Section 11 Transmission

The analyzer can transmit the sample data and QC data to the external computer through RS-232C serial port. The transmission can be conducted either automatically or through the command of the operator after the completion of sample analysis. This section gives detailed discussion about the setup of transmission parameter, RS-232C Serial Port and the Data Transmission Format, therefore, providing detailed information for the software engineers to program. Besides, the user can conveniently perform transmission.

§11.1 Connection

BC-3000 is connected with the external computer through DB9 connector. The pins of DB9 connector are shown in figure 11-1.
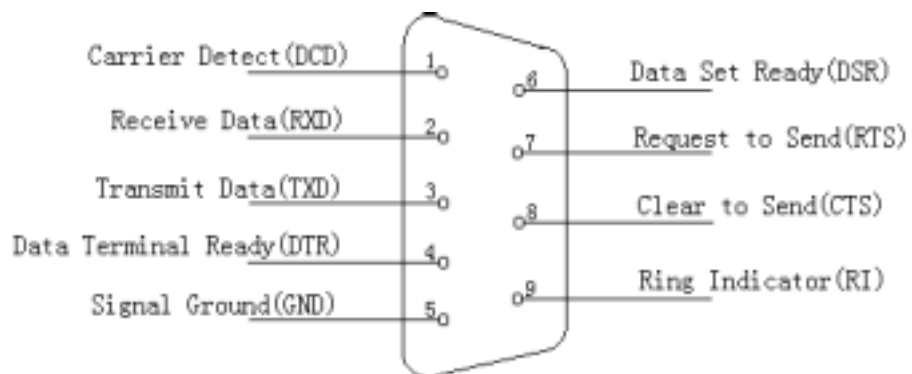
Figure 11-1 DB9 Connector

Analyzer communicate with an external computer through serial port 1. Use DB9 connector Pin 2, Pin 3 and Pin 5.

§11.2 Setup Transmission Parameters

The data bits and stop bit in serial transmission is fixed.

    Data Bits: 7

    Stop Bit: 1

■ Transmission

Figure 11-2

In Menu operation, move the cursor to "Setup/Transmission", then press [ENTER] key to access the Transmission screen.

Figure 11-3 Transmission Screen

Baud Rate："9600"，"4800"，"2400"，"1200"

Parity Bit："Odd"，"Even"，"No"

Handshake: On, Off

    On: BC-3000 transmits the body of text acknowledging the presence of an external computer.

    Off: BC-3000 transmits the body of text without acknowledging the presence of an external computer.

Auto Transmission: On, Off

On: In Count screen, BC-3000 automatically transmits the sample data to the external computer after count process.

Off: In Count screen, BC-3000 does not automatically transmit the sample data to the external computer after count process.

■ **Transmission in Count Screen**

Figure 11-4

In Menu operation, move the cursor to "Count" item, then press [ENTER] key to access the Count screen.
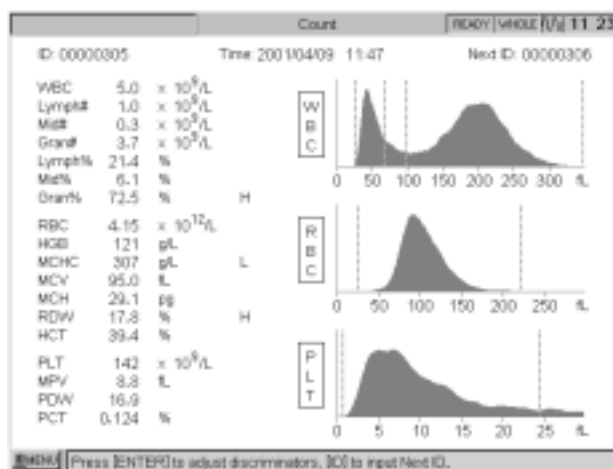

Figure 11-5 Count Screen

Transmission Icon

When the transmission icon is active, it indicates that the transmission is in the process.

If the "Auto Transmission" item in the "Setup/Transmission" is "On", then in the Count screen,

after the counting process has ended, BC-3000 automatically transmits the sample data to the external computer.

If the "Auto Transmission" item in the "Setup/Transmission" is "Off", then in the Count screen, after the counting process has ended, BC-3000 does not transmits the sample data to the external computer automatically.

■ **Transmission in Review Screen**

Figure 11-6

In Menu operation, move the cursor to "Review/Sample Review/Sample Table Review", then press [ENTER] key to access the "Sample Table Review" screen.

Figure 11-7 Sample Table Review Screen

● **Select**

Press [3], the Select dialog box pops up.

The user can select the sample data to be used for transmission.

