VersaCell™

VersaCell™ System

LIS Interface Guide

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Origin: US

Siemens Healthcare Diagnostics Inc.
Flanders, NJ 07836-9657 USA

EC REP Siemens Healthcare Diagnostics Ltd.
Sir William Siemens Sq.
Frimley, Camberley, UK GU16 8QD

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System Interface Policy

The VersaCell™ system can be interfaced with many LIS hardware and software configurations. To ensure a smooth, successful interface with your LIS, follow the policy outlined below. Every LIS interface is unique because individual laboratories have different needs, requirements, and hardware. Therefore, the LIS interface must be customized for each lab by the laboratory's software department or a software development vendor.

Siemens Healthcare Diagnostics is responsible for providing LIS communication software on the VersaCell system that performs according to standards specified in ASTM E1394 and ASTM E1381, and according to the Siemens LIS communications specifications. Siemens is also responsible for proper hardware functionality (serial port functionality) of the PC supplied with the VersaCell system. Siemens supplies the LIS communications specifications to the MIS director and the LIS developer. Siemens is not responsible for cabling errors, software or hardware errors on intermediary systems, or for software and hardware errors on the LIS.

A Siemens Field Service Engineer can be present on the day the laboratory launches the VersaCell system and LIS interface at no charge to the customer. On that day, the lab director, the MIS director and the VersaCell system must be available to facilitate the process. Siemens recommends that a representative of the LIS developer be on-site the day the interface is launched. The laboratory and the LIS developer must make the decision to have a representative present.

If a problem is encountered, the Siemens Field Service Engineer will attempt to identify the cause and find a solution. With all parties available when the interface is launched, problems can be solved in a timely manner. If a problem is encountered that is not caused by Siemens and requires several days to repair, the Siemens service representative will depart only after demonstrating the proper operation of the VersaCell system portion of the LIS interface via diagnostic tools. If the problem is suspected to have been caused by the VersaCell system at a later date, a Siemens Field Service Engineer will further evaluate the problem. If the Siemens Field Service Engineer determines that the cause of this subsequent visit is a defect in the Siemens software or hardware, the problem will be corrected under the VersaCell system warranty or service contract as applicable. If the instrument is no longer under warranty and a service contract is not in effect, the visit will be billed at the prevailing rates. If the problem is not the result of Siemens equipment or software, as in the case of cabling problems, the service call will be billed at prevailing rates regardless of VersaCell system warranty or service contract.

For the duration of the initial testing and validation process, the status of the VersaCell system should be considered under evaluation. The validation process is performed by the laboratory and the LIS developer and typically lasts one to two weeks. During the validation period, any problems can be identified and corrected. In extreme cases, it may be necessary to disable the LIS feature until a problem has been corrected.

During the validation period, it is the responsibility of the lab director to ensure that LIS communications are used in a manner consistent with normal laboratory operations. All results sent to the LIS must be verified on the LIS by comparing results and patient information to the VersaCell system result printout. Any problems must be reported to Siemens and all other affected parties. Upon successful completion of the validation process, the system is upgraded to on-line status. When the system is online, the requirement to verify results on the LIS should conform to the operating procedures of the lab.

Supported Instruments

This document describes the VersaCell system interface to an LIS system. The VersaCell system connects to the following instruments:

- IMMULITE® 2000 system, IMMULITE 2500 system, and IMMULITE 2000 XPi system. In this document, the term IMMULITE 2000/2500/2000 XPi refers to these 3 systems.
- ADVIA Centaur® system, and ADVIA Centaur XP system. In this document, the term ADVIA Centaur systems refers to these 2 systems.
- ADVIA® 1800 Chemistry system
- Dimension® RxL Max® and EXL™ integrated chemistry, immunochemistry instruments. In this document Dimension RxL / EXL refers to these 2 instruments.
- T60 instrument

LIS Overview

A Laboratory Information System (LIS) is software that receives, processes, and stores information generated by laboratory processes. This system connects to instruments, and other information systems such as the VersaCell system, a robotic sample-moving device that uses a robotic arm to load and retrieve samples.

The three primary functions of an LIS system are test ordering, result management and reporting, and billing. An LIS is composed of software applications customized for each laboratory's current policies and standard operating procedures. The laboratory provides the information used to build the necessary tables and definitions.

An LIS has modular components, allowing a laboratory to select the appropriate modules. There are basic test ordering and billing modules, and modules designed for specific lab disciplines, such as microbiology, blood banking, and genetics testing. Some vendors offer all components; others specialize in specific modules.

NOTE: An LIS and a Laboratory Information Management System (LIMS) perform similar functions. The term LIMS describes systems targeted toward environmental research or commercial analysis (pharmaceutical or petrochemical); the term LIS describes systems targeted toward the clinical market (hospitals and other clinical labs).

LIS Communication Protocols

The VersaCell system interface uses the following bi-directional communications:

- Bi-directional mode. This mode provides bi-directional data transfer between the LIS and the VersaCell system. In this mode, the LIS generates a worklist and sends it to the VersaCell system. After processing completes, the VersaCell system receives results from an instrument, sends results to the LIS. The VersaCell system does not query the LIS for orders in this mode.
- Bi-directional query mode. In this mode, the VersaCell system sends a query to the LIS requesting a worklist for a sample. The LIS then sends test orders to the VersaCell system, which processes samples and uploads results to the LIS.

  You can place samples on the instrument or on the VersaCell system. When the instrument or VersaCell system scans the sample, the VersaCell system sends a request for orders for each scanned sample.

  In bi-directional query mode, the VersaCell system can also accept a downloaded worklist as it does in bi-directional mode.
- ASTM Handshaking. The VersaCell system is configured to communicate with LIS systems via a standard ASTM Handshaking protocol. This protocol requires all data transactions to include a query (to send) and an acknowledgement (to receive).
- The VersaCell system interface is based on the ASTM E1394-97 and E1381-95 standards. It does not support intermediate frames as described in section 6.3.1 of ASTM E1381-95. If a sample contains a large number of tests for download, we recommended transmitting the tests using multiple order records rather than intermediate frames. The VersaCell system can accept message frames up to 2048 bytes in length as an alternative to using intermediate frames.

  NOTE: If a Dimension system is attached to the VersaCell system, order information from the LIS must be in Standard ASCII only. Result information may contain Extended ASCII characters due to manual samples or orders entered on the attached instruments.

Basic LIS Terms

Term	Description
ENQ (Enquiry)	First character sent in a transaction. Initiates a communication session.
STX (Start of Text)	Indicates start of text for a message.
ETX (End of Text)	Indicates end of text for a message.
EOT (End Transmit)	Indicates the sender completed sending and is entering idle mode. Terminates a communication session.
ACK (Acknowledge)	Response to sender that the message was properly received.
NAK (Negative Acknowledge)	Response to sender that message was not properly received.
Record	Also known as a message. Contains all information for an item (for example, an order or a patient record).
Field	An item within a record, for example, a Patient Name in a patient message.
Pipe Sign (|)	A vertical bar separating fields in a record.
Caret (^)	A symbol that subdivides a field in a record into component fields.
Frame Number	The first character sent in a message. The value increments by 1 every message until number 7, when it resets to 0. The header message (the first message sent) always begins with 1.
Sequence Number	Number defining a message type. Each message type has its own sequence number. The number increments by 1 after each record is sent. A record sent of a higher hierarchy (see message hierarchy) resets this value to 1.
Checksum	Calculation performed on each message to ensure the receiver properly receives all characters.
Header Message (H message)	First message sent in any transaction. Contains system information, including sender ID, receiver ID, or address. Always uses frame number of 1.
Patient Message (P message)	Contains patient information, patient ID, name.
Order Message (O message)	Defines the test, such as TSH or HCG, that the instrument performs on the sample for a particular accession number.
Result Message (R message)	Contains test results and additional information such as Test Code and the units in which the results are delivered.

Term	Description
Comment Message (C Message)	Contains custom additional information about the patient, order, or result.
Query Message (Q message)	A request sent to the LIS for patient information and test orders. Contains the sample tube accession number.
Terminator Message (L message)	Last message sent in a transaction. Contains termination codes.
Sender ID	Identifies the system sending a message (for example, VersaCell system or LIS). The LIS software company defines this data.
Receiver ID	Identifies the system receiving a message (for example, VersaCell system or LIS). The LIS software company defines this data.
Password	A password defined by the LIS software company.

Message Hierarchy Examples

Basic Message Hierarchy (Lower number has higher priority)

Priority	Message
1	Header
2	Patient
3	Order
4	Result

Hierarchy Example: LIS to VersaCell System Transfer

```
<ENQ>
Header
   Patient 1
      Order 1
   Patient 2
      Order 1
      Order 2
      Order 3
   Patient 3
      Order 1
Terminator
<EOT>
```

Hierarchy Example: VersaCell System to LIS Transfer

```
<ENQ>
Header
   Patient 1
      Order 1
         Result 1
   Patient 2
      Order 1
         Result 1
   Patient 2
      Order 2
         Result 1
   Patient 2
      Order 3
         Result 1
   Patient 3
      Order 1
         Result 1
Terminator
<EOT>
```

Hierarchy Example: VersaCell System to LIS Transfer (IMMULITE 2000/2500/2000 XPi Systems Allergy)

```
<ENQ>
Header
   Patient 1
      Order 1
         Result 1
         Result 2
   Patient 2
      Order 1
         Result 1
         Result 2
   Patient 3
      Order 1
         Result 1
         Result 2
Terminator
<EOT>
```

Hierarchy Example: VersaCell System to LIS Transfer (ADVIA 1800 Chemistry System Result)

```
<ENQ>
Header
   Patient 1
      Order 1
         Result 1
            Comment 1 (when 1 flag associated with a
            result)
            Comment 2 (when 2 flags associated with a
            result)
            Comment 3 (when 3 flags associated with a
            result)
   Patient 2
      Order 1
         Result 1
            Comment 1 (when 1 flag associated with a
            result)
            Comment 2 (when 2 flags associated with a
            result)
            Comment 3 (when 3 flags associated with a
            result)
Terminator
<EOT>
```

Hierarchy Example: VersaCell System to LIS Transfer (ADVIA Centaur Systems Result)

NOTE: Results for ADVIA Centaur systems can include 3, 4, or 5 result aspects, depending on the assay.

```
<ENQ>
Header
   Patient 1
      Order
         Result Aspect 1
            Comment 1
            Comment n
         Result Aspect 2
            Comment
            Comment n
         Result Aspect 3
            Comment
            Comment n
   Patient 1
      Order
         Result Aspect 1
         Result Aspect 2
         Result Aspect 3
   Patient 2
      Patient 2 Comment 1
      Patient 2 Comment 2
      Patient 2 Comment 3
      Order
         Result Aspect 1
         Result Aspect 2
         Result Aspect 3
Terminator
<EOT>
```

Hierarchy Example: VersaCell System to LIS Transfer (Dimension RxL/EXL Systems Result)

```
<ENQ>
Header
   Patient 1
      Order 1
         Result 1
            Comment 1 (when a result error code is
            associated with a result)
   Patient 1
      Order 2
          Result 1
   Patient 2
      Order 1
         Result 1
            Comment 1 (when a result error code is
            associated with a result)
Terminator
<EOT>
```

Hierarchy Example: Query to LIS

```
<ENQ>
Header
   Query
Terminator
<EOT>
```

Hierarchy Example: LIS Response to Query

```
<ENQ>
Header
   Patient 1
      Order 1
      Order 2
      Order 3
Terminator
<EOT>
```

Message Definitions

NOTE: The VersaCell system does not support all fields shown in this section.

Basic Format of a Message

```
[Start of Text <STX>][Frame Number][Message Type]
[Message][Carriage Return <CR>][End of Text <ETX>][CHECKSUM]
[Carriage Return <CR>][Line Feed <LF>]
```

Header Message

```
[Record Type (H)] [Delimiter Def.] [Message Control ID] [Password]
[Sending systems company name] [Sending Systems address]
[Reserved] [Senders Phone#] [Communication parameters]
[Receiver ID] [Comments/special instructions] [Processing ID]
[Version#] [Message Date + Time]
```

Example

```
<STX>1H|\^&||PASSWORD|Siemens||Flanders^New^Jersey^07836||973-927-
2828|N81|Your System||P|1|19940407120613<CR><ETX>51 <CR><LF>
```

Patient Message

```
[Record Type (P)][Sequence #][Practice Assigned Patient
ID][Laboratory Assigned Patient ID][Patient ID][Patient
Name][Mother's Maiden Name][BirthDate][Patient Sex][Patient
Race][Patient Address][Reserved][Patient Phone #][Attending
Physician ID][Special Field 1][Special Field 2][Patient
Height][Patient Weight][Patients Known or Suspected Diagnosis]
[Patient active medications][Patients Diet][Practice Field
#1][Practice Field #2][Admission and Discharge Dates][Admission
Status][Location][Nature of Alternative Diagnostic Code and
Classification][Alternative Diagnostic Code and
Classification][Patient Religion][Marital Status][Isolation
Status][Language][Hospital Service][Hospital Institution][Dosage
Category]
```

Example

```
2P|1|101|||Riker^Al||19611102|F|||||Bashere<CR><ETX>[2ACheckSum]
<CR><LF>
```

Patient Comment Message (ADVIA Centaur Systems)

```
[Record Type][Sequence Number][Comment Source][Comment Text]
[Comment Type]
```

Use the following structural rules for the Patient Comment Message:

Field	Definition
1 Record type	C
2 Sequence Number	Equal to n^{th} occurrence of a patient comment record within the current outgoing message. ADVIA Centaur systems accept or transmit up to 3 patient comments.
3 Comment Source	Empty
4: Comment Text	Contains 2 component fields
	4.1 Comment Code: Outgoing: always empty. Incoming 0-120 characters
	4.2 Comment Text: Outgoing: 1-120 characters.
5: Comment Type	Outgoing & Incoming: always G

Example

```
C|1||SPECIMEN HEMOLYZED|G
```

Order Message

```
[Record Type (O)][Sequence#][Specimen ID (Accession#)][Instrument
Specimen ID][Universal Test ID][Priority][Order
Date/Time][Collection Date/Time][Collection End Time][Collection
Volume][Collector ID][Action Code][Danger Code][Relevant Clinical
Info][Date/Time Specimen Received][Specimen Descriptor,Specimen
Type,Specimen Source][Ordering Physician][Physician's Telephone
Number][User Field No.1][User Field No.2][Lab Field No.1][Lab
Field No.2][Date/Time results reported or last
modified][Instrument Charge to Computer System][Instrument Section
ID][Report Types][Reserved Field][Location or ward of Specimen
Collection][Nosocomial Infection Flag][Specimen Service][Specimen
Institution]
```

Example

```
3O|1|1550623||^^^LH|R|19931011091233|19931011091233<CR><ETX>6C<CR>
<LF>
```

Result Message

```
[Record Type (R)][Sequence #][Universal Test ID][Data
(result)][Units][ReferenceRanges] [Result abnormal flags][Nature
of Abnormality Testing][Result Status][Date of change in
instruments normal values or units][Operator ID][Date\Time Test
Started][Date\Time Test Completed][Instrument ID]
```

Example

```
4R|1|^^^LH|8.2|mIU/mL|.7\.7^400\400|N|N|F||test|19931011091233|199
31011091233|A0021<CR><ETX>[checksum]<CR><LF>
```

Result Comment Message

Result Comment Message (ADVIA 1800 Chemistry System)

```
[Record Type][Sequence Number][Comment Source][Comment Text]
[Comment Type]
```

Use the following structural rules for the Result Comment Message:

For …	Use …
Record type	C
Comment source	I (for Instrument, per ASTM standard)
Comment text	Individual flag
Comment type for the 1800	I (for Instrument, per ASTM standard)

Example

The following is an example of a result comment message with a rerun flag (R):

```
C|1|I|R|I
```

Result Comment Message (ADVIA Centaur Systems)

```
[Record Type][Sequence Number][Comment Source][Comment Text]
[Comment Type]
```

Use the following structural rules for the Result Comment Message:

Field	Definition
1: Record type	C
2: Sequence Number	Equal to n^{th} occurrence of a result comment record within the current outgoing message. Range 1 to 65535.
3: Comment Source	I for result flags, blank for operator-entered comments.
4: Comment Text	Contains 2 component fields. 4.1 Comment Code: 0-60 characters. Instrument generated comments or flags. 4.2 Comment Text: 0-120 characters. Operator entered comments.
5: Comment Type	'I' for result flags, 'G' for operator-entered comments.

