

4610 SureMark Printer

User's Guide

IBM Retail Stores Solutions, Raleigh

**4610 Windows Printer Driver
Version 1.08**

August 18, 2004

Retail Stores Solutions
Raleigh, North Carolina

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It is the responsibility of the user to ensure that they have the current version. Any outdated hard copy is invalid and must be removed from possible use. It is also the responsibility of the user to ensure the completeness of this document prior to use.

This document describes the technical aspects of the high level design

Preface

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1 Printers

The following printers will be supported:

PPM	Model	Printer Name
N/A	4610 TI3	IBM 4610 TI3
N/A	4610 TI4	IBM 4610 TI4
N/A	4610 TI5	IBM 4610 TI5
N/A	4610 TI8	IBM 4610 TI8
N/A	4610 TM6	IBM 4610 TM6
N/A	4610 TF6	IBM 4610 TF6
N/A	4610 TM7	IBM 4610 TM7
N/A	4610 TF7	IBM 4610 TF7

2 Printer Features

Printer Features are Standard and are shipped with the printer by default. Standard features are always present (depending on the specified model).

2.1 Paper Sizes

The following paper sizes represent the dimension of a single page and these dimensions are required by any Windows application that supports printing (for formatting the documents).

Paper size	4610 TI3	4610 TI4	4610 TI5	4610 TI8	4610 TM6	4610 TM7	Comments
58 x 297 mm	No	No	No	No	Yes	Yes	Customer Receipt Station
58 x 3276 mm	No	No	No	No	Yes	Yes	Customer Receipt Station
80 x 297 mm	Yes	Yes	Yes	Yes	Yes	Yes	Default. Customer Receipt Station
80 x 3276 mm	Yes	Yes	Yes	Yes	Yes	Yes	Customer Receipt Station
48 x 274 mm	Yes	Yes	Yes	Yes	No	No	Document Station only
85.7 x 274 mm	Yes	Yes	Yes	Yes	No	No	Document Station only

2.2 Output Trays

Output trays	4610 TI3	4610 TI4	4610 TI5	4610 TI8	4610 TM6	4610 TM7	Comments
Customer Receipt	Yes	Yes	Yes	Yes	Yes	Yes	Default. Standard
Document	Yes	Yes	Yes	Yes	No	No	

2.3 Resident Fonts

Font Name	Comments
Codabar	Bar code font
Code 128ABC	Bar code font
Code 128C	Bar code font
Code 39	Bar code font
Code 93	Bar code font
control	Control font For more information see the table below
Font A	Resident character set. Cash Receipt and Document Station
Font A Width X 2	Resident character set. Cash Receipt and Document Station
Font B	Resident character set. Cash Receipt and Document Station
Font B Width X 2	Resident character set. Cash Receipt and Document Station
Font C	Resident character set. Cash Receipt Station only
Font C Width X 2	Resident character set. Cash Receipt Station only
ITF	Bar code font
JAN13 (EAN-13)	Bar code font
JAN8 (EAN-8)	Bar code font

PDF417	Bar code font. Cash Receipt Station only
UPC-A	Bar code font
UPC-E	Bar code font
TrueType user-defined font 1	User-defined character set, proportional font slot 1 Cash Receipt Station only Downloaded from Fonts Page
TrueType user-defined font 2	User-defined character set, proportional font slot 2 Cash Receipt Station only Downloaded from Fonts Page

Control font mapping table (ASCII code -> command)

ASCII code	Command
2	Print to Receipt Station
4	Print to Impact Station – Portrait
8	Print to Impact Station – Landscape
a	Open Drawer 2 (50ms drive pulse width)
b	Open Drawer 2 (100ms drive pulse width)
c	Open Drawer 2 (150ms drive pulse width)
d	Open Drawer 2 (200ms drive pulse width)
e	Open Drawer 2 (250ms drive pulse width)
f	Cut Receipt
g	Cut Receipt
h	Flip Check
p	HRI characters are not added to barcode
q	HRI characters are added at the top of the bar code using Font B
r	HRI characters are added at the bottom of the bar code using Font B
s	HRI characters are added at the top of the bar code using Font A
t	HRI characters are added at the bottom of the bar code using Font A
w	Text is aligned left
x	Text is aligned centered
y	Text is aligned right
A	Open Drawer 1 (50ms drive pulse width)
B	Open Drawer 1 (100ms drive pulse width)
C	Open Drawer 1 (150ms drive pulse width)
D	Open Drawer 1 (200ms drive pulse width)
E	Open Drawer 1 (250ms drive pulse width)
F	Cut Receipt
G	Print predefined graphics (logo) #1 Normal Mode
H	Print predefined graphics (logo) #2 Normal Mode
I	Print predefined graphics (logo) #3 Normal Mode
J	Print predefined graphics (logo) #4 Normal Mode
K	Print predefined graphics (logo) #5 Normal Mode
P	Cut Receipt
[Print predefined graphics (logo) #1 in Double Height Double Wide Mode
]	Print predefined graphics (logo) #2 in Double Height Double Wide Mode
^	Print predefined graphics (logo) #3 in Double Height Double Wide Mode
_	Print predefined graphics (logo) #4 in Double Height Double Wide Mode
`	Print predefined graphics (logo) #5 in Double Height Double Wide Mode

2.4 Miscellaneous

2.4.1 Resolution


Resolution	4610 TI3	4610 TI4	4610 TI5	4610 TI8	4610 TM6	4610 TM7	Comments
120 dpi	Yes	Yes	Yes	Yes	No	No	Document Station only
150 dpi	Yes	Yes	Yes	Yes	No	No	Document Station only
200 dpi	Yes	Yes	Yes	Yes	Yes	Yes	Default Customer Receipt Station

2.4.2 Print Quality


Print Quality	4610 TI3	4610 TI4	4610 TI5	4610 TI8	4610 TM6	4610 TM7	Comments
Low Quality Print Mode	Yes	Yes	Yes	Yes	Yes	Yes	Default
High Quality Print Mode	Yes	Yes	Yes	Yes	Yes	Yes	

2.5 Printer Graphics

2.5.1 4610 TI3, TI4, TI5 and TI8 (4610 dual station printers)

Graphic	Comment
	Base Printer

2.5.2 4610 TM6/TF6 and TM7/TF7 (4610 single station printers)

Graphic	Comment
	Base Printer

2.6 Plug and Play ID

Dummy plug and play ID is used (since the 4610 printers do not have a parallel port):

Printer	PPM	Plug and Play ID
4610	N/A	LPTENUM\IBM46100000

3 Datastream Commands

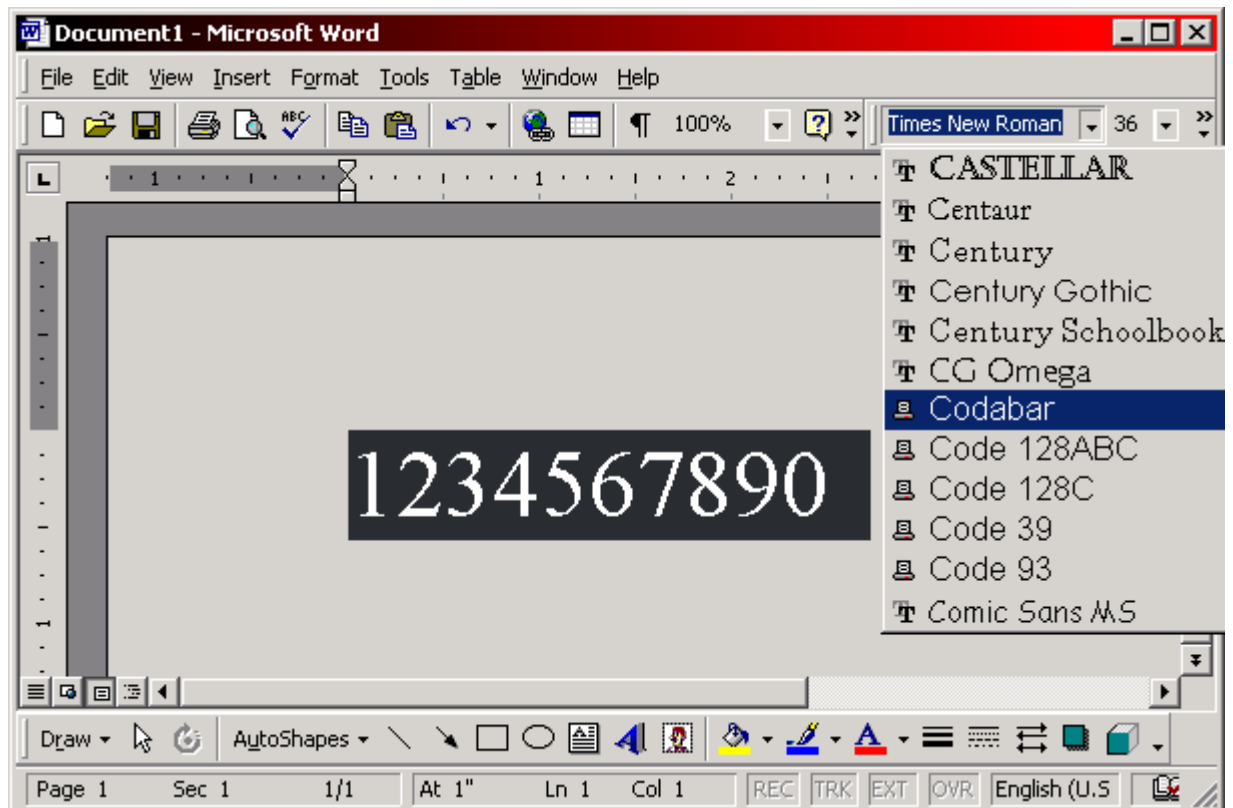
3.1 Printing Offset

The guaranteed printable area for all paper sizes is with approximation a 1/8th of an inch. We have determined the following values that actually work in this Windows Printer Driver:

Paper size	Portrait		Landscape	
	X (mm)	Y (mm)	X (mm)	Y (mm)
Receipt 58 x 297 mm	4	3	--	--
Receipt 58 x 3276 mm	4	3	--	--
Receipt 80 x 297 mm	4	4	--	--
Receipt 80 x 3276 mm	4	4	--	--
Document 48 x 274 mm	2	2	2	2
Document 85.7 x 274 mm	2	2	2	2

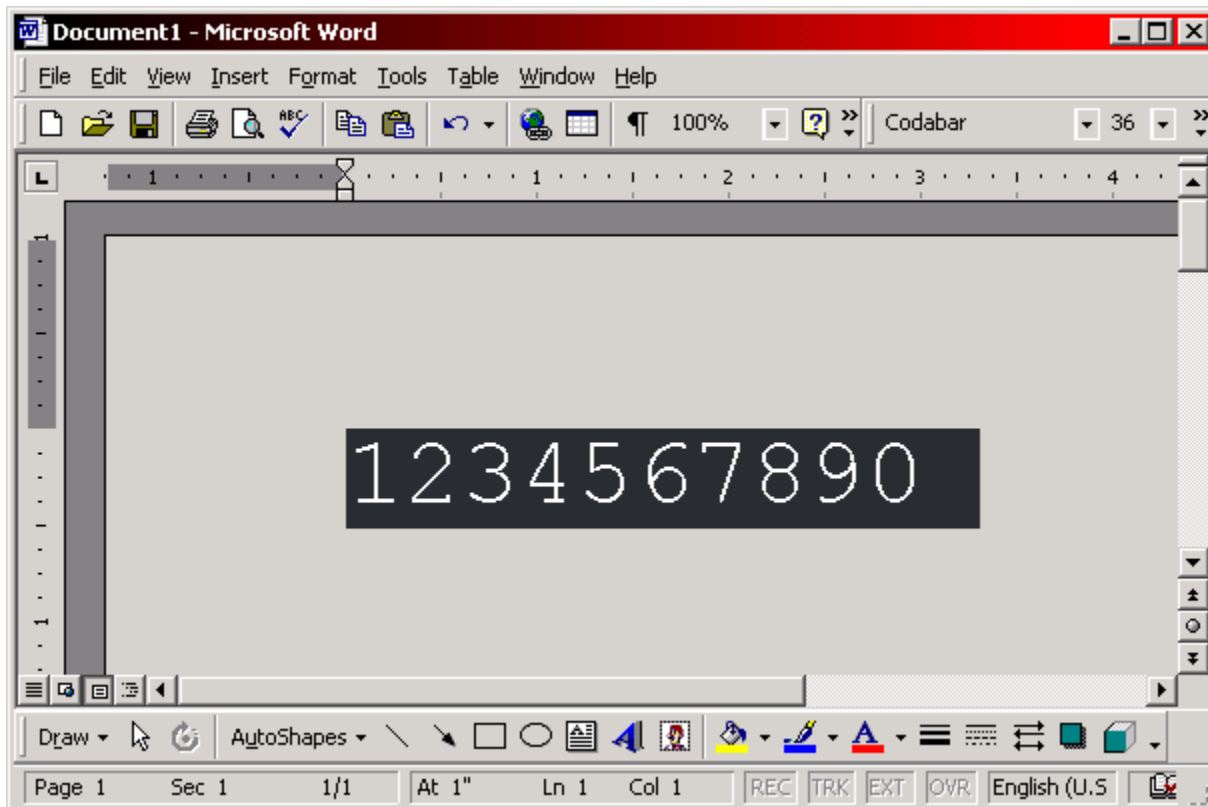
Note 1: For printing Bar Codes using 4610 printers, do as follows:

- 1) The user edits a document (MS Word, Notepad, WordPad etc.) that contains the desired string as barcode, using one of the Bar Code Fonts. The Bar Code fonts appear as resident fonts of the 4610 Printer Driver in the fonts combo box with a distinct icon:



The 4610 Printer Driver resident fonts are present in the fonts combo box only when the current 4610 Printer Driver is the default printer driver on the system.

Selecting one of the Bar Code fonts (for example CODABAR), the edited string will be formatted on display using CODABAR font metrics (dummy metrics).



- 2) The user can set Bar Code aspect ratio and other settings using Document Properties: Setup page. The user prints the document, using File -> Print command. The 4610 Printer Driver will receive from application the edited text and the font used to edit it.
- 3) If "Use application settings" is selected, the 4610 Printer Driver will generate Bar Code commands according to Bar Code font used to edit the text.
- 4) Otherwise, the 4610 Printer Driver will generate Bar Code commands according to Bar Code settings from Setup page, including Bar Code type.

Note 2: The default resident font on the 4610 printers will be Font B rather than Font A. The 4610 Windows Printer Driver will be responsible to verify if the default resident font is Font B, before each job.

4 NLS Considerations

4.1 Languages

Languages	3 letter code	2 letter code
English	ENU	EN

4.2 NLS Support

Operating System	Data Streams	Languages
Windows 2000	RS-232 and RS-485	English
Windows XP Professional	RS-232 and RS-485	English

4.3 Terminology

Terms:	Preferred string:	Alternate string:
Paper Sizes:		
Receipt 58 x 297 mm	Receipt 58 x 297 mm	58 x 297 mm
Receipt 58 x 3276 mm	Receipt 58 x 3276 mm	58 x 3276 mm
Receipt 80 x 297 mm	Receipt 80 x 297 mm	80 x 297 mm
Receipt 80 x 3276 mm	Receipt 80 x 3276 mm	80 x 3276 mm
Document 48 x 274 mm	Document 48 x 274 mm	48 x 274 mm
Document 85.7 x 274 mm	Document 85.7 x 274 mm	85.7 x 274 mm
Print Station:		
Cash Receipt	Cash Receipt	Receipt
Document	Document	
Orientation:		
Portrait	Portrait	
Landscape	Landscape	

5 GUI Layouts

In both the Printer Properties and the Printing Preferences notebooks there are two types of pages:

- 1) Those supplied by the Operating System that cannot be modified by our driver:

General
Sharing
Ports
Advanced
Color Management
Security

- 2) Those supplied by our driver that we have complete control over:

Setup
Options
Document Header and Footer

These pages can be accessed like this:

- Start -> Settings -> Control Panel -> Printers -> right click on <printer_name> -> Printing Preferences...
- Start -> Settings -> Control Panel -> Printers -> right click on <printer_name> -> Properties -> on General Tab push Printing Preferences... button
- Start -> Settings -> Control Panel -> Printers -> right click on <printer_name> -> Properties -> on Advanced tab push Printing Defaults... button
- Any Windows Application that supports printing -> **File** menu -> **Print...** -> push **Properties** button or the **Setup** page is already displayed like a tab in the **Print** property sheet

MS Word: **File** menu -> **Print...** -> select the printer -> push **Properties** button

Notepad or WordPad: **File** menu -> **Print...** -> the **Setup** page will be displayed like a tab in the **Print** property sheet.

Logos, Messages, Firmware
Fonts

These pages can be accessed like this:

- Start -> Settings -> Control Panel -> Printers -> right click on <printer_name> -> Properties

5.1 Property Pages

5.1.1 Printer Properties Notebook: Logos, Messages, Firmware Page

The **Logos, Messages, Firmware** page allows the user to know what logos and messages are already downloaded to the printer and to manage them (adding and deleting).

The **Logos, Messages, Firmware** page will look like:

The screenshot shows a window titled "Logos, Messages, Firmware". It has three main sections:

- Logos:** A table with columns "Logo #", "Status", and "Action".

Logo #1	Used (Document station)	▲
Logo #2	Used (Cash Receipt station)	■
Logo #3	Used (Cash Receipt station)	■
Logo #4	Not Used	▼

 To the right is a preview of the IBM logo. Below the table are "Add logo..." and "Delete" buttons.
- Messages:** A table with columns "Message #", "Status", and "Action".

Message #1	Used	▲
Message #2	Used	■
Message #3	Not Used	■
Message #4	Not Used	▼

 To the right is a text input field labeled "message_text" with up/down arrows. Below are "Add message" and "Delete" buttons.
- Update firmware:** A text input field containing "C:\4610firmware_v1.1.hex", a "Browse..." button, and an "Update..." button.

At the bottom, it says "Printer connected" and "Model: XYZ" with an "About..." button.