Figure 11-8

Following procedures are for selecting the data between 5 ~ 10:

Press [3] to pop up Select dialog box.

Input 5 in start edit box.

Press [↓] to move the cursor to the end edit box, then input 10.

Press [↓] to move the cursor to Select button, press [ENTER] to select the data from the start to the end.

Press [↓], the cursor moves to Exit button, press [ENTER] to exit the select dialog box.

Figure 11-9

"*" will appear above the selected sample.

Following procedures are for selecting the data from 5 to 10 and 80 to 120.

Press [3] to pop up Select dialog box.

Input 5 in start edit box.

Press [↓] to move the cursor to the end edit box, then input 10.

Press [↓] to move the cursor to Select button, press [ENTER] to select the data from the start to the end.

Press [↑] to move the cursor to start edit box. Input 80.

Press [↓] to move the cursor to end edit box. Input 120.

Press [↓] to move the cursor to Select button, press [ENTER] to select the data from the start to the end.

Press [↓], the cursor moves to Exit button, press [ENTER] to exit the select dialog box.

Following procedures are for deselecting the data from 5 to 10:

Press [3] to pop up Select dialog box.

Input 5 in start edit box.

Press [↓] to move the cursor to the end edit box, then input 10.

Press [↓] to move the cursor to Deselect button, press [ENTER] to deselect the data from the start to the end.

Press [↓], the cursor moves to Exit button, press [ENTER] to exit the select dialog box.

Following procedures are for deselecting the data from 5 to 10 and 80 to 120:

Press [3] to pop up Select dialog box.

Input 5 in start edit box.

Press [↓] to move the cursor to the end edit box, then input 10.

Press [↓] to move the cursor to Deselect button, press [ENTER] to select the data from the start to the end.

Press [↑] to move the cursor to start edit box. Input 80.

Press [↓] to move the cursor to end edit box. Input 120.

Press [↓] to move the cursor to Deselect button, press [ENTER] to select the data from the start to the end.

Press [↓], the cursor moves to Exit button, press [ENTER] to exit the select dialog box.

● **Select/Deselect the Data of the Item Where the Cursor is Located**

Press [ENTER] to select or deselect the data of the item where the cursor is located.

● **Transmission**

Press [4], then the Transmit dialog box pops up.

Figure 11-10

Four items are available: Selected, All, Stop, Exit.

When the cursor is at "Selected", press [ENTER] to transmit the selected data to the external computer.

When the cursor is at "All", press [ENTER] to transmit all the data to the external computer.

When the cursor is at "Stop", press [ENTER] to stop the Transmission.

When the cursor is at "Exit", press [ENTER] to exit the Transmit dialog box.

■ **Transmission in QC Table Screen**
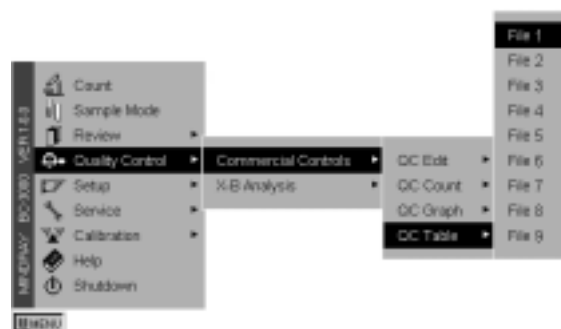
Figure 11-11

In Menu operation, move the cursor to "Quality Control/Commercial Controls/QC Table/File", then press [ENTER] to access the QC Table screen.

Figure 11-12 QC Table Screen

Transmission:

Press [1], then the Transmit dialog box pops up.

Transmit all the standard QC data and QC run data in the current file to the external computer.

Figure 11-13

Select "Yes" to start the transmission.

Select "Cancel" to cancel the transmission

§11.3 Transmission Data Format

■ Description

● Symbols

[ENQ]	0x05
[STX]	0x02
[EOT]	0x04
[EOF]	0x1A
[ETX]	0x03
[ACK]	0x06
[NACK]	0x15
"A"	0x41
"B"	0x42
"C"	0x43
"#"	0x30-0x39
"*"	0x2A

If the LotNo., Month, Day, Year are empty in QC Edit menu, the "*" (2A Hex) will be transmitted to the external computer.

For all the data formats, if the data are mark "*" in BC-3000, then "*" (2A Hex) will be transmitted to the external computer.

