IBM

User's Guide for Models 2CR and 2NR

User's Guide for Models 2CR and 2NR

June 2010

This edition applies to IBM SureMark Printer Models 2CR and 2NR and to all subsequent releases and modifications until otherwise indicated in new editions.

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About this guide

This guide contain information about installing, using, and maintaining the IBM® SureMark™ Models 2CR and 2NR printers.

Who should read this guide

This guide is intended for personnel who are installing and using the IBM SureMark Models 2CR and 2NR printers.

How this guide is organized

This guide is organized as follows:

- Chapter 1, "Introducing the 4610 Models 2CR and 2NR," on page 1 provides an overview of the 4610 Models 2CR and 2NR.
- Chapter 2, "Installing the 4610 Models 2CR and 2NR," on page 11 includes procedures on setting up and installing the product.
- Chapter 5, "Replacing printer components," on page 43 includes procedures on replacing printer parts
- Chapter 3, "Using and maintaining the 4610," on page 15 contains information on maintaining the 4610, such as cleaning the unit and replenishing paper rolls and ribbon.
- Chapter 4, "Running tests and diagnostics," on page 31 provides information on using the utility disks and running diagnostics procedures.
- Chapter 5, "Replacing printer components," on page 43 provides information on replacing defective printer parts
- Appendix A, "Product specifications," on page 53 contains technical information about the IBM 4610 Models 2CR and 2NR, such as physical dimensions and station characteristics.

Related publications

The following IBM publications and service diskettes provide additional information on using your IBM SureMark 4610 Models 2CR and 2NR printer. You can download this information from the IBM Retail Store Solutions Web site at www.ibm.com/solutions/retail/store/support.

- *IBM SureMark Printers: Hardware Service Guide for Models 2CR and 2NR*, GA27-5004
- *IBM SureMark Printers: Programming Guide for Models 2CR and 2NR*, GA27-5005
- *IBM SureMark Printers: Fonts and Logos Utility Diskette*
- *IBM SureMark Printers: Firmware Update Diskettes*
- *IBM 4693 Point-of-Sale Terminals Reference Diskette*
- *IBM 4694/4695 Point-of-Sale Terminals Service Diskette*
- *IBM Safety Information—Read This First*, GA27-4004.
- *IBM SurePOS 700 Series: System Reference*, SA27-4220.
- *IBM SurePOS 500 Series: System Reference*, SA27-4255.
- *POSS Programming Reference and User's Guide*, SC30-3560

Publications accessibility

The softcopy version of this guide and other related publications are accessibility enabled.

Notices and statements used in this book

The following notices and statements are used in the documentation:

- **Notes:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate potential damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.
- **Caution:** These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.
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Summary of changes

This section documents the updates for each revision of this guide.

October 2011

This edition of the IBM SureMark Printer Models 2CR and 2NR User's Guide (GA27-5003-01) highlights table changes for operating system requirements.

June 2010

This edition of the IBM SureMark Printer Models 2CR and 2NR User's Guide (GA27-5003-01) includes the following updates:

- Revised description of the features for each 4610 model.
- New section on light path LEDs.
- Expanded the section on paper types.
- New chapter on replacing customer replaceable units (CRU).
- New section on inserting documents from the side of the printer.
- Revised diagrams for clarification: Figures 21, 22, 23, 28, and 31.
- New section on how to calibrate the low paper sensor.
- Enhanced offline test menu descriptions.
- Included additional troubleshooting scenarios.
- Revised or new part numbers.

Chapter 1. Introducing the 4610 Models 2CR and 2NR

The IBM SureMark Models 2CR and 2NR printers are dual station, point-of sale (POS) printers. The IBM SureMark 4610 is available in two models:

- Model 2CR - provides thermal station and impact station printing for your cash register receipts, check processing, bar codes, and documents.
- Model 2NR - provides thermal station and impact station printing for your cash register receipts and bar codes.

With a print speed of 80 lines per second (LPS) and a 4 inch paper roll diameter, this high-speed printer lets you quickly print long receipts, monitor paper status and gather printer usage statistics.
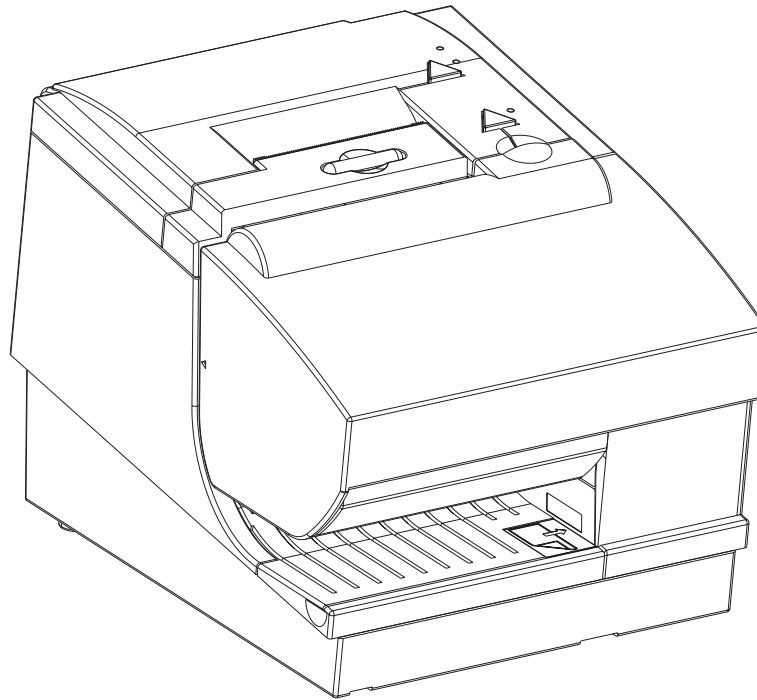
Figure 1. IBM SureMark 4610 printer

Features and specifications

The key features of the Models 2CR and 2NR include:
- Print speeds of 80 lines per second (LPS).
- One-hand paper loading with the touch of a button.
- System management sensors that alert you to:

    – Close the cover on the printer.

    – Replace the receipt paper.

    – Clear a paper jam.

    – Status of the printhead.

    – Printer usage statistics.
- Efficient replacement of receipt paper and ribbon cartridge, including larger paper rolls to accommodate printing more receipts.
- Three mega-bytes of memory to store messages, logos, codes pages, and electronic journal data.

Introducing 4610 Models 2CR and 2NR

- Magnetic ink character resolution (MICR) enables electronic check conversion (Model 2CR only).
- Downloadable codes and fonts for thermal (24x24 matrix) and impact (9x16 or 16 matrix) printing.

Table 1 summarizes the specifications of the Models 2CR and 2NR printers.

Table 1. Printer specifications

Features	2CR	2NR
Cash receipt/document insert	Thermal/Impact	
Print speed	80 lps thermal, 4.7 lps narrow format, 4.1 lps wide format for impact (8 lpi)	
Usage data	Yes	
User defined fonts - including proportional fonts	Yes	
Scalable fonts up to 8X	Yes	
Journal station	No	
Single pass MICR, check franking, flipping, printing	Yes	No
MICR reading	Yes	No
Check insert station	Yes	Yes
Document insert station	Yes	Yes
Document insert print width	83.0 mm	
Document insert form width	58 mm minimum	
Document flipper form width	102 mm maximum 80 mm minimum	N/A
Document flipper form length	223 mm maximum 65 mm minimum	N/A
Multipart form	Yes	
Barcode printing	Yes	
Receipt paper loading	Drop and load	
Receipt paper cutter	Standard	
Receipt tear bar	Standard	
Receipt paper width	80 mm	
Print fonts (CPI)	12, 15, 17, 20	
Rotate print (line by line)	Yes	
DBCS thermal font - 24x24 matrix	Yes	
DBCS impact font - 9x16 or 16x16 matrix	Yes	

Communication and power

An interface card is shipped with the 4610 SureMark printers to provide communication to the system unit. Depending on your connectivity requirements, you will have an USB, RS-485, or RS-232 interface card. Table 2 on page 3 includes a description of each interface cards and its respective power supply.

Table 2. Communication interface, rate and power source

Device	Description	Power
USB	USB is 2.0 Compliant Full Speed HID; Bulk transfers at 12 Mbps (Mega bits per second)	System unit input voltage (+24 V); separate power supply if standard USB connector is used
RS-485	IBM proprietary	System unit input voltage +38 V or +24 V (Japan only)
RS-232	9.6K - 115.2K (selectable using offline or online configuration) Baud rate	Separate power supply

Figure 2 shows the different communications connections on the USB interface card.
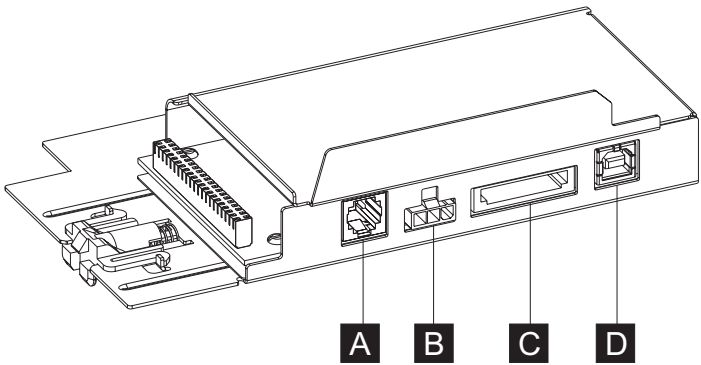
Figure 2. USB interface card.

A	Cash drawer
B	Power supply
C	Powered USB
D	Standard USB

Figure 3 on page 4 illustrates the communications connections on the RS-485 interface card.
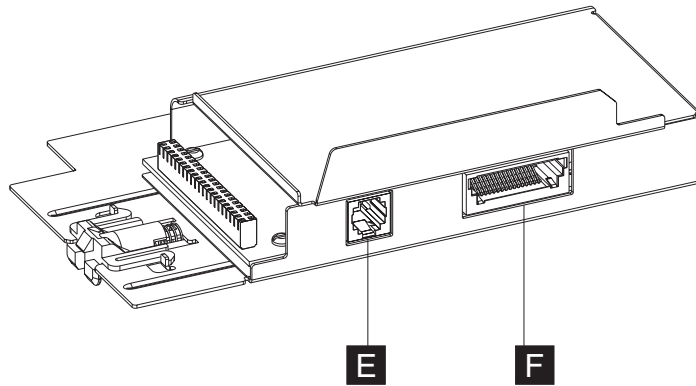
Figure 3. RS-485 interface card.

E   Cash drawer

F   RS-485

Figure 4 illustrates the communications connections on the RS-232 interface card.
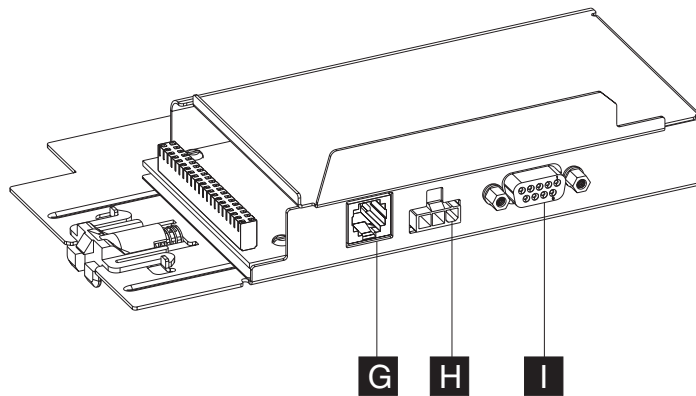
Figure 4. RS-232 interface card.

G   Cash drawer

H   Power supply

I   RS-232

Locating the power button

The power button (**P** in Figure 5) of the Models 2CR and 2NR is located under the paper door. A removable cover is included over the power button.
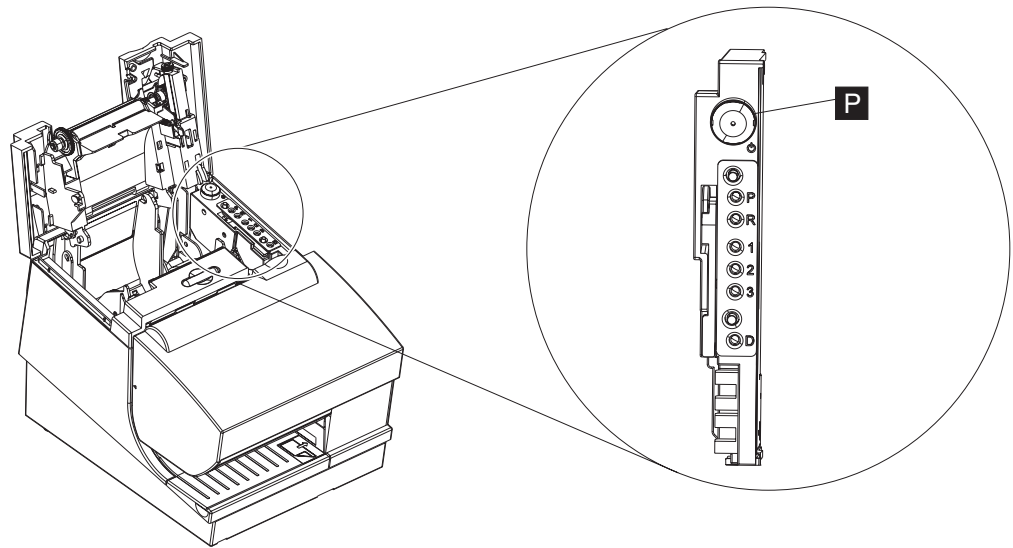
Figure 5. Power button

Operating system requirements

You can download drivers from the Retail Store Solutions Web site: www.ibm.com/solutions/retail/store/support.

A compatibility mode is provided in the printers to enable use of existing drivers and applications with only minor modifications. For native mode support, see the following tables:

RS-232 Printer

Table 3 includes a description of native mode support for the RS-232 Printer.

Table 3. Native Mode Support - RS-232 Printer

Operating System	JavaPOS Drivers 1.9.6 or later	OPOS Drivers 1.9.6 or later	POS Subsystem 1.9.6 or later	Windows Native Drivers (NWD)	Direct IO	Comments
IBM 4690					Yes	V5R2 and V6R2*
Windows XP	Yes	Yes		Yes	Yes	
Microsoft Windows Embedded for Point of Service (WEPOS) 1.11	Yes	Yes		Yes	Yes	
Microsoft Windows Embedded POSReady 2009	Yes	Yes		Yes	Yes	

Introducing 4610 Models 2CR and 2NR

Table 3. Native Mode Support - RS-232 Printer (continued)

Operating System	JavaPOS Drivers 1.9.6 or later	OPOS Drivers 1.9.6 or later	POS Subsystem 1.9.6 or later	Windows Native Drivers (NWD)	Direct IO	Comments
Microsoft Windows 7 (Professional/ Ultimate)	Yes	Yes		Yes	Yes	
IBM Retail Environment for SUSE Linux (IRES)	Yes				Yes	
Novell Linux Point of Service (NLPOS)	Yes				Yes	
SUSE Linux Enterprise Desktop (SLED) 11	Yes				Yes	
SUSE Linux Enterprise Server (SLES) 11	Yes				Yes	
SUSE Linux Enterprise Point of Service (SLEPOS) 11	Yes				Yes	
PC DOS 2000					Yes	

Note: *The 2NR/2CR printers are supported in compatibility mode in V5R2 but 4690 OS can only update the firmware starting with the 0820 maintenance package. The 1NR is supported in compatibility mode in V5R2 but requires package 0900 for firmware update. All of these models are supported in compatibility or native mode in V6R2.

RS-485 Printer

Table 4 includes a description of native mode support for the RS-485 Printer.