Examples

```
C|1|I|Above Check|I
C|1||RSLT_USR_CMNT^OPERATOR COMMENT 1|G
```

Result Comment Message (Dimension RxL/EXL Systems)

```
[Record Type][Sequence Number][Comment Source][Comment Text]
[Comment Type]
```

Use the following structural rules for the Result Comment Message:

Field	Definition
1: Record type	C
2: Sequence Number	Equal to n^{th} occurrence of a result comment record within the current outgoing message. Range 1 to 65535.
3: Comment Source	I (instrument)
4: Comment Text	Contains a result error code as defined in *Dimension Clinical Chemistry Interface Specification*
5: Comment Type	I (instrument flag)

Examples

```
C|1|I|3|I
```

Message Terminator

```
[Record Type ID (L)][Sequence Number][Termination Code]
```

Example

```
5L|1|N<CR><ETX>[CheckSum]<CR><LF>
3L|1<CR><ETX>[CheckSum]<CR><LF>
```

Request Information (Query) Message

```
[Record Type ID (Q)][Sequence #][Starting Range][Ending
Range][Test ID][Request Time Limits][Beginning request results
date and time][Ending request results date and time][Physician
name][Physician Phone Number][User Field 1]User Field 2][Status
Codes]
```

Example

```
2Q|1|^1234ABC||ALL||||||||O<CR><ETX>[CheckSum]<CR><LF>
```

VersaCell System Control Samples

This section provides information on ordering tests for control samples from the LIS. Ordering for controls is supported for the IMMULITE 2000/2500/XPi systems. Control samples for these instruments may be placed either physically on the VersaCell system or front-loaded manually on the instrument.

Transmitting control results is supported for all connected analyzers. The VersaCell system transmission of control results utilizes some supported fields from the patient and order records to transmit information such as control lot, name, level, and expiration date when this information is provided by the instrument. These fields therefore have different meaning depending on whether the VersaCell system is transmitting a patient or control result. Fields utilized in this mapping include P3 (Patient ID), P6 (Patient Name), P8 (Birthdate), and O17: Physician Name.

More information on control handling is also summarized in section VersaCell System and Instrument LIS Interface Comparisons

Instrument	Control Location	Orders From LIS	Results to LIS
IMMULITE 2000/2500/XPi	VersaCell system or instrument	Supported	Supported
Dimension RxL/EXL	Instrument only	Not Supported	Supported
ADVIA 1800 Chemistry	Instrument only	Not Supported	Supported
ADVIA Centaur	Instrument only	Not Supported	Supported

IMMULITE 2000/2500/XPi Systems Controls

The VersaCell system supports IMMULITE 2000/2500/XPi systems control samples that are physically loaded on the VersaCell system or front-loaded on the instrument. The IMMULITE 2000/2500.XPi systems support standard Siemens barcoded controls (sample ID beginning with ~C) as well as custom controls defined with any sample ID accepted for the instrument. Controls must be defined on the instrument prior to downloading orders from the LIS.

The VersaCell system does not require Control name, lot, level, and expiration date in the LIS order. The instrument retrieves this information from the instrument's control definition. Control name, lot, level, and expiration date are uploaded with the control result. See section VersaCell System and Instrument LIS Interface Comparisons for instrument-specific mapping of this information.

NOTE: With the exception of frame numbers, transmission control characters (STX, checksum, etc) and message acknowledgements are not shown in these examples.

The following is an example of a control order for the IMMULITE 2000/2500/XPi systems:

1H|\^&||||Randolph^New^Jersey^07869||(201)927-2828|8N1|||P|1|20100427115200

2P|1|~ccon6 0222011015|||~ccon6^0222011015|||||||

3O|1|~CCON6 0222011015||^^^HCG\^^^TU||||||||||

4L|1|N

The following is an example of a result transmission for a control sample from the IMMULITE 2000/2500/XPi systems:

1H|\^&||||111 Canfield Ave^Randolph^NJ^07869||(201)927-2828|N81|||P|1|20100427200211

2P|1|022|||CON6||201101||||||4

3O|1|~CCON6 0222011014||^^^HCG|R|||||||||Normal|4|||||||C0239|

4R|1|^^^HCG|12.7|mIU/mL|12.3\1.00^17.7\5000|N|N|F|||20100427143113|20100427150810|C0239

5L|1

Dimension RxL/EXL Systems Controls

The VersaCell system supports transmitting Dimension RxL/EXL systems control results to the LIS. XQC results are not distinguished from QC results. See section VersaCell System and Instrument LIS Interface Comparisons for instrument-specific mapping of this information.

NOTE: With the exception of frame numbers, transmission control characters (STX, checksum, etc) and message acknowledgements are not shown in these examples.

The following is an example of a transmission of a control result with an error from the Dimension RxL/EXL systems:

1H|\^&||||111 Canfield Ave^Randolph^NJ^07869||(201)927-2828|N81|||P|1|20100430143528

2P|1|stm001||||||||||1

3O|1|stm001||^^^GLUC|R||||||Q||||6|1|||||||ID A|

4R|1|^^^GLUC|-1|mg/dL||*|N|F||||20100501101532|ID A

5C|1|I|3|I

6L|1

ADVIA 1800 Chemistry System Controls

The VersaCell system does not support receiving LIS orders for controls on ADVIA 1800 Chemistry systems. Controls must be manually ordered and manually front loaded on the instrument. The VersaCell system supports transmitting ADVIA 1800 Chemistry system control results to the LIS. See section VersaCell System and Instrument LIS Interface Comparisons for instrument-specific mapping of this information.

The following is an example for an ADVIA 1800 Chemistry system control result transmission with action code transmission enabled. Field 12 of the order message contains an action code of Q, indicating a control result.

NOTE: With the exception of frame numbers, transmission control characters (STX, checksum, etc) and message acknowledgements are not shown in these examples.

```
1H|\^&||||111 Canfield Ave^Randolph^NJ^07869||(201)927-
2828|N81|||P|1|20090115080032
2P|1|QC2|||197290/20091231||||||||
3O|1|PB007||^^^TP^^NEAT|||20090113||||Q||||1|||||||||ADVIA 1800|
4R|1|^^^TP^^NEAT|0.3||||N|R||||20090114145656|ADVIA 1800
5L|1
```

ADVIA Centaur System Controls

The VersaCell system does not support receiving LIS orders for controls on ADVIA Centaur systems. Controls must be manually ordered and manually front loaded on the instrument. The VersaCell system supports transmitting ADVIA Centaur system control results to the LIS. See *VersaCell System and Instrument LIS Interface Comparisons* on page 56 for instrument-specific mapping of this information.

The following is an example of a VersaCell system transmission of an ADVIA Centaur XP system Control result with action code transmission enabled.

NOTE: With the exception of frame numbers, transmission control characters (STX, checksum, etc) and message acknowledgements are not shown in these examples.

```
1H|\^&||||111 Canfield Ave^Randolph^NJ^07869||(201)927-
2828|N81|||P|1|20090105160549
2P|1|512192|||cPSA2||||||||
3O|1|K0512192||^^^PSA|R||||||Q|||||||||||||CENTAUR XP|F
4R|1|^^^PSA^^^1^DOSE|14.527|ng/mL||||R||||20090105155616
|CENTAUR XP
5C|1|I|Out|I
6R|2|^^^PSA^^^1^COFF|1.00|ng/mL||||R||||20090105155616|CENTAUR XP
7C|1|I|Out|I
0R|3|^^^PSA^^^1^RLU|421772|||||R||||20090105155616|CENTAUR XP
1C|1|I|Out|I
```

0L|1

VersaCell System Result Transmissions

This section provides result transmission examples for the instruments supported by the VersaCell system.

IMPORTANT: The VersaCell system transmits results to the LIS in the same order that it receives results from instruments. This does not guarantee that test results are transmitted in the order in which they were completed unless the instruments connected to the VersaCell system transmit in that order.

Bi-Directional Transfer Example (VersaCell System to LIS)

NOTE: With the exception of frame numbers, transmission control characters (for example STX, checksum) and message acknowledgements are not shown in this example.

```
1H|\^&||PASSWORD|SenderID|Randolph^New^Jersey^07869||(201)927-
2828|8N1|ReceiverID||P|1|19950522092817
2P|1|119813;TGH|||Last 1^First 1||19801102|F|||||
3O|1|130000445||^^^TT4|||19950118085700
4R|1|^^^TT4|10.3|ug/dL|4.5\.4^12.5\24|N|N|F||test|19950119084508|1
9950119092826|A0021
5O|2|130000445||^^^TU|||19950118085700
6R|1|^^^TU|26.6|Percnt|23\10^35\70|N|N|F||test|19950119084508|1995
0119092756|A0021
7P|2|325031;AH|||Last 2^First 2|||F|||||
0O|1|130000617||^^^FER|||19950118103000
1R|1|^^^FER|173.|ng/mL|.5\.5^1500\1500|N|N|F||test|19950119084641|
19950119092858|A0021
2P|3|326829;AH|||Last 3^First 3|||F|||||
3O|1|130000722||^^^FER|||19950118102000
4R|1|^^^FER|490.|ng/mL|.5\.5^1500\1500|N|N|F||test|19950119084741|
19950119092928|A0021
5P|4|124462;TGH|||Last 4^First 4|||F|||||
6O|1|130000724||^^^E2|||19950118122000
7R|1|^^^E2|25.3|pg/mL|12\12^2000\2000|N|N|F||test|19950119084815|1
9950119100049|A0021
0O|2|130000724||^^^FSH|||19950118122000
1R|1|^^^FSH|60.6|mIU/mL|.1\.1^170\170|N|N|F||test|19950119084815|1
9950119093030|A0021
2O|3|130000724||^^^LH|||19950118122000
3R|1|^^^LH|24.4|mIU/mL|.7\.7^400\400|N|N|F||test|19950119084815|19
950119093101|A0021
4P|5|556395;AH|||Last 5^First 5|||M|||||
5O|1|130000741||^^^FER|||19950118115500
6R|1|^^^FER|238.|ng/mL|.5\.5^1500\1500|N|N|F||test|19950119084949|
19950119093132|A0021
7P|6|556357;MB|||Last 6^First 6|||M|||||
```

```
0O|1|130000790||^^^IGE|||19950118120000
1R|1|^^^IGE|517.|IU/mL|.01\.01^600\600|N|N|F||test|19950119085018|
19950119093202|A0021
2P|7|141053;TGH|||Last 7^First 7|||F|||||
3O|1|130000805||^^^FER|||19950118120000
4R|1|^^^FER|21.0|ng/mL|.5\.5^1500\1500|N|N|F||test|19950119085049|
19950119093233|A0021
5P|8|320439;TGH|||Last 8^First 8|||F|||||
6O|1|130000890||^^^FER|||19950118130000
7R|1|^^^FER|12.9|ng/mL|.5\.5^1500\1500|N|N|F||test|19950119085254|
19950119093609|A0021
0P|9||||Last 9^First 9|||||||
1O|1|130000911||^^^E2
2R|1|^^^E2|71.3|pg/mL|12\12^2000\2000|N|N|F||test|19950119085423|1
9950119100800|A0021
3P|10|358069;TGH|||Last 10^First 10|||F|||||
4O|1|130000929||^^^FER|||19950118123000
5R|1|^^^FER|219.|ng/mL|.5\.5^1500\1500|N|N|F||test|19950119085628|
19950119093843|A0021
6L|1
```

VersaCell System Result Transmission (IMMULITE 2000/2500/2000 XPi Systems)

NOTE: With the exception of frame numbers, transmission control characters (STX, checksum, etc) and message acknowledgements are not shown in these examples.

The following is an example of VersaCell system transmission of IMMULITE 2000 system patient result with dilution transmission enabled.

```
1H|\^&||||111 Canfield Ave^Randolph^NJ^07869||(201)927-
2828|N81|||P|1|20081230123216
2P|1|12345|||Doe||19681004|F|||||N10136Doc
3O|1|00012||^^^HCG^5|||||||||Normal||||||||||IMM2000|
4R|1|^^^HCG^5|401|mIU/mL|1.00\1.00^5000\5000|N|N|F|||2008123011572
9|20081230123339|IMM2000
5L|1
```

The following is an example of a VersaCell system transmission of an IMMULITE 2500 system control result with action code transmission enabled.

```
1H|\^&||||111 Canfield Ave^Randolph^NJ^07869||(201)927-
2828|N81|||P|1|20090109163457
2P|1|021|||CON9||200903 31||||||4
3O|1|12345||^^^RHC|R||||||Q||||Normal|4|||||||IMMULITE 2500|
4R|1|^^^RHC|1.04|mIU/mL|8.44\1.00^12.2\5000|N|N|F|||20090109162046
|20090109163525|IMMULITE 2500
5L|1
```

VersaCell System Result Transmission (ADVIA 1800 Chemistry System)

NOTE: Note: With the exception of frame numbers, transmission control characters (STX, checksum, etc) and message acknowledgements are not shown in these examples.

