DXH LIS支持手册V1.2

一、如何编写散点图？

二、如何编写直方图？

三、DXH流水线，如何分辨哪台仪器传输过来的样本结果和质控结果？

四、如何编写DXH双向通讯语句？

五、双向通讯的仪器设置

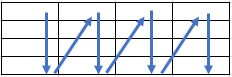
六、如何将仪器的提示信息解析出来？

一、DXH散点图的解析，如何编写散点图：

1.定义70种不同的颜色点，它就是数据点的颜色。分别如下：

|  |  |
| --- | --- |
| 数据点的70种不同颜色 | 编号（十六进制） |
| 00000000000000000000000000000000 | 00 |
| 00000000000000000001000000000000 | 01 |
| 00000000000D01000001000000000000 | 02 |
| 0000000000010000010D010000010000 | 03 |
| 000000000D0100000101010000010D00 | 04 |
| 0001000000010D00010101000D010100 | 05 |
| 0001000002010D00010101010D010100 | 06 |
| 0101010001010101010D010101010100 | 07 |
| 0101010001010101010D010101010101 | 08 |
| 00010101010101010101010101010101 | 09 |
| 00000000000000000000000000000000 | 0A |
| 00000000000000000003000000000000 | 0B |
| 00000000000304000004000000000000 | 0C |
| 00000000000300000304030000040000 | 0D |
| 00000000030300000304030000030400 | 0E |
| 00030000000304000304030003030300 | 0F |
| 00030000030304000304030303030300 | 10 |
| 03030300030303030304030303030400 | 11 |
| 03030300040303030303030303030304 | 12 |
| 03030303030303030303030303030303 | 13 |
| 00000000000000000000000000000000 | 14 |
| 00000000000000000005000000000000 | 15 |
| 00000000000405000005000000000000 | 16 |
| 00000000000500000506040000040000 | 17 |
| 00000000040500000506050000050400 | 18 |
| 00050000000504000506050004050500 | 19 |
| 00050000040505000506050505050400 | 1A |
| 06050500050605050605060505050500 | 1B |
| 06050600060506050506050606050605 | 1C |
| 06060606060606060606060606060606 | 1D |
| 00000000000000000000000000000000 | 1E |
| 00000000000000000007000000000000 | 1F |
| 00000000000708000007000000000000 | 20 |
| 00000000000700000708070000070000 | 21 |
| 00000000070800000807080000080700 | 22 |
| 00080000000807000807080008070800 | 23 |
| 00080000080807000807080808080700 | 24 |
| 08080900080807080809080808080800 | 25 |
| 08080800080808080808080808080808 | 26 |
| 08080808080808080808080808080808 | 27 |
| 00000000000000000000000000000000 | 28 |
| 0000000000000000000A000000000000 | 29 |
| 0000000000070A00000A000000000000 | 2A |
| 00000000000A00000A070A00000A0000 | 2B |
| 000000000D0A00000A070A00000A0D00 | 2C |
| 000A0000000A0700070A0A000A0A0A00 | 2D |
| 000A00000A0A0A000A0A0A0A0A0A0A00 | 2E |
| 0A0B0A000B0A0B0A0A0B0A0B0B0A0B00 | 2F |
| 0A0B0A000B0A0B0A0A0B0A0B0B0A0B0A | 30 |
| 0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B | 31 |
| 00000000000000000000000000000000 | 32 |
| 00000000000000000003000000000000 | 33 |
| 0000000000030C00000D000000000000 | 34 |
| 00000000000300000D0C0C00000D0000 | 35 |
| 00000000030C00000D030D00000D0C00 | 36 |
| 000C0000000C03000D030D000D0E0C00 | 37 |
| 000D00000C030C000D030D0D0C0D0C00 | 38 |
| 0D0C0D000C030D0D0D03030C0C0D0C00 | 39 |
| 0C0D0D000D03030C03030C0D0D0C0D03 | 3A |
| 0C03030C030C0D0D0C0D030C030C0C03 | 3B |
| 00000000000000000000000000000000 | 3C |
| 0000000000000000000F000000000000 | 3D |
| 00000000000F0F00000F000000000000 | 3E |
| 00000000000F00000F0F0F00000F0000 | 3F |
| 000000000F0F00000F0F0F00000F0F00 | 40 |
| 000F0000000F0F000F0F0F000F0F0F00 | 41 |
| 000F00000F0F0F000F0F0F0F0F0F0F00 | 42 |
| 0F0F0F000F0F0F0F0F0F0F0F0F0F0F00 | 43 |
| 0F0F0F000F0F0F0F0F0F0F0F0F0F0F0F | 44 |
| 0F0F0F0F0F0F0F0F0F0F0F0F0F0F0F0F | 45 |

以编号07为例，它的数据是0101,0100,0101,0101,010D,0101,0101,0100，将这些数据按照下面的方法，放在4\*4的小方格中：从上往下，再从左往右。



|  |  |  |  |
| --- | --- | --- | --- |
| 01 | 01 | 01 | 01 |
| 01 | 01 | 0D | 01 |
| 01 | 01 | 01 | 01 |
| 00 | 01 | 01 | 00 |

这4\*4方格中的00，01或0D，是从Windows操作系统中调用颜色的。以下是DXH从Windows取得的16种颜色。详细的Windows色阶定义，请见附件。

