Info HQ Manager v2.1

HL7 SPECIFICATION

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Introduction

Foreword

This manual specifies HL7-based messaging between the Info HQ Manager point-of-care data management system and a Laboratory Information System or other host system.

This manual assumes the reader is familiar with programming techniques and is capable of programming using a high-level language. This manual also assumes the reader has a good working knowledge of network communications and HL7 as they relate to the computer system that interfaces with Info HQ Manager.

Refer to the *Info HQ Manager Implementation Guide* for information on communication setup and HL7 interface troubleshooting.

Customer support

For technical support information, refer to the *Info HQ Manager User Guide*.

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References

This guide is based on the following documents:

HL7 Version 2.6 Messaging Standard
HL7 Implementation Support Guide for HL7 Standard Version 2.3

Purpose

The Abbott Info HQ Manager HL7 specification is intended to specify the electronic communication to an external Information System (LIS/HIS) using HL7 messaging. This interface is based on the standard, Health Level 7, Version 2.6.

Scope

This specification focuses exclusively on the HL7 based electronic communication between the Info HQ Manager system and an unspecified LIS or other host system.

The remainder of this document specifies the dynamic and static aspects of the Abbott Info HQ Manager HL7 interface in detail. The specification defines the message details for relevant HL7 message types, both the dynamic aspects of information interchange (i.e., the systems that participate in such interchanges and the real-world events that trigger messaging) as well as the static aspects of messaging (i.e., the structure and contents of the electronic messages that are exchanged).

Acronyms

ADT	Admission, Discharge and Transfer
AMR	Analytical Measurement Range
DOB	Date of Birth
HIS	Hospital Information System
HL7	Health Level Seven
LAN	Local Area Network
LIS	Laboratory Information System
MLLP	Minimal Lower Layer Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol

1 - Overview

1.1 Layered Protocols

The HL7 Interface is based on a multi-layer protocol implementation, for ease of connectivity with existing HL7-based host systems.

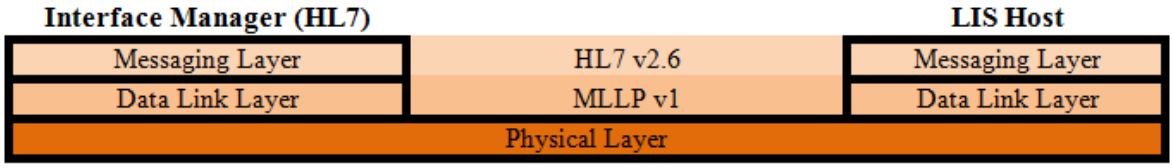

Figure 1: HL7 Interface - Protocol Layers

Based on this architecture, the HL7 Interface includes the following layers for implementation of communications software:

- **Physical Layer (Layer 1)** – Physical connection directing transmission of binary data bits between the Info HQ Manager and external host computers across a mechanical and electrical connection.
- **Data Link Layer (Layer 2)** – Lower level protocol providing services for establishing a link connection, transferring data and releasing the connection. Also provides services for delimiting messages.
- **Messaging Layer (Layer 3)** – Messaging infrastructure initiating communication between HL7 Connectivity component of the Abbott Info HQ Manager and the LIS/HIS Host that transfers results and orders and receives patient-specific data as defined by the HL7 v2.6.

Physical Layer

The Info HQ Manager can be connected to an external LIS/HIS through a network connection using TCP/IP as the transport protocol. Most of the details of error detection and correction are handled by the lower levels of TCP/IP and do not require any supplementation.

Lower Level Protocol

Info HQ Manager uses the Minimal Lower Layer Protocol (MLLP) as defined in Appendix C, section C. 4, of the HL7 v2.3.1 *Implementation Support Guide*. The protocol assumes operation in a networked environment, such as TCP/IP, in which most details of error detection and correction are handled by the lower levels of the network protocol and do not require supplementation.

Network Connections

When two entities communicate in a LAN environment, they must establish a virtual circuit, also referred to here as a connection. The circuit/connection provides reliable, sequenced, error-free, full-duplex data transmission over the network. The connection is established by one of the entities performing a “call” operation to the other entity performing a “listen” operation. With TCP/IP, the two entities use IP addresses and ports to identify each other. The call operation is often called an “active connection” while the listen operation may be called a “passive connection.” Once the calling entity has connected to the listening entity, the two-way circuit/connection is established and the entities may exchange data.

