

QPCPrintTM

© 2005 Marcel Kilgus

Manual

Revision 1.02

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1. Introduction

Many years ago computers didn't have as much memory and processing power as they have today. To compensate for this fact all periphery like printers had their own intelligence to relieve the computer of some of their work. They understood languages like ESC/P and later ESC/P2, which applications could easily use and thus transfer the responsibility for rendering the page to the printer.

With computers getting more powerful by the day and a big price war in the printer segment manufacturers started to strip the printers of their intelligence and instead put it into the drivers. Of course this poses a problem for all systems for which the manufacturers don't provide drivers. SMSQ/E is one of the platforms that heavily relies on the ESC/P2 language, which nowadays fewer and fewer printers support.

QPCPrint was created as an answer to this problem. It accepts raw printer data in ESC/P2 format and outputs the result to any raster printer that is supported by Windows. It is designed to directly plug into the "printer filter" functionality of the QPC emulator, but can also be integrated into other applications or even be used to simulate a DOS LPT port if you're running Windows NT4/2000/XP or later. The manual tries to explain all three usages.

QPCPrint does **not** claim to be 100% compatible to any ESC/P2 printer, emulating every quirk of them is a next to impossible task without having seen their actual firmware. But often this actually means that QPCPrint is just **less** restricted than any real printer. As a generic reference an Epson Stylus Colour 740 printer was used during development, so in most situations it will probably behave like this printer.

2. The font problem

To render any kind of text one needs fonts. In real ESC/P2 printers these are built into the printer and are often even expandable using discs or modules. QPCPrint on the other hand has to rely on Windows and the installed fonts to do the character rendering. Problem is that standard Windows installations do not have all fonts that match the ones defined by the ESC/P2 language. We lack the means and manpower to design our own fonts and while we did go to great length looking for free fonts that fit, fonts that are both free *and* good are pretty rare.

There are commercial fonts that do fit very well, especially from the Bitstream foundry, but we certainly do not have the purchase power to license them at any reasonable price. And paying the standard license fee for all these fonts would add up to several hundred euros for every **single** QPCPrint license! Obviously this is not an option.

So what we do in the end is twofold: first, provide as many good free fonts as we can find to provide a usable solution. Secondly, give guidance to the user on which commercial fonts are the best and how one can get them.

Fortunately the latter one is often not as complicated as it sounds. Unlike us, the Corel company has the purchasing power that enables them to include hundreds of fonts with their products and almost every Corel product that has been sold within the last 10 years (since circa 1995) comes with most or even all the fonts needed to get optimal results out of QPCPrint. So all you need is a product like an old CorelDraw copy, which depending on the version should often be available for free or little money, and you are set.

2.1. Typefaces

ESC/P2 defines 12 typefaces in total, though even most modern printer do only support a subset of those. The following table shows the defined typefaces, a matching free/commercial font if available and for reference whether a modern ESC/P2 printer would support the typeface, in this example the Epson Stylus Color 740.

<i>Typeface</i>	<i>Free font</i>	<i>Commercial font</i>	<i>Available on Stylus Color 740</i>
Roman	Luxi Mono	Century Schoolbook Mono BT ¹ CentSchbook Mono BT ¹	X
Sans serif	Bitstream Vera Sans Mono	Monospaced821 BT ¹	X
Courier	Courier 10 Pitch ^{1,3} Courier New ²	Courier10 BT ¹	X
Prestige		Prestige12 BT ¹	X
Script	Kathleen	Script12 BT ¹	X
OCR-B		OCR-B-10 BT ¹	
OCR-A	STALKER1 ¹	OCR-A BT ¹	
Orator		Orator10 BT ¹	
Orator-S		Orator15 BT ¹	
Script-C	Kathleen	Script12 BT	
Roman T	Times New Roman ^{1,2}		X
Sans Serif H	Arial ^{1,2}		X

Remarks:

1: Very good replica of printer typeface.

2: Not really "free" but included with Windows, so everybody should have a copy.

3: Free predecessor of Courier10 BT. Needs the free Adobe Type Manager Light to work on Win9x/NT4.

Pretty much all of the commercial fonts are from the Bitstream foundry and are included with most Corel products. However, when a free alternative is given the commercial font is not automatically better, so consult your sense of taste to determine which suits you most.

Additionally, we've included the font *SaxMono*, which doesn't match any of the listed typefaces but is very well made. Perhaps you have some use for it. If you want to try other fonts make sure that you use mono spaced fonts (where every character has the same width) for all typefaces other than *Roman T* and *Sans Serif H*. Most Windows fonts are proportionally spaced and not suitable for substitution because some characters like the W or M are just too wide.

2.2. Automatic configuration

The above table with font names is inbuilt into QPCPrint and used to determine a default configuration for systems that haven't been configured before. There's also an "auto detect" button that re-evaluates the system even when QPCPrint has already been configured.

2.3. Fonts contained in commercial products

Here we try to provide a list of products that ship with fonts that suite QPCPrint. The list is far from comprehensive and mostly compiled using 3rd party information, so while we did take care in

compiling it we can not vouch for its accuracy. OEM versions might differ in the number of fonts! Any feedback to complete this list is appreciated.