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 00 | 000000 | black | 黑色 | |  | | --- | |  | | |  | | --- | |  | |
| 01 | FFFFFF | white | 白色 |  |  |
| 02 | 606060 |  | 黑色 |  |  |
| 03 | FF0000 | red | 红色 |
| 04 | FFFF00 | yellow | 黄色 |  |  |
| 05 | FF00FF | magenta | 洋红 |
| 06 | 800080 |  | 紫色 |  |  |
| 07 | 00FFFF | cyan | 蓝绿 |
| 08 | 00FF00 | green | |  | | --- | | 绿色 | |  |  |
| 09 | 008000 |  | 深绿 |  |
| 0A | 0000FF | blue | 蓝 色 |  |  |
| 0B | 000080 | navyblue | 海蓝 |
| 0C | 800000 |  | |  | | --- | | 褐色 | |  |
| 0D | 808080 |  | 黑色 |  |
| 0E | C0C0C0 |  | 黑色 |  |  |
| 0F | FFA500 | orange | 橙色 |



所以编号07代表的颜色如下所示：

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

同理，编号0D为

|  |  |  |  |
| --- | --- | --- | --- |
| 00 | 00 | 03 | 00 |
| 00 | 03 | 04 | 04 |
| 00 | 00 | 03 | 00 |
| 00 | 00 | 00 | 00 |

它代表的颜色为：

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

编号24为：

|  |  |  |  |
| --- | --- | --- | --- |
| 00 | 00 | 08 | 08 |
| 08 | 08 | 07 | 08 |
| 00 | 07 | 08 | 07 |
| 00 | 00 | 08 | 00 |

它代表的颜色为：

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

编号26为：

|  |  |  |  |
| --- | --- | --- | --- |
| 08 | 08 | 08 | 08 |
| 08 | 08 | 08 | 08 |
| 08 | 08 | 08 | 08 |
| 00 | 08 | 08 | 08 |

它代表的颜色为：

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

编号27为：

|  |  |  |  |
| --- | --- | --- | --- |
| 08 | 08 | 08 | 08 |
| 08 | 08 | 08 | 08 |
| 08 | 08 | 08 | 08 |
| 08 | 08 | 08 | 08 |

它代表的颜色为：

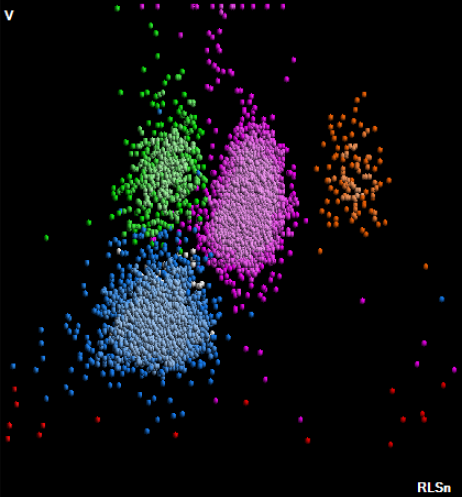
|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

第一步就是按照以上方法，定义这70中不同的颜色点。

2. LIS接收到的WBC散点数据是8192个十六进制数字，以两个数字为一个点，一共4096个数据点。是M代码后面的字符，也就是以下数据中红色部分。我们可以直接从最后一位数字开始，往前取8192个数字。

<STX>0M|4|!!!5PD1||||||F||||20200428085218|BC47204<CR><ETX>D6<CR><LF>

3.将这4096个数据点的颜色按照下面的方法，放到64\*64的方格中。第一个数据点放在左上角第一个位置，往右依次放到第64个位置后，再放接下来一行，继续放数据，直到所有的数据放满64\*64格。最终呈现如下的散点图。



4.补充信息：LIS接收到的散点图数据分两种，一种是带颜色定义的数据，它只有在仪器刚做完“每日检查”后才会发送，就是第二步中的数据。另一种是不带颜色定义的数据，为了节省传输的字符，后续所有的数据都是不带颜色定义的。如下面的例子。这也是在第二条中建议从后往前取8192个数据的原因。

<STX>6M|4|!!!5PD1||||||R||||20240411150050|BG50697<CR><ETX>47<CR><LF>

二、DXH直方图的解析，如何编写直方图：

1.LIS接收到的WBC直方图数据是512个十六进制数字，以两个数字为一个数据点，一共256个数据点。是M代码后面的字符，也就是以下数据中红色部分。

<STX>3M|1|!!!WBC.Histogram.Array||||||F||||20240411150050|BG50697<CR><ETX>98<CR><LF>

2.请先找出这256组中最大的数据点F2H（H是16进制），以它为1，其他的数据点转换为与它的比值。以第一个数字02H为例，它就是02H/F2H=2/242=0.00826，这就是第一个数据点的高度。依此类推，我们可以算出每个点的高度，一共是256个点。所以直方图的横坐标是0-255，纵坐标就是数据的大小。横坐标：纵坐标=3：1。再按照下图，标上刻度。

备注：横坐标和纵坐标的单位不一样，当我们设定纵坐标高度为3cm时，横坐标我们可以取9cm，把这256个点不同高度相应表示出来。

A purple graph with black text

Description automatically generated

3. LIS接收到的RBC直方图数据是512个十六进制数字，以两个数字为一个数据点，一共256个数据点。是M代码后面的字符，也就是以下数据中红色部分。

<STX>5M|3|!!!RBC.Histogram.Array||||||F||||20240411150050|BG50697<CR><ETX>8A<CR><LF>

