Swecoin Windows Driver

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1 OVERVIEW

The TTP Printer Family consists of the following printers.

TTP 1000 series

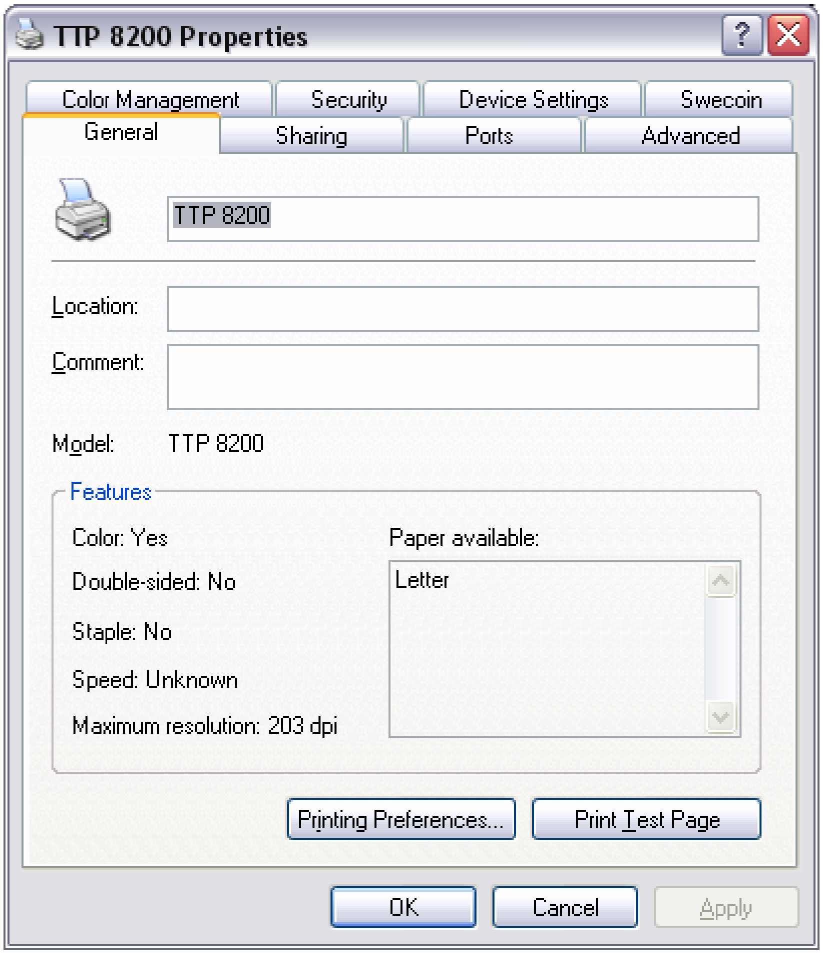
TTP 2000 series

TTP 7000 series

TTP 8000 series

This publication describes the drivers for Windows NT4, 2000 and XP, which are all based on Microsoft Unidriver with special OEM plugins.

2 PRINTING PREFERENCES



TTP 8200

Location:

Comment:

Model: TTP 8200

Features

Color: Yes

Double-sided: No

Staple: No

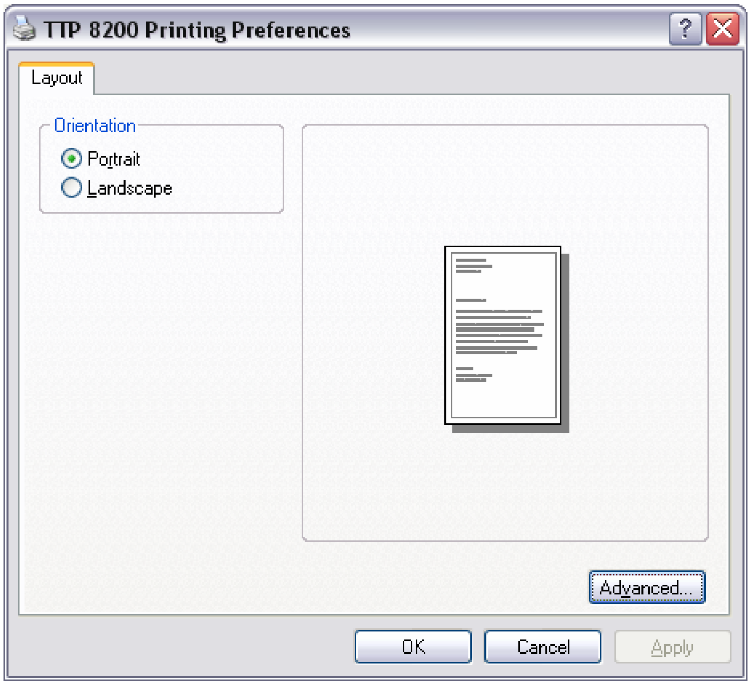
Speed: Unknown

Maximum resolution: 203 dpi

Paper available:

Letter

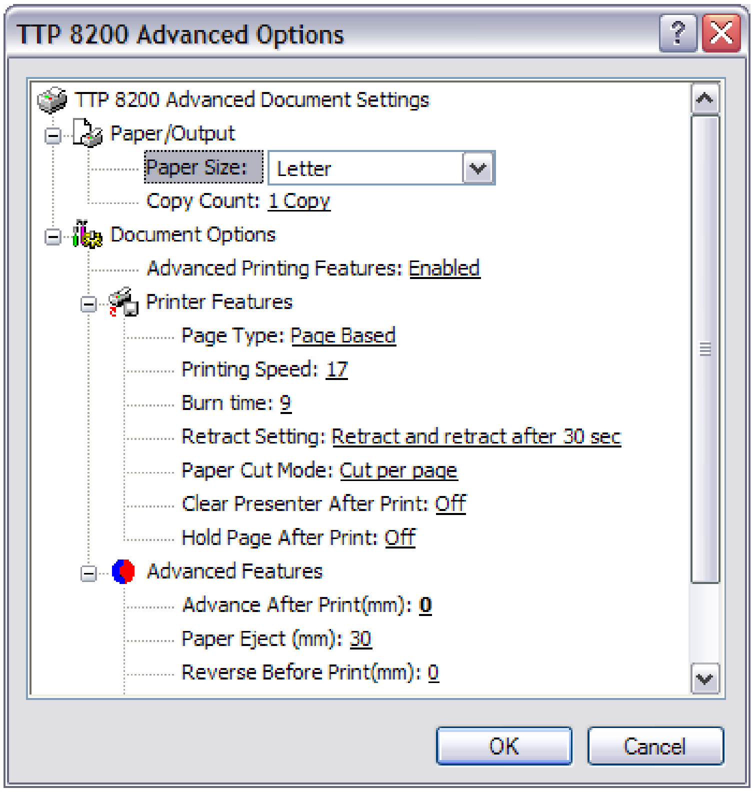
You can reach the Printing Preferences either through the button in the Printer Properties or directly through the right-click printer menu in the Printers Control Panel.



Orientation
- ● Portrait
- ○ Landscape

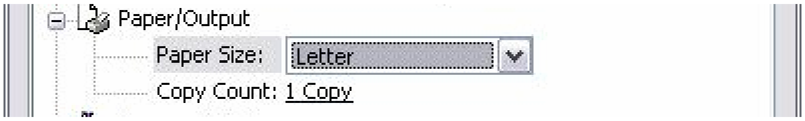
In Printing Preferences you can only select Portrait or Landscape orientation, all other settings are under the “Advanced... button.

The Advanced Options enable you to modify printing behavior and quality.



- TTP 8200 Advanced Document Settings
  - Paper/Output
    - Paper Size: Letter
    - Copy Count: 1 Copy
  - Document Options
    - Advanced Printing Features: Enabled
    - Printer Features
      - Page Type: Page Based
      - Printing Speed: 17
      - Burn time: 9
      - Retract Setting: Retract and retract after 30 sec
      - Paper Cut Mode: Cut per page
      - Clear Presenter After Print: Off
      - Hold Page After Print: Off
    - Advanced Features
      - Advance After Print(mm): 0
      - Paper Eject (mm): 30
      - Reverse Before Print(mm): 0

2.1 Paper/Output



Paper Size: Letter

Copy Count: 1 Copy

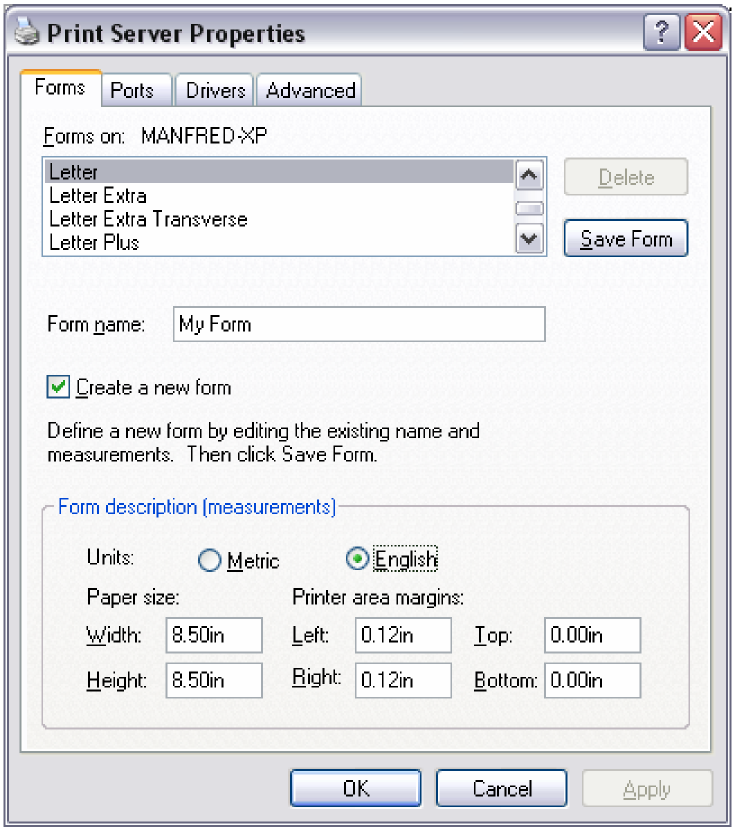
2.1.1 Paper Size

The paper size allows you to adjust the printer default paper size to any one of the forms available by default.

