

# SQA-VISION

## Lab Interface (QwikLink™ LIS) Instructions

### Background

Vision Lab Interface is a Windows application that is included in the SQA-Vision software. Once activated in the SQA-Vision settings, the Vision Lab Interface continuously runs in the background as long as the SQA-Vision is turned on. The program retrieves data from the SQA-Vision data base and sends it to an external host computer through the RS232 cable supplied with the SQA-Vision.

### Concept

The Vision Lab Interface automatically sends test results to the host computer whenever a test is completed or updated in the SQA-Vision. The interface also supports Bi-Directional communication to retrieve the patient information from the host system.

### Document Overview

This document provides instructions for loading and for setting up the Lab Interface software on the SQA-Vision.

### System Requirements

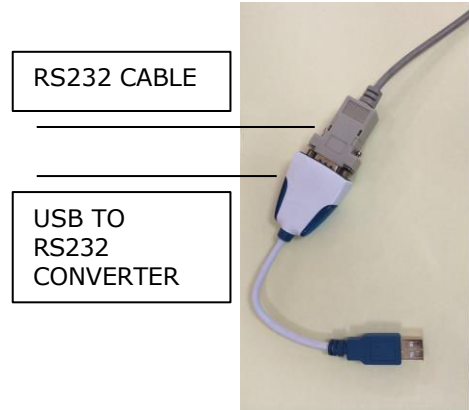
- SQA-Vision software installed on the SQA-Vision computer
- SQA-Vision software installed on the SQA-Vision testing device
- USB to RS232 converter
- RS232 cable

### Overview of the 4 Step Vision Lab Interface Set-up Process

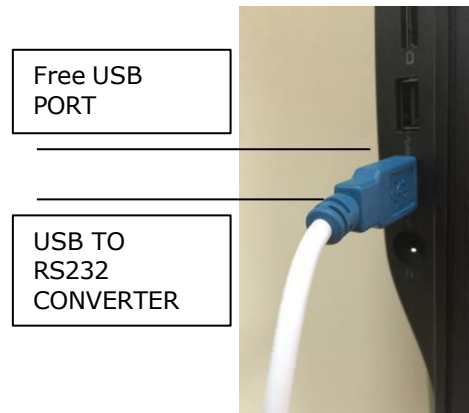
1. Hardware Connections
2. Software Set-Up
3. Testing
4. Communication Interface Specifications (Appendix 1)

### Step 1 Hardware Connections

- Connect one side of the **RS232 CABLE** to the **USB TO RS232 CONVERTER**
- Connect the other side of the **RS232 CABLE** to the **HOST COMPUTER**.

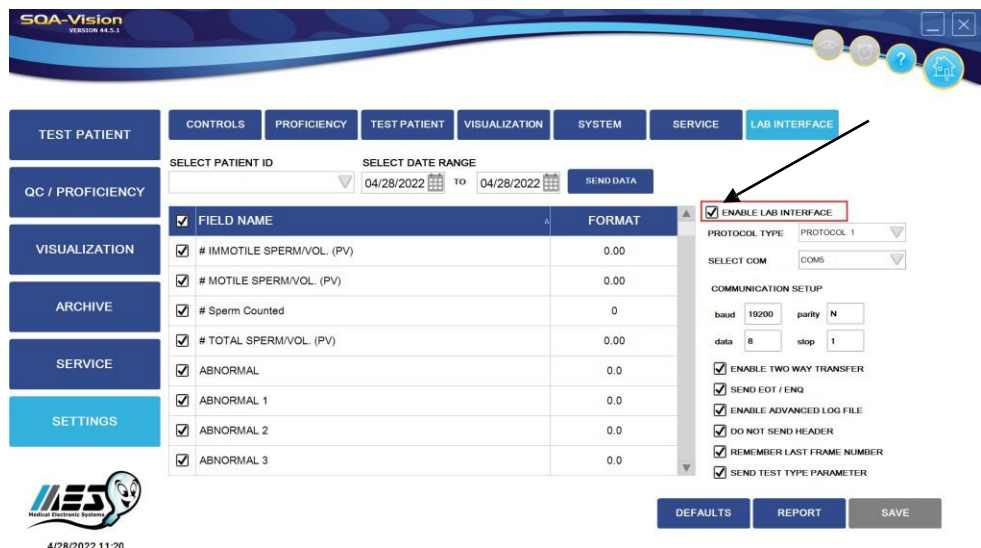


- Connect the free end of the **USB TO RS232** converter to a USB port in the SQA-VISION PC
- The required drivers will be installed / updated automatically.



### Step 2 Software Set-up

- Turn on the PC and start the Vision software.
- From the SQA-Vision menu on the left side of the screen select: **SETTINGS**
- From the top menu options which are now displayed select: **LAB INTERFACE**
- Click the **"Enable LAB INTERFACE™"** checkbox (✓) to activate the Lab Interface.



- Next, go to the **SELECT COM PORT** drop down menu
- If only one additional PC communication port is available, the SQA-Vision will recognize it and automatically assign it to Vision Lab Interface. If multiple ports are available, select a port for Vision Lab Interface.
- After an appropriate port is selected, verify that the Communication Setup parameters are as follows:
  - Baud - 19200
  - Parity - N
  - Data - 8
  - Stop - 1