4.画图的方法与WBC相同，最终呈现的是如下的直方图。

A graph of a number of data

Description automatically generated with medium confidence

5. LIS接收到的PLT直方图数据是512个十六进制数字，以两个数字为一个数据点，一共256个数据点。是M代码后面的字符，也就是以下数据中红色部分。

<STX>4M|2|!!!Plt.Histogram.Array||||||F||||20240411150050|BG50697<CR><ETX>B5<CR><LF>

6. 画图的方法与WBC有一点不同，它只用其中的前面一半数据点，也就是后面一半的0都不用，所以PLT直方图上只有128个数据点，最终呈现的是如下的直方图。

A green line graph with white text

Description automatically generated

三、DXH流水线，如何分辨哪台仪器传输过来的样本结果和质控结果？

1.DXH流水线有两台仪器血常规仪器，如序列号分别是BG50697(DXH1)和BG50696(DXH2)。

2.每台仪器做完样本，向LIS传输结果的时候，都带有序列号。请见下面的代码，它表示是DXH1传输过来的手动进样样本9601的结果。注意，样本号码在O字段后面，仪器序列号都在R字段的后面。

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4/12/2024 9:07 | 客户端 | <STX>1H|\!~|||DxH|||||LIS||P|LIS2-A|20240412090759<CR><ETX>61<CR><LF> | | | | | | | |  |  |  |
| 4/12/2024 9:07 | 主机 | <ACK> |  |  |  |  |  |  |  |  |  |  |
| 4/12/2024 9:07 | 客户端 | <STX>2P|1<CR><ETX>3F<CR><LF> | | | |  |  |  |  |  |  |  |
| 4/12/2024 9:07 | 主机 | <ACK> |  |  |  |  |  |  |  |  |  |  |
| 4/12/2024 9:07 | 客户端 | <STX>3O|1|9601|99999|!!!CD|R|||||||||20240410154118|Whole blood|||||!SYSTEM||20240410154302|||F<CR><ETX>00<CR><LF> | | | | | | | | | | |
| 4/12/2024 9:07 | 主机 | <ACK> |  |  |  |  |  |  |  |  |  |  |
| 4/12/2024 9:07 | 客户端 | <STX>4C|1|I|Test names beginning with @ are research use only. Not for use in diagnostics procedures.|G<CR><ETX>B9<CR><LF> | | | | | | | | | | |
| 4/12/2024 9:07 | 主机 | <ACK> |  |  |  |  |  |  |  |  |  |  |
| 4/12/2024 9:07 | 客户端 | <STX>5M|1|!!!WBC.Histogram.Array||||||F||||20240410154258|BG50697<CR><ETX>B2<CR><LF> | | | | | | | | | | |
| 4/12/2024 9:07 | 主机 | <ACK> |  |  |  |  |  |  |  |  |  |  |
| 4/12/2024 9:07 | 客户端 | <STX>6M|2|!!!Plt.Histogram.Array||||||F||||20240410154258|BG50697<CR><ETX>00<CR><LF> | | | | | | | | | | |
| 4/12/2024 9:07 | 主机 | <ACK> |  |  |  |  |  |  |  |  |  |  |
| 4/12/2024 9:08 | 客户端 | <STX>7M|3|!!!RBC.Histogram.Array||||||F||||20240410154258|BG50697<CR><ETX>41<CR><LF> | | | | | | | | | | |
| 4/12/2024 9:08 | 主机 | <ACK> |  |  |  |  |  |  |  |  |  |  |
| 4/12/2024 9:08 | 客户端 | <STX>0M|4|!!!5PD1|0E1001010040004000000800000000000000000000000000000000000000000000001F001500000000150015151515151700000000150000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000015150000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000001500000000000000000000000000000000001515000000000000000000000000000000000B000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000001500000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000151515000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000001F000000001F0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000001F000000000000000000000000000000000015000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000001F0000000000000000000015000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000001F00290000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000201F00001F000000001500000000151500000000000000000000000000000000000000000000000000000000000000000000000000000000000000001F0000001F201F0000150015151516000015000015000000000000000000000000000000000000000000000000000000000000000000000000000000001500001F001F000000000000000000000000151500151515150000000000000000000000000000000000000000000000000000000000000000000000000000000000001F20201F0000001F1F00001500001515171917171700000000000000000000000000000000000000000000000000000000000000000000000000000000001F00001F1F0000002100000000000015161718191A191615000000000000000000000000000000000000000000000000000000000000000000000000001500000000000000201F0020001F1F0000000017001A19191A19001500000000000000000000000B00000000000000000000000000000000000000000000000000000000000000002021202020000000160016171A1A1B1B1B1A1516000000000B00000B000000000000000000000000000000000000000000000000000000000000000029000021002020201F20201F001517191A1B1B1B1A1918001500000000000000000B0B0B000000000000000000000000000000000000000000000000000000000000000021002321201F1F1F001715181B1B1B1C1B1B181615000000000000000B0B0E00000000000000000000000000000000000000000000000000000000001F1F201F20232320201F1F001515191A1B1C1C1C1C1B1919161500000000000B0B0C0B0B0B00000000000000000000000000000000000000000000000000000000001F201F1F21202022201600161A171B1C1C1C1C1B1B180000000000000C0B0B0C100B000000000000000000000000000000000000000000001F1F00150000001F2100212023222221001517161A1B1C1C1C1C1C1C1A19000000000000000D0C0D0F0B0B0B00000000000000000000000000000000000000000015000020201F1F1F232324242220201F1F16181B1B1C1C1C1C1C1C1B190000000000000B0C0B0E000C0B0C000000000000000000000000000000000000000000001F00151F0000211F2324232121201F1516191A1C1C1C1C1C1C1C1B1A1700000000000E000D0C0B0C000000000000000000000000000000000000000000000000000020001F20002121212221151F001519191B1C1C1C1C1