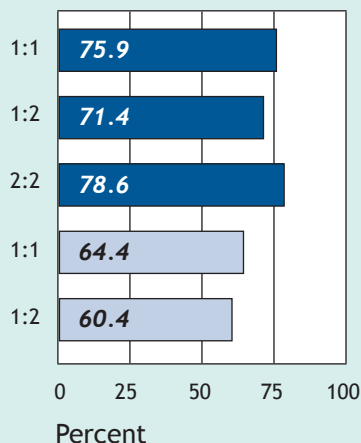
■ Colour
■ Monochrome

MIXED Colour AND BLACK COPY/PRINT EFFICIENCY FOR MULTIPLE SETS

Copy 1:1					
Sets	Min.	Sec.	PPM	Efficiency	Overall Efficiency
1	0	38.11	15.7	45.0%	45.0%
5	2	4.99	24.0	68.6%	56.8%
10	3	53.22	25.7	73.5%	62.4%
Copy 1:2					
Sets	Min.	Sec.	PPM	Efficiency	Overall Efficiency
1	0	47.1	12.7	36.4%	36.4%
5	2	22.07	21.1	60.3%	48.4%
10	4	19.16	23.2	66.1%	54.3%
Copy 2:2					
Sets	Min.	Sec.	PPM	Efficiency	Overall Efficiency
1	1	10.24	17.1	48.8%	48.8%
5	4	11.3	23.9	68.2%	58.5%
10	7	52.33	25.4	72.6%	63.2%
Print 1:1					
Sets	Min.	Sec.	PPM	Efficiency	Overall Efficiency
1	0	41.22	14.6	41.6%	41.6%
5	2	14.85	22.2	63.6%	52.6%
Print 1:2					
Sets	Min.	Sec.	PPM	Efficiency	Overall Efficiency
1	0	49.38	12.2	34.7%	34.7%
5	2	23.35	20.9	59.8%	47.3%

Efficiency is tested using a 10-page document consisting of six black pages and four pages containing a mix of black and colour, with the unit in auto-colour mode (in which the unit detects whether the original is black or colour and outputs in the correct mode). In print mode, the document is printed using the Postscript driver at 600-dpi resolution.

Overall Efficiency



BLI obtains the overall efficiency for each copy/print mode by averaging the efficiency ratings (derived by dividing the tested speed of the device by the rated speed, and then multiplying by 100) for each run length (1,5 and 10 sets in copy mode and 1 and 5 sets in print mode).

■ Colour
■ Monochrome

BLACK COPY/PRINT EFFICIENCY FOR MULTIPLE SETS

Copy 1:1					
Sets	Min.	Sec.	PPM	Efficiency	Overall Efficiency
1	0	25.59	23.4	52.1%	52.1%
5	1	19.12	37.9	84.3%	68.2%
10	2	25.94	41.1	91.4%	75.9%
Copy 1:2					
Sets	Min.	Sec.	PPM	Efficiency	Overall Efficiency
1	0	30.14	19.9	44.2%	44.2%
5	1	23.29	36.0	80.0%	62.1%
10	2	28.2	40.5	90.0%	71.4%
Copy 2:2					
Sets	Min.	Sec.	PPM	Efficiency	Overall Efficiency
1	0	40.47	29.7	65.9%	65.9%
5	2	26.87	40.9	90.8%	78.3%
10	5	36.97	35.6	79.1%	78.6%
Print 1:1					
Sets	Min.	Sec.	PPM	Efficiency	Overall Efficiency
1	0	26.56	22.6	50.2%	50.2%
5	1	24.82	35.4	78.6%	64.4%
Print 1:2					
Sets	Min.	Sec.	PPM	Efficiency	Overall Efficiency
1	0	29.56	20.3	45.1%	45.1%
5	1	28.12	34.0	75.7%	60.4%

Efficiency is tested using a 10-page document with the unit in black mode. In print mode, the document is printed using the PostScript driver at 600-dpi resolution.