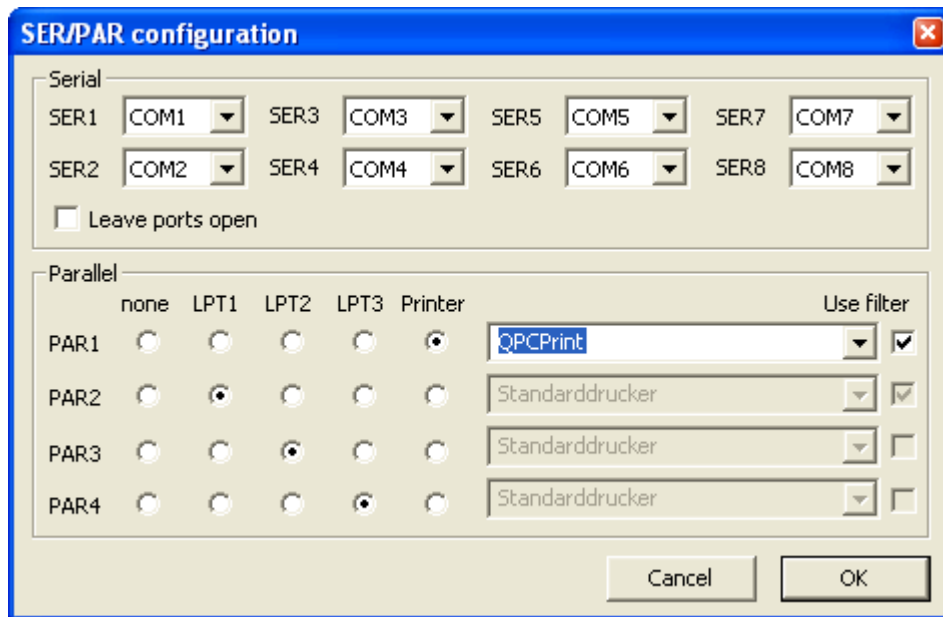
<i>Product</i>	<i>Century Schoolbook M</i>	<i>Monospaced821</i>	<i>Courier10</i>	<i>Prestige12</i>	<i>Script12</i>	<i>OCR-B</i>	<i>OCR-A</i>	<i>Orator10</i>	<i>Orator15</i>
CorelDraw Classic OEM	-	-	-	-	-	-	-	-	-
CorelDraw 4 + 5	-	-	-	-	-	*	*	*	*
CorelDraw 6	-	*	*	*	*	*	*	*	*
CorelDraw 9 - 11	*	*	*	*	*	*	*	*	*
CorelDraw Essentials 2	*	-	*	-	*	-	-	*	*
CorelVentura 10	*	*	*	*	*	*	*	*	*
Bitstream: The Cambridge Collection	*	-	-	-	*	*	*	*	*

3. Installation

Run the "setup.exe" file on the CD to start the installation, the setup wizard will then take over to guide you through the setup process. You have the option to only install the core files or to also include the manual and fonts. Installing the fonts can never do any harm, but if you've got better fonts (see chapter 2.1) you will probably not need them. Using QPCPrint without installing either the free or any fitting commercial font is possible but probably not very enjoyable.

3.1. Installing QPCPrint for use with the QPC emulator

If QPCPrint is to be used with the QPC emulator then it is crucial that you install it in the directory where the QPC2.exe file resides. Alternatively you can install it anywhere and just copy the QPCPrint.exe and QPCPrint.key files to the QPC directory. The same is true if you have multiple QPC directories.



In QPC's SER/PAR dialog, select "Printer" for the PAR port you want to use, chose a printer model (or leave it as "Default printer") and make sure that the "Use filter" option is enabled. Remember to hit "Save" to save your changes in the main dialog. That's all, the next time you print to the configured PAR port QPCPrint will be used for the print job.

3.2. Installing QPCPrint for legacy application support

3.2.1. Installing QPCPrint as a virtual printer

QPCPrint is designed to work as a print filter called directly by a program which sends Epson printer output to the filter, for QPCPrint to convert to any installed Windows printer driver. However, QPCPrint can also be installed as a virtual printer driver, enabling it to capture all output sent to a specific port (such as the parallel port LPT1), in which case it can be used with any DOS program or emulator which attempts to send Epson printer output direct to the parallel port.

NOTE: QPCPrint cannot currently output to a printer attached to the device which it is set up to capture. Therefore if your printer is physically attached to LPT1, you will need to set up your programs to output to LPT2 instead and read these instructions with LPT2 substituted for LPT1.

