**仪器接口程序说明文档**

1. **接口说明**

|  |  |  |  |
| --- | --- | --- | --- |
| 仪器厂商 | 罗氏 | 适用型号 | **8000** |
| 通讯方式 | **双向** | 仪器类型 | 生化 |
| 程序名称 | MI.MIFCOBASE602 | | |
| 附件 | 仪器通讯协议（<LIS 通讯接口说明 cobas 8000 专用.pdf>） | | |

1. **连接说明**

**连接方式：**~~串口 串口线接仪器主机/串口线接仪器配备电脑~~

**是否支持其他连接方式**：网口，~~读文本，读数据库~~

**3.串口盒子设定参数**

**1）串口盒子型号及线序**

**MOXA 5410**

RS232 母对母 23交叉5直连

**2）盒子及仪器设定参数**

|  |  |  |  |
| --- | --- | --- | --- |
| 序号 | 选项中文名称 | 选项英文名称 | 设置 |
| 1 | 波特率 | Baud | 9600 |
| 2 | 数据位 | Code | 8 |
| 3 | 停止位 | Stop Bit | 1 |
| 4 | 奇偶校验 | Parity Bit | None |
| 5 | 模式 | Mode | RS232 |
| 6 | 流量控制 | Flow | None |

**4.仪器参数设定说明（保留仪器设置图片存档）**

仪器上设置：见附件<LIS 通讯接口说明 cobas 8000 专用.pdf>

仪器管理设置：

**5.仪器数据传输说明**

1）仪器自动传输结果：支持

2）手工传输结果：支持

**手动传输操作图片**

**6．修改记录**

|  |  |  |  |
| --- | --- | --- | --- |
| 序号 | 日期 | 操作人 | 说明 |
| 1 | 2018-12-12 | 刘彬 | CS版系统HL7双向接口，及BS版系统接口 |

1. **数据格式：**

**仪器请求：**

"H<--M : 64994,56998 : MSH|^~\&|cobas 8000||host||20181212155304||TSREQ|46258||2.5||||ER||UNICODE UTF-8|"

**LIS应答：**

"H-->M : 64994,56998 :   
MSH|^~\&|cobas 8000||host||20181212155304||ACK|46258||2.5||||NE||UNICODE UTF-8|【CR】MSA|AA|38777||【CR】【CR】"

"H-->M : 64994,56998 : ACK"

**请求信息：**

"H<--M : 64994,56998 : QPD|TSREQ|46258|1003208889||50053|1||||S1|SC|R1|R|"

**LIS上传:**

"H->M : 64994,56998 :   
MSH|^~\&|iMedicalLIS||cobas 8000||20181212154958||OML^O33|46258||2.5||||ER||UNICODE UTF-8|【CR】PID|1||||^|||【CR】SPM||1003208889||S1||||||||||TEST^^^^|||20181212154958||||||||||SC【CR】SAC||||||||||50053|2【CR】TQ1|1||||||||R【CR】OBR|1|||64^1|||||||A【CR】TQ1|1||||||||R【CR】OBR|2|||66^1|||||||A【CR】TQ1|1||||||||R【CR】OBR|3|||73^1|||||||A【CR】TQ1|1||||||||R【CR】OBR|4|||250^1|||||||A【CR】TQ1|1||||||||R【CR】OBR|5|||715^1|||||||A【CR】【CR】"

**仪器应答:**

"H<--M : 64994,56998 : RCP|I|1|R|"

**仪器结果：**

"H<--M : 64994,58756 : MSH|^~\&|cobas 8000||host||20181212162221||OUL^R22|46289||2.5||||ER||UNICODE UTF-8|"

"H-->M : 64994,58756 :   
MSH|^~\&|cobas 8000||host||20181212162221||ACK|46289||2.5||||NE||UNICODE UTF-8|【CR】MSA|AA|38777||【CR】【CR】"

"H-->M : 64994,58756 : ACK"

"H<--M : 64994,58756 : PID|1||||^||||"

"H<--M : 64994,58756 : SPM||1003208889||S1||not|||||P|||TEST^^^^|||20181212154958||||||||||SC|"

"H<--M : 64994,58756 : SAC||||||||||50053|1|"

"H<--M : 64994,58756 : OBR|2|||64|"

"H<--M : 64994,58756 : TQ1|1||||||||R|"

"H<--M : 64994,58756 : OBX|1||64||1000|IU/L|^TECH~^NORM~^CRIT~^USER||||F|||20181212155532|1^SYSTEM||0|e602^1^MU1#e602#1#1^3|20181212161400|"

