CBN Eagle Travel Document User Guide

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Notices:

GNU General Public License

The EAGLE Reader incorporates software that is subject to the GNU General Public License.

Version 2, June 1991

For further information see http://www.gnu.org/copyleft/gpl.html.

FCC Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the installer for help.

Caution

Changes or modifications to this device that are not expressly approved by Canadian Bank Note Company Limited could void the user's authority to operate the equipment.

Revision Control Page

Rev. Number	***Reason for Revision***	***Date of Issue***	***Authorisation***
1.1	Initial Release	December 2003	ID Systems Marketing
2.0	USB 2.0 Release (applicable with firmware version Eagle2.0 and up)	October 2004	ID Systems Marketing
2.1	Update to include Dual-RF and USB-only options.	November 2005	ID Systems Marketing
2.2	Use EAGLE Reader instead of CM2500	December 2005	ID Systems Marketing
2.3	Update to include FCC declarations	December 2005	ID Systems Marketing

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1 Introduction

The EAGLE Travel Document Reader[1] captures machine-readable data from ICAO compliant passports, visas and identification cards. The EAGLE Reader has an advanced neural network, which is designed to efficiently capture OCR-B data from travel documents with unparalleled accuracy. This data is then used to query databases or generate manifests.

Each EAGLE Reader includes a range of advanced features, including full-page CMOS imaging from the travel documents, using the reader's five light sources (red, green, blue, infrared and ultraviolet). The CMOS technology offers high-resolution bitmap or jpeg images, which are ideal where detailed examination of the document is required. The EAGLE Reader has the ability to read dense PDF417 barcodes, as well as one-dimensional barcodes.

The unit comes with a variety of communication options including serial, TCP-IP Ethernet, USB2.0, and parallel ports. As of 2005, the EAGLE Reader is available in two interface variants; one with all the interfaces described above fitted, and one with only USB2.0 fitted. The EAGLE Reader can operate with Windows operating software, or within traditional mainframe environments. Designed with a robust, non-mechanical imaging system, the EAGLE Reader is engineered to operate continuously at airports, land crossings, and seaports.

Also as of 2005, the EAGLE Reader provides an option to read ICAO-compliant e-Passports, using a dual-antenna RFID interface incorporated into the top glass and front surfaces. This interface is ISO-14443 and ISO-7816 compliant.

This User Manual will cover the basic installation and operation of the device. Please refer the Software Developer Kit (SDK), should additional technical information be required.

The fully-optioned EAGLE Reader comes with the following capabilities:

Optical Spectrum

Visible Spectrum Scanning:
Documents can be scanned in full color or any combination of the red-blue-green color planes[2].

Infrared Scanning:
Documents can be scanned in the B-900 infrared spectrum, which is required to meet the ICAO 9303 standard, and to highlight any infrared features.

[1] This manual can be used for all CM25XX and CM26XX models.
[2] Adjustments to the monitor brightness and/or contrast may be required for improved viewing of the color images.

Ultraviolet Scanning:
Documents can be scanned in the ultraviolet spectrum to highlight any ultraviolet features that fluoresce at 365nm.

Hardware

Resolution:
The EAGLE Reader offers high resolution imaging under each of the light sources.

Power:
The EAGLE Reader consumes minimal energy by using a high-efficiency power supply. The EAGLE Reader uses an external 100-240 volt, 50-60 Hz switching power supply, with removable input cable.

Serial Port Communication:
Communication can take place over one of the two serial ports on the EAGLE Reader. Furthermore, any available serial port(s) can be connected to peripherals such as a fingerprint reader, live digital camera, etc.

Parallel Port Communication[3]:
The EAGLE Reader supports high-speed data transfer over the parallel port connection.

Ethernet Port Communication:
The EAGLE Reader can communicate over an ethernet connection.

USB Hub and USB2.0 Communication:
The EAGLE Reader contains an internal USB hub allowing two USB peripherals such as USB mouse or barcode scanner to connect to the host PC. Also, the EAGLE Reader can communicate with the host PC over USB2.0 connection.

Dual-antenna ePassport RFID reader (Optional):
The EAGLE Reader with the optional RFID reader is designed to read ICAO-compliant ePassports per ISO-14443 (both types A and B) and ISO-7816 standards.

Features

Optical Character Recognition:

[3] The parallel port functionality is not presently implemented, but may be available in a future release.