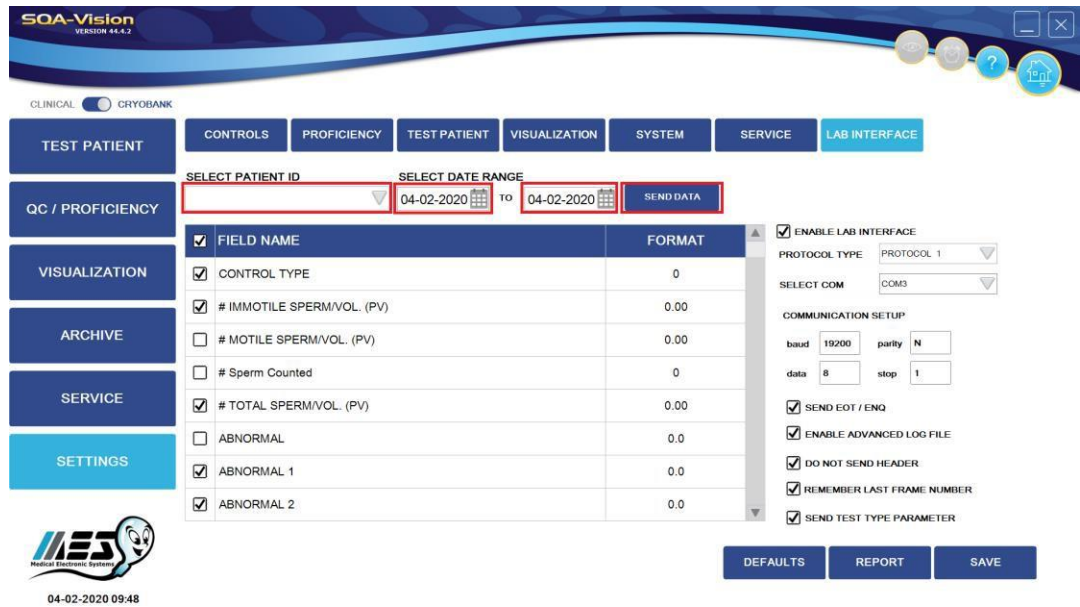
- To activate the Bi-Directional function, select the **“ENABLE TWO WAY TRANSFER”** (✓) option.
- Select the parameters that you need to transfer to the Lab Interface HOST by checking the required **FIELD NAME(s)** as seen in the table below.

FIELD NAME	FORMAT
<input checked="" type="checkbox"/> # IMMOTILE SPERM/VOL. (PV)	0.00
<input checked="" type="checkbox"/> # MOTILE SPERM/VOL. (PV)	0.00
<input checked="" type="checkbox"/> # Sperm Counted	0
<input checked="" type="checkbox"/> # TOTAL SPERM/VOL. (PV)	0.00
<input checked="" type="checkbox"/> ABNORMAL	0.0
<input checked="" type="checkbox"/> ABNORMAL 1	0.0
<input checked="" type="checkbox"/> ABNORMAL 2	0.0
<input checked="" type="checkbox"/> ABNORMAL 3	0.0

- Click: **SAVE** to save all the changes.

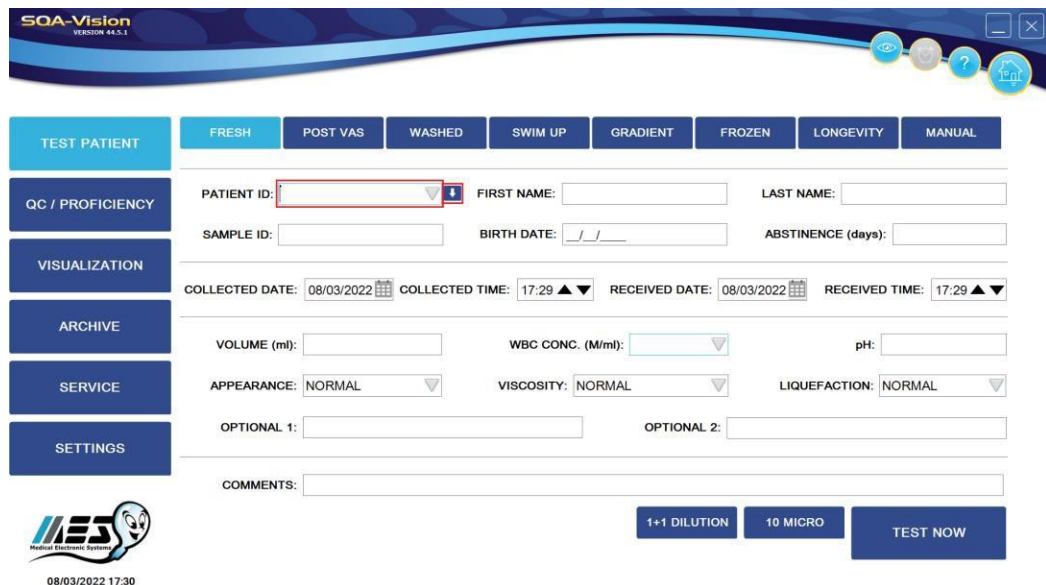
### Step 3 Testing

- To validate that the Vision Lab Interface is sending data stored in the SQA-Vision archive to the host computer go to: **SETTINGS > LAB INTERFACE** and select a **DATE RANGE** (be sure there are test results in the SQA-Vision archive in this date range) or a specific **Patient ID**.
- Click: **SEND DATA** as shown in the screen below.



- Make sure that the selected test data was transferred by confirming with the HOST COMPUTER.
- Please note : The Vision Lab Interface will not send records with **PENDING** Patient ID.

