



Atellica[®] UAS 800

Analyzer

LIS Interface Guide

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1 Introduction

Purpose

The purpose of this document is to describe the interfaces that enable programming between the Atellica® UAS 800 analyzer and a Laboratory Information System (LIS). This guide is intended for use by software engineers and programmers who will program the LIS to use data generated by the Atellica UAS 800 analyzer.

Note: All LIS transmissions are in English only.

Scope

This interface description applies only to the Atellica UAS 800 software.

Note: The result transmission depends on the user interface Measure Unit setting and (for RBC and WBC) the Quantitative/Semi-quantitative setting.

Note: The result transmission depends on the user interface Performance Profile setting. The examples within this document were produced with the OUS Performance Profile. Therefore, WBCc, BACr, and BACc sub-particles are present.

Note: The examples within this document were produced with an Operator user. When a Service user is logged in, the result transmission includes additional data.

Example:

```
R|1|798-9^^^RBC|132|p|ul||A||F||test|||Atellica UAS 800  
C|1|I|A|I
```

Communications Protocols

The term ASTM refers to the LIS1-A (formerly ASTM E1381-95) and LIS2-A (formerly ASTM E1394-97) protocols. These protocols transfer data between clinical laboratory analyzers and computer systems.

- **LIS1-A** Low-level protocol that transfers data packets
- **LIS2-A** High-level protocol that defines the content and use of the data packets

Low-level protocols supported by the ASTM external communication system are defined by the LIS1-A standard, except for the establishment of an Ethernet physical link that is the logical extension of that specification.

The analyzer uses another protocol named Health Level 7 (HL7), a messaging standard for exchanging clinical and administrative data among hospital computer systems. HL7 is a standard protocol developed by Health Level 7 International.

The analyzer uses version 2.5 of the HL7 standard to format outgoing messages and process messages from hospital systems.

Information sent using the HL7 standard is structured in individual messages. Each type of HL7 message has a purpose and structure.

Message event codes, also called triggers, include 3-digit alphanumeric codes in each message. A message event code enables an application receiving HL7 messages to recognize the purpose of each message and the location of individual pieces of information in messages.

Information in HL7 messages is organized by segments. Each segment is a group of fields that contain individual items of related data. A segment may also contain other segments.

For information about HL7, or to obtain the specification for this standard, go to www.hl7.org.

Interface Summary

This section describes the different physical connections that are used to implement the interface between the Atellica UAS 800 analyzer and the LIS (when referring to the connection between an Atellica UAS 800 analyzer and a specific LIS device, the LIS device is referred to as the “host”).

Physical interfaces

Name	Description
Serial	connects to host via RS-232 port (Atellica UAS 800 PC COM port 2)
Ethernet	connects to host via LAN (Atellica UAS 800 PC Ethernet port to right of COM 2)

Serial Pin Out:

Pin 2 = Receive

Pin 3 = Transmit

Pin 5 = Ground

All other pins are not utilized by the Atellica UAS 800.

RS-232 interface settings

The following configuration of the RS-232 serial communication protocol settings are present in the user software:

- Baud rate:
 - 9600
 - 14400
 - 19200
 - 38400
 - 57600
 - 115200

Non-configurable settings in the user software:

- Length:
 - 8
- Parity check:
 - N (no)
- Stopbits:
 - 1

Ethernet

If the Ethernet is used, the following LAN configuration settings of the host device must be provided in order to open the communication channel:

- IP address
- Port

Note: The Atellica UAS 800 software always acts as a client when connecting to the host device.

The LAN settings of the Atellica UAS must also be configured so that communication can take place with the host device. These settings include:

- Address Type (DHCP/Static)
- IP address
- Subnet Mask
- Default Gateway
- DNS Server Address
- Device Name (If using DHCP)

2 ASTM Low Level Interface

Frame structure:

[STX]	{FN}	Data content of Message	[ETB]	{CHS}	[CR]	[LF]
-------	------	-------------------------	-------	-------	------	------

The following legend defines the colors used to signify the fields in a high-level protocol frame:

	Mandatory fields
	Common fields
	Data field

Mandatory fields

The ASTM standard imposes constraints on some fields, which are indicated as mandatory fields in the legend. Mandatory fields cannot be changed and retain the same static content over the entire communication sequence in all frames.

Common fields

The content of these fields changes during the communication sequence. The content is generated by the protocol according to rules which apply to all frames.

Data fields

Data content varies for each type of record. The details for each type of record are described in this document.

Abbreviation	FN
Short explanation	Frame Number
Description	A single digit from 0 to 7 The frame number begins at 1 with the first frame of the transfer phase. The frame number is incremented by 1 for every new frame transmitted. After 7, the frame number rolls over to 0 and continues in this fashion.
Example	1

Abbreviation	CHS
Short explanation	Checksum
Description	The checksum enables the receiver to detect a defective frame. The checksum is encoded as two characters, which are sent after the <ETB> or <ETX> characters. The checksum is computed by adding the binary values of the characters and keeping the least significant eight bits of the result. The checksum is initialized to zero with the <STX> character. The first character used in computing the checksum is the frame number. Each character in the message text is added to the checksum (modulo 256). The computation for the checksum does not include <STX>, the checksum characters, or trailing <CR> and <LF>. The checksum is an integer represented by eight bits (two 4 group bits). The four bits are converted to the ASCII character in a hexadecimal format.
Example	A0

3 ASTM High Level Interface

The high-level layer of the data exchange is described in the LIS2-A2 standard.

Characters and encoding

The Atellica UAS 800 analyzer sends and receives strings in ASCII character encoding.

Note: All LIS transmissions are in English only.

Delimiters

For the purpose of providing examples, the following delimiters are used in this description:

Delimiter type	Name of the character	Sign of the character	ASCII code of the character
Field delimiter	vertical bar		124
Repeat delimiter	backslash	\	92
Component delimiter	caret	^	94
Escape delimiter	ampersand	&	38

Message Types

The following message types exist in the LIS2-A2 implementation of the Atellica UAS 800 analyzer:

- Measurement messages: (initiated only by the Atellica UAS 800)
 - Sample Measurement Message
 - QC Measurement Message
 - Host Query Message
- Request message (sent from host to the Atellica UAS 800 analyzer):
 - Worklist Entry Message
 - Host Query Response Message

Sample Measurement Message

The Sample Measurement message contains the data for a single Atellica UAS 800 measurement.

The Sample Measurement message send operation is always initiated by the Atellica UAS 800 analyzer. Chemistry results are sent in a separate sample measurement message when in the Atellica 1500 configuration.

General structure:

- Header¹
 - Patient² #1 (general information about the first patient)
 - Comment³ #1 (optional; related to patient #1)
 - Order⁴ #1 (information about the first test order, which relates to patient #1)
 - Comment³ #1 (optional; related to order #1)
 - Result⁵ #1 (result information related to order #1)
 - Comment #1 (optional; related to result #1)
 - Comment #2 (optional; related to result #1)
 - ...
 - Result #2 (result information related to order #1)
 - ...
 - Result⁵ #n (result information related to order #1)
 - Order #2 (information about the second test order, which relates to patient #1)
 - Result #1 (result information related to order #2)
 - Result #2 (result information related to order #2)
 - ...
 - Order #n (information about the last test order; it relates to patient #1)
 - Result #1 (result information relates to order #n)
 - ...
 - Patient #2 (all of the structures repeats)
 - ...
 - Patient #n
- Message Terminator Record⁶

¹ see also [Message Header Record \(H\)](#)

² see also [Patient Identifying Record \(P\)](#)

³ see also [Comment Record \(C\)](#)

⁴ see also [Test Order Record \(O\)](#)

⁵ see also [Result Record \(R\)](#)

⁶ see also [Message Terminator Record \(L\)](#)

- Message Header
 - Patient (general information about the patient)
 - Comment (general comment for sample)
 - Order (information about the test order)
 - Result #1 (result related to order #1)
 - Comment #1 (related to result #1)
 - Result #2 (result related to order #1)
 - Comment #2 (related to result #2)
 -
 - Result #n (result information relates to order #1)
 - Comment #n (related to result #n)
- Message Terminator