The following is an example of a patient result transmission for a flagged ADVIA 1800 Chemistry system result to the LIS host. The result value is 10.3 with three flags:

- H – judgment flag
- U – photometric flag
- R – rerun flag

One comment message is generated for each flag to be sent. Since there is at least one comment message in the transmission, the Result record field 7 contains an asterisk (*).

```
1H|\^&||PASSWORD|SenderID|Randolph^New^Jersey^07869| |(201)927-
2828|8N1|ReceiverID||P|1|19950522092817
2P|1|119813TGH|||Last 1^First 1|||F|||||
3O|1|130000445||^^^TT4|||19950118085700
4R|1|^^^TT4|10.3|||*|N|F||||19950119092826|SenderID
5C|1|I|H|I
6C|2|I|U|I
7C|3|I|R|I
0L|1
```

The following example shows the patient result transmission with the VersaCell System configured to transmit dilution

```
1H|\^&||PASSWORD|SenderID|Randolph^New^Jersey^07869| |(201)927-
2828|8N1|ReceiverID||P|1|19950522092817
2P|1|119813TGH|||Last 1^First 1|||F|||||
3O|1|130000445||^^^TT4^^NEAT|||19950118085700
4R|1|^^^TT4^^NEAT|10.3|||*|N|F||||19950119092826|SenderID
5C|1|I|H|I
6C|2|I|U|I
7C|3|I|R|I
0L|1
```

VersaCell System Result Transmission (ADVIA Centaur XP System)

NOTE: With the exception of frame numbers, transmission control characters (STX, checksum, etc) and message acknowledgements are not shown in these examples.

The following is an example of a VersaCell system transmission of an ADVIA Centaur XP system patient result, including multiple result aspects, patient comments, and flags transmitted in result comments.

```
1H|\^&||||111 Canfield Ave^Randolph^NJ^07869||(201)927-
2828|N81|||P|1|20081217180713
2P|1|222|||Smith|||U|||||
3C|1||^Patient Comment 1|G
4C|2||^Patient Comment 2|G
5C|3||^Patient Comment 3|G
6O|1|12345||^^^DIG|R||||||||||||||||||CENTAUR XP|F
7R|1|^^^DIG^^^1^DOSE|0.00|ng/mL||||F||||20081217180242|CENTAUR XP
0C|1|I|Waived|I
1R|2|^^^DIG^^^1^COFF|1.00|ng/mL||||F||||20081217180242|CENTAUR XP
2C|1|I|Waived|I
3R|3|^^^DIG^^^1^RLU|318406|||||F||||20081217180242|CENTAUR XP
4C|1|I|Waived|I
5L|1
```

The following is an example of a VersaCell system transmission of an ADVIA Centaur XP system patient result with dilution transmission enabled.

```
1H|\^&||||111 Canfield Ave^Randolph^NJ^07869||(201)927-
2828|N81|||P|1|20090115141840
2P|1|||||||U|||||
3O|1|10000021||^^^TSH3^2^dilute only|R||||||||||||||||
|CENTAUR XP|F
4R|1|^^^TSH3^2^dilute only^1^DOSE|0.019|uIU/mL||||F|||
|20081212121557|CENTAUR XP
5C|1|I|Waived|I
6C|2|I|Diluted|I
7R|2|^^^TSH3^2^dilute only^1^COFF|1.000|uIU/mL|||
|F||||20081212121557|CENTAUR XP
0C|1|I|Waived|I
1C|2|I|Diluted|I
2R|3|^^^TSH3^2^dilute only^1^RLU|2058||||
|F||||20081212121557|CENTAUR XP
3C|1|I|Waived|I
4C|2|I|Diluted|I
5L|1
```

VersaCell System Result Transmission (Dimension RxL/EXL Systems)

NOTE: If a Dimension system is attached to the VersaCell system, order information from the LIS must be in Standard ASCII only. Result information may contain Extended ASCII characters due to manual samples or orders entered on the attached instruments.

NOTE: With the exception of frame numbers, transmission control characters (STX, checksum, etc) and message acknowledgements are not shown in these examples.

The following is an example of a VersaCell system transmission of a Dimension RxL/EXL system patient result.

1H|\^&||||111 Canfield Ave^Randolph^NJ^07869||(201)927-2828|N81|||P|1|20100430152535

2P|1|00100011|||Smith^John|||||||

3O|1|100011||^^^ALP|R|||||||||1|||||||||ID A|

4R|1|^^^ALP||||*|N|F||||20100501094033|ID A

5C|1|I|16|I

6P|2|00100011|||Smith^John|||||||

7O|1|100011||^^^ALB|R|||||||||1|||||||||ID A|

0R|1|^^^ALB|12.5|g/dL|||N|F||||20100501093023|ID A

1L|1

Host Query

The VersaCell system supports querying the LIS for orders for a sample when it is introduced either in a VersaCell system drawer or front-loaded in a rack on the instrument.

When a query has been transmitted by the VersaCell system to the LIS, the LIS has up to 15 seconds to initiate the response to the query. If a response is not initiated within 15 seconds, the VersaCell system considers the query to be closed. No cancellation message is transmitted by the VersaCell system. If the query was closed unsuccessfully, the VersaCell system may retry the query at a later time.

Once a query has been initiated, a response received by the VersaCell system from the LIS that was initiated within the 15 second window is considered to be a response to that query. The LIS should therefore always respond to the outstanding query before downloading any orders for other samples.

Host Query Example

The following is an example of a Query to LIS for orders.

```
1H|\^&||PASSWORD|Siemens||Randolph^New^Jersey^07869||(201)927-
2828|N81|Your System||P|1|19940407120613
51
2Q|1|^123ABC||ALL||||||||O
76
3L|1
3C
```

VersaCell System Bi-directional LIS Specification ASTM E1394

Header Record Definition (7.1–7.1.14)

```
[Record Type (H)] [Delimiter Def.] [Message Control ID] [Password]
[Sending systems company name] [Sending Systems address]
[Reserved] [Senders Phone#] [Communication parameters] [Receiver
ID] [Comments/special instructions] [Processing ID] [Version#]
[Message Date + Time]
```

Header Message Example

```
<STX>[FrameNumber]H|\^&||Password|Siemens|
Randolph^New^Jersey^07869||(201)927-2828|
8N1|YourSystem||P|1|19940323082858<CR><ETX>[CheckSum]<CR><LF>
```

Section	Field Name	Letter/ Symbol	Definition	Value
7.1.1	Record Types	H	Header record	Required
7.1.2	Delimiter	¦	Field Delimiter	Required
		\	Repeat Delimiter	Required
		^	Component Delimiter	Required
		&	Escape Delimiter	Defined, not supported
7.1.3	Message Control ID			Not supported
7.1.4	Access Password			Required. Configure to match LIS. This can include leaving the field blank. (10 char max)
7.1.5	Sender Name or ID			Required. Configure to match LIS. This can include leaving the field blank. (10 char max)
7.1.6	Sender Street Address			Supported
7.1.7	Reserved Field			Not supported
7.1.8	Senders Telephone Number			Supported
7.1.9	Characteristics of Sender			Supported 8 bits No Parity 1 Stop Bit

Section	Field Name	Letter/ Symbol	Definition	Value
7.1.10	Receiver ID			Required. Configure to match LIS. This can include leaving the field blank. (10 char max)
7.1.11	Comments/Special Instructions			Not supported
7.1.12	Processing ID	P	“Normal" production/running message	Supported
		T	Training message	Not supported
		D	Debugging, used to debug a program(s)	Not supported
		Q	Message is for QC/regulatory purpose	Not supported
7.1.13	Version Number			Supported
7.1.14	Date+Time of Message			Supported (YYYYMMDDHHMMSS)

Patient Information Record Definition (8.1–8.1.35)

```
[Record Type (P)][Sequence #][Practice Assigned Patient
ID][Laboratory Assigned Patient ID][Patient ID][Patient
Name][Mother's Maiden Name][BirthDate][Patient Sex][Patient
Race][Patient Address][Reserved][Patient Phone #][Attending
Physician ID][Special Field 1][Special Field 2][Patient
Height][Patient Weight][Patients Known or Suspected Diagnosis]
[Patient active medications][Patients Diet][Practice Field
#1][Practice Field #2][Admission and Discharge Dates][Admission
Status][Location][Nature of Alternative Diagnostic Code and
Classification][Alternative Diagnostic Code and
Classification][Patient Religion][Marital Status][Isolation
Status][Language][Hospital Service][Hospital Institution][Dosage
Category]
```

Patient Information Message Example

```
<STX>[FrameNumber]P|1|101|||Riker^Al||19611102|F|||||Bashere<CR>
<ETX>[CheckSum]<CR><LF>
```

Section	Field Name	Letter/ Symbol	Definition	Value
8.1.1	Record Types	P	Patient Identity record	Required
8.1.2	Sequence #			Required
8.1.3	Practice Assigned Patient ID			Required (20 char max) **NOTE:** This field contains the QC lot number for IMMULITE 2000/2500/XPi and ADVIA Centaur systems control results. Refer to the Control Handling sections for each instrument in *VersaCell System and Instrument LIS Interface Comparisons* on page 56.
8.1.4	Laboratory Assigned Patient ID			Not supported
8.1.5	Patient ID-			Not supported

Section	Field Name	Letter/ Symbol	Definition	Value
8.1.6	Patient Name			Supported Last^First^Initial (Total 30 char max) • Patient names starting with ~C are recognized as IMMULITE 2000/2500/2000 XPI systems control samples. • Patient names starting with ~A are reserved for adjustors and are not supported. • Patient names starting with ~V are reserved for calibration verifiers and are not supported. **NOTE:** ADVIA Centaur systems interpret embedded spaces in patient names as component field delimiters. Therefore, an uploaded result from an ADVIA Centaur system can include additional component field delimiters (^) that replace the original embedded spaces. **NOTE:** This field contains the QC lot number for ADVIA 1800 Chemistry system control results. Refer to the Control Handling section for the instrument in *VersaCell System and Instrument LIS Interface Comparisons.*

Section	Field Name	Letter/ Symbol	Definition	Value
8.1.7	Mother's Maiden Name		Patient Identity record	Not supported
8.1.8	Birthdate			Supported (YYYYMMDD; 8 char max)
8.1.9	Patient's Sex			Supported (M, F, U; 1 char max)
8.1.10	Patient Race-Ethnic Origin			Not supported
8.1.11	Patient's Address			Not supported
8.1.12	Reserved Field			Not supported
8.1.13	Patient's Phone #			Not supported
8.1.14	Attending Physician ID			Supported (Upload only) With results, VersaCell system uploads any value received in field 9.14.17 of the order message (physician name). Any value downloaded in this field is ignored. (30 char max)
8.1.15	Special Field 1			Not supported
8.1.16	Special Field 2			Not supported
8.1.17	Patient Height			Not supported
8.1.18	Patient Weight			Not supported
8.1.19	Known or Suspected Diagnosis			Not supported
8.1.20	Active Medications			Not supported
8.1.21	Patient's Diet			Not supported

Section	Field Name	Letter/ Symbol	Definition	Value
8.1.22	Practice Field 1			Not supported
8.1.23	Practice Field 2			Not supported
8.1.24	Admission and Discharge Dates			Not supported
8.1.25	Admission Status			Not supported
8.1.26	Location			Not supported
8.1.27	Nature of Alt. Diag. Code			Not supported
8.1.28	Diag. Code and Classifications			Not supported
8.1.29	Patient Religion			Not supported
8.1.30	Marital Status			Not supported
8.1.31	Isolation Status			Not supported
8.1.32	Language			Not supported
8.1.33	Hospital Service			Not supported
8.1.34	Hospital Institution			Not supported
8.1.35	Dosage Category			Not supported

Order Record Definition (9.4.1–9.4.31)

```
[Record Type (O)][Sequence#][Specimen ID (Accession#)][Instrument
Specimen ID][Universal Test ID][Priority][Order
Date/Time][Collection Date/Time][Collection End Time][Collection
Volume][Collector ID][Action Code][Danger Code][Relevant Clinical
Info][Date/Time Specimen Received][Specimen Descriptor,Specimen
Type,Specimen Source][Ordering Physician][Physician's Telephone
Number][User Field No.1][User Field No.2][Lab Field No.1][Lab
Field No.2][Date/Time results reported or last
modified][Instrument Charge to Computer System][Instrument Section
ID][Report Types][Reserved Field][Location or ward of Specimen
Collection][Nosocomial Infection Flag][Specimen Service][Specimen
Institution]
```

Test Order Message Example

```
<STX>[FrameNumber]O|1|1550623||^^^LH|R|19931011091233|199310110912
33|||||2<CR><ETX>[CheckSum]<CR><LF>
```

Section	Field Name	Letter/ Symbol	Definition	Value
9.4.1	Record types	O	Test order record	Required
9.4.2	Sequence #			Required
9.4.3	Specimen ID			Required (20 char max) • Sample IDs starting with ~C are recognized as IMMULITE 2000/2500/2000 XPI control samples. • Sample IDs starting with ~A are reserved for adjustors and are not supported. • Sample IDs starting with ~V are reserved for calibration verifiers and are not supported.
9.4.4	Instrument Specimen ID			Not supported
9.4.5	Universal Test ID			Required
6.6.1.1	Test ID			Not supported
6.6.1.2	Test ID Name			Not supported
6.6.1.3	Test ID Type			Not supported

Section	Field Name	Letter/ Symbol	Definition	Value
6.6.1.4	Manufacturer Test Code			Required (30 char max)
	Online Dilution			Supported. Integer values
	Dilution Protocol			Supported (20 char max)
	Example			
	Order for TSH		^^^TSH	
	Order for multiple TSH tests		^^^TSH\^^^TSH	
	Order for TSH with ten-fold dilution		^^^TSH^10	
	Order for multiple TSH tests with dilutions		^^^TSH^10\^^^TSH^40	
	Order for a panel of tests called PANEL1		^^^PANEL1	
	Order for allergy		^^^ SPE D120	
	Order for ADVIA Centaur systems dilution		^^^TSH^5^dilute only	
	Order for ADVIA 1800 dilution		^^^chol^^UP	
9.4.6	Priority	S	Stat	Supported (1 char max)
		A	As soon as possible	Supported
		R	Routine	Supported
		C	Callback	Not supported
		P	Preoperative	Not supported
9.4.7	Requested/Ordered Date and Time			Supported YYYYMMDDHHMMSS; (14 char max)
9.4.8	Specimen Collection Date and Time			Supported YYYYMMDDHHMMSS, (14 char max)
9.4.9	Collection End Time			Not supported
9.4.10	Collection Volume			Not supported
9.4.11	Collector ID			Not supported