In addition to the currently available forms, you can create new ones in the Server Properties dialog. To get to this dialog, right click on a blank area in the Printers Control Panel and select Server Properties from the menu that appears.

Select the form closest to what you want as your starting point and modify it with your customizations. Give the form a new name (*never* overwrite the original form) and press “Save Form”.

As you can see above, you may modify the height as well as the left and right margins.



Forms on: MANFRED-XP

Letter
Letter Extra
Letter Extra Transverse
Letter Plus

Form name: My Form

☑ Create a new form

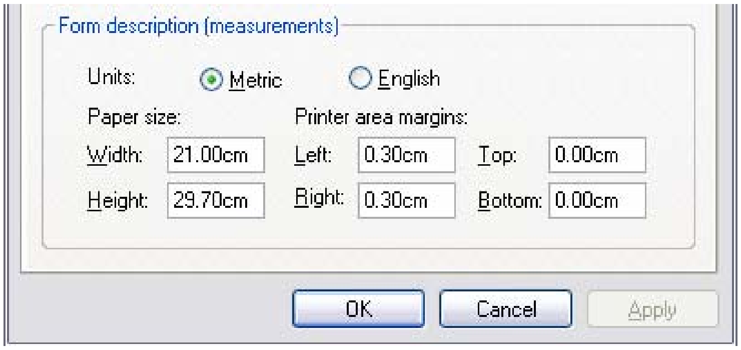
Define a new form by editing the existing name and measurements. Then click Save Form.

Form description (measurements)

Units: ○ Metric ● English

Paper size:
Width: 8.50in
Height: 8.50in

Printer area margins:
Left: 0.12in
Right: 0.12in
Top: 0.00in
Bottom: 0.00in



Form description (measurements)

Units: ● Metric ○ English

Paper size:
Width: 21.00cm
Height: 29.70cm

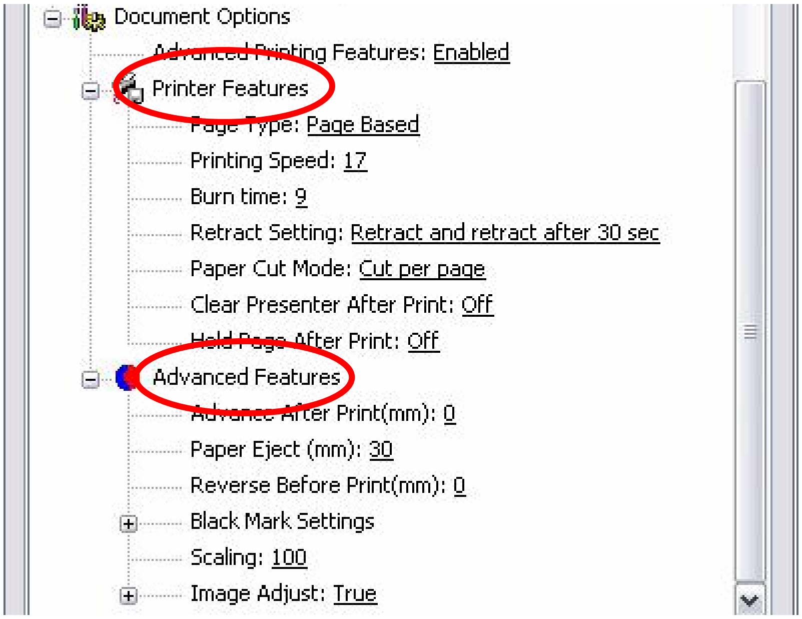
Printer area margins:
Left: 0.30cm
Right: 0.30cm
Top: 0.00cm
Bottom: 0.00cm

2.1.2 Copy Count

Copy count prints multiple copies of each page sent (the printer can't store and reproduce the page sent to it) so this is handled by the host PC.

2.2 Document Options

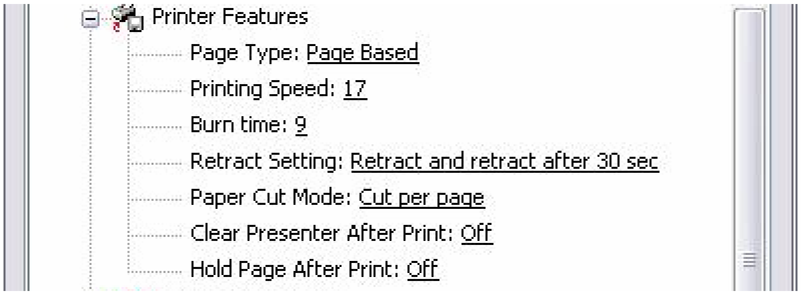
Some of the document options override parameter settings stored in the printer. When the printer is turned off and back on, the overridden parameters return to their default value. This is normally no problem because the selections you make in Windows are sent to the printer with each page printed. However it is an advantage to have the same parameters both stored in the printer and set up in Windows. For example, the Windows settings are not used during operations such as paper loading, so if you are using paper with black registration marks, it is recommended to have your black mark configuration set in the printer as well as in the Document Options. This way, auto loading of paper will work correctly even if the printer has been turned off.



- Document Options
  - Advanced Printing Features: Enabled
  - Printer Features
    - Page Type: Page Based
    - Printing Speed: 17
    - Burn time: 9
    - Retract Setting: Retract and retract after 30 sec
    - Paper Cut Mode: Cut per page
    - Clear Presenter After Print: Off
    - Hold Page After Print: Off
  - Advanced Features
    - Advance After Print(mm): 0
    - Paper Eject (mm): 30
    - Reverse Before Print(mm): 0
    - Black Mark Settings
    - Scaling: 100
    - Image Adjust: True

The Document Options dialog includes two printer-specific parts, the Printer Features and the Advanced Features.

2.2.1 Printer Features



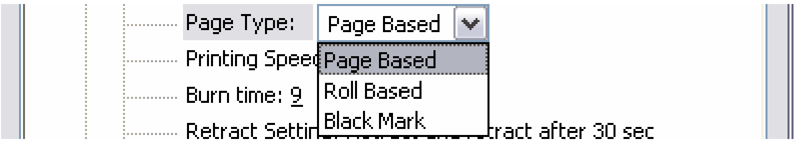
Printer Features
- Page Type: Page Based
- Printing Speed: 17
- Burn time: 9
- Retract Setting: Retract and retract after 30 sec
- Paper Cut Mode: Cut per page
- Clear Presenter After Print: Off
- Hold Page After Print: Off

The following table shows the driver settings and their corresponding printer parameters:

Driver Setting	Printer Parameter	Parameter #
Page Type	Document Mode	36
Printing Speed	Max print speed	8
Burn time	Burn time	7
Retract Setting	Waste basket mode	45
Paper Cut Mode	--	--
Clear Presenter After Print	--	--
Hold Page After Print	--	--

Table 2-1 Printer Parameters

Page Type



Page Type: Page Based

Burn time: 9

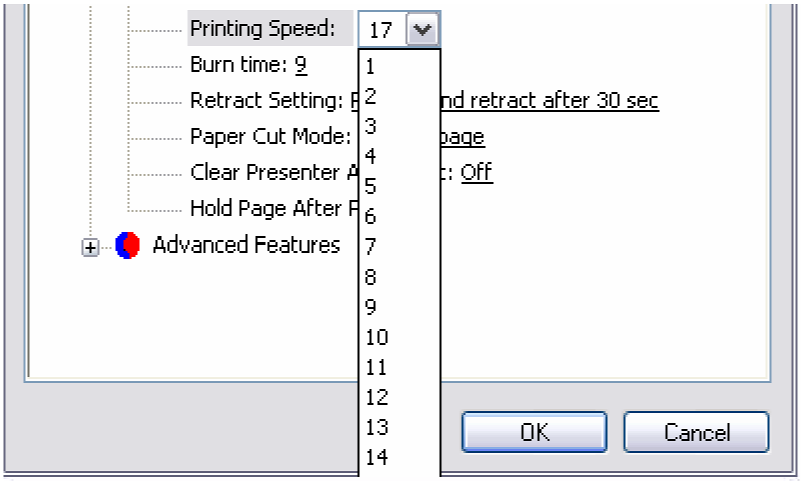
The Page Type allows the control of the cutting position.

Page Based: the printer will always feed as much paper as it needs for the set default Paper Size and then cut the paper at the end of the page. Example: if you have four inches of text and you have “Letter” selected as your paper size, you will get a Letter-sized (11”) page.

Roll Based: the printer will cut the page after the last line of text plus any additional paper advancement set in the Advanced Feature section. Example: if you have four inches of text, the printer will end the page after this text.

Black Mark: the cut will be controlled through the Black Mark settings and the Black Marks on the underside of the paper. (Also known as registration or sense marks).