Example 1: Sample Measurement Message transfer (Sediment + Chemistry)

```
H|\^&|||Atellica UAS 800^Atellica UAS 800^4.0.90.5575^1^H100016|||||P|LIS2-
A2|20171027094601
P|1|||Name in user sw
C|1|I|Sediment comment in user sw|G
C|2|I|Review|I
C|3|I|Low Level|I
C|4|I|Dilution factor2.5|I
O|1|0064|1^5^opera^SAMPLE|S|R||||N|||20171027091030|||||||F
R|1|798-9^^^RBC|132|p/ul||A||F||test|||Atellica UAS 800
C|1|I|A|I
R|2|51487-7^^^WBC|267.3|p/ul||A||F||test|||Atellica UAS 800
C|1|I|A|I
R|3|33768-3^^^WBCc|-||N||F||test|||Atellica UAS 800
R|4|53334-9^^^CRY|++++||A||F||test|||Atellica UAS 800
C|1|I|A|I
R|5|50231-0^^^HYA|++++||A||F||test|||Atellica UAS 800
C|1|I|A|I
R|6|72224-9^^^PAT|+||A||F||test|||Atellica UAS 800
C|1|I|A|I
R|7|50225-2^^^NEC|-||N||F||test|||Atellica UAS 800
R|8|53318-2^^^EPI|++++||A||F||test|||Atellica UAS 800
C|1|I|A|I
R|9|72223-1^^^YEA|-||N||F||test|||Atellica UAS 800
R|10|50221-1^^^BAC|++++||A||F||test|||Atellica UAS 800
C|1|I|A|I
R|11|^^^.BACr|+||A||F||test|||Atellica UAS 800
C|1|I|A|I
R|12|^^^.BACc|++||A||F||test|||Atellica UAS 800
C|1|I|A|I
R|13|53321-6^^^MUC|+||A||F||test|||Atellica UAS 800
C|1|I|A|I
R|14|33232-0^^^SPRM|+||A||F||test|||Atellica UAS 800
C|1|I|A|I
L|1|N
H|\^&|||CLINITEK Novus^S001802^1.2.0.9000000^CONN|||||P|LIS2-A2|20171027094601
P|1|||Name in user sw
O|1|0064^1^5^^^|0-08782|^^^CLINITEK Novus
10^__^K372087^20171103015522^23298|||||||20171027090801|||||||20171027090801|||F
C|1|I|Chemical comment in user sw|G
C|2|I|ResultComment^COMMENT 1^NOVUS COMM1|G
```

```
C|3|I|ResultComment^COMMENT 2^N COMM2|G
C|4|I|ResultComment^COMMENT 3^N COMM3|G
C|5|I|ResultComment^COMMENT 4^N COMM4|G
R|1|^^^BIL|Negative|||N||F||NOVUS OPID
C|1|I|Note for BIL|G
R|2|^^^BLO|Small|||A||F||NOVUS OPID
C|1|I|A|I
R|3|^^^CLA|Cloudy|||A||F||NOVUS OPID
C|1|I|A|I
R|4|^^^COL|Red|||A||F||NOVUS OPID
C|1|I|A|I
R|5|^^^GLU|Negative|||N||F||NOVUS OPID
R|6|^^^KET|Negative|||N||F||NOVUS OPID
C|1|I|Note for KET|G
R|7|^^^LEU|Trace|||A||F||NOVUS OPID
C|1|I|A|I
R|8|^^^NIT|Positive|||A||F||NOVUS OPID
C|1|I|A|I
R|9|^^^pH|8.5|||A||F||NOVUS OPID
C|1|I|A|I
R|10|^^^PRO|Negative|||N||F||NOVUS OPID
R|11|^^^SG|1.004|||N||F||NOVUS OPID
R|12|^^^URO|0.2|E.U./dL||N||F||NOVUS OPID
L|1|N
```

QC Measurement Message

The QC Measurement message has the same message structure as the Sample Measurement message, except that the “sample type” component of the “Analyzer Specimen ID” (ISID) field of the test order record contains “CONTROL” instead of “SAMPLE.”

The QC Measurement message send operation is always initiated by the Atellica UAS 800 analyzer.

The sediment QC Measurement message only contains result records for RBC and WBC parameters.

Example 2: QC Measurement Message transfer (Sediment)

```
H|\^&|||Atellica UAS 800^Atellica UAS 800^4.0.90.5575^1^H100016|||||Q|LIS2-
A2|20171030162702
P|1|||QC_LOW
C|1|I|Test Passed!|G
C|2|I|Lot ID: 2222|I
C|3|I|Liquid Type: Quantimetrix QuantScopics|I
C|4|I|Expiration Date: 20180904|I
O|1|0296|1^5^test^CONTROL|S|R|||||Q|||20171030162552|||||||F
R|1|798-9^^^RBC|<4|p/ul||N||F||test|||Atellica UAS 800
R|2|53292-9^^^RBC|In Range|||N||F||test|||Atellica UAS 800
R|3|51487-7^^^WBC|<3|p/ul||N||F||test|||Atellica UAS 800
R|4|53316-6^^^WBC|In Range|||N||F||test|||Atellica UAS 800
L|1|N
```

Worklist Entry Message

This message adds a worklist entry from the host side to the Atellica UAS 800.

Note: Worklist entry messages only provide demographic and dilution information for a sample. They do not control whether or not a test is performed.

Example (without a comment and without a dilution factor; the default dilution factor is 1):

```
H|\^&|||LIS^123^1.0.3|||||P||20160825132734
P|1||||T Pal
O|1|98765|1^1|S
L|1|N
```

Example (with rack 3, tube position 4, dilution factor 2 and with a comment):

```
H|\^&|||LIS^123^1.0.3|||||P||20160825132734
P|1||||Smith
C|1||The comment itself|G
O|1|12345|3^4|S^2
L|1|N
```

Example (with rack 3, tube position 4, dilution factor 5, comment and extended patient data):

```
H|\^&|||LIS^123^1.0.3|||||P||20160825132734
P|1||||Henri Charriere||19061116|M|||||||Langogne
C|1||The comment itself|G
O|1|BAR1234|3^4|S^5
L|1|N
```

Host Query Message

This message asks the host whether the sample with the given ID should be measured for sediment or not.

Example host query for sample ID 0416 sent from the UAS 800

```
H|\^&|||Atellica UAS 800^Atellica UAS 800^4.0.123.6420^1^H100017|||||P|LIS2-
A2|20180628104335
Q|1|^0416|||||||O
L|1|N
```

Host Query Response Message

According to the host response the Atellica UAS 800 starts or skips the sample. The response can contain patient name, comment, and dilution. The Atellica UAS 800 will wait up to 30 seconds for the response to a request. If a response is sent by the data manager after 30 seconds, the UAS 800 will process the sample based on the configured settings.

Note: If for any reason the host does not answer in time with the Host Query Response Message (e.g. network environment is slow) it can result in a decrease of the throughput of the analyzer. In extreme cases it can be advised to disable the host query mode if the speed of the analyzer is important for the customer and the network environment is continuously unstable.

Example (without comment and without dilution factor, dilution factor is the default 1):

```
H|\^&|||||||P|1
P|1||||Jonas Queen
O|1|0416|^|^|R|20180214133832||||N||||Urine||||||Q
L|1|F
```

Example host query response to sample ID 0416 with patient name sent to the UAS 800

```
H|\^&|||||||P|1
P|1||||Jonas Queen
O|1|0416||^1|R|20180214133832||||N||||Urine|||||||Q
L|1|F
```

Example host query response to sample ID 0416 with patient name and comment sent to the UAS 800

```
H|\^&|||||||P|1
P|1||||Jonas Queen
O|1|0416||^1|R|20180214133832||||N||||Urine|||||||Q
C|1||The comment itself|G
L|1|F
```

Example host query response to sample ID 0416 with patient name, dilution factor and comment sent to the UAS 800

```
H|\^&|||||||P|1
P|1||||Jonas Queen
O|1|0416||^2|R|20180214133832||||N||||Urine|||||||Q
C|1||The comment itself|G
L|1|F
```

Example host query response to sample ID 0416 with patient name, dilution factor 1.5, comment and extended data sent to the UAS 800

```
H|\^&|||||||P|1
P|1||||Elizabeth Alexandra Mary||19260421|F|||||||London
O|1|0416||^1.5|R|20180214133832||||N||||Urine|||||||Q
C|1||The comment itself|G
L|1|Fatient data sent to the UAS 800
```

Example host query response to skip the sediment measurement for sample ID 0416 sent to the UAS 800

```
H|\^&|||||||P|1
O|1|0416||^1|R|20180214133832||||C|||||||Y
L|1|I
```

Data Record Types

Common fields for data records

Abbreviation	RSN
Short explanation	Record Sequence Number
Description	This field is used in record types that may occur multiple times within a single message. The number used defines the i'th occurrence of the associated record type at a particular hierarchical level and is reset to 1 whenever a record of a greater hierarchical significance (lower number) is transmitted or if the same record is used at a different hierarchical level (e.g., comment records)
Example	C 1 I Chemical comment in user sw G C 2 I ResultComment^COMMENT 1^NOVUS COMM1 G C 3 I ResultComment^COMMENT 2^N COMM2 G C 4 I ResultComment^COMMENT 3^N COMM3 G C 5 I ResultComment^COMMENT 4^N COMM4 G

Abbreviation	DT
Short explanation	Date Time codes
Description	Date code should be in YYYYMMDDHHMMSS. Variations for this field: <ul style="list-style-type: none"> • Date/Time of the Message (DTM) • Date/Time Specimen Received (DTSR) • Date/Time Test Started (DTTS) • Date/Time Test Completed (DTTC) • Expire Date/Time of Operator's information (DTOE)
Example	20170205120130

Message Header Record (H)

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
[STX]	{FN}	H	{DEL}			{SEN}							{TT}	{PVN}	{DTM}	[CR]	[ETB]	{CHS}	[CR]	[LF]

Note: All used fields from 3...14, including empty fields, start with a field separator (a vertical line character: "|" ASCII124). For host query response message, fields 3 to 13.