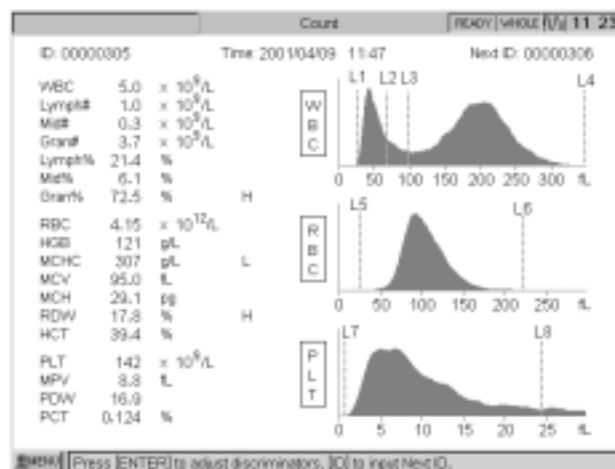L1 Region --- L8 Region are LI --- L8 as shown in figure 11-14.

Figure 11-14

● **Programming**

If the Handshake is Off, the analyzer will transmit the body of the text without acknowledging the presence of an external computer.

If the Handshake is On, the analyzer will communicate with the external computer in following procedures:

1   The analyzer sends an ENQ(05 Hex), then waits up to 4 seconds for the external computer to respond. If the external computer does not respond, then one more ENQ(05 Hex) is tried before giving up.

2   The external computer must respond by sending an ACK(06 Hex). If any other response is received, another ENQ(05 Hex) is sent by the analyzer(a maximum of only two ENQ[05 Hex] will be sent).

3   The analyzer then sends：
    ★   Body of text
    ★   EOT（04 Hex）
    ★   ETX (03 Hex)

    It then waits 4 seconds for the external computer to respond. If no response is received, one more ETX (03 Hex) is sent before giving up.

4   The external computer must respond by sending an ACK(06 Hex). If the external computer responds by sending a NACK(15 Hex), then the analyzer will execute Step 3 once again. If anything else is received, the analyzer will send ETX(03 Hex) once more.

■ **Sample Data Format**

If handshake is selected	[ENQ]
If handshake is not selected	[STX]
Body of the text start	
Text Distinction Code	"A"
ID	########
Sample Mode	#
month	##
day	##
year	####
hour	##
minutes	##
seconds	##
WBC	###.#
Lymph#	###.#

Mid#	###.#
Gran#	###.#
Lymph%	##.#
Mid%	##.#
Gran%	##.#
RBC	##.#
HGB	###
MCHC	####
MCV	###.#
MCH	###.#
RDW	##.#
HCT	##.#
PLT	####
MPV	##.#
PDW	##.#
PCT	.###
Reserved	################
Rm	#
R1	#
R2	#
R3	#
R4	#
Pm	#
Ps	#
Pl	#
L1 Region	###
L2 Region	###
L3 Region	###
L4 Region	###
L5 Region	###
L6 Region	###
L7 Region	###
L8 Region	###
Reserved	################
WBC Histo (256 channels)	###
RBC Histo (256 channels)	###
PLT Histo (256 channels)	###
Body of the text end	

If handshake is selected	[EOT]
If handshake is not selected	[EOF]
If handshake is selected	[ETX]

■ Standard QC Data Format

If handshake is selected	[ENQ]
If handshake is not selected	[STX]
Body of the text start	
Text Distinction Code	"B"
File No.	#
Lot No.	######
Month	##
Day	##
Year	####
WBC	###.#
RBC	#.##
HGB	###
PLT	####
Lymph#	###.#
Lymph%	##.#
Gran#	###.#
Gran%	##.#
HCT	##.#
MCV	###.#
MCH	###.#
MCHC	####
WBC Limit	###.#
RBC Limit	#.##
HGB Limit	###
PLT Limit	####
Lymph# Limit	###.#
Lymph% Limit	##.#
Gran# Limit	###.#
Gran% Limit	##.#
HCT Limit	##.#
MCV Limit	###.#
MCH Limit	###.#

MCHC Limit   ####

Body of the text end

If handshake is selected   [EOT]

If handshake is not selected   [EOF]

If handshake is selected   [ETX]

■ Run QC Data Format

If handshake is selected   [ENQ]

If handshake is not selected   [STX]

Body of the text start

Text Distinction Code   'C'

Month   ##

Day   ##

Year   ####

Hour   ##

Minutes   ##

WBC   ###.#

RBC   #.##

HGB   ###

PLT   ####

Lymph#   ###.#

Lymph%   ##.#

Gran#   ###.#

Gran%   ##.#

HCT   ##.#

MCV   ###.#

MCH   ###.#

MCHC   ####

Body of the text end

If handshake is selected   [EOT]

If handshake is not selected   [EOF]

If handshake is selected   [ETX]