Label	Default	Type	Tab	Group
Logos, Messages, Firmware	N/A	Title	Yes	Page
<u>Logos</u>	Focus See below	List	1	No
<i>Logo graphic</i>	See below	Graphic object	No	No
Add logo...	N/A See below	Push button	2	1.1
Dele <u>t</u> e	N/A See below	Push button	3	1.2
<u>M</u> essages	See below	List	4	No
<i>message_text</i>	Empty Read only	Edit box	5	No
Add me <u>s</u> sage	N/A	Push button	6	2.1
Dele <u>t</u> e	N/A	Push button	7	2.2

	See below			
Update <u>F</u> irmware	Empty Read only	Edit box	8	No
<u>B</u> rowse...	N/A	Push button	9	No
<u>U</u> ppdate...	Disabled See below	Push button	10	No
<i>Printer connection status</i>	See below	Static text	No	No
<u>A</u> bout...	N/A	Push button	11	No

Logo Graphic Details:

- This graphic dynamically reflects the selected logo on the Logos list.

Logos Details:

- Lists the logos currently downloaded on the printer. This list contains exactly 40 items (rows). This means that the printer has only 40 positions available in the memory for user-defined logos for Document Station and for Cash Receipt Station. If the second column of this list contains the string “Used (Cash Receipt Station)” or “Used (Document Station)”, this means that the selected logo is downloaded to the printer and ready to be used in the specified station (Document Station or Cash Receipt Station). This logo – station dependency exist because the logos should be encoded according to selected output station. If the second column contains the string “Not Used”, this means that this logo position in the printer’s memory is available.

Messages Details:

- Lists the messages currently downloaded on the printer. This list contains exactly 25 items (rows). This means that the printer has only 25 positions available in the memory for user-defined messages. If the second column of this list contains the string “Used”, this means that the selected message is downloaded to the printer and ready to be used. If the second column contains the string “Not Used”, this means that this message position in the printer’s memory is available.

Printer Connection Status Details:

- If an IBM 4610 printing device is properly connected and is one of the supported models (TI3, TI4, TI5, TI8, TM6 or TM7)
 - If the port of the current Printer Driver is not FILE:
 - Printer Connection Status text will be:
Printer connected
Model: XYZ
where XYZ is the model of the connected printer
 - Otherwise, the Printer Connection Status text will be:
No printer connected
 - Otherwise, the Printer Connection Status text will be:
No printer connected

When this page is first displayed:

- The first item in the **Logos** list is selected (if there is a known 4610 printer connected)
- The first item in the **Messages** list is selected (if there is a known 4610 printer connected)
- If there is a known 4610 printer connected on the PC and the printer has a firmware installed, the **Logos** list and the **Messages** list will contain the logos and messages of the connected printer (identified by his unique printer identifier (MCT location 0x60 - -x63) and check sum of logos and messages sectors). If the check sum of the logos sector and/or messages sector does not match all the logos and/or messages will be erased from printer and the **Logos** and **Messages** lists will be emptied

The **Printer Connection Status** text will be:

Printer connected

Model XYZ

where XYZ is the model of the connected printer

- If there is a known 4610 printer connected on the PC, but the printer don't have a firmware installed, the **Logos** list and **Messages** list will be emptied and all the controls on this page will be disabled, except for the update firmware related controls and **About...** button, and the **Printer Connection Status** text will be:

Printer connected

Model XYZ No firmware installed

- If there is no known 4610 printer connected on the PC, the **Logos** list and **Messages** list will be emptied and all the controls on this page will be disabled, except **About...** button, and the **Printer Connection Status** text will be:

No printer connected

5.1.2 Printer Properties Notebook: Fonts Page

The **Fonts** page allows the user to know what logos and messages are already downloaded to the printer and to manage them (adding and deleting).

The **Fonts** page will look like:

Label	Default	Type	Tab	Group
Fonts	N/A	Title	Yes	Page
Cash Receipt station	N/A	Static text	No	No
Font 1:	Focus Empty Read only	Edit box	1	No
Select...	N/A	Push button	2	No
Font 2:	Empty Read only	Edit box	3	No
Select...	N/A	Push button	4	No

When this page is first displayed:

- If there is a known 4610 printer connected on the PC, the **Font 1:** and **Font 2:** edit boxes will contain the currently downloaded TrueType fonts to the connected printer (identified by his unique printer identifier (MCT location 0x60 - -x63) and check sum of thermal user-defined fonts sector)
- If there is no known 4610 printer connected on the PC, the **Font 1:** and **Font 2:** edit boxes will be emptied and all the controls on this page will be disabled (except **Cash Receipt station** static text)

Note (known limitation):

The downloaded user-defined TrueType fonts will appear in any Windows application that deals with device fonts in the fonts drop down list with the named formed as described above (<font_name> **Npts**< Bold><Italic>). Also the font size drop down list will display only the selected size when the TrueType font was downloaded (**M**).

When the user edits text using one of the user-defined TrueType fonts the screen image of the text may not match the screen image of the same text edited using the original TrueType font, because the font metrics provided by 4610 Printer Driver for user-defined TrueType fonts can only contain integer rounded values with no decimals, during to a Windows limitation.

5.1.3 Printing Preferences Notebook: Setup Page

The Setup Page will provide the user the possibility to set the output station, paper size and orientation and barcode type and size.

The Setup Page will look like (when the selected type of the bar code is other than PDF417):

Setup

Output

Print station: Cash Receipt ▼

Paper

Size: Receipt 80 x 297 mm ▼

Orientation: Portrait Landscape

Bar Code

Type: CODABAR ▼

Width ratio: 3 ▼ Height: 162 ◊ dots

HRI position: Not printed ▼

About...

The Setup Page will look like (when the selected type of the bar code is PDF417):

Setup

Output

Print station: Cash Receipt ▼

Paper

Size: Receipt 80 x 297 mm ▼

Orientation: Portrait Landscape

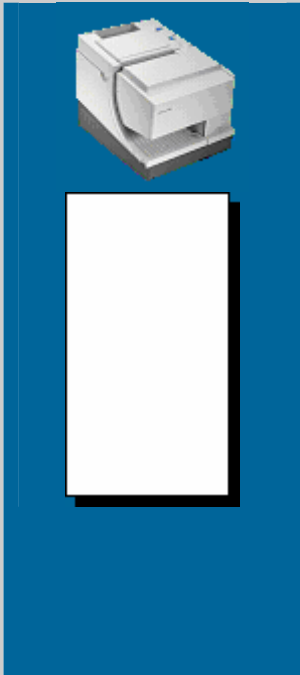
Bar Code

Type: PDF417 ▼

Width ratio: 2 ▼ Height ratio: 1 ▼

Enable truncation

About...



Control	Default	Type	Tab	Group
Setup	N/A	Title	Yes	Page
Output	N/A	Static text	No	No
Print Station:	Focus See below	Drop list	1	No
<i>Print station graphic</i>	See below	Graphic object	No	No
Paper	N/A	Static text	No	No
Size:	Receipt 80 x 297 mm See below	Drop list	2	No
Orientation:	N/A See below	Static text	No	No
Portrait	Checked Disabled	Radio button	3	1.1
Landscape	Unchecked Disabled	Radio button	No	1.2
<i>paper graphic</i>	See the 6.1.5 Printing Preferences Notebook, Document Header and Footer Page at the paper graphic details section	Graphic object	No	No
Bar Code	N/A	Static text	No	No
Type:	Use application settings See below	Drop list	4	No
Width ratio:	3 or 2 See below	Drop list	5	No
Height:	162 See below	Spin box	6	No
Dots	N/A	Static text	No	No
Height ratio:	1 See below	Drop list	6	No
HR _I position	Not printed See below	Drop list	7	No
Enable truncation	Unchecked	Check box	7	No
About...	N/A	Push button	8	No

Print Station details:

- This combo box will contain the following strings: “Cash Receipt” and “Document”
- When a connection status change occurs, this combo box will be reinitialized and reset to default

Print Station graphic details:

- This graphic represents the 4610 printers with highlighted output (depends on selection of **Print Station** combo box). Highlighting the print station is programmatically. The printer graphic depends on the model of the printer that is currently connected. If no printer is connected, the default printer graphic is the printer graphic that represents the 4610 dual station printers. For more details about printer graphics see **2.4 Printer Graphics**.

Paper and Orientation:

- When the Setup Page is opened from Printer Server (Printers Folder), the Paper and Orientation settings are the default settings (global settings) for the current printer, otherwise the Paper and Orientation are temporary settings for the current document and will not be saved as global settings.

Type details:

- Contains the list of all bar code types supported on the current printer.