Section	Field Name	Letter/ Symbol	Definition	Value
9.4.12	Action Code	Q	QC sample	Supported (Upload only) (1 or more repetitions of 1 character) For a complete list of Action Code return values, refer to the appropriate interface comparison section for a list of values for that instrument.
9.4.13	Danger Code			Not supported
9.4.14	Relevant Clinical Information			Not supported. Clinical information is not supported, but you can configure VersaCell system to accept specimen type in this field instead of field 9.4.16.
9.4.15	Date/Time Specimen Received			Not supported
9.4.16	Specimen Descriptor	1	Serum	Supported (20 char max) Required for systems that include a Dimension RxL/EXL systems or ADVIA 1800 chemistry system. VersaCell systems that include a T60 use the existing specimen type mapping defined for the T60 shown in section VersaCell system and T60 comparison.
		2	Urine	
		3	Plasma	
		4	CSF	
		5	Whole Blood	
		6	Other	

Section	Field Name	Letter/ Symbol	Definition	Value
9.4.17	Ordering Physician			Supported Smith^Joseph (30 char max) **NOTE:** This field contains the QC lot level for IMMULITE 2000/2500/XPi systems and Dimension RxL/EXL systems control results. Refer to the Control Handling section for the instrument in *VersaCell System and Instrument LIS Interface Comparisons*. **NOTE:** The level for Dimension/RxL/EXL systems controls is specified as: 1 = QC level 1 2 = QC level 2 3 = QC level 3 4 = QC level 4 5 = QC level 5
9.4.18	Physician's Telephone Number			Not supported
9.4.19	Users Field No. 1			Not supported
9.4.20	Users Field No. 2			Not supported
9.4.21	Lab Field No. 1			Not supported
9.4.22	Lab Field No. 2			Not supported
9.4.23	Date/Time Results Reported			Not supported
9.4.24	Instrument Charge to Computer Sys			Not supported
9.4.25	Instrument Section ID			Supported (Upload only) (20 char max)

Section	Field Name	Letter/ Symbol	Definition	Value
9.4.26	Report Types			Supported (Upload only) 1 or more repetitions of 1 character
9.4.27	Reserved Field			Not supported
9.4.28	Location of Specimen Collection			Not supported
9.4.29	Nosococmial Infection Flag			Not supported
9.4.30	Specimen Service			Not supported
9.4.31	Specimen Institution			Not supported

Result Record Definition (10.1-10.1.14)

```
[Record Type (R)][Sequence #][Universal Test ID][Data
(result)][Units][ReferenceRanges] [Result abnormal flags][Nature
of Abnormality Testing][Result Status][Date of change in
instruments normal values or units][Operator ID][Date\Time Test
Started][Date\Time Test Completed][Instrument ID]
```

Result Message Example

```
<STX>[FrameNumber]R|1|^^^LH|8.2|mIU/mL|.7\.7^400\400|N|N|F|||19931
011091233|19931011091233|Siemens<CR><ETX>
[CheckSum]<CR><LF>
```

Section	Field Name	Letter/ Symbol	Definition	Value
10.1.1	Record Types	R	Result Record	Required
10.1.2	Sequence #			Required
10.1.3	Universal Test ID			Required
6.6.1.1	Test ID			Not supported
6.6.1.2	Test ID Name			Not supported
6.6.1.3	Test ID Type			Not supported
6.6.1.4	Manufacturer Test Code			Required (30 char max)
	Online Dilution			Supported. Integer values
	Dilution Protocol			Supported (20 char max)
	Replicate Number			Supported (2 char max)
	Result Aspect			Supported (4 char max)
10.1.4	Data or Measurement Value (Result)			Required (20 char max) **NOTE:** This field can contain non-numeric data or symbols indicating out of range conditions.
10.1.5	Units			Supported (10 char max) Refer to individual instrument documentation.
10.1.6	Reference Ranges			Supported (80 char max)

Section	Field Name	Letter/ Symbol	Definition	Value
10.1.7	Result Abnormal Flags			Supported (0 or more repetitions of 1 character)
		L	Below Normal	Supported
		H	Above Normal	Supported
		LL	Below Panic	Not supported
		HH	Above Panic	Not supported
		<	Below readable limit	Required
		>	Above readable limit	Required
		N	Normal	Supported
		A	Abnormal	Not supported
		U	Significant change UP	Not supported
		D	Significant change DOWN	Not supported
		B	Better	Not supported
		*	Custom flags exist	Supported - indicates that result flag comments containing custom error information are provided. Applicable for ADVIA 1800 chemistry systems and Dimension RxL/EXL systems only.
		W	Worse	Not supported
10.1.8	Nature of Abnormality Testing			Supported (1 char max)
		A	Age population tested	Not supported
		S	Sex based Population	Not supported
		R	Race based Population	Not supported
		N	Normal generic range	Supported
10.1.9	Results Status			Supported (1 char max)

Section	Field Name	Letter/ Symbol	Definition	Value
		C	Correction of previously sent results	Not supported
		P	Preliminary Results	Not supported
		F	Final Results	Supported
		X	Results cannot be done	Not supported
		I	In instrument, results pending	Not supported
		S	Partial Results	Not supported
		M	Result is a MIC level	Not supported
		R	This result was previously transmitted	Supported
		N	This result record contains necessary information to run a new order	Not supported
10.1.10	Date systems values/units changed			Not supported
10.1.11	Operator Name/ID#			Not supported
10.1.12	Date+Time Test Started			Supported YYYYMMDDHHMMSS
10.1.13	Date+Time Test Completed			Supported YYYYMMDDHHMMSS
10.1.14	Instrument ID			Supported. Configurable from VersaCell system software (20 char max)

Request Information Record Definition (Host Query) (12.1–12.1.13)

```
[Record Type ID (Q)][Sequence #][Starting Range][Ending
Range][Test ID][Request Time Limits][Beginning request results
date and time][Ending request results date and time][Physician
name][Physician Phone Number][User Field 1]User Field 2][Status
Codes]
```

Request Message Example

```
<STX>[FrameNumber]Q|1|^1234ABC||ALL||||||||O<CR><ETX>[CheckSum]
<CR><LF>
```

Section	Field Name	Letter/ Symbol	Definition	Value
12.1.1	Record Types	Q	Request information Record	Required (Upload only)
12.1.2	Sequence Number			Supported
12.1.3	Starting Range ID Number			Required
12.1.4	Ending Range ID Number			Not supported
12.1.5	Universal Test ID			Required
12.1.6	Request Time Limits			Not supported
12.1.7	Beginning Request Results			Not supported
12.1.8	Ending Request Results			Not supported
12.1.9	Physician Name			Not supported
12.1.10	Physician Phone #			Not supported
12.1.11	User field #1			Not supported
12.1.12	User field #2			Not supported
12.1.13	Request information status codes	C	Correction of previous results	Not supported
		P	Preliminary Results	Not supported
		F	Final Results	Not supported
		X	Results cannot be done, cancel	Not supported
		I	Request Results Pending	Not supported

Section	Field Name	Letter/ Symbol	Definition	Value
		S	Request partial results	Not supported
		M	Result is a MIC level	Not supported
		R	Result previously transmitted	Not supported
		A	Abort/cancel last request	Required
		N	Requesting new results only	Not supported
		O	Requesting orders and demographics	Required
		D	Requesting demographics only	Not supported

Message Terminator Record Definition (13.1–13.1.3)

`[Record Type ID (L)][Sequence Number][Termination Code]`

Termination Message Example

`<STX>[FrameNumber]L|1|N<CR><ETX>[CheckSum]<CR><LF>`

Section	Definition	Letter/ Symbol	Type	Status
13.1.1	Record Types	L	Terminator record	Supported
13.1.2	Sequence #			Required
13.1.3	Termination Code	N	Normal termination	Supported
		T	Sender Aborted	Not supported
		R	Receiver Abort	Not supported
		E	Unknown system error	Not supported
		Q	Error in last request for information	Required with query
		I	No information available in last query	Required with query
		F	Last request for information processed	Required with query

VersaCell System Features

Qualitative Test Results

Qualitative tests result as a qualitative interpretation for Reactive, Non-Reactive or Indeterminate, or as a semi-quantitative ratio (patient CPS/Cutoff CPS), and, depending on the capability of the instrument, can be sent to the LIS via the VersaCell system as a qualitative interpretation, as a ratio, or as both.

The following is an example of a qualitative interpretation for and IMMULITE 2000/2500/2000 XPi result sent to the LIS:

Result	Sent to LIS as Qualitative
Non-reactive	0.0
Reactive	1.00
Indeterminate	2.00

See assay package inserts for interpretation of qualitative assay ratio results.

VersaCell System LIS Configurations

Perform the following steps to configure the VersaCell system:

2. At the VersaCell system, select **Configurations**>**System Configurations**.
3. Select the **LIS** button.

Figure 1. VersaCell System LIS Configuration Screen

4. At the LIS Configuration screen, in the LIS Mode area, select the appropriate LIS Query Mode.

   NOTE: The re-query settings for patient samples are available as long as you select Bi-Directional Query. The Re-Query LIS – Controls settings are available only if you select both Bi-Directional Query and Query Controls.

5. At the LIS Comm Configurations area, perform the following steps:
   a. At the Receiver ID field, enter the ID supplied by the LIS vendor.
   b. At the Sender ID field, enter the ID supplied by the LIS vendor.
   c. At the Password field, enter the password supplied by the LIS vendor.
   d. At the Baud Rate field, enter the baud rate supplied by the LIS vendor.
   e. At the COM Parameters field, enter **N81**.
   f. At the Serial Port field, enter **10**.

      This is the typical setting.
6. In the LIS Query area, perform the following steps:
   a. If you selected Bi-Directional Query mode, and want the VersaCell system to query for control samples, select the **Query Controls** checkbox.
   b. If you selected the Query Controls checkbox, at the Re-Query LIS – Controls field, select 1 of the following options from the drop-down menu:

      NOTE: If you do not select the **Query Controls** checkbox, the Re-Query LIS – Controls field is not available. In this case, skip to step 6.c.

      - No Re-Query: if an accession number is found in the VersaCell system database (pending or completed tests), the accession number is not re-queried to an LIS.
      - Re-Query New Orders: Accession numbers are always re-queried and duplicate test orders are not run if that test has not yet resulted.
      - Re-Query No Duplicates: Accession numbers are always re-queried and duplicate test orders are not run regardless of the result status.
      - Re-Query All: Accession numbers are always re-queried and duplicate test orders are run.
   c. If you selected Bi-Directional Query mode, at the Re-Query LIS – Patients field, select 1 of the following options from the drop-down menu:
      - No Re-Query: If an accession number is found in the VersaCell system database (pending or completed tests), the accession number is not re-queried to an LIS.
      - Re-Query New Orders: Accession numbers are always re-queried and duplicate test orders are not run if that test has not yet resulted
      - Re-Query No Duplicates: Accession numbers are always re-queried and duplicate test orders are not run, regardless of the result status.
      - Re-Query All: Accession numbers are always re-queried and duplicate test orders are run

7. At the LIS Settings area, perform the following steps, as appropriate:
   a. Select **Auto Send Patient Results** to automatically send all results for patient samples to the LIS
   b. Select **Auto Send Control Results** to automatically send all results for control samples to the LIS.
   c. Select **Auto Clear Controls Without Sending** to cause control results received on VersaCell system to be automatically cleared from the VersaCell screens without sending to the LIS.

      NOTE: You cannot select this setting if you selected Auto Send Control Results. Use this setting if there is no need to send control results to the LIS, and all control review is done on the instrument rather than on the VersaCell system or LIS.
   d. Select **Hide Sent** to choose whether the default behavior hides results on the LIS screen after results are sent to the LIS.
   e. Verify that the Diagnostics checkbox is selected.

   This option should be selected at all times.
8. At the LIS Results Settings area, perform the following steps, as appropriate:
   a. Always select **Send Commented Results**.

      IMPORTANT: This option should be selected. Many instruments use custom comment messages in the result transmission to provide information about the result. If this option is not selected, the VersaCell system does not transmit any results to the LIS that include result comments.
   b. Select **Send Dilution** to control whether online dilution and dilution protocol information are transmitted with results to the LIS.
   c. Select **Send Action Code/Report Type** to control whether action code and report type fields are transmitted with results.

      You can use the Action Code fields to identify control result transmissions because this field contains the letter ‘Q’ for quality control results.
   d. Select **Send Patient Comments** to transmit patient comment messages with results for analyzers that support patient comments.

      If you do not select this option, results are transmitted without the patient comments.
9. Select **Save**.

   The system prompts you to log off. Most changes take effect only after you restart the software.