Table 4. Native Mode Support - RS-485 Printer

Operating System	JavaPOS Drivers 1.9.6 or later	OPOS Drivers 1.9.6 or later	POS Subsystem 1.9.6 or later	Windows Native Drivers (NWD)	Direct IO	Comments
IBM 4690						V5R2 and V6R2*
Windows XP	Yes	Yes				
Microsoft Windows Embedded for Point of Service (WEPOS) 1.11	Yes	Yes				

Table 4. Native Mode Support - RS-485 Printer (continued)

Operating System	JavaPOS Drivers 1.9.6 or later	OPOS Drivers 1.9.6 or later	POS Subsystem 1.9.6 or later	Windows Native Drivers (NWD)	Direct IO	Comments
Microsoft Windows Embedded POSReady 2009	Yes	Yes				
Microsoft Windows 7 (Professional/Ultimate)	Yes	Yes				
IBM Retail Environment for SUSE Linux (IRES)	Yes		Yes			
Novell Linux Point of Service (NLPOS)	Yes		Yes			
SUSE Linux Enterprise Desktop (SLED) 11	Yes		Yes			
SUSE Linux Enterprise Server (SLES) 11	Yes		Yes			
SUSE Linux Enterprise Point of Service (SLEPOS) 11	Yes		Yes			
PC DOS 2000						Not supported

Note: *The 2NR/2CR printers are supported in compatibility mode in V5R2 but 4690 OS can only update the firmware starting with the 0820 maintenance package. The 1NR is supported in compatibility mode in V5R2 but requires package 0900 for firmware update. All of these models are supported in compatibility or native mode in V6R2.

USB Printer

Table 5 includes a description of native mode support for the USB Printer.

Table 5. Native Mode Support - USB Printer

Operating System	JavaPOS Drivers 1.9.6 or later	OPOS Drivers 1.9.6 or later	POS Subsystem 1.9.6 or later	Windows Native Drivers (NWD)	Direct IO	Comments
IBM 4690						V5R2 and V6R2*
Windows XP	Yes	Yes		Yes		
Microsoft Windows Embedded for Point of Service (WEPOS) 1.11	Yes	Yes		Yes		
Microsoft Windows Embedded POSReady 2009	Yes	Yes		Yes		
Microsoft Windows 7 (Professional/Ultimate)	Yes	Yes		Yes		
IBM Retail Environment for SUSE Linux (IRES)	Yes		Yes			
Novell Linux Point of Service (NLPOS)	Yes		Yes			
SUSE Linux Enterprise Desktop (SLED) 11	Yes		Yes			
SUSE Linux Enterprise Server (SLES) 11	Yes		Yes			
SUSE Linux Enterprise Point of Service (SLEPOS) 11	Yes		Yes			
PC DOS 2000						Not supported

Note: *The 2NR/2CR printers are supported in compatibility mode in V5R2 but 4690 OS can only update the firmware starting with the 0820 maintenance package. The 1NR is supported in compatibility mode in V5R2 but requires package 0900 for firmware update. All of these models are supported in compatibility or native mode in V6R2.

Hardware requirements

SureMark printers work with the following systems:
- IBM 4694 systems
- IBM 4695 systems (RS-232 connection only and with power supply)
- PC or other store controller with an RS-232 or USB port
- SurePOS 100 Series systems
- SurePOS 700 Series systems
- SurePOS 500 Series systems
- SurePOS 300 Series systems
- IBM Self Checkout solution

Calling for service

When you call IBM for warranty information or service, be sure you have the serial number and model number of your printer available. The serial number and model number are located beside the flipper door (see **S** in Figure 6).
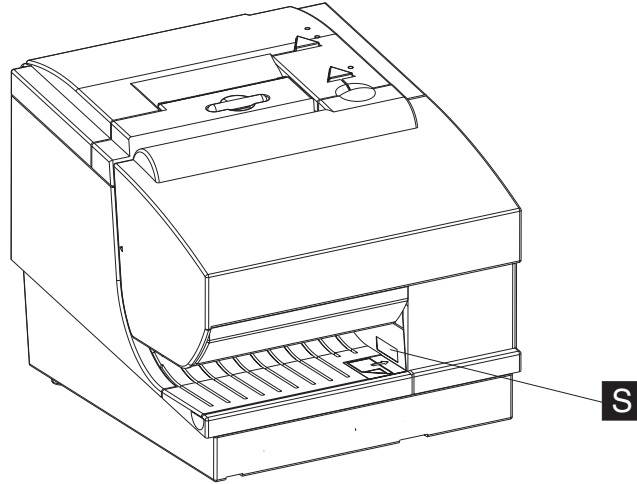
Figure 6. Location of serial number

Chapter 2. Installing the 4610 Models 2CR and 2NR

This section provides instructions to safely install the Models 2CR and 2NR printer, and includes the following topics:
- "Before you begin"
- "Understand your configuration"
- "Verify your order"
- "Identifying the controls and indicators" on page 37
- "Replacing the logic card" on page 43
- "Replacing the thermal printhead assembly" on page 46
- "Installing the fillers" on page 13.

Before you begin

Before you install your IBM SureMark printer, be sure to read this section and the *IBM Safety Information—Read This First*, GA27-4004.

Verify your order

Your order should contain the following components:
- 4610 printer
- Safety manual
- Ribbon
- Paper roll (specified by the customer)
- Customized printer options (packaged separately), including:
  - Interface card (a RS-232, RS-485, or USB)
  - Fillers
  - Cables
  - Power bricks

Understand your configuration

Your printer can be set up in an integrated or distributed configuration. An *integrated* configuration has all parts of a system assembled in one location. A *distributed* configuration is set up with the parts of the system in different physical locations. In an integrated configuration, you can install the printer on the input/output tray option (with the fillers that contains the printer and display) on top of the wide-footprint system units. Other tray options include mounting the printer on the full-size cash drawer or directly on the counter.

Installing the interface card

> **Note:** Plug all cables into the interface card before installation; however, **do not** plug in any power until after installation.

The interface card (either a RS232, RS485, or USB interface) is shipped in a separate box with your printer. To install the interface card, complete the following steps:
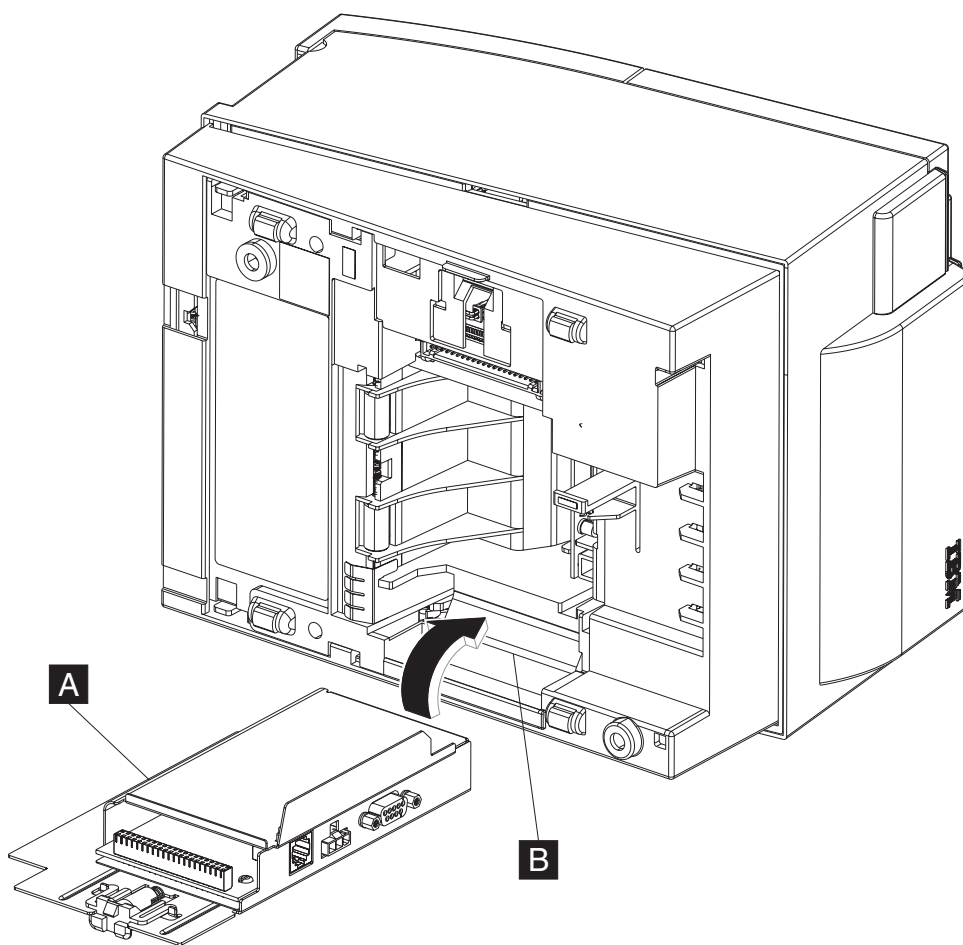
Figure 7. Installing the interface card

1. Place the printer unit on one side, as shown in Figure 7.
2. Align the bottom of the interface card (**A**) to the slot (**B**) on the base of the printer and press to secure the latch.
3. Connect the printer with your system unit (using the RS-232, RS-485, or USB connector).
4. If you have a power cord, connect it to the printer.

Installing the fillers

The fillers are an important part of your integrated system. They securely position your printer into position with the system unit and other peripherals.

Refer to the installation documentation for your system unit for complete instructions.

Chapter 3. Using and maintaining the 4610

This section contains information about the proper use and maintenance of the Models 2CR and 2NR. For detailed technical information, see Appendix A, "Product specifications," on page 53.

Note: All covers must be installed on the SureMark printers during operation.

Replenishing consumable supplies

You are responsible for replenishing consumable supplies, which include:

- Paper rolls
- Inserted forms
- Ribbon cartridges

Make sure that you are using the recommended supplies for the 4610, which are described in the following sections.

Loading and replacing the paper roll

The 4610 printers can accommodate a four inch printer roll. When your paper roll is running low, the paper supply LED indicator will blink continuously. Once the paper is out, the amber (orange) light of the paper supply LED indicator will remain lit until you replace the roll.

Note: See "Supported paper types" on page 17 to verify that you are using the correct paper for the 4610.

To properly install the paper roll, make sure you install the paper with the printing side facing out. The paper should not be attached to the core in any manner. To load a new paper roll, complete the following steps:.
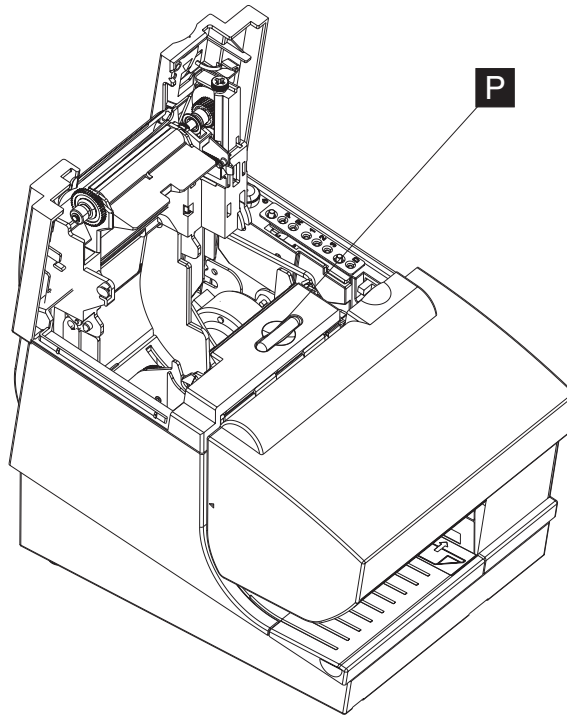
Figure 8. Opening the paper door

1. Press and release the blue release button (**P** in Figure 8) to release the paper door.

2. If necessary, remove any unused paper or empty paper roll cores from the paper roll bucket before inserting a new paper roll.

   Note: Refer to the label inside the rear wall of the printer for a diagram of how to load paper.
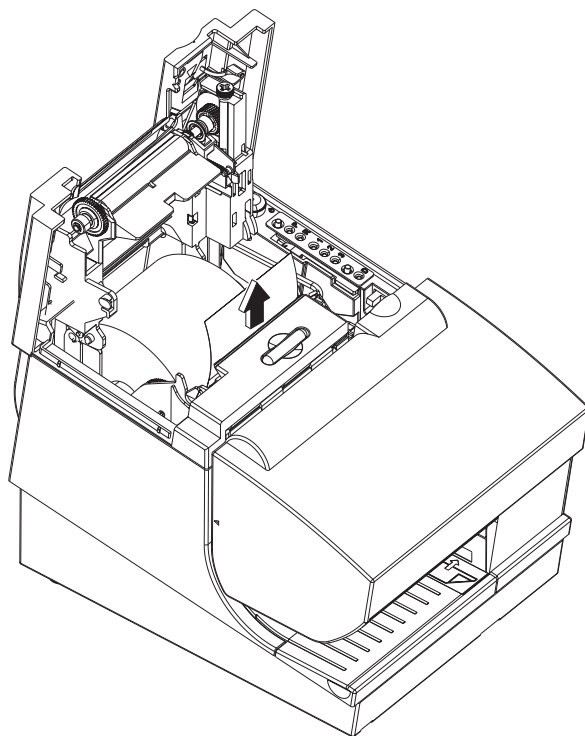
Figure 9. Paper roll placement

3. Place the paper roll into the paper roll bucket with the leading edge of the paper coming from the bottom of the roll, as shown in Figure 9.

    Note: The thermal printhead will not print on paper with glue on it. If the new paper roll was sealed by glue, tear off the 6 to 8 inches of paper with glue on it before loading it.

4. Close the paper cover.
5. Press the customer receipt feed button to advance the paper about 30 cm (about 1 ft.) to test for proper feeding and correct alignment.
6. Tear off excess paper.

Attention: Do not pull the receipt paper out of the printer with the paper access cover closed. This disengages the paper feed. The paper feed motor must then catch up before the printer can feed the paper, which causes missing lines or partial lines of print. Use the customer receipt feed button to advance the receipt and all lines will print.

Supported paper types

The type of paper required for the 4610 is dependent on the printer model. The Models 2CR and 2NR printers require paper that supports both thermal and impact printing.

Attention: Using an inferior grade of paper can affect the print quality, printhead life expectancy, and printer mechanisms.

Note: When selecting a paper, ensure that the paper's archive life meets the requirements of the tax authorities of your country for archiving tax-related data.

Thermal paper: The paper used in the thermal receipt station must meet the following requirements:

Width 79.5 ± 0.5 mm (3.13 ± 0.02 in.)

Outside Diameter

   102 mm (4.0 in.) maximum

Thickness

   57 µm (0.00225 in.) Range: 41 µm (0.0016 inches) minimum to 99 µm (0.0039) maximum

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Important

Paper has a significant manufacturing tolerance and nominal paper designations do not reflect actual measurements. The manufacturing tolerance must fall within the published operating thickness range. You should test paper in your specific configuration before using. If any spot measurement of the paper is outside the specified range, the paper does not meet the paper specification, which will result in an end-user error paper jam.

For supported papers, see the following Web site: http://www.ibm.com/support/docview.wss?rs=219&uid=pos1R1002033.

Important

Printer reliability and performance are directly related to the quality of the supplies you use. The published parameters for printer performance are established using supplies that meet the specifications listed above.

Thermal paper with watermarks, coupons, or advertisements printed on the front or back of the paper **is not covered by IBM specifications.** Some inks and printing processes will work acceptably, while others will not. Printer problems that are caused by supplies that do not meet IBM specifications may result in a billable service call, regardless of the existence of a service contract.

Impact printing (Model 2CR only): With thermal impact station printing, the Model 2CR can print up to three parts on a multi-part form. Table 6 list the specifications of supported single and multi-part forms.

- Test all forms in the printer to ensure acceptable performance prior to buying a significant quantity.
- No binding holes or other holes should be within 10 mm (0.4 in.) from the right edge of the form.
- Forms less than 0.15 mm (0.006 in.) thick with the grain of the paper perpendicular to the feed direction (short-grain paper) should not be used for landscape printing.

Table 6. Specifications of supported single and multi-part forms

Specification	Value
Minimum width:	50 mm (2 in.)
Maximum thickness of multi-part forms:	0.47 mm (0.0185 in.)

Table 6. Specifications of supported single and multi-part forms (continued)

Specification	Value
Maximum thickness of front sheet, multi-part forms:	0.08 mm (0.003 in.)
Minimum thickness of single-part form:	0.10 mm (0.004 in.)
Maximum thickness of single-part form:	0.2 mm (0.008 in.)
Weight range for single-part forms:	68–90 g/m^2 (18–24 #)
For best reliability, paper grain should be in the direction that the paper is fed into the printer.	