"H<--M : 64994,58756 : TCD|64|1|"

"H<--M : 64994,58756 : SID|64^^64^ASY^6^0|305731|8946|"

"H<--M : 64994,58756 : NTE|1|I|26^Technical limit over (upper)|I|"

"H<--M : 64994,58756 : OBR|3|||66|"

"H<--M : 64994,58756 : TQ1|1||||||||R|"

"H<--M : 64994,58756 : OBX|1||66||-1^1.53|COI|^TECH~^NORM~^CRIT~^USER||||F|||20181212155614|1^SYSTEM||0|e602^1^MU1#e602#1#1^3|20181212161445|"

"H<--M : 64994,58756 : TCD|66|1|"

"H<--M : 64994,58756 : SID|66^^66^ASY^4^0|271790|55181|"

"H<--M : 64994,58756 : NTE|1|I|0|I|"

"H<--M : 64994,58756 : OBR|4|||73|"

"H<--M : 64994,58756 : TQ1|1||||||||R|"

"H<--M : 64994,58756 : OBX|1||73||-1^0.107|COI|^TECH~^NORM~^CRIT~^USER||||F|||20181212155429|1^SYSTEM||0|e602^2^MU1#e602#1#2^4|20181212161300|"

"H<--M : 64994,58756 : TCD|73|1|"

"H<--M : 64994,58756 : SID|73^^73^ASY^3^0|288386|91848|"

"H<--M : 64994,58756 : NTE|1|I|0|I|"

"H<--M : 64994,58756 : OBR|5|||250|"

"H<--M : 64994,58756 : TQ1|1||||||||R|"

"H<--M : 64994,58756 : OBX|1||250||-1^0.638|COI|^TECH~^NORM~^CRIT~^USER||||F|||20181212155717|1^SYSTEM||0|e602^2^MU1#e602#1#2^4|20181212161545|"

"H<--M : 64994,58756 : TCD|250|1|"

"H<--M : 64994,58756 : SID|250^^250^ASY^5^0|317432|114377|"

"H<--M : 64994,58756 : NTE|1|I|0|I|"

"H<--M : 64994,58756 : OBR|6|||715|"

"H<--M : 64994,58756 : TQ1|1||||||||R|"

"H<--M : 64994,58756 : OBX|1||715||-1^1.74|COI|^TECH~^NORM~^CRIT~^USER||||F|||20181212155450|1^SYSTEM||0|e602^1^MU1#e602#1#1^3|20181212162225|"

"H<--M : 64994,58756 : TCD|715|1|"

"H<--M : 64994,58756 : SID|715^^715^ASY^8^0|334443|6910|"

"H<--M : 64994,58756 : NTE|1|I|0|I|"

"H<--M save : 64994,58756 : 1003208889:64\1000,66\1.53,73\0.107,250\0.638,715\1.74,"

1. **接口程序**

**CS版接口**

//// MIFCobasHL7

/// 名称: MIFHE602

/// 描述: Cobas 8000 E602 HL7

/// 通讯方式：双向

/// 编写者:BinL

/// 编写日期: 20181211

MIFCobasHL7(mi)

S mi=$G(mi)

Q:'$L(mi)

Q:$$select^LVBMIMP(mi)

F j=1:1:PLIST {

S @("par"\_j)=PLIST(j)

}

S mi1=$P($G(par36),",",1)

S stx=$C(2),etx=$C(3),ack=$C(6),enq=$C(5),eot=$C(4),etb=$C(23)

S sb=$C(11),eb=$C(28),cr=$C(13),fs=$c(28)

S lf=$C(10),nak=$C(21),(AllRecord,result,epis)="",kk=1

S $ZT="ErrHandler",$EC=""

S (sample,epis,surname,rec,res,result,date,time,QC,errFlag,resultType)=""

Q:$$start^MIF000()

F {

D Main

Q:$$stop^MIF000()

}

C par4

Q

Main R \*R:10

Q:'$TEST //如果超时则退出

Q:$c(R)'=sb //以sb开头

S (sample,epis,surname,rec,res,result,date,time,QC,errFlag,resultType,msgType,barcode,mshStr)=""

S startTime=$P($H,",",2)

K PLIST

S index=1

F {

S curTime=$P($H,",",2)

Q:curTime>(startTime+300) //5分钟内没有处理完则退出循环

Q:$$stop^MIF000()

R \*R:10

Q:'$TEST //如果超时则退出

I $L($G(PLIST(index)))>=32700 { //32767

S index=+$O(PLIST(""),-1)+1

S PLIST(index)=""