IMMULITE 2000/2500/2000 XPi Systems Configurations

Perform the following steps to configure the IMMULITE 2000/2500/2000 XPi systems:

1. At the IMMULITE 2000/2500/2000 XPi systems, select **Configurations**>**Configure**.
2. Select the **LIS** button.

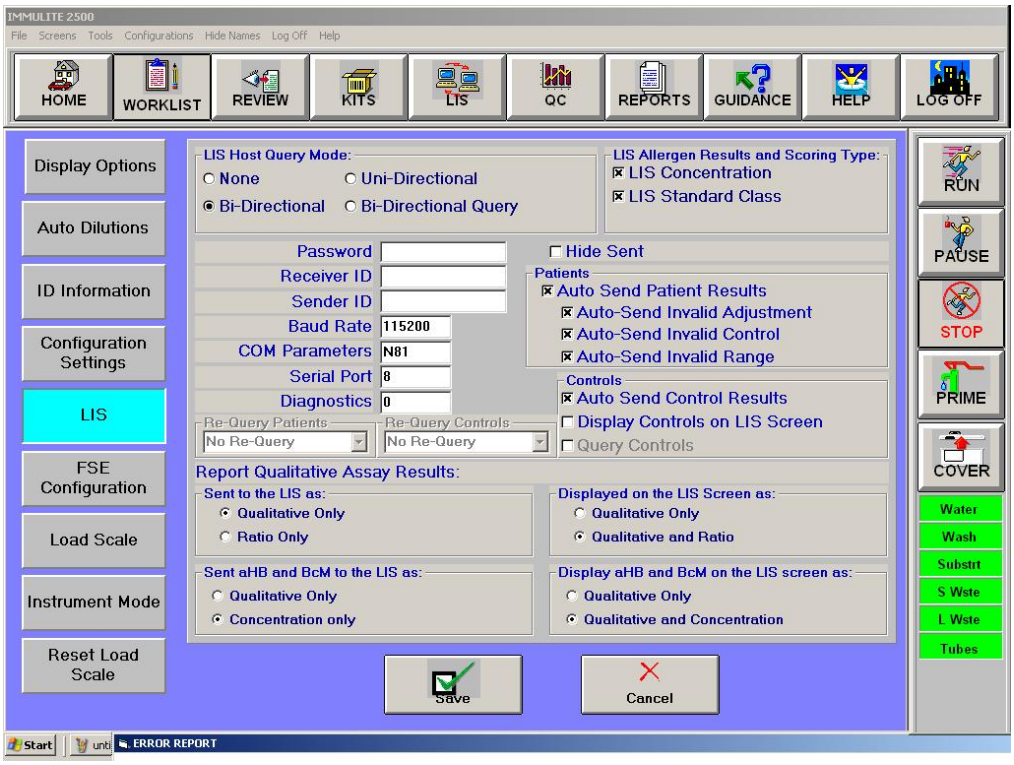

Figure 2. IMMULITE 2000/2500/2000 XPi Systems LIS Configuration Screen

3. At the LIS screen, in the LIS Host Query Mode area, select **Bi-Directional**.

   This configuration does not use the Password, Receiver ID, and Sender ID fields.
4. At the Baud Rate field, enter **115200**.
5. At the COM Parameters field, enter **N81**.
6. At the Serial Port field, enter **8**.

   This is the typical setting.

7. At the Diagnostics field, enter **0**.

   This indicates that a log of the transmission between the instrument and the VersaCell system is not active. To activate the log for troubleshooting purposes, set this value to 1.

8. Select **Hide Sent** to choose whether the default behavior hides results on the IMMULITE system LIS screen after results are sent to the VersaCell system.

9. At the Patients area, select the following fields:

   a. Select **Auto Send Patient Results**.

      Always select this option when the one of the IMMULITE 2000/2500/2000 XPi systems is in a VersaCell system configuration.

   b. Select **Auto-Send Invalid Adjustment** to automatically send patient results flagged ADJ.

   c. Select **Auto-Send Invalid Control Results** to automatically send patient results flagged as having invalid controls based on the configured single or multi-rules in the QC/Data Entry screen.

   d. Select **Auto-Send Invalid Range** to automatically send patient results that are outside the calibration range.

      NOTE: If you de-select the Auto-Send Invalid Adjustment, Auto-Send Invalid Control Results, and Auto-Send Invalid Range checkboxes, affected results are sent to VersaCell system, but the VersaCell system does not autosend them to the LIS.

10. At the Controls area, select **Auto Send Control Results**.

    Always select this option when the one of thte IMMULITE 2000/2500/2000 XPi systems is in a VersaCell system configuration.

    NOTE: The Query Controls, Re-Query Patients, and Re-Query Control options are not applicable. These settings are configured on the VersaCell system.

11. At the Report Qualitative Assay Results area, perform the following steps:
    a. At the Sent to the LIS as: area, select 1 of the following options:
       - **Qualitative Only** directs the instrument to send a qualitative interpretation to the LIS.
       - **Ratio Only** sends results as a ratio (Patient cps/cutoff cps)

       Refer to *Qualitative Test Results* for additional information.
    b. At the Display on the LIS Screen as: area, select 1 of the following options:
       - **Qualitative Only** displays results on the IMMULITE system and the VersaCell system LIS screen as Reactive, Non-React, Indeterm.
       - **Qualitative and Ratio** displays results on the IMMULITE system and the VersaCell system LIS screen as numerical ratio plus NR, R or I.
    c. At the Sent aHB and BcM to the LIS as: area, select 1 of the following options to control how results are sent to the VersaCell system and LIS:
       - **Qualitative Only** directs the instrument to send a qualitative interpretation to the LIS.
       - **Concentration** directs the instrument to send the numerical concentration to the LIS.

       Refer to *Qualitative Test Results* for additional information.
    d. At the Display aHB and BcM on the LIS screen as: area, select 1 of the following options to control how results are displayed on the IMMULITE system LIS screen and on the VersaCell system.
       - **Qualitative only** displays results on the LIS screen as Reactive, Non-React, Indeterm.
       - **Qualitative and Concentration** displays qualitative and numerical concentration.
12. Select **Save**.
13. Respond to the message that prompts you to restart the system.

    Most changes take effect only after you restart the software.

Test Codes

Tests are ordered according to the manufacturer test code. Test codes vary based on the instrument. Refer to the individual instrument operating manual for additional information.

Ordering Dilutions on Tests

- If ^^^HCG^40 is downloaded, the Instrument dilutes HCG assay x40
- You can configure the VersaCell system to transmit the online dilution with the result. ^^^HCG (dilution transmission not configured)) or ^^^HCG^40 (dilution configured). The VersaCell system transmits only online dilution factors with results.
- The VersaCell system does not support manual (offline) dilution factors in orders. Dilution transmitted with results does not include any manual dilution factor that may exist.
- Operators can create test panels on the VersaCell system.
- Panel names can be sent to the VersaCell system. All tests within a panel are run.
- Individual test codes are sent with results. The Panel name is not returned.

VersaCell System and Instrument LIS Interface Comparisons

This section compares the VersaCell system LIS interface to the instrument LIS interface for each instrument supported by the VersaCell system. It highlights differences between the standalone instrument interface and the VersaCell system. In cases where the instrument provides custom information through its LIS interface, this section indicates whether the VersaCell system interface supports that information, and how it is mapped into the VersaCell system ASTM LIS interface definition.

VersaCell System and IMMULITE 2000/2500/2000 XPi Systems Comparison

The following table compares supported ASTM interface fields for the VersaCell system and IMMULITE 2000/2500/2000 XPi systems LIS interfaces.

Field Description	VersaCell System	IMMULITE 2000/2500/2000 XPi Systems	Comments
Case sensitive Specimen ID	No	No	
Case sensitive Test Name	No	No	
		Patient Records	
8.1.1 Record Type	Required	Required	Always letter P.
8.1.2 Sequence Number	Required	Required	
8.1.3: Patient ID	Required (20 char max)	Required (20 char max)	The VersaCell system does not save or process orders if the Patient ID exceeds 20 characters.
8.1.6: Patient Name	Supported (30 char max) Last^First^Initial	Supported (30 char max). Last^First^Initial	
8.1.8 Birthdate	Supported. YYYYMMDD	Supported. YYYYMMDD	
8.1.9 Patient Sex	Supported (1 char max)	Supported (1 char max)	
8.1.14 Physician ID	Upload only (30 char max)	Upload only (30 char max)	
8.1.26 Location	Not supported	Not supported	

Field Description	VersaCell System	IMMULITE 2000/2500/2000 XPi Systems	Comments
		Order Records	
9.4.1 Record Type	Required	Required	Always letter O.
9.4.2 Sequence Number	Required	Required	
9.4.3 Specimen ID (Accession Number)	Supported (20 char max)	Supported (20 char max)	The VersaCell system does not save or process orders if the accession number exceeds 20 characters. **NOTE:** IMMULITE 2000/2500/XPi systems control accession numbers do not need to begin with '~C'. You can also define controls using any allowed characters for a patient accession number. However, the LIS must be able to distinguish that the sample is a control and extract the Control Lot, Name, Level, and Expiration date from the fields described in the Control Handling section of this table.
9.4.5 Test ID			You can also configure the upload of online dilution with results on the VersaCell system. Examples of orders with and without dilution: • ^^^TSH^10\^^^TSH^40 • ^^^HCG You can order multiple tests using a repeat delimiter.
6.6.1.1 Test ID	Not supported	Not supported	
6.6.1.2 Test ID Name	Not supported	Not supported	

Field Description	VersaCell System	IMMULITE 2000/2500/2000 XPi Systems	Comments
6.6.1.3 Test ID Type	Not supported	Not supported	
6.6.1.4 Manufacturer Test Code	Required (30 char max)	Required (10 char max)	
Online Dilution	Supported (integer)	Supported (1, 3, 5, 10, 20, 40, 100)	• The dilution is the online value only: it does not contain any manual (offline) dilution value that might be present. • If the dilution value supplied with the order is not one of the supported online dilution values, the IMMULITE 2000/2500/2000 XPi systems will run the order neat.
Dilution Protocol	Supported (20 char max)	Not supported	Dilution protocol is not present in IMMULITE 2000/2500/2000 XPi systems results. The IMMULITE 2000/2500/2000 XPi systems ignore any value provided with the downloaded order.
9.4.6. Priority	Supported (1 char max) • S- STAT • R-Routine • A- ASAP	Supported (1 char max) • S- STAT • R-Routine	
9.4.7 Requested Order Date and Time	Supported YYYYMMDDHHMMSS	Supported YYYYMMDDHHMMSS	
9.4.8 Specimen Collection Date and Time	Supported YYYYMMDDHHMMSS	Supported YYYYMMDDHHMMSS	

Field Description	VersaCell System	IMMULITE 2000/2500/2000 XPi Systems	Comments
9.4.12 Action Code	Supported (Upload only) (1 or more repetitions of 1 character)	Supported with VersaCell system only, upload only • Q – QC sample • blank – patient sample	• You can configure the Action Code on the VersaCell system for upload with results. The Action Code is ignored for download of orders. • For IMMULITE 2000/2500/2000 XPi connected to a VersaCell system, a Q action code identifies quality control samples. • Patient samples use a blank action code.
9.4.14 Relevant Clinical Behavior	Supported (20 char max)	Supported (20 char max)	Contact Technical Service for configuration assistance: • The VersaCell system interface does not support clinical information. • IMMULITE 2000/2500/2000 XPi systems use this field for specimen type. • You can configure the VersaCell system to support specimen type in Field 14 or Field 16 based on the preference of the LIS provider. The VersaCell system maps the specimen type to the correct IMMULITE 2000/2500/2000 XPi systems field in either case. • IMMULITE 2000/2500/2000 XPi systems default the specimen type value to Normal if not provided.

Field Description	VersaCell System	IMMULITE 2000/2500/2000 XPi Systems	Comments
9.4.16 Specimen Descriptor	Supported (20 char max)	Not supported	Contact Technical Service for configuration assistance • You can configure the VersaCell system to support specimen type in Field 14 or Field 16 based on the preference of the LIS provider. The VersaCell system maps the specimen type to the correct IMMULITE 2000/2500/2000 XPi systems field in either case. • IMMULITE 2000/2500/2000 XPi systems default the specimen type value to Normal if not provided.
9.4.17 Physician Name	Supported (30 char max)	Supported (30 char max)	Physician name also uploads in field 8.1.14 of the order message.
9.4.25 Instrument ID	Supported (20 char max) Upload only	Supported (10 char max) Upload only	You can configure the instrument ID sent for the IMMULITE 2000/2500/2000 XPi systems on the VersaCell system.
9.4.26 Report Type	Supported (Upload only) (1 or more repetitions of 1 character)	Not supported	Because it is not supported by the IMMULITE 2000/2500/2000 XPi, the report type is always blank for IMMULITE 2000/2500/2000 XPi results
Result Records			
10.1.1 Record Type	Required	Required	Always letter R.
10.1.2 Sequence Number	Required	Required	

Field Description	VersaCell System	IMMULITE 2000/2500/2000 XPi Systems	Comments
10.1.3: Test ID			You can also configure the upload of online dilution with results on the VersaCell system. Examples of test field in result upload with and without dilution for IMMULITE 2000/2500/2000 XPi: • ^^^TSH^10 • ^^^HCG
6.6.1.1 Test ID	Not supported	Not supported	
6.6.1.2 Test ID Name	Not supported	Not supported	
6.6.1.3 Test ID Type	Not supported	Not supported	
6.6.1.4 Manufacturer Test Code	Required (30 char max)	Required (10 char max)	
Online Dilution	Supported (integer)	Supported (1, 3, 5, 10, 20, 40, 100)	The dilution is the online value only: it does not contain any manual (offline) dilution value that might be present.
Dilution Protocol	Supported (20 char max)	Not supported	IMMULITE 2000/2500/2000 XPi systems results do not include Dilution protocol.
10.1.4 Data or Measurement Value	Required (20 char max)	Required (20 char max)	
10.1.5 Units	Supported (10 char max)	Required (10 char max)	
10.1.6 Reference Ranges	Supported (80 char max)	Supported (80 char max)	Reference range transmission format for IMMULITE 2000/2500/2000 XPi: • [Low]\[Panic Low]^[High]\Panic High] • 23.0\10.0^35.0\70.0

Field Description	VersaCell System	IMMULITE 2000/2500/2000 XPi Systems	Comments
10.1.7 Result Abnormal Flags	Supported	Supported	Abnormal flags used by IMMULITE 2000/2500/2000 XPi systems: • L = Below Normal • H = Above Normal • < = Below readable limit • > = Above readable limit • N = Normal
10.1.8 Nature of Abnormality Testing	Supported	Supported	The IMMULITE 2000/2500/2000 XPi systems use N (Normal generic range).
10.1.9 Results Status	Supported	Supported	Results status flags supported by the IMMULITE 2000/2500/2000 XPi systems: • F = Final Results • R = Result was previously transmitted.
10.1.12 Date Time Test Started	Supported YYYYMMDDHHMMSS	Supported YYYYMMDDHHMMSS	
10.1.13 Date Time Test Completed	Supported YYYYMMDDHHMMSS	Supported YYYYMMDDHHMMSS	
10.1.14 Instrument ID	Supported (20 char max)	Supported (10 char max)	You can configure the instrument ID sent for the IMMULITE 2000/2500/2000 XPi systems on the VersaCell system.
Control Handling			
Control orders from LIS	Supported	Supported	The VersaCell system can receive control orders from the LIS only for the IMMULITE 2000/2500/2000 XPi systems.
Configurable Control Result Transmission to LIS	Supported	Supported	

Field Description	VersaCell System	IMMULITE 2000/2500/2000 XPi Systems	Comments
Control Name *	Upload in Patient Record Field 6	Upload in Patient Record Field 6	
Control Lot*	Upload in Patient Record Field 3	Upload in Patient Record Field 3	
Control Level*	Upload in Order Record Field 17	Upload in Order Record Field 17	
Control Expiration*	Upload Patient Record Field 8	Upload Patient Record Field 8	

* The VersaCell system maps control information for results from the IMMULITE 2000/2500/2000 XPi systems as specified in these fields. Mapping may differ for other instruments connected to the VersaCell system.