Supported documents that are flipped: The flipping of multi-part forms and short-grain single-part forms is not supported. Table 7 describes the supported flipping specifications.

Table 7. Supported flipping specifications

Specification	Value
Minimum form length:	80 mm (3.14 in.)
Maximum form length:	223 mm (8.78 in.)
Minimum form width:	65 mm (2.56 in.)
Maximum form width:	102 mm (4 in.)
Paper weight:	75–95 g/m^2

Loading large paper rolls

You can load extra large paper rolls (up to 15 in.) below the printer to reduce how often you need to replace the paper roll. Mounting hardware is necessary to avoid placing undue strain on the paper feed motor. See your IBM representative for additional information.

Replacing the ribbon

When the print quality is not clear, it might be necessary to replace the ribbon on your printer. To replace the ribbon:

1. Open the ribbon door. As the door is opened, the printhead moves to a position where you can easily load the ribbon.
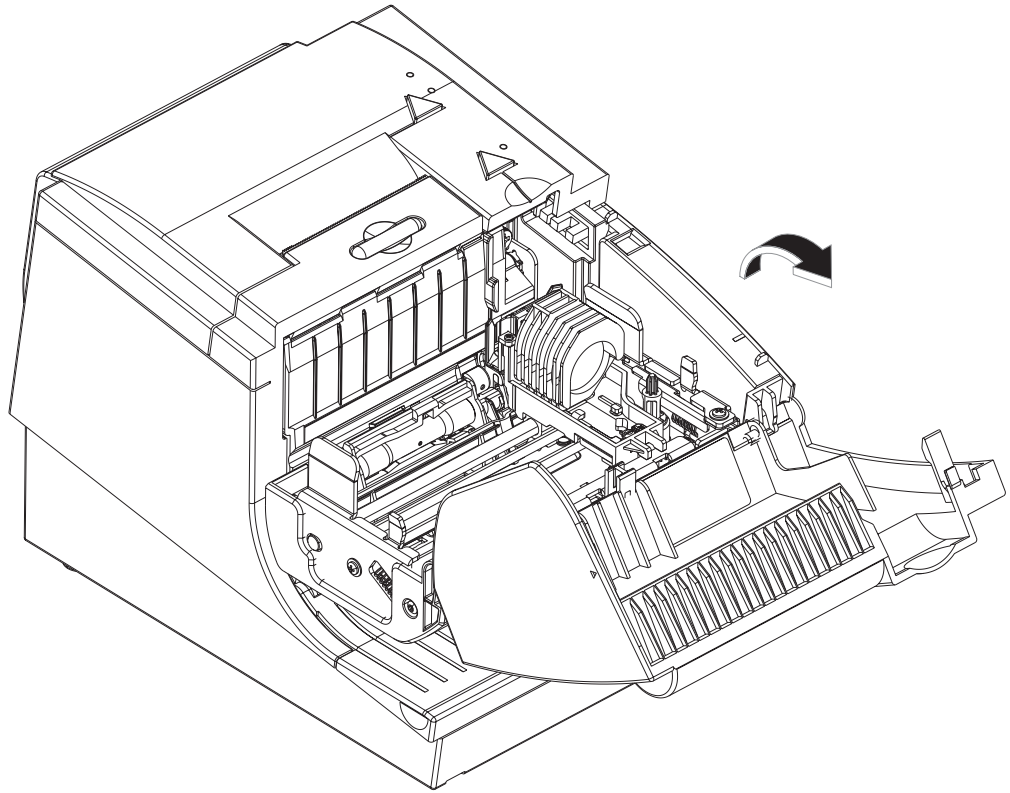
Figure 10. Opening the ribbon cover

2. If a ribbon cartridge is installed, remove it by lifting it straight up.

   Note: You might need to grasp the body of the cartridge rather than the top to remove it.
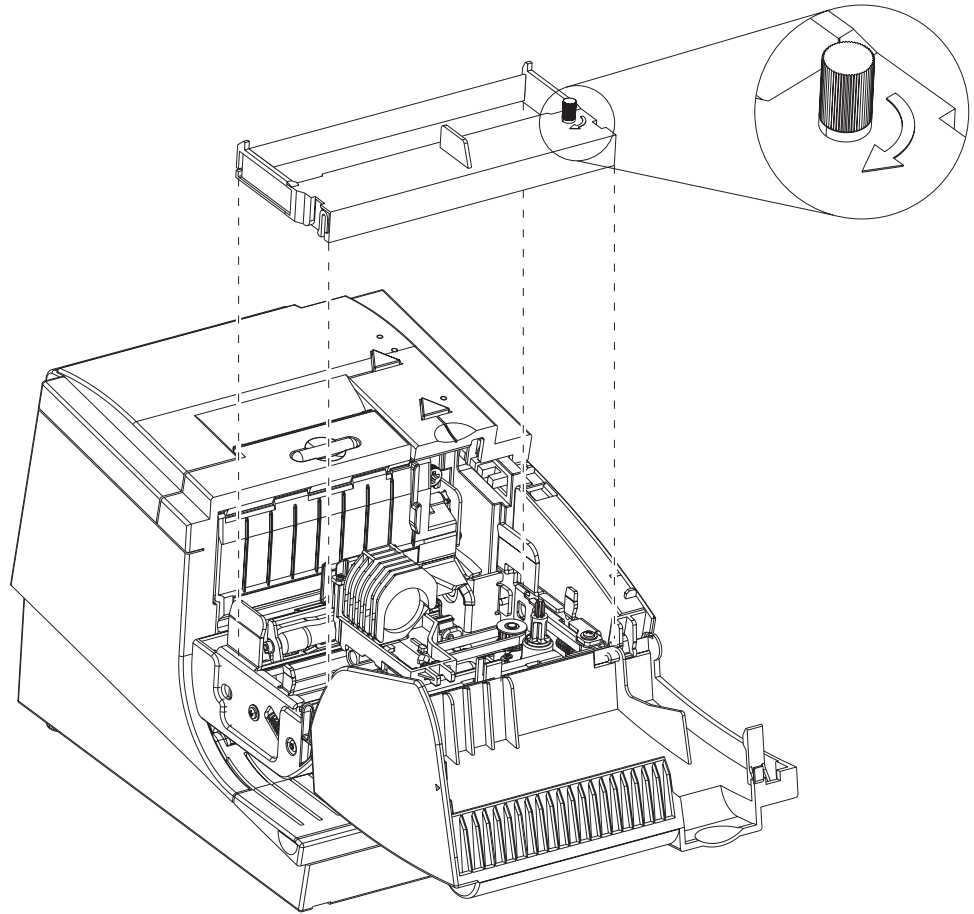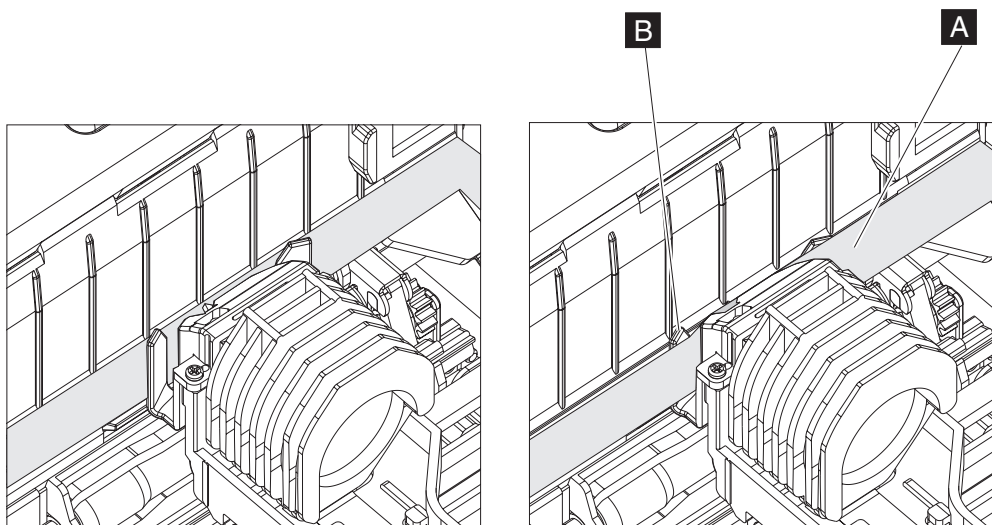
Figure 11. Ribbon cartridge loading

3. Maintain ribbon tension by turning the ribbon cartridge knob as shown in Figure 11. Lower the cartridge into position until the notches on its sides snap into place on the printer guides.

Incorrect   Correct

Figure 12. Ribbon path around the printhead. Correct placement of the ribbon (A) around the printer guides (B)

4. Make sure the ribbon is correctly positioned with the print head guides, as shown in Figure 12.
5. Once the cartridge is in place, close the ribbon cover. The ribbon will be moved into the correct position.

Supported ribbon types

Attention: Using an inferior grade of ribbon can affect the print quality, printheads life expectancy, and printer mechanisms.

The 4610 Models 2CR and 2NR require a stuffer-box ribbon type (feed rollers pull the ribbon from one end of the cartridge and stuff it into the cartridge cavity of the other end). The Epson ERC 35 ribbon meets these specifications; however, other original equipment manufacturers also offer replacements that are adequate.

Inserting checks (Model 2CR only)

The Model 2CR printer is capable of printing verification information on a check or an inserted document. You must correctly insert your check or document into the printer to use this printer feature. To correctly insert a check into the printer, complete the following steps, as shown in Figure 13 on page 23.

Insertion of Check for MICR Reading and Franking
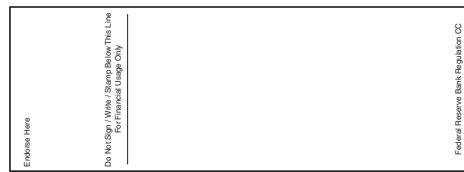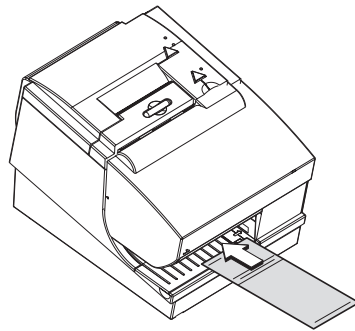
Insertion of Check for Printing the Face
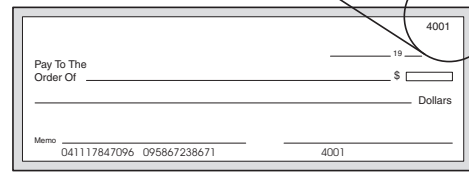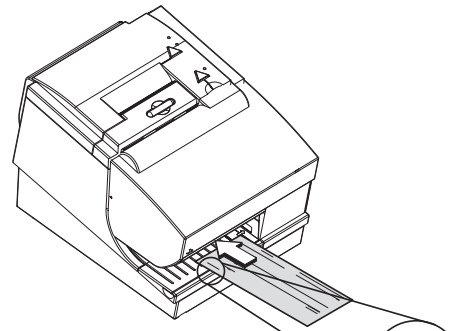
Figure 13. Inserting checks

Inserting documents from the side

You can also insert documents from the side of the Models 2CR and 2NR printers. If you are inserting a document from the side, complete the following steps:

1. Press the **A** and **B** buttons at the same time (see Figure 14). When you press both buttons at the same time and then release, the document insert throat opens.

Insertion of Document (Side Load)
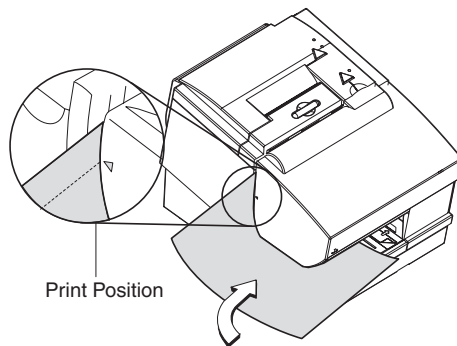
Insertion of Document (Front Load)

Print Position
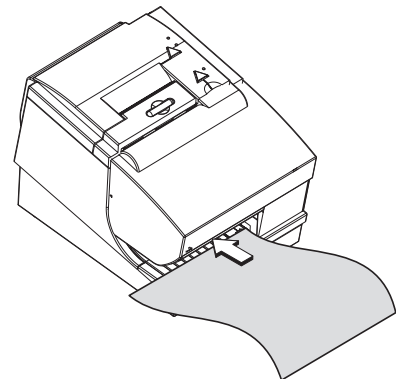
Figure 14. Inserting documents from the side

2. Insert the document facedown into the right side of the printer (see Figure 21).

   Note: The throat must be open to insert a document from the side

3. Press and then release both buttons again to close the throat.

Buttons **A** and **B** are also used to test the printer. See "Firmware offline tests" on page 33for additional button functions.

Retrieving printer statistics

The Model 4610 2CR and 2NR printers retain usage statistics to help you evaluate your printer usage and performance. The statistics available for your printer are defined during printer configuration. Figure 15 is an example of a printed receipt with usage statistics for the Models 2CR and 2NR.

Figure 15. Receipt showing usage statistics

The Printers S/N is 41-MNCLF

Microcode EC level is: 09.17

Motion detection turned off:
Serial Interface: RS485
: 115200 Baud, DTR/DSR
MICR reader enabled
The default coe page is: 858

|"#$%&'()*+,-./0123456789:;<->?ABCDEFGHIKJK
LMNOPQRSTUVWXYZ[\]^_ abcdefghijklmnopqrstuvw
xyz{|}~.CüéâäàåçêëèïîìÄÅÉæÆôöòûùÿÖÜø£ØSsáíóú
ÁÑGg¿ · · · · ¡ · ·   ÁÂÀI   ¢ · · · · · · · · ãÃ   ·
HIIII · · · · · · · · · · · · · õÐÊËÈÍÎÏÌÓßOO õÕµþÞUUUyY±÷ ·

Top = 241,   76   Bot = 242,   76

Type 0   Paper Out Sensor

|	
Cuts:	10054
CR Characters Printed:	1422924
CR Paper Fed (km):	2.7
CR Cover Openings:	1193
DI Characters Printed:	578164
DI Paper Fed (km):	1.2
DI Transport Motor Passes:	31517
DI Cover Openings:	328
DI Documents Inserted:	1028
MICR Reads:	153
High Interference MICR Reads:	0
Check Flips:	167
Barcodes Printed:	6370
Manufactured date:	week 42 of 2008

To retrieve the usage statistics for your printer:

1. Press and hold down buttons **A** and **B** (see Figure 21 on page 33) at the same time until the paper feed light blinks amber (orange).
2. Press the paper feed button **A** .
3. The 4610 prints a receipt that includes the programmed statistics for your printer.

The available statistics for the 4610 include:

- Unexpected Ribbon Cover Open Count
- Slip Feed Error Count
- Receipt Paper Jam Count
- Number of Failed Flash Writes

- Unexpected Cover Open Count
- Current MCR noise value (Model 2CR only)
- Number of Impact Head failed coils
- Thermal Print Head element failure
- Printer serial number
- Manufacturing Week Code
- Number of paper cuts
- Number of characters printed on the CR (thermal) station
- Number of steps performed by the CR paper feed motor (200 steps per inch of paper)
- Number of times the customer receipt cover was opened
- Number of failed paper cuts
- Number of characters printed at the DI (impact) station – thermal/impact printers only
- Number of MICR reads (Model 2CR only)
- Number of high-interference MICR reads (Model 2CR only)
- Number of check flips performed (Model 2CR only)
- Number of check flip failures (Model 2CR only)
- Number of Flash Erase commands performed (NVRAM write count)
- Cash drawer opened successfully count
- Cash drawer failed to opened count
- Number of bar codes printed
- Number of times the max temperature of either the motors or the print heads have been reached
- Number of time the printer reset due to the SOF USB error – see MCT #F1

Cleaning recommendations

You should periodically inspect your 4610 unit and clean the cover as required. Use a soft clean cloth with warm soapy water to clean the plastic parts. Do not use abrasives or any alkaline, ammonia, or chloride-based cleaner.

Note: Do not apply cleaning solution directly to the cover. Always apply the cleaner on a clean cloth and then wipe the cover with the damp cloth. Be certain that the cloth is only damp and not dripping wet.