### Bi-Directional



- There are two options to get patient test data from the host:
  - Type the selected Patient ID in the **Patient ID** field and press the blue arrow. It will import the relevant information from the Host and populate it in the data entry screen (Selecting a Patient ID can be done also by scanning a barcode that includes the **Patient ID**)

**SQA-Vision**  
VERSION 44.5.1

TEST PATIENT FRESH POST VAS WASHED SWIM UP GRADIENT FROZEN LONGEVITY MANUAL

QC / PROFICIENCY PATIENT ID:  FIRST NAME:  LAST NAME:

SAMPLE ID:  BIRTH DATE:  ABSTINENCE (days):

VISUALIZATION

ARCHIVE

SERVICE

SETTINGS

COLLECTED DATE: 08/03/2022 COLLECTED TIME: 17:29 RECEIVED DATE: 08/03/2022 RECEIVED TIME: 17:29

VOLUME (ml):  WBC CONC. (M/ml):  pH:

APPEARANCE: NORMAL VISCOSITY: NORMAL LIQUEFACTION: NORMAL

OPTIONAL 1:  OPTIONAL 2:

COMMENTS:

MES Medical Electronic Systems

08/03/2022 17:30

1+1 DILUTION 10 MICRO TEST NOW

- To get the daily test list from the host, make sure that the patient ID field is empty and then press the blue arrow

**DAILY TESTS**

FILTER BY PATIENT ID FILTER BY PATIENT NAME FILTER BY DATE TO

05/19/2021 04/28/2022 FILTER

PATIENT ID	COLLECTED DATE/TIME	PATIENT NAME	SAMPLE ID
1	05/19/2021	George Johnson	123456789
123	05/28/2021	Jonny Blunt	646856894
2	05/20/2021	Brad james	464
2569	05/20/2021	Tom Franco	8585

CONTINUE SHOW ALL

## APPENDIX 1: COMMUNICATION INTERFACE SPECIFICATIONS

### Data Flow Protocol

Once the system is installed, the host computer acts as a "listener" and responds to messages sent from the SQA-VISION computer. The "listener" responds with an "acknowledge" to confirm whether the data was accepted correctly.

#### 1. Message structure

Three types of messages, with unique fields, can be sent to the host computer:

1. Facility Data [H]
2. Patient Data [P]
3. Test Data [O] for a specific Patient

A message is composed of several delimited components. Two levels of delimiter are used – vertical bar (|) as the primary, and caret (^) as the secondary. The primary delimiter (|) comes before the parameter name, and the secondary delimiter (^) comes before and after the parameter value i.e. |SID^123456789^

#### 1.1 Protocol 1

The message structure contains the following items:

1. [ENQ] (Optional)
2. [STX]
3. Frame number: 0-7
4. Message type indicator: (H) for Facility Data, (P) for Patient Data, (O) for Test Data.
5. List of fields and values, separated by primary (|) and secondary (^) delimiters. As indicated before, each type of message has its own unique fields (See Appendix 1.0 – Field list).
6. [ETX]
7. Check Sum number.
8. [CR]
9. [LF]
10. [EOT] (Optional)

#### ASCII Values:

[STX] = 2, [ETX] = 3, [ACK] = 6, [LF] = 10, [CR] = 13, [NAK] = 21, [ENQ] = 5, [EOT] = 4

Example: [STX]20|SN#^52^|SID^6^|FIC^1^|ATM^08:10^[ETX]8D[CRLF]

Primary / Secondary Piece	Description	Example
1	[ENQ] enquiry – Start of Transmission	ENQ
2	[STX] – marks the beginning of the message	STX
3	Frame Number	2
4	Message type indicator	O
5	Parameter Name: Serial Number Field Code: SN# Field value: 52	SN#^52^
6	Parameter Name: Sample Number Field Code: SID Field value: 6	SID^6^
7	Parameter Name: field count -Number of result fields to follow Field Code: FIC Field value: 1	FIC^1^
8	Parameter Name: Test Time Field Code: ATM Field value: 08:10	ATM^08:10^
9	[ETX] – marks the end of the fields list	ETX
10	Check Sum Number(HEX)	8D
11	[CR]	CR
12	[LF]	LF
13	[EOT] End of Transmission	EOT

## ENQ\EOT keys

The [ENQ] (Inquire) key prepares the Host to be ready to get the tests data and the [EOT] (end of transmission) announces to the host system that the send tests data session ended.

## Host Response

The host must respond with [ACK] character to confirm that the data was accepted correctly and with a [NAK] in cases where erroneous data is received.

## Message Order

The order in which the messages are sent to the computer is as follows:

1. First, the Facility Data [H].
2. Second, the Patient Data [P].
3. Last, the Test Data [O] relevant to the first patient and all subsequent patients in the queue is sent until all the Test Data messages for all the Patients are successfully transferred to the Lab Interface.

## Frame Number

For each message, the first character after the [STX] is a number between 0 and 7. This number is the Frame Number. The Frame Number is increased by 1 each time a message is successfully sent. When the Frame Number reaches the value of 7, the Frame Number will reset to 0.

If the message has not been sent successfully (Received [NAK] from Host) it will be resent with the same Frame Number. As stated above (section 9.2) after five consecutive [NAK] are sent, the MES SQA-VISION Computer discards the transaction to prevent an endless loop.

## Example

Below is an example of the MES SQA-Vision and Host computer communication:

```

MES SQA-Vision:      [ENQ]
{Patient tests example}
HOST:                [ACK]
MES SQA-Vision:      [STX]0H| MES SQA-V|FIC^2^|TFN^Keiser^|TFC^New York^[ETX]47[CR][LF]
HOST:                [ACK]
MES SQA-Vision:      [STX]1P|PID^173^|RTY^0^|FIC^1^|PBD^07/08/78^[ETX]80[CR][LF]
HOST:                [ACK]
MES SQA-Vision        [STX]2O|SN#^52^|SID^6^|FIC^5^|ATM^08:07^|ADT^10/26/06^|VOL^6.0^|
                        NLMORPH^^|CONC^114.8^[ETX]6E[CR][LF]
HOST:                [ACK]
MES SQA-Vision:      [STX]3O|SN#^52^|SID^7^|FIC^5^|ATM^09:20^|ADT^10/26/06^|VOL^6.0^|
                        NLMORPH^^|CONC^321.8^[ETX]6C[CR][LF]
{Control tests example}
HOST:                [ACK]
MES SQA-Vision:      [STX]4P|SID^15^|RTY^1^|FIC^0^[ETX]A7[CR][LF]
HOST:                [ACK]
MES SQA-Vision:      [STX]5O|FIC^8^|LOT^1^|EXD^01/00^|TAR^1.0^|RAN^1.0^|CTS^5.3^|RST^1^|COA^1^|
                        CMSC^^[ETX]52[CR][LF]
HOST:                [ACK]
MES SQA-Vision:      [EOT]
HOST:                [ACK]