VersaCell System and T60 Comparison

The following table compares supported ASTM interface fields for the VersaCell system and T60 LIS interfaces.

Field Description	VersaCell System	T60	Comments
Case sensitive Specimen ID	No	Yes	
Case sensitive Test Name	No	Yes	
Patient Records			
8.1.1 Record Type	Required	Required	Always letter P.
8.1.2 Sequence Number	Required	Required	
8.1.3 Patient ID	Required (20 char max)	Supported (16 char max)	The VersaCell system does not process orders for the T60 if the patient ID exceeds 16 characters. The T60 defaults to the Patient Name if the Patient ID is not supplied.
8.1.6 Patient Name	Supported (30 char max)	Required (24 char max)	Patient Name is a primary identifier for the T60.
8.1.8 Birthdate	Supported YYYYMMDD	Supported YYYYMMDD	
8.1.9 Patient Sex	Supported (1 char max)	Supported (10 char max)	For Patient Sex, the VersaCell system supports 1 character; the T60 supports 10 characters.
8.1.14 Physician ID	Upload only (30 char max)	Not supported	
8.1.26 Location	Not supported	Supported	The VersaCell system does not support this field. If the T60 or the LIS sends this value, the VersaCell system ignores it.
Order Records			
9.4.1 Record Type	Required	Required	Always letter O.
9.4.2 Sequence Number	Required	Required	

Field Description	VersaCell System	T60	Comments
9.4.3: Accession Number	Supported (20 char max)	Supported (16 char max)	The VersaCell system does not process orders for the T60 if the sample ID exceeds 16 characters
9.4.5: Test ID			You can also configure upload of online dilution with results on the VersaCell system. Examples of orders without dilution: • ^^^TSH\^^^HCG • ^^^HCG You can order multiple tests using a repeat delimiter.
6.6.1.1 Test ID	Not supported	Not supported	
6.6.1.2 Test ID Name	Not supported	Not supported	
6.6.1.3 Test ID Type	Not supported	Not supported	
6.6.1.4 Manufacturer Test Code	Required (30 char max)	Required (30 char max)	
Online Dilution	Supported (integer)	Supported (Upload only)	The T60 ignores online dilution in downloaded orders. The dilution is the online value only: it does not contain any manual (offline) dilution value that might be present.
Dilution Protocol	Supported (20 char max)	Not supported	T60 results do not include dilution protocol. The T60 ignores any value provided with the downloaded order.
9.4.6 Priority	Supported (1 char max) • S- STAT • R-Routine • A-ASAP	Supported (1 char max) • S- STAT • R-Routine • A - ASAP	
9.4.7 Requested Order Date and Time	Supported YYYYMMDDHHMMSS	Not supported	The T60 ignores this value.

Field Description	VersaCell System	T60	Comments
9.4.8 Specimen Collection Date and Time	Supported YYYYMMDDHHMMSS	Supported YYYYMMDDHHMMSS	
9.4.12: Action Code	Supported (Upload only) (1 or more repetitions of 1 character)	Supported C - cancel P - pending specimen X - specimen or test in process Q - QC specimen	The VersaCell system action code defaults to the letter A (Add test requests to existing specimen) for orders sent to the T60. If you configure the VersaCell system to upload the Action Code with results, the T60 provides uploaded value; otherwise, the field is blank.
9.4.14: Relevant Clinical Behavior	Not supported	Supported	Contact Technical Service for configuration assistance: • The T60 supports clinical information and specimen type fields; the VersaCell system supports only the specimen type field.
9.4.16: Specimen Descriptor	Supported	Supported 1 = Serum 2 = Plasma 3 = Urine 4 = CSF 5 = Other	For VersaCell systems that include a T60, the T60's specimen type mapping shown here should be used instead of the VersaCell system definition shown in the Order Record definition section.
9.4.17: Physician Name	Supported (30 char max)	Not supported	The T60 ignores this field.
9.4.25 Instrument ID	Supported (Upload only) (20 char max)	Supported (2 char max)	You can configure the T60 instrument ID on the VersaCell system using up to 20 characters.

Field Description	VersaCell System	T60	Comments
9.4.26 Report Type	Supported (Upload only) (1 or more repetitions of 1 character)	Supported	The VersaCell system report type defaults to the letter O (Order) for orders sent to the T60. If you configure the VersaCell system to upload the report type with results, the T60 provides uploaded value; otherwise, the field is blank.

Field Description	VersaCell System	T60	Comments
		Result Records	
10.1.1 Record Type	Required	Required	Always letter R.
10.1.2 Sequence Number	Required	Required	
10.1.3: Test ID			You can also configure upload of online dilution with results on the VersaCell system. Examples of orders without dilution: • ^^^TSH\^^^HCG • ^^^HCG
6.6.1.1 Test ID	Not supported	Not supported	
6.6.1.2 Test ID Name	Not supported	Not supported	
6.6.1.3 Test ID Type	Not supported	Not supported	
6.6.1.4 Manufacturer Test Code	Required (30 char max)	Required (30 char max)	
Online Dilution	Supported	Supported	The dilution is the online value only: it does not contain any manual (offline) dilution value that might be present.
Dilution Protocol	Supported	Not supported	T60 results do not include dilution protocol.
10.1.4 Data or Measurement Value	Required (20 char max)	Required (8 char max)	
10.1.5 Units	Supported (10 char max)	Required (10 char max)	
10.1.6 Reference Ranges	Supported (80 char max)	Required (6 char max for Low; 6 char max for High)	Reference range transmission for T60: [Low]^[High].

Field Description	VersaCell System	T60	Comments
10.1.7 Result Abnormal Flags	Required	Required	The T60 uses the following Abnormal flags: • L = Below Normal • H = Above Normal • LL = Below Panic Normal • HH = Above Panic Normal • < = Below readable limit • > = Above readable limit • N = Normal
10.1.8 Nature of Abnormality Testing	Supported	Not supported	The VersaCell system defaults this value to N (Normal generic range).
10.1.9 Result Status	Supported	Supported	The T60 supports the following Results status flags: • F = Final Results • R = Result was previously transmitted.

VersaCell System and ADVIA 1800 Chemistry System Comparison

The following table lists the differences in the VersaCell system interface for the ADVIA 1800 Chemistry system. The ADVIA 1800 Chemistry system does not use an ASTM standard interface. The table includes mapping of the ASTM data fields to the ADVIA 1800 Chemistry system.

Field Description	VersaCell System	ADVIA 1800 System	Comments
Case sensitive Specimen ID	No	Yes	
Case sensitive Test Name	No	No	
Patient Records			
8.1.3 Patient ID	Required (20 char max)	Supported (16 char max)	The VersaCell system does not process orders for the ADVIA 1800 Chemistry system if the Patient ID exceeds 16 characters. The patient ID maps to Comment 1 of the ADVIA 1800 Chemistry system.
8.1.6 Patient Name	Supported (30 char max)	Supported (16 char max)	The patient name maps to Comment 2 of the ADVIA 1800 Chemistry system. The VersaCell system truncates patient names that use more than 16 characters before transmitting an order to the ADVIA 1800 Chemistry system.
8.1.8 Birthdate	Supported YYYYMMDD	Supported YYYYMMDD	

Field Description	VersaCell System	ADVIA 1800 System	Comments
8.1.9 Patient Sex	Supported (1 char max)	Supported (1 char max) • M - Male • F - Female	The ADVIA 1800 Chemistry system supports values F and M. (not case sensitive) in the LIS order: • If the value is blank or U (Unknown), the VersaCell system uses the default value M when it processes the order on the ADVIA 1800 Chemistry system. • If the value in the order is anything other than M, F, U, or blank, the VersaCell system does not process the order on the ADVIA 1800 Chemistry system. • The VersaCell system does not read Patient Sex from the ADVIA 1800 Chemistry system result. • The value uploaded to the LIS with the result is the value that was downloaded with the order. • If the order originated on the ADVIA 1800 Chemistry system, the uploaded value is blank.
8.1.14 Physician ID	Supported (Upload only) (30 char max)	Not supported	
8.1.26 Location	Not supported	Not supported	

Field Description	VersaCell System	ADVIA 1800 System	Comments
		Order Records	
9.4.3 Specimen ID	Required (20 char max)	Required (13 char max)	The VersaCell system does not process orders for the ADVIA 1800 Chemistry system if the sample ID exceeds 13 characters.
9.4.5: Test ID			• Dilution upload with result is configurable. Dilution is specified as follows: • ^^^Test Code^Online Dilution Coefficient^Dilution Protocol • Online Dilution Coefficient and Dilution Protocol are optional. Examples: • Order download for D dilution condition on ADVIA 1800 Chemistry system: ^^^ALB^^DOWN • Order download for multiple tests, both tests run as neat (M condition): ^^^ALB^^NEAT\^^^CHOL
6.6.1.1 Test ID	Not supported	Not supported	
6.6.1.2 Test ID Name	Not supported	Not supported	
6.6.1.3 Test ID Type	Not supported	Not supported	
6.6.1.4 Manufacturer Test Code	Required (30 char max)	Required (10 char max)	
Online Dilution	Supported (integer)	Not supported	For the ADVIA 1800 Chemistry system, online dilution coefficient is not applicable (ignored)

Field Description	VersaCell System	ADVIA 1800 System	Comments
Dilution Protocol	Supported (20 char max)	Supported • NEAT • UP • DOWN	Allowed Dilution Protocol values include: • NEAT runs as M condition on the ADVIA 1800 Chemistry system • UP runs as U condition • DOWN runs as D condition • Blank or any other value defaults to NEAT
9.4.6. Priority	Supported (1 char max) • S- STAT • R-Routine • A- ASAP	Supported (1 char max) • S- STAT • R-Routine	Any value other than S is processed as a general (routine) sample on the ADVIA 1800 Chemistry system.
9.4.7 Request Date and Time	Supported YYYYMMDD HHMMSS	Not supported	
9.4.8 Specimen collection date/time	Supported YYYYMMDD HHMMSS	Supported YYYYMMDD	
9.4.12 Action Code	Supported (Upload only) (1 or more repetitions of 1 character)	Supported (Upload only) The ADVIA 1800 Chemistry system uses the following values for registration data: • 0 – New Request • 1 – Test addition/ re-run • 2 – Not used • 3 – Sample deletion • Q – Control sample	The VersaCell system defaults to Registration 1, Test Addition, rerun for orders sent to the ADVIA 1800 Chemistry system. If you configure the VersaCell system to upload the Action Code with results, the ADVIA 1800 Chemistry system provides uploaded value as the registration data/ID specification; otherwise, the field is blank. For control samples, a value of Q is uploaded if you configure the VersaCell system to transmit the action code.

Field Description	VersaCell System	ADVIA 1800 System	Comments
9.4.16 Specimen Descriptor	Supported (20 char max)	Required (1 char max) The ADVIA 1800 Chemistry system supports the following values: • 1 = Serum • 2 = Urine	If a value other than 1 or 2 is supplied, the order is not processed on the ADVIA 1800 Chemistry system.
9.4.17 Physician Name	Supported (30 char max)	Not supported	The ADVIA 1800 Chemistry system ignores this field.
9.4.25 Instrument ID	Upload only (20 char max)	Upload only	You can configure the instrument ID for the ADVIA 1800 Chemistry system on the VersaCell system.

Field Description	VersaCell System	ADVIA 1800 System	Comments
Result Records			
10.1.3: Test ID			• Dilution upload with result is configurable. Dilution is specified as follows: • ^^^Test Code^Online Dilution Coefficient^Dilution Protocol • Online Dilution Coefficient and Dilution Protocol are optional. • For the ADVIA 1800 Chemistry system Chemistry system, online dilution coefficient is not applicable (ignored). Examples: Result upload for D dilution condition on ADVIA 1800 Chemistry system: ^^^ALB^^DOWN
6.6.1.1 Test ID	Not supported	Not supported	
6.6.1.2 Test ID Name	Not supported	Not supported	
6.6.1.3 Test ID Type	Not supported	Not supported	
6.6.1.4 Manufacturer Test Code	Required (30 char max)	Required (10 char max)	
Online Dilution	Supported	Not supported	This value is blank for ADVIA 1800 Chemistry system The VersaCell system does not download online dilution to the ADVIA Chemistry system because the ADVIA Chemistry system does not support ordering by online dilution.

Field Description	VersaCell System	ADVIA 1800 System	Comments
Dilution Protocol	Supported	Supported	Allowed Dilution Protocol values include: • NEAT runs as M condition on the ADVIA 1800 Chemistry system • UP runs as U condition • DOWN runs as D condition • Blank or any other value defaults to NEAT
10.1.4 Result Value	Supported	Supported	
10.1.5 Units	Supported	Not supported	
10.1.6 Reference Ranges	Supported	Not supported	
10.1.7 Result Abnormal Flags	Supported	Supported. Field contains an asterisk (*) if abnormal flags exist	Custom abnormal flag information is transmitted via Result Comment Records. Refer to the *ADVIA 1650 and 1800 Chemistry Systems LIS Interface Guide* for more information.
10.1.8 Nature of Abnormality Range	Supported N = Normal	Not supported	The VersaCell system defaults to N (Normal generic range).
10.1.9 Results Status	Supported	Supported	The ADVIA 1800 Chemistry system supports the following Results status flags: • F = Final Results • R = Result was previously transmitted
10.1.12: Date & Time Test Started	Supported YYYYMMDDHHMMSS	Not supported	
10.1.13 Date & Time Completed	Supported YYYYMMDDHHMMSS	Supported YYYYMMDDHHMMSS	
10.1.14 Instrument ID	Supported (20 char max)	Supported	You can configure the instrument ID sent for the ADVIA 1800 Chemistry system on the VersaCell system using up to 20 characters.

Field Description	VersaCell System	ADVIA 1800 System	Comments
		Control Handling	
Control orders from LIS	Not supported	Supported	The VersaCell system does not support this feature for the ADVIA 1800 Chemistry system.
Configurable Control Result Transmission to LIS	Supported	Supported	
Control Name **	Upload in Patient Record, Field 3	Supported	
Control Lot **	Upload in Patient Record, Field 6	Supported	Transmission of control lot and expiration for the ADVIA 1800 Chemistry system are in Field 6 of the patient record. The form is NNNNNN/YYYYMMDD, where NNNNNN = 0 to 6 characters for lot number / = delimiter separating lot number and expiration date YYYYMMDD = expiration date. ***
Control Level **	N/A	N/A	
Control Expiration **	Upload in Patient Record, Field 6	Supported	Transmission of control lot and expiration for the ADVIA 1800 Chemistry system are in Field 6 of the patient record. The form is NNNNNN/YYYYMMDD, where NNNNNN = 0 to 6 characters for lot number / = delimiter separating lot number and expiration date YYYYMMDD = expiration date. ***

** VersaCell system mapping of control information for control results run on the ADVIA 1800 Chemistry system. Mapping can differ for other instruments connected to the VersaCell system.