Cleaning the MICR read head (Model 2CR only)

You should clean the MICR read head after 10,000 checks are processed, or every three months. Clean the MICR read head using a cotton swab soaked in isopropyl alcohol.

To clean the MICR read head:

1. Open the ribbon door by pulling downward.
2. Remove the ribbon cartridge by lifting it out.
3. Move the carriage to the right until it stops, or as shown in Figure 16 on page 26.
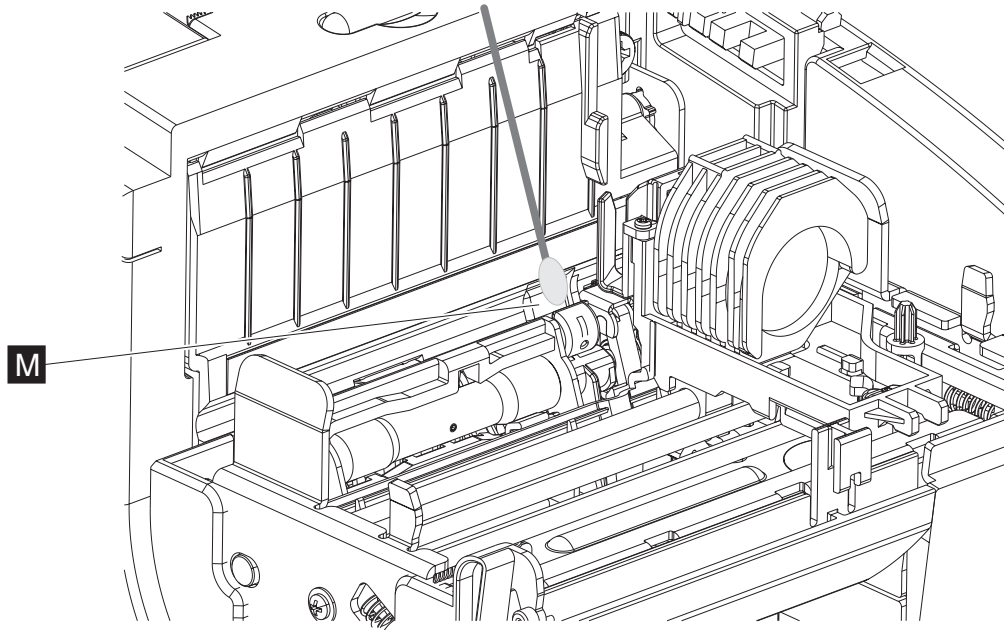
Figure 16. Cleaning the MICR read head

4. Prepare a swab with isopropyl alcohol.
5. Gently wipe the head (see **M** in Figure 16) with the swab several times. Wipe away any residual alcohol with a dry swab.
6. Replace the ribbon and close the ribbon door.

If cleaning the MICR read head does not solve the problem you are having, it might be that you are experiencing electromagnetic noise interference. Sources of electromagnetic noise (for example, displays, security towers, and other sources) can interfere with the MICR read head. The printer is equipped to filter noise from many devices. If the MICR read head does not function properly, rearranging the printer relative to the noise source may improve MICR reading. The noise source should be as far away as possible from the right side of the printer.

For additional information on troubleshooting MICR read problems, see "Firmware offline tests" on page 33.

Cleaning the thermal printhead

You can clean the thermal printhead when you notice that the print quality has deteriorated. Complete the following steps to clean the thermal printhead:

1. Open the paper cover by pushing the large blue button on the top of the printer.

Detailed View of Thermal Printhead

Thermal Printhead

Paper Cover
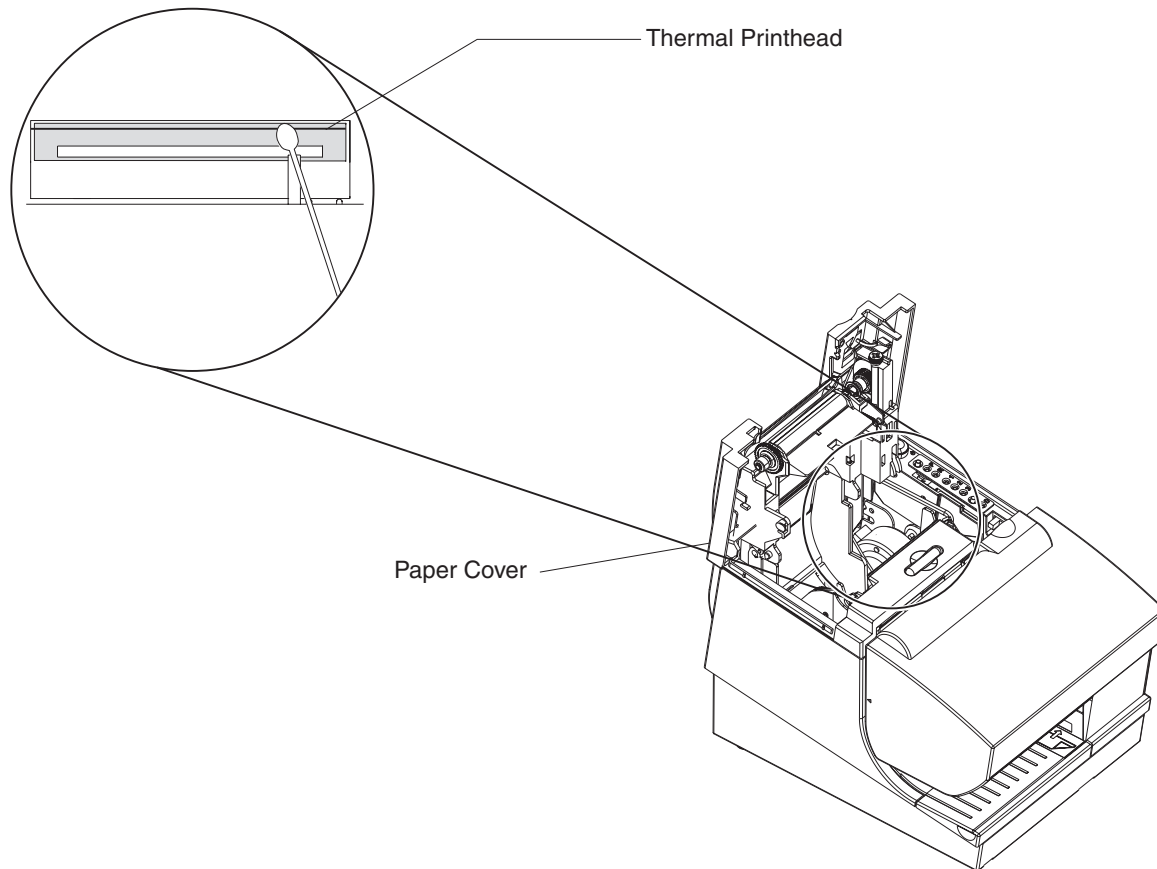
Figure 17. Cleaning the thermal printhead

2. Using a cotton swab soaked in isopropyl alcohol, gently wipe the printhead several times on its print line and on the surrounding area.
3. Wipe off any residual alcohol with a dry swab.

If print quality does not improve after cleaning the thermal printhead, contact your IBM Service Representative.

Clearing jams in the check flipper area

If a check jams in the check flipper mechanism, you can remove the flipper door to clear the jam. Complete the following steps to clear a paper jam:
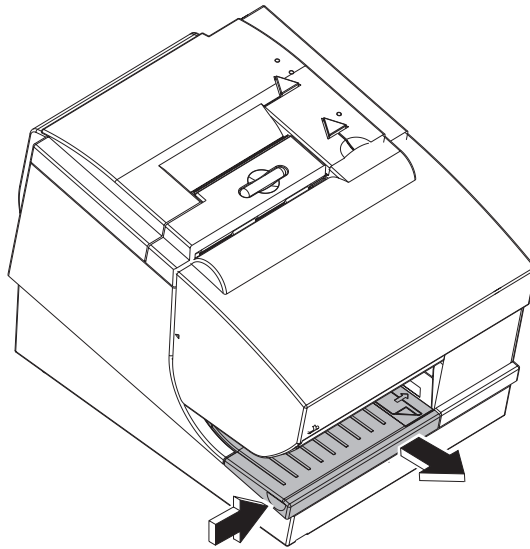
Figure 18. Removing the flipper door (lower document insert cover)

1. Lift up the left front corner of the flipper door (document insert cover) and pull the cover from the printer (see Figure 18).
2. If the document is visible, remove the document.
3. Replace the flipper door.
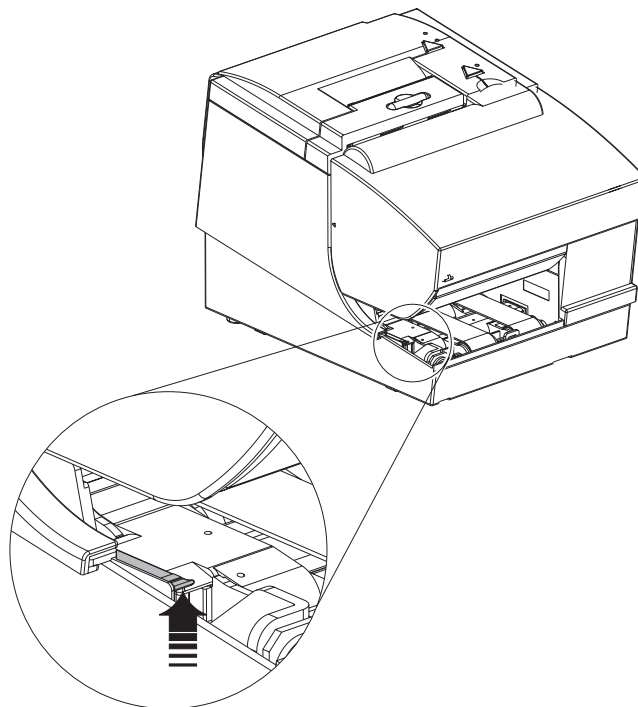
Figure 19. Lifting up on the thumb tab

4. If you cannot remove the document, lift up the tab on the left side of the check flipper cartridge (with a blue label) and remove the check flipper cartridge from the printer (see Figure 20).
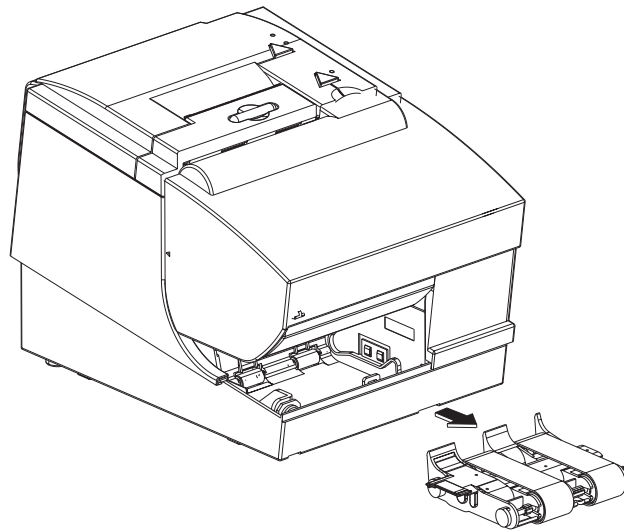
Figure 20. Removing the check flipper cartridge

5. Reach inside the document insert station and carefully remove the jammed check.
6. Reinstall the check flipper cartridge and the flipper door.

Chapter 4. Running tests and diagnostics

This chapter describes the diagnostic tools, offline tests, and troubleshooting procedures for your printer.

Attention: For firmware and driver updates, see the *IBM SureMark Printers: Programming Guide for Models 2CR and 2NR*, GA27-5005

Testing the 4610

When you switch on the SureMark printer, it runs a power-on self-test (POST). If the POST finds no errors, the printer is ready for operation. Follow these steps if you receive an error:

1. If the printer is powered ON, power OFF the printer and power it ON again.
   - If the printer is attached to the system with the RS-232 cable or the standard USB cable with a power brick, disconnect the power cord, then reconnect the power cord to a properly wired and grounded power source.
   - If the printer is attached to the system with the RS-485 cable, power OFF the POS system, and then switch on the system, which also powers ON the printer.
2. Check the status of the printer-ready indicator:

   Printer-ready indicator ON:
   > The power-on self-test completed successfully.

   Printer-ready indicator OFF or blinking:
   > The POST failed.
3. If the POST fails or if you suspect problems with your system, see "Troubleshooting" on page 40.
4. See "Firmware offline tests" on page 33 and run the offline tests. If the offline tests fail or you suspect problems with your system, see "Troubleshooting" on page 40.

Low paper sensing and calibration

Low-paper sensing in the 4610 Models 2CR and 2NR is based upon the paper thickness and the core size. You can modify the low-paper and critically low sensing settings. These settings determine the amount of paper that remains on the roll and at which time the low-paper and the critically low-paper status is sent. The default setting for low-paper status is 5 meters (or 5000 mm) remaining on the roll, and critically low status is 1 meter (or 1000 mm) remaining on the roll.

Note: Prior to turning off the printer, send a reset command to the printer or open and close the paper door. If you turn off the printer without a reset command, when you turn the printer back on, it will start counting motor steps from the number stored in the printer's memory. This will not be an accurate number if the printer was not able to store the number with a reset command.

You must calibrate the printer to accurately recognize the thickness of the paper supply, which you can do with an offline test or by a command (see "Summary of offline test menus" on page 34). You only need to calibrate one printer for a specific paper supply. You can then broadcast that calibration constant to all printers that will use the same paper.

To set the low-paper supply sensors of all printers within your system:

Running tests and diagnostics

1. Run the calibration on one printer (see "Summary of offline test menus" on page 34).
2. Read out MCT#0X'28' from the calibrated printer.

   Note: The calibration constant is stored in MCT#0X'28'. System management can interrogate all printers to determine whether one has been recently calibrated.

3. Clear the high-order bit and send the value to all printers in the enterprise.

Table 8. MCT load command settings for low-paper and critically low-paper amounts

Constant	Decimal	Hexadecimal	Description
Low-paper amount	38	X'26'	The amount of paper left in the printer when it sends the low-paper status. Default is 5 meters (5000 or 0X'1388'; number is stored as mm).
Critically low-paper amount	39	X'27'	The amount of paper remaining in the printer when it sends the critically low-paper status. Default is 1 meter (1000 or 0X'03E8'; number is stored as mm).
LowPaperCalibrationConstant	40	X'28'	The high order bit to this variable is set after this printer has calibrated the low-paper amount. The lower order bits are the number of mm that the printer feeds after it detects the sensor change, until the paper is out.