Printing Speed

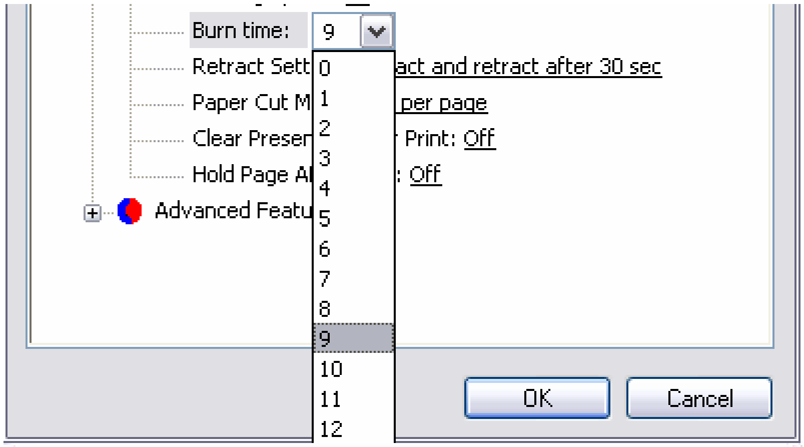


Printing Speed: 17

Burn time: 9

The printing speed setting will change the actual print speed according to the value selected and as referenced in the Installation / Technical Manual for your printer. You rarely need to change this setting, as the default is the maximum speed.

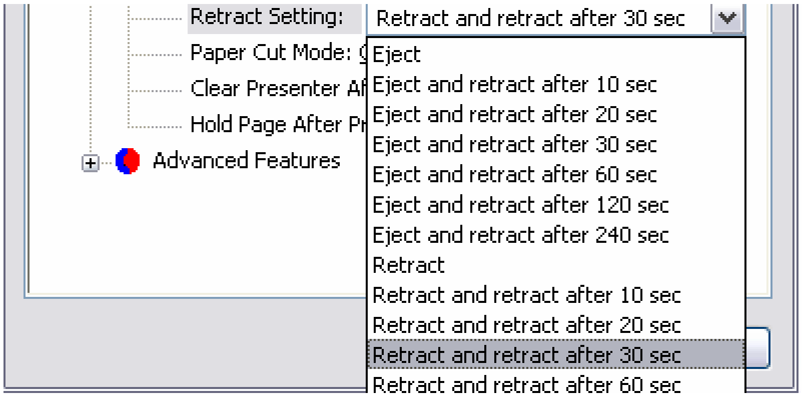
Paper sensitivity



Burn time: 9

Burn time will change the Burn time setting in the printer according to the value selected and as referenced in the Installation / Technical Manual for your printer. A higher value gives more dense (darker) print, but may also slow down printing.

Retract Setting


Retract Setting: Retract and retract after 30 sec

Paper Cut Mode: (
Clear Presenter Af
Hold Page After Pr
Advanced Features
Eject
Eject and retract after 10 sec
Eject and retract after 20 sec
Eject and retract after 30 sec
Eject and retract after 60 sec
Eject and retract after 120 sec
Eject and retract after 240 sec
Retract
Retract and retract after 10 sec
Retract and retract after 20 sec
Retract and retract after 30 sec
Retract and retract after 60 sec

The Retract Setting controls the Waste basket mode in the printer and sets the value of parameter 45 according the Technical Manual. This setting consists of two parts: what occurs when a new page is sent to the printer, and what occurs after a given timeout. For example, the above selection, “Retract and retract after 30 sec”, will retract the page currently in the presenter when a new page arrives. If no new page arrives, any page remaining in the presenter after 30 seconds will be retracted. The options “Eject” and “Retract” do not have any timeout action; the page will be ejected or retracted when a new page arrives to be printed.

What to do with uncollected printouts remaining in presenter when a new page is to be printed:	**When the customer does not take the printout:**	**After what time is this action performed:**	**Setting**
Eject	Do nothing	Disabled	Eject
-”-	Retract	10 s	Eject and retract after 10 sec
-”-	Retract	20 s	… 20 sec
-”-		Etc.	Etc.
Retract	Do nothing	Disabled	Retract
-”-	Retract	10 s	Retract and retract after 10 sec
-”-	Retract	20 s	… 20 sec
-”-		Etc.	Etc.
Hold until taken [1]	Retract	10 sec	Retract and retract after 10 sec, *and* Hold page after print = ON

Table 2-2 Retract and retain settings overview

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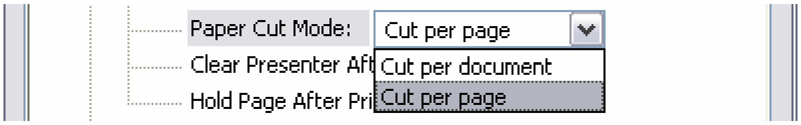
[1] Holds the subsequent pages in a print job until the completed & presented page is taken by the customer. If a page is not taken before the timeout elapses, the entire print job is deleted from the Windows spooler. This function is not available on all printers.

Paper Cut Mode



Paper Cut Mode: Cut per page

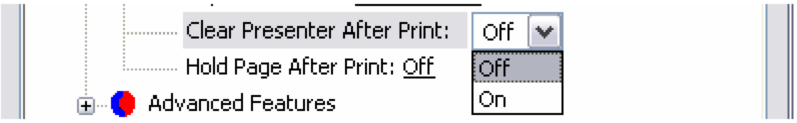
Paper Cut Mode allows control of the way the printer operates after a Page End or Document End. “Cut per Document” will feed as many pages uncut through the presenter as the document includes and cut at the end of the document. For example, if your print job consists of 3 pages, you will end up with one long uncut sheet which includes these three pages.

NOTE! – *If you intend to feed long documents: you can only loop a maximum of 60 cm (23”) inside the presenter. When this amount has built up, the printer will start feeding out the complete document while printing. The amount of paper looped is controlled by printer parameter 9, “presenter loop length”. Please see the technical manual for more information. Also, documents larger then 4 m(100”) will be cut after this length in order to assure proper printer functionality.*

“Cut per Page” will cut every page (as defined by the selected page size) of a printed document and present the existing page after the next page has started printing. For example, if your print job consists of 3 pages, you will end up with 3 individually cut sheets.

NOTE! – *If you print documents with more then one page you need to make sure that the paper can be collected outside the printer, since a completed page will be ejected from the printer when the next page prints. Ensure that the wastebasket setting is set to “Eject…” or else each page of your document will be retracted back into the enclosure when a subsequent page prints.*

Clear Presenter After Print



Clear Presenter After Print: Off

Hold Page After Print: Off

When set to “On” this function enables a forced full eject after a page is printed and cut. If set to “Off” the page will only be partially ejected, and the retract settings are in effect.

Hold page after print

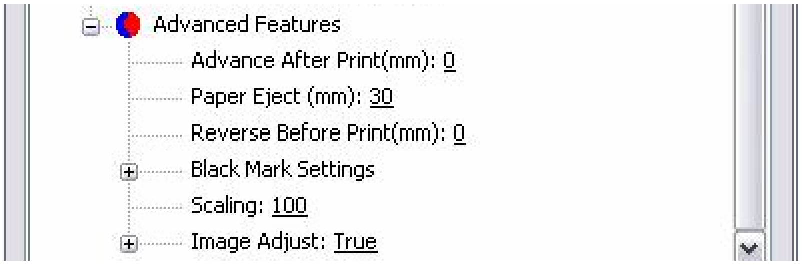
This function holds the page in the presenter until the customer takes it even if new pages are waiting to be printed. When he takes a page, the next is printed, and so on.

If he does not take a page, it remains in the presenter until the retract timer elapses, then the presenter is cleared according to the behavior specified in the Retract Setting and the rest of that print job is deleted from the Windows print spooler.

***NOTE 1! –** The "hold page after print" function relies on delicate interaction between the printer and Windows, so bi-directional communication must be on and working before you enable this function.*

***NOTE 2! –** "Hold page after print" only works in "Cut per page" mode (because it needs individual pages to hold).*

2.2.2 Advanced Features



Advanced Features
- Advance After Print(mm): 0
- Paper Eject (mm): 30
- Reverse Before Print(mm): 0
- Black Mark Settings
- Scaling: 100
- Image Adjust: True

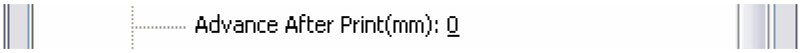
There are six advanced features which control printer behavior and print quality.

The following table shows the driver settings and their corresponding printer parameters or commands:

Driver Function	**Printer Command**
Advance After Print	Uses ESC J to advance paper
Paper Eject	Advances paper using ESC FF after it has been cut. Corresponds to printer parameter 47, "Wall compensation".
Reverse Before Print	Uses ESC j to reverse paper
Black Mark Settings	Sets parameters 37 to 42
Scaling	--
Image Adjust	--

Table 2-3 Printer commands and parameters

Advance After Print

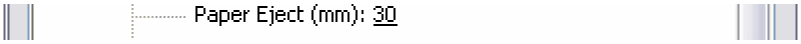


Advance After Print(mm): 0

Advance After Print increases the bottom margin. If set to 0, the printer cuts directly after the last text or graphics.

***NOTE! –** This should be set to 0 in "Page Mode", if not, the pages will be longer than the length of the selected form.*

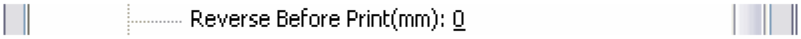
Paper Eject



Paper Eject (mm): 30

Paper Eject will allow control of the amount of paper fed out of the printer after cutting. This value is only approximate, since the presenter is controlled with a DC motor. Adjust this setting to work with the thickness of your kiosk wall.

Reverse Before Print

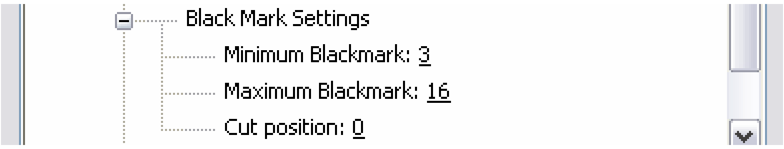


Reverse Before Print(mm): 0

The Reverse Before Print setting allows the user to control the Top Margin of the document. Since the printer has a physical distance between the print head and the cutter of either 14 mm (for TTP 1000 and TTP 7000), 12 mm (for TTP 2000) or 19 mm (for TTP 8000) you will always encounter a Top Margin of 12 mm, 14 mm or 19 mm respectively. This can be reduced with this function.