C1C1C1B1A170000000B000D000B000E00000B0B00000000000000000000000000000000000000000000001500002022212323211F000020171A1A1B1C1C1C1D1C1C1C1B1A151600000B0B0B0E0C0B0B0B00000000000000000000000000000000000000000000000000000029202023232020222020001F18161A1C1C1C1C1D1D1C1C1A1A001500000C0B0B0C0E0F0B000C00000000000000000000000000000000000000000029001500001F1F222000221F1F1F1F1F2017171B1B1C1C1C1D1C1C1C1A1815000000000B00000D00000B0000000000000000000000000000000000000000000000000000001F1F292120000000000000160018191B1C1C1C1D1C1C1C19161516000B00000000000B000B000B000B000000000000000000000000000000000000000000292900201F2A201F00001F15150017161A1A1C1C1C1C1C1C1B1716000000000B00000B00000B0C0B000000000000000000000000000000000000000000001F2B001F2021011F29001F01001F1600171A181B1B1C1C1C1C1B1917000000000B00000000000B00000000000000000000000000000000000000000000000000000029292A00010001001F02000017161916191B1B1B1C1C1B1A161618160000000000000000000B00000000000000000000000000000000000000000000000029290029292B2D2900001F011F04001717171A191A1A1B1A1A18170000000000000000000000000000000000000000000000000000000000000000000000002929000029012A2D022C02012B010001171516171A17191919161816150000000000000000000B0000000000000000000000000000000000000000000000000000002A2A2B012A2C2D022C0101010002160015161616190018190000000000000000000000000000000000000000000000000000000000000000000000000000292B2A2D2A2E2E2E2F02012D0102010003161715171615180016151500150000000000000000000000000000000000000000000000000000000000002900002900292C2D2D012F012F012F012E2D2B010100151516150015150000000000000000000000000000000000000000000000000000000000000000000000002900292B2B2E2F2F2F2F012F2F2F2E2E2B012A290115160016000015000000000000000000000000000000000000000000000000000000000000000000000000002929292E2E2E2F2F3001012F2F01012B2D2A2915001515000000150000000000000000000000000000000000000000000000000000000000000000000000290029002C2D2D302F30303030302F2F152D2D01292A00150000151600000000150000000000000000000000000000000000000000000000000000000000002A2900292B2D2E2F2F2F300130302F302F2F2D2E15152915160000000016000000000000000000000000000000000000000000000000000000000000000000290029002C2E2B2E2E2F2F0130302F2F2F2F2F2D2A29000015151600001500001500000015000000000000000000000000000000000000000000000000002929292A2A2C2A2D2D2E2F2E2F2F302F2F2F2F2E2E012B292900151617001500001516000000000000000000000000000000000000000000000000000000000000002A000029292E2B2E2F2F2F2F2F2F2F2F2E2E2D2D291500001515150000161500000000000000000000000000000000000000000000000000000000000000000000002915292F2E2E2E2E2F2F2F2E2F2F2C292D2A00152A00000016000000000000000000000000000000000000000000000000000000000000000000000000000000002A2A2B2E2E2B2C2E2D152B2E2C2D2B152A16150000171515000000000000000000000000000000000000000000000000000000000000000000292A00000029150029292A2D2A2A2C2D2C2C292A2D290029001500001500000000000000000000000000000000000000000000000000000000000000000000000000290015000029000000002A2B000000292A00292B002A00000000000000000000000000000000000000000000000000000000000000000000000000000000290000000000000000000000000000292900002900000000000000000015000000000000000000000000000000000000000000000000000000000000000B0000000000000000000000290000000000000029000000290033000029000000000000000000000000000000000000000000000000000000000000000000000000000000000029000000000000000000002900000000000029000000000000000000000000000000000015000000000000000B000000000000000000000000000000000033000000000033290000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000340000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000330000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000343300000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000003300000000000000000000000000330000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000|||||F||||20240410154258|BG50697<CR><ETX>FF<CR><LF> | | | | | | | | | | |
| 4/12/2024 9:08 | 主机 | <ACK> |  |  |  |  |  |  |  |  |  |  |
| 4/12/2024 9:08 | 客户端 | <STX>1R|1|!!!WBC!33256-9|7.3|10^9/L||3.6 to 10.2|||R||SYSTEM||20240410154258|BG50697<CR><ETX>6C<CR><LF> | | | | | | | | | | |
| 4/12/2024 9:08 | 主机 | <ACK> |  |  |  |  |  |  |  |  |  |  |
| 4/12/2024 9:08 | 客户端 | <STX>2R|2|!!!UWBC!6690-2|7.3|10^9/L|||||R||SYSTEM||20240410154258|BG50697<CR><ETX>13<CR><LF> | | | | | | | | | | |
| 4/12/2024 9:08 | 主机 | <ACK> |  |  |  |  |  |  |  |  |  |  |
| 4/12/2024 9:08 | 客户端 | <STX>3R|3|!!!RBC!789-8|5.01|10^12/L||4.06 to 5.63|||R||SYSTEM||20240410154258|BG50697<CR><ETX>A1<CR><LF> | | | | | | | | | | |
| 4/12/2024 9:08 | 主机 | <ACK> |  |  |  |  |  |  |  |  |  |  |
| 4/12/2024 9:08 | 客户端 | <STX>4R|4|!!!HGB!718-7|143|g/L||125 to 163|||R||SYSTEM||20240410154258|BG50697<CR><ETX>4B<CR><LF> | | | | | | | | | | |
| 4/12/2024 9:08 | 主机 | <ACK> |  |  |  |  |  |  |  |  |  |  |