Firmware offline tests

To enter the firmware offline test and setup procedures, follow these steps:
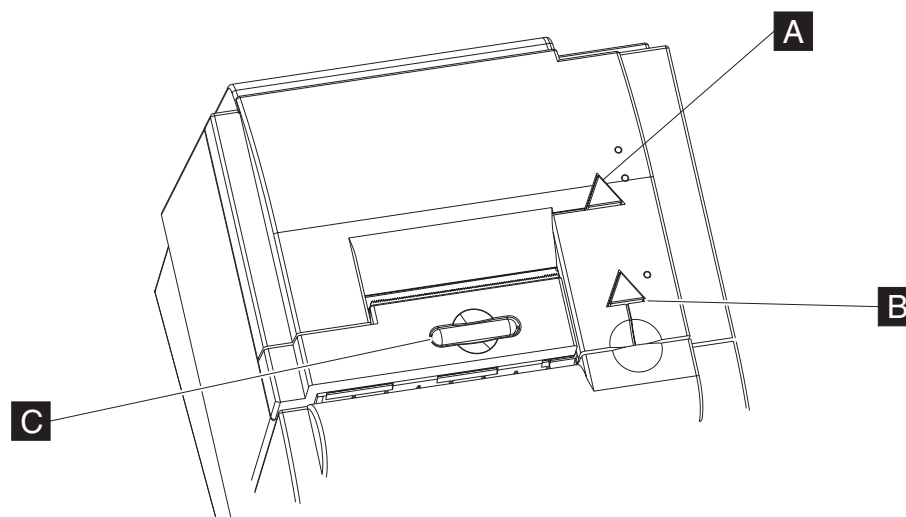
Figure 21. Paper feed and document feed buttons

1. Open the paper cover (C) and press the power button to power on the printer. The power button comes with a cover over it, so it may be necessary to use a paper clip or similar item to push the button through the cover. See Figure 22 for the location of the power button.
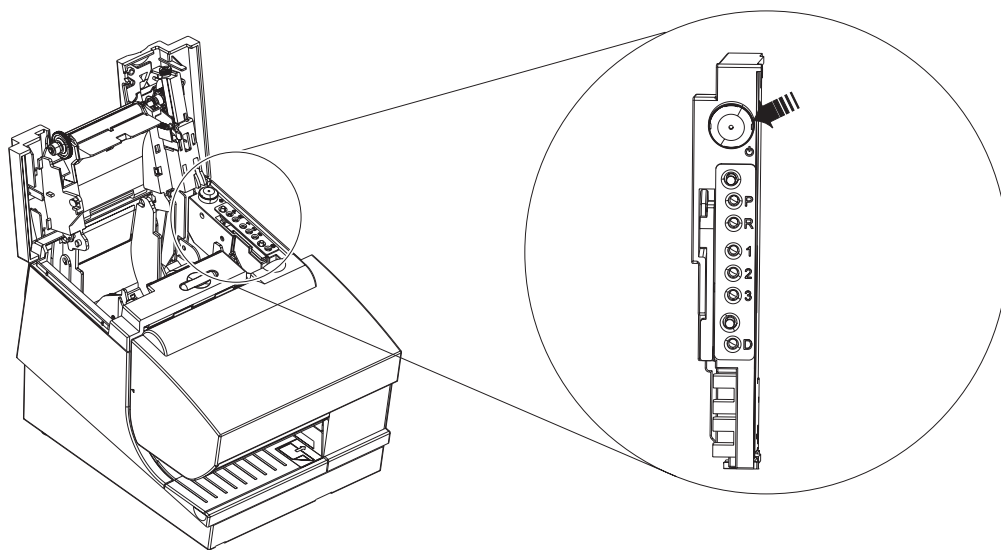
Figure 22. Pressing the power button

2. Close the paper cover and press the paper feed button (A) while the printer is powering up.
3. The following offline selection menu is printed. See Figure 23 on page 34.

Running tests and diagnostics

```
Off-line Selection started
To select a sub-menu or test:
FIRST, press the paper feed button the indicated number of times.
THEN, press again and hold button down at least 1
second to confirm selection.

Sub-menus and tests                              Press
 Thermal Receipt test                            1
 Choose Emulation Mode                           2
 Model Selection                                 3
 EIA-232/RS-232 Flow Control                     4
 More Selections                                 5

To exit Off-line setup, open printer cover.
```

Figure 23. Example of the offline selection main menu. See Table 9 for an explanation of these menu items.

4. Follow the instructions that are printed for each required test.

Summary of offline test menus

IBM recommends that you use the firmware offline test menus to perform the offline tests. However, note that some existing offline test methods still apply (see "Earlier methods for offline tests" on page 36). Table 9 describes the available firmware offline test menus:

Table 9. Summary of the offline test menu items

Menu item	Definition	Sub-menu (if applicable)	Definition
1. Thermal receipt test	Prints a receipt		
2. Choose emulation mode	Displays the sub-menus (see next column)	Compatibility with Legacy 4610	Changes the command set and statuses to support the previous drivers and applications (such as plug and play for existing 4610 printers).
		Native mode	Changes the command set and statuses to support the low-paper detection, paper jam detection, and other 4610 Model 2CR and 2NR sensors.
3. Model selection	You specify the printer type: MICR reading or non-MICR reading model.		
4. EIS-232/RS-232 flow control	Provides a list of available baud rates and flow controls.		
5. More selections	Provides additional menus:		
6. MCT listing	Information for service personnel		
7. Low-paper calibration	You are instructed to insert a *small* roll of paper in the printer. During the test the printer ejects all of the paper from this roll to calibrate the low-paper sensor.		
8. MICR read test (Model 2CR only)			
9. Document print test	Starts print test		
10. For more selections:	Provides additional menus:		
11. Hex dump mode	A debug mode that is used when attached using a RS 232 that will have the printer print the data/commands that it receives. This enables the application writer the ability to see what data is actually being received at the printer.		
12. Execute printhead test	Starts printhead test		

Table 9. Summary of the offline test menu items (continued)

Menu item	Definition	Sub-menu (if applicable)	Definition
13. Reset TPH user data Execute after thermal Printhead is replaced	Select after you install a new thermal printhead.		
14 Paper out sensor test	Checks the operation of the paper-out sensor.		
15. resident code pages	Prints out a test page for the Code Pages resident in the printer.		
14. Main menu	Return to main menu		

Changing the interface card or logic card

During the servicing process, you often will change an interface card or logic card in the printer. If one of the cards is a new FRU, then the printer firmware automatically updates the new card with the printer settings and other information. (These settings include the serial number, baud rate, and model number.) The first time you power on the printer with a FRU card in it, the update will occur and the printer will reset.

For proper operation, the information on the interface and logic cards must match. If you install either card (interface or logic) with previously written firmware information, you must direct the firmware to overwrite the correct card.

The following message is printed when an information mismatch occurs:

```
A card in the printer has been replaced
Main Logic's S/N is 41-MVT02
Interface Card's S/N is 41AAVT50
Check the serial number (S/N) of the
printer. The S/N is located next to the
document insert station and on the
bottom of the printer.

If S/N matches one of the above, please
update the card with the incorrect S/N.

If S/N does not match one of the above,
Refer to the Hardware Service Manual.

To select a sub-menu or test:
FIRST, Press the paper feed button
the indicated number of
times.
THEN, press again and hold
button down at least 1 second
to confirm selection.

OPTIONS. . . . . . . . .  Press
1. Main Logic Update Menu . . . . 1
2. Interface Card Update Menu . . 2
3. Continue without updating  . . 3

To exit Off-line setup, open printer cover.
```

If you select option 1, the following message prints:

```
Main Logic Card Update Menu
    Data will be copied from the
     interface card to the main logic
     Printer will reset when update is done.
To update the Main Logic Card,
     Press the paper feed button

To Exit without updating, Open Printer Cover.
```

If you select option 2, the following message will print:

```
Interface Card Update Menu
To update the Interface Card,
Press the paper feed button
Data will be copied from the
main logic to the Interface Card.

To Exit without updating,
open printer cover
```

Selecting `Option 3. Continuing without updating` could produce unexpected results.

Storing a new serial number in the firmware

For proper printer operation, the firmware must correlate the serial number of the printer with the serial number of the logic card. When you replace either the logic card or the interface card, the serial number is restored into the new card. However, if both cards are replaced, you must store the correct serial number in the firmware.

For more information, see the IBM Retail Store Solutions support Web site at www.ibm.com/solutions/retail/store/support/.

Earlier methods for offline tests

The section provides the previous methods for initiating offline tests. Although these methods are supported, IBM recommends that you use the firmware menu and sub-menus to initiate all offline tests.

Resetting the printer and the document sensor threshold: To reset the printer,:
1. Press and hold the paper feed and document feed buttons (**A** and **B** in Figure 21 on page 33) to enter offline mode.
2. When the printer-ready indicator begins blinking, release both buttons.
3. Open and close the paper door by pressing the paper release button **C** in Figure 21 on page 33.

Customer receipt test:

Note: IBM recommends that you use the offline menus to initiate this test.

To initiate the customer receipt test, follow these steps:
1. Press and hold both the paper feed and document feed buttons (**A** and **B** in Figure 21 on page 33) to enter offline mode
2. When the printer-ready indicator begins blinking, release both buttons.
3. Press and release the paper feed button to start the test

Document insert station test:

Note: IBM recommends that you use the offline menus to initiate this test.

To initiate the document insert station test, follow these steps:

1. Press and hold both the paper feed and document feed buttons (**A** and **B** in Figure 21 on page 33) buttons to enter offline mode.

2. When the printer-ready indicator begins blinking, release both buttons.

3. Press and release the document feed button to start the test.

MICR read, flipper test (Model 2CR only):

Note: IBM recommends that you use the offline menus to initiate this test.

The MICR read test is accessed through the sub-menus in offline mode.

Follow these steps to start the MICR read and flipper test:

1. Insert the check face down with the magnetic ink characters to the right.

2. To enter offline mode, press and hold both buttons until the printer-ready indicator begins blinking.

3. Then release both buttons.

4. Press and release both buttons again. The printer reads the check.

5. Characters that match the magnetic ink characters are printed on the customer receipt. The check is then flipped over, and ejected.

Understanding MICR test results: If the characters printed do not match the magnetic ink characters, check the MICR read head. The printer will insert question marks if the MICR read engine cannot decode a number. If the printer detects noise, it will print out the amplitude and frequency of the noise, if possible.

Identifying the controls and indicators

This section describes the controls, indicators, and connectors of the IBM 4610 Models 2CR and 2NR printers. Figure 24 on page 38 provides a diagram of these indicators and controls.
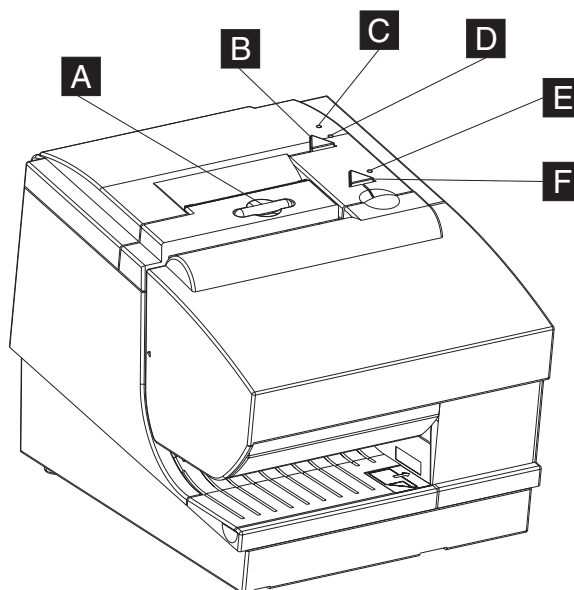
Running tests and diagnostics

Figure 24. Indicators and controls.

A Paper door release button

B Paper feed button - press to advance the customer receipt paper

C Paper supply LED indicator (see Table 10)

D Printer ready LED indicator (see Table 11)

E Document presence LED indicator (see Table 12 on page 39)

F Document feed button - press to advance the document

Table 10 describes the LED indicators that show the status of the paper supply:

Table 10. Paper supply LED Indicator

LED Indicator (**C**)		
Amber (orange)	On	Paper out
	Off	Paper sufficient
	Blinking	Critically low paper supply

Table 11 describes the LED indicators that communicates the printer status:

Table 11. Printer ready LED indicator

Printer ready (D)		
Amber (orange)	Blinking (0.5s on / 0.5s off)	Station not ready; recoverable error - paper jam, cover open, cutter jam
	Blipping (0.25s on / 1.75s off)	Offline or hardware failure: Cannot communicate with paper motion sensor, or the thermal printhead, MLC or IFC problem
Green	On	Station is ready

Table 12 on page 39 describes the LED indicators that reflect document status:

Table 12. Document presence LED indicator

Document inserted / No document inserted (**E**)		
Green	On	Station is ready
Amber (orange)	Blinking (0.5s on / 0.5s off)	Station is not ready or one of the following conditions exists: • The cover is open. • The printer has a nonrecoverable home error.
Green	Blinking	Station is waiting

Understanding the Light-Path LEDs

The light-path LEDs illuminate to indicate a potential problem with your printer. To locate the light-path LEDs, open the paper door and you will see the LED lights (see Figure 25) on the far right side of the printer. Table 13 includes a description of these indicators.
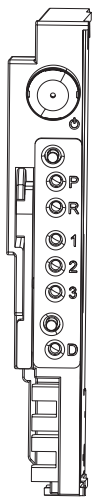
Figure 25. Illustration of the diagnostic LEDs

Table 13. Lightpath LED conditions

LED	Failing Component
1	Main logic card
2	Interface card
3	Thermal printhead

Troubleshooting

Table 14 contains common problem scenarios and steps to help you identify and resolve these problems. For the latest troubleshooting guidance and symptom-fix information, go to the IBM Knowledgebase support Web site at www2.clearlake.ibm.com/store/support/html/knowledgebase.html. This site contains additional information that is gathered from field experience, and might not have been available at the publishing date of this document.

Table 14. Troubleshooting

If the problem is...	Then do this...
Printer-ready indicator is OFF	• Check the power to the printer. • If connected to a system using the RS-485 communication port, check that the system is powered ON and cable 7 is connected. • If using the RS-232 communication port or a USB port with a power brick, check that the brick power supply is connected to the printer and plugged into an AC power source. • If using USB communication with a powered USB cable, check that the system is powered ON.
Printer-ready indicator is blinking	• Check that the customer receipt station has paper loaded correctly. Close the cover and push the Customer Receipt Feed button to feed a small amount of paper. • Check the document insert station printhead and paper path for any obstructions. • Check that the paper and ribbon doors are closed. • Check that the cutter does not have an error.
Checks not flipping (Model 2CR only)	1. Check for printer jams. Go to "Clearing jams in the check flipper area" on page 28. 2. Print the offline menu and verify that the printer is configured correctly for a MICR/flipper printer. See "Firmware offline tests" on page 33.
Checks not reading (Model 2CR only)	1. Go to "Cleaning the MICR read head (Model 2CR only)" on page 25. 2. Print the offline menu and verify that the printer is configured correctly for a MICR/flipper printer. See "Firmware offline tests" on page 33.
Customer receipt station is feeding paper, but is not printing.	• Ensure that the paper roll is not upside down. Go to "Loading and replacing the paper roll" on page 15. • Clean the printhead. See "Cleaning the thermal printhead" on page 27.
Document insert station is not printing	• Check the paper path. • Check to see if the ribbon is installed correctly. • Change the ribbon. See "Replacing the ribbon" on page 19.

Printer not cutting	• Check for a paper jam.
	• Verify that the paper door is closed.
	• If the cutter is jammed, follow these steps:
	  1. Open the paper door; the cutter should automatically reset.
	  2. If the paper door will not open, open the ribbon door and locate the blue thumbscrew. Turn the screw counter clockwise until the cutter is retracted enough to open the paper door.
	  3. If the cutter does not automatically reset, use the blue thumbscrew to fully retract the cutter.

Table 14. Troubleshooting (continued)

If the problem is...	Then do this...

Firmware will not update to an earlier version (Paper Out Sensor Type 1 will only work with 9.x firmware or later)	• Perform an offline test to determine which sensor type you have.
	• Paper out sensor is not working:
	  1. Check printer firmware level by performing an offline test.
	  2. If the firmware version is earlier than 9.x and the paper ready light stays green when the paper is out, update the firmware to 9.x or later.
	  3. Perform the Paper-out sensor test in the offline menu.

Document insert station is not working properly	• Verify that the ribbon is properly installed. • Check the form or paper against the printer spec. • Adjust the print head gap (contact IBM Service for assistance). • Verify that the impact platen is free to rotate. If it is not free, remove the upper throat assembly. Locate the paper guide on the platen assembly directly below the MICR head (Model 2CR only). Rotate the paper guide until the platen assembly is free to rotate. Reassemble the upper throat assembly. • After all of the above steps have been tried, readjust the platen bushings. (contact IBM Service for assistance).

Notes:

1. Record all symptoms before calling for service.
2. If you receive software error messages, refer to the software manual of the application.
3. Call your service representative.

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Chapter 5. Replacing printer components

The Models 2CR and 2NR allows easy access to the key printer components, which are referred to as customer replaceable units (CRU). These CRUs snap out to provide easy service and maintenance for your printer. This section describes the steps to replace the CRUs. You can replace the parts yourself or call an IBM certified technician. If you choose to replace the defective part, contact your IBM Service Representative for the correct part number.

Replacing the logic card

Attention: You must power off the printer prior to replacing the logic card. You should also touch the metal of the printer frame with the back of your hand before making contact with the printer. See "Electrostatic Discharge (ESD)" on page 68 for more information regarding ESD handling procedures.

The logic card is the central processing unit that controls all the electronic components of your printer, and is a customer replaceable part. If the Number 1 light-path LED is illuminated, you should replace the logic card. Contact your IBM Service Representative for the correct logic card part number.