```

## 1.2: Protocol 2 (Kaiser ONLY)

This specification has been updated to eliminate the initial [ENQ] / [ACK] sequence because it is not required. Whenever the LMS interface program is running it will be ready to receive data.

### ASCII Values:

[STX] = 2, [ETX] = 3, [ACK] = 6, [LF] = 10, [CR] = 13, [NAK] = 21, [ENQ] = 5, [EOT] = 4

Primary / Secondary Piece	Description	Example Data
1	Interface software version – used to verify that our software is written for the correct version of your interface.	MES SQA-V
2	Instrument Identifier – Used to uniquely identify the instrument in case in the future, the interface can send data from multiple instruments.	SN# 10550
3	Test Type	0 - Normal Test 1- Control Test
3	Specimen number	123456789
4	Number of result fields to follow	10
5	Result Field 1	ATM^14:20^
5/1	Assay Code	ATM
5/2	Result Value	14:20
5/3	Flag (for future use)	
6-nn	Result Field 2 – Same as 5	VOL^1.5^

Example:

**MES SQA-Vision:** [STX]MES SQA V1.2|SN#  
10550|123456789|9|ATM^14:20^|VOL^1.5^|NLMORPH^25^|CONC^20.5^|  
NPMOT^14^|SPMOT^31^|RPMOT^77^|TPCOUNT^31^[ETX]8F[CR][LF]

**HOST:** [ACK]

## 2. Check Sum calculation

[STX]10|SN#^52^|SID^3^|FIC^5^|ATM^07:41^|ADT^10/26/06^|VOL^5.0^  
|NLMORPH^^|CONC^125.3^[ETX]EA[CR][LF]

A standard ASTM checksum calculation is used. The checksum calculation for the example above is displayed below:

1. Set  $chksum = mod(chksum, 256)$ ; Extract the least significant 8 bits
2. Set  $A = mod(chksum, 16)$ ; Extract the least significant 4 bits
3. Set  $B = int(chksum / 16)$ ; Extract the most significant 4 bits

### Based on the conditions below...

- The values of A and B are converted to HEX format
- The numbers 0 through 9 are unchanged
- The numbers 10 through 16 (decimal format) are converted to A through F (HEX format) resulting in 2 single-byte values.

### ...the Check Sum of the ASCII values is 6038

- The value associated with #1 (above) is 150 (the least significant 8 bits)
- The value associated with #2 (above) is 6 (the least significant 4 bits)
- The value associated with #3 (above) is 9 (the most significant 4 bits)

### Comments:

1. The [STX], [CR] and [LF] values are not included in the checksum calculation  
The check sum calculation used the [ETX] value as 3.



## Bi-Directional

Once the system is installed, Vision can get the Patient tests data from the host computer. To do so, a request (with a pre-defined structure) should be sent to the host computer. The data flow is based on the ASTM protocol which is already used for sending the data to the host.

### 1. Request Structure

The order in which the messages are sent to the host computer is as follows:

1. First, send the Facility Data [H]
2. Second, send request message with the [Q] record type

Select the request type is:

1. Request information for a specific patient only. In this case, only information for selected patient will be sent by the host
2. Request all pending "daily Patient Tests". In this case, all pending tests will be sent from the host

#### 1.1. Request protocol

The message structure contains the following items:

1. [ENQ] **Optional**
2. [STX]
3. Frame number: 0-7
4. Message type indicator: (Q) for query Data.
5. List of fields and values, separated by primary (!) and secondary (^) delimiters. As indicated before, each type of message has its own unique fields (See Appendix 1.0 – Field list).
6. [ETX]
7. Check Sum number.
8. [CR]
9. [LF]
10. [EOT] **Optional**

#### **ASCII Values:**

[STX] = 2, [ETX] = 3, [ACK] = 6, [LF] = 10, [CR] = 13, [NAK] = 21, [ENQ] = 5, [EOT] = 4

Example: [STX]4Q[^1^|RTY^0^[ETX]58[CR][LF]

Primary / Secondary Piece	Description	Example
1	[ENQ] enquiry – Start of Transmission	ENQ
2	[STX] – marks the beginning of the message	STX
3	Frame Number	4
4	Message type indicator	Q
5	Selected Patient ( <b>All</b> or ^selected Patient ID^)	1
6	Record Type	0
7	[ETX] – marks the end of the fields list	ETX
8	Check Sum Number(HEX)	58
9	[CR]	CR
10	[LF]	LF
11	[EOT] End of Transmission	EOT

## 2. Received Message structure

Two types of messages, with unique fields, can be sent to the Vision computer:

1. Patient Data [P]
2. Test Data [O] for a specific Patient

A message is composed of several delimited components. Two levels of delimiter are used – vertical bar (|) as the primary, and caret (^) as the secondary. The primary delimiter (|) comes before the parameter name, and the secondary delimiter (^) comes before and after the parameter value i.e. |SID^123456789^

### Frame Number

For each message, the first character after the [STX] is a number between 0 and 7. This number is the Frame Number. The Frame Number is increased by 1 each time a message is successfully sent. When the Frame Number reaches the value of 7, the Frame Number will reset to 0.