Bar code type	Text	Comment
(application provided)	Use application settings	The application used for editing the document will provide the bar code type
UPC-A	UPC-A	Ignores the application settings
UPC-E	UPC-E	Ignores the application settings
JAN13 (EAN-13)	JAN13 (EAN-13)	Ignores the application settings
JAN8 (EAN-8)	JAN8 (EAN-8)	Ignores the application settings
CODE 39	CODE 39	Ignores the application settings
ITF	ITF	Ignores the application settings
CODABAR	CODABAR	Ignores the application settings
CODE 128C	CODE 128C	Ignores the application settings
CODE 93	CODE 93	Ignores the application settings
CODE 128 ABC	CODE 128 ABC	Supported only in models: T13, T14, TM6 Ignores the application settings
PDF417	PDF417	This item is present in the list if the user selected “Cash Receipt” in the Print Station combo box from Setup Page Ignores the application settings

- If no printer is connected, this list will contain all the bar code types for the default printer model (T13, T14, T15, T18): UPC-A, UPC-E, JAN13 (EAN-13), JAN8 (EAN-8), CODE 39, ITF, CODABAR, CODE128C, CODE 93, CODE128ABC and PDF417
- If “Use application settings” is selected, the Printer Driver will generate the bar code commands for the bar code type specified by application used for editing the document, otherwise, if there is a bar code text in the document, the Printer Driver will generate bar code commands using the Setup Page settings for bar code (type, layout etc.)

Width ratio details:

- If the selected bar code type differs from PDF417, the **Width ratio** combo box will contain the following strings: “2”, “3” and “4”. In this case the default width ratio is “3”

- Otherwise the **Width ratio** combo box will contain the following strings: “1”, “2”, “3”, “4”, “5”, “6”, “7”, “8” and “9”. In this case the default width ratio is “2”

Height details:

- The **Height** spin box will contain the numbers from 1 to 255 that represents the height of bar code in dots. The default height value is 162 dots

Human readable info position details:

- The position of the human readable information can be:

HRI position	Comment
Not printed	The HRI will not be present on the printout
Above the bar code	
Below the bar code	
Both above and below the bar code	

Height ratio details:

- The **Height ratio** combo box will contain the following strings: “1”, “2”, “3”, “4”, “5”, “6”, “7”, “8” and “9”. The default height ratio is “1”

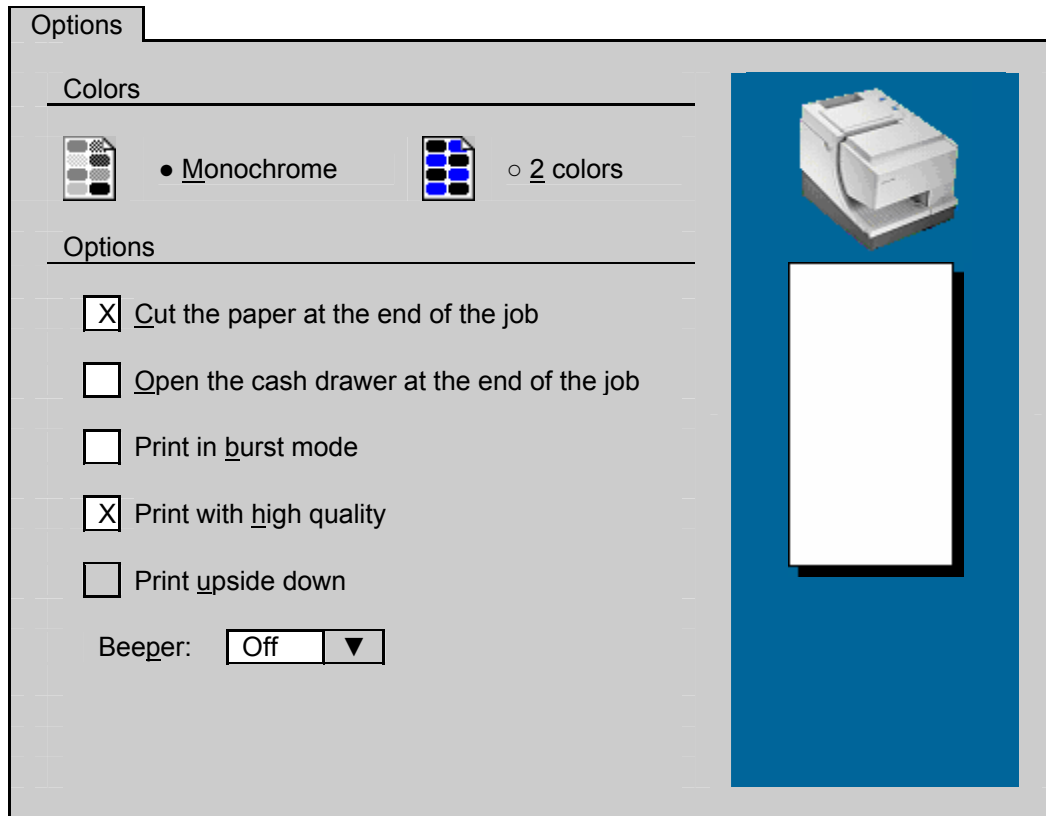
When this page is first displayed:

- If there is no 4610 printer connected, the Setup page will be filled with data like when a 4610 dual station printer is connected (TI3, TI4, TI5, TI8)

5.1.4 Printing Preferences Notebook: Options Page

The Options Page will let the user to set the colors and some 4610 printer specific features.

The Options Page will look like:



Control	Default	Type	Tab	Group
Options	N/A	Title	Yes	Page
Colors	N/A	Static text	No	No
<i>monochrome graphic</i>	N/A	Graphic object	No	No
<u>M</u> onochrome	Focus Checked See below	Radio button	1	1.1
<i>2colors graphic</i>	N/A	Graphic object	No	No
<u>2</u> colors	Unchecked See below	Radio button	No	1.2
Options	N/A	Static text		
<u>C</u> ut the paper at the end of the job	Checked See below	Check box	2	No
<u>O</u> pen the cash drawer at the end of	Unchecked	Check box	3	No

the job				
Print in <u>b</u> urst mode	Unchecked	Check box	4	No
Print with <u>h</u> igh quality	Checked	Check box	5	No
Print <u>u</u> pside down	Unchecked	Check box	6	No
Beeper:	Off See below	Combo box	7	No
<i>paper graphic</i>	See the 6.1.5 Printing Preferences Notebook, Document Header and Footer Page at the paper graphic details section	Graphic object	No	No

Monochrome and 2 colors details:

- If the currently connected printer supports 2 color printing the **Monochrome and 2 colors** radio buttons will be enabled
- Otherwise (including the case when there is no printer connected) the **Monochrome** radio button will be checked and these two radio buttons will be disabled

Cut the paper at the end of job details:

- If the user selected "Cash Receipt" in **Print Station** combo box from Setup Page, the label of this check box will be **Cut the paper at the end of job**
- Otherwise the label of this check box will be **Eject document at the end of job**

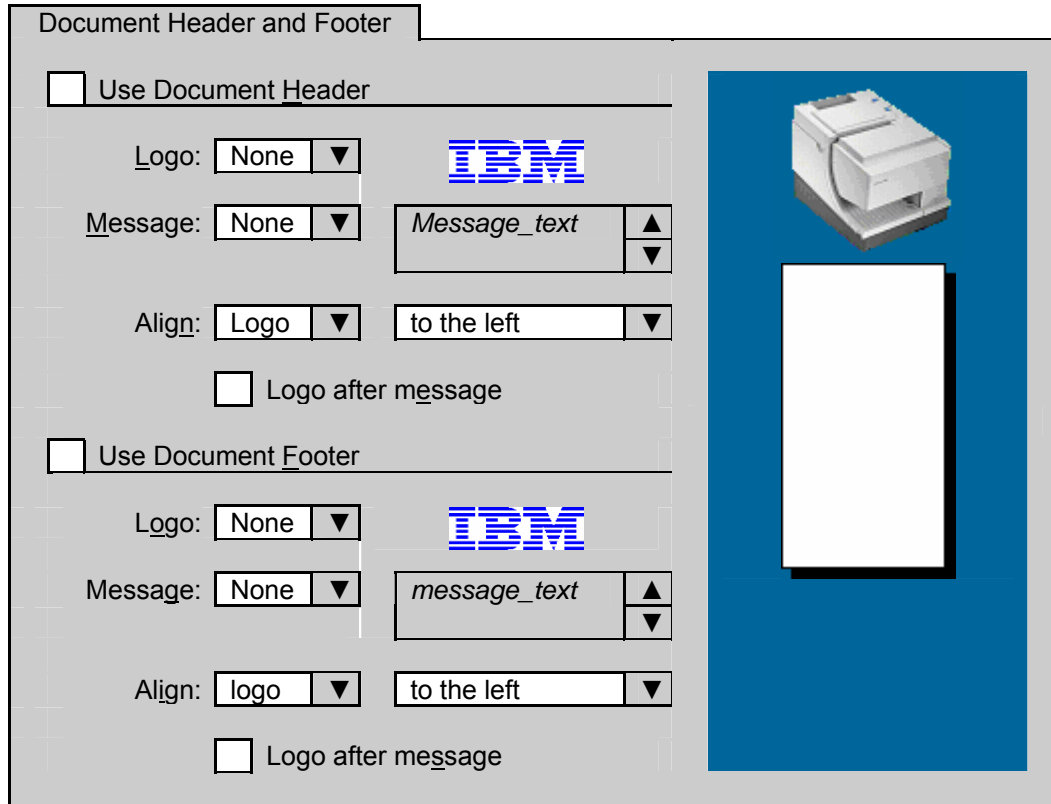
Beeper details:

- If the connected printer model is TM6 or TF6 the **Beeper** combo box will be enabled
- Otherwise (including the case when there is no printer connected) **Beeper** combo box will be disabled and the item "Off" selected

5.1.5 Printing Preferences Notebook: Document Header and Footer Page

The Document Header and Footer Page will let the user to customize the header and/or the footer of any document by using the predefined logos and messages (previous downloaded to a 4610 printing device).