Follow these procedures to remove the old logic card:
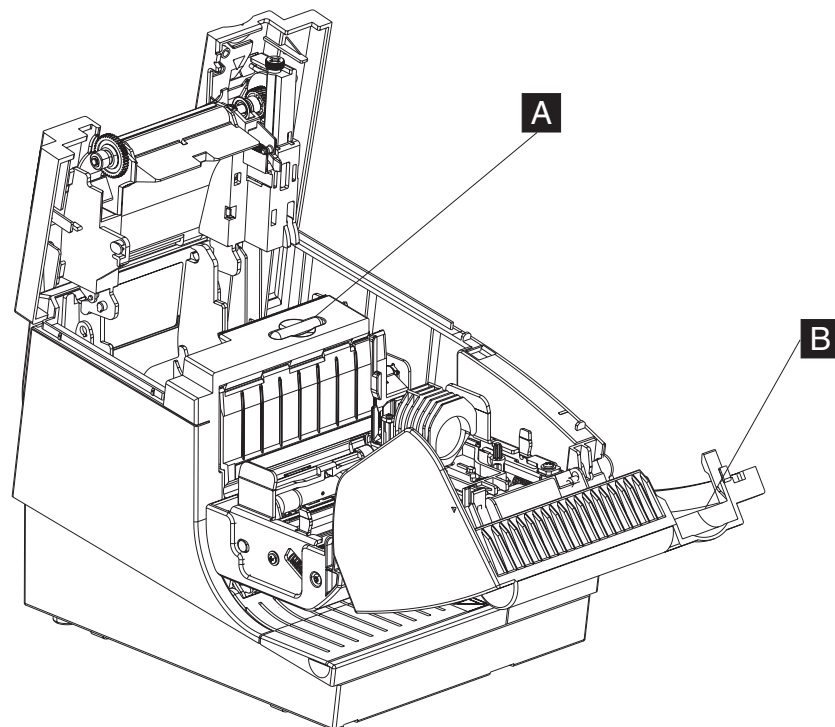
Figure 26. Opening the paper door and ribbon door

1. Turn off the power to the 4610.
2. Open the paper door by pressing the blue release button (**A** in Figure 26).

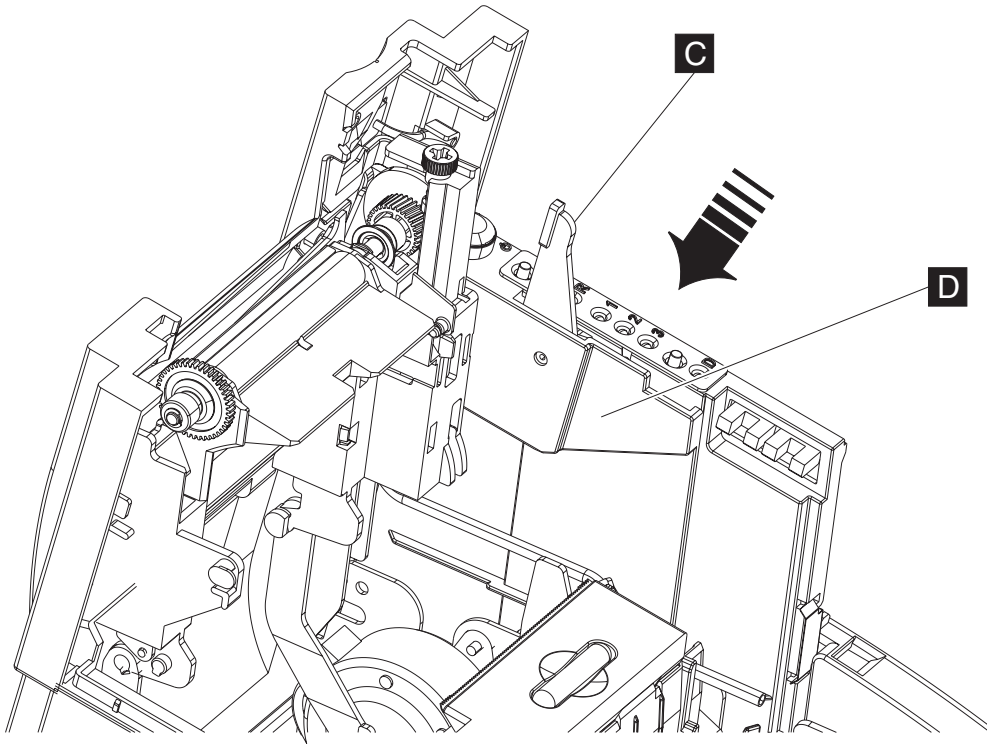3. Open the ribbon door (**B**) by pulling downward, as shown in Figure 26 on page 43).

Figure 27. Replacing the logic card

4. Remove the impact printer ribbon.
5. Insert the logic card (**D**), and press down on the blue lever (**C** in Figure 27) to lock the card into the correct position.

To replace the logic card, complete the following steps:

1. Turn off the power to the 4610.
2. Insert the logic card (**D**) into the open slot to the right of the printer.
3. Press down on the blue lever (**C** in Figure 27) to lock the card into the correct position.
4. Replace the impact printer ribbon.
5. Close the ribbon door (**B**) by pushing forward until it clicks into position, as shown in Figure 26 on page 43).
6. Close the paper door (see **A** in Figure 26 on page 43.

After replacing the logic card, a message might print. For more information, see "Changing the interface card or logic card" on page 35

Replacing the interface card

Follow these procedures to remove the old logic card:

If your interface card becomes defective, the Number 2 light-path LED will illuminate. To replace your interface card, contact your IBM Service Representative for the correct part number. After you receive the replacement part, complete the
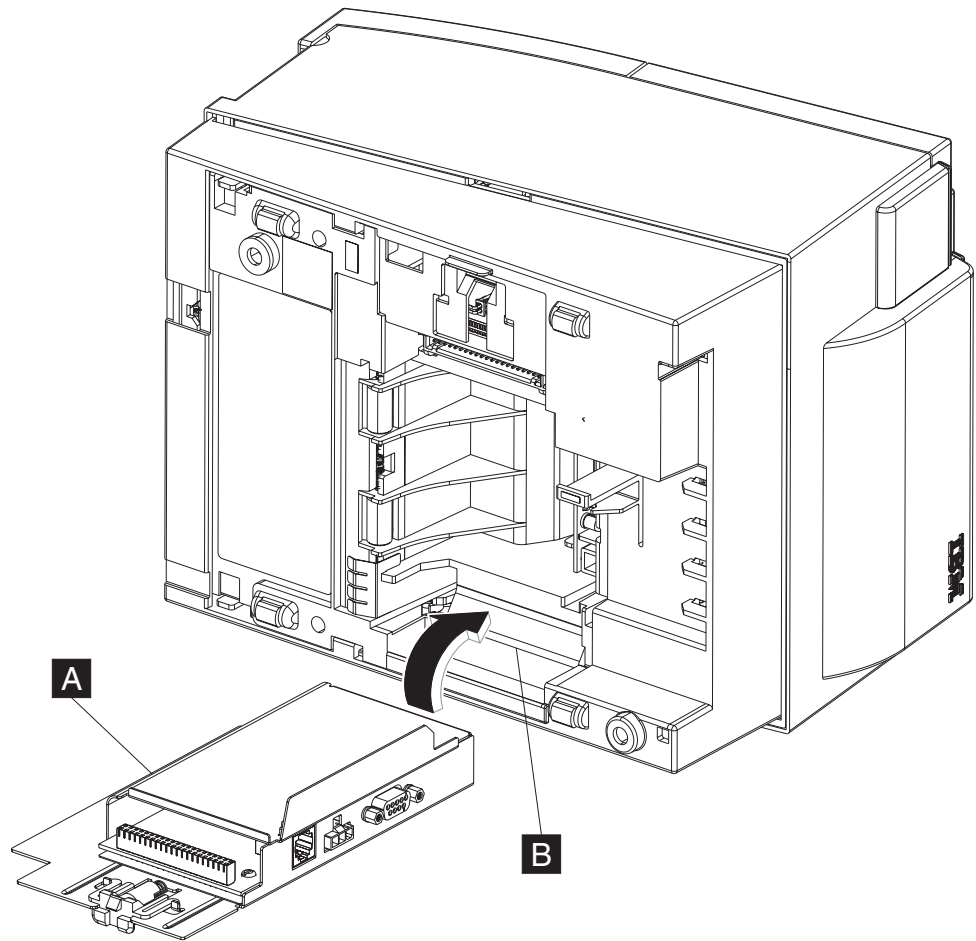
following steps to replace the interface card.

Figure 28. Replacing the interface card

Remove the old interface card:

1. Disconnect all power from the 4610.
2. Place the printer unit on one side, as shown in Figure 28.
3. Press the latch on the base of the printer to unsecure the interface card.

To replace the interface card, complete the following steps:

1. Align the bottom of the replacement interface card to the slot on the base of the printer.
2. Press to secure the latch.

After replacing the logic card, a message might print. For more information, see "Changing the interface card or logic card" on page 35

Replacing the thermal printhead assembly

Attention: You must power off the printer prior to replacing the thermal printhead. You should also touch the metal of the printer frame with the back of your hand before making contact with the printer. See "Electrostatic Discharge (ESD)" on page 68 for more information regarding ESD handling procedures.

The thermal printhead is designed to print 150,000 million receipts, but if you encounter a problem with the printhead you can replace this part without a service call. If you see a decreased print quality or if the Number 3 light-path LED is illuminated, you should replace the thermal printhead. Contact your IBM Service Representative for the correct thermal printhead part number for your printer.

Follow these procedures to remove the old thermal printhead assembly:

1. Open the paper door by pressing the blue release button (see Figure 26 on page 43).
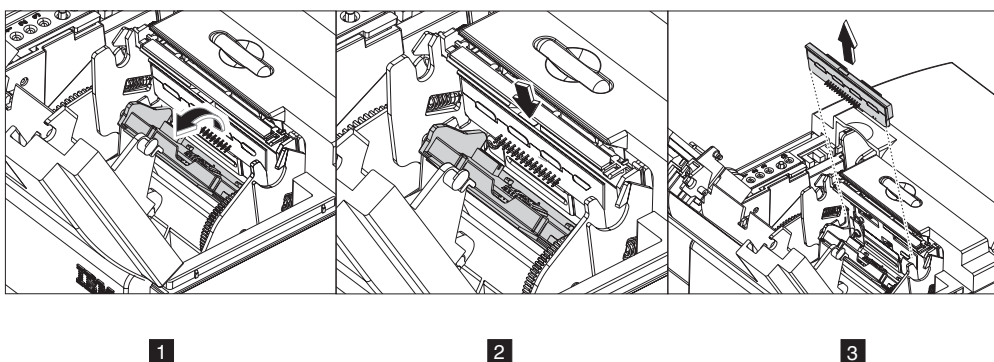
Figure 29. Replacing the thermal printhead assembly

2. Open the paper-out sensor by grasping the edge and pulling downward. See ▓1 in Figure 29.
3. Press downward on the thermal printhead assembly, as shown in ▓2 in Figure 29.
4. Lift the printhead assembly outward to remove (see ▓3 in Figure 29).

To install the new thermal printhead, complete the following steps:

1. Open the paper door by pressing the blue release button (see Figure 26 on page 43).
2. Align the thermal printhead to the assembly slot and press downward until the printhead clicks into place.
    CAUTION:
    When pressing downward, make sure your fingers do not come in contact with the paper cutter.
3. Close the paper-out sensor by pulling the edge forward.
4. Close the paper door.

After you have installed the thermal printhead, run an offline test to reset the thermal print head user data. See "Firmware offline tests" on page 33 for the steps to run an offline test.

Replacing the ribbon door

If you encounter a problem with the ribbon door, you can replace this part without a service call. Contact your IBM Service Representative for the correct ribbon door part number for your printer.

Follow these steps to remove the old ribbon door:
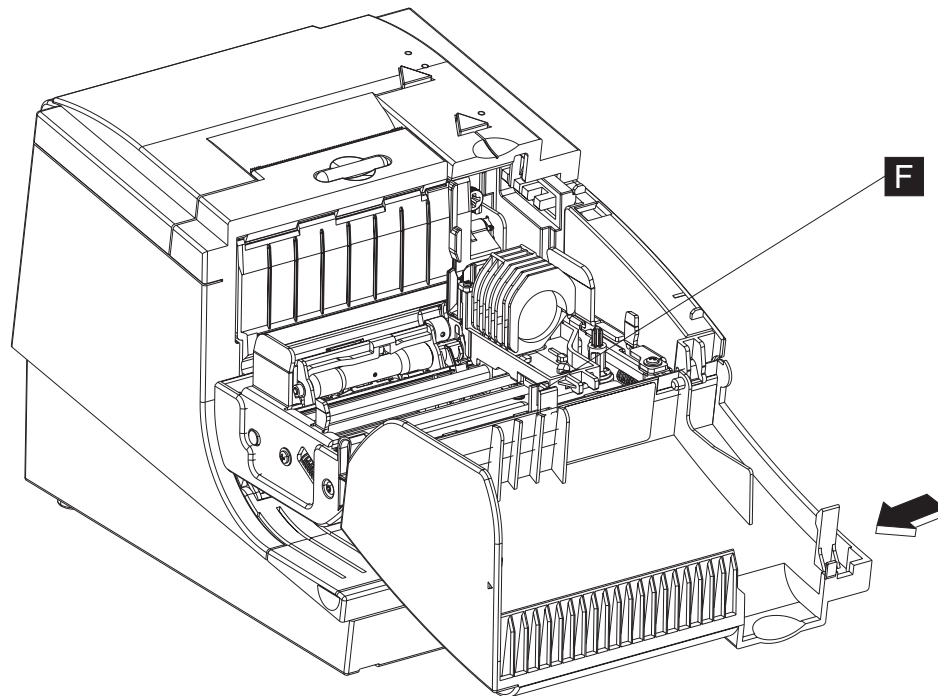
1. Open the ribbon door.

Figure 30. Removing the ribbon door

2. Slightly push the middle tab (**F**) towards the back of the printer and slide the door to the left to remove. (See Figure 30).

To replace the ribbon door:

1. Open the ribbon door (see Figure 30),
2. Slide the door to the right (see Figure 30), aligning the post with the slots.
3. Push forward until the ribbon door clicks into place.
4. Close the ribbon door.

Replacing the flipper door (document insert cover)

If you encounter a problem with the flipper door, you can replace this part without a service call. Contact your IBM Service Representative for the correct flipper door part number for your printer.

Follow these steps to remove the flipper door:

1. Lift up the left front corner of the flipper door (document insert cover).
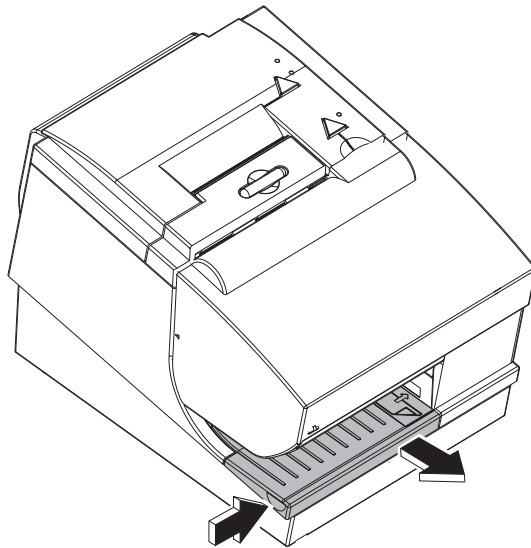
Figure 31. Removing the flipper door

2. Pull the cover from the printer.

To replace the flipper door:
1. Insert the flipper door into the open slot of the bottom left of the printer.
2. Push the flipper door into the printer, and downward until it clicks into place.