Legend:

	Mandatory fields
	Common data fields
	Unique record fields
	Empty fields
	Not used fields
	Frame elements

Sediment Example:

```
H|\^&|||Atellica UAS 800^Atellica UAS 800^4.0.90.5575^1^H100016|||||P|LIS2-A2|20171027094601
```

Chemistry Example:

```
H|\^&|||CLINITEK Novus^S001802^1.2.0.9000000^CONN|||||P|LIS2-A2|20171027094601
```

Explanation of the fields:

Abbreviation	DEL
Short explanation	Delimiters of the protocol
Description	Any four ASCII characters can be used except for restricted characters. It is important to use delimiters consistently in the protocol. The order of the delimiter is: field, repeat, component, escape. For the Atellica UAS 800 analyzer, the content is always constant and static.
Example	\^&

Abbreviation	SEN
Short explanation	Sender name or ID
Description	<p>When the Atellica UAS 800 sends this field, it contains several components:</p> <p>Sediment:</p> <pre>{Instrument name}^{Instrument type}^{SW version}^{SW ID}^{Serial Number}</pre> <ul style="list-style-type: none"> {Instrument name} – 'Atellica UAS 800' {Instrument type} – 'Atellica UAS 800' {SW version} – version of the Atellica UAS 800 sw {SW ID} – LIS2-A2 module version of Atellica UAS 800 sw {Serial Number} – Serial Number of the UAS 800 <p>Chemical:</p> <pre>{Instrument name}^{Serial Number}^{SW version}^{Rack Type}</pre> <ul style="list-style-type: none"> {Instrument name} – CLINITEK Novus {Serial Number} – Serial Number of the CLINITEK Novus {SW version} – version of the CLINITEK Novus sw {Rack Type} – always 'CONN' <p>When the Atellica UAS 800 receives this field as host query response:</p> <ul style="list-style-type: none"> {SEN} – Empty. The field is not used for any special purpose.
Example	Atellica UAS 800^Atellica UAS 800^4.0.90.5575^1^H100016 CLINITEK Novus^S001802^1.2.0.9000000^CONN

Abbreviation	TT
Short explanation	Test Type
Description	<p>For Atellica UAS 800 Sediment Results:</p> <ul style="list-style-type: none"> • P: Patient Results • Q: QC Results <p>For CLINITEK Novus Results:</p> <ul style="list-style-type: none"> • P: Patient Results • Q: Calibration Results and QC Results <p>For host query response:</p> <ul style="list-style-type: none"> • P: Patient Result

Abbreviation	PVN
Short explanation	(protocol) Version Number
Description	<p>When the Atellica UAS 800 sends this field, it displays the version of the current communication protocol.</p> <p>When the Atellica UAS 800 receives this field as host query response: {PVN} – should always be “1”.</p>
Example	LIS2-A2

Remarks:

- **Frame Number (FN)** in headers is always 1, as this is always the first record in a message.
- **Date/Time of the Message (DTM)** represents the date and time when the message has been sent. Not used for host query response message.

Patient Identifying Record (P)

When extended patient data is disabled:

0	1	2	3	4	5	6	7				
[STX]	{FN}	P	{RSN}			{PID}	[CR]	[ETB]	{CHS}	[CR]	[LF]

Note: All used fields from 2...7 start with a vertical line character field separator ("|"; ASCII124).

When extended patient data is enabled:

	0	1	2	3	4	5	6	7	8	9	10..25	26	27				
{STX}	{FN}	P	{RSN}				{PID}		{DOB}	{GEN}		{DEPT}	{CR}	{ETB}	{CHS}	{CR}	{LF}

Note: All used fields from 2...26 start with a vertical line character field separator ("|"; ASCII124).

Legend:

	Mandatory fields
	Common data fields
	Unique record fields
	Empty fields
	Not used fields
	Frame elements

Sediment example 1:

P|1||||Patient Name in user sw

Sediment example 2 (no patient is set):

P|1||||--

Explanation of the fields:

Abbreviation	PID
Short explanation	Patient Name
Description	The Name of the patient will be transmitted. In the case of a QC measurement, QC_HIGH or QC_LOW is sent
Example	Patient Name in user sw, QC_LOW

Abbreviation	DOB
Short explanation	Date of Birth
Description	Represents the patient's date of birth Date code should be in YYYYMMDD.
Example	19260421

Abbreviation	GEN
Short explanation	Gender
Description	Represents the gender of the patient. Possible values: <ul style="list-style-type: none"> Male: M, Female: F, Unknown: U Other values or empty Gender field are replaced by the analyzer to U (Unknown).
Example	M

Abbreviation	DEPT
Short explanation	Dept/Ward
Description	Represents the location information of the patient or sample. It can be defined as free text.
Sediment Example	London

Request Information Record (Q)

This record type is sent from the instrument when Host Query setting is enabled. The UAS 800 software does not support being queried.

	0	1	2	3	4..12	13		
[STX]	{FN}	Q	{RSN}	{SRID}		{RISC}	[CR]	[LF]

Note: From 2...13 all used fields start with vertical line character („|”; ASCII124), as field separator.

Legend:

	Mandatory fields
	Common data fields
	Unique record fields
	Empty fields
	Not used fields
	Frame elements

Sediment example:

Q|1|^0416|||||||O

Explanation of the fields:

Abbreviation	SRID
Short explanation	Starting Range ID Number
Description	Formatted in two fields separated by ^ First Field: Blank (future use) Second Field: Specimen ID of sample requesting test order
Example	^0416

Abbreviation	RISC
Short explanation	Request Information Status Codes
Description	Status of the request message. Always O
Example	O

Test Order Record (O)

Sediment Result and Host Query Response:

0	1	2	3	4	5	6	7	8..11	12	13..14	15	16..25	26	27					
[STX]	{FN}	O	{RSN}	{SID}	{ISID}	{UTI}	{PR}	{DTTS}		{AC}		{DTTS}		{RT}	[CR]	[ETB]	{CHS}	[CR]	[LF]

Note: All used fields between 2...26 start with a vertical line character field separator (“|”; ASCII124).

Chemical Results:

0	1	2	3	4	5	6..14	15	16..22	23	24..25	26	27					
[STX]	{FN}	O	{RSN}	{SID}	{ISID}	{UTI}		{DTTS}		{DTTS}		{RT}	[CR]	[ETX]	{CHS}	[CR]	[LF]

Note: All used fields between 2...26 start with a vertical line character field separator (“|”; ASCII124).

Legend:

	Mandatory fields
	Common data fields
	Unique record fields
	Empty fields
	Not used fields
	Frame elements

Examples:**Sediment (sample measurement):**

```
O|1|0064|1^5^opera^SAMPLE|S|R|||||N|||20171027091030|||||||F
```

Sediment (QC measurement):

```
O|1|0296|1^5^test^CONTROL|S|R|||||Q|||20171030162552|||||||F
```

Host Query Response:

```
O|1|0416||^1|R|20180214133832|||||N||||Urine|||||||Q
```

Chemistry (sample measurement):

```
O|1|0064^1^5^^|0-08782|^CLINITEK Novus
10^__^K372087^20171103015523^23298|||||||20171027090801|||||||20171027090801|||F
```

Chemistry (Control measurement):

```
O|1|^1^2^P0053102P^^CONTROL +|C-00045|^CLINITEK Novus
10^__^K372087^20171103015523^23298|||||||20171026144433|||||||20171026144433|||F
```

Chemistry Error (sample measurement):

```
O|1|8205^1^3^^|0-08783|^__^_____|19050314000000|||||||19050314000000|||X
```

Chemistry (calibration)

```
O|1|^1^3^9999^^|K-00574|^CLINITEK Novus
10^__^K372087^20171103015523^23298|||||||20171020140022|||||||20171020140022|||F
O|2|^1^4^9999A^^|K-00576|^CLINITEK Novus
10^__^K372087^20171103015523^23298|||||||20171020140052|||||||20171020140052|||F
O|3|^1^5^9999B^^|K-00578|^CLINITEK Novus
10^__^K372087^20171103015523^23298|||||||20171020140122|||||||20171020140122|||F
O|4|^1^2^9999C^^|K-00572|^CLINITEK Novus
10^__^K372087^20171103015523^23298|||||||20171020135952|||||||20171020135952|||F
```

Explanation of the fields:

Abbreviation	SID
Short explanation	Specimen ID
Description	<p>For Sediment results: The unique ID of the sample.</p> <p>For Chemistry results: Specimen ID of the sample with rack and tube location information.</p> <p>{SampleID}^{Rack number}^{Tube Number}^{LotNumber}^{ExpirationDate}^{Level}</p> <ul style="list-style-type: none"> • {SampleID} – is the Sample ID of the specimen. For patient result the {SampleID} contains the Specimen ID. Control and calibration order records this component is empty. When field 26 is “X” this component is empty. • {Rack number} – the number of the rack maintained by the analyzer • {Tube number} – tube position in the rack • {LotNumber} - contains the lot number. For calibration result order record this component contains the calibrator lot number. For control result order record this component contains the control sample lot number. For patient result order record this component is empty. When field 26 is “X” this component is empty. • {ExpirationDate} - contain expiration date in the format of “YYYYMM” or “YYYYMMDD”. For calibration result order record this component contains the calibrator expiration date. For control result order record this component contains the control sample expiration date. When field 26 is “X” this component is empty. • {Level} - For control result order record this component contains the control level (system default name or user defined name) of the control sample. For patient

	<p>and calibration result order record this component is empty. When field 26 is "X" this component is empty.</p> <p>For Host query response: The unique ID of the sample.</p>
Sediment Example	081315493912
Chemistry Examples	<p>Patient Result: 0001089^1^4^^^</p> <p>Calibration Result: ^1^4^9999A^^</p> <p>Control Result: ^1^2^P0053102P^^CONTROL +</p>
Host query response Example	081315493912

Abbreviation	ISID
Short explanation	Instrument Specimen ID
Description	<p>For Sediment results:</p> <p>{Rack number}^{Tube number}^{User}^{Sample Type}</p> <ul style="list-style-type: none"> • {Rack number} – the number of the rack maintained by the analyzer • {Tube number} – tube position in the rack • {User} – User name, who is sending the result • {Sample Type} – "SAMPLE" / "CONTROL" <ul style="list-style-type: none"> ○ "SAMPLE" – marking samples ○ "CONTROL" – for QC measurements <p>For Chemistry results: This field contains the sequence number assigned to the specimen in the format of "x-xxxxx"</p> <p>For routine sample the 1st character = 0 - 9 For Stat sample the 1st character = "S" For control sample the 1st character = "C" For calibration the 1st character = "K"</p> <p>For Host query response: {ISID} is not used.</p>
Sediment Example	1^1^dani^SAMPLE 1^2^dani^CONTROL
Chemistry Example	0-12345 S-00001 C-10213 K-00234