***NOTE! –** In order to assure printing safety (i.e., to avoid paper jams) you have to ensure that the paper is not pulled back too far. A minimum Top Margin of 7 mm has to be kept in order to avoid paper jams (i.e., do not set this value to greater than 7mm for TTP 1000 and TTP7000 or 12mm for TTP 8000).*

Black Mark Settings



Black Mark Settings
- Minimum Blackmark: 3
- Maximum Blackmark: 16
- Cut position: 0

If the Black Mark is selected as the Page Type the driver will send Black Mark commands to the printer. This allows using paper with top-of-form (registration, or sense) marks on the back to be used.

– ***Minimum Blackmark***

Specifies the minimum length of the black mark in mm. Shorter marks are ignored. Use this to filter out dirt on the back of the paper.

– ***Maximum Blackmark***

Specifies the length of the black mark in mm. Measure the length of the black mark on your paper and enter that value here.

Marks 5 mm longer than the entered value will be interpreted as paper out.

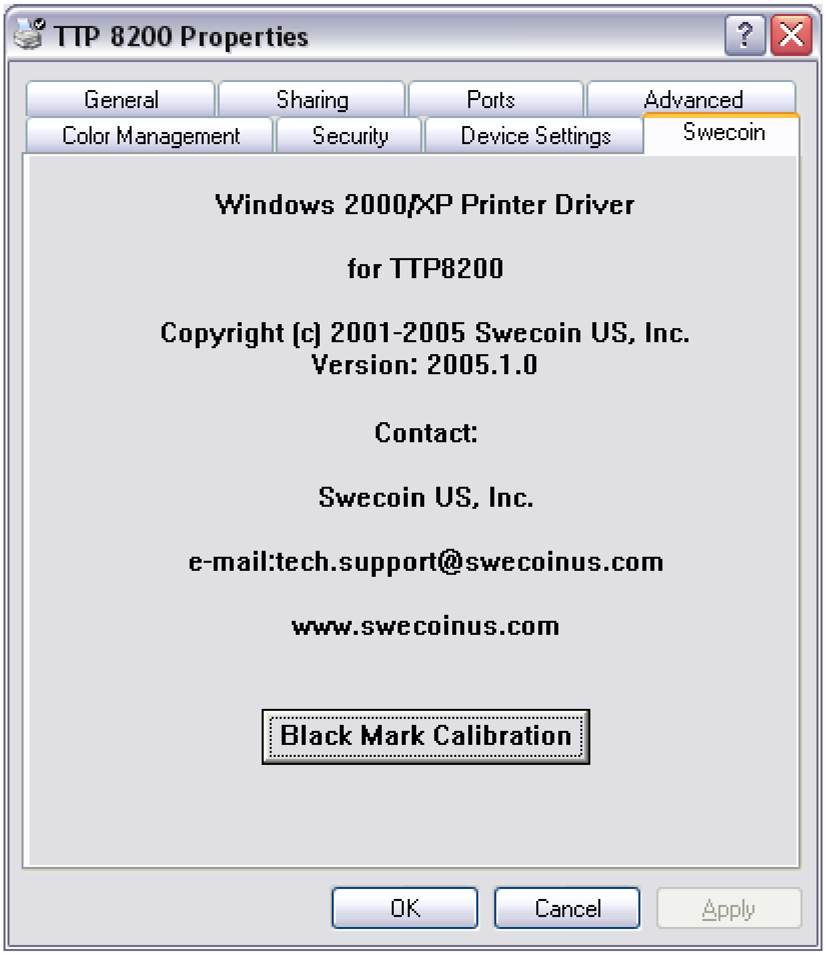
– ***Cut position***

This parameter defines the actual cut position relative to the Black Mark. When using fanfold paper, position the cut about 1 mm after the perforation so that the chance of paper jam is minimized.

Keep in mind that the physical distance between the paper sensor and the cutter is 14mm on the TTP 1000 and TTP7000, 12 mm on the TP 2000 and 19mm on the TTP 8000. Any change to the cut position is in addition to the physical distance. For example, if the black mark is 25mm after the desired cut position, set this value to 7 (19mm distance + 6mm additional + 1mm to get past the perforation). This parameter can not be negative, so determine your cut position based on the first black mark *after* your desired cut position.

NOTE! – *The printer senses the black-to-white transition of the black mark. Measure from the trailing edge of the black mark when you determine your cut position.*

Note! – In order to calibrate the printer for the specific black mark density used you can put the printer into calibration mode by selecting the Calibration button on the Swecoin Tab in Printer properties. (This is only implemented for the TTP 8000 series.)



Windows 2000/XP Printer Driver

for TTP8200

Copyright (c) 2001-2005 Swecoin US, Inc.
Version: 2005.1.0

Contact:

Swecoin US, Inc.

e-mail:tech.support@swecoinus.com

www.swecoinus.com

Scaling

Scaling: 100

Scaling allows resizing the actual print view to fit the paper size. This can be important if Web pages, etc. exceed the printable area of the printer and you want to see all the information on the page.

Also, for the small-format printers you can define larger pages and scale the page down to the actual paper size.

NOTE! – *The paper can be redefined in the Server Properties, where you start with the actual paper form, resize it to the desired size, then save this new form with a new name. See the Server Properties section above (2.1.1).*

Image Adjust

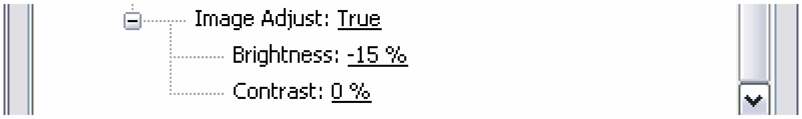


Image Adjust: True
Brightness: -15 %
Contrast: 0 %

If the Image Adjust is set to true, the driver will use special dithering algorithms in order to modify the page to be printed on the B&W thermal printer.

– ***Brightness***

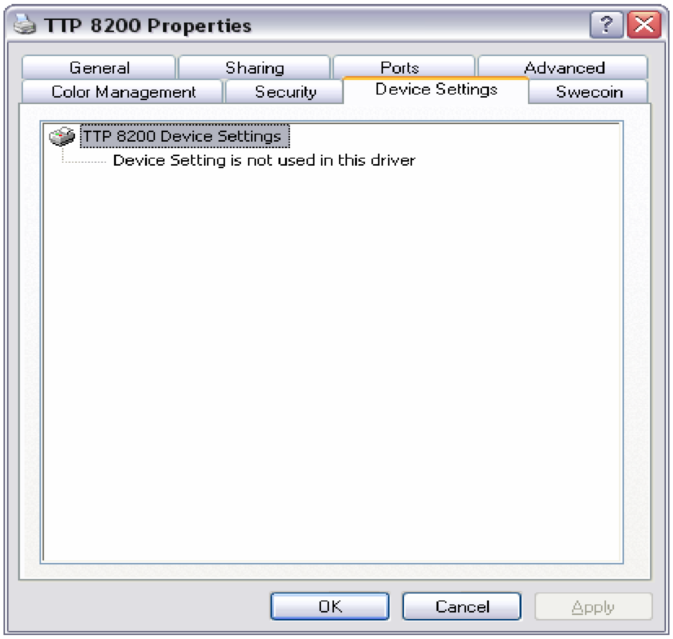
The Brightness setting will change the lightness of the printed page. Decreasing the value will make the picture darker and increasing it will make the picture lighter.

NOTE! – *Setting this to negative values will change white pixels to shades of gray.*

– ***Contrast***

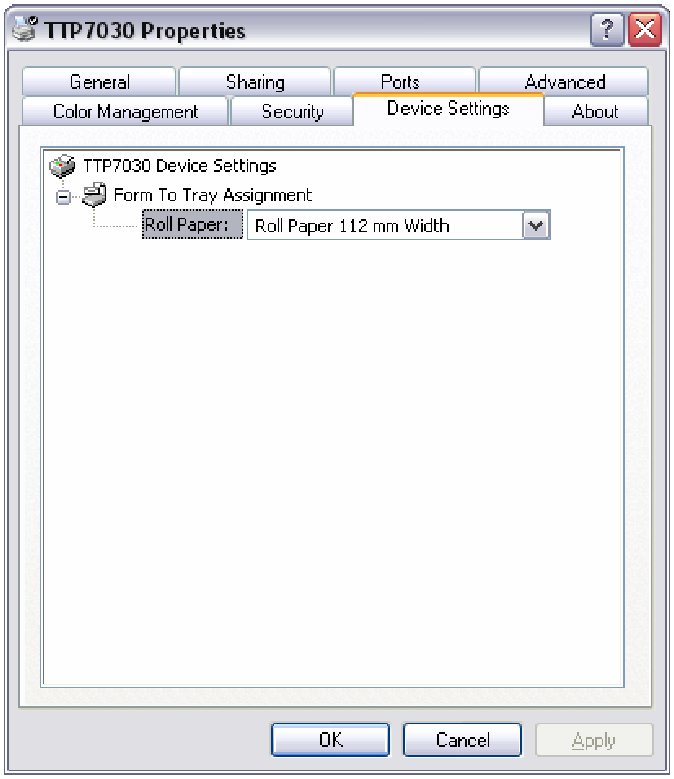
The Contrast setting will change the contrast (difference between black and white) of the image.

3 DEVICE SETTINGS



TTP 8200 Device Settings
Device Setting is not used in this driver

Device settings are not used for the TTP 8000 series.