3. 以下代码表示是DXH1传输过来的自动动进样样本01124030700001的结果。注意，样本号码在O字段后面，仪器序列号都在R字段的后面。

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4/11/2024 15:14 | 客户端 | <ENQ> |  |  |  |  |  |  |  |  |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>1H|\!~|||DxH|||||LIS||P|LIS2-A|20240411151415<CR><ETX>53<CR><LF> | | | | | | | |  |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>2P|1<CR><ETX>3F<CR><LF> | | | |  |  |  |  |  |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>3O|1|01124030700001|00181|!!!CD|R|||||||||20240411150322|Whole blood||||||DO||||P<CR><ETX>95<CR><LF> | | | | | | | | |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>4C|1|I|Variant LY|I!U<CR><ETX>4A<CR><LF> | | | | |  |  |  |  |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>5C|2|I|Left Shift|I!U<CR><ETX>5B<CR><LF> | | | | |  |  |  |  |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>6C|3|I|NE Blast|I!U<CR><ETX>5D<CR><LF> | | | | |  |  |  |  |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>7C|4|I|Excessive Debris: D|I!Y<CR><ETX>80<CR><LF> | | | | | |  |  |  |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>0C|5|I|Low Events: D|I!Y<CR><ETX>19<CR><LF> | | | | | |  |  |  |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>1C|6|I|NRBC Inter|I!Y<CR><ETX>FD<CR><LF> | | | | |  |  |  |  |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>2C|7|I|呼叫送检医生|L<CR><ETX>CB<CR><LF> | | | | | |  |  |  |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>3C|8|I|Test names beginning with @ are research use only. Not for use in diagnostics procedures.|G<CR><ETX>BF<CR><LF> | | | | | | | | |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>4R|1|!!!WBC!33256-9|6.5|10^9/L||3.6 to 10.2|||S||||20240411150520|BG50697<CR><ETX>81<CR><LF> | | | | | | | | |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>5R|2|!!!UWBC!6690-2|6.5|10^9/L|||||S||||20240411150520|BG50697<CR><ETX>28<CR><LF> | | | | | | | | |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>6R|3|!!!RBC!789-8|5.04|10^12/L||4.06 to 5.63|||S||||20240411150520|BG50697<CR><ETX>B8<CR><LF> | | | | | | | | |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |  |  |  |  |

4.每台血常规仪器每天都要做三个水平的质控，分别是是Level1，Level2和Level3，我们以批号来区别不同水平的质控。请见下面的代码，它表示是DXH1传输过来的Level3批号为143195330的结果。注意，质控号码在O字段后面，仪器序列号都在R字段的后面。

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4/12/2024 9:08 | 客户端 | <ENQ> |  |  |  |  |  |  |  |  |
| 4/12/2024 9:08 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/12/2024 9:08 | 客户端 | <STX>1H|\!~|||DxH|||||LIS||Q|LIS2-A|20240412090826<CR><ETX>5D<CR><LF> | | | | | | | |  |
| 4/12/2024 9:08 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/12/2024 9:08 | 客户端 | <STX>2P|1<CR><ETX>3F<CR><LF> | | | |  |  |  |  |  |
| 4/12/2024 9:08 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/12/2024 9:08 | 客户端 | <STX>3O|1|143195330!Level 3!COULTER® 6C Cell!20240505|00178||||||||Q|||||||||SYSTEM|!A!!Shift 1||||F<CR><ETX>22<CR><LF> | | | | | | | | |
| 4/12/2024 9:08 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/12/2024 9:08 | 客户端 | <STX>4C|1|I|Test names beginning with @ are research use only. Not for use in diagnostics procedures.|G<CR><ETX>B9<CR><LF> | | | | | | | | |
| 4/12/2024 9:08 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/12/2024 9:08 | 客户端 | <STX>5M|1|!!!RBC.Histogram.Array||||||F||||20240411110218|BG50697<CR><ETX>C8<CR><LF> | | | | | | | | |
| 4/12/2024 9:08 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/12/2024 9:08 | 客户端 | <STX>6M|2|!!!Plt.Histogram.Array||||||F||||20240411110218|BG50697<CR><ETX>EA<CR><LF> | | | | | | | | |
| 4/12/2024 9:08 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/12/2024 9:08 | 客户端 | <STX>7M|3|!!!WBC.Histogram.Array||||||F||||20240411110218|BG50697<CR><ETX>3C<CR><LF> | | | | | | | | |
| 4/12/2024 9:08 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/12/2024 9:08 | 客户端 | <STX>0M|4|!!!5PD1||||||F||||20240411110218|BG50697<CR><ETX>91<CR><LF> | | | | | | | | |
| 4/12/2024 9:08 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/12/2024 9:08 | 客户端 | <STX>1R|1|!!!WBC!33256-9|9.1|10^9/L|||||F||||20240411110218|BG50697<CR><ETX>F5<CR><LF> | | | | | | | | |
| 4/12/2024 9:08 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/12/2024 9:08 | 客户端 | <STX>2R|2|!!!RBC!789-8|5.60|10^12/L|||||F||||20240411110218|BG50697<CR><ETX>F1<CR><LF> | | | | | | | | |
| 4/12/2024 9:08 | 主机 | <ACK> |  |  |  |  |  |  |  |  |
| 4/12/2024 9:08 | 客户端 | <STX>3R|3|!!!HGB!718-7|161|g/L|||||F||||20240411110218|BG50697<CR><ETX>F8<CR><LF> | | | | | | | | |
| 4/12/2024 9:08 | 主机 | <ACK> |  |  |  |  |  |  |  |  |