Replacing the skirt cover

If you encounter a problem with the skirt cover, you can replace this part without a service call. Contact your IBM Service Representative for the correct skirt cover part number for your printer:

Follow these steps to remove the old skirt cover:
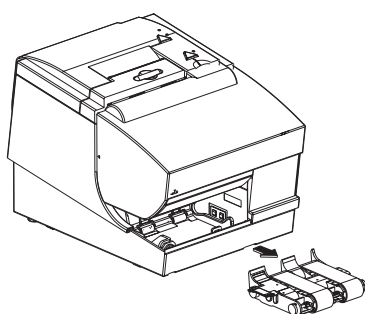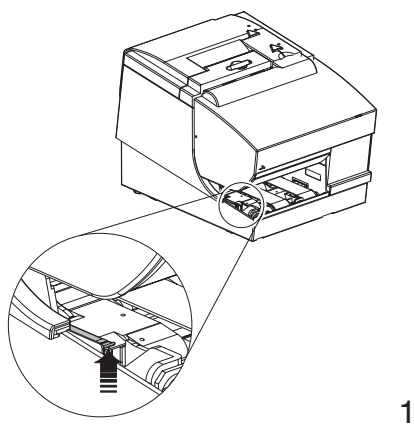1. Remove the flipper door. See "Replacing the flipper door (document insert cover)" on page 47.
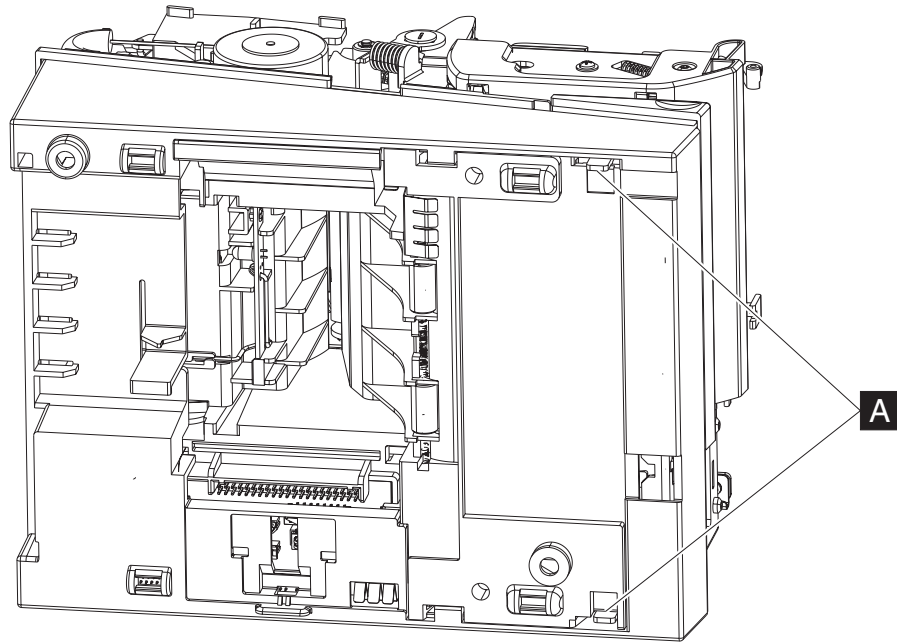
Figure 32. Removing the skirt cover

2. Remove the interface card as described in "Replacing the interface card" on page 44.

3. Turn the printer on one side. Insert the skirt cover, installing the rear of the cover first (see Figure 32).

To replace the new skirt cover:

1. Place the printer on the side and remove the interface card as described in "Replacing the interface card" on page 44.

2. Align the skirt cover with the bottom of the printer, installing the read of the cover first.

3. Push the cover onto the printer until it clicks into place.

4. Replace the interface card ad described in "Replacing the interface card" on page 44.

5. Remove the flipper door. See "Replacing the flipper door (document insert cover)" on page 47.

6. Turn the printer on one side. Press outward on the tabs (see Figure 32) on the bottom skirt cover and lift to remove.

Replacing the flipper cartridge

If you encounter a problem with the flipper cartridge, you can replace this part without a service call. Contact your IBM Service Representative for the correct flipper cartridge part number for your printer:

Follow these steps to remove the old flipper cartridge:

1

2

Figure 33. Removing the flipper cartridge

1. Remove the flipper door as described in "Replacing the flipper door (document insert cover)" on page 47.
2. Lift up the tab on the left side of the flipper cartridge (with a blue label), as shown in picture 1 of Figure 33.
3. Remove the check flipper cartridge from the printer, as shown in picture 2 of Figure 33.

To replace the new flipper cartridge:

1. Replace the check flipper cartridge from the printer, as shown in picture 2 of Figure 33.
2. Lift up the tab on the left side of the flipper cartridge (with a blue label), as shown in picture 1 of Figure 33.
3. Replace the flipper door as described in "Replacing the flipper door (document insert cover)" on page 47.

Removing the paper-out sensor assembly

If you encounter a problem with the paper-out sensor assembly, you can replace this part without a service call. Contact your IBM Service Representative for the correct paper-out sensor assembly part number for your printer:

Follow these steps to remove the old paper-out sensor assembly:

1. Open the paper door by pressing the blue release latch.
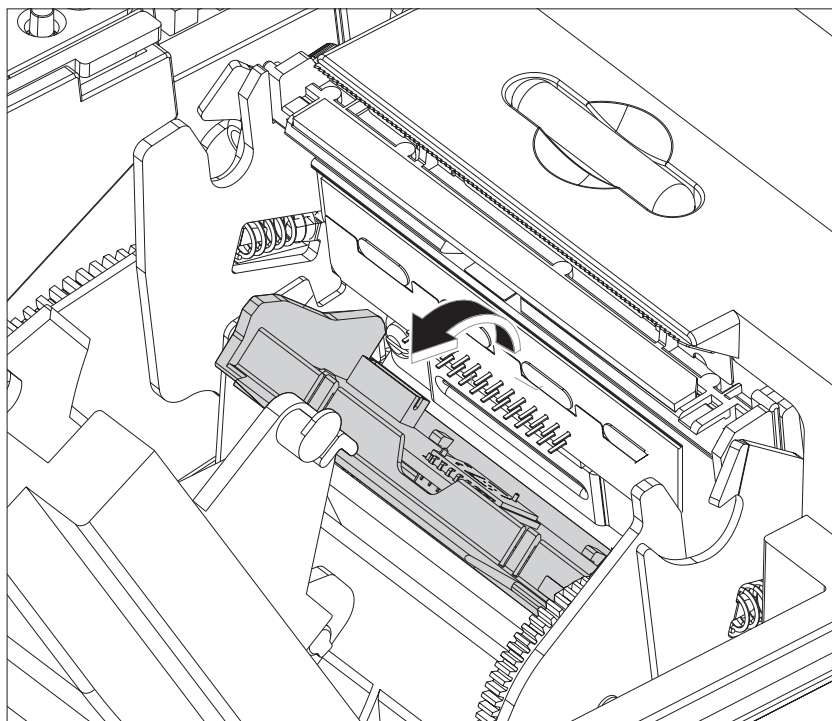
Figure 34. View with paper-out sensor assembly open

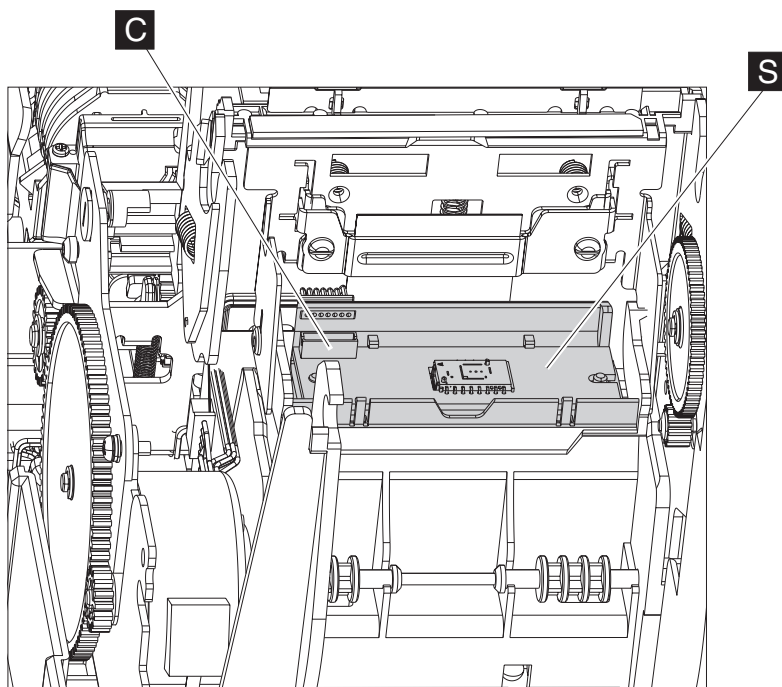2. Flip down the paper out sensor assembly cover. See Figure 34.

Figure 35. Removing the paper-out sensor assembly

3. As shown in Figure 35, push the paper-out sensor assembly (**S**) to the side and pull out the latch.
4. Unplug the cable from the paper-out sensor and remove. See location **C** .

To replace the paper-out sensor assembly:

1. Plug the cable into the paper-out sensor and insert the paper-out sensor. See location **C** .

2. Place the new paper-out sensor into the printer, and push to either side, aligning the paper-out sensor (**S** Figure 35 on page 51)with the open slots.

3. Once the paper-out sensor clicks into place, close the sensor assembly cover. See Figure 34 on page 51.

4. Close the paper door by pressing the blue release latch.

Appendix A. Product specifications

This section describes the Models 2CR and 2NR physical specifications, including the printer size, temperature guidelines, connector pin assignments, print dimensions, printer speed, printer acoustics, bar codes generated, and resident code pages.

Physical dimensions

Figure 36 describes the physical dimensions:
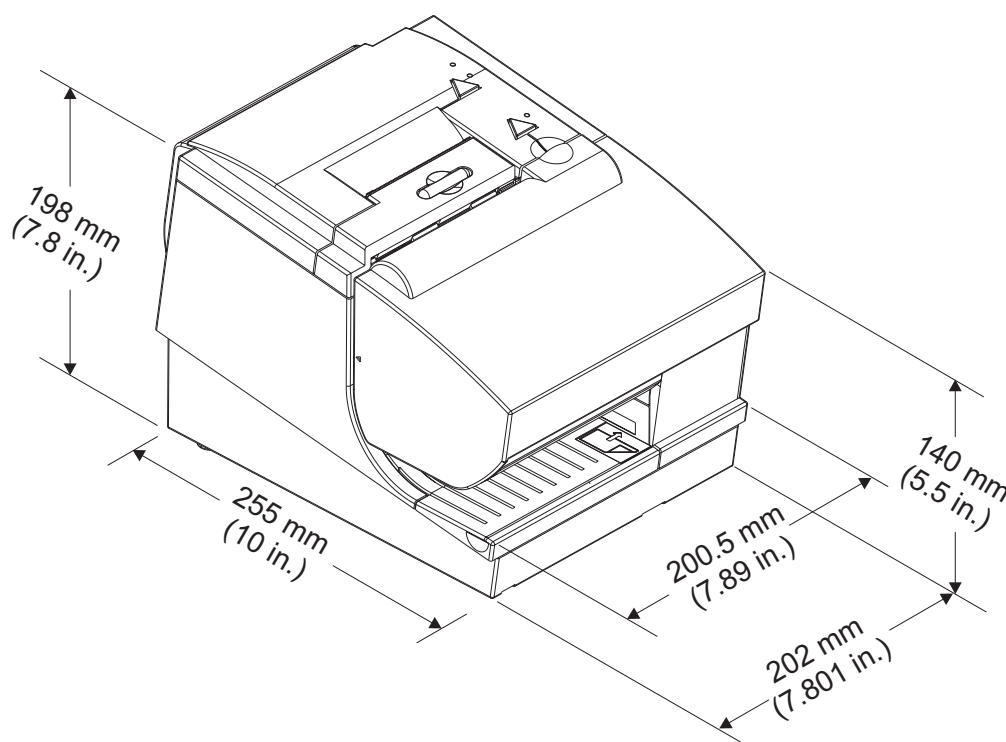
Figure 36. SureMark 4610 Models 2CR and 2NR dimensions

Table 15. Summary of dimensions

Width:	202 mm (7.801 in.) footprint
	200.5 mm (7.89") with overhanging edge
Height:	Front: 140 mm (5.5 in.)
	Rear: 198 mm (7.8 in.)
Depth:	277 mm (10.914 in.)
Weight:	4.8kg (10.582 lb)

Temperature and humidity limits

Extreme temperatures can impact the performance and durability of the Models 2CR and 2NR printers. The humidity and temperature limits for the Models 2CR and 2NR printers are:

Product specifications

Shipping	-40° to 60° C (-40° to 140° F) with 5% to 100% relative humidity including condensation, but excluding rain
Storage	0° to 60° C (32° to 140° F)
Operating	5° to 40° C (42.8° to 104° F) with 8% to 80% relative humidity

Printing width, speed, and acoustics

This section provides detailed specifications on the printer's speed, width, and the acoustics.

Print measurements

Table 16 summarizes the printer speed, paper size, and print area for each type of document that can be printed by the Models 2CR and 2NR:

Table 16. Station characteristics

Characteristic	Customer Receipt Station	Document Insert Station
Speed (see note following table)	80 lps	4.1 lps wide station 4.7 lps narrow station (8 lpi)
Paper Width	All models: 80 mm (3.54 in.)	
Print Width	34 characters at 12 cpi, 44 characters at 15 cpi, 48 characters at 17 cpi 57 characters at 20 cpi	37 characters at 12 cpi, 47 characters at 15 cpi, 52 characters at 17 cpi.
Pitch	12, 15, 17, 20 cpi	12, 15, 17 cpi

Note: To conserve power, the Models 2CR and 2NR reduce their throughput when printing high print densities, such as logo messages or full black lines. Because these types of print messages are used on a limited basis, the overall performance when printing a customer receipt is not noticeably affected.

The reduced print speed is based on the number of print dots that are turned on for a given print line, which is defined as dot utilization. Dot utilization is typically low for normal character printing and up to 100% for full black line printing. The SureMark printer operates at 80 lps at low dot utilization, and at slower speeds as the dot utilization increases.