If the message has not been sent successfully (Received [NAK] from Host) it will be resent with the same Frame Number. As stated above (section 9.2) after five consecutive [NAK] are sent, the sending system discards the transaction to prevent an endless loop.

### 2.1 Protocol 1

The message structure contains the following items:

1. [ENQ] (Optional)
2. [STX]
3. Frame number: 0-7
4. Message type indicator: (H) for Facility Data, (P) for Patient Data, (O) for Test Data.
5. List of fields and values, separated by primary (|) and secondary (^) delimiters. As indicated before, each type of message has its own unique fields (See Appendix 1.0 – Field list).
6. [ETX]
7. Check Sum number.
8. [CR]
9. [LF]
10. [EOT] (Optional)

#### ASCII Values:

[STX] = 2, [ETX] = 3, [ACK] = 6, [LF] = 10, [CR] = 13, [NAK] = 21, [ENQ] = 5, [EOT] = 4

Example: [STX]20|SN#^52^|SID^6^|FIC^1^|ATM^08:10^[ETX]8D[CRLF]

Primary / Secondary Piece	Description	Example
1	[ENQ] enquiry – Start of Transmission	ENQ
2	[STX] – marks the beginning of the message	STX
3	Frame Number	2
4	Message type indicator	O
5	Parameter Name: Serial Number Field Code: SN# Field value: 52	SN#^52^
6	Parameter Name: Sample Number Field Code: SID Field value: 6	SID^6^
7	Parameter Name: field count -Number of result fields to follow Field Code: FIC Field value: 1	FIC^1^
8	Parameter Name: Test Time Field Code: ATM Field value: 08:10	ATM^08:10^
9	[ETX] – marks the end of the fields list	ETX
10	Check Sum Number(HEX)	8D
11	[CR]	CR
12	[LF]	LF
13	[EOT] End of Transmission	EOT

## ENQ\EOT keys

The [ENQ] (Inquire) key prepares the SQA-Vision to be ready to get the tests data and the [EOT] (end of transmission) announces to the host system that the send tests data session ended.

## SQA-Vision Response

The SQA-Vision will respond with [ACK] character to confirm that the data was accepted correctly and with a [NAK] in cases where erroneous data is received.

## Example

Below is an example of the MES SQA-Vision and Host computer communication:

{Request – selected Patient example}

```

MES SQA-Vision:    [ENQ]
HOST:              [ACK]
MES SQA-Vision:    [STX]0H|MES SQA-V|FIC^2^|TFN^Keiser^|TFC^New York^[ETX]27[CR][LF]
HOST:              [ACK]
MES SQA-Vision:    [STX]1Q|^1^|RTY^0^[ETX]55[CR][LF]
HOST:              [ACK]
MES SQA-Vision:    [EOT]
HOST:              [ACK]

```

{Start HOST of Transitions}

```

HOST:              [ENQ]
MES SQA-Vision:    [ACK]

```

{Get Patient tests example}

```

HOST:              [STX]0P|PID^5643^|FIC^4^|PFN^George^|PLN^Johnson^|PBD^1980-5-21^[ETX]F0[CR][LF]
MES SQA-Vision:    [ACK]
HOST:              [STX]10|FIC^16^|VOL^3.312^|ABS^3^|APPR^0^|VISC^0^|LIQ^0^|PH^7.2^|WBCCONC^0^|OP
T1^o1^|OPT2^o2^|COMM^Test^|COLLDATE^5/19/2021 12:00:00 PM^|RECEDATE^5/19/2021
2:00:00 PM^|COLLTIME^5/19/2021 12:00:00 PM^|RECETIME^5/19/2021 2:00:00
PM^|SID^123456789^|AGE^41^[ETX]A8[CR][LF]
MES SQA-Vision:    [ACK]

```

{Request – Daily List example}

```

MES SQA-Vision:    [ENQ]
HOST:              [ACK]
MES SQA-Vision:    [STX]0H|MES SQA-V|FIC^2^|TFN^Keiser^|TFC^New York^[ETX]27[CR][LF]
HOST:              [ACK]
MES SQA-Vision:    [STX]1Q|ALL|RTY^0^[ETX]41[CR][LF]
HOST:              [ACK]
MES SQA-Vision:    [EOT]
HOST:              [ACK]

```

{Start HOST of Transitions}

```

HOST:              [ENQ]
MES SQA-Vision:    [ACK]

```

{Get Patient tests example}

```

HOST:              [STX]2P|PID^1^|FIC^4^|PFN^George^|PLN^Johnson^|PBD^5/21/1980^[ETX]55[CR][LF]
MES SQA-Vision:    [ACK]

```

## SQA-VISION Lab Interface Instructions

**HOST:** [STX]30|FIC^16^|VOL^3.312^|ABS^3^|APPR^0^|VISC^0^|LIQ^0^|PH^7.2^|WBCCONC^0^|OPT1^o1^|OPT2^o2^|COMM^Test^|COLLDATE^5/19/2021 12:00:00 PM^|RECEDATE^5/19/2021 2:00:00 PM^|COLLTIME^5/19/2021 12:00:00 PM^|RECETIME^5/19/2021 2:00:00 PM^|SID^123456789^|AGE^41^[ETX]AA[CR][LF]