The Document Header and Footer Page will look like:



Control	Default	Type	Tab	Group
Document Header and Footer	N/A	Title	Yes	Page
Use Document Header	Focus Unchecked	Check box	1	No
Logo:	None Disabled See below	Combo box	2	No
Logo graphic	See below	Graphic object	No	No
Message:	None Disabled See below	Combo box	3	No
message_text	Empty Read only	Edit box	4	No
Align:	logo Disabled See below	Combo box	5	No
align position	to the left Disabled	Combo box	6	No

	See below			
Logo after message	Unchecked Disabled	Check box	7	No
Use Document Footer	Unchecked	Check box	8	No
Logo:	None Disabled See below	Combo box	9	No
<i>Logo graphic</i>	See below	Graphic object	No	No
Message:	None Disabled See below	Combo box	10	No
<i>message_text</i>	Empty Read only	Edit box	11	No
Align:	Logo Disabled See below	Combo box	12	No
<i>align position</i>	to the left Disabled See below	Combo box	13	No
Logo after message	Unchecked Disabled	Check box	14	No
<i>paper graphic</i>	See below	Graphic object	No	No

Logo combo box details:

- If there is no printer connected to the PC, this combo box will contain only the string “None”
- Otherwise, this combo box will contain the following strings: “None”, “#1”, “#j”, ..., “#n”, where i, j, n is the position of the logos already stored in the printer EPROM and $1 \leq i, j, n \leq 40$, corresponding to the specified output station in Setup Page (Cash Receipt Station or Document Station)
- When a connection status change occurs, this combo box will be reinitialized and reset to default

Logo graphic details:

- This graphic object will represent the selected logo in the **Logo** combo box, but scaled to fit in the *logo graphic* area.

Message combo box details:

- If there is no printer connected to the PC, this combo box will contain only the string “None”
- Otherwise, this combo box will contain the following strings: “None”, “#1”, “#j”, ..., “#n”, where i, j, n is the position of the messages already stored in the printer EPROM and $1 \leq i, j, n \leq 25$, corresponding to the specified output station in Setup Page (Cash Receipt Station or Document Station)



Align combo box details:



- This combo box will contain the strings: “Logo” and “Message”

Align position combo box details:

- This combo box will contain the strings: “to the left”, “centered” and “to the right”


Paper graphic details:

Image	Orientation	Colors	Document Header and Footer
	Portrait	Monochrome	No document header No document footer
	Portrait	2 colors	

	Landscape	Monochrome	
	Landscape	2 colors	

If the Document Header and/or Document Footer is present, the *paper graphic* will have the following extra graphic objects appended at the top and/or at the bottom of the base paper graphic (this graphic will depend also by the alignment specified by user):

Message graphic for monochrome: `message`

Logo graphic for monochrome: 

Message graphic for 2 colors: `message`

Logo graphic for 2 colors: 

Above the paper graphic area will be displayed the printer image (single or dual station), depending on the currently connected printer. If there is no printer connected the default printer image will be the dual station printer image. The output station area will be highlighted according to the Print Station selection (on the Setup Page) on printer image.

5.2 Dialogs

Only those dialogs controlled by this printer driver are documented here.

5.2.1 About Dialog

The About Dialog will look something like:



version is replaced with:

- The actual version number of the Printer Driver, for example "1.00"

years is replaced with:

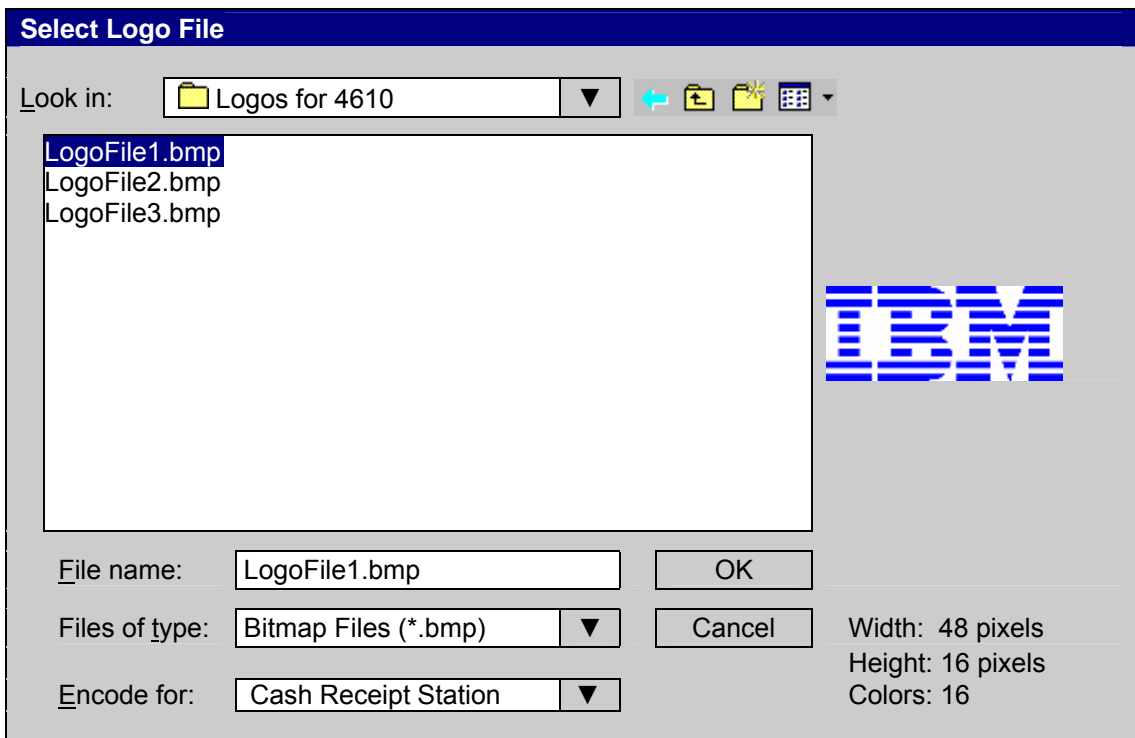
- The first and last year the Printer Driver was actually shipped. For example "2004-2005"

The About dialog is displayed when:

- The user selects **A**bout... on the Setup Page of the Printer Driver
- The user selects **A**bout... on the Logos, Messages, Firmware Page of the Printer Driver

5.2.2 Select Logo File Dialog

The Select Logo File dialog should work like a standard Open File dialog on Windows and will look something like:



The Select Logo File dialog is displayed when:

- The user selects **A**dd... on the Logos, Messages, Firmware Page

Bitmap preview details

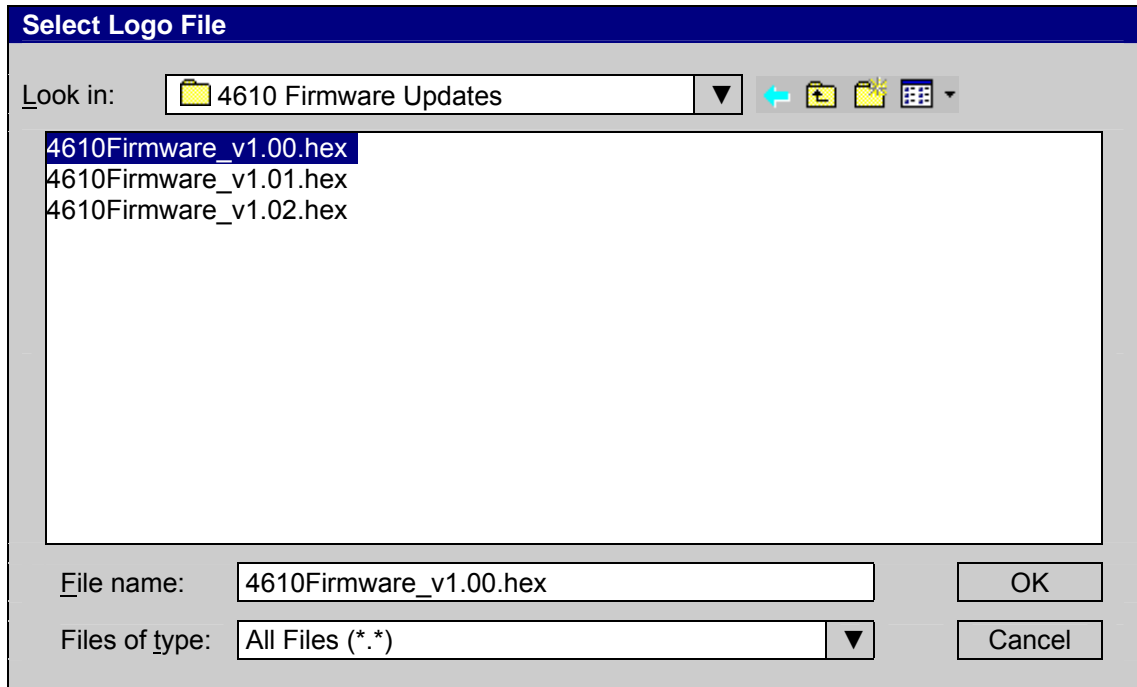
- Display the bitmap stretched to the preview zone, but keeping the original aspect ratio
- Displays the width, height and number of colors used on the selected bitmap