TTP7030 Device Settings
Form To Tray Assignment
Roll Paper: Roll Paper 112 mm Width

Device settings are used for the TTP 1000 and TTP 7000 series printer

4 PORTS

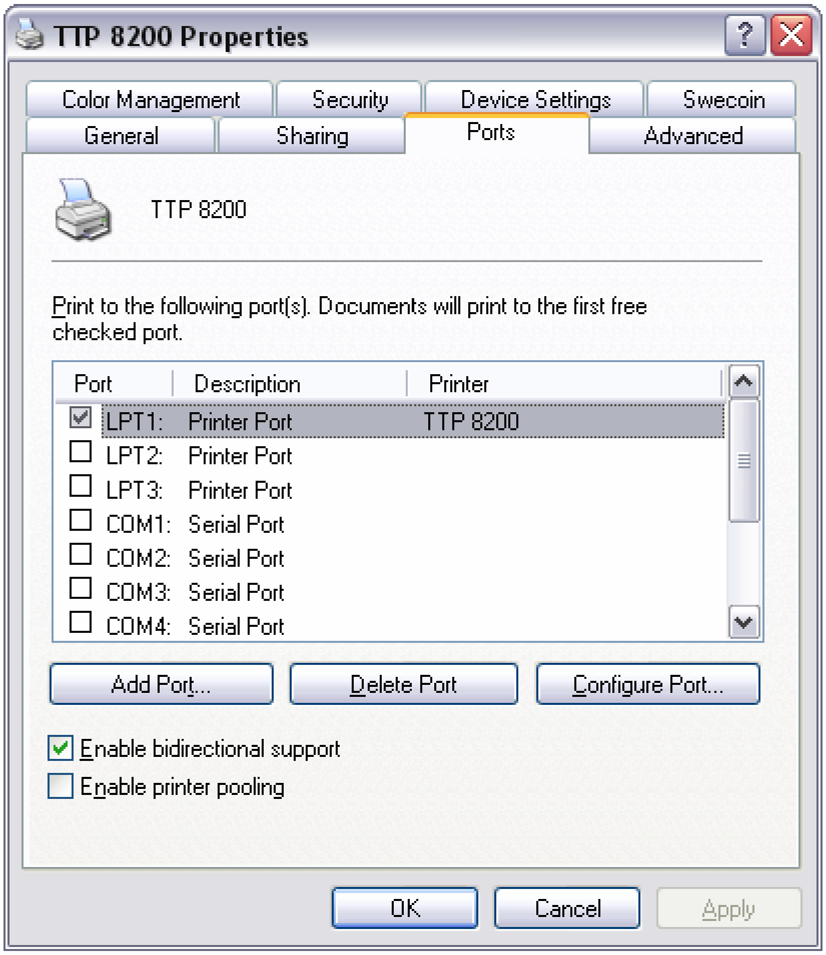
The Ports option is used to setup the IO port used to print to the printer and also to configure the serial IO if used.

The following port types are usually available:
LPT, COM, USB.

LPT (parallel) port is commonly used and doesn't need any setup. The printers TTP 1020, TTP 7020, and TTP 8200 can exchange status information via the parallel port by means of the Language Monitor interface.

COM (RS232 serial) port is generally an option typically used in text applications where no Windows driver is used, due to its slow transfer speed. The Language Monitor functions are not fully supported when using the RS232 interface.

USB is a fast serial IO. It can be used with TTP 1030, TTP 7030, and TTP 8200. The USB port also allows exchanging status information by means of the Language Monitor interface.



TTP 8200

Print to the following port(s). Documents will print to the first free checked port.

Port	Description	Printer
☑ LPT1:	Printer Port	TTP 8200
☐ LPT2:	Printer Port	
☐ LPT3:	Printer Port	
☐ COM1:	Serial Port	
☐ COM2:	Serial Port	
☐ COM3:	Serial Port	
☐ COM4:	Serial Port	

☑ Enable bidirectional support
☐ Enable printer pooling

4.1 Enable bidirectional support

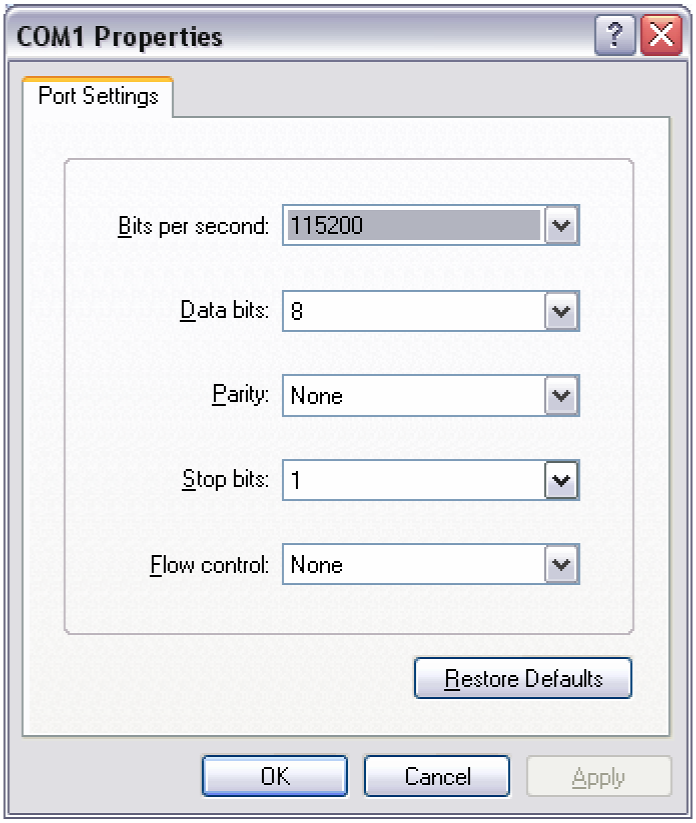
This selection enables use of the Language Monitor.

The Language Monitor is an additional DLL in the Windows driver chain that allows the printer to exchange status information with the PC. In order to use the Language Monitor it is necessary to program support for it within an application.

NOTE! – *In order for the printer to operate under all error situations the printer parameter 5 "Disable parallel port signaling" has to be set to 1 when using the parallel interface.The Technical Manual describes how to set parameters in the printer, and utility programs for this are available from Swecoin.*

4.2 Configure Port

Port settings are available if you use the serial COM port or the parallel LPT port. This port is not commonly used with the Windows driver because of its limited transfer speed.


COM1 Properties

Bits per second: 115200

Data bits: 8

Parity: None

Stop bits: 1

Flow control: None

There is one option under Configure Port when using the parallel interface, Transmission Retry timeout. In the event that there is a problem in communicating with the parallel printer, Windows will suspend port activity for this duration. After this timeout has elapsed, it will retry communication.

4.2.1 Bits per second

This setting has to match the Baud rate setting in the printer parameters (1).

4.2.2 Data bits

This setting has to match the Data bits setting in the printer parameters (2).

4.2.3 Parity

This setting has to match the Parity setting in the printer parameters (3).

4.2.4 Stop bits

The printer is fixed at 1 stop bit.

4.2.5 Flow control

This setting has to match the Flow control setting in the printer parameters (4).

When using the Windows driver, you must always use Hardware flow control. Graphical page data may very well contain the XON (11h) or XOFF (13h) characters which will interrupt data transfer.

NOTE! – *The port settings have to match the settings in the printer based on parameters 1 through 4.*

5 PAPER/QUALITY

All Swecoin thermal printers are direct thermal printers which use special paper with a thermally-sensitive coating on the print side.

You can get a variety of papers from different paper manufacturers for use with the Swecoin printer families. See the Technical Manual or our Web site for more information on paper manufacturers and paper converters.

Thermal paper comes in different grades and qualities. For detailed information contact a paper converter.

The most commonly-used paper for our printers is either a 3.5 mil (0.09 mm) non-top-coated or top-coated paper. You can also use heavier or lighter paper with Swecoin printers depending on the printer specification. Please refer to the appropriate technical manual for these specifications.

6 RESTRICTIONS WHEN USING THE LANGUAGE MONITOR AND ADVANCED DRIVER PROPERTIES

6.1 Using cut per document with page hold enabled

When cut per document is on, there is no cut and eject between pages of a job. The page hold function waits for a page of a job to be taken before continuing. Since there was no cut/eject, the user can't take the page, and the LM waits indefinitely (freezes). A reboot and a printer power cycle are necessary. Even then, the job may not be able to be deleted easily.

Solution: Don't allow page hold function to be used with cut per document mode.

6.2 Retract behavior set to "Eject" with page hold enabled

The LM will hold the job pending the retrieval of the page. If the page is not taken, the printer ejects the page after about 1 minute. The next page prints, but the LM hangs. A reboot and a printer power cycle are necessary, and even then, the job may not be able to be deleted easily.

Solution: The LM is not receiving the NAK 16 signal, since there was no official timeout and retract/eject. Do not use these settings together. Use one of the two-part settings, such as Eject and Retract after 60 seconds.

6.3 Restarting a print job during cut/eject

Restarting a print job while the job is in the cut/eject phase may lock the LM and require a reboot.

Solution: Under normal printing circumstances, this should never happen.

6.4 A presenter jam doesn't clear all print jobs

When a presenter jam occurs, the Language Monitor will not delete all print jobs in the spooler, only the current print job (the job that encountered the error). All pending print jobs will be paused. After the error is cleared the spooled jobs will continue printing.

6.5 Offline/Online status is not automatically updated

When the printer is powered off and powered on again, the printer status may not update in the Windows Spooler. Also, if the printer is restarted with a pending error, or if the spooler is restarted with a pending error, the status may not automatically update.