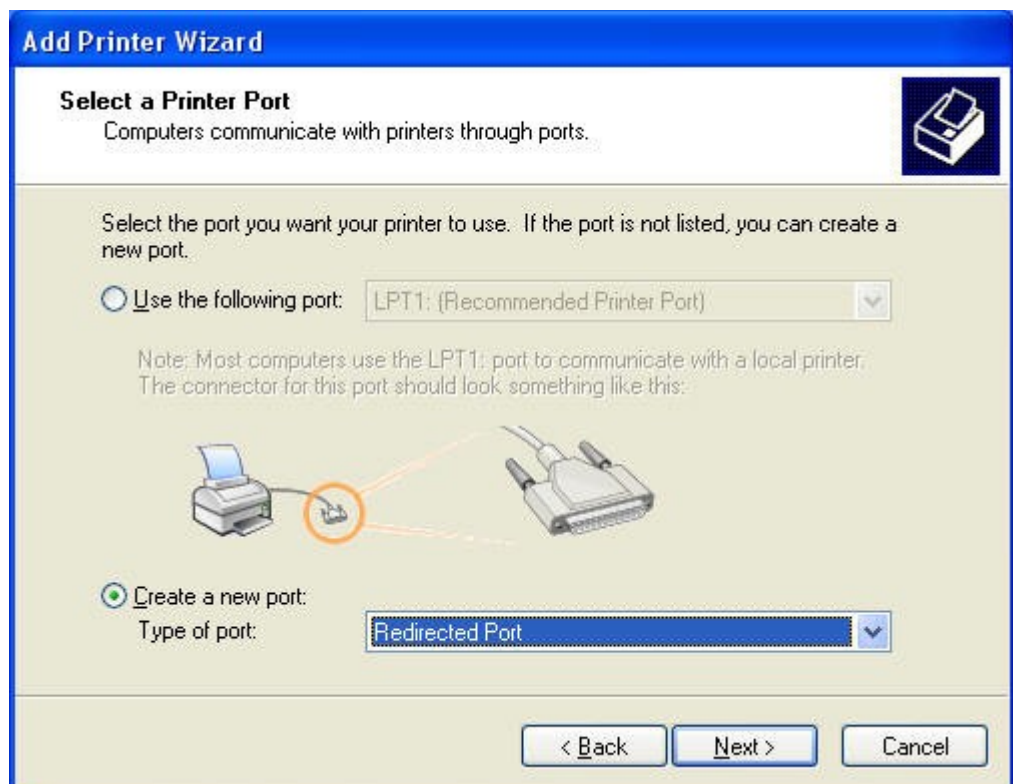
In order to set up QPCPrint as a virtual printer, you need to follow these instructions carefully.

1. Install QPCPrint as described earlier.
2. Download and install the free program redmon from <http://www.cs.wisc.edu/~ghost/redmon/>
3. Now go to Start on your PC and click on Printers and Faxes
4. Select Add a Printer - this will start the Add Printer Wizard.



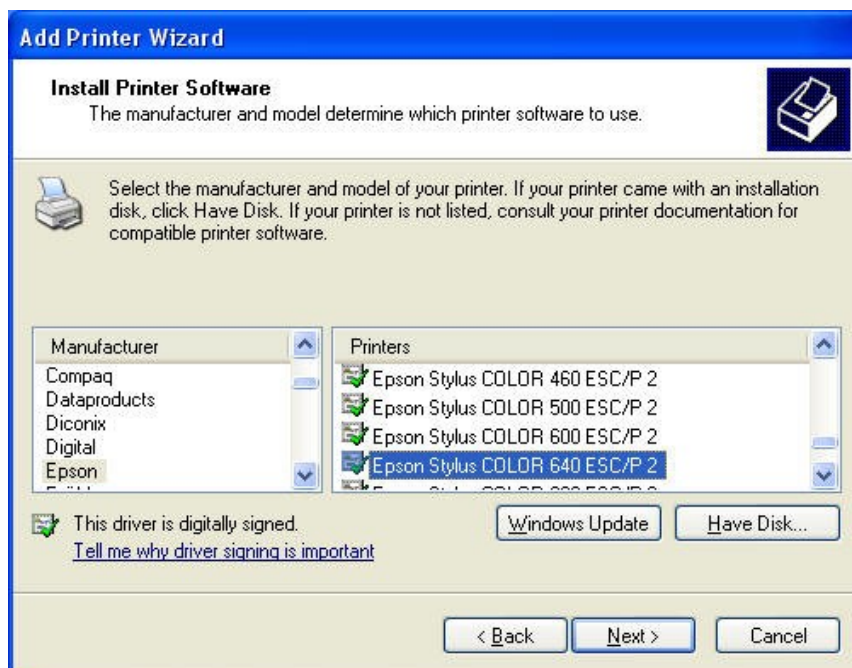
5. Click on Next and ensure "Local Printer Attached to this Computer" is selected - click on Next Again

6. You will now be given the options to select a Printer Port. You need to select Create a New Port and ensure that the Type of Port is set to "Redirected Port". Then click Next.