Abbreviation	UTI
Short explanation	Universal Test ID
Description	<p>For Sediment Results</p> <ul style="list-style-type: none"> S <p>For Chemistry Results</p> <p>^^^{ReagentName}^{YZ}^{ReagentLotNumber}^{ReagentExpirationDate}^{CassetteSerialNumber}</p> <ul style="list-style-type: none"> {ReagentName} contains the name of the reagent used (ie: "CLINITEK Novus 10" or "CLINITEK Novus PRO 12"). {YZ} indicates Color and Clarity manual entry indicators. <ul style="list-style-type: none"> "Y" contains "C" if color was manually entered for this result else it is an underscore (does not matter if color result is being sent or not) "Z" contains "C" if clarity was manually entered for this result else it is an underscore (does not matter if clarity result is being sent or not) {ReagentLotNumber} contains the reagent lot number. {ReagentExpirationDate} contains the reagent Use life expiration date in format of YYYYMMDDHHMMSS. {CassetteSerialNumber} contains the serial number of the reagent cassette. <p>For host query response:</p> <p>{Not used}^{Not used}^{Not used}^{dilution factor}</p> <p>{dilution factor} - the dilution factor for the sample.</p>
Sediment Example	S
Chemistry Example	^^^CLINITEK Novus PRO 12^__^R325017^20170914073100^52077
Host query response	<p>Not diluted:</p> <p>^^^1</p> <p>Dilution factor 2:</p> <p>^^^2</p>

Abbreviation	PR
Short explanation	Priority
Description	<p>For Sediment Results</p> <ul style="list-style-type: none"> R (routine)
Sediment Example	R

Abbreviation	AC
Short explanation	Action code
Description	For Sediment Results <ul style="list-style-type: none"> • For Quality Control results: Q • For Sample results: N • For host query response: <ul style="list-style-type: none"> ○ when skip sample: C ○ when start sample: N
Sediment Example	Q

Abbreviation	RT
Short explanation	Report type
Description	{RT} <ul style="list-style-type: none"> • F – Final result (successful measurement) • C – Correction (only supported for chemical results) • X – order cannot be done, error occurred • U – Unknown (indication of unknown report type) • Q – Response to Query (sent to UAS 800 as positive response to Host Query) • Y – No order on Record for this test (sent to UAS 800 as negative response to Host Query)
Example	F

Abbreviation	DTTS
Short explanation	Date/Time Test Started
Description	{DTTS} <p>Represents the date and time when the test has been started. (see also Common Data Fields)</p> <p>Date code should be in YYYYMMDDHHMMSS.</p> <ul style="list-style-type: none"> • For Sediment Results the 15th field is used, and 7th is blank • For host query response the 7th field is used and 15th is blank
Example	20171030162552

Result Record (R)

Sediment Results:

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
[STX]	{FN}	R	{RSN}	{UTID}	{DMV}	{UNIT}	{RAF}	F		{OpID}			{AN}	[CR]	[ETB]	{CHS}	[CR]	[LF]

Note: All used fields from 2...14 start with a vertical line character field separator ("|"; ASCII124).

Chemistry Results:

	0	1	2	3	4	5	6	7	8	9	10	11	12					
[STX]	{FN}	R	{RSN}	{UTID}	{DMV}	{UNIT}		{RAF}		F		{OpID}	[CR]	[ETB]	{CHS}	[CR]	[LF]	

Note: All used fields from 2...14 start with a vertical line character field separator ("|"; ASCII124).

Chemistry Calibrations:

0	1	2	3	4	5	6	7	8	9	10				
[STX]	{FN}	R	{RSN}		{DMV}				N	[CR]	[ETB]	{CHS}	[CR]	[LF]

Note: All used fields from 2...9 start with a vertical line character field separator ("|"; ASCII124).**Legend:**

	Mandatory fields
	Common data fields
	Unique record fields
	Empty fields
	Not used fields
	Frame elements

Sediment example:

R|40|50221-1^^^BAC|+|||A||F||test|||Atellica UAS 800

Chemistry example:

R|2|^^^BIL|Moderate|||A||F||NOVUSOPID

Chemistry calibration example:

R|1||Passed|||||N

Explanation of the fields:

Abbreviation	UTID
Short explanation	Universal Test ID
Description	<p>For Sediment Results:</p> <p>{Test code}^{NU}^{NU}^{Test Name}</p> <ul style="list-style-type: none"> {Test code} – Test code (LOINC code) {NU} – Not used (empty) {Test Name} – name of the tested parameter <p>For Chemistry Results:</p> <p>{NU}^{NU}^{NU}^{Analyte}</p> <ul style="list-style-type: none"> {NU} – Not used (empty) {Analyte} - contains the 2 or 3 letter analyte abbreviation. The analyte abbreviations are dependent upon the result unit system configured for the instrument. <p>For Calibration results this field is not used (empty).</p>

Sediment Example	51487-7^^^WBC
Chemistry Example	^^^LEU

Abbreviation	DMV
Short explanation	Data or Measurement Value
Description	<p>For Sediment Results: The value (or category) of the measured test.</p> <p>For Chemistry Results: This field contains the numerical value of the test result. If the test result is a qualitative result (such as Positive, Negative, Normal, Clear, Yellow) this qualitative result is positioned in this Data Value field. The value is dependent upon the result unit system configured for the instrument.</p> <p>For Calibration results: "Passed" or "Failed"</p>
Sediment Examples	<ul style="list-style-type: none"> • - • +++ • 485.10
Chemistry Example	<ul style="list-style-type: none"> • 100 • Positive

Abbreviation	UNIT
Short explanation	Unit
Description	<p>For Sediment Results: Unit of the result data (in the DMV field). It is always transmitted regardless of the value of the measurement. In case of an arbitrary unit, for example "++", this field is empty.</p> <p>For Chemistry Results: This field contains the unit of measure used for the test result Data Value. For qualitative and calibration results (such as Positive, Negative, Normal, Clear, Yellow) this field is empty. The unit is dependent upon the result unit system configured for the instrument.</p>
Sediment Example	<ul style="list-style-type: none"> • p/ul • p/HPF
Chemistry Example	<ul style="list-style-type: none"> • mg/dL • E.U./dL

Abbreviation	RAF
Short explanation	Result Abnormal Flags
Description	<p>If the result was normal: N</p> <p>If the result was abnormal: A</p> <p>In case of chemical Calibration this field is not used (empty).</p>
Example	A

Abbreviation	OpID
Short explanation	Operator Identification / Operator's ID
Description	<p>Sediment results: The ID of the operator which was given when the test was made</p> <p>Chemistry results: The ID of the operator which was given when the test was made</p> <p>For Calibration results this field is not used (empty).</p>
Example	user1

Abbreviation	AN
Short explanation	Analyzer Name
Description	<p>Sediment results: Name of the analyzer, static content.</p>
Example	Atellica · UAS · 800

Comment Record (C)

0	1	2	3	4	5	6						
[STX]	{FN}	C	{RSN}	{CS}	{CTX}	{CTY}	[CR]	[ETB]	{CHS}	[CR]	[LF]	

Note: All used fields from 2...5 start with a vertical line character field separator (“|”; ASCII124).

Legend:

	Mandatory fields
	Common data fields
	Unique record fields
	Empty fields
	Not used fields
	Frame elements

Example for sediment result record, followed by a result comment:

```
R|1|46419-8^^^RBC|178.93|p/HPF|A||F||test||Atellica UAS 800
C|1|I|A|I
```

Example for multiple sediment result comments:

```
C|1|I|Sed comm in user sw|G
C|2|I|Dilution factor2.5|I
```

Example for sediment QC result comments

```
C|1|I|Test Passed!|G
C|2|I|Lot ID: 2222|I
C|3|I|Liquid Type: Quantimetrix QuantTscopics|I
C|4|I|Expiration Date: 20180904|I
```

Example for multiple chemistry comment:

```
C|1|I|Chemical comment in user sw|G
C|2|I|ResultComment^COMMENT 1^NOVUS COMM1|G
C|3|I|ResultComment^COMMENT 2^N COMM2|G
C|4|I|ResultComment^COMMENT 3^N COMM3|G
C|5|I|ResultComment^COMMENT 4^N COMM4|G
```

Example for Image path sending as comment when Image transfer enabled:

```
C|2|I|R&R&RemoteServer&R&privat&R&210225_15_15_34_022515153391|I_
```

Explanation of the fields:

Abbreviation	CS
Short explanation	Comment Source
Description	Instrument
Example	I

Abbreviation	CTX
Short explanation	Comment Text
Description	System comment and Sediment comment: Dynamic text, the comment itself Particle comment (only for Abnormal particles): A
Example	Sed comm in user sw

Abbreviation	CTY
Short explanation	Comment Type
Description	<p>Sediment result comment</p> <ul style="list-style-type: none"> • Result statuses (Low sample volume, To confirm, Review, Dilution factor etc.): I • Abnormal particle comment: I • User entered comment or QC result text: G • For QC sediment results the QC LOT ID, Liquid type and expiration date: I <p>Chemical result comment</p> <ul style="list-style-type: none"> • User entered comment on Atellica UAS 800: G • User entered comment on CLINITEK Novus: G • User entered analyte note: G • Abnormal analyte comment: I
Example	I G

Message Terminator Record (L)

[illegible]

Note: All used fields between 2...13 start with a vertical line character field separator ("|"; ASCII124).

Legend:

	Mandatory fields
	Common data fields
	Unique record fields
	Empty fields
	Not used fields
	Frame elements

Example:

```
[STX] 0L|1|N[CR] [ETX] 03[CR] [LF]
```

Explanation of the fields:

Abbreviation	TC
Short explanation	Termination Code
Description	<p>In Atellica UAS 800 only one content entry is possible in this field: N = normal termination</p> <p>For host query response: I: when skip sample F: when start sample</p>
Example	N

Remarks:

Record sequence number (RSN) in terminator record is always 1 as this is always the first of this type of record in a message.

4 HL7 Low Level Interface

The physical layer of the data exchange is the same as described in TCP/IP protocol standard.