Solution: When a printer goes offline, Windows deactivates the Language Monitor used for that printer. Language monitors are not restarted until a bi-directional operation comes through the spooler. This operation can be a print job or a manual status request, which “wakes” the LM. To work around this, implement a status request before any print job. This will ensure that the LM is up and running, and that any pending errors may be trapped before sending a print job.

7 BI-DIRECTIONAL COMMUNICATION

7.1 The Language Monitor

The Windows operating system beginning with Windows NT4 had major restrictions with regard to bi-directional communication when using a Windows driver. In Windows 98 you could use a driver and still open the same port to write and read status information to it. After Windows NT4, however, you need a Language Monitor to do the same thing.

The Language Monitor is part of the Windows driver and sits between the Driver UI and the Port Monitor, which takes care of the direct communication with the selected port.

The Swecoin Language Monitor has two different interfaces: The LmPrinterIoControl function which is a proprietary (OEM) function and the Windows (API) function GetPrinterData. It also offers an event notification when status of the printer changes.

See the TTP Language Monitor Implementation Guide for complete descriptions and programming examples.

7.2 Swecoin functions for communication with the printer

The proprietary function LmPrinterIoControl was originally built into the Language Monitor to provide bi-directional support for the first generation of TTP 1000 printers. This function has been modified over the years and is still available for status communication with the TTP 1000, TTP 7000 and TTP 8000 families. Nevertheless the general functionality has been changed to accommodate more stability.

Note:
For new developments it is strongly recommended not to use this function due to the complexity of its use. The event notification and the GetPrinterData function are the preferred method of status inquiry.

In order to use the LmPrinterIoControl function you need to load the LM library and open the function with the following structure:

```
proc=(BOOL(__stdcall*)(PVOID,DWORD,PVOID,DWORD,PDWORD))
GetProcAddress(hLib, FUNC_NAME);
```

To enable an easier handling of this function we designed an interface function, which is included in the TTP.CPP source file and the TTP.h header file.

These files need to be included into your C/C++ project; then you will be able to call the simpler function getPrinterData defined in TTP.CPP.

The following function calls can be executed:

```
        TTPKEY          ttpkey[13] =
        {
```

```
        { "\x00\x00\x00", 3, 1, REG_BINARY, TEXT("Language Monitor")},
        { "\x1b\x05\x01", 3, 2, REG_BINARY, TEXT("Status General")},
        { "\x1b\x05\x02", 3, 1, REG_BINARY, TEXT("Paper Near End")},
        { "\x1b\x05\x06", 3, 2, REG_BINARY, TEXT("Status Report")},
        { "\x1b\x05\x07", 3, 2, REG_BINARY, TEXT("Program Version")},
        { "\x1b\x05\x09", 3, 6, REG_BINARY, TEXT("Serial Number")},
        { "\x1b\x05\x0a", 3, 1, REG_BINARY, TEXT("Hardware Revision")},
        { "\x1b\x05\x63", 3, 1024, REG_BINARY, TEXT("Device ID")},
        { "\x1b\x05\x50", 4, 4, REG_BINARY, TEXT("Get Parameter")},
        { "\x1b\x3F", 2, 0, REG_BINARY, TEXT("Reset Full")},
        { "\x1b\x40", 2, 0, REG_BINARY, TEXT("Reset Initialize")},
        { "\x00\x00\x01", 3, 4, REG_BINARY, TEXT("Auto Status")},
        { "\x00\x01\x01", 3, 4, REG_BINARY, TEXT("Ext Auto Status")}
};
```

Table 7-1 TTPKEY structure

The call “Language Monitor” has a special function: this result in the status of the spooler, either “Printing” or “Not Printing”. All operations in the printer occur serially. As a consequence, while the printer is performing mechanical operations, such as printing existing data from the buffer, cutting, or ejecting, it cannot respond to communication requests. If you attempt to query the printer during one of these operations, the call will likely fail, returning an error. Therefore, If you are directly querying the printer status with the LMPrinterIOControl function, you should first use the “Language Monitor” call to determine the spooler state. When this call returns “Not Printing”, you may then attempt your regular status request.

Calls with "Status General", "Paper Near End" and "Status Report" will result in printer-defined status (see the appropriate Technical Manual for more information), as will the other available calls besides the call “Auto Status”. “Auto Status” will result in Windows compatible status information.

If the printer is offline, the status will show the word DEAD in hex bytes in the first and second return byte of ESC ENQ 1 and ESC ENQ 6. (First byte = 0xDE and second byte = 0xAD.) It is recommended to repeat this call a few times to ensure that the printer is really offline and not just experiencing delayed communication.

7.2.1 Windows compatible status with Auto Status

These statuses will also be stored in the printer ERROR key in the registry and can be extracted with GetPrinterData.

WINDOWS STATUS	*COMPARES TO SWECOIN STATUS*
PRINTER_STATUS_PAPER_JAM	Paper jam (ESC ENQ 1 = 1)
PRINTER_STATUS_ERROR	Temperature error (ESC ENQ 1 = 6)
PRINTER_STATUS_PAPER_PROBLEM	Paper feed problem (ESC ENQ 1 = 5)
PRINTER_STATUS_DOOR_OPEN	Print head lifted (ESC ENQ 1 = 4)
PRINTER_STATUS_PAPER_OUT	Out of paper (ESC ENQ 1 = 3)
PRINTER_STATUS_USER_INTERVENTION	Cutter not home (ESC ENQ 1 = 2)
PRINTER_STATUS_PAPER_NEAR_END	Paper near end (ESC ENQ 6)
PRINTER_STATUS_PAPER_WEEKEND	Weekend paper status (ESC ENQ 6)
PRINTER_STATUS_ERROR	Undefined error

Table 7-2 Windows status

Statuses defined in winspool.h

```
#define PRINTER_STATUS_ERROR                 0x00000002
#define PRINTER_STATUS_PAPER_JAM             0x00000008
#define PRINTER_STATUS_PAPER_OUT             0x00000010
#define PRINTER_STATUS_PAPER_PROBLEM         0x00000040
#define PRINTER_STATUS_OFFLINE               0x00000080
#define PRINTER_STATUS_USER_INTERVENTION     0x00100000
#define PRINTER_STATUS_DOOR_OPEN             0x00400000
```

Table 7-3 Status defined in Winspool

Statuses defined by Swecoin

```
#define PRINTER_STATUS_PAPER_NEAR_END        0x02000000
#define PRINTER_STATUS_PAPER_WEEKEND         0x04000000
#define PRINTER_STATUS_PAPER_AT_PRESENTER    0x08000000
#define PRINTER_STATUS_EXTERNAL_ERROR        0x10000000
```

Table 7-4 Status defined by Swecoin

7.2.2 Windows compatible status with Ext Auto Status

These statuses will also be stored in the printer EXTERNALERROR key in the registry and can be extracted with GetPrinterData.

Below statuses are Extended Error statuses defined by Swecoin. For the meanings of these NAK responses, please see the appropriate Technical Manual for your printer, under the ESC ENQ 1 section.

#define NAK6	0x00000001
#define NAK7	0x00000002
#define NAK12	0x00000004
#define NAK13	0x00000008
#define NAK14	0x00000010
#define NAK16	0x00000020
#define BUFFEROVERFLOW	0x00000040

Table 7-5 Extended error status

***NOTE! –** Any other Windows status may be used in the future, so mask away undefined bits in your application!*

7.3 Windows API's for communication with the printer

In order to make bi-directional communication easier and also compatible to more then one printer of the same kind on a specific PC, we implemented the Language Monitor function GetPrinterData. This is a Windows API described in the Windows documentation. To retrieve immediate printer status from the Spooler you can also use the function GetPrinter, however the GetPrinterData function is preferred over GetPrinter due to the fact that with GetPrinterData, all statuses and errors display, while with GetPrinter, only printer errors display.

7.3.1 GetPrinterData

The **GetPrinterData** function retrieves configuration data for the specified printer or print server.

Windows 2000/XP: Calling **GetPrinterData** is equivalent to calling the **GetPrinterDataEx** function with the *pKeyName* parameter set to "PrinterDriverData".

DWORD GetPrinterData(

HANDLE *hPrinter***,** // handle to printer or print server

```
  LPTSTR pValueName,  // value name
  LPDWORD pType,      // data type
  LPBYTE pData,       // configuration data buffer
  DWORD nSize,        // size of configuration data buffer
  LPDWORD pcbNeeded   // bytes received or required
);
```

Parameters

hPrinter

[in] Handle to the printer or print server for which the function retrieves configuration data. Use the **OpenPrinter** or **AddPrinter** function to retrieve a printer handle.

pValueName

[in] Pointer to a null-terminated string that identifies the data to retrieve.

For printers, this string is the name of a registry value under the printer's "PrinterDriverData" key in the registry.

For print servers, this string is one of the predefined strings listed in the following Remarks section.

pType

[out] Pointer to a variable that receives the type of data retrieved. The function returns the type specified in the **SetPrinterData** or **SetPrinterDataEx** call when the data was stored. This parameter can be NULL if you don't need the information.

pData

[out] Pointer to a buffer that receives the configuration data.

nSize

[in] Specifies the size, in bytes, of the buffer pointed to by *pData*.

pcbNeeded

[out] Pointer to a variable that receives the size, in bytes, of the configuration data. If the buffer size specified by *nSize* is too small, the function returns ERROR_MORE_DATA, and *pcbNeeded* indicates the required buffer size.

Return Values

If the function succeeds, the return value is ERROR_SUCCESS. If the function fails, the return value is an error value. Please see the standard Windows error codes in the Windows development documentation.

Remarks

GetPrinterData retrieves printer-configuration data set by the **SetPrinterDataEx** or **SetPrinterData** function.

If *hPrinter* is a handle to a print server, *pValueName* can specify one of the following predefined values.