Files of type drop down combo box should contain:

- Bitmap Files (*.bmp)
- All Files (*.*)

5.2.3 Select Firmware File Dialog

The Select Firmware File dialog should work like a standard Open File dialog on Windows and will look something like:



The Select Firmware File dialog is displayed when:

- The user selects **Browse...** on the Logos, Messages, Firmware Page

Initial directory/file selection:

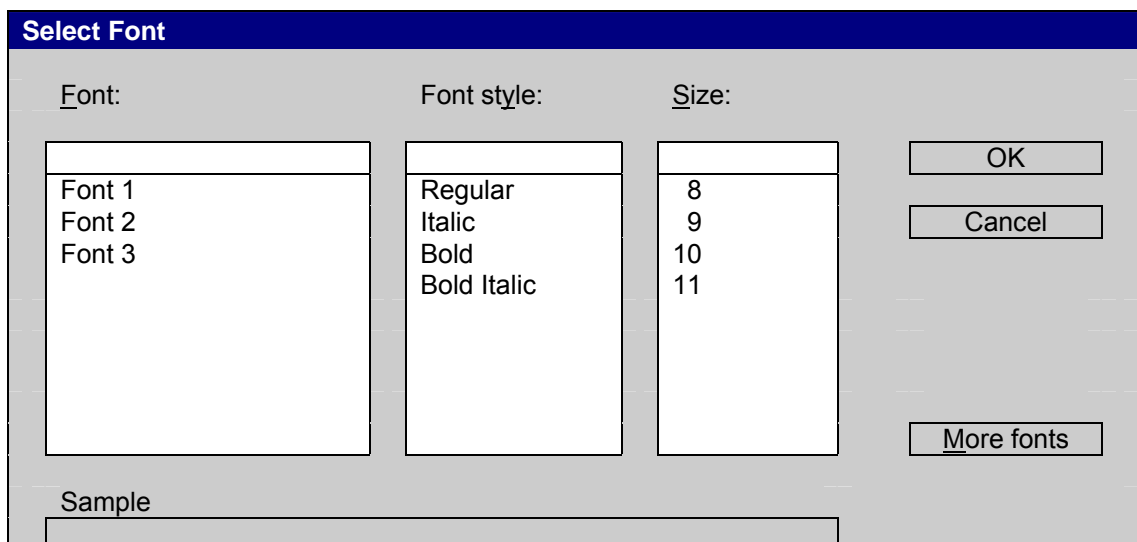
- Show the current directory with the first file in the list selected.

Files of type drop down combo box should contain:

- Firmware Files (*.hex)
- All Files (*.*)

5.2.4 Select Font Dialog

The Select Font dialog should work like a standard Choose font dialog on Windows and will look something like:





The Select Font dialog is displayed when:

- The user selects **S**elect... or **S**elect... on the Fonts Page

Initial font selection:

- None
- The **F**ont: list should display initially only the **POS** fonts installed on the system (if any)
- The **F**ont style: list should display the **Regular**, **Italic**, **Bold** and **Bold Italic** styles
- The **S**ize: list should display only the font sizes that are in printer font matrix range.

6 Install Wizard

The Install Wizard application (**setup.exe**) is an alternative to the Windows Add Printer wizard, performing a similar function in fewer steps.

The Install Wizard application installs IBM 4610 Printer Drivers and their associated utilities on Windows Operating Systems. The Install Wizard runs on:

- Windows 2000
- Windows XP Professional (32 bit version)

In addition, the Install Wizard can also install IBM 4610 Language/Port Monitor.

6.1.1 Languages

The Install Wizard ships in the languages listed in **5.1 Languages**.

6.2 Functional Characteristics

The Install Wizard enables the user to create a printer icon on a Windows operating system as quickly and easily as possible. It allows also to install a Language/Port Monitor and to optionally create serial ports and/or USB ports, required in communication with the printing device via serial ports or USB ports. The Install Wizard also copies the file **ibm4610api.dll** (API module) into **<windows_directory>\system32**. For more details about API module see **9 API Description and Functionality** section.

When running the Install Wizard package from the Web, the first dialog displayed is the License Agreement dialog.

6.2.1 GUI

Install Shield controls some of the Install Wizard dialogs.

6.2.2 License Agreement Dialog

This is a standard Install Shield dialog that displays our license agreement:

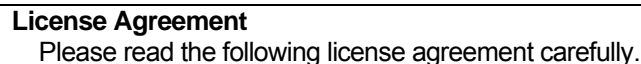
1. Title Bar



package -- Install Shield Wizard

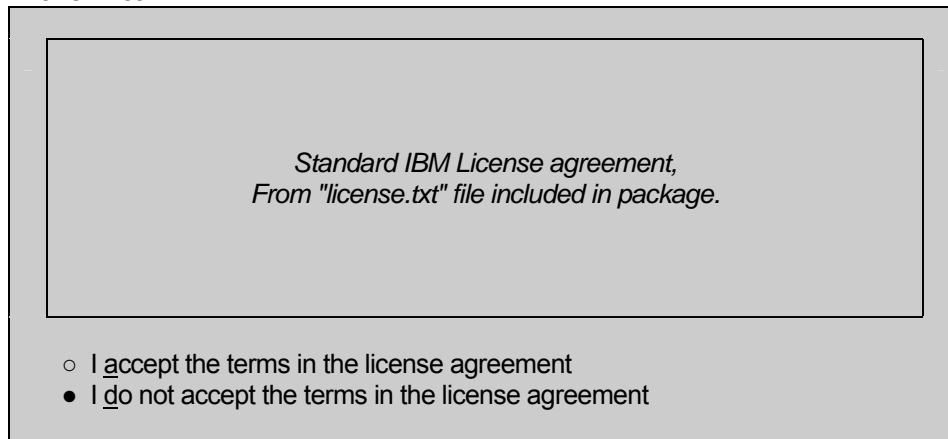
where *package* is in our case: **wxprsnls.exe** (see **1.2 Web** for details about *nls*)

2. Header Bar



License Agreement
Please read the following license agreement carefully.

3. Panel Area



*Standard IBM License agreement,
From "license.txt" file included in package.*

I acept the terms in the license agreement
 I do not accept the terms in the license agreement

4. Button Bar



< Back Next > Cancel

6.2.3 Extracting Files Dialog

This is a standard Install Shield dialog that displays while Install Shield is extracting files from the package. This dialog is sometimes up so briefly, a user may not even notice it.

5. Title Bar

package -- Install Shield Wizard

where *package* is in our case: **wxprsnls.exe** (see **1.2 Web** for details about *nls*)

6. Header Bar

Extracting files...
The contents of this package are being extracted.

7. Panel Area

Please wait while the Install Shield Wizard extracts the files needed to install *package* on your computer. This may take a few minutes.

100%

8. Button Bar

< Back Next Cancel


6.2.4 Main Dialog

This is an Install Wizard dialog that allows the user to choose whether they want to install a new printer or copy the install files to a directory.

9. Title Bar

IBM 4610 Printer Driver Wizard

10. Panel Area

This wizard helps you install IBM 4610 Printer Driver. 

Which task do you want to do?

- Install a new printer
- Copy a printer driver to a directory

11. Button Bar




6.2.5 Set Printer Driver Dialog

This is an Install Wizard dialog that allows the user to set the new printer driver name and select an existing RSS port or create a new RSS port for the printer driver.

12. Title Bar

IBM 4610 Printer Driver Wizard

13. Panel Area

Enter a printer name and select a port for the printer driver. 

Printer name:

Ports:

Port name	Related physical port
IBM RSS:1_COM1	COM1:
IBM RSS:2_COM2	COM2:
IBM RSS:3_COM3	COM3:
IBM RSS:4_COM4	COM4:
IBM RSS:5_USB	USB
FILE:	

14. Button Bar

Printer name details

- Valid printer names are 1-220 characters long
- Valid printer names do not contain the following characters:
 - =, ;, \, *, ?, /, <, >, |, ":
 - equals, comma, semicolon, backslash, asterisk, question mark, forward slash, left angle bracket, right angle bracket, vertical bar, double quote, colon
- When installing a new printer, only unique printer names are valid (no other printer icon can already exist with the same name).

Ports details

- The ports list will contain in the first column only the ports created with 4610 Language/Port Monitor present on the OS (if any) and FILE: port and in the second column contains the related physical port (COM1:, COM2:, USB etc.)