*** Refer to *Uploading Control Lot Numbers and Expiration Dates to a Host Computer* (073D0270-xx) for additional formatting information.

VersaCell System and ADVIA Centaur Systems Comparison

The following table lists the differences in the VersaCell system interface for ADVIA Centaur systems.

Field Description	VersaCell System	ADVIA Centaur Systems	Comments
Case sensitive Specimen ID	No	Yes	
Case sensitive Test Name	No	Yes	
Patient Records			
8.1.1 Record Type	Required	Required	Always letter P
8.1.2 Sequence Number	Required	Required	
8.1.3 Patient ID	Required (20 char max)	Required (11 char max)	The VersaCell system provides 2 options for transmitting orders to ADVIA Centaur systems if the patient ID exceeds 11 characters. • The default option sends the patient ID and allows ADVIA Centaur systems to truncate it. The truncated patient ID is uploaded in the result. ADVIA Centaur systems truncate characters from the right. • The VersaCell system sends a blank patient ID to ADVIA Centaur systems. The VersaCell system uploads a blank Patient ID with the result.

Field Description	VersaCell System	ADVIA Centaur Systems	Comments
8.1.6 Patient Name	Supported (30 char max)	Supported (30 char max)	The VersaCell truncates longer patient names. **NOTE:** ADVIA Centaur systems interpret embedded spaces in patient names as component field delimiters. Therefore, an uploaded result from an ADVIA Centaur system can include additional component field delimiters (^) that replace the original embedded spaces.
8.1.8 Birthdate	Supported YYYYMMDD	Supported YYYYMMDD	
8.1.9 Patient Sex	Supported (1 char max)	Supported (1 char max)	ADVIA Centaur systems default any value other than M or F to U (unknown).
8.1.14 Physician ID	Supported upload only (30 char max)	Supported (12 char max)	The VersaCell system maps the value received in Field 17 of the order message (physician name) to this field.
8.1.26 Location	Not supported	Supported	ADVIA Centaur systems support this field; The VersaCell system does not support this field. This field is ignored by the VersaCell system with downloaded orders and is blank in uploaded results.
Order Records			
9.4.1 Record Type	Required	Required	Always letter O.
9.4.2 Sequence Number	Required	Required	
9.4.3 Specimen ID	Required (20 char max)	Required (13 char max)	If a specimen ID exceeds the maximum for the instrument, that sample is not processed on that instrument.

Field Description	VersaCell System	ADVIA Centaur Systems	Comments
9.4.5: Test ID			You can configure dilution upload with results, with dilution specified as follows: • ^^^Test Code^Online Dilution Coefficient^Dilution Protocol • Online Dilution Coefficient and Dilution Protocol are optional. If an order for an ADVIA Centaur system specifies a dilution ratio but no dilution protocol, the VersaCell system defaults the dilution protocol to “dilute only.” Example: Order download for an ADVIA Centaur system ^^^HCG^200^dilute only.
6.6.1.1 Test ID	Not supported	Not supported	
6.6.1.2 Test ID Name	Not supported	Not supported	
6.6.1.3 Test ID Type	Not supported	Not supported	
6.6.1.4 Manufacturer Test Code	Required (30 char max)	Required (8 char max)	
Online Dilution	Supported (integer)	Supported (2,5,10,20,50,100,200, 500,1000,2500)	The VersaCell system and ADVIA Centaur systems support online dilution in different fields. The VersaCell system maps the value to the correct ADVIA Centaur system field when it sends orders and receives results.

Field Description	VersaCell System	ADVIA Centaur Systems	Comments
Dilution Protocol	Supported (20 char max)	Supported • neat only • neat and diluted • dilute if over • dilute only • dilution profile	Dilution protocol in the VersaCell system interface is not case sensitive. Prior to sending an order to ADVIA Centaur systems, the VersaCell system adjusts case as needed for all dilution protocols. The VersaCell system and ADVIA Centaur systems support dilution protocol in different fields. The VersaCell system maps the value to the correct ADVIA Centaur system field when it sends orders and receives results.
9.4.6 Priority	Supported (1 char max) • S – Stat • A – As soon as Possible • R – Routine	Supported (1 char max) • S – Stat • R – Routine	
9.4.7 Request Date and Time	Supported YYYYMMDDHHMMSS	Not supported	
9.4.8 Specimen collection date/time	Supported YYYYMMDDHHMMSS	Not supported	
9.4.12 Action Code	Supported (Upload only) (1 or more repetitions of 1 char)	Supported (Upload only) Q - QC specimen empty - patient	You can configure the VersaCell system to enable or suppress the upload of action code/report type.
9.4.14 Relevant Clinical Information	Not supported	Not supported	The VersaCell system does not support Relevant Clinical Information. However, you can configure the VersaCell system to send/receive specimen type in this field rather than Field 16.
9.4.16 Specimen Type	Supported (20 char max)	Not supported	ADVIA Centaur systems ignore this field.

Field Description	VersaCell System	ADVIA Centaur Systems	Comments
9.4.17 Physician Name	Supported (30 char max)	Not supported	The VersaCell system maps this field to Field 14 of the patient message (physician ID) when sending orders to ADVIA Centaur systems. The VersaCell system uploads results from ADVIA Centaur systems that include a physician ID in the physician ID field (Field 14 of the patient message) and physician name field (Field 17 of the order message).
9.4.25 Instrument ID	Upload only (20 char max)	Upload only	You can configure the instrument ID sent for ADVIA Centaur systems on the VersaCell system.
9.4.26 Report Type	Upload only (1 or more repetitions of 1 char)	Upload only	For ADVIA Centaur systems, this field can include more than 1 character separated by a repeat delimiter (\). You can configure the VersaCell system to enable or suppress the upload of action code/report type.

Field Description	VersaCell System	ADVIA Centaur Systems	Comments
		Result Records	
10.1.3: Test ID			
6.6.1.1 Test ID	Not supported	Not supported	
6.6.1.2 Test ID Name	Not supported	Not supported	
6.6.1.3 Test ID Type	Not supported	Not supported	
6.6.1.4 Manufacturer Test Code	Required (30 char max)	Required (8 char max)	
Online Dilution	Supported (integer)	Supported (2,5,10,20,50,100,200, 500,1000,2500)	The VersaCell system and ADVIA Centaur systems support online dilution in different fields. The VersaCell system maps the value to the correct ADVIA Centaur system field when it sends orders and receives results.
Dilution Protocol	Supported (20 char max)	Supported • neat only • neat and diluted • dilute if over • dilute only • dilution profile	The VersaCell system and ADVIA Centaur systems support dilution protocol in different fields. The VersaCell system maps the value to the correct ADVIA Centaur system field when it sends orders and receives results.
Replicate Number	Supported	Supported (2 char max)	
Result Aspect	Supported	Supported (4 char max)	
10.1.4 Result Value	Supported (20 char max)	Supported (15 char max)	
10.1.5 Units	Supported (10 char max)	Supported (6 char max)	
10.1.6 Reference Ranges	Supported (50 char max)	Supported (34 char max)	

Field Description	VersaCell System	ADVIA Centaur Systems	Comments
10.1.7 Result Abnormal Flags	Supported	Supported • L = below reference • H = above reference • < = below conc. range • > = above conc. Range	ADVIA Centaur systems can use multiple flags separated by a repeat delimiter (\).
10.1.8 Nature of Abnormality Range	Supported N = Normal	Not supported	The VersaCell system defaults to N (Normal generic range).
10.1.9 Result Status	Supported • F = Final • R = previous transmit	Supported • F = Final • R = previous transmit • C = correction to previous transmitted value • P = preliminary	The VersaCell system does not support a corrected result status flag or preliminary results. If a preliminary result is received from an ADVIA Centaur system, it is discarded by the VersaCell system.
10.1.11 Operator Name/ID	Not supported	Not supported	
10.1.12 Date & Time Test Started	Supported YYYYMMDDHHMMSS	Not supported	
10.1.13 Date & Time Completed	Supported YYYYMMDDHHMMSS	Supported YYYYMMDDHHMMSS	
10.1.14 Instrument ID	Supported (20 char max)	Supported	You can configure the instrument ID sent for ADVIA Centaur systems on the VersaCell system.

Field Description	VersaCell System	ADVIA Centaur Systems	Comments
Control Handling			
Control orders from LIS	Not supported for ADVIA Centaur systems	Supported	
Configurable Control Result Transmission to LIS	Supported	Supported	
Control Name	Upload in Patient Record Field 6	Supported (in Manufacturer record)	The VersaCell system maps control name to patient record Field 6 for ADVIA Centaur systems results.
Control Lot	Upload in Patient Record Field 3	Supported (in Manufacturer record)	The VersaCell system maps control lot to patient record Field 3 for ADVIA Centaur systems results.
Control Level	Supported	Not supported	
Control Expiration	Supported	Not supported	

VersaCell System and Dimension RxL/EXL Systems Comparison

The following table lists the differences in the VersaCell system interface for the Dimension RxL/EXL systems. The Dimension RxL/EXL systems do not use an ASTM standard interface. The table includes mapping of the ASTM data fields to the Dimension RxL/EXL systems.

Field Description	VersaCell System	Dimension RxL/EXL Systems	Comments
Case sensitive Specimen ID	No	Yes	
Case sensitive Test Name	No	Yes	Test names may be considered as case insensitive. The VersaCell system automatically adjusts the case of test names prior to transmitting orders to the Dimension RxL/EXL systems.

Field Description	VersaCell System	Dimension RxL/EXL Systems	Comments
		Patient Records	
8.1.3 Patient ID	Required (20 char max)	Supported (27 char max)	The VersaCell system can be configured to transmit either patient ID or patient name to the Dimension RxL/EXL systems. The Dimension RxL/EXL systems cannot support both patient name and patient ID together.
8.1.6 Patient Name	Supported (30 char max)	Supported (27 char max)	The VersaCell system can be configured to transmit either patient ID or patient name to the Dimension RxL/EXL systems. The Dimension RxL/EXL systems cannot support both patient name and patient ID together.
8.1.8 Birthdate	Supported YYYYMMDD	Not Supported	Birthdate is ignored for LIS orders for the Dimension system.
8.1.9 Patient Sex	Supported (1 char max)	Not Supported	Patient Sex is ignored for LIS orders for the Dimension system.
8.1.14 Physician ID	Supported (Upload only) (30 char max)	Not Supported	Physician ID is ignored for LIS orders for the Dimension system.
8.1.26 Location	Not Supported	Supported	Location field is not supported by the VersaCell system (ignored)

Field Description	VersaCell System	Dimension RxL/EXL Systems	Comments
	Order Records		
9.4.3 Specimen ID	Required (20 char max)	Required (12 char max)	The VersaCell system does not process orders for the Dimension RxL/EXL systems if the sample ID exceeds 12 characters.
9.4.5: Test ID			The VersaCell system does not support receipt or transmission of offline (manual) dilutions.
6.6.1.1 Test ID	Not supported	Not supported	
6.6.1.2 Test ID Name	Not supported	Not supported	
6.6.1.3 Test ID Type	Not supported	Not supported	
6.6.1.4 Manufacturer Test Code	Required (30 char max)	Required (5 char max)	
Online Dilution	Supported (integer)	Not supported	For the Dimension RxL/EXL systems, online dilution coefficient is not applicable (ignored)
Dilution Protocol	Supported (20 char max)	Not supported	For the Dimension RxL/EXL systems, dilution protocol is not applicable (ignored)
9.4.6. Priority	Supported (1 char max) • S- STAT • R-Routine • A- ASAP	Supported • STAT • Routine • ASAP	Any value received from the LIS other than S,R,A will be transmitted to the Dimension RxL/EXL systems as routine.
9.4.7 Request Date and Time	Supported YYYYMMDD HHMMSS	Not Supported	
9.4.8 Specimen collection date/time	Supported YYYYMMDD HHMMSS	Not Supported	

Field Description	VersaCell System	Dimension RxL/EXL Systems	Comments
9.4.12 Action Code	Supported (Upload Only) (1 or more repetitions of 1 character)	Not supported	For control samples, a value of Q is uploaded with QC or XQC results if you configure the VersaCell system to transmit the action code. The VersaCell does not support distinguishing between QC and XQC results. Patient results upload a blank value.
9.4.16 Specimen Descriptor	Supported for all instruments, Required for Dimension system orders. (20 char max) • 1 = Serum • 2 = Urine • 3 = Plasma • 4 = CSF • 5 = Whole Blood • 6 = Other	Required The Dimension RxL/EXL systems support the following specimen types: • Serum • Urine • Plasma • CSF • Whole Blood	If specimen type is not provided, or a value other than 1-5 is provided, the order will not be processed if it is for a Dimension RxL/EXL systems. Control results are transmitted with specimen type of 6 (Other).
9.4.17 Physician Name	Supported (30 char max) • 1 = QC level 1 • 2 = QC level 2 • 3 = QC level 3 • 4 = QC level 4 • 5 = QC level 5	Not supported	This field is used to upload the control level with control results.
9.4.25 Instrument ID	Upload only (20 char max)	Upload only	You can configure the instrument ID for the Dimension RxL/EXL systems on the VersaCell system.

Field Description	VersaCell System	Dimension RxL/EXL Systems	Comments
Result Records			
10.1.3: Test ID			Online Dilution Coefficient and Dilution Protocol are not applicable to the Dimension RxL/EXL systems.
6.6.1.1 Test ID	Not supported	Not supported	
6.6.1.2 Test ID Name	Not supported	Not supported	
6.6.1.3 Test ID Type	Not supported	Not supported	
6.6.1.4 Manufacturer Test Code	Required (30 char max)	Required (5 char max)	
Online Dilution	Supported	Not supported	This value is blank for Dimension RxL/EXL systems.
Dilution Protocol	Supported	Not supported	This value is blank for Dimension RxL/EXL systems.
10.1.4 Result Value	Supported	Supported (10 char max)	
10.1.5 Units	Supported	Supported (10 char max)	
10.1.6 Reference Ranges	Supported	Not supported	
10.1.7 Result Abnormal Flags	Supported	Supported. Field contains an asterisk (*) if abnormal flags exist	Custom result error code information is transmitted via Result Comment Records. Refer to the *Dimension Clinical Chemistry Interface Specification* for more information on result error codes.
10.1.8 Nature of Abnormality Range	Supported N = Normal	Not supported	The VersaCell system defaults to N (Normal generic range).