SPLREG_DEFAULT_SPOOL_DIRECTORY
SPLREG_PORT_THREAD_PRIORITY_DEFAULT
SPLREG_PORT_THREAD_PRIORITY
SPLREG_SCHEDULER_THREAD_PRIORITY_DEFAULT
SPLREG_SCHEDULER_THREAD_PRIORITY
SPLREG_BEEP_ENABLED
SPLREG_NET_POPUP
SPLREG_EVENT_LOG
SPLREG_MAJOR_VERSION
SPLREG_MINOR_VERSION
SPLREG_ARCHITECTURE
SPLREG_OS_VERSION
Windows 2000/XP: SPLREG_OS_VERSIONEX
SPLREG_DS_PRESENT (On successful return, *pData* contains 0x0001 if the machine is on a DS domain, 0 otherwise.)
SPLREG_DS_PRESENT_FOR_USER (On successful return, *pData* contains 0x0001 if the user is logged onto a DS domain, 0 otherwise.)
SPLREG_REMOTE_FAX (On successful return, *pData* contains 0x0001 if the FAX service supports remote clients, 0 otherwise.)
SPLREG_NET_POPUP_TO_COMPUTER (On successful return, *pData* contains 1 if job notifications should be sent to the client computer, or 0 if job notifications are to be sent to the user.)
SPLREG_RETRY_POPUP (On successful return, *pData* contains 1 if server is set to retry PopUps for all jobs, or 0 if server does *not* retry PopUps for all jobs.)

In addition, the following values indicate pool printing behavior when an error occurs.

SPLREG_RESTART_JOB_ON_POOL_ERROR (Indicates the time, in seconds, when a job is restarted on another port after an error occurs. This is used with SPLREG_RESTART_JOB_ON_POOL_ENABLED.)
SPLREG_RESTART_JOB_ON_POOL_ENABLED (A nonzero value indicates that SPLREG_RESTART_JOB_ON_POOL_ERROR is enabled.)

The time specified in SPLREG_RESTART_JOB_ON_POOL_ERROR is a minimum time. The actual time can be longer, depending on the following port monitor settings, which are found under HKLM\SYSTEM\CurrentControlSet\Control\Print\Monitors\MonitorName\Ports.

Swecoin has added status functionality in the Language Monitor function GetPrinterDataFromPort which is called by GetPrinterData. This way you can get printer-specific data through this Windows function.

The following table gives an overview of the Swecoin specific keys (*pValueName*) used with GetPrinterData..

Printer DsMonitor Key	**Explanation**	**Type**
DeviceID	Printer’s device ID string	REG_BINARY
ERROR	Printer Error or Status in Windows 16-bit format (see Appendix A)	REG_DWORD
ErrorEvent	Error event name for error event trigger	REG_SZ
EXTERNALERROR	Extended status according to Appendix B	REG_DWORD
Firmware	Firmware version	REG_BINARY
PAGECOUNT	Page counter for cut pages	REG_DWORD
PCB_REV	Printers PCB revision number	REG_BINARY
PCB_SN	Printers PCB serial number	REG_BINARY
StatusEvent	Status event name for status event trigger	REG_SZ

Monitor Key	**Explanation**	**Type**
ACK_SLEEP	ACK marker sleep time	REG_DWORD
READ_SLEEP	Sleep time before a read after write	REG_DWORD
READ_THREAD_SLEEP	Read thread sleep time	REG_DWORD
READ_REPEAT	Read repeat count.	REG_DWORD

Table 7-6 GetPrinterData Key values

For more information about the ERROR and EXTERNALERROR status response see the Remark section of the GetPrinter function.

7.3.2 GetPrinter

The **GetPrinter** function retrieves information about a specified printer.

```
BOOL GetPrinter(
  HANDLE hPrinter,    // handle to printer
  DWORD Level,        // information level
  LPBYTE *pPrinter,    // printer information buffer
  DWORD cbBuf,        // size of buffer
  LPDWORD pcbNeeded   // bytes received or required
);
```

Parameters

hPrinter

[in] Handle to the printer for which the function retrieves information. Use the **OpenPrinter** or **AddPrinter** function to retrieve a printer handle.

Level

[in] Specifies the level or type of structure that the function stores into the buffer pointed to by *pPrinter*.

Windows NT/2000/XP: This value can be 1, 2, 3, 4, 5, 6, 7, 8 or 9.

pPrinter

[out] Pointer to a buffer that receives a structure containing information about the specified printer. The buffer must be large enough to receive the structure and any strings or other data to which the structure members point. If the buffer is too small, the *pcbNeeded* parameter returns the required buffer size.

The type of structure is determined by the value of *Level*.

Level	Structure
1	A **PRINTER_INFO_1** structure containing general printer information.
2	A **PRINTER_INFO_2** structure containing detailed information about the printer.
3	**Windows NT/2000/XP:** A **PRINTER_INFO_3** structure containing the printer's security information.
4	**Windows NT/2000/XP:** A **PRINTER_INFO_4** structure containing minimal printer information, including the name of the printer, the name of the server, and whether the printer is remote or local.
5	A **PRINTER_INFO_5** structure containing printer information such as printer attributes and time-out settings.
6	**Windows 2000/XP:** A **PRINTER_INFO_6** structure specifying the status value of a printer.
7	**Windows 2000/XP:** A **PRINTER_INFO_7** structure that indicates whether the printer is published in the directory service.
8	**Windows 2000/XP:** A **PRINTER_INFO_8** structure specifying the global default printer settings.
9	**Windows 2000/XP:** A **PRINTER_INFO_9** structure specifying the per-user default printer settings.

cbBuf

[in] Specifies the size, in bytes, of the buffer pointed to by *pPrinter*.

pcbNeeded

[out] Pointer to a variable that the function sets to the size, in bytes, of the printer information. If *cbBuf* is smaller than this value, **GetPrinter** fails, and the value represents the required buffer size. If *cbBuf* is equal to or greater than this value, **GetPrinter** succeeds, and the value represents the number of bytes stored in the buffer.

Return Values

If the function succeeds, the return value is a nonzero value.

If the function fails, the return value is zero. To get extended error information, call **GetLastError**.

Remarks

Swecoin Printer status: It is recommended to use the **PRINTER_INFO_3** structure to inquire for the printer status presented by the LM.

Security Alert The **pDevMode** member in the **PRINTER_INFO_2**, **PRINTER_INFO_8**, and **PRINTER_INFO_9** structures can be NULL. When this happens, the printer is unusable until the driver is reinstalled successfully.

Windows NT/2000/XP: For the **PRINTER_INFO_2** and **PRINTER_INFO_3** structures that contain a pointer to a security descriptor, the function retrieves only those components of the security descriptor that the caller has permission to read. To retrieve particular security descriptor components, you must specify the necessary access rights when you call the **OpenPrinter** function to retrieve a handle to the printer. The following table shows the access rights required to read the various security descriptor components.

Access Right	Security Descriptor Component
READ_CONTROL	Owner Primary group Discretionary access-control list (DACL)
ACCESS_SYSTEM_SECURITY	System access-control list (SACL)

Windows 2000/XP: If you specify level 7, the **dwAction** member of **PRINTER_INFO_7** returns one of the following values to indicate whether the printer is published in the directory service.

dwAction value	Meaning
DSPRINT_PUBLISH	The printer is published. The **pszObjectGUID** member contains the GUID of the directory services print queue object associated with the printer.
DSPRINT_UNPUBLISH	The printer is not published.

DSPRINT_PENDING	Indicates that the system is attempting to complete a publish or unpublish operation. If a **SetPrinter** call fails to publish or unpublish a printer, the system makes further attempts to complete the operation in the background.

Swecoin-added status functionality in the Language Monitor sets the spooler status with Windows defined status and a few additional status values.

The following tables give an overview of the Windows and Swecoin status responses.

Windows style status response

Printer status		Windows status	
Paper Jam	NAK 1	PRINTER_STATUS_PAPER_JAM	0x00000008
Cutter not home	NAK 2	PRINTER_STATUS_USER_INTERVENTION	0x00100000
Out of paper	NAK 3	PRINTER_STATUS_PAPER_OUT	0x00000010
Print head lifted	NAK 4	PRINTER_STATUS_DOOR_OPEN	0x00400000
paper-feed error	NAK 5	PRINTER_STATUS_PAPER_PROBLEM	0x00000040
Temperature error	NAK 6	PRINTER_STATUS_ERROR	0x00000002
Presenter jam	NAK 7	PRINTER_STATUS_ERROR	0x00000002
Index Error	NAK 12	PRINTER_STATUS_ERROR	0x00000002
Checksum error	NAK 13	PRINTER_STATUS_ERROR	0x00000002
Wrong FW	NAK 14	PRINTER_STATUS_ERROR	0x00000002
Retract occurred	NAK 16	PRINTER_STATUS_ERROR	0x00000002
Paper near end	0x00 0x02	PRINTER_STATUS_PAPER_NEAR_END	0x02000000
Weekend sensor	0x00 0x40	PRINTER_STATUS_PAPER_WEEKEND	0x04000000
Paper at presenter	0x00 0x08	PRINTER_STATUS_PAPER_PRESENTER	0x08000000
Buffer overflow	0x10 0x00	PRINTER_STATUS_ERROR	0x00000002
Print data exist	0x40 0x00	PRINTER_STATUS_PROCESSING	0x00004000
External error		PRINTER_STATUS_ERROR	0x00000002

Table 7-7 Windows status response

Note:
The spooler status is changed by SetPort. When using SetPort with custom messages, you can't set these to be displayed or used by the spooler. This is a known bug; SetPort doesn't work with custom status messages. (Microsoft) Therefore, all custom messages have been exchanged to PRINTER_STATUS_USER_INTERVENTION. The custom messages are only accessible through the GetPrinterData function.