Data frame elements

This protocol applies the MLLP (Minimum Lower Layer Protocol) over the TCP/IP protocol.

Frame structure:

{SB}	Data content of Message	{EB}	[CR]
------	-------------------------	------	------

Element	Description
{SB}	Start Block character Value: ASCII 0x0B (vertical tab, [VT]) This should not be confused with ASCII characters SOH, STX
{EB}	End Block character Value: 0x1C (file separator, [FS]) This should not be confused with ASCII characters EOT, ETX

5 HL7 High Level Interface

Characters and encoding

The Atellica UAS 800 analyzer sends and receives strings in ASCII character encoding.

Note: All LIS transmissions are in English only.

Restricted characters

The following characters are restricted:

- The start block and end block character.
- Separators cannot be part of the data of the fields and components. Separators will be rejected.

For the purpose of providing examples, the following delimiters are used in this description:

Delimiter type	Name of the character	Sign of the character	ASCII code of the character
Segment terminator	carriage return	[CR]	13
Field separator	vertical bar		124
Repeat separator	tilde	~	126
Component separator	caret	^	94
Escape separator	backslash	\	92
Subcomponent separator.	ampersand	&	38

Example:

```
MSH|^~\&|Atellica UAS
800^1|||20170905150315||OUL^R22^OUL_R22|20170905150315196|P|2.5|||NE|AL||ASCII
```

The following escape sequences are defined:

\H\	start highlighting
\N\	normal text (end highlighting)
\F\	field separator
\S\	component separator
\T\	subcomponent separator
\R\	repetition separator
\E\	escape character
\Xddd...\	hexadecimal data
\Zddd...\	locally defined escape sequence

Message types

The following message types exist in the HL7 implementation of the Atellica UAS 800 analyzer:

- Measurement messages (sent from the Atellica UAS 800 to the host):
 - Sample Measurement Message
 - QC Measurement Message
 - Host Query Message
- Received messages (sent from the host to the Atellica UAS 800):
 - Worklist Entry Message
 - Host Query Response Message

Sample Measurement Message

The measurement message contains the data for a single measurement performed by the Atellica UAS 800 analyzer. The measurement message send operation is always initiated by the Atellica UAS 800 analyzer.

The measurement message can be followed by a single measurement result, measured by the Novus.

The Atellica UAS 800 analyzer uses only the following message segments:

Segments	Description
MSH	Message Header
SFT - Software segment	Software Segment
PID	Patient Identification
{	--- SPECIMEN begin
SPM - Specimen Segment	Specimen information
SAC	Container information
{	--- ORDER begin
OBR	Observation request
ORC	Common Order
NTE	Notes and Comments
[OBX]	Observation Result(s)
}	--- ORDER end
}	--- SPECIMEN end

Sediment + Chemistry Example:

```
<VT>MSH|^~\&|Atellica UAS
800^1|||20171027094314||OUL^R22^OUL_R22|20171027094314617|P|2.5||NE|AL||ASCII<CR>
SFT|Atellica UAS 800|4.0.90.5575|Atellica UAS 800|4.0.90.5575<CR>
PID|1||1||Name in user sw<CR>
SPM|1|0064||UR^Urine^HL70487|||||P^Patient^HL70369<CR>
SAC|||||||1|5<CR>
OBR|1|||UrineSedimentResult<CR>
ORC|RE||0064|CM|||||test|admini<CR>
```

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```
NTE|1||Sediment comment in user sw<CR>
NTE|2||Review|RE<CR>
NTE|3||Low Level|RE<CR>
NTE|4||Dilution factor2.5|RE<CR>
OBX|1|ST|798-9^RBC^LN|1|132|p/ul||A||F|||||H100016|20171027091030<CR>
OBX|2|ST|51487-7^WBC^LN|2|267.3|p/ul||A||F|||||H100016|20171027091030<CR>
OBX|3|ST|53317-4^.WBCc^LN|3|-||N||F|||||H100016|20171027091030<CR>
OBX|4|ST|53334-9^CRY^LN|4|+++||A||F|||||H100016|20171027091030<CR>
OBX|5|ST|50231-0^HYA^LN|5|++++||A||F|||||H100016|20171027091030<CR>
OBX|6|ST|72224-9^PAT^LN|6|+||A||F|||||H100016|20171027091030<CR>
OBX|7|ST|50225-2^NEC^LN|7|-||N||F|||||H100016|20171027091030<CR>
OBX|8|ST|53318-2^EPI^LN|8|+++||A||F|||||H100016|20171027091030<CR>
OBX|9|ST|72223-1^YEA^LN|9|-||N||F|||||H100016|20171027091030<CR>
OBX|10|ST|50221-1^BAC^LN|10|+||A||F|||||H100016|20171027091030<CR>
OBX|11|ST|^ .BACr^LN|11|+||A||F|||||H100016|20171027091030<CR>
OBX|12|ST|^ .BACC^LN|12|+||A||F|||||H100016|20171027091030<CR>
OBX|13|ST|53321-6^MUC^LN|13|+||A||F|||||H100016|20171027091030<CR>
OBX|14|ST|33232-0^SPRM^LN|14|+||A||F|||||H100016|20171027091030<CR>
<FS><CR>
<VT>MSH|^~\&|CLINITEK
Novus|||20171027094314||OUL^R22^OUL_R22|20171027094314829|P|2.5|||ASCII<CR>
SFT|CLINITEK Novus|1.2.0.9000000|CLINITEK Novus|1.2.0.9000000<CR>
PID|1<CR>
SPM|1|0064||UR|||||P<CR>
SAC|||||||1|5<CR>
INV|CLINITEK Novus 10|OK|||||||20171103015522|||K372087<CR>
OBR|1|0-08782||CLINITEK Novus 10|||||||F<CR>
NTE|1||Chemical comment in user sw<CR>
NTE|2||ResultComment:COMMENT 1:NOVUS COMM1|RE<CR>
NTE|3||ResultComment:COMMENT 2:N COMM2|RE<CR>
NTE|4||ResultComment:COMMENT 3:N COMM3|RE<CR>
NTE|5||ResultComment:COMMENT 4:N COMM4|RE<CR>
OBX|1|ST|BIL|1|Negative||N||F||||user1||S001802|20171027090801<CR>
TCD|BIL<CR>
NTE|1||Note for BIL<CR>
OBX|2|ST|BLO|2|Small||A||F||||user1||S001802|20171027090801<CR>
TCD|BLO<CR>
OBX|3|ST|CLA|3|Cloudy||A||F||||user1||S001802|20171027090801<CR>
TCD|CLA<CR>
OBX|4|ST|COL|4|Red||A||F||||user1||S001802|20171027090801<CR>
TCD|COL<CR>
OBX|5|ST|GLU|5|Negative||N||F||||user1||S001802|20171027090801<CR>
TCD|GLU<CR>
OBX|6|ST|KET|6|Negative||N||F||||user1||S001802|20171027090801<CR>
TCD|KET<CR>
NTE|1||Note for KET<CR>
OBX|7|ST|LEU|7|Trace||A||F||||user1||S001802|20171027090801<CR>
TCD|LEU<CR>
OBX|8|ST|NIT|8|Positive||A||F||||user1||S001802|20171027090801<CR>
```



```
TCD|NIT<CR>
OBX|9|ST|pH|9|8.5|||A|||F|||||user1||S001802|20171027090801<CR>
TCD|pH<CR>
OBX|10|ST|PRO|10|Negative|||N|||F|||||user1||S001802|20171027090801<CR>
TCD|PRO<CR>
OBX|11|ST|SG|11|1.004|||N|||F|||||user1||S001802|20171027090801<CR>
TCD|SG<CR>
OBX|12|ST|URO|12|0.2|E.U./dL||N|||F|||||user1||S001802|20171027090801<CR>
TCD|URO<CR>
<FS><CR>
```

Sediment with Image transfer enabled Example:

```
<VT>MSH|^~\&|Atellica UAS
800^1|||20210319022425||OUL^R22^OUL_R22|20210319022425731|P|2.5|||NE|AL||ASCII<CR>
SFT|Atellica UAS 800|4.0.324.8307|Atellica UAS 800|4.0.324.8307<CR>
PID|1||1||-<CR>
SPM|1|022515165010||UR^Urine^HL70487|||||P^Patient^HL70369<CR>
SAC|||||||2|1<CR>
OBR|1|||UrineSedimentResult<CR>
ORC|RE||022515165010||CM|||||dani|dani<CR>
NTE|1||To Confirm|RE<CR>
NTE|2||\E\\E\RemoteServer\E\privat\E\210225_15_16_50_022515165010|RE<CR>
OBX|1|ST|798-9^RBC^LN|1|13,2|p/ul||A|||F|||||123454321|20210225151650<CR>
OBX|2|ST|53292-9^RBC^LN|1|+|||A|||F|||||123454321|20210225151650<CR>
OBX|3|ST|51487-7^WBC^LN|2|485,1|p/ul||A|||F|||||123454321|20210225151650<CR>
OBX|4|ST|53316-6^WBC^LN|2|++++|||A|||F|||||123454321|20210225151650<CR>
OBX|5|ST|33768-3^.WBCc^LN|3|0|p/ul||N|||F|||||123454321|20210225151650<CR>
OBX|6|ST|53317-4^.WBCc^LN|3|-|||N|||F|||||123454321|20210225151650<CR>
OBX|7|ST|53297-8^CRY^LN|4|191,4|p/ul||A|||F|||||123454321|20210225151650<CR>
OBX|8|ST|53334-9^CRY^LN|4|++++|||A|||F|||||123454321|20210225151650<CR>
OBX|9|ST|51484-4^HYA^LN|5|0|p/ul||N|||F|||||123454321|20210225151650<CR>
OBX|10|ST|50231-0^HYA^LN|5|-|||N|||F|||||123454321|20210225151650<CR>
OBX|11|ST|^PAT^LN|6|13,2|p/ul||A|||F|||||123454321|20210225151650<CR>
OBX|12|ST|72224-9^PAT^LN|6|+|||A|||F|||||123454321|20210225151650<CR>
OBX|13|ST|51485-1^NEC^LN|7|0|p/ul||N|||F|||||123454321|20210225151650<CR>
OBX|14|ST|50225-2^NEC^LN|7|-|||N|||F|||||123454321|20210225151650<CR>
OBX|15|ST|51486-9^EPI^LN|8|19,8|p/ul||A|||F|||||123454321|20210225151650<CR>
OBX|16|ST|53318-2^EPI^LN|8|+|||A|||F|||||123454321|20210225151650<CR>
OBX|17|ST|51481-0^YEA^LN|9|0|p/ul||N|||F|||||123454321|20210225151650<CR>
OBX|18|ST|72223-1^YEA^LN|9|-|||N|||F|||||123454321|20210225151650<CR>
OBX|19|ST|51480-2^BAC^LN|10|1115,4|p/ul||A|||F|||||123454321|20210225151650<CR>
OBX|20|ST|50221-1^BAC^LN|10|++|||A|||F|||||123454321|20210225151650<CR>
OBX|21|ST|^BACr^LN|11|46,2|p/ul||N|||F|||||123454321|20210225151650<CR>
OBX|22|ST|^BACr^LN|11|-|||N|||F|||||123454321|20210225151650<CR>
OBX|23|ST|^BACc^LN|12|1069,2|p/ul||A|||F|||||123454321|20210225151650<CR>
OBX|24|ST|^BACc^LN|12|++|||A|||F|||||123454321|20210225151650<CR>
OBX|25|ST|51478-6^MUC^LN|13|0|p/ul||N|||F|||||123454321|20210225151650<CR>
OBX|26|ST|53321-6^MUC^LN|13|-|||N|||F|||||123454321|20210225151650<CR>
OBX|27|ST|51479-4^SPRM^LN|14|0|p/ul||N|||F|||||123454321|20210225151650<CR>
OBX|28|ST|33232-0^SPRM^LN|14|-|||N|||F|||||123454321|20210225151650<CR>
<FS><CR>
```

QC Measurement Message

The QC measurement message contains the data for a single QC measurement by the Atellica UAS 800 or for the CLINITEK NOVUS instrument. The QC measurement message sending is always initiated by the Atellica UAS 800.

The Atellica UAS 800 uses only the following message segments:

Segments	Description
MSH	Message Header
SFT - Software segment	Software Segment
PID	
{	--- SPECIMEN begin
SPM	Specimen information
SAC	Container information
{	--- ORDER begin
OBR	Observation Order
ORC	Common Order
NTE	Notes and Comments
[OBX]	Observation Result(s)
}	--- ORDER end
}	--- SPECIMEN end

Sediment Example (QC passed):

```
<VT>MSH|^~\&|Atellica UAS
800^1|||20171030162921||OUL^R22^OUL_R22|20171030162921434|P|2.5|||NE|AL||ASCII<CR>
SFT|Atellica UAS 800|4.0.90.5575|Atellica UAS 800|4.0.90.5575<CR>
PID|1||1||QC_LOW<CR>
SPM|1|0296||UR^Urine^HL70487|||||Q^Control specimen^HL70369<CR>
SAC|||||||1|5<CR>
OBR|1|||UrineSedimentResult<CR>
ORC|RE||0296||CM|||||test|Automatically validated<CR>
NTE|1||Test Passed!<CR>
NTE|2||Lot ID: 1111|RE<CR>
NTE|3||Liquid Type: Quantimetrix QuantScopics|RE<CR>
NTE|4||Expiration Date: 20180904|RE<CR>
OBX|1|ST|798-9^RBC^LN|1|<4|p/ul||N||F|||||H100016|20171030162552<CR>
OBX|2|ST|53292-9^RBC^LN|1|In Range||N||F|||||H100016|20171030162552<CR>
OBX|3|ST|51487-7^WBC^LN|2|<3|p/ul||N||F|||||H100016|20171030162552<CR>
OBX|4|ST|53316-6^WBC^LN|2|In Range||N||F|||||H100016|20171030162552<CR>
<FS><CR>
```

Sediment Example (QC failed):

```
<VT>MSH|^~\&|Atellica UAS
800^1|||20171030162921||OUL^R22^OUL_R22|20171030162921731|P|2.5|||NE|AL||ASCII<CR>
SFT|Atellica UAS 800|4.0.90.5575|Atellica UAS 800|4.0.90.5575<CR>
PID|1||1||QC_HIGH<CR>
SPM|1|8114||UR^Urine^HL70487|||||Q^Control specimen^HL70369<CR>
```

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```
SAC|||||||1|6<CR>
OBR|1|||UrineSedimentResult<CR>
ORC|RE||8114||CM|||||test|Automatically validated<CR>
NTE|1||Test Failed!<CR>
NTE|2||Lot ID: 1111|RE<CR>
NTE|3||Liquid Type: Quantimetrix QuantScopics|RE<CR>
NTE|4||Expiration Date: 20180904|RE<CR>
OBX|1|ST|798-9^RBC^LN|1|<4|p/ul||A||F|||||H100016|20171030162611<CR>
OBX|2|ST|53292-9^RBC^LN|1|Failed|||A||F|||||H100016|20171030162611<CR>
OBX|3|ST|51487-7^WBC^LN|2|5.28|p/ul||A||F|||||H100016|20171030162611<CR>
OBX|4|ST|53316-6^WBC^LN|2|Failed|||A||F|||||H100016|20171030162611<CR>
<FS><CR>
```

Chemistry Example (Control):

```
<VT>MSH|^~\&|CLINITEK·Novus|||20171129171051||OUL^R22^OUL_R22|20171129171051200|P|2.5
|||||ASCII<CR>
SFT|CLINITEK·Novus|1.2.0.9000000|CLINITEK·Novus|1.2.0.9000000<CR>
PID|1<CR>
SPM|1|||UR|||||Q<CR>
SAC|||||||1|1<CR>
INV|CLINITEK·Novus·PRO·12|OK|||||||20171017|||R325017<CR>
OBR|1|C-00036||CLINITEK·Novus·PRO·12|||||||F<CR>
OBX|1|ST|QCLot||P0053102P|||||F||||user1||S001802|20171009143757<CR>
TCD|QCLot<CR>
OBX|2|ST|QCExpiration||201905051108|||||F||||user1||S001802|20171009143757<CR>
TCD|QCExpiration<CR>
OBX|3|ST|QCLevel||CONTROL·+|||||F||||user1||S001802|20171009143757<CR>
TCD|QCLevel<CR>
OBX|4|ST|ALB|1|30|mg/L||N|||F||||user1||S001802|20171009143757<CR>
TCD|ALB<CR>
OBX|5|ST|BIL|2|Negative|||N|||F||||user1||S001802|20171009143757<CR>
TCD|BIL<CR>
OBX|6|ST|BLO|3|Trace|||N|||F||||user1||S001802|20171009143757<CR>
TCD|BLO<CR>
OBX|7|ST|CLA|4|Clear|||N|||F||||user1||S001802|20171009143757<CR>
TCD|CLA<CR>
OBX|8|ST|COL|5|Yellow|||N|||F||||user1||S001802|20171009143757<CR>
TCD|COL<CR>
OBX|9|ST|CRE|6|10|mg/dL||N|||F||||user1||S001802|20171009143757<CR>
TCD|CRE<CR>
OBX|10|ST|GLU|7|Negative|||N|||F||||user1||S001802|20171009143757<CR>
TCD|GLU<CR>
OBX|11|ST|KET|8|Negative|||N|||F||||user1||S001802|20171009143757<CR>
TCD|KET<CR>
OBX|12|ST|LEU|9|Moderate|||N|||F||||user1||S001802|20171009143757<CR>
TCD|LEU<CR>
OBX|13|ST|NIT|10|Negative|||N|||F||||user1||S001802|20171009143757<CR>
TCD|NIT<CR>
OBX|14|ST|pH|11|8.0|||N|||F||||user1||S001802|20171009143757<CR>
```

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```
TCD|pH<CR>
OBX|15|ST|PRO|12|Negative|||N|||F|||||user1||S001802|20171009143757<CR>
TCD|PRO<CR>
OBX|16|ST|SG|13|1.002|||N|||F|||||user1||S001802|20171009143757<CR>
TCD|SG<CR>
OBX|17|ST|URO|14|0.2|E.U./dL||N|||F|||||user1||S001802|20171009143757<CR>
TCD|URO<CR>
OBX|18|ST|A:C|15|150|mg/g||N|||F|||||user1||S001802|20171009143757<CR>
TCD|A:C<CR>
OBX|19|ST|P:C|16|300|mg/g||N|||F|||||user1||S001802|20171009143757<CR>
TCD|P:C<CR>
<FS><CR>
```

Worklist Entry Message

This message serves to add a worklist entry, received from the host side, to the Atellica UAS 800.

The Atellica UAS 800 is able to process data for 1 single sample in one Worklist Entry Message (between the {SB} {EB}). If multiple data is ready to transfer, then send each sample data in a different Worklist Entry Message one after another, with each message encapsulated by {EB} {SB}.

Note: Worklist entry messages only provide demographic and dilution information for a sample. They do not control whether or not a test is performed. If a worklist message is received before the analyzer begins taking sample images, the data is added to the sample.

Example (with dilution factor 1.5):

```
MSH|^~\&|||||20161028152244||OML^O33^OML_O33|123456|P|2.7
PID|1||||John Smith
NTE|1|L|Comment for patient|G
SPM||BAR1122||UR|||||P
ORC|NW
OBR|1
NTE|1|L|CS^1.5|G
```

Example (without dilution factor, dilution factor is the default 1):

