

NucleoCounter® SP-100™ System

Connecting a PCNEOS Thermal printer

Revision 2.0



NucleoCounter[®] SP-100[™] System – Technical Note No.0102

Connecting a PCNEOS Thermal printer to the NucleoCounter[®] SP-100[™] system

Introduction

The NucleoCounter[®] SP-100[™] instrument is intended for the counting of various animal semen cells in a fast and efficient way. The analysis can be documented using specialized software like SemenView. The present Technical Note describes how to connect the NucleoCounter[®] SP-100[™] instrument to a printer or a PC using a standard Serial Port (RS-232).

Application

For the purpose of documentation a printer or a PC can be connected to the NucleoCounter[®] SP-100[™] system with SW release 1.18 or higher.

Product description

A printed report contains fields for: Instrument information, software version, date, time, number, sample ID, sample type, DF, Number of Cells/ml, operator signature.

Unpacking the printer

Figure 1 Location of the Printer output on the NucleoCounter[®] SP-100[™] (lower connector).



Figure 2 Location of the Serial connector on the PCNEOS printer (to the left).

The "Neo's User's Guide" is supplied with the printer and this documents the printer and its use. **Please follow the instructions in this manual before attempting to use the printer.**

NucleoCounter[®] SP-100[™] System – Technical Note No.0102

How to connect the printer to the NucleoCounter[®] SP-100[™]

The Printer output on the NucleoCounter[®] SP-100[™] is on the left hand side of the instrument when seen from the rear (see Figure 1). Please note that the Printer output is the circular shaped connector below the USB connector.

The Printer cable must be connected to the Serial Connector placed on the left hand side of the printer when seen from the rear (see Figure 2). Please note that the connector to the right is the mains connector.

How to install the paper

Page 8-9 of the printer User's guide describes the steps required for the installation of paper rolls.

How to select either the printer option or the PC option on the NucleoCounter[®] SP-100[™]

F310 – Print -> PC (enabled or disabled)

- Turn the NucleoCounter[®] SP-100[™] on
- Use the keypad to enter the sequence <F310> followed by <enter>
- Then you must select 1 for "Print -> PC" enabled (On) or 2 for disabled (Off). When using the printer the "Print -> PC" must be disabled.
- Turn the NucleoCounter[®] SP-100[™] off and use the <enter> key to save the settings.

The printed report can be seen in Figure 3 The report is only available in English.

In Table 2 the different results transmitted to the PC can be seen.

Other features for your printer option:

The NucleoCounter[®] SP-100[™] software has features used for the printing report: Analysis Number, Time and Date.

The Analysis Number is a number incremented by 1 each time an Analysis is performed (if the Printer is enabled). This number is present on the Printing report. The Analysis Number can be reset to 1 using the F30 function. When the number reaches 9999 the next analysis will have no. 1. On the printout The Field "Number" contains the value of the Analysis Number.

The time and data of the analysis are printed on the printing report. Use the functions F200 and F201 to set Date and Time.

NucleoCounter[®] SP-100[™] System – Technical Note No.0102

F30 - Resetting of the Analysis Number.

- Turn the instrument on
- Use the keypad to enter <F30> <enter>, then select <enter> or <Esc> to either continue or cancel the operation. If <enter> is selected the display will shortly show " Resetting.." indicating that the Analysis Number is being reset.

F200 - Setting of the Date.

- Turn the instrument on
- Use the keypad to enter <F200> <enter>, then you are prompted to enter the date using the format yy-mm-dd (year-month-day), below the present data value. If the year is 2004 then yy = 04, if the month is may then mm = 05 and if the day is the 17th then dd = 17. Use the <enter> key when done. You can at any time use the <Esc> key to cancel the operation.

F201 - Setting of the Time (24 hour clock).

- Turn the instrument on
- Use the keypad to enter <F201> <enter>, then you are prompted to enter the time using the format hh:mm (hour:minutes), below the present time value. If the time is 15 minutes past 16 (16:15 or 4:15pm), then hh = 16 and mm = 15. Use the <enter> key when done. You can at any time use the <Esc> key to cancel the operation.

Accessories	Part no.	Description.
	939-0006	Thermal Printer PCNEOS-S2BN
	931-0010	Printer cable 0.9 m.
	931-0011	PS-100 Serial PC cable 2.0 m.
	991-0008	Neo's User's Guide
	939-0012	LTS Paper for PCNEOS-S2BN
	939-0012-16	Datasheet for printer paper – LTS paper for PCNEOS-S2BN.pdf

Content of the Serial Output reports.