When the data exchange is complete, either side may perform a disconnect operation to break the circuit, or the connection may remain open for future data exchange. The Info HQ Manager will leave

connections open.

In general terms, the usual method of establishing a circuit/connection is for the system that wants to initiate the message exchange (i.e., client) to perform the call operation and for the responding system (i.e., server) to perform the listen operation. The Info HQ Manager will always support both client and server operation.

Channel Use of Network Connections

The Info HQ Manager will support two separate network channels:

1. Client Channel – for message transactions that are initiated by the Info HQ Manager.
2. Server Channel – for message transactions that are responded to by the Info HQ Manager.

Each communication channel makes use of a MLLP network connection to send and receive the messages.

From a transactional viewpoint a MLLP (Minimal Lower Layer Protocol) network connection is *unidirectional*. Event-triggered messages flow in one direction and acknowledgement messages related to those event-triggered messages flow in the other direction. The acknowledgement message to an event-triggered message shall be sent immediately to the sender on the same MLLP connection that carried the event-triggered message. The receiver of an event triggered message should assume that the sending application is blocking and send an application level acknowledgement as soon as possible.

Messaging Layer

The Info HQ Manager uses the protocol defined by the HL7 v2.6 standard as the basis for the message content layer of the communication interface. This layer specifies the conventions used in structuring information (messages) for transmission to external host systems and for receiving information from these host systems.

An HL7 message transaction is initiated by an application in response to some real-world trigger event. For example, a result being produced and released on an Info HQ Manager system can trigger the initiation of an Unsolicited Observation message transaction. The message transaction includes the client (i.e., triggering application) sending a message over a communication channel and the server replying with an application level acknowledgement message on that same channel.

From the perspective of the application that initiates an event triggered transaction, it is acting in the role of a client (or sender). The application that responds with an acknowledgement message is acting in the role of a server (or receiver).

Client Transactions

The Info HQ Manager acts as a client (or sender) for the following message transactions:

- Unordered Observation
- Search for an Order

Server Transactions

The Info HQ Manager acts as a server (or receiver) for the following message transactions:

- Admit/Visit Notification
- Transfer a Patient
- Discharge/End Patient Visit
- Update Patient Information

2 - HL7 Low Level Protocols

2.1 MLLP

The Info HQ Manager uses MLLP (referred to as the Minimal Lower Layer Protocol) for an HL7 message. The HL7 Message is wrapped using a header and trailer (immediately followed by a carriage return).

It is assumed that this HL7 protocol will be used only in a network environment. Most of the details of error detection and correction are handled by the lower levels of any reasonable network protocol and do not require any supplementation.

HL7 messages are enclosed by special characters to form a block. The format is as follows:

<SB>dddd<EB><CR>

<VT> =	Start Block character (1 byte) ASCII <VT>, i.e., <0x0B>. This should not be confused with the ASCII characters SOH or STX.
dddd =	Data (variable number of bytes) This is the HL7 data content of the block.
<FS> =	End Block character (1 byte) ASCII <FS>, i.e., <0x1C>. This should not be confused with the ASCII characters ETX or EOT.
<CR> =	Carriage Return (1 byte) Terminator The ASCII carriage return character, i.e., <0x0D>.

2.2 HL7 Messages

Note: Parameters in square brackets ([ ]) are optional. ORC is not supported.

Results

The ORU message format is defined as:

	Unsolicited Observation Message	Chapter
MSH	Message Header	4
{		
[		
PID	Patient Identification	5
[		

		Unsolicited Observation Message	Chapter
	PV1	Patient Visit	5
]			
]			
{			
	[ORC]	Order Common	
	OBR	Observations Report ID	4
	{		
	[OBX]	Observation/Result	4
	{[NTE]}	Notes and Comments	4
	}		
}			
}			

ADT Messages

The ADT message format is defined as:

		Unsolicited Observation Message	Chapter
MSH		Message Header	3
{			
[			
PID		Patient Identification	5
	[		
	PV1	Patient Visit	5
	]		
]			
}			

Acknowledgement Messages

Except for pass-through systems and ACK messages, we will acknowledge any HL7 message we receive. An ACK message consists of an MSH segment and an MSA segment. The MSA contains the Message ID from the message that was received.