The EAGLE Reader Optical Character Recognition (OCR) engine recognizes the OCR-B font found within the MRZ on passports, visas and cards. The fields for identified documents are automatically parsed, check-summed, and compared for valid country code.

1-D Barcode Reading:
The EAGLE Reader can capture 1-D barcode information

2-D Barcode Reading:
The EAGLE Reader can capture and de-compress 2-D barcode information.

MRZ Modes:
Upon reading an MRZ the EAGLE Reader outputs the MRZ text in the user-defined format to interoperate with downstream processing. Beyond reading the MRZ text, the EAGLE Reader can also read ICAO and Quality Assurance data as well as take a sub-image of the MRZ zone.

Multiple Sessions:
The EAGLE Reader supports multiple sessions. One primary and two secondary connections are supported at all times.

Full Page or Sub-Image:
The EAGLE Reader is capable of returning a full-page image or any sub-image within the full page in any resolution up to the maximum supported resolution. Examples of sub-imaging include the capture of the portrait area found on MRPs.

ICAO-compliant ePassport data:
The EAGLE Reader is capable of performing Basic Access Control, Passive Authentication, and the reading of all defined LDS structures per ISO-7816, using the RF interface defined by ISO-14443, types A and B.

2 Installation & Configuration

2.1 System Requirements

The EAGLE Reader access software and Software Development Kit (SDK) are designed for use with a PC-based system running Windows 98, 2000 or XP. It can also be used with mainframe applications. For custom software solutions, the EAGLE Reader with the optional serial interface fitted will work with any computer with a serial port.

Figure 1 Back of full connectivity option EAGLE Reader before installation

2.2 Installing the EAGLE Reader

Ensure that all connections are made while the host PC is shut down. The EAGLE Reader power connection must be made after all others. The full connectivity option EAGLE Reader can be set up three ways, whereas the USB-only variant may only utilize Option 3:

Option 1: Serial Connection

Step 1:

Attach the serial cable provided to the back of the EAGLE Reader as shown in "Figure 2 Attaching the serial cable".

Figure 2 Attaching the serial cable

Attach the other end of the serial cable to one of the serial communications ports on the PC.[4]

Step 2:

Before connecting the power adapter be sure to route the power adapter through the strain-relief feature shown in "Figure 3 Detail of strain-relief feature". Attach the power adapter to the EAGLE Reader as shown in "Figure 4 Attaching the power adapter". Attach the other end of the power adapter to the AC outlet.

[4] The software default for the EAGLE reader is COM1.

Figure 3 Detail of strain-relief feature

Figure 4 Attaching the power adapter

(Serial cable removed for clarity, <u>the power should be connected after all other connections</u>)

Ensure that the LEDs (green and red) on the EAGLE Reader turn on indicating power.

Option 2: Ethernet Connection

Step 1:

Attach the network cable provided with the EAGLE Reader to the back of the unit. Attach the other end of the network cable to the network Hub (Switch). If

connecting the EAGLE READER directly to a PC, a crossover cable (not supplied) is required.

Figure 5 Attaching the ethernet cable

Step 2:

See “Figure 3 Detail of strain-relief feature” for a close-up view of the power adapter strain-relief feature. Attach the power adapter as shown in “Figure 6 Attaching the power adapter”. Attach the other end of the power adapter to the AC outlet.

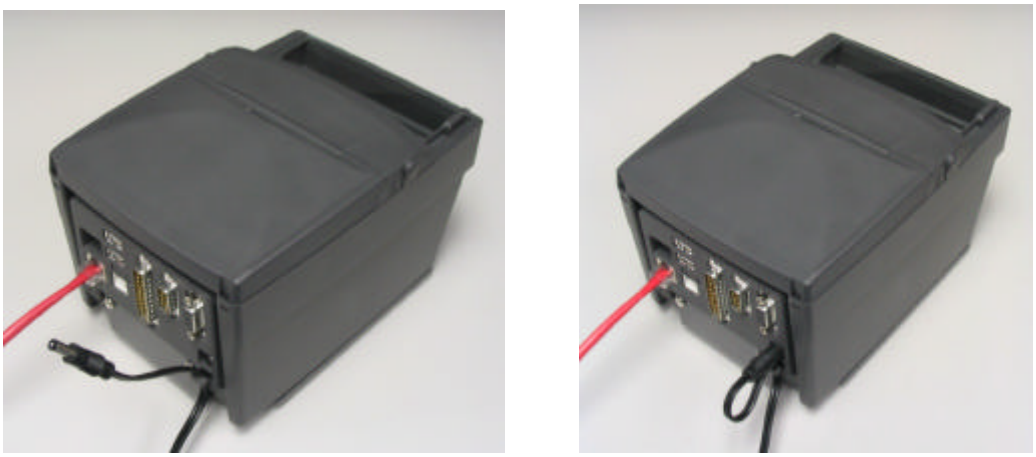

Figure 6 Attaching the power adapter

(<u>The power should be connected after all other connections</u>)