```
MSH|^~\&|||||20161028152255||OML^O33^OML_O33|98765|P|2.7
PID|1||||Isaac Newton
NTE|1|L|Comment for Newton|G
SPM||B3344||UR|||||P
SAC|||||||567|3
ORC|NW
OBR|1
NTE|1|L|S|G
```

Example (with dilution factor 1.5 and extended patient data)

```
MSH|^~\&|||||20161028152244||OML^O33^OML_O33|123456|P|2.7
PID|1|1||Henri Charriere||19061116|M|||||||Langogne
NTE|1|L|Comment for patient|G
SPM||BAR1234||UR|||||P
ORC|NW
OBR|1
NTE|1|L|CS^1.5|G
```

Host Query Message

This message asks the host whether the sample with the given ID should be measured for sediment or not.

Example host query for sample ID 01416 sent from the UAS 800:

```
MSH|^~\&|Atellica UAS
800^1|||||20180727154737||QBP^Q11^QBP_Q11|20180727154737508|P|2.5|||NE|AL||ASCII
QPD|WOS^Work Order Step|IHELAW||01416
RCP|I|RD
```

Host Query Response Message

According to the host response the Atellica UAS 800 starts or skips the sample. UAS 800 will wait up to 30 seconds for the response to a request. If a response is sent by the data manager after 30 seconds, the UAS 800 will process the sample based on the configured settings.

Example To start ID 01416 the following message is the expected response sent to the UAS 800:

```
MSH|^~\&||Atellica UAS800^1|||20160204160942||RSP^K11^RSP_K11|20160204160942|
P|2.5|||NE|AL||ASCII
MSA|AA
QAK|LaboratoryOrderQuery|OK
QPD|WOS^Work Order Step^IHELAW||01416
```

Example To skip ID 01416 the following message is the expected response sent to the UAS 800:

```
MSH|^~\&||Atellica UAS800^1|||20160204160942||RSP^K11^RSP_K11|20160204160942|
P|2.5|||NE|AL||ASCII
MSA|AA
QAK|LaboratoryOrderQuery|NF
QPD|WOS^Work Order Step^IHELAW||01416
```

Control segments

MSH - Message Header Segment

The Atellica UAS 800 uses only the following fields:

```
MSH-1: |
MSH-2: ^~\&
MSH-3: ^Atellica·UAS·800.1^L
MSH-7: YYYYMMDDHHMMSS
MSH-9: OUL^R22^OUL_R22
MSH-10: YYYYMMDDHHMMSSmmm
MSH-11: P
MSH-12: 2.5
MSH-15: NE
MSH-16: NE
MSH-18: ASCII
```

SEQ	ELEMENT NAME	Local application/ implementation
1	Field Separator	
2	Encoding Characters	^~\&
3	Sending Application	Sediment result: {Analyzer short name} ^{SW HL7 version} Chemical result: {Analyzer short name}
7	Date/Time of Message	YYYYMMDDHHMMSS (e.g 20151012111727) YYYY: Year MM: Month DD: Days HH: Hours MM: Minutes SS: Seconds
9	Message Type	For Sediment result: OUL^R22^OUL_R22 For Chemical result: OUL^R22^OUL_R22 For Host query message: QBP^Q11^QBP_Q11 For Host query response message: RSP^K11^RSP_K11
10	Message Control ID	{uniqueID} (uniquely identifies the message)
11	Processing ID	"P"
12	Version ID	"2.5"
15	Accept Acknowledgment Type	Sediment results: "NE" Chemistry results: empty(not used)
16	Application	Sediment results:

	Acknowledgment Type	“AL” Chemistry results: empty (not used)
18	Character Set	“ASCII”

Sediment Example:

```
MSH|^~\&|Atellica UAS
800^1|||20171027094314||OUL^R22^OUL_R22|20171027094314617|P|2.5|||NE|AL||ASCII
```

Chemistry example:

```
<VT>MSH|^~\&|CLINITEK
Novus|||20171027094314||OUL^R22^OUL_R22|20171027094314829|P|2.5||||||ASCII<CR>
```


SFT - Software segment

The Atellica UAS 800 uses only the following fields:

SFT-1: Atellica·UAS·800 or CLINITEK Novus

SFT-2: X.X.X.X

SFT-3: Atellica·UAS·800 or CLINITEK Novus

SFT-4: X.X.X.X

SEQ	ELEMENT NAME	Sediment Results	Chemistry Results
1	Software Vendor Organization	Atellica·UAS·800	CLINITEK Novus
2	Software Certified Version or Release Number	X.X.X.X (ex. 4.0.85.5449)	X.X.X.X (Ex. 1.0.85.5449)
3	Software Product Name	Atellica·UAS·800	CLINITEK Novus
4	Software Binary ID	X.X.X.X (ex 4.0.56.3914)	X.X.X.X (Ex. 1.2.0.9000000)

Sediment Example:

SFT|Atellica UAS 800|4.0.90.5575|Atellica UAS 800|4.0.90.5575<CR>

Chemistry Example:

SFT|CLINITEK Novus|1.2.0.9000000|CLINITEK Novus|1.2.0.9000000<CR>

Data segments**PID - Patient Identifying Segment**

The Atellica UAS 800 uses only the following fields:

SEQ	ELEMENT NAME	Local application/ implementation
1	Set ID - PID	1
3	Patient Identifier List	1
5	Patient Name	Patient Name
7	Date/Time of Birth	Date of Birth format: YYYYMMDD
8	Administrative Sex	Patient Sex Possible values: Male: M, Female: F, Unknown: U
34	Last Update Facility	Department / Ward

Sediment example:

PID|1||1||Jasmine<CR>

Sediment example with extended patient data:

PID|1||1||Henri Charriere||19061116|M||||||||||||||||||||||Langogne

Sediment QC Example (For QC results, the LOT type is displayed):

PID|1||1||QC_HIGH<CR>

Chemical results have static content for this segment:

PID|1<CR>

SPM - Specimen Segment

The Atellica UAS 800 uses only the following fields:

SEQ	ELEMENT NAME	Local application/ implementation
1	Set ID - SPM	1
2	Specimen ID	Sample ID or sequence number
4	Specimen Type	Sediment results: UR^Urine^HL70487 Chemical results: UR
11	Specimen Role	Sediment Patient Sample: P^Patient^HL70369 Sediment QC: Q^Control specimen^HL70369 Chemical Patient Sample: P Chemical Control (QC): Q Chemical Calibrator: C

Sediment Example:

```
SPM|1|8230||UR^Urine^HL70487|||||P^Patient^HL70369
```

Sediment QC Example:

```
SPM|1|0311||UR^Urine^HL70487|||||Q^Control specimen^HL70369<CR>
```

Chemistry Control Example:

```
SPM|1|||UR|||||Q
```

SAC - Container information Segment

The Atellica UAS 800 uses only the following fields:

SEQ	ELEMENT NAME	Local application/ implementation
10	Carrier Identifier	Rack number
11	Position in Carrier	Tube position

Example:

```
SAC|||||||1|2<CR>
```

INV – Inventory Detail Segment

This segment is provided when a chemical result is transmitted.

SEQ	ELEMENT NAME	Local application/ implementation
1	Substance Identifier	CLINITEK Novus 10 CLINITEK Novus PRO 12
2	Substance Status	OK
12	Expiration Date/Time	“YYYYMMDDHHMMSS”
16	Manufacturer Lot Number	RG325017

Example:

Example:

```
INV|CLINITEK Novus 10|OK|||20171103015522|||K372087<CR>
```

OBR - Observation request segment

For Sediment results, the Atellica UAS 800 uses only the following fields:

SEQ	ELEMENT NAME	Local application/ implementation
1	Set ID – OBR	1
4	Universal Service ID	UrineSedimentResult

Example:

```
OBR|1|||UrineSedimentResult
```

For Chemistry results, the Atellica UAS 800 uses only the following fields:

SEQ	ELEMENT NAME	Local application/ implementation
1	Set ID – OBR	Record sequence number
2	Placer Order Number	Specimen ID or sequence number. For a patient result this field contains the Specimen ID if available, else it contains the sample sequence number (format x-xxxxx). For a Control result this field contains the sequence number of the control sample. For a calibration result this field contains the sequence number.
4	Universal Service ID – Reagent Type Type	CLINITEK Novus 10 CLINITEK Novus PRO 12
25	Result Status	F for Final results X if there was an error which prevented a result from being reported.

Example:

```
OBR|1|0-00123||CLINITEK Novus PRO 12|||||||F<CR>
```

ORC – Common order

For chemical results, this record type is not used.

For sediment results, the Atellica UAS 800 uses only the following fields:

SEQ	ELEMENT NAME	Local application/ implementation
1	Order Control	RE
3	Filler Order Number	Sample ID
5	Order Status	CM (measurement successful)
10	Entered By	user name (at measure start)
11	Verified By	user name (at validation)

Example:

```
ORC|RE||8218||CM||||test|Automatic validated<CR>
```

NTE - notes and comments segment

The Atellica UAS 800 uses only the following fields:

SEQ	ELEMENT NAME	Local application/ implementation
1	Set ID - NTE	Comment sequence
3	Comment	Comment text
4	Comment Type	Sediment result comment <ul style="list-style-type: none"> • Result statuses (Low sample volume, To confirm, Review, Dilution factor etc.): RE • QC lot data: RE • User entered comment or QC result text: Empty (not used) Chemical result comment <ul style="list-style-type: none"> • User entered comment added on Atellica UAS 800: Empty (not used) • User entered analyte note: Empty (not used) • User entered comment added on CLINITEK Novus: RE

Example (2 notes if the dilution factor does not equal 1):