Output to a Printer

The printed report for the NucleoCounter SP-100[™] looks as follows when transmitted to the Printer (F310 = 2).

NucleoCounter[®] SP-100[™] System – Technical Note No.0102

NucleoCounter SP-100 S/N 004-12 v1.16	Report header
Date 02-Jan-2000 Time 04:40:54 Number #8551	Analysis Number
Sample ID _____	Sample ID*
Sample Type _____	Sample Type**
DF 200	Dilution factor used for the analysis
Cells/ml 76.00 mill.	Dilution corrected result
Operator _____	Operator**

Figure 3. Printed report from a NucleoCounter[®] SP-100[™].

* Must be entered by the operator if the NucleoCounter SP-100 sample ID feature is not being used

** Must be entered by the operator

Output to a PC

The different results transmitted from the NucleoCounter[®] SP-100[™] to the PC appears like shown below in *Table 2* (F310 = 1). *Table 1* shows the RS-232 settings for the communication.

Table 1 Communications settings for the Serial Port on the PC

Baud rate:	19200
Data bits:	8
Parity:	None
Stop bits:	1
Flow control:	None

NucleoCounter[®] SP-100[™] System – Technical Note No.0102

Communication protocol.

Each time an analysis has been performed a Result status (made of ASCII characters) followed by a comma "," and a Result value (also made of ASCII characters) followed by a "carriage return(CR)" and "line feed(LF)" will be transmitted on the serial port. The format of the transmission is:

<Result status>,<Result value><CR><LF>

There is no check of transmission errors so the NucleoCounter[®] SP-100[™] will simply dump the data on the serial port.

On the PC a program must collect the characters transmitted. This program is suggested to look for the following four combinations of character strings in each transmission:

- <OK, XXXXX mill.><CR><LF>
- <RETEST, XXXXX mill.><CR><LF>
- <RETEST, N/A><CR><LF>
- <ERROR, N/A><CR><LF>

Please note that there is a space character < > before and after the actual number of cells. So the Result value XXXXX¹ will be between:

< , >

and

< mill.><CR><LF>

The unit for this number is: 10⁶ cells/ml.

Printer settings report.

Page 14 of the printer User's guide describes the steps required to check the printer settings

¹ When 999.9 < Result value < 10000, no decimal symbol is present and therefore only 4 characters are present. In all other cases the Result value have 5 characters unless it is N/A. The X's can only be the numeric characters and "period".

NucleoCounter[®] SP-100[™] System – Technical Note No.0102

```
Printer Emul.: Custom DPT24
Protocol      : No Addressable
Baud Rate    : 19200 bps
Data length  : 8 bits/chr
Parity       : None
Handshaking  : Xon/Xoff
Autofeed     : CR disabled
Panel Key    : Enabled
Print Mode   : Normal
Font Type    : Font A
Speed/Quality: Normal
Offline      : Disabled
Print Density: Dark
```

This part of the printer settings report appears after a small header.

Figure 4 Printer settings report from the PCNEOS printer with settings for the NucleoCounter[®] SP-100[™].

Table 2 The various types of results received by the PC (XXXXXX) designates the sperm cell density in millions per ml

OK, XXXXX mill.
RETEST, XXXXX mill.
RETEST, N/A
ERROR, N/A

NucleoCounter[®] SP-100[™] System – Technical Note No.0102

- Troubleshooting** In case your printer is not working please ensure that:
- The Printer cable is Connected
 - The Printer is turned ON
 - The Paper roll is correctly installed
 - The settings of the printer matches the settings when the printer was supplied (see Figure 4)
- In case your PC do not collect any data please ensure that:
- The PC cable is Connected
 - The PC application for collecting data is running correct
 - The RS-232 setting for the PC collecting data matches the settings in Table 1
- Limitations** The use of a printer together with the NucleoCounter[®] SP-100[™] system does not alter the analytical application or performance of the NucleoCounter[®] SP-100 system used. For use of the NucleoCounter[®] SP-100[™] system please refer to the NucleoCounter[®] SP-100[™] User's guide or the appropriate Application Note.
- Liability Disclaimer** This Technical Note is intended to be used only as INSTRUCTIONS FOR THE CONNECTION OF THE SPECIFIED PRINTER TO THE APPROPRIATE NucleoCounter[®] SP-100[™] System.
This Technical Note does not warrant any use of the mentioned printer or consumables except for the printing of reports as described. Use of the printer for other purposes, lack of maintenance, use of un-recommended consumables or connectors can result in faulty and/or hazardous operation of the printer.
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