Ensure that the LEDs (green and red) on the EAGLE READER turn on indicating power. Note that even the EAGLE Reader is powered up, the

Ethernet connection could still take some time to establish depending on network configuration, when DHCP is selected

Option 3: USB2.0 Connection

Step 1:

Attach the USB2.0 cable provided to the back of the EAGLE READER as shown in “Figure 7 Attaching the USB2.0 cable”.

Figure 7 Attaching the USB2.0 cable

Attach the other end of the USB2.0 cable to one of the USB ports on the PC.

Step 2:

Before connecting the power adapter be sure to route the power adapter through the strain-relief feature shown in “Figure 8 Detail of strain-relief feature”. Attach the power adapter to the EAGLE Reader as shown in “Figure 9 Attaching the power adapter“. Attach the other end of the power adapter to the AC outlet.

Figure 8 Detail of strain-relief feature

Figure 9 Attaching the power adapter

(USB2.0 cable removed for clarity, <u>the power should be connected after all other connections</u>)

Ensure that the LEDs (green and red) on the EAGLE Reader turn on indicating power.

Step 3:

Once the unit is powered up with the USB connection, and if the USB driver for the reader has not been installed in the PC, Windows operating system will prompt for the driver location. Insert the setup CD to complete the installation. The supported Windows OS are 2000 and XP. Ensure that the PC supports high speed USB2.0 connection.

Additionally, other USB devices can be plugged into the B ports to get connected to the PC via the reader's hub.

2.3 Configuring the EAGLE Reader

You can configure the EAGLE Reader using any terminal emulation program, such as HyperTerminal.

2.3.1 Connecting to the EAGLE Reader

Serial Connection

If connecting through a serial port connection, the factory default values are as follows:

Port: COM1 (the female serial port on the back of the reader)
Baud Rate: 19200
Parity: None
Data Bits: 8
Stop Bits: 1
Flow Control: None

Ethernet Connection

If connecting to the EAGLE Reader through an ethernet connection, the factory default configuration uses static routing.

Host Address: 10.10.10.1 (just an example)

Port Number: 5002

Once a connection has been established, type **connect** followed by a carriage return and a CM2500 prompt will appear. The default configuration for the reader is “no local echo”. To see characters as they are typed you can turn local echo on in the terminal emulation program that is being used or you can turn echo on in the EAGLE Reader (see “2.3.3 Configuring the Serial Connection” for details).

USB Connection

If connecting to the EAGLE Reader through an USB connection, the EAGLE Reader device is identified using the device’s MAC address. The MAC address label is placed on the bottom of the reader.

2.3.2 The Help Command

Type **help** or **?** to display a list of available commands. Type **help** or **?** followed by the command of interest to see its specification. Some basic commands for configuring the EAGLE Reader follow (for a more detailed

listing and specifications for each command refer to the *Command Protocol Specification* document).

2.3.3 Configuring the Serial Connection

Command:

serial <port> [-e { on | off }] [-b <baud rate> [-p { n | e | o } { 8 | 7) { 1 | 2 }]]

Sets CM2500 serial port parameters. The reader must be rebooted for the new settings to take effect.

<port>	: Specifies the serial port for which to set the parameters (eg. 1 or 2).
-b <baud rate>	: Sets the baud rate. Valid baud rates are 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600.
-p	: Sets the communication parameters of the serial port
{ n | e | o }	: Sets parity. n = no, e = even, o = odd.
{ 8 | 7 }	: Sets data bits.
{ 1 | 2 }	: Sets stop bits.
-e { on | off }	: Turn echo on or off.

Note: The CM2500 must be reset before changes to the serial port settings take effect.

2.3.4 Configuring the Ethernet Connection

Command:

ethernet [-d | -t] [-i <ip address>] [-p <port number>]
[-g <default gateway>] [-s <subnet mask>]

Displays and sets the parameters for the ethernet port.