**MES SQA-Vision:** [ACK]

{End of Transitions}

**HOST:** [EOT]

**MES SQA-Vision:** [ACK]

Appendix 2: SQA-Vision LAB INTERFACE – Fields List

Field Name	Field Unit	WHO	Field Code	Format	Description	Field Type	Message Type	Rec. Type
<b>Facility Data</b>								
LIS(H) Header					Header (MES SQA-VISION)	Mandatory	H	0
LIS(H) # Fields			FIC	0	# Fields in 1 record transferred to LIS	Mandatory	H	0
FACILITY NAME			TFN	String	Testing Facility name		H	0
ADDRESS			TFA	String	Testing Facility address		H	0
PHONE			TFP	String	Testing Facility Phone		H	0
FAX			TFF	String	Testing Facility Fax		H	0
SITE			TFS	String	Testing Facility Site		H	0
E-MAIL			TFZ	String	Testing Facility E-Mail		H	0
<b>Patient Data</b>								
Patient ID			PID	String	Number identifying the patient	Mandatory	P	1
LIS Record Type			RTY	0	Record Type 0 – Test 1 – Control	Mandatory	P	1
LIS(P) # Fields			FIC	0	# Fields in 1 record transferred to LIS	Mandatory	P	1
Birth Date			PBD	MM/DD/YY	Birth date of patient		P	1
First Name			PFN	String	First name of patient		P	1
Last Name			PLN	String	Last name of patient		P	1
<b>Test/Sample Identifying Data</b>								
SERIAL NUMBER			SN#	String	SQA-Vision system serial number	Mandatory	O	1
SAMPLE ID			SID	String	Semen sample identification number	Mandatory	O	1
LIS(O) # Fields			FIC	0	# Fields in 1 record transferred to LIS	Mandatory	O	1
<b>Sample Information</b>								
ABSTINENCE	days		ABS	0	ABSTINENCE		O	1
AGE			PAGE	0	AGE		O	1
APPEARANCE			APPR	0	APPEARANCE 1 – CLEAR/WHITE/GREY 2 – YELLOW 3 – PINK 4 – RED/BROWN 5 – OTHER 6 – NA		O	1
COLLECTED DATE / TIME			COLLDATE	MM/DD/YY	COLLECTED DATE / TIME		O	1
COLLECTED TIME			COLLTIME	HH:mm	COLLECTED TIME		O	1
COMMENTS			COMM	@	COMMENTS		O	1
CONC. STANDARD			STAND	0	CONC. STANDARD		O	1

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Field Name	Field Unit	WHO	Field Code	Format	Description	Field Type	Message Type	Rec. Type
					1 - CONC. STANDARD 1 2 - CONC. STANDARD 2			
CRITERIA			MORPHINDEX	0	CRITERIA 1 - WHO 3RD 2 - WHO 4TH 3 - WHO 5TH 4 - WHO 6TH		0	1
CUP WT.	g/oz		VOLC	0.00	CUP WEIGHT		0	1
INITIAL VOL.	ml		IVOL	0.00	INITIAL VOLUME		0	1
FINAL VOL.	ml		FVOL	0.00	FINAL VOLUME		0	1
FINAL WT.	g/oz		VOLF	0.00	FINAL WEIGHT		0	1
LES			LES	0	LES 1 - US 2 - ROW		0	1
LIQUEFACTION			LIQ	0	LIQUEFACTION 1 - 0-30 MINUTES 2 - 30-60 MINUTES 3 - 60+ MINUTES 4 - NA		0	1
MURL			MURL	0.0	Morphology Upper Range Limit (MURL)		0	1
OPTIONAL 1			OPT1	@	OPTIONAL 1		0	1
OPTIONAL 2			OPT2	@	OPTIONAL 2		0	1
RECEIVED DATE / TIME			RECEDATE	MM/DD/YY	RECEIVED DATE / TIME		0	1
RECEIVED TIME			RECETIME	HH:mm	RECEIVED TIME		0	1
SAMPLE TESTED			TESTM	0	SAMPLE TESTED 1- FULL VOLUME 2- DILUTED 1+1 3- 10 MICROLITERS		0	1
STEP TEST TYPE			ARTTETY	0	ART PREP Test Type 1 - FRESH 2 - WASHED 3 - FROZEN 6 - SWIM UP 8 - GRADIENT		0	1
TEST DATE / TIME			ADT	MM/DD/YY	TEST DATE / TIME		0	1
TEST MODE (PV)			PVTEMO	0	TEST MODE (PV) 1- Only Automated 2- Manual 3- Semi Auto		0	1
TEST TIME			ATM	HH:mm	TEST TIME		0	1
TEST RUN BY			TRB	@	TEST RUN BY		0	1
TEST TYPE			SAMTY	0	TEST TYPE 1 - FRESH 2 - WASHED 3 - FROZEN 4 - POST VASECTOMY 5 - LONGEVITY 6 - SWIM UP 7 - MANUAL		0	1