When this page is first displayed:

- If the 4610 Language/Port Monitor is not installed on the System or is installed a previous version, the Install Wizard should install the 4610 Language/Port Monitor included in the current package

6.2.6 Install Confirmation Dialog

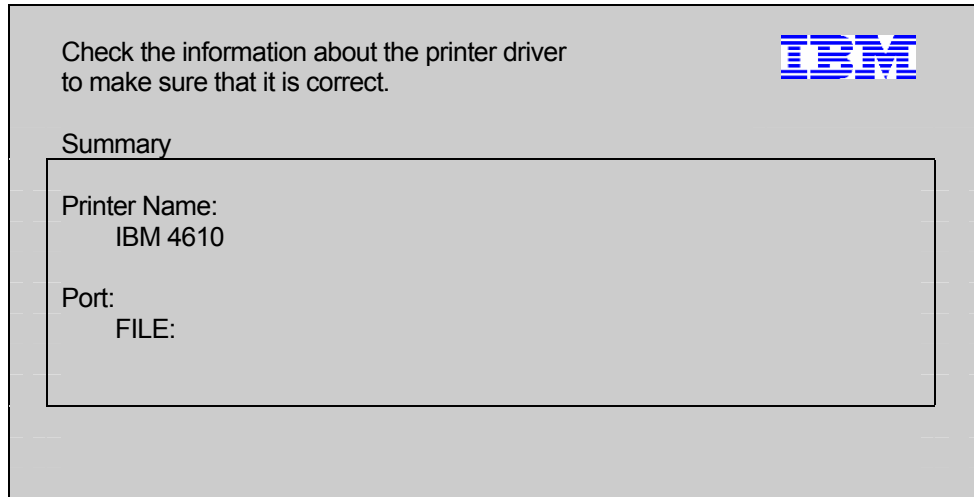
This is an Install Wizard dialog that allows the user to confirm which printer name and port is used.


15. Title Bar



IBM Printer Software Wizard

16. Panel Area

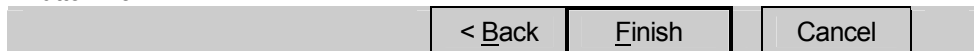


Check the information about the printer driver to make sure that it is correct. 

Summary

Printer Name: IBM 4610
Port: FILE:

17. Button Bar



< Back Finish Cancel

Summary details:

- Printer name is set to the name entered on the Set Printer Driver dialog
- Port is set to the port selected on the Set Printer Driver dialog


6.2.7 Select Directory Dialog

This is an Install Wizard dialog that allows the user to select which directory to copy files into.

18. Title Bar

IBM Printer Software Wizard

19. Panel Area

Which drive and directory do you want to copy files to? 

Drive:

C:
list of directories

Directory:

20. Button Bar

Notes:

- The Create button is disabled whenever the Directory entry field is empty.
- The Next button is disabled whenever the Directory entry field is empty.


6.2.8 Copy Confirmation Dialog

This is an Install Wizard dialog that allows the user to confirm which directory to copy files into.

21. Title Bar

IBM Printer Software Wizard

22. Panel Area

Check the information about the files to be copied. 

Summary

Destination Directory:
C:\temp

23. Button Bar

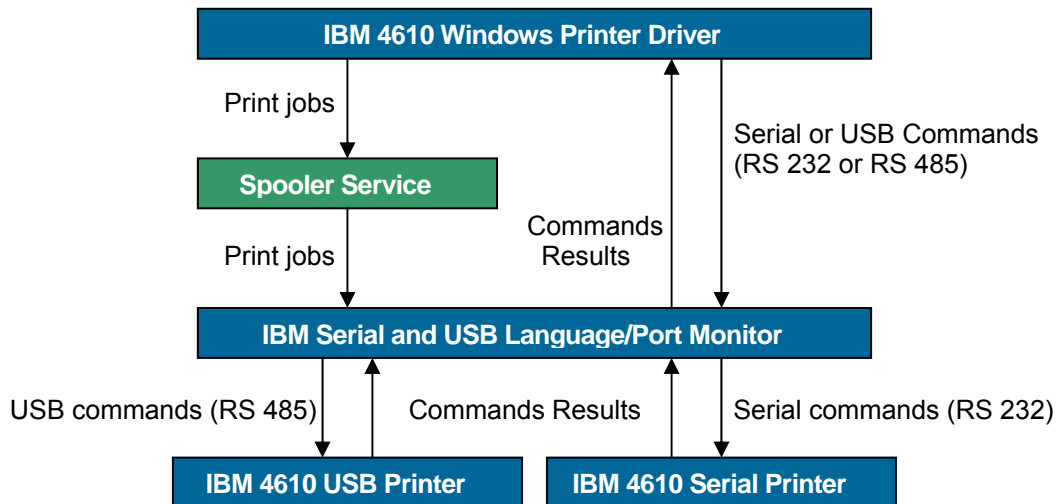
< Back Finish Cancel

Destination Directory:

- Contains the actual directory selected on the Select Directory dialog

7 Serial and USB Language/Port Monitor

7.1 Printer Driver -> Language/Port Monitor -> 4610 Printers workflow



The 4610 Windows Printer Driver lets the user to send jobs to 4610 USB printers (USB ports) or 4610 Serial printers (COM ports). The jobs are composed by sequences of RS 232 or RS 485 commands and are sent through Windows Spooler Service. The Windows Spooler Service will pass the job to port associated to the 4610 Printer Driver. The Serial and USB Language/Port Monitor will intercept these jobs. This component will process and analyze each of these jobs and will send them directly to the 4610 printer attached on the specified port (USB or COM's). The Serial and USB Language/Port Monitor will also report the printer and job status to the Windows Spooler Service that will display it in the Windows jobs queue view.

The 4610 Windows Printer Driver will need also to send commands directly to the 4610 printers and receive results from these printers. The Serial and USB Language/Port Monitor provides this feature.

In order to have a good functionality and management when dealing with logos, messages and fonts or when more than one 4610 printers are connected to the same PC, the Serial and USB Language/Port Monitor and Printer Driver components should have the possibility to uniquely identify the connected 4610 printer(s). The 4610 printer unique identifier is usually its serial number that is stored in the printer's flash memory. This serial number is frequently a dummy value, so the Language/Port Monitor should generate (using the current time stamp) and store on the printer MCT location from address 0x60 to 0x63 a new unique printer identifier (when the serial number is requested by the Serial and USB Language/Port Monitor for the first time).

7.2 Serial and USB Language/Port Monitor Deliverables

The Serial and USB Language/Port Monitor is packaged together with the printer driver and the Install Wizard and supports the following operating systems: Windows 2000 and Windows XP Professional. After installation of this component in the user's System, the Port Type list available

in the Printer Ports dialog provided by the System, will contain our component, named: IBM 4610 Language/Port Monitor.

7.3 Language/Port Monitor Features

7.3.1 Create Printer Ports

The Serial and USB Language/Port Monitor creates printer ports associated with IBM 4610 printers:

- IBM 4610 model TI3
- IBM 4610 model TI4
- IBM 4610 model TI5
- IBM 4610 model TI8
- IBM 4610 model TF6
- IBM 4610 model TM6
- IBM 4610 model TF7
- IBM 4610 model TM7

7.3.2 Manage Printer Ports

The Serial and USB Language/Port Monitor manages printer ports associated with IBM 4610 printers. The Serial and USB Language/Port Monitor is intended to benefit the end-user. It allows the end-user to get real-time printer and job status in the Windows standard way—in the standard Windows “queue view”.

7.3.3 Submit Print Jobs

The Serial and USB Language/Port Monitor submits print jobs to IBM 4610 printers, directly to COM ports or to USB ports. The Serial and USB Language/Port Monitor is a standard Windows port monitor, so it does the standard task of job submission to the printer. In addition, it is a bi-directional port monitor, which means that it gets status information back from the printer and uses the Win32 API into the spooler to display that information to the user. This status information includes both printer status (for example: out of paper) as well as job status (for example: “Printing”).

7.3.4 Cancel Print Jobs

The Serial and USB Language/Port Monitor cancels print jobs at the print device, not just on the Windows system.

7.3.5 Monitor Printer and Job Status

The Language/Port Monitor monitors printer and job status for IBM 4610 printers directly through COM ports and USB driver. Job and printer status is displayed in the status column on the Windows printer's queue view, but it is not the only place where you can find information about printer and job status. There are many possible places, as any application can simply make standard Win32 API calls to get printer or job status information, then display that information to the user—since it is our port monitor that sets the information

being shown by the application, that application is displaying information that essentially comes straight from the port monitor.

The first place we will see is the standard **Printers** folder, brought up by **Start -> Settings -> Printers**. If on this folder, you select **View -> Details**, the status of each printer icon is shown directly in the folder, in the **Status** column.

The most important place to get status information is the standard Windows queue view for a printer, opened as a result of double-clicking on the printer on the **Printers** folder. This is the most important place for at least a couple reasons:

1. This is the only Windows standard place to get job status information for a specific job.
2. All status information, including the printer status information, on the queue view is kept up-to-date by the system. This is not true for the **Printers** folder. For example, if the port monitor sets the port status for some port to “Out of paper”, the queue view for any printers using that port will immediately show the printer as out of paper, whereas the **Status** column in the **Printers** folder might not update for minutes—I’m not sure what the exact algorithm is for refreshing the **Printers** folder, but I have noticed it is not very good at keeping things up-to-date.
3. This is simply the accepted standard way on any Windows operating system to get status for a printer.

Note that the Language/Port Monitor reports end-of-job status at the time the job completes printing, not at the time it completes sending. This is known as true end-of-job, and is one of the major benefits of using the port monitor.