5.根据仪器序列号，在LIS端就可以标注出，接收的结果是哪台仪器做的。也可以根据质控批号与仪器序列号，在LIS端可以判断出哪台仪器做的哪个水平的质控。

四、如何编写DXH双向通讯语句？

1.在仪器的条码阅读器扫描到样本的条码后，会自动生成向LIS询问的客户端语句，如下是询问2404011787样本需要做什么测试组合。

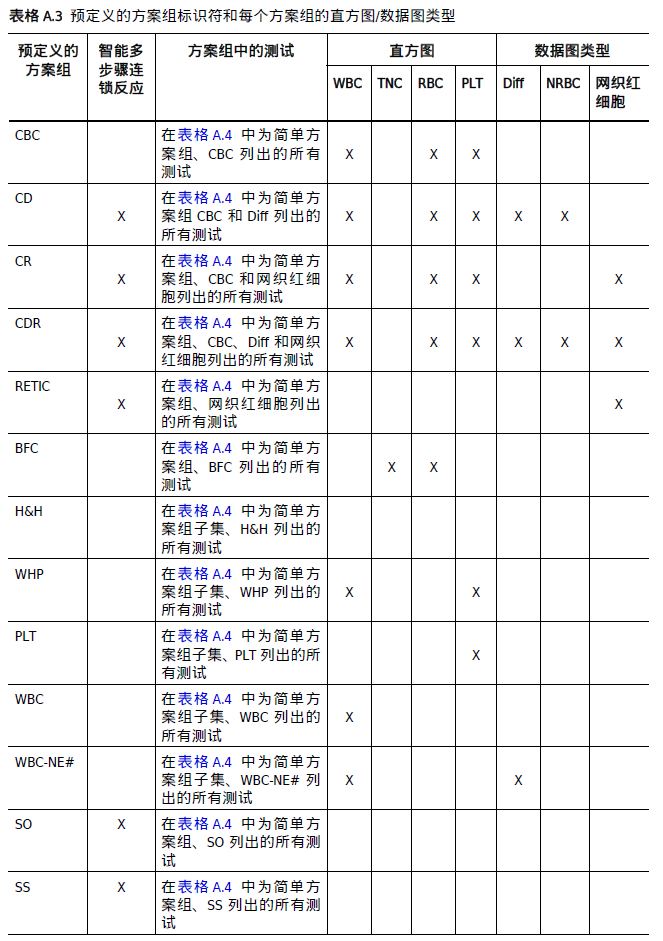
|  |  |
| --- | --- |
| 客户端 | <ENQ> |
| 主机 | <ACK> |
| 客户端 | <STX>1H|\!~|(0:0-41805934#322551182, 571)||DxH|||||LIS||P|LIS2-A|20240403083547<CR><ETX>F1<CR><LF> |
| 主机 | <ACK> |
| 客户端 | <STX>2Q|1|!2404011787||ALL||||||||O<CR><ETX>DF<CR><LF> |
| 主机 | <ACK> |
| 客户端 | <STX>3L|1|N<CR><ETX>06<CR><LF> |
| 主机 | <ACK> |
| 客户端 | <EOT> |

2.LIS需要回复以下主机的语句：

|  |  |
| --- | --- |
| 主机 | <ENQ> |
| 客户端 | <ACK> |
| 主机 | <STX>1H|\!~<CR><ETX>A8<CR><LF> |
| 客户端 | <ACK> |
| 主机 | <STX>2P|1|<CR><ETX>3F<CR><LF> |
| 客户端 | <ACK> |
| 主机 | <STX>3O|1|2404011787||!!!CBC|||||||||||Whole blood<CR><ETX>9C<CR><LF> |
| 客户端 | <ACK> |
| 主机 | <STX>4L|1|N<CR><ETX>07<CR><LF> |
| 客户端 | <ACK> |
| 主机 | <EOT> |