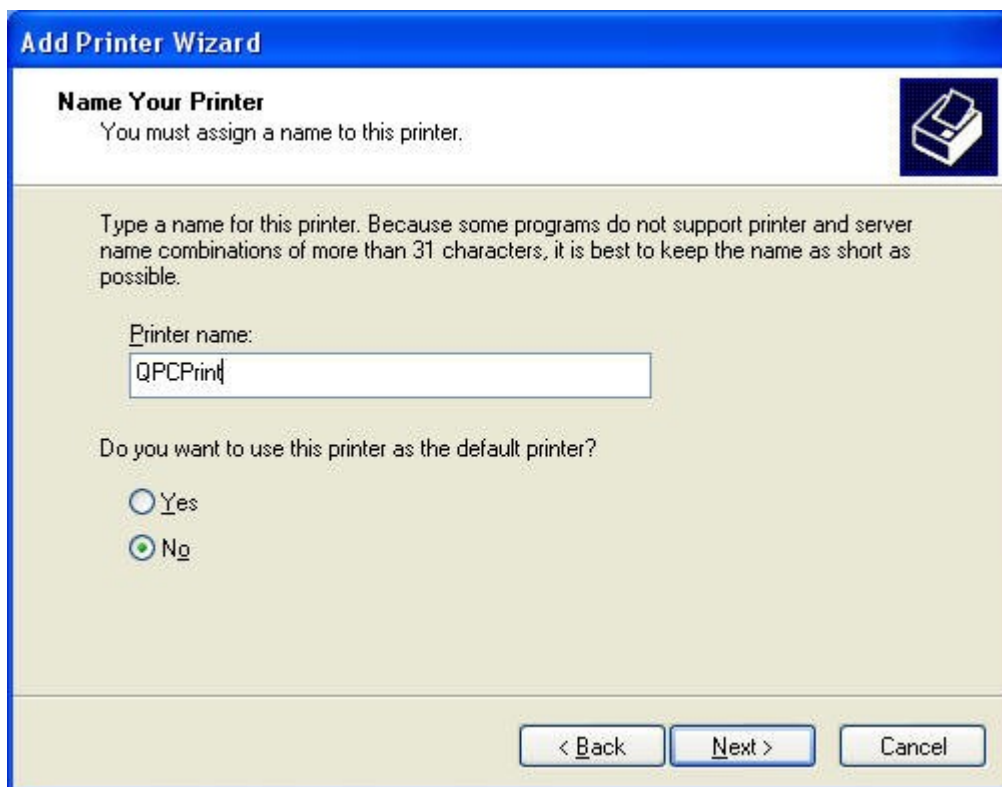
7. You will now need to enter the name of the redirected port - we shall presume that this is RPT1. Then click OK.

8. You will now be prompted to Install Printer Software. We would recommend that you choose the driver for an Epson Stylus Colour 640 ESC/P2 - this driver should be built into Windows (or you may need to insert the Windows CD-ROM into the drive in order to install this printer software. The driver which you install at this point is only really important if you intend printing to QPCPrint from within a Windows program - QPCPrint expects its incoming data to be in Epson format.

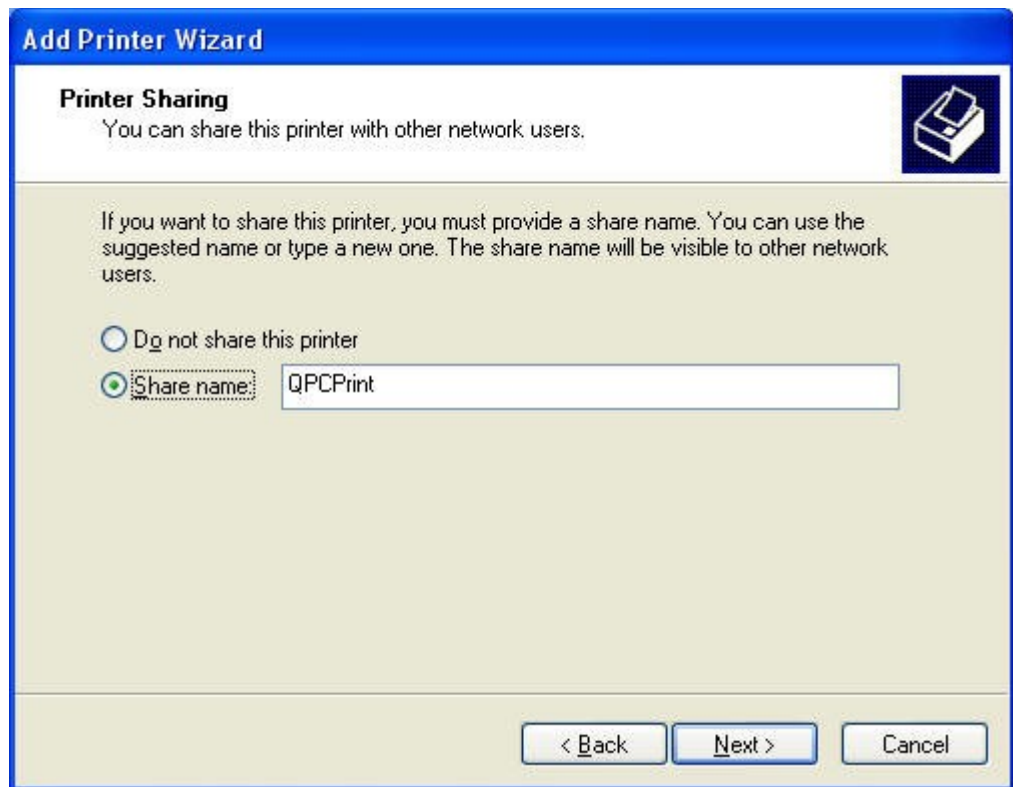


9. Click on Next. You will now be prompted to name the new printer - do not accept the default name (Epson Stylus colour 640), but enter the name as QPCPrint.

Ensure that this is not set as the default printer and click Next.