Field Name	Field Unit	WHO	Field Code	Format	Description	Field Type	Message Type	Rec. Type
					8 - GRADIENT 9 - NONE 10 - DOSING 11 - ART PREP			
TEST TYPE (PV)			PVTETY	0	TEST TYPE (PV) 1 - ROW 2- CENTRIFUGED (Step 1) 3- CENTRIFUGED (Step 2)		0	1
VISCOSITY			VISC	0	VISCOSITY 1 - NORMAL 2 - ABNORMAL 3 - DECREASED		0	1
<b>Test Results Main Data</b>								
DEBRIS / ROUND CELLS			ROUNCELL	0	DEBRIS / ROUND CELLS 1 - NONE/FEW 2 - MODERATE 3 - MANY 4 - GROSS		0	1
pH			PH	0.0	pH		0	1
VOLUME	ml		VOL	0.00	VOLUME		0	1
WBC CONC.	M/ml		WBCCONC	0	WBC CONC. 1 - <1 2 - >=1		0	1
<b>Automated Test Results</b>								
ART PREP ID			ARTID	0	ART PREP ID		0	1
ART PREP STEP			ARTS	0	ART PREP STEP 1 - PRE PREP 2 - POST PREP		0	1
AUTOMATED NORMAL FORMS	%	All	MORPHA	0.0	NORMAL FORMS (Automatic value)		0	1
CONCENTRATION	M/ml	All	CONC	0.0	CONCENTRATION		0	1
FUNCTIONAL SEPRM CONC.	M/ml	All	FSC	0.0	FUNCTIONAL SEPRM CONC.		0	1
FUNCTIONAL SPERM	M/ejac	All	FUNCSPE	0.0	FUNCTIONAL SPERM		0	1
IMMOTILE IM	%	5	IMMOT5	0	WHO 5TH: IMMOTILE IM		0	1
IMMOTILITY d	%	3/4	IMMOT	0.0	IMMOTILITY d		0	1
IMMOTILE	%	6	IMMOT	0.0	IMMOTILE		0	1
LONGEVITY ID			LONGID	0	LONGEVITY ID		0	1
LONGEVITY STEP			LONGS	0	LONGEVITY STEP		0	1
MORPH. NORMAL FORMS	%	All	NLMORPH	0.0	NORMAL FORMS		0	1
MORPH. NORMAL SPERM	M/ejac	All	MORPHSPE	0.0	MORPH. NORMAL SPERM		0	1
MOTILE SPERM	M/ejac	All	MOTSPE	0.0	MOTILE SPERM		0	1
MOTILITY	M/ml	3/4/6	MOT	0.0	MOTILITY		0	1
MOTILE SPERM CONC.	M/ml	All	MSC	0.0	MOTILE SPERM CONC.		0	1
NON-PROGRESSIVE c	%	3/4	NPMOT	0.0	NON-PROGRESSIVE c		0	1
NON-PROGRESSIVE	%	6	NPMOT	0.0	NON-PROGRESSIVE		0	1

Field Name	Field Unit	WHO	Field Code	Format	Description	Field Type	Message Type	Rec. Type
NON-PROGRESSIVE NP	%	5	NPMOT5	0	NON-PROGRESSIVE NP		O	1
PROG. MOTILE SPERM	M/ejac	All	PMOTSPE	0.0	PROG. MOTILE SPERM		O	1
PROG. MOTILE SPERM CONC.	M/ml	All	PMSC	0.0	PROG. MOTILE SPERM CONC.		O	1
PROG. MOTILE SPERM CONC. A	M/ml	3/4	PMSCA	0.0	PROG. MOTILE SPERM CONC. A		O	1
PROG. MOTILE SPERM CONC. B	M/ml	3/4	PMSCB	0.0	PROG. MOTILE SPERM CONC. B		O	1
PROGRESSIVE PR	%	5	PMOT	0.0	PROGRESSIVE PR		O	1
RAPID PR MOTILE SPERM CONC.	M/ml	6	PMSCA	0.0	RAPID PR MOTILE SPERM CONC.		O	1
RAPID PROGRESSIVE a	%	3/4	PMOTA	0.0	RAPID PROGRESSIVE a		O	1
RAPIDLY PROGRESSIVE	%	6	PMOTA	0.0	RAPIDLY PROGRESSIVE		O	1
SLOW PR MOTILE SPERM CONC.	M/ml	6	PMSCB	0.0	SLOW PR MOTILE SPERM CONC.		O	1
SLOW PROGRESSIVE b	%	3/4	PMOTB	0.0	SLOW PROGRESSIVE b		O	1
SLOWLY PROGRESSIVE	%	6	PMOTB	0.0	SLOWLY PROGRESSIVE		O	1
SPERM #	M/ejac	All	TSPE	0.0	SPERM #		O	1
SPERM MOTILITY INDEX		All	SMI	0	SPERM MOTILITY INDEX		O	1
TOTAL MOTILE PR + NP	%	5	MOT5	0	TOTAL MOTILE PR + NP		O	1
VELOCITY	mic/sec	All	VELOC	0	VELOCITY		O	1
<b>Visual Morphology manual results</b>								
ABNORMAL	%	All	ABNOR	0.0	MORPH. ABNORMAL		O	1
ABNORMAL 1	%	All	AB1	0.0	MORPH. ABNORMAL 1		O	1
ABNORMAL 2	%	All	AB2	0.0	MORPH. ABNORMAL 2		O	1
ABNORMAL 3	%	All	AB3	0.0	MORPH. ABNORMAL 3		O	1
ABNORMAL 4	%	All	AB4	0.0	MORPH. ABNORMAL 4		O	1
ABNORMAL 5	%	All	AB5	0.0	MORPH. ABNORMAL 5		O	1
ABNORMAL 6	%	All	AB6	0.0	MORPH. ABNORMAL 6		O	1
ABNORMAL 7	%	All	AB7	0.0	MORPH. ABNORMAL 7		O	1
ABNORMAL 8	%	All	AB8	0.0	MORPH. ABNORMAL 8		O	1
ABNORMAL 9	%	All	AB9	0.0	MORPH. ABNORMAL 9		O	1
PINHEAD	%	All	AB10	0.0	PINHEAD		O	1
<b>Visual DNA Fragmentation manual results</b>								
DNA FREGMENTATION INDEX DFI	%	All	DFI	0.00	DNA FREGMENTATION INDEX DFI		O	1
FREGMENTED DNA (No Halo)	%	All	DNAF	0.0	FREGMENTED DNA - No Halo		O	1
LARGE HALO	%	All	DNANF	0.0	Large Halo		O	1
MEDIUM HALO	%	All	DNANFM	0.0	NON-FREGMENTED DNA - Medium Halo		O	1
NO HALO - DEGRADED	%	All	DNADG	0.0	FREGMENTED DNA - No Halo Degraded		O	1
NON-FREGMENTED DNA (Halo)	%	All	DNANF	0.0	NON-FREGMENTED DNA - Halo		O	1
SMALL HALO	%	All	DNANFS	0.0	NON-FREGMENTED DNA - Small Halo		O	1