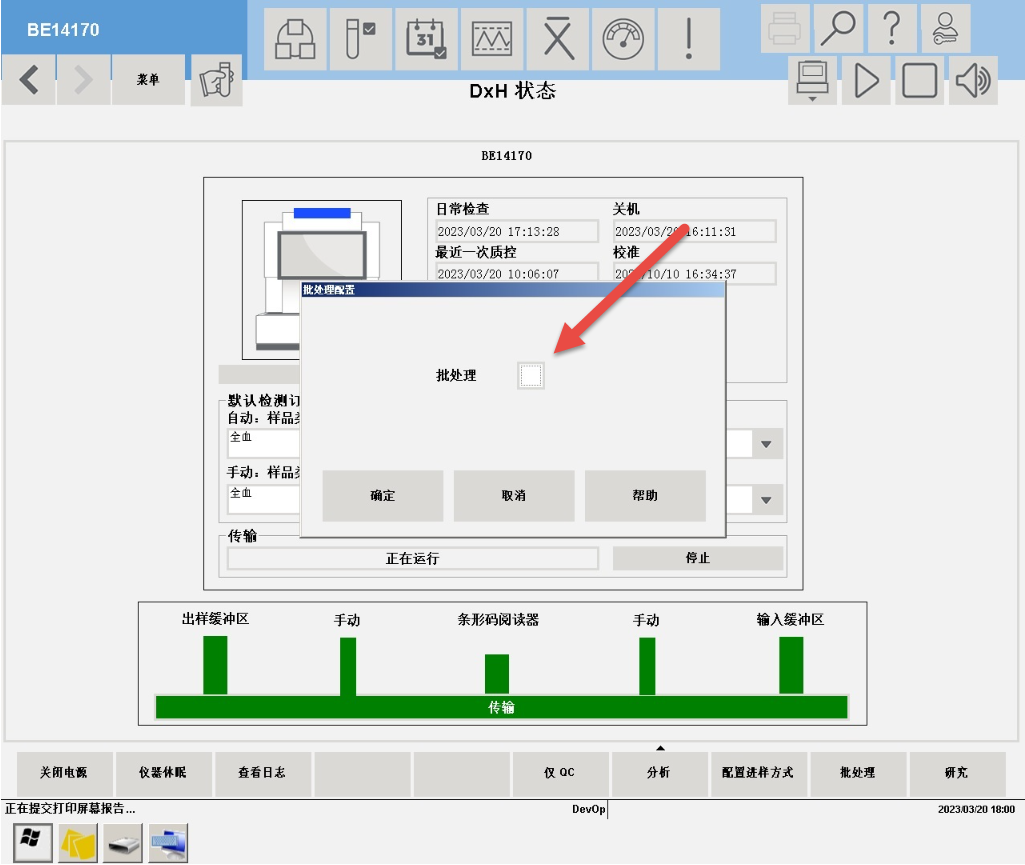
其中CBC就是LIS发送给DXH的测试组合（方案组），只能在下面表格中的预定义的方案组中选择。这个测试组合信息来自于HIS中医生开出的化验单。如果只做CBC计数，则选CBC；如果做计数和五分类，则选择CD；如果既做五分类，又做网织红，则选择CDR；如果仅做网织红，则选择RETIC。