Figure 37 and Figure 38 on page 55 show the printable area on an inserted document for both portrait and landscape.
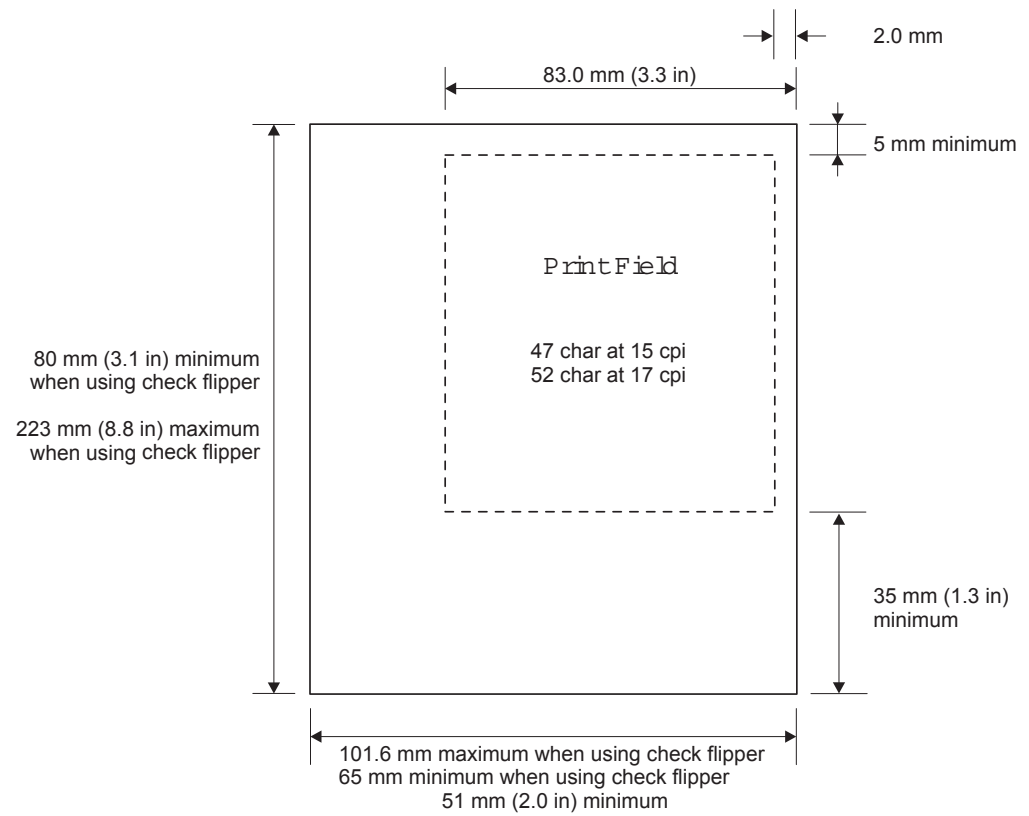
2.0 mm

83.0 mm (3.3 in)

5 mm minimum

PrintField

47 char at 15 cpi
52 char at 17 cpi

80 mm (3.1 in) minimum
when using check flipper

223 mm (8.8 in) maximum
when using check flipper

35 mm (1.3 in)
minimum

101.6 mm maximum when using check flipper
65 mm minimum when using check flipper
51 mm (2.0 in) minimum

Figure 37. Printable area of an inserted document (portrait)

17mm for landscape printing

83.0 mm (3.3 in)

10 mm minimum

Print Field

80 mm (3.1 in) minimum
when using check flipper

223 mm (8.8 in) maximum
when using check flipper

223 mm maximum
for landscape

38 mm (1.5 in)
minimum for landscape

101.6 mm maximum when using check flipper
65 mm minimum when using check flipper
51 mm (2.0 in) minimum
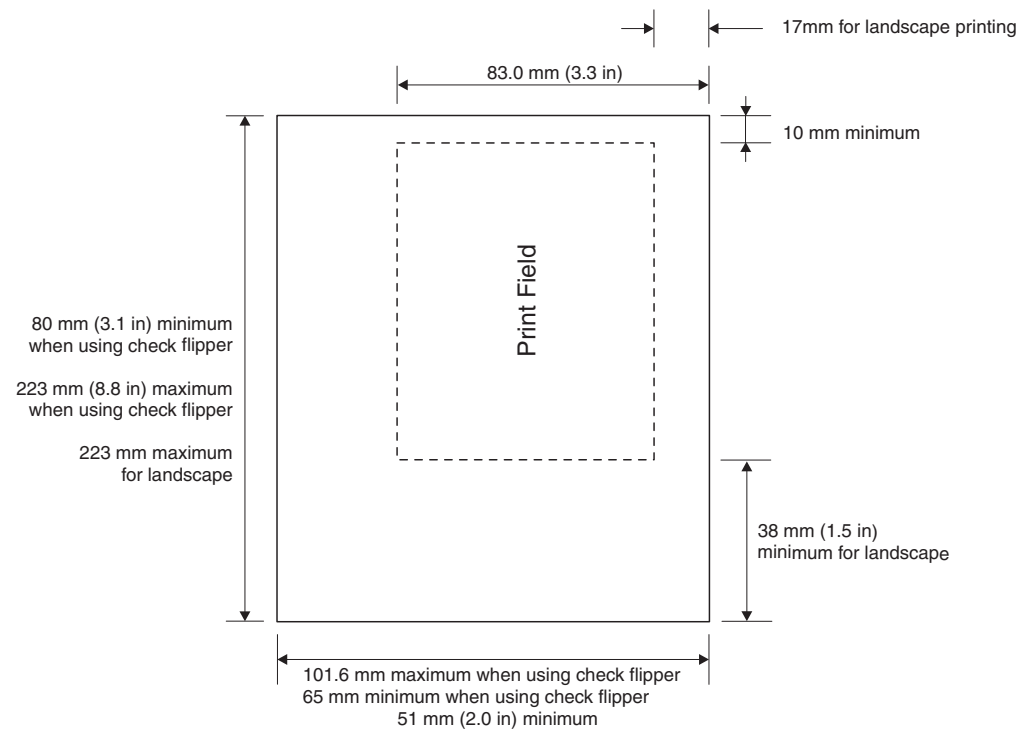
Figure 38. Printable area of an inserted document (landscape)

Product specifications

Printer acoustics

One of the key features of the Models 2CR and 2NR is the capacity to quietly print your documents. Table 17 summarizes the sound specifications for the Models 2CR and 2NR printers.

Table 17. Sound characteristics

Type	Description	LwAd		LpAm		<LpA>m	
		Operating (bels)	Idling (bels)	Operating (dB)	Idling (dB)	Operating (dB)	Idling (dB)
SureMark	Printer	5.7	N/A	61.5	N/A	47	N/A

Notes:

LwAd The declared upper limit of the sound power level for a random sample of machines.

LpAm The mean value of the A-weighted sound pressure levels at the operator position (if any) for a random sample of machines.

<LpA>m
The mean value of the A-weighted sound pressure levels at the one-meter (bystander) positions for a random sample of machines.

N/A Indicates *not applicable*.

All measurements were made in accordance with ISO 7779 and reported in conformance with ISO 9296.

Bar codes

With the 4610 SureMark printers, you can define and print bar codes on your customer receipts. The bar codes always print in black with thermal printing. You can generate bar codes with the following fonts:
- UPC A/E
- JAN 8 (EAN)
- JAN 13 (EAN)
- Code 39
- ITF
- Code 128 A, B, C
- Code 93
- Codabar
- PDF417

Appendix B. Safety information

⚠

Danger:

Before you begin to install this product, read the safety information in *IBM Safety Information — Read This First*, GA27-4004. This booklet describes safe procedures for cabling and plugging in electrical equipment.

⚠

Gevaar:

Voordat u begint met de installatie van dit produkt, moet u eerst de veiligheidsinstructies lezen in de brochure *Veiligheidsinstructies—Lees dit eerst*, GA27-4004. Hierin wordt beschreven hoe u electrische apparatuur op een veilige manier moet bekabelen en aansluiten.

⚠

Perigo:

Antes de começar a instalar este produto, leia as informações de segurança contidas em *Informações Sobre Seguranaça—Leia Isto Primeiro,* GA27-4004. Esse folheto descreve procedimentos de segurança para a instalação de cabos e conexões em equipamentos elétricos.

⚠

Fare!

Før du installerer dette produkt, skal du læse sikkerhedsforskrifterne i *Sikkerhedsforskrifter—Læs dette først* GA27-4004. Vejledningen beskriver den fremgangsmåde, du skal bruge ved tilslutning af kabler og udstyr.

```
     /!\
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     /!\
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     /!\
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     /!\
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> **Vigyázat**
>
> Mielôtt megkezdi a berendezés üzembe helyezését, olvassa el a *IBM Safety Information — Read This First*, GA27-4004 könyvecskében leírt biztonsági információkat. Ez a könyv leírja, milyen biztonsági intézkedéseket kell megtenni az elektromos berendezés huzalozásakor illetve csatlakoztatásakor.

> **Pericolo**
>
> prima di iniziare l'installazione di questo prodotto, leggere le informazioni relative alla sicurezza riportate nell'opuscolo *Informazioni di sicurezza—Prime informazioni da leggere* in cui sono descritte le procedure per il cablaggio ed il collegamento di apparecchiature elettriche.

> **Fare**
>
> Før du begynner å installere dette produktet, må du lese sikkerhetsinformasjonen i *Sikkerhetsinformasjon—Les dette først,* GA27-4004 som beskriver sikkerhetsrutinene for kabling og tilkobling av elektrisk utstyr.

> **Perigo**
>
> Antes de iniciar a instalação deste produto, leia as informações de segurança *Informações de Segurança—Leia Primeiro,* GA27-4004. Este documento descreve como efectuar, de um modo seguro, as ligações eléctricas dos equipamentos.

Peligro

Antes de empezar a instalar este producto, lea la información de seguridad en *Información de Seguridad—Lea Esto Primero,* GA27-4004. Este documento describe los procedimientos de sequridad para cablear y enchufar equipos eléctricos.

Varning—livsfara

Innan du börjar installera den här produkten bör du läsa säkerhetsinformationen i dikumentet *Säkerhetsföreskrifter—Läs detta först,* GA27-4004. Där beskrivs hur du på ett säkert sätt ansluter elektrisk utrustning.

危險：安裝本產品之前，請先閱讀
"IBM Safety Information--Read
This First" GA27-4004 手冊中所提
供的安全注意事項。 這本手冊將會說明
使用電器設備的纜線及電源的安全程序。

Opasnost: Prije nego sto pŏcnete sa instalacijom produkta,
pročitajte naputak o pravilima o sigurnom rukovanju u
Upozorenje: Pravila o sigurnom rukovanju - Prvo pročitaj ovo,
GA27-4004. Ovaj privitak opisuje sigurnosne postupke za
priključrivanje kabela i priključivanje na električno napajanje.

Upozornění: než zahájíte instalaci tohoto produktu, přečtěte si
nejprve bezpečnostní informace v pokynech „ Bezpečnostní
informace" č. GA27-4004. Tato brožurka popisuje bezpečnostní
opatření pro kabeláž a zapojení elektrického zařízení.

Κίνδυνος: Πριν ξεκινήσετε την εγκατάσταση αυτού του προϊόντος,
διαβάστε τις πληροφορίες ασφάλειας στο φυλλάδιο *IBM Safety
Information-Read this first*, GA27-4004. Στο φυλλάδιο αυτό
περιγράφονται οι ασφαλείς διαδικασίες για την καλωδίωση των
ηλεκτρικών συσκευών και τη σύνδεσή τους στην πρίζα.

危險： 導入作業を開始する前に、安全に関する
小冊子 GA27-4004 の「最初にお読みください」
(Read This First)の項をお読みください。
この小冊子は、電気機器の安全な配線と接続の
手順について説明しています。

위험: 이 제품을 설치하기 전에 반드시
"주의: 안전 정보-시작하기 전에"
(GA27-4004) 에 있는 안전 정보를
읽으십시오.

סכנה: לפני שמתחילים בהתקנת מוצר זה, יש לקרוא את הוראות הבטיחות בחוברת
Caution: Safety Information - Read This First, GA27-4004
חוברת זו מתארת את הוראות הבטיחות לחיבור הכבלים ולחיבור לחשמל של ציוד חשמלי.

خطــر: قبــل عمــلية بــدء تركيــب هذا المنتــج، قم بقراءة معلومــات
الحمــاية الموجودة في التحذيــر: معلومــات الحمــاية – Read This First،
GA27-4004 . يقــوم هذا الكتيــب بوصــف اجــراءات الآمــان
لتوصــيل الأدوات الكــهربائية بالكــابلات والمقبــس الكــهربائــي.

ОПАСНОСТ
Пред да почнете да го инсталирате овој продукт, прочитајте
ја информацијата за безбедност:
"Предупредување: Информација за безбедност: Прочитајте го
прво ова", GA27-4004.
Оваа брошура опишува безбедносни процедури за каблирање
и вклучување на електрична опрема.

Uwaga:
Przed rozpoczęciem instalacji produktu należy zapoznać się z instrukcją:
"IBM Safety Information - Read This First", GA27-4004.
Zawiera ona warunki bezpieczeństwa przy podłączaniu do sieci elektrycznej
i eksploatacji.

ОСТОРОЖНО: Прежде чем инсталлировать этот
продукт, прочтите Инструкцию по технике безо-
пасности в документе "Внимание: Инструкция по
технике безопасности -- Прочесть в первую очередь",
GA27-4004. В этой брошюре описаны безопас-
ные способы каблирования и подключения элект-
рического оборудования.

Nebezpečenstvo: Pred inštaláciou výrobku si prečítajte
bezpečnosté predpisy v
Výstraha: Bezpeč osté predpisy - Prečítaj ako prvé,
GA27-4004. V tejto brožúrke sú opísané bezpečnosté
postupy pre pripojenie elektrických zariadení.

Pozor: Preden zaènete z instalacijo tega produkta
preberite poglavje: 'Opozorilo: Informacije
o varnem rokovanju-preberi pred uporabo,"
GA27-4004. To poglavje opisuje pravilne
postopke za kabliranje,

危險：

開始安裝此產品之前，請先閱讀安全資訊。

注意：

請先閱讀 - 安全資訊 GA27-4004

此冊子說明插接電器設備之電纜線的安全程序。

危险：
在开始安装本产品之前，请阅读
IBM Safety Information - Read This First，
GA27-4004 中的安全信息。
此手册描述了如何安全地连接和插拔电气设备。

Appendix C. Notices

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Electronic emission notices

Federal Communications Commission (FCC) statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against iinterferencewith licensed communication equipment.

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

European Community contact:

IBM Technical Regulations
Pascalstr. 100, Stuttgart, Germany 70569
Telephone: 0049 (0)711 785 1176
Fax: 0049 785 1283
E-mail: tjahn@de.ibm.com

Industry Canada Class A Emission Compliance statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité aux normes d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Germany

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) vom 30. August 1995 (bzw. der EMC EG Richlinie 89/336).

Dieses Gerät ist berechtigt in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Konformitätserklärung nach Paragraph 5 des EMVG ist die

IBM Deutschland Informationssysteme GmbH, 70548 Stuttgart

Informationen in Hinsicht EMVG Paragraph 3 Abs. (2) 2:

Das Gerät erfüllt die Schutzanforderungen nach EN 50082–1 und EN 55022 Klasse A.

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:

"Warnung: dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen durchzuführen und dafür aufzukommen."

EN 50082–1 Hinweis:

"Wird dieses Gerät in einer industriellen Umgebung betrieben (wie in EN 50082–2 festgelegt), dann kann es dabei eventuell gestört werden. In solch einem Fall ist der Abstand bzw. die Abschirmung zu der industriellen Störquelle zu vergrößern."

Anmerkung:

Um die Einhaltung des EMVG sicherzustellen sind die Geräte, wie in den IBM Handbüchern angegeben, zu installieren und zu betreiben.

Australia and New Zealand

Attention: This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

Chinese Class A warning statement

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

中华人民共和国"A类"警告声明

声 明
此为 A 级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

Japanese power line harmonics compliance statement

高調波ガイドライン適合品

高調波ガイドライン適合品

Japanese Voluntary Control Council for Interference (VCCI) statement

Attention: This product is a Class A Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Technology Equipment (VCCI). In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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Korean communications statement

Please note that this device has been approved for business purposes with regard to electromagnetic interference. If you find this is not suitable for your use, you may exchange it for a non-business purpose one.

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Taiwanese Class A warning statement

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Taiwan contact information

台灣IBM 產品服務聯絡方式：
台灣國際商業機器股份有限公司
台北市松仁路7號3樓
電話：0800-016-888

IBM Taiwan Product Service Contact Info:
IBM Taiwan Corporation
3F, No 7, Song Ren Road, Taipei Taiwan
Telephone: 0800-016-888

Cable ferrite requirement

All cable ferrites are required to suppress radiated EMI emissions and must not be removed.

Electrostatic Discharge (ESD)

Attention: ESD damage can occur when there is a difference in charge between the part, the product, and the service person. No damage will occur if the service person and the part being installed are at the same charge level.

ESD Damage Prevention

Anytime a service action involves physical contact with logic cards, modules, back-panel pins, or other ESD sensitive (ESDS) parts, the service person must be connected to an ESD common ground point on the product through the ESD wrist strap and cord.

The ESD ground clip can be attached to any frame ground, ground braid, green wire ground, or the round ground prong on the AC power plug. Coax or connector outside shells can also be used.

Handling Removed Cards

Logic cards removed from a product should be placed in ESD protective containers. No other object should be allowed inside the ESD container with the logic card. Attach tags or reports that must accompany the card to the outside of the container.

Product Recycling and disposal

This unit must be recycled or discarded according to applicable local and national regulations. IBM encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. IBM offers a variety of product return programs and services in several countries to assist equipment owners in recycling their IT products. Information on IBM product recycling offerings can be found on IBM's Internet site at http://www.ibm.com/ibm/environment/products/prp.shtml.

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In accordance with the European WEEE Directive, electrical and electronic equipment (EEE) is to be collected separately and to be reused, recycled, or recovered at end of life. Users of EEE with the WEEE marking per Annex IV of the

WEEE Directive, as shown above, must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and recovery of WEEE. Customer participation is important to minimize any potential effects of EEE on the environment and human health due to the potential presence of hazardous substances in EEE. For proper collection and treatment, contact your local IBM representative.

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SureMark 4610 Printers
User's Guide for Models 2CR and 2NR

Publication No. GA27-5003-01

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