-d	: Use DHCP (Ignores all other flags but '-p')
-t	: Use Static IP Addresses
-i <ip address>	: Set ip address, must be in dotted-decimal format (eg. 10.10.10.1)
-p <port number>	: Set the port number of the reader
-g <default gateway>	: Set gateway, must be in dotted-decimal format (eg. 10.10.10.1)
-s <subnet mask>	: Set the subnet mask, must be in dotted-decimal format (eg. 10.10.10.1)

Note: The EAGLE Reader must be reset before changes to the ethernet settings take effect.

3 How to Read Documents

The document window is used primarily for scanning passports and visas. A document (MRP, MRV) is slid into the reader so that it is positioned as far back and as far to the left as possible, see “Figure 10 Placement of document on the EAGLE R”. The reader will automatically begin reading the document.

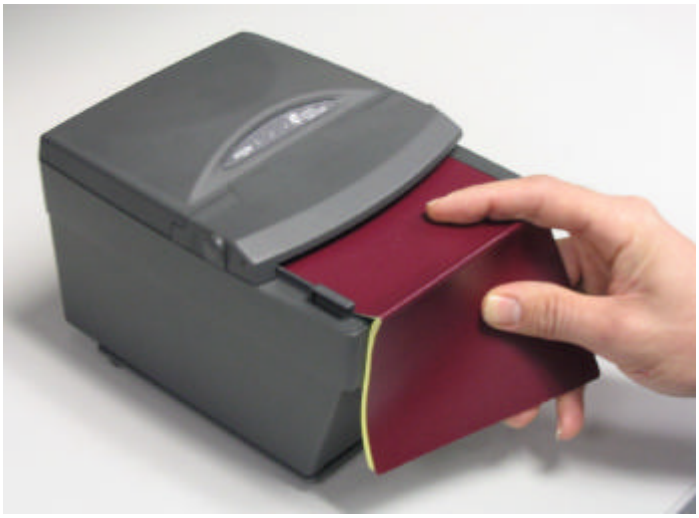

Figure 10 Placement of document on the EAGLE Reader

ID-card sized documents are inserted into the reader, by sliding the card to the back of the reading window as shown in “Figure 11 ID card placement”. The card does not need to be right or left aligned

Figure 11 ID card placement

4 LED Interpretation

The EAGLE Reader has three LEDs located above the document window. LED 1, LED 2, and LED 3 refer to the left, middle, and right LED respectively (see "Figure 12 LED locations")

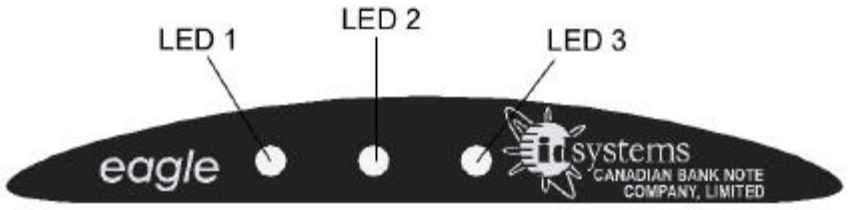

Figure 12 LED locations

4.1 LED States

For a description of the static states of the EAGLE Reader LEDs, see "Table 1: EAGLE Reader LED States".

Table 1: EAGLE Reader LED States

LED 1	LED 2	LED 3	Description
Power	*Status*	*Result*	
Red	Off	Green	EAGLE Reader is ready for document processing.
Red	Yellow	Yellow	Processing document.
Red	Off	Green	Document processed – OK
Red	Off	Red	Document Processed - Fail[5]
Red	Off	Off	EAGLE Reader is resetting.

4.2 LED Sequences

The various dynamic states of the EAGLE Reader LEDs are explained here. Each row in the tables represents a sub-sequence in the overall sequence. Each number in a row represents a step in that row's sub-sequence.

The following example indicates that LED 1 turned on for a short time and was followed by LED 3 turning on for a short time.

LED 1	LED 2	LED 3

[5] Failed does not necessarily indicate a defective/invalid document. It can be an indication of an error reading the document such as the canopy not being closed within 3 seconds of the document's insertion.

1		2

The following example indicates that LED 1, LED 2, and LED 3 simultaneously turned on for a short time.

LED 1	LED 2	LED 3
1	1	1

Power Up Sequence:

LED 1	LED 2	LED 3
1		2
5	4	3
6	6	6
7		8
11	10	9
12	12	12
13		14

*Note that steps 8 through 13 may cycle more than once before step 14 is reached (i.e. EAGLE Reader is ready to process documents).