备注：如果结果中需要有WBC，则至少要做CBC；如果结果中需要做NE%(中性粒细胞百分比)，则至少做五分类。如果结果中需要Retic，则至少做RETIC。

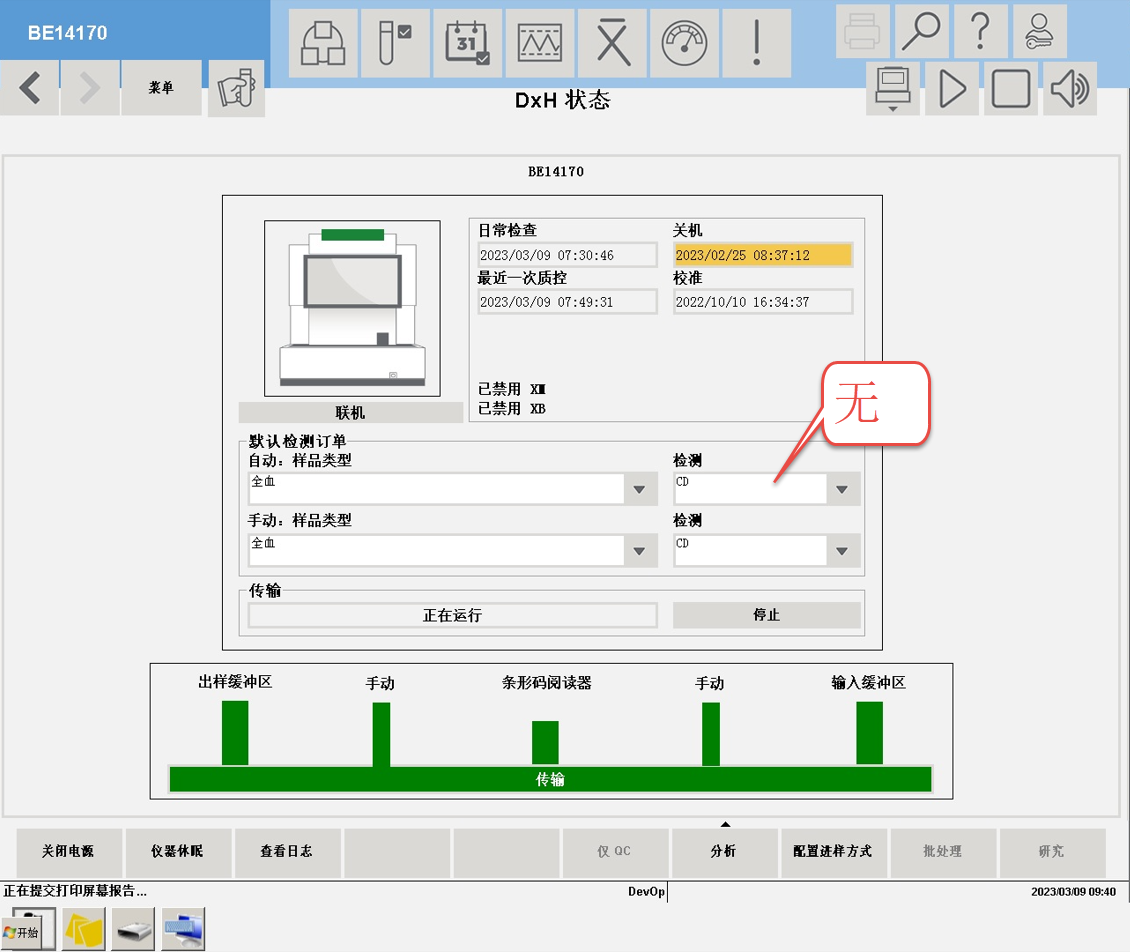


五、双向通讯的仪器设置

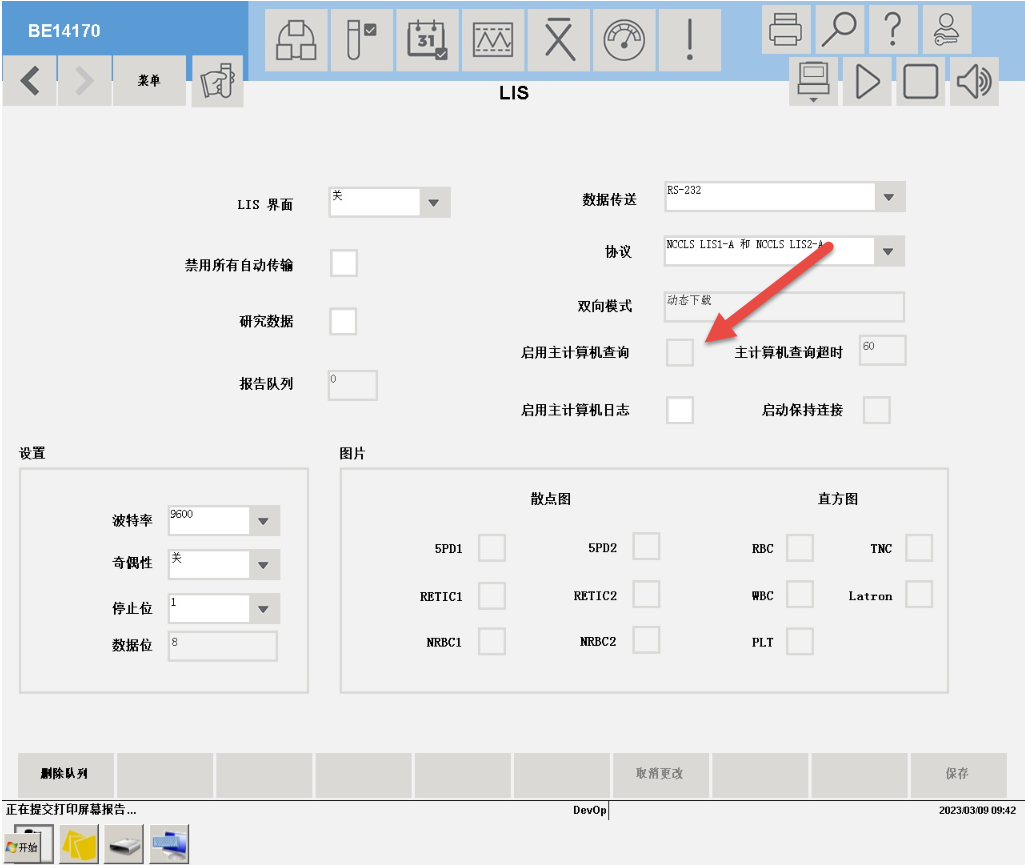
1.将“批处理“去掉。



2.将自动进样的默认设置为“无”。



3.LIS参数中选择“启用主计算机查询”。



六、如何将仪器的提示信息解析出来？

在仪器向LIS传输的语句中，C代码后面的内容就是仪器的样本结果中的提示信息，以英文传送，可以根据附录中的表格，将中文显示在LIS界面中。下面例子中的“呼叫送检医生”是实验室自己定义的提示语句。

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 4/11/2024 15:14 | 客户端 | <ENQ> |  |  |  |  |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>1H|\!~|||DxH|||||LIS||P|LIS2-A|20240411151415<CR><ETX>53<CR><LF> | | | | | | |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>2P|1<CR><ETX>3F<CR><LF> | | | |  |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>3O|1|01124030700001|00181|!!!CD|R|||||||||20240411150322|Whole blood||||||DO||||P<CR><ETX>95<CR><LF> | | | | | | | |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>4C|1|I|Variant LY|I!U<CR><ETX>4A<CR><LF> | | | | |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>5C|2|I|Left Shift|I!U<CR><ETX>5B<CR><LF> | | | | |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>6C|3|I|NE Blast|I!U<CR><ETX>5D<CR><LF> | | | | |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>7C|4|I|Excessive Debris: D|I!Y<CR><ETX>80<CR><LF> | | | | | |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>0C|5|I|Low Events: D|I!Y<CR><ETX>19<CR><LF> | | | | | |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>1C|6|I|NRBC Inter|I!Y<CR><ETX>FD<CR><LF> | | | | |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>2C|7|I|呼叫送检医生|L<CR><ETX>CB<CR><LF> | | | | | |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>3C|8|I|Test names beginning with @ are research use only. Not for use in diagnostics procedures.|G<CR><ETX>BF<CR><LF> | | | | | | | |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>4R|1|!!!WBC!33256-9|6.5|10^9/L||3.6 to 10.2|||S||||20240411150520|BG50697<CR><ETX>81<CR><LF> | | | | | | | |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>5R|2|!!!UWBC!6690-2|6.5|10^9/L|||||S||||20240411150520|BG50697<CR><ETX>28<CR><LF> | | | | | | | |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |
| 4/11/2024 15:14 | 客户端 | <STX>6R|3|!!!RBC!789-8|5.04|10^12/L||4.06 to 5.63|||S||||20240411150520|BG50697<CR><ETX>B8<CR><LF> | | | | | | | |
| 4/11/2024 15:14 | 主机 | <ACK> |  |  |  |  |