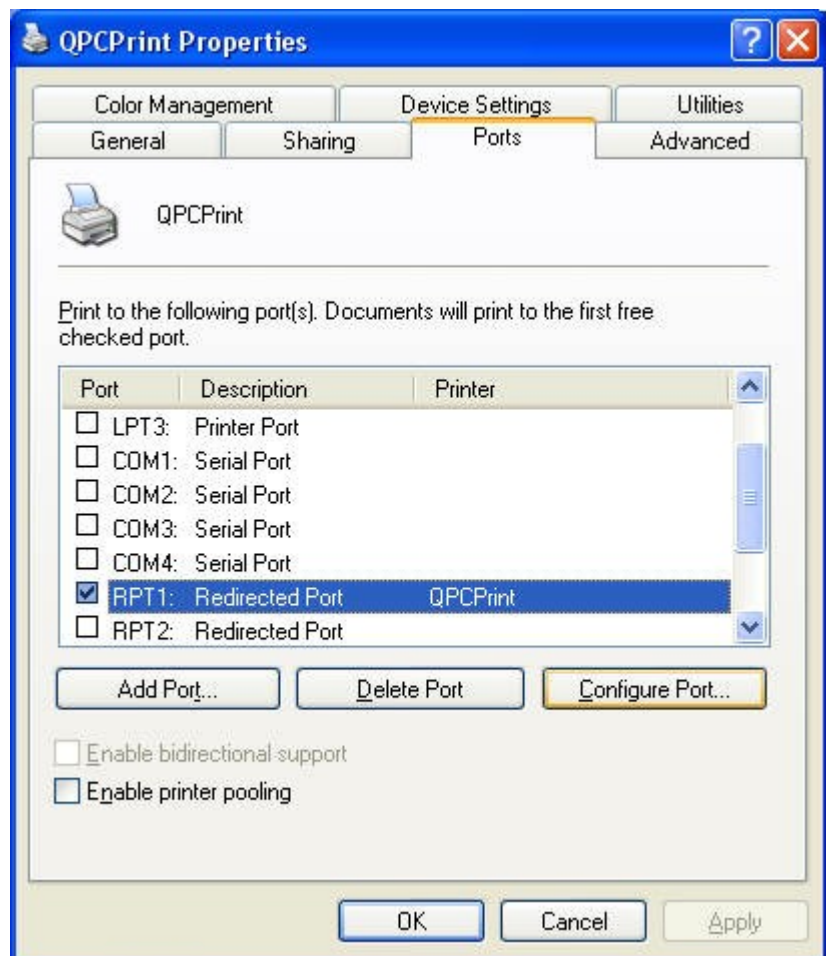
10. You will now need to finish the wizard - you will need to share the printer with the name set to QPCPrint. All other options can just be ignored - keep clicking Next until you get to Click Finish to install the printer - click Finish.



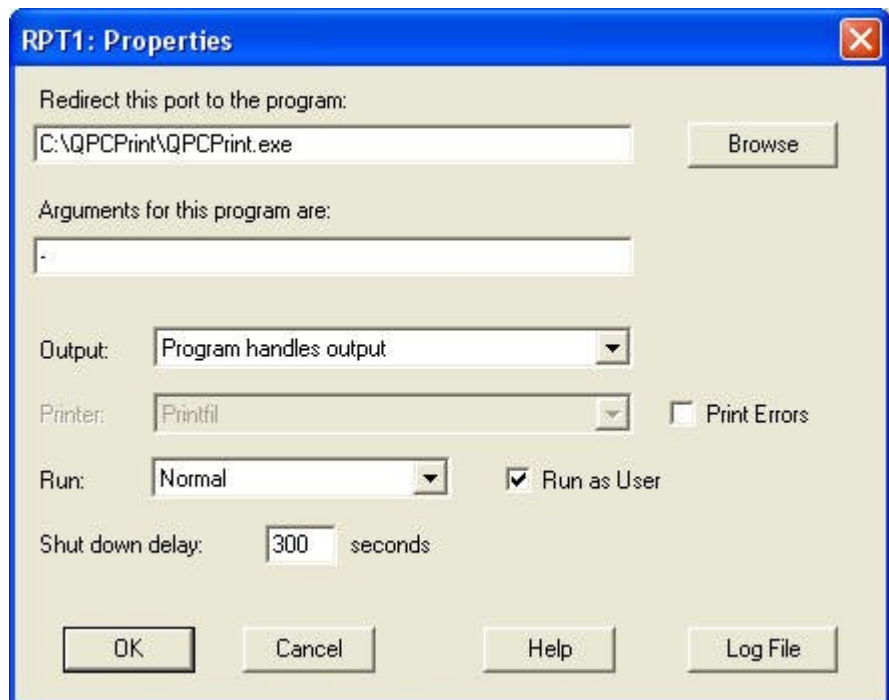
11. You should now see the QPCPrint printer icon appear in the Printers and Faxes Window.

12. Right click on the QPCPrint printer icon and select Properties.

Once the Properties Window opens, go to the ports tab. Ensure that RPT1: is selected (as shown) and click on Configure Port.



13. Set "Redirect this port to the program:" to the full path and name of QPCPrint.exe installed at step 1 - this would normally be: C:\QPCPrint\QPCPrint.exe
14. Set the "Arguments for this program" to - (a single dash)
15. Ensure Output is set to "Program handles output"
16. Select the box for "Run as User"
17. Click OK
18. You will be returned to the QPCPrint Properties Window - click OK to exit this and then close the Printers and Faxes Window.