7.3.5.1 Printer Status

The Language/Port Monitor can only set an integer value to indicate printer status. Here are the values set, and when they are set:

Value set	Set when
Door open/Out of paper on Receipt Station	Paper cover is open on the printer or the cash receipt station is out of paper
Paper absent on Document Station	Paper absent under the front sensor of the Document Station.
Door open on Document Station	Paper cover is open on the printer Document Station
Off line	The printer is off line
Print buffer full	The printer buffer is full

7.3.5.2 Job Status

The Language/Port Monitor can set the status of a job to any string it desires. This section will discuss the strings used.

String set	Set when
Printing	The job is in the process of printing
Printed	The job printed successfully
Canceling	The job is in the process of being canceled
Canceled	The job canceled from jobs queue view

More than one string can be displayed at a time for a job. For example, one possible job status could be:

Printing – Out of paper

This would indicate that the job was a normal job; but the printer is currently out of paper.

The job printing status may be more complicated:

Error – Printing - Canceling – Out of paper

since the spooler would add the first two words (the word “Printing” might instead be “Printed” if the spooler considered the job fully sent).

7.4 NLS Considerations

7.4.1 Languages

The Serial and USB Language/Port Monitor ships in the languages listed in **5.1 Languages**.

7.5 GUI Layouts

7.5.1 Windows 2000 and Windows XP Professional

The Language/Port Monitor for Windows 2000 and XP Professional provides the job status information to the Windows spooler such that it appears on the queue view of the printer.

There is 2 GUI's related to 4610 Language/Port Monitor:

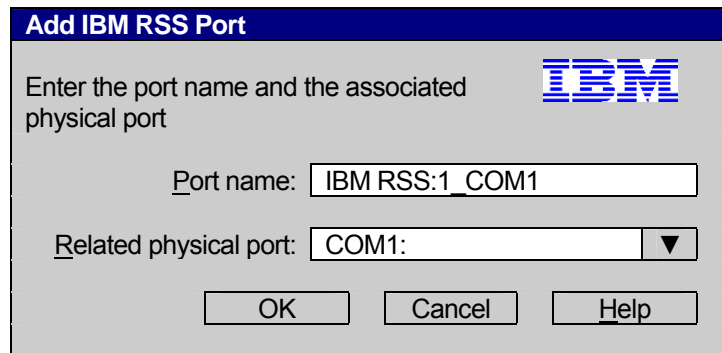
1. The Add RSS Port GUI, which is supplied by the Language/Port Monitor (see **8.5.2 Add RSS Port GUI**)
2. The Queue View GUI, which is supplied by the operating system. The Language/Port Monitor can change the strings that display in this GUI, but cannot change the basic layout.

7.5.2 Add RSS Port GUI

The Add RSS Port dialog is displayed when the user selects New RSS Port button.

Another way to display this dialog is: from Printers Server (Printers Folder) -> File -> Server Properties -> Ports Tab -> Add Port button. Select the IBM RSS Port item in the Available Port Types list (this item is present only if the 4610 Language/Port Monitor is properly installed on the Operating System) and select **New Port...** button.

This dialog looks like:



Label	Default	Type	Tab	Group
Add IBM RSS Port	N/A	Title	Yes	Page
Port Name:	Focus See below	Edit box	1	No
Related Physical Port:	N/A See below	Drop list	2	No
OK	N/A	Push button	3	1.1

Cancel	N/A	Push button	4	1.2
Help	N/A	Push button	5	1.3

Port Name Details:

- This edit box specifies the port name. The port name is suggested by IBM RSS Language/Port Monitor as follows:
 - IBM RSS:**X_COMY**, where **X** represents the number of RSS ports already created + 1 and **COMY** represents the related physical port of this RSS port (COM1:, COM2: etc).
 - IBM RSS:**X_USB**, where **X** is described above and **USB**, means that the related physical port is one of the USB ports.

Related Physical Port Details:

- This combo box contains all the available COM ports (“COM1:”, “COM2:” etc) and USB port (“USB”). In certain cases the system enumerates all the COM ports (not only the valid ones). This combo box will contain only the valid COM ports and USB port.

7.5.3 Queue View GUI

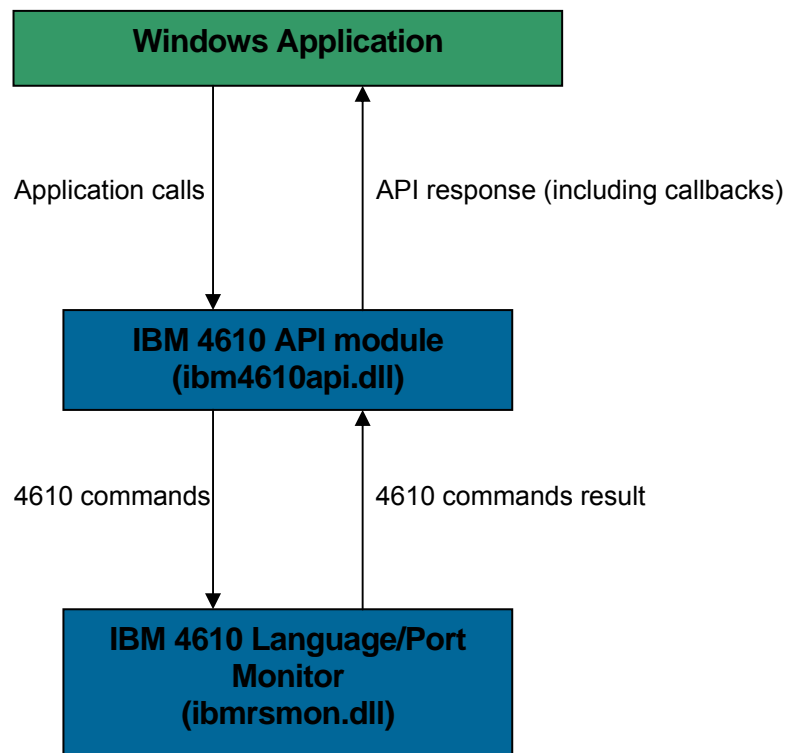
The Queue View GUI is displayed whenever you open a printer icon, if that print icon’s port is a IBM serial port or USB port, then the Language/Port Monitor can modify the strings displayed in the status column. The rest of the Queue View GUI is controlled by the operating system. For details on what strings are displayed in the status column, see section **2.8.5 Monitor Printer and Job Status**.

8 4610 API Description and Functionality

8.1 Overview

The IBM 4610 API module (**ibm4610api.dll**) that is provided in the IBM 4610 Windows Printer Driver Installation Kit is useful for developers that build 4610 printers related applications. This module offers the possibility to do check processing using 4610 printers and to monitoring the 4610 printer status, in conjunction with the IBM 4610 Windows Printer Driver.

The workflow **Windows Application – IBM 4610 API module – IBM 4610 Windows Printer Driver** is as follows:



In order to properly use this API the user should do as follows:

- Install 4610 Windows Printer Driver (if is not already installed)
- Install 4610 Language/Port Monitor (if is not already installed)
- Create a RSS port using 4610 Language/Port Monitor and associate it to the physical port where the 4610 printer is connected (if is not already created)

8.2 Exported functions

The API module exports the following functions:

Function name	Description
BiOpenMonPrinter	This opens a new session and if is successfully opened will return a handle to the specified printer Before using an API function other than this function, it is necessary that this function be executed first
BiCloseMonPrinter	This closes the opened session and frees all allocated resources
BiGetType	Acquires the printer's type ID (capabilities) 1-byte
BiGetStatus	Acquires the current printer status (4-bytes status)
BiGetOfflineCode	Acquires a 5-bytes offline code that indicates the reason for 4610 printer being off-line
BiCancelError	Restores recoverable printer errors This sends a release print buffer command
BiOpenDrawer	This opens the specified cash drawer (1 or 2) with a specified delay (in milliseconds)
BiSetMonInterval	Specifies the interval of the 4610 printers status monitoring by API (in milliseconds)
BiSetStatusBackFunction	This enables the Automatic Status Back mode and registers the address of the callback function where the results are notified When a printer status change occurs, API will call the registered callback function with the new 4-bytes status as parameter
BiCancelStatusBack	This disables the Automatic Status Back mode
BiMICRSetReadBackFunction	Executes reading of checks by BiMICRReadCheck and registers the address of the callback function when the results are notified
BiMICRRetransmissionCheckData	Resends the check reading results
BiMICRSelectDataHandling	Selects the check reading data handling mode
BiMICRReadCheck	Executes check reading
BiMICRLoadCheck	Loads the check to the check print start position
BiMICRGetStatus	Acquires the MICR status
BiMICREjectCheck	Ejects the check
BiMICRCancelWaitCheckInsertion	Cancels check insertion wait
BiMICRCancelReadBack	Cancels a reading information notification request registered using BiMICRSetReadBackFunction function

Appendixes

Appendix A

Acronyms

GUI	Graphical User Interface
NLS	National Language Support
PDF	Portable Document Format
POD	Print On Demand
UCD	User Centered Design
HRI	Human Readable Information
OS	Operating System

Documentation used as References

4610 Printer Interface Specification version 2.3	21 March 2000
SureMark Printers User's Guide (fifth edition)	September 2000
4610 Design Change Request version 01.1	24 June 2004

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