```
NTE|1||Sed comm in user sw<CR>
```

```
NTE|2||Dilution factor2.5|RE<CR>
```

Example (2 notes if result status is “Review”):

```
NTE|1||This is a comment<CR>
```

```
NTE|2||Review|RE<CR>
```

Example (Image path sending as comment when Image transfer enabled):

```
NTE|2||\E\\E\RemoteServer\E\privat\E\210225_15_16_50_022515165010|RE<CR>
```

TCD – Test Code detail segment

This record type is used only for Chemical results:

SEQ	ELEMENT NAME	Local application/ implementation
1	Universal Service Identifier	Acronym/Name

Example:

TCD | LEU

QPD – Query Parameter Definition segment

This record type is sent by the UAS 800 and received from the Data Manager as part of the Host Query transaction.

SEQ	ELEMENT NAME	Local application/ implementation
1	Message Query Name	Host query message: WOS^Work Order Step Host query response: WOS^Work Order Step^IHELAW
2	Query Tag	Host query message: IHELAW Host query response: blank
3	User Parameter 1	Host query message: blank Host query response: Specimen ID of sample
4	User Parameter 2	Host query message: specimen ID of sample requesting test order

Example:

QPD|WOS^Work Order Step|IHELAW||01416

RPC – Response Control Parameter segment

This record type is sent by the UAS 800 as part of the Host Query message sent to a Data Manager.

SEQ	ELEMENT NAME	Local application/ implementation
1	Query Priority	Always I (Immediate)
2	Quantity Limited Request	Always RD (Records)

Example:

RCP|I|RD

MSA – Message Acknowledgement segment

This record type is provided to the UAS 800 as part of the Host Query Response message.

SEQ	ELEMENT NAME	Local application/ implementation
1	Acknowledgement Code	Always sent AA to UAS 800

Example:

MSA|AA

QAK – Query Acknowledgement segment

This record type is provided to the UAS 800 as part of the Host Query Response message

SEQ	ELEMENT NAME	Local application/ implementation
1	Query Tag	Always "LaboratoryOrderQuery"
2	Query Response Status	OK – Data found, run the sample NF – No data found, skip the sample

Example of Positive Response (run the sample):

QAK|LaboratoryOrderQuery|OK

Example of Negative Response (skip the sample):

QAK|LaboratoryOrderQuery|NF

OBX - Observation/Result Segment

The Atellica UAS 800 uses only the following fields:

SEQ	ELEMENT NAME	Local application/ implementation
1	Set ID – OBX	Sequence number, starting with 1
2	Value Type	“ST”
3	Observation Identifier	Sediment results: LOINC number(value)^ Description^ LN Chemical results: Acronym/Name
4	Observation Sub-ID	Parameter sequence number For Chemistry calibration this element is empty (not used).
5	Observation Value	Result value For Chemistry calibration, this element contains either the LOT name or the LOT expiration time or the calibration result text. For Chemistry control, this element contains either the LOT name, the lot level, or the LOT expiration time.
6	Units	Result unit For Chemistry calibration this element is empty (not used).
8	Interpretation Codes	N: Normal A: Abnormal For Chemistry calibration this element is empty (not used).
11	Observation Result Status	“F”
16	Responsible Observer	For Chemistry results: The ID of the operator from Novus if it was given, otherwise empty.
18	Equipment Instance Identifier	Serial number
19	Date/Time of the Observation	Measurement DateTime YYYYMMDDHHMMSS

Example Sediment QC result:

```
OBX|3|ST|51487-7^WBC^LN|2|<3|p|u|l||N|||F| |||||H100016|20171030162552<CR>
OBX|4|ST|53316-6^WBC^LN|2|In Range||N|||F| |||||H100016|20171030162552<CR>
```

Example Sediment QC result- Failed:

```
OBX|1|ST|798-9^RBC^LN|1|<4|p|u|l||A|||F| |||||H100016|20171030162611<CR>
OBX|2|ST|53292-9^RBC^LN|1|Failed||A|||F| |||||H100016|20171030162611<CR>
```

Example Chemistry result:

OBX|2|ST|BIL|2|Moderate||N||F||||user1||S001802|20170904123813<CR>

LOINC (Logical Observation Identifier Names and Codes) Terminology for Particles

LOINC provides a universal standard for identifying medical laboratory observations, which helps facilitate the exchange of healthcare records information.

The following table provides LOINC terminology for particles:

Test Name	Test Code	Results	LOINC#
Red Blood Cells	RBC	category	53292-9
		p/HPF	46419-8
		p/uL	798-9
	.RBCi	category	53968-4
		p/HPF	-
		p/uL	-
	.RBCd	category	58444-1
		p/HPF	-
		p/uL	33666-9
	.RBC-G1	category	53973-4
		p/HPF	-
		p/uL	-
	.RBC-oth	category	-
		p/HPF	-
		p/uL	-
White Blood Cells	WBC	category	53316-6
		p/HPF	46702-7
		p/uL	51487-7
	.WBCc	category	53317-4
		p/HPF	50233-6
Squamous Epithelial Cells	EPI	p/uL	33768-3
		category	53318-2
		p/HPF	33219-7
Unclassified	UNC	p/uL	51486-9
		category	-
		p/HPF	-
Non Squamous Epithelial Cells	NEC	p/uL	-
		category	50225-2
		p/HPF	53294-5
	.s-TRA	p/uL	51485-1
		category	53272-1
		p/HPF	33220-5
	.d-TRA	p/uL	53275-4
		category	53272-1
		p/HPF	33220-5
	.REN	p/uL	53275-4
		category	53271-3

		p/HPF	33221-3
		p/uL	53274-7

Test Name	Test Code	Results	LOINC#
Lipids	LIP	category	-
		p/HPF	5800-8
		p/uL	-
	.REN-L	category	50228-6
		p/HPF	53354-7
		p/uL	53352-1
	.LDR	category	-
		p/HPF	-
		p/uL	-
	.CHOL	category	50223-7
		p/HPF	55367-7
		p/uL	-
Hyaline casts	HYA	category	50231-0
		p/HPF	33223-9
		p/uL	51484-4
Pathological casts	PAT	category	72224-9
		p/HPF	-
		p/uL	-
	.C-HGR	category	50230-2
		p/HPF	33341-9
		p/uL	53282-0
	.C-GRA	category	50230-2
		p/HPF	33341-9
		p/uL	53282-0
	.C-NEC	category	50224-5
		p/HPF	53291-1
		p/uL	53287-9
	.C-RBC	category	53278-8
		p/HPF	33229-6
		p/uL	53285-3
	.C-WBC	category	53279-6
		p/HPF	33228-8
		p/uL	53286-1
	.C-CRY	category	-
		p/HPF	-
		p/uL	-
	.C-MIC	category	33784-0
		p/HPF	53128-5
		p/uL	-
	.C-FAT	category	50229-4
		p/HPF	33231-2
		p/uL	53288-7
	.C-WAX	category	41190-0
		p/HPF	33230-4
		p/uL	41868-1

Test Name	Test Code	Results	LOINC#
	.C-MIX	category	50234-4
		p/HPF	53289-5
		p/uL	53283-8
Crystals	CRY	category	53334-9
		p/HPF	53307-5
		p/uL	53297-8
	.CaOx	category	33234-6
		p/HPF	53306-7
		p/uL	53296-0
	.CaOxm	category	-
		p/HPF	-
		p/uL	-
	.CaOxd	category	38993-2
		p/HPF	-
		p/uL	-
	.TRI	category	33238-7
		p/HPF	53308-3
		p/uL	53298-6
	.URI	category	-
		p/HPF	-
		p/uL	-
	.CapH	category	33235-3
		p/HPF	53309-1
		p/uL	53299-4
	.U-AMO	category	50239-3
		p/HPF	32150-5
		p/uL	13657-2
	.P-AMO	category	50236-9
		p/HPF	55378-4
		p/uL	13656-4
	.CYS	category	33240-3
		p/HPF	53313-3
		p/uL	53303-4
	.LEU	category	50232-8
		p/HPF	53310-9
		p/uL	53300-0
	.TYR	category	50238-5
		p/HPF	53314-1
		p/uL	53304-2
	.ATY	category	53329-9
		p/HPF	53332-3
		p/uL	53331-5
Yeast	YEA	category	72223-1
		p/HPF	78742-4
		p/uL	51481-0

Test Name	Test Code	Results	LOINC#
Bacteria	BAC	category	50221-1
		p/HPF	33218-9
		p/uL	51480-2
	.BACr	category	-
		p/HPF	-
		p/uL	-
	.BACc	category	-
		p/HPF	-
		p/uL	-
Mucus	MUC	category	53321-6
		p/HPF	50235-1
		p/uL	51478-6
Spermatozoa	SPRM	category	33232-0
		p/HPF	53324-0
		p/uL	51479-4
Trichomonas	TRV	category	50237-7
		p/HPF	53357-0
		p/uL	53355-4
Parasites	SCH	category	-
		p/HPF	33017-5
		p/uL	-
Artifacts	ART	category	42578-5
		p/HPF	-
		p/uL	-

Note: For CLINITEK Novus test codes, refer to the “Tables of Results” section in Appendix D of the *CLINITEK Novus Operator’s Guide*.

6 Definitions and Acronyms

Term	Definition
LIS	Laboratory Information System
Host	In this document, it refers to the laboratory information system. It communicates with the Atellica UAS 800 and with other network elements.
LAN	Local Area Network
RS-232	Serial connection standard EIA RS-232
USB	Universal Serial Bus
Ethernet	IEEE 802.3 standard connection
Atellica UAS 800	Urine analyzer refers to the laboratory analyzer. It communicates with the HOST.
Message	A series of records of the same type.
Record	One line of transmission closed with [CR][LF].
Field	This is the sub-element of the record separated by field separator character.
Component	This is the sub-element of the field separated by the component separator character.