Field Description	VersaCell System	Dimension RxL/EXL Systems	Comments
10.1.9 Results Status	Supported F = Final R = Result previously transmitted	Supported	The VersaCell system treats all results received from the Dimension RxL/EXL systems as Final results. Result status transmitted to the LIS will initially be F. Subsequent retransmission will have an 'R' value.
10.1.12: Date & Time Test Started	Supported YYYYMMDDHHMMSS	Not supported	
10.1.13 Date & Time Completed	Supported YYYYMMDDHHMMSS	Supported	
10.1.14 Instrument ID	Supported (20 char max)	Supported	You can configure the instrument ID sent for the Dimension system on the VersaCell system using up to 20 characters.

Field Description	VersaCell System	Dimension RxL/EXL Systems	Comments
Control Handling			
Control orders from LIS	Not Supported	Supported	Ordering controls from the LIS is not supported by VersaCell system for the Dimension RxL/EXL systems.
Configurable Control Result Transmission to LIS	Supported	Supported	
Control Name	Supported	Not Supported	Control name is not transmitted by Dimension RxL/EXL systems with control results. The Dimension sample ID field or Patient Identifier field may be used to transmit this information if desired. The Dimension Patient Identifier field maps to either the VersaCell Patient ID or Patient Name fields as configured on the VersaCell.

Field Description	VersaCell System	Dimension RxL/EXL Systems	Comments
Control Lot	Supported	Not Supported	Control lot is not transmitted by Dimension RxL/EXL systems with control results. The Dimension Sample ID field or Patient Identifier field may be used to transmit this information if desired. The Dimension Patient Identifier field maps to either the VersaCell Patient ID or Patient Name fields as configured on the VersaCell system.
Control Level	Supported Order Record Field 17 1 = 1st QC level 2= 2nd QC level 3 = 3rd QC level 4 = 4th QC level 5 = 5th QC level	Supported 1 = 1st QC level 2= 2nd QC level 3 = 3rd QC level 4 = 4th QC level 5 = 5th QC level	The VersaCell system uploads the control level in the range of 1-5 in Order Record Field 17 for Dimension system control results.
Control Expiration	Supported	Not Supported	Control expiration is not transmitted with Dimension RxL/EXL systems control results.

VersaCell System To LIS Cable Wiring ASTM E1381 (5.2.4.2)

The following definition is the wiring "pin out" for the cable connecting the VersaCell system to the LIS.

NOTE: The column labeled Contact Number is for the VersaCell system side of the cable only. The connector "pin out" for the LIS side of the cable must be supplied by your MIS department or LIS software company.

There are two possible connector types for the LIS and VersaCell system serial communication cable for the VersaCell system. The computer is configured with a 25 position connector, or a 9 position connector. The cable is connected to COM10 of the PC used by the VersaCell system. The connector on the back of the PC should be examined to determine the proper connector type. Pin connections for a 25-position or a 9-position connector are defined below. Siemens Diagnostics suggests the use of shielded cable.

DB25 Connector:

Contact Number	EIA Circuit	Description	VersaCell	Computer LIS)
1		Shield		No connection
2	BA	Transmitted Data	Output	Input
3	BB	Received Data	Input	Output
7	AB	Signal Ground		

DB9 Connector:

Contact Number	EIA Circuit	Description	VersaCell	Computer (LIS)
2	BB	Received data	Input	Output
3	BA	Transmitted data	Output	Input
5	AB	Signal ground		

Appendix A: VersaCell System LIS Interface Changes for Version 3.5a

This section summarizes important changes in the VersaCell LIS interface when it supports ADVIA Centaur systems. In addition, it includes interface changes to support new features available to other instruments. These changes are incorporated in Version 3.5a of the VersaCell software.

Required Changes

Description	Reference
Results from ADVIA Centaur systems can include results comment records. The ADVIA 1800 Chemistry system also uses results comments. The IMMULITE 2000/2500/XPi do not use result comment records.	Refer to *Result Comment Message (ADVIA 1800 Chemistry System)* on page 20and *Result Comment Message (ADVIA Centaur* Systems) on page 21
ADVIA Centaur systems transmit multiple result records (aspects) for each test. The VersaCell uploads all result aspects received from the instrument.	Refer to result upload examples for ADVIA Centaur systems in *Hierarchy Example: VersaCell System to LIS Transfer (ADVIA Centaur Systems Result)* on page 15 and *VersaCell System Result Transmission (ADVIA Centaur XP System)* on page 28.
The uploaded result record contains new component fields in Field 3, Test ID, for ADVIA Centaur systems. These fields include Online Dilution Ratio, Dilution Protocol, Replicate Number, and Result Aspect.	Refer to *Result Record Definition (10.1-10.1.14)* on page 43. For result upload examples, refer to *VersaCell System Result Transmission (ADVIA Centaur XP System)* on page 28. For result upload examples for ADVIA 1800 Chemistry system, refer to *Hierarchy Example: VersaCell System to LIS Transfer (ADVIA 1800 Chemistry System Result)* on page 14 and *VersaCell System Result Transmission (ADVIA 1800 Chemistry System)* on page 28.

Optional Changes

Description	Reference
The VersaCell system now provides support for downloaded or uploaded patient comment messages. You can configure the VersaCell system to suppress patient comment message uploads. Patient Comments are supported only by ADVIA Centaur systems. The IMMULITE 2000/2500/XPi and the ADVIA 1800 Chemistry system do not upload patient comments with results regardless of configuration settings.	Refer to *Patient Comment Message (ADVIA Centaur Systems)* on page 19.
The LIS can specify dilution protocol in downloaded orders. If an order provides a dilution ratio for ADVIA Centaur systems, the VersaCell defaults the dilution protocol to 'dilute only' if no dilution protocol is provided by the LIS. The ADVIA 1800 Chemistry system can use the dilution protocol for orders.	Refer to *Order Record Definition (9.4.1–9.4.31)* on page 38. For supported dilution protocol values for ADVIA Centaur systems, refer to *VersaCell System and ADVIA Centaur Systems Comparison* on page 78. For supported dilution protocol values for the ADVIA 1800 Chemistry system refer to *VersaCell System and ADVIA 1800 Chemistry System Comparison* on page 70.
A new option can upload dilution ratio and dilution protocol information with results as applicable. The uploaded values affect the Test ID field of the order and result records. If selected, this option applies to all supported instruments as applicable.	Refer to *VersaCell System Bi-directional LIS Specification ASTM E1394, Order Record Definition (9.4.1–9.4.31)* on page 38 and *Result Record Definition (10.1-10.1.14)* on page 43.

Behavior Notes for ADVIA Centaur Systems

Description	Section and Page Reference
ADVIA Centaur systems truncate patient IDs longer than 11 characters. The VersaCell allows order processing with patient IDs longer than 11 characters on ADVIA Centaur systems, but uploaded results contain the truncated value. The VersaCell system also provides an option that sends a blank patient ID to ADVIA Centaur systems. The VersaCell system uploads a blank patient ID with the result.	
ADVIA Centaur systems treat embedded spaces in patient names as component field delimiters. If embedded spaces are included in the patient name field, these will be replaced with component delimiters on the result upload.	
For control results, the VersaCell system uploads control name and lot in the same fields of the patient record as those used by the IMMULITE 2000/2500/2000 XPi. (Note that the uploaded fields for controls on an ADVIA 1800 are different)	Refer to *VersaCell System and ADVIA Centaur Systems Comparison* on page 78.
A new configuration option uploads action code with results (Field 12 of the order record.). An action code of 'Q' can identify control results for all supported instruments. The VersaCell system supports configurable upload of control results to the LIS, but does not support ordering controls through the LIS for ADVIA Centaur systems.	
There are field size differences for various parameters. However, all supported ADVIA Centaur system fields are equal to or smaller than those for the IMMULITE 2000/2500/2000 XPi	Refer to *VersaCell System and ADVIA Centaur Systems Comparison* on page 78.
ADVIA Centaur systems are case sensitive. When placing orders, the exact case of test names and sample IDs (accession numbers) must be preserved for the test to run. Dilution protocols can be considered case insensitive as the VersaCell automatically adjusts the case of dilution protocols to match the lower case required by the instrument.	
IMMULITE 2000/2500/XPi is not case sensitive.	

Behavior Notes for ADVIA 1800 Chemistry Systems

Description	Section and Page Reference
The VersaCell system supports PIDs up to 16 characters for ADVIA 1800 Chemistry system. The VersaCell system does not process orders to the ADVIA 1800 Chemistry system with PIDs longer than 16 characters.	
For control results, the VersaCell system uploads control name and lot in different fields of the patient record from those used by the IMMULITE 2000/2500/2000 XPi and ADVIA Centaur systems.	*VersaCell System and ADVIA 1800 Chemistry System Comparison* on page 70
A new configuration option uploads action code with results (Field 12 of the order record.). An action code of 'Q' can identify control results for all supported instruments. The VersaCell system supports configurable upload of control results to the LIS, but does not support ordering controls through the LIS for the ADVIA 1800 Chemistry system.	
There are field size differences for various parameters. However, all supported ADVIA 1800 Chemistry system fields are equal to or smaller than those for the IMMULITE 2000/2500/2000 XPi. See previous page.	*VersaCell System and ADVIA 1800 Chemistry System Comparison* on page 70.
The ADVIA 1800 Chemistry system uses case-sensitive sample IDs. Test names or dilution protocols for the ADVIA 1800 Chemistry system are not case-sensitive.	
The patient sex field must contain values of M, F, U, or blank for the VersaCell system to process an order on the ADVIA 1800 Chemistry system The value is not case sensitive as the VersaCell adjusts the case when transmitting the order. The VersaCell system does not read patient sex from the ADVIA 1800 Chemistry system result. The patient sex value uploaded with the result is the value that was downloaded with the order. If the order originated on the ADVIA 1800 Chemistry system, the patient sex value uploaded with the result is blank.	
The specimen type field must contain values of 1, 2 or blank for the VersaCell system to process orders on the ADVIA 1800 Chemistry system. A blank value defaults to 1 (Serum).	
Result Abnormal Flags (Field 7 of the result record) can contain an asterisk (*) if there are result flags on the ADVIA 1800 Chemistry system result. In this case, the result flag information is uploaded in result comment records.	Refer to the *ADVIA 1800 Chemistry System Interface Specification Guide* for more information on the interpretation of custom flags in result comment records.

General Notes

- The VersaCell system interface is based on the ASTM E1394-97 and E1381-95 standards. It does not support intermediate frames as described in section 6.3.1 of ASTM E1381-95. If a sample contains a large number of tests for download, we recommended transmitting the tests using multiple order records rather than intermediate frames. The VersaCell system can accept message frames up to 2048 bytes in length as an alternative to using intermediate frames.
- The VersaCell system transmits results to the LIS in the same order in which it receives the results from instruments. Note that this does not guarantee that test results are transmitted in the order in which they were completed unless the instruments connected to VersaCell system transmit in that order.

Appendix B: VersaCell System LIS Interface Changes for Version 3.6

This section summarizes important changes in the VersaCell LIS interface when it supports Dimension RxL/EXL systems. In addition, it includes interface changes to support the ADVIA 1800 Chemistry system. These changes are incorporated in Version 3.6 of the VersaCell software.

Required Changes

Description	Reference
Results from Dimension RxL/EXL systems can include result comment records. Result Field 7 (Result Abnormal Flags) contains an asterisk if result comment records apply to the result.	Refer to *Result Comment Message (ADVIA 1800 Chemistry System)for examples and format. Refer to Dimension Clinical Chemistry System Interface Specification for a listing of result error codes for Dimension RxL/EXL results.*
Specimen type (Order record field 16) is a required field for orders for a Dimension RxL/EXL system.	Refer to Order Record Definition
If a Dimension system is attached to the VersaCell system, order information from the LIS must be in Standard ASCII only. Result information may contain Extended ASCII characters due to manual samples or orders entered on the attached instruments.	
Specimen type is now also required for orders for ADVIA 1800 Chemistry systems. If specimen type is omitted for orders for these instruments, the VersaCell will not process those orders.	
Specimen type remains optional for orders for ADVIA Centaur, IMMULITE 2000/2500/XPi, and T60 systems.	
Specimen type values for the VersaCell system are now specified. However, VersaCell systems that include a T60 analyzer will continue to use the same specimen type mapping as before, based on the T60 specimen type definitions.	

Optional Changes

Description	Reference
The VersaCell supports transmitting control results for the Dimension RxL/EXL. Control information is identified in the following fields: • Order Field 16: A specimen type of '6' (Other) • Order Field 12: An Action code of 'Q' • Order Field 17: Control level (1-5)	Refer to *VersaCell System Bi-directional LIS Specification ASTM E1394*. Refer to VersaCell System Control Samples

Behavior Notes for Dimension RxL/EXL Systems

Description	Section and Page Reference
Dimension RxL/EXL systems cannot support a sample ID (accession number) length greater than 12 characters. The VersaCell will not process orders to a Dimension RxL/EXL system if the sample ID exceeds 12 characters.	See page 87, 9.4.3 Specimen ID.
The Dimension RxL/EXL provides a single field that can be used to identify the sample either by patient name or patient ID. The maximum length of this field is 27 characters. The VersaCell provides a configuration option to identify which field should be transmitted / received from the RxL/EXL. If patient ID is configured on the VersaCell, the patient identifier for results from the RxL must not exceed the maximum of 20 characters or the VersaCell will not accept the result.	See page 86, 9.4.3 Patient Name.
Dimension RxL/EXL systems are case sensitive. When placing orders, the exact case of sample IDs (accession numbers) must be preserved for the test to run.	See page 85, *VersaCell System and Dimension RxL/EXL Systems Comparison.*
The VersaCell automatically uppercases test names in orders sent to the Dimension RxL/EXL so test names for Dimension RxL/EXL orders may be considered case insensitive.	
The Dimension RxL/EXL does not transmit autodilution values with results. Dimension RxL/EXL results transmitted to the LIS from the VersaCell will therefore not contain an online dilution value even if the result was autodiluted. The Dimension RxL/EXL may include a result code indicating the result was autodiluted. This result code is transmitted by the VersaCell in a result comment record.	