Field Name	Field Unit	WHO	Field Code	Format	Description	Field Type	Message Type	Rec. Type
<b>Visual Vitality manual results</b>								
VITALITY (DEAD)	%	All	VITD	0.0	VITALITY (DEAD)		O	1
VITALITY (LIVE)	%	All	VIT	0.0	VITALITY (LIVE)		O	1
<b>Post-Vasectomy Automated Test Data</b>								
# IMMOTILE SPERM/VOL.	M		PVTOTIMM	0.00	# IMMOTILE SPERM/VOL. (PV)		O	1
# MOTILE SPERM/VOL.	M		PVTOTMOTIMM	0.00	# MOTILE SPERM/VOL. (PV)		O	1
# TOTAL SPERM/VOL.	M		PVTOTSPE	0.00	# TOTAL SPERM/VOL. (PV)		O	1
# Sperm Counted			DNAT	0.00	# Sperm Counted (DNA)		O	1
IMMOTILE SPERM (PV)	M/ml		PVIMM	0.00	IMMOTILE SPERM (PV)		O	1
MOTILE SPERM (PV)	M/ml		PVMOT	0.00	MOTILE SPERM (PV)		O	1
TOTAL SPERM (PV)	M/ml		PVTOTMOT	0.00	TOTAL SPERM (PV)		O	1
<b>Additional Data</b>								
AGGLUTINATION		All	AGGL	@	AGGLUTINATION (1-4, A-E)		O	1
COLLECTION LOCATION			CLOC	@	COLLECTION LOCATION 1, AT LABORATORY; 2, AT HOME		O	1
COMPLETE SAMPLE			COMSAM	@	COMPLETE SAMPLE (1, COMPLETE; 2, INCOMPLETE)		O	1
DIFFICULTIES WITH COLLECTION			DIFF	@	DIFFICULTIES WITH COLLECTION		O	1
DIRECT IB-TEST IgA			DIRIB2	@	DIRECT IB-TEST IgA (% with beads) [<50]		O	1
DIRECT IB-TEST IgG			DIRIB1	@	DIRECT IB-TEST IgG (% with beads) [<50]		O	1
DIRECT MAR-TEST IgA			DIRMAR2	@	DIRECT MAR-TEST IgA (%) (3 or 10 minute) [<50]		O	1
DIRECT MAR-TEST IgG			DIRMAR1	@	DIRECT MAR-TEST IgG (%) (3 or 10 minute) [<50]		O	1
FRUCTOSE (µmol per ejaculate) [>=13]			FRUC	@	FRUCTOSE (µmol per ejaculate) [>=13]		O	1
GLUCOSIDASE (NEUTRAL) (mU per ejaculate) [>=20]			AGLUC	@	GLUCOSIDASE (NEUTRAL) (mU per ejaculate) [>=20]		O	1
MEDICATION			MEDI	@	MEDICATION		O	1
OPTIONAL INPUT 1			OIN1	@	OPTIONAL INPUT 1		O	1
OPTIONAL INPUT 2			OIN2	@	OPTIONAL INPUT 2		O	1
OPTIONAL INPUT 3			OIN3	@	OPTIONAL INPUT 3		O	1
OPTIONAL INPUT 4			OIN4	@	OPTIONAL INPUT 4		O	1
PEROXIDASE-POSITIVE LEUKOCYTES (M/ml)			PEROX	@	PEROXIDASE-POSITIVE LEUKOCYTES (M/ml)		O	1
SEMEN TREATMENT			SEMTRE	@	SEMEN TREATMENT		O	1

Field Name	Field Unit	WHO	Field Code	Format	Description	Field Type	Message Type	Rec. Type
(e.g. BROMELAIN / CHYMOTRYPSIN)					(e.g. BROMELAIN / CHYMOTRYPSIN)			
ZINC (µmol per ejaculate) [ $\geq 2.4$ ]			ZINC	@	ZINC (µmol per ejaculate) [ $\geq 2.4$ ]		O	1
<b>Main Control Data</b>								
SERIAL NUMBER			SID	String	Number identifying the device	Mandatory	P	2
LIS Record Type			RTY	0	Record Type: 0 -Test 1 - Control	Mandatory	P	2
LIS(P) Fields Count			FIC	0	# Fields in 1 record transferred to LIS	Mandatory	P	2
<b>Controls Data</b>								
LIS(O) Fields Count			FIC	0	# Fields in 1 record transferred to LIS	Mandatory	O	2
CONC.	M/ml		CTSC	0.0	Conc. Results		O	2
CONTROL TYPE			CTY	0	Control Type: 1 - Latex-beads 2 - Stabilized Sperm 3 - Proficiency		O	2
CORRECTIVE ACTION			COA	0.0	Corrective Action		O	2
DATE			CDT	MM/DD/YY	Date the control test was run		O	2
EXP. DATE			EXD	MM/YY	Expire Date		O	2
LEVEL			CLEV	0	Control Level: 1 - Level 1 2 - level 2 3 - Negative Control/Level 3		O	2
LOT #			LOT	String	Lot Number		O	2
MSC	M/ml		CMSC	0.0	MSC		O	2
RANGE +/-			RAN	0.0	Range +/-		O	2
STANDARD			STY	0	Standard Type 1 - CAP 2 - NEQAS		O	2
STATUS			RST	0	Range Status 0 - Pass 1 - High 2 - Low 3 - NA		O	2
TARGET	M/ml		TAR	0.0	Target Value		O	2
TIME			CTM	HH:MM	Time the control test was run		O	2