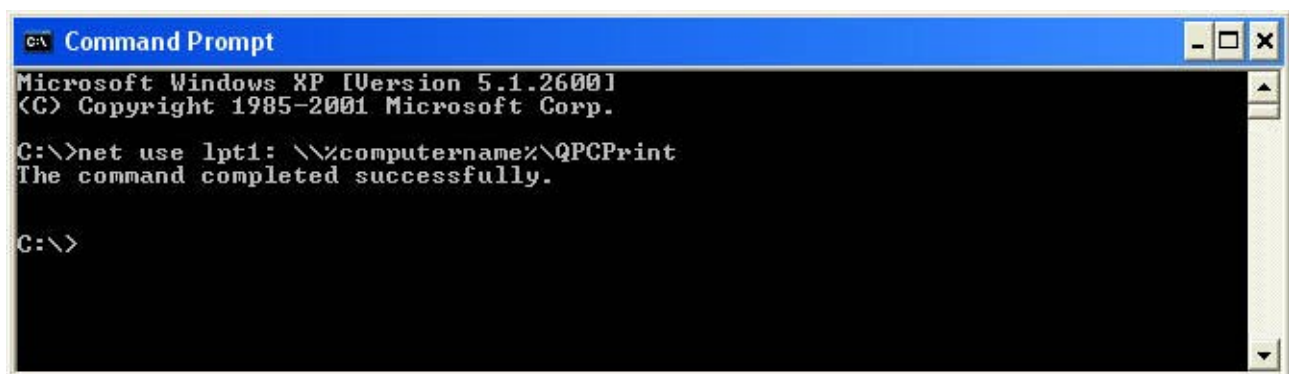
That completes setting up the QPCPrint Virtual Printer Driver.

3.2.2. Connect the printer to LPT1

Windows can redirect a local LPT port to a shared network printer. On Windows NT/2000/XP this printer can be installed on the same machine, on Windows 9x/ME it can only be connected to an actually remote computer. In this chapter we use the *%computername%* variable to determine the name of the local PC. For the reason stated above this will **not** work on Windows 9x/ME! In this case it will have to be exchanged by the name of a remote computer.

To set up the redirection open a DOS command prompt and enter the command:

```
net use lpt1: \\%computername%\QPCPrint
```



NOTE: the LPT1 port will only be redirected to use QPCPrint after you have issued this command.

If you get an error when you issue this command, then you may want to enter the command:

```
net use
```

to get a list of any pre-existing redirections on your system. You will then need to decide whether to redirect another printer port to QPCPrint (such as LPT2) or whether to remove the existing redirection first - see below.

If you want to ensure that all output is captured by QPCPrint (even after resetting the PC), then you would have to issue the following command in the DOS command prompt:

```
net use lpt1: \\%computername%\QPCPrint /persistent:yes
```

To remove the redirection again open a DOS command prompt and issue the command:

```
net use lpt1: /DELETE
```

4. Command line interface

QPCPrint's print process is controlled through command line parameters. If you use it in conjunction with QPC this is done completely transparently. But if you want to drive QPCPrint directly the syntax is fairly simple:

```
qpcprint [file[, printer]]
```

Parameters in square brackets are optional.

file refers to the name of the file with the raw print data. If omitted QPCPrint will default to an internal sample document. If “-” (a single dash) is given as the file name then the data is read from StdIn (the default input channel).

Attention: If the given file name ends in “.tmp” QPCPrint will assume that it was called with a disposable temporary file and that it is responsible for cleaning up. It will therefore delete this file before exiting!

printer refers to the name of the printer the document is supposed to be printed to. If omitted QPCPrint will use the default printer.

Examples:

```
qpcprint
```

Show configuration dialog. Tests can be done using the inbuilt example document.

```
qpcprint c:\doc.prt
```

Print doc.prt on default printer

```
qpcprint c:\doc.prt “Epson Stylus Color 740”
```

Print doc.prt on Epson printer

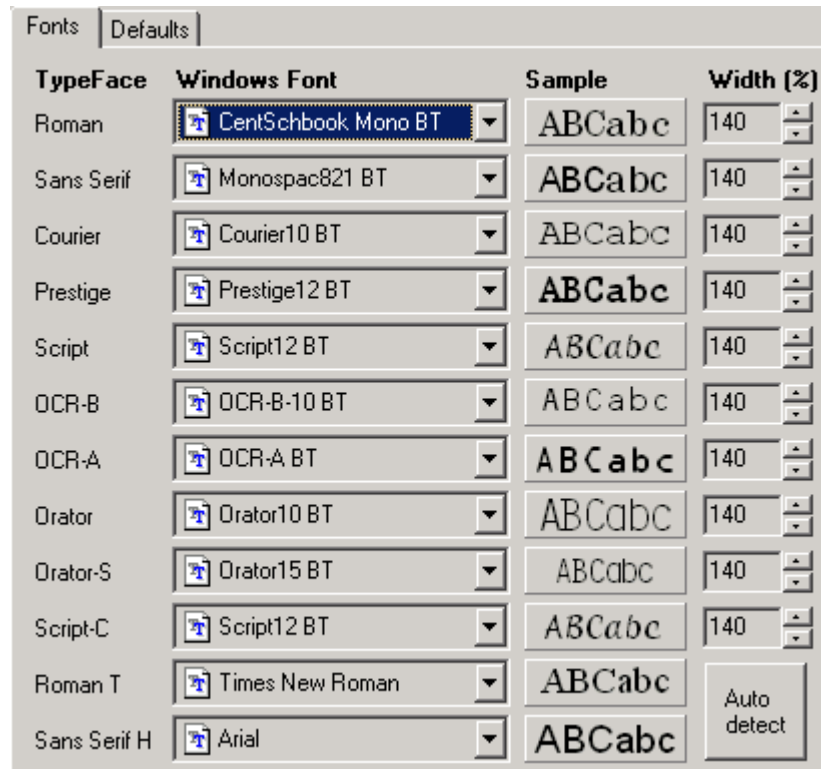
```
type c:\doc.prt | qpcprint -
```

Let QPCPrint get the data from StdIn

5. The configuration dialog

When you first start QPCPrint the main configuration dialog will pop up. All settings done here are loaded from and saved to the QPCPrint.ini file which resides in the same directory as QPCPrint.exe.