}

I $C(R)'=eb,$C(R)'=cr {

S PLIST(index)=$G(PLIST(index))\_$C(R)

}

I $C(R)=cr { //解析一条记录

D Record

K PLIST

S index=1

}

Q:$C(R)=eb //循环读取,当为eb的时候则退出

}

D Save

Q

Record

S index=""

S segmentType="",dataTye="",graphType="",base64Stream=""

S isImage=0,isBinary=0

F {

S index=$O(PLIST(index))

Q:'$L(index)

S record=$TR($G(PLIST(index)),cr)

Continue:'$L(record)

D trace^MIF000(mi,record,"H<--M")

I index=1 {

S segmentType=$P(record,"|",1)

I segmentType="MSH" { //信息头信息

S mshStr=record

//消息类型

S msgType=$P($P(record,"|",9),"^",1) //ORU,ACK,QRY,QCK,DSR

D SendACK(mi,record,"AA",0,"Message accepted")

I msgType="ORU" {

D SendACK(mi,record,"AA",0,"Message accepted")

}

I msgType="ORM" {

}

S resultType=$P(record,"|",11)

}

i segmentType="QPD"{ //请求信息

///QPD|TSREQ|43240|1003203377||50051|1||||S1|SC|R1|R|"

S barcode=$P(record,"|",4)

d SendDSR(mi,record,mshStr,barcode)

}

I segmentType="PID" { //患者信息

}

I segmentType="PVI" { //就诊信息

}

I segmentType="SPM" { //医嘱信息

S epis=$P(record,"|",3)

}

}

I segmentType="OBX" {

S dataTye=$P(record,"|",3) //NM (numeric) 表示数字值，用于定量项目,

//ST (string) 表示字符串值，用于定性项目

S channel=$P(record,"|",4)

S value=$P(record,"|",6)

i value ["^"

{

s value=$p(value,"^",2)

}

I $L(channel),$L(value){

S result=result\_channel\_$C(par10)\_value\_$C(par11)

}

I segmentType="ORC" { //就诊信息

S barcode=$P(record,"|",4)

S:$ZCVT(barcode,"U")=$ZCVT("Invalid","U") barcode="" //条码扫描错误

I $L(barcode) { //文档未给出双向例子

}

D trace^MIF000(mi,result,"H<--M result")

}

}

}

Q

Save

I $l(epis),$l(result) {

S QC=$$findQC^MIF000(mi,epis)

D file^MIF000(mi,sample,epis,surname,result,date,time,QC,mi1)

D trace^MIF000(mi,epis\_":"\_result,"H<--M save")

}

S (sample,epis,surname,rec,res,result,date,time,QC,resultType)=""

Q

SendACK(mi,mshStr,ackType="AA",errCode=0,errDesc="Message accepted") //send 'ack' to instrument

N (mi,mshStr,ackType,errCode,errDesc)

S mi=$g(mi),mshStr=$g(mshStr),ackType=$g(ackType),errCode=$g(errCode),errDesc=$g(errDesc)

S ret=1,sb=$C(11),eb=$C(28),cr=$C(13)

Q:('$l(mi))||('$l(mshStr)) ret

S mshStr=$TR(mshStr,cr,"")

S $P(mshStr,"|",9)="ACK"

S $P(mshStr,"|",16)="NE"

s MSA="MSA|AA|38777||"

W sb,mshStr,cr,MSA,cr,eb,cr,\*-3

s SM=sb\_mshStr\_cr\_MSA\_cr\_eb\_cr

D trace^MIF000(mi,SM,"H-->M")

D trace^MIF000(mi,$S(ackType="AA":"ACK",ackType="AE":"Error",ackType="AR":"NAK",1:"NULL"),"H-->M")

Q ret

ErrHandler

H 1

D trace^MIF000(mi,$TR($ZERROR,"^","--")\_".错误代码:"\_$ECODE,"Runtime Error")

Q

SendDSR(mi,record,mshStr,epis)

N (mi,record,AckType,ErrCode,ErrDesc,mshStr,epis)

s mi=$g(mi),record=$g(record),AckType=$g(AckType),ErrCode=$g(ErrCode),ErrDesc=$g(ErrDesc),mshStr=$g(mshStr),epis=$g(epis)

S ret=1,sb=$C(11),eb=$C(28),cr=$C(13),fs=$c(28)

S mshStr=$TR(mshStr,cr,"")

//S mshStr=$P(mshStr,"|",1,2)\_"|LIS||||"\_$P(mshStr,"|",7,$l(mshStr))

//S $P(mshStr,"|",9)="DSR^Q03"

S $P(mshStr,"|",3)="iMedicalLIS"