SCAN FUNCTIONS

Scan speed (300-dpi, PDF):

1:1 mode: 46.69 originals per minute

2:2 mode: 27.52 originals, or 55.04 images, per minute

Scan file size

	Mode	Low compression	G3 MR/Medium	G4 MMR
Single-page file	B&W	1 MB	143 KB	60 KB
Multi-page file	B&W	13 MB	1 MB	793 KB
Multi-page file	Colour	15.1 MB	11 MB	5.1 MB
Single page file	Colour	4.1 MB	3.2 MB	885 KB

Note the default mode for transmission is G4 MMR, which offers the most compression.



PRINT DRIVERS

SHARP MX-4501N PRINT DRIVER FEATURES

	Windows XP PCL 5c	Windows XP PCL 6	Windows XP PostScript
Auto Feature/Device Detection	Yes*	Yes*	Yes*
Booklet Printing	Yes	Yes	Yes
Collate Sets	Yes**	Yes**	Yes**
Consumable gauge	No	No	No
Delayed print	No	No	No
Max paper sources per job	6	6	6
N-up Printing	2 to 16	2 to 16	2 to 16
Overlay	Yes	Yes	Yes
Paper Gauge	Yes	Yes	Yes
Print and Hold	Yes	Yes	Yes
Proof Print	Yes	Yes	Yes
Quantity Selection	Up to 999	Up to 999	Up to 999
Reduction/Enlargement	25% to 400%	25% to 400%	25% to 400%
Resolution Modes	600 dpi 300 dpi	600 dpi 300 dpi	Very High Quality High Quality Medium Quality Draft
Save Settings	Yes	Yes	Yes
Secure Printing	Yes	Yes	Yes
Watermarks/Custom Watermarks	Yes/Yes	Yes/Yes	Yes/Yes

* The system detects configured accessories, but the administrator must confirm each.

** There is a selection in the driver, but users must select Collate from the print screen within an application.



TONER YIELD

TESTED TONER YIELD/COST PER PAGE (5% COVERAGE PER Colour)

Colour 5%	Net Weight (Grams)	Toner Yield (Impressions) ¹	Impressions Per Gram	Toner Cost Per Page ¹	Total Toner Cost Per Page	Supplies Cost Per Page ²
Black	839.2	30,925	36.85	*	*	*
Cyan	336.5	17,324	51.48	*		
Magenta	341.7	16,479	48.22	*		
Yellow	347.0	17,987	51.83	*		

¹ Testing was conducted using BLI's colour toner yield test original with 5% page coverage per colour.

² Toner and supplies cost per page could not be calculated, as pricing is set by dealers and was not provided by Sharp.

TESTED TONER YIELD/COST PER PAGE (10% COVERAGE PER Colour)

Colour 10%	Net Weight (Grams)	Toner Yield (Impressions) ¹	Impressions Per Gram	Toner Cost Per Page ¹	Total Toner Cost Per Page	Supplies Cost Per Page ²
Black	775.3	15,396	19.85	*	*	*
Cyan	346.3	12,584	36.33	*		
Magenta	333.5	11,005	32.99	*		
Yellow	341.5	12,718	37.24	*		

¹ Testing was conducted using BLI's colour toner yield test original with 10% page coverage per colour.

² Supplies cost per page could not be calculated, as pricing is set by dealers and was not provided by Sharp.

TESTED TONER YIELD/COST PER PAGE (6% BLACK COVERAGE)

Colour 6%	Net Weight (Grams)	Toner Yield (Impressions) ¹	Impressions Per Gram	Toner Cost Per Page ¹	Total Toner Cost Per Page	Supplies Cost Per Page ²
Black	846.4	25,671	30.32	*	*	*

¹ Tested using BLI's 6% toner yield test original.

² Supplies cost per page could not be calculated, as supplies pricing is established by dealers and was not provided by Sharp.

CERTIFICATE OF RELIABILITY

AWARDED TO
SHARP CORPORATION

For the performance of the
Sharp MX-4501N
throughout BLI's in-house durability test.

This is to certify that when subjected to a 150,000-impression
Buyers Lab durability test in a networked environment,
the Sharp MX-4501N proved to be a highly reliable product.


ANTHONY F. POLIFRONE
MANAGING DIRECTOR



October 2006
DATE

THE LEADING INDEPENDENT OFFICE PRODUCTS TEST LAB AND BUSINESS CONSUMER ADVOCATE
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