Extended Error status response

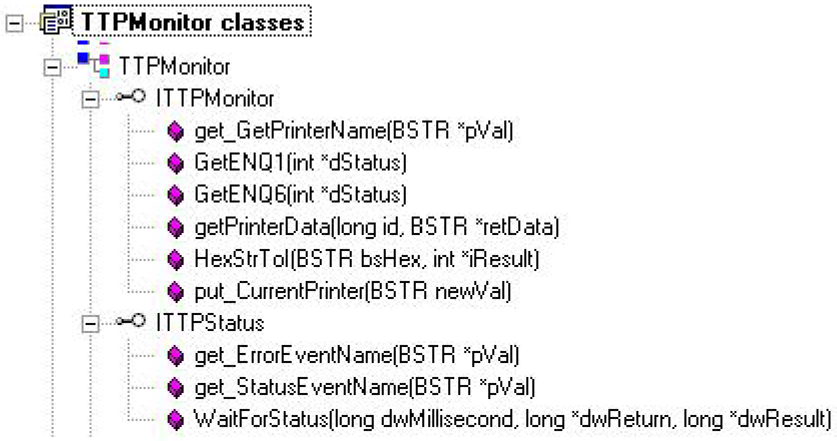
Printer status		Decode with
Temperature error	NAK 6	0x00000001
Presenter jam	NAK 7	0x00000002
Index Error	NAK 12	0x00000004
Checksum error	NAK 13	0x00000008
Wrong FW	NAK 14	0x00000010
Retract occurred	NAK 16	0x00000020
Buffer overflow		0x00000040

Table 7-8 Extended status response

7.4 ATL object for communication with the printer

In order to make implementation of the original LmPrinterIoControl function easier, Swecoin implemented an ATL object TTPMONITOR. This DLL provides a function interface which is easy accessible from many programming languages. It is not recommended to be used in new applications. For new applications you should instead use the Windows API functionality as described above.

7.4.1 ATL object function and property definition



- TTPMonitor classes
  - TTPMonitor
    - ITTPMonitor
      - get_GetPrinterName(BSTR *pVal)
      - GetENQ1(int *dStatus)
      - GetENQ6(int *dStatus)
      - getPrinterData(long id, BSTR *retData)
      - HexStrToI(BSTR bsHex, int *iResult)
      - put_CurrentPrinter(BSTR newVal)
    - ITTPStatus
      - get_ErrorEventName(BSTR *pVal)
      - get_StatusEventName(BSTR *pVal)
      - WaitForStatus(long dwMillisecond, long *dwReturn, long *dwResult)

The SetCurrentPrinter property sets the current printer and loads the LM DLL and initializes the Error and Status events.

get_GetPrinterName will return the set printer name.

getPrinterData returns the status information from the LmPrinterIoControl function.

The parameter id can have one of the following values:

#define	TTPKEY_LANGUAGE_MONITOR	0
#define	TTPKEY_STATUS_GENERAL	1
#define	TTPKEY_PAPER_NEAR_END	2
#define	TTPKEY_STATUS_REPORT	3
#define	TTPKEY_PROGRAM_VERSION	4
#define	TTPKEY_SERIAL_NUMBER	5
#define	TTPKEY_HARDWARE_REVISION	6
#define	TTPKEY_DEVICE_ID	7
#define	TTPKEY_GETPARAMETER	8
#define	TTPKEY_AUTO_STATUS	9
#define	TTPKEY_EXT_AUTO_STATUS	10
#define	TTPKEY_DEVICE_ID_FC	11
#define	TTPKEY_RESET_FULL	12
#define	TTPKEY_RESET_INITIALIZE	13

Table 7-9 getPrinterData ID values

GetENQ1 returns only the printer status ESC ENQ 1 in a WORD, in the form second byte and then first byte.

GetENQ6 returns only the printer status ESC ENQ 6 in a WORD, in the form second byte and then first byte.

GetErrorEventName returns the “Error event name” after the call of SetCurrentPrinter.

GetStatusEventName returns the “Status event name” after the call of SetCurrentPrinter.

HexStrToI implements a conversion function for the getPrinterData function results which are Hex string results. The result of this function is an Integer representation of the Hex string value.

WaitForStatus implements a WaitForMultipleObjects and returns with the result of the Wait function and the status result from the LmPrinterIoControl function call.

7.5 Event notification

In order to for a program to not have to continuously poll the printer for status, Swecoin implemented an Event notification in the Language Monitor.

This notification, used together with the WaitForStatus function in the ATL object or the WaitForMultipleObjects Windows function, enables applications to react on status changes rather then looking for status periodically.

When the internal polling thread recognizes a status change or error then it will fire an event, either an error or a status event.

The Application or the ATL object (TTPMONITOR) can open an event object to the LM events and initialize a “Wait for event” function. The necessary event names can be extracted from the registry.

When an event occurs, call the LmPrinterIoControl function with “Auto Status” or GetPrinterData and you will get the error or status condition in the DWORD returned.

***NOTE! –** To extract registry information you need to:*

1. *Starting with the printer name, open the HKEY_LOCAL_MACHINE with the following path: "SYSTEM\\CurrentControlSet\\Control\\Print\\Printers\\%s" where %s stands for the printer name.*
2. *Extract the string "Printer Driver" from this key.*
3. *Open the Printer driver with the following path: "HKLM\\SYSTEM\\CurrentControlSet\\Control\\Print\\Environments\\Windows NT x86\\Drivers\\Version-3\\%s" where %s is the extracted printer driver from step 2.*
4. *Extract the string "Monitor" from this key*
5. *Open the Monitor with the following path "HKLM\\SYSTEM\\CurrentControlSet\\Control\\Print\\Monitors\\%s" where %s is the extracted monitor from step 4.*
6. *Extract the string "Driver" (the LM DLL) to be opened for function calls*
7. *Extract the Event names with the strings "ErrorEvent" and "StatusEvent" in older drivers or use step 8 to open a new Key in newer drivers (after September 2004).*
8. *Open the Printer with the following path "HKLM\\SYSTEM\\CurrentControlSet\\Control\\Print\\Printers\\%s\\DsMonitor" and extract the event names with the strings "ErrorEvent" and "StatusEvent".*

As an alternative you can call the GetPrinterData function with ErrorEvent or StatusEvent as the key value and extract the event name to open the event handle.

7.6 Registry entries

7.6.1 In the Language Monitor Key

ACK_SLEEP = REG_DWORD 00000064 (100 decimal)

DeleteJob = REG_DWORD 00000001 (1 decimal)

Driver = REG_SZ "10x0MON.DLL" or the equivalent LM for the specific printer

READ_REPEAT = REG_DWORD 00000001 (1 decimal)

READ_SLEEP = REG_DWORD 00000064 (100 decimal)

READ_THREAT_SLEEP = REG_DWORD 000005dc (1500 decimal)

TransmissionRetryTimeout = REG_SZ 5

For older drivers (before September 2004) the following two entries are still available.

ErrorEvent = REG_SZ "ErrorEvent1" or the equivalent name for the specific printer

StatusEvent = REG_SZ "StatusEvent1" or the equivalent name for the specific printer

The READ_THREAD_SLEEP controls the auto status inquiry time.

When the LM initializes it starts a read thread which in turn runs until the LM closes down.

During print idle time, the read thread is inquiring the status from the printer and signals a status change to the listening application.

ACK_SLEEP controls the sleep time in case of a page hold inquiry.

The page hold function is not available for all printers and is used together with a driver setting in the 8x00 series driver.

READ_SLEEP controls the sleep time between a status inquiry and the successive read call.

When the LM is inquiring for status the printer needs time to gather the needed information and therefore can’t react immediately. Since some printers react faster then others and the speed of the PC system and the used OS are also variables which differ, this key was implemented to fine-tune the application.

READ_REPEAT controls the amount of re-tries on a failed read inside the LM read function.

DeleteJob controls the LM behavior when an error appears. In the case this value is 1 the LM will delete all print jobs and if it is 0 it will hold the job and stop any spooler activities until the error is resolved.

TransmissionRetryTimeout is a parallel timeout setting in the Printer Properties which can cause long delays while waiting for status. The Language Monitor is setting this to the value in the registry key.

7.6.2 In the Printer Key

In recent drivers (after September 2004) the Error and Status event names have been moved into a separate key (DsMonitor) in the Printers section. This is to allow multiple printers of the same kind to reflect status and error conditions independently, on the same PC.

DeviceID = REG_SZ	the printer’s DeviceID in hex value
ERROR = REG_BINARY	the printer’s error status according to Windows status values
EXTERNALERROR = REG_BINARY	the printer’s error status according to ESC ENQ 1 (Swecoin-specific)
ErrorEvent = REG_SZ	"ErrorEvent1" or the equivalent name for the specific printer
PAGECOUNT = REG_DWORD	current page count
PCB_REV = REG_BINARY	printer’s PCB revision
PCB_SN = REG_BINARY	printer’s serial number
StatusEvent = REG_SZ	"StatusEvent1" or the equivalent name for the specific printer

ErrorEvent and StatusEvent are the event names used in the LM to signal the current status changes. When you open an event with the listed name you can wait for this event to happen and inquire with the “Auto Status” or “Ext Auto Status” for the status value.

NOTE! – *The difference between “Auto Status” and “Ext Auto Status” is the return value. In case of “Auto Status” you will get a DWORD back that is also stored in the ERROR value in the registry and in case “Ext Auto Status” you will get two DWORD’s back where the first is the ERROR and the second the EXTERNALERROR value in the registry which reflects the printers ESC ENQ 1 value.*

NOTE! – *When changes have been made in the registry it is necessary to reboot the PC (or restart the spooler service) in order for the changed parameters to take effect.*

8 TABLES OVERVIEW