Reset Sequence:

LED 1	LED 2	LED 3
1		
4	3	2
5	5	5
6		7

*Note: Steps 1 to 6 may cycle more than once before step 7 is reached (i.e. EAGLE Reader is ready to process documents). When the EAGLE Reader is reset using a terminal emulation program, step one of the reset sequence will occur once the command is entered, a short time will pass then rest of the sequence will follow. When resetting the EAGLE Reader using the EagleEye Demo software, the EAGLE Reader will remain in its current state for a short time before the reset sequence begins.

Download Sequence:

While downloading a new version of firmware the EAGLE Reader LEDs will repeat the following sequence.

LED 1	LED 2	LED 3
1	2	3

When the data transfer is complete, the LED that happens to be lit will remain lit during data decompression. The whole downloading process should take 10 to 20 seconds and is followed by a reset sequence (see above).

Error Sequences:

When the EAGLE Reader encounters an error, all 3 LEDs cycle on and off. The number of times that the LEDs flash on and off conveys the type of error condition. Please count the number of consecutive flashes and contact your service representative.

5 Cleaning

5.1 General Cleaning

The EAGLE Reader is sensitive and requires special care when being cleaned. A damp cloth can be used to wipe away any dust that may have collected on the body of the EAGLE Reader.

Warning: No cleaning fluids should be used to clean the EAGLE Reader.

5.2 Document Window cleaning

Step 1:

Gently slide the cover forward on the document window as shown in “Figure 13 Sliding the cover forward”.

Figure 13 Sliding the cover forward

Step 2:

Gently lift the cover until the document window is exposed as shown in “Figure 14 Lifting the cover”. DO NOT force the cover more than 90° from it’s starting position.

Figure 14 Lifting the cover

Step 3:

The lens cloth provided should be used to clean the document window. Gently wipe any dust or fingerprints that might interfere with document scanning.

Step 4:

Gently rotate the cover back onto the glass and push it back towards the LEDs as shown in “Figure 15 Pushing the cover back”. If the cover does not fit “flush” with the unit, gently slide it forward and retry sliding it back into place.

Figure 15 Pushing the cover back

6 Troubleshooting

6.1 Resetting the Reader

To manually reset the EAGLE Reader, unplug the power connector from the back of the unit. Wait 5 seconds and then plug the A/C adapter back into the EAGLE Reader.

6.2 Poor scan results

If you notice a consistent number of bad read errors, it is recommended that you clean your reader. Please refer to “5 Cleaning” for instructions on how to clean the various components of your EAGLE Reader.

6.3 Flashing LED lights

If any LEDs flash on your reader, count the number of consecutive flashes and contact your technical support representative. After recording the number of flashes, reset the reader.

6.4 No Power to EAGLE Reader

If there is no power on the EAGLE REeader:

- Verify that the power supply is properly plugged in and the green light on the power supply is on.
- If the green light on the power supply is not on, contact your CBN representative to acquire a new power supply.

6.5 EAGLE Reader is Non-Responsive

If the power light is on, but the yellow status LED stays on for several minutes, then it is necessary to reset the EAGLE Reader.

6.6 No Communication

If the LEDs report that the EAGLE Reader is ready but there is no communication between the EAGLE Reader and the software on the PC, verify the cables are properly connected. Refer to *“2 Installation & Configuration*” for details on connecting the cables to the EAGLE Reader.

For ethernet communication, verify that the proper IP address is obtained. Use the Ping command to ping the reader’s IP address to verify communication is established.

6.7 High Speed USB2.0 Connection

To verify if the PC supports high speed USB2.0 connection, go to Device Manager, Universal Serial Bus Controllers to check if there is an Enhanced Host Controller. USB1.1 connection only requires Universal (or Open) Host Controller.

6.8 Corrupt Application

The following is the procedure of recovering a EAGLE Reader with a corrupt application.

The application on the EAGLE Reader can be corrupted if the reader loses power for any reason during decompression including being unplugged. The reader will not boot if the application is corrupt. E.g. lights won't flash, no sound on start-up.

Please contact your CBN representative for the recovery procedures.

7 Further Information

For further assistance please contact CBN at:

Customer Service: 613-722-6607
Website: www.cbnco.com
Email: id.support@cbnco.com