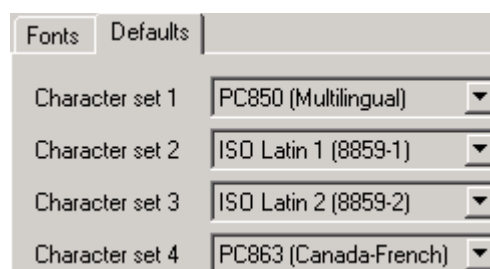
5.1. Fonts



On the “fonts” page you can select which font should be used for a specific typeface. You can also change the width of the font here, which is necessary as different fonts have different spacings and usually the fonts in their default width are too narrow. 140% is often a good value. This option is not available for the Roman T and San Serif H typefaces, which have special widths that already match the Times New Roman and Arial fonts perfectly.

Instead of these two widths the button to automatically detect a good font configuration is located here. This feature uses the font list shown earlier in this manual to select the best fonts for the different typefaces.

5.2. Defaults



On the “defaults” page you can pre-select the code pages for the ESC/P2 character tables. Most proper applications will however set their own code pages at the beginning of a print job anyway.

5.3. Commands

At the bottom there are some more check boxes and buttons:



☐ Don't show dialog

This option prevents the dialog from showing up the next time you start a print job. The output is directly and transparently transferred to the printer, without any window popping up. If you want to show the dialog again, execute the QPCPrint executable directly without any parameters.

Quit

Exit QPCPrint without printing anything. If any settings have been changed QPCPrint will ask whether they should be saved.

About

Show a dialog containing some further information on QPCPrint.

Setup

Opens the printer setup dialog. The settings you do there will only affect the current print job and cannot be saved. You can also change the currently selected printer here.

Preview

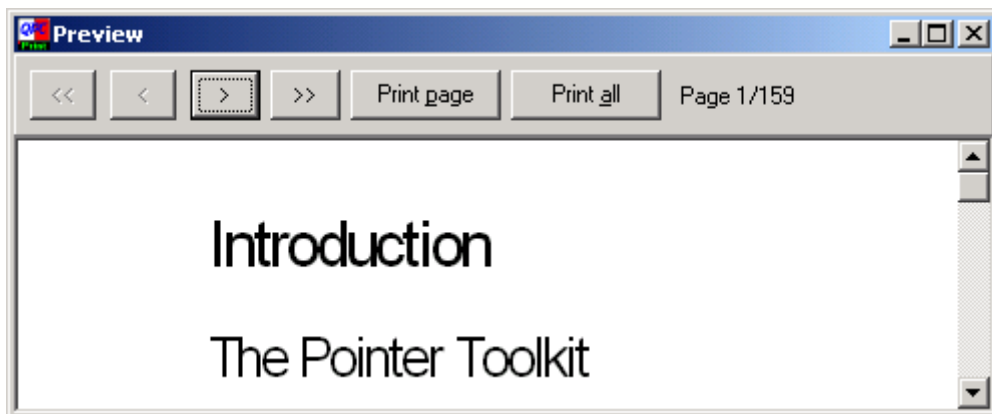
Opens the preview window that shows a rendering of the current print job. The button can also refresh an already open preview after you have made changes to the font settings for example.

Print

Close the dialog and start printing of all pages. If any settings have been changed QPCPrint will ask whether they should be saved.

6. The preview dialog

With the preview window you can have a rough glimpse on how the print result will look like. The preview, unlike the printed result, is of a somewhat lower quality but usually good enough to see the effects of your changes when playing around with the font settings. Raster images, especially colour raster images, do not look very good in the preview but should be fine in the final printout. This is also true for normal text, which may sometimes look a bit compressed in the preview.



<<

Skip 5 pages backwards.

<

Go to previous page.



Go to next page.



Skip 5 pages.



Print the currently visible page.



Print all pages. Unlike the print button in the main dialog this button will not cause QPCPrint to quit.

7. Limitations of QPC printer filters (and QPCPrint in general)

This chapter describes some specific peculiarities when using QPCPrint with the QPC emulator. Of course these limitations are basically also true for non-QPC users, but there they are more self-evident.

When the “printer filter” option is selected in QPC all data that goes to the PAR device is written to a temporary file on disc. When the PAR channel is closed, QPC automatically starts the QPCPrint.exe file with the name of the temporary file and the name of the printer as parameters. Then QPCPrint will read the temporary file, interpret its contents and output the result to the specified printer.

This behaviour has some implications:

- The printing will only start **after** the PAR channel is closed.
- QPCPrint is invoked anew on every closing of the PAR channel and it does not retain state between different print runs. Imagine it like the printer you're using just got switched on every time you print something. If your application does its output in several goes you will have to change it to print into a temporary file and then copy the whole result to the PAR device.