S $P(mshStr,"|",5)="cobas 8000"

s Time=$tr($zdt($h,3)," -:")

S $P(mshStr,"|",7)=Time

S $P(mshStr,"|",9)="OML^O33"

s isRecieve=""

s isRecieve=epis //##class(HIS.DHCReportPrint).GetReportAssayNoMTHD(mi,epis)

D trace^MIF000(mi,isRecieve,"isRecieve is ")

S seq=$P(record,"|",6)

s S1=$P(record,"|",11)

s SC=$P(record,"|",12)

s SeqFlag=$P(record,"|",14)

s TestCodeDate=""

s TestCodeDate=$$SearchTestItem(mi,epis,SeqFlag)

s PID="PID|1||||^|||"

s SPM="SPM||"\_epis\_"||"\_S1\_"||||||||||TEST^^^^|||"\_Time\_"||||||||||"\_SC

S SAC="SAC||||||||||"\_seq\_"|2"

S TMPORDER=sb\_mshStr\_cr\_PID\_cr\_SPM\_cr\_SAC\_cr\_TestCodeDate\_fs\_cr

D trace^MIF000(mi,TMPORDER,"H->M")

w sb,mshStr,cr,PID,cr,SPM,cr,SAC,cr,TestCodeDate,fs,cr,\*-3

Q ret

SearchTestItem(mi,epis,SeqFlag)

S tcx="",tc="",Num=1,TcNum=0,cr=$c(13),SeqFlag=$g(SeqFlag),tc1=""

d scanone^MIF000(mi,epis)

s TQ1="TQ1|1||||||||"\_SeqFlag\_cr

s OBR="OBR|2|||8717^INC|||||||A"

s tc="" f s tc=$o(^TMP("MIF-SINGLE",$j,mi,epis,tc)) q:tc="" d

.s tc1=tc\_"^1"

.s tcx=tcx\_TQ1\_"OBR|"\_Num\_"|||"\_tc1\_"|||||||A"\_cr

.s Num=Num+1

Q tcx

**BS接口**

MIFCOBASHL7Bi(mi)

///仪器名称: 罗氏E801

///通信协议: HL7

///交互方式: 双 向

///编 写 者: liubin

///编写日期: 2019-03-11

///接 口: TCP/IP

S mi=$G(mi)

Q:'$L(mi)

s par11=$li(^dbo.BTMIMachineParameterD(mi),12) //项目分隔符

s par10=$li(^dbo.BTMIMachineParameterD(mi),13) //结果分隔符

s AntDeli=$li(^dbo.BTMIMachineParameterD(mi),14) //抗生素分隔符

s SenDeli=$li(^dbo.BTMIMachineParameterD(mi),15) //药敏结果分隔符

s par4="|TCP|"\_$li(^dbo.BTMIMachineParameterD(mi),17) //端口号

S stx=$C(2),etx=$C(3),ack=$C(6),enq=$C(5),eot=$C(4),etb=$C(23)

S sb=$C(11),eb=$C(28),cr=$C(13)

S lf=$C(10),nak=$C(21),(AllRecord,result,epis)="",kk=1

S $ZT="ErrHandler",$EC=""

S (sample,epis,surname,rec,res,result,date,time,QC,errFlag,resultType)=""

Q:$$Start^MI.MIF000(mi)

F {

D Main

Q:$$Stop^MI.MIF000(mi)

}

C par4

Q

Main

s record=$$Read^MI.MIF000(mi,sb,eb) i '$l(record) q

d Trace^MI.MIF000(mi,record,"H<--M")

S (sample,epis,surname,rec,res,result,date,time,QC,subRecord,msgType)=""

F i=1:1:$L(record,cr) D

.S subRecord=$P(record,cr,i)

.d Trace^MI.MIF000(mi,subRecord,"H<--M")

.Q:'$L(subRecord)

.S msgType=$P(subRecord,"|",1)

.I msgType="MSH" D Q //消息头

..S msgID=$P(subRecord,"|",10)

..S mshStr=subRecord

..S msgTypeF=$P($P(subRecord,"|",9),"^",1)

..D SendACK(mi,subRecord,"AA",0,"Message accepted")

..//I msgTypeF="ORU" D SendACK(mi,subRecord,"AA",0,"Message accepted")

.i msgType="QPD" d //请求信息

..S barcode=$P(subRecord,"|",4)

..d Trace^MI.MIF000(mi,barcode,"H<--M")

..d SendDSR(mi,subRecord,mshStr,barcode)

.i msgType="SPM" d Q

..s epis=$P(subRecord,"|",3)