8. Features

8.1. Text

QPCPrint does support all text output commands defined in the ESC/P2 manual with the following exceptions:

1. User defined characters are not supported.
2. The “outline” font setting has no effect. “Shadow” however works as expected.

Colour is supported in text mode.

8.2. Raster graphics

The following raster graphic modes are supported:

- ESC . 0 Uncompressed, up to 1440 dpi
- ESC . 1 RLE compressed, up to 1440 dpi
- ESC . 2 TIFF mode, up to 1440 dpi
- ESC . 3 Differential TIFF mode, up to 1440 dpi

- ESC ^ 60/72 or 120/72 dpi 9-dot graphics
- ESC K 60 dpi 8-dot graphics
- ESC L 120 dpi 8-dot graphics
- ESC Y 120 dpi 8-dot graphics
- ESC Z 240 dpi 8-dot graphics
- ESC * 60 to 360 dpi 8, 24 or 48-dot graphics

Basic colour support is available in raster graphics mode. Colour (or actually raster graphics in general) will look much better in a real printout than in the preview or in a PDF conversion.

8.3. Bar codes

Bar code output is not supported.

8.4. International characters

All commands for selecting international character sets are supported. Following is the list of code pages that are recognized by QPCPrint:

- Italic
- PC437 (US)
- PC850 (Multilingual)
- PC851 (Greek)
- PC855 (Cyrillic)
- PC857 (Turkish)
- PC861 (Iceland)
- PC862 (Hebrew)
- PC863 (Canada-French)
- PC865 (Norway)
- PC866 (Latvian)
- PC869 (Greek)
- ISO Latin 1 (8859-1)
- ISO Latin 2 (8859-2)
- ISO Latin 7 (8859-7)
- ISO Latin 15 (8859-15)

Please note that even though all those code pages are supported the fonts in use must include the specific characters, too, otherwise only an empty box will usually be displayed instead.

8.5. Legacy international support

Some very old printer drivers used old typewriter tricks to print some international characters. For example, to print the Ø character they printed a capital O, then backspaced to the character and afterwards printed a slash / over it. Of course this didn't particularly look good and was never encouraged by Epson. Nonetheless, to support these old tricks, QPCPrint exchanges all occurrences of these character combinations with the actual international character. Currently almost 50 different combinations are supported. More examples:

A<BS>~	Ã
C<BS>=	€
O<BS>c	©

8.6. EURO support

There are two ways to print the € symbol in QPCPrint:

1. Select ISO Latin 15 as the active code page. Code 164 (\$A4) is then the Euro symbol.
2. Use the legacy combining trick described in chapter 8.5. The character sequence **C<BS>=** results in the Euro symbol. This works in all code pages.

Please note that the currently selected font must contain the Euro symbol for the above methods to work.

8.7. Selecting the paper bin

The ESC EM command to select the paper bin the printer should use is supported. Paper bin number 1 is always the default paper bin of the printer, 2..9 are the bins as returned by the printer driver. Experiment with the values to see which is which, the mapping should always be the same as long as you use the same driver. The command can only be used at the beginning of the print job or between pages, i.e. before anything is printed on the current page.

8.8. Portrait/Landscape printing

Since version 1.01 QPCPrint not only supports portrait but also landscape printing. The ESC EM command has been extended for this purpose:

ASCII	ESC	EM	n
Hex	1B	19	n
Decimal	27	25	n

Parameters

n = 1..9	- Select paper bin (see chapter 8.7)
R	- Eject page
L	- Enter landscape mode
P	- Enter portrait mode

Attention: Previewing pages with graphics in landscape mode can take *considerably* more time than in portrait mode. Also, most printer drivers will only accept a change of mode at the beginning of a new page.

8.9. Draw horizontal or vertical line

On special request QPCPrint supports one command that is not defined by the ESC/P2 standard. The definition is however very similar to the corresponding command in the GQ command set:

ASCII	ESC	<u> </u>	n	h _L	h _H	v _L	v _H	r	t _L	t _H	l _L	l _H
Hex	1B	5F	n	h _L	h _H	v _L	v _H	r	t _L	t _H	l _L	l _H
Decimal	27	95	n	h _L	h _H	v _L	v _H	r	t _L	t _H	l _L	l _H

Parameter range

n	= 0..4
r	= 0..1

Function

Draws a horizontal or vertical line. The unit of measurement is set by the ESC (U command and defaults to 1/360 inch. The print position is not affected.

Parameters

n:	line type
0:	solid
1:	dot

- 2: dash
- 3: dash dot
- 4: dash dot dot

h, v: horizontal/vertical position (absolute on page, not relative to print position).

r: line direction

- 0: horizontal
- 1: vertical

t: thickness

l: length

8.10. *Lifted restrictions*

The ESC/P2 specification restricts how much the vertical positioning commands, namely “ESC (V” and “ESC (v” can move backwards on a page. These restrictions have been removed on special request, so that the complete page can be drawn upon in any order you like. Also, the size of the fonts is not limited in any way.

9. Manual revision history

Revision 1.02

- New chapter about EURO support
- Improved QPC chapter

Revision 1.01

- New chapter for landscape mode feature
- New chapter for legacy international support

Revision 1.00

- Initial revision