.I msgType="OBX" D Q //结果

..S dataType=$P(subRecord,"|",3) //NM,ED

..S itemChl=$P(subRecord,"|",4)

..S itemVal=$P(subRecord,"|",6)

.I msgType="SID" D Q

..S result=result\_itemChl\_$C(92)\_itemVal\_$C(44)

I $l(epis),$l(result) D

.d Trace^MI.MIF000(mi,epis\_":"\_result,"H<--M")

.D Save^MI.MIF000(mi,epis,result,date,time,QC)

q

SendACK(mi,mshStr,ackType="AA",errCode=0,errDesc="Message accepted") //send 'ack' to instrument

N (mi,mshStr,ackType,errCode,errDesc)

S mi=$g(mi),mshStr=$g(mshStr),ackType=$g(ackType),errCode=$g(errCode),errDesc=$g(errDesc)

S ret=1,sb=$C(11),eb=$C(28),cr=$C(13)

Q:('$l(mi))||('$l(mshStr)) ret

S mshStr=$TR(mshStr,cr,"")

S $P(mshStr,"|",9)="ACK"

S $P(mshStr,"|",16)="NE"

s MSA="MSA|AA|38777||"

W sb,mshStr,cr,MSA,cr,eb,cr,\*-3

s SM=sb\_mshStr\_cr\_MSA\_cr\_eb\_cr

D Trace^MI.MIF000(mi,SM,"H-->M")

D Trace^MI.MIF000(mi,$S(ackType="AA":"ACK",ackType="AE":"Error",ackType="AR":"NAK",1:"NULL"),"H-->M")

Q ret

SendDSR(mi,record,mshStr,epis)

N (mi,record,AckType,ErrCode,ErrDesc,mshStr,epis)

s mi=$g(mi),record=$g(record),AckType=$g(AckType),ErrCode=$g(ErrCode),ErrDesc=$g(ErrDesc),mshStr=$g(mshStr),epis=$g(epis)

S ret=1,sb=$C(11),eb=$C(28),cr=$C(13),fs=$c(28)

S mshStr=$TR(mshStr,cr,"")

//S mshStr=$P(mshStr,"|",1,2)\_"|LIS||||"\_$P(mshStr,"|",7,$l(mshStr))

//S $P(mshStr,"|",9)="DSR^Q03"

S $P(mshStr,"|",3)="iMedicalLIS"

S $P(mshStr,"|",5)="cobas 8000"

s Time=$tr($zdt($h,3)," -:")

S $P(mshStr,"|",7)=Time

S $P(mshStr,"|",9)="OML^O33"

s isRecieve=""

s isRecieve=epis //##class(HIS.DHCReportPrint).GetReportAssayNoMTHD(mi,epis)

D Trace^MI.MIF000(mi,isRecieve,"isRecieve is ")

S seq=$P(record,"|",6)

s S1=$P(record,"|",11)

s SC=$P(record,"|",12)

s SeqFlag=$P(record,"|",14)

s TestCodeDate=""

s TestCodeDate=$$SearchTestItem(mi,epis,SeqFlag)

s PID="PID|1||||^|||"

s SPM="SPM||"\_epis\_"||"\_S1\_"||||||||||TEST^^^^|||"\_Time\_"||||||||||"\_SC

S SAC="SAC||||||||||"\_seq\_"|2"

S TMPORDER=sb\_mshStr\_cr\_PID\_cr\_SPM\_cr\_SAC\_cr\_TestCodeDate\_fs\_cr

D Trace^MI.MIF000(mi,TMPORDER,"H->M")

w sb,mshStr,cr,PID,cr,SPM,cr,SAC,cr,TestCodeDate,fs,cr,\*-3

Q ret

SearchTestItem(mi,epis,SeqFlag)

S tcx="",tc="",Num=1,TcNum=0,cr=$c(13),SeqFlag=$g(SeqFlag),tc1=""

d ScanOne^MI.MIF000(mi,epis)

s TQ1="TQ1|1||||||||"\_SeqFlag\_cr

s OBR="OBR|2|||8717^INC|||||||A"

s tc="" f s tc=$o(^TMP("MIFTESTCODE",$j,mi,epis,tc)) q:tc="" d

.s tc1=tc\_"^1"

.s tcx=tcx\_TQ1\_"OBR|"\_Num\_"|||"\_tc1\_"|||||||A"\_cr

.s Num=Num+1

Q tcx

ErrHandler

H 1

D Trace^MI.MIF000(mi,$TR($ZERROR,"^","--")\_".错误代码:"\_$ECODE,"Runtime Error")

q