		Unsolicited Observation Message	Chapter
MSH		Message Header	6
{			
[			
MSA		Message Acknowledgement	6

		Unsolicited Observation Message	Chapter
[			
	ERR	Error	6
]			
]			
}			

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3 - Results (R30 and R31)

3.1 Message Header Segment

The Header Segment contains data about intent, source, destination and some specific syntax of the message. The following table details the exact format of the Message Header Segment sent from Info HQ Manager to the Host. Info HQ Manager supports ORU R30 and R31 for patient results. QC results will use ORU R30 message type only, regardless of the message selection under the LIS connectivity profile. LOINC code is not supported for QC results.

Fields listed below are supported:

Table 1: Message Header: Info HQ Manager System to Host (MSH)

HL7 Field	Field Name	Maximum Characters	Field Contents/Example	Comments
1	Field Separator	1	| - Field	Field delimiter: vertical bar
2	Encoding Characters	4	^ - Component	Component delimiter: caret
			~ - Repeat	Repeat delimiter: tilde
			\ - Escape	Escape delimiter: backslash
			& - Sub Component	Sub Component: ampersand
3	Sending Application	180	Abbott Point of Care	Abbott Point of Care
4	Sending Facility	180	Abbott Point of Care	Abbott Point of Care
7	Date/Time of Message	26	20120906112350-04:00	YYYY[MM[DD[HH[MM[SS]]]]][+/-ZZ:ZZ]
9	Message Type	15	ORU^R30^ORU-R30 Or ORU^R31^ORU- R31	Message Code ^ Trigger Event ^ Message Structure *ORU is not supported for QC
10	Message Control ID	38	String	Unique ID
11	Processing ID	3	Always “P”	Production indicator
12	Version ID	8	2.6	HL7 version of the message
16	Application Acknowledgement Type		AL NE ER SU	AL – Always NE – Never ER – Error/Rejection Only SU – Successful (Default to NE)

Transmitted to Host example:

MSH|^~\&|Abbott Point of Care|Abbott Point of Care|||20120906112350-04:00||ORU^R30^ORU-R30|290|P|2.6||||NE

3.2 Patient Information Segment

The Patient Information Segment is used as the primary means of communicating patient identification information or to identify the result type for QC tests. The following table details the exact format of the Patient Information Segment sent from Info HQ Manager to the Host.

Fields listed below are supported:

Table 2: Patient Information Segment: Info HQ Manager System to Host

HL7 Field	Field Name	Maximum Characters	Field Contents/Example	Comments
1	Set ID - PID	3	1	Segment sequence
3	Patient Identifier	200	 32P47-0 QC15068^1 QC92978	Only 1 identifier supported Patient test: Patient ID Control, CalVer: Lot #^Level Proficiency: Sample ID "QC" is the prefix for all Control, CalVer and Proficiency identifiers
5	Patient Name	Last Name: 50 First Name: 50 Middle Name: 50	EVERYMAN1 ^AD AM1 ^A	Patient Full Name: Last Name ^First Name ^Middle Name
7	Date/Time of Birth	26	19701021	YYYY[MM[DD]]
8	Administrative Sex	1	As received (i.e. F, M, U, O)	Patient Gender

Transmitted to Host example:

PID|1||32147||EVERYMAN1^ADAM1^A^III||19610615|M

3.3 Observation Request Segment

The Observation Request Segment is used to transmit information that is specific to a diagnostic study or observation. The following table details the exact format of the Observation Request Segment sent from Info HQ Manager to the Host.

Fields listed below are supported:

Table 3: Observation Request Segment: Info HQ Manager System to Host

HL7 Field	Field Name	Maximum Character	Field Contents/Example	Comments
1	Set ID - OBR	3	1	Sequence Number
4	Universal Service Identifier	300	6+	Identifier code for requested observation/test/battery. Test Service Code ^ Description
7	Observation Date/Time #	26	20131029010746-04:00	Test result end date and time with format - YYYY[MM[DD[HH[MM[SS]]]]][+/- ZZ:ZZ]
11	Specimen Action Code	1	O	Not supported for QC; O for patient results
15	Specimen Source	80	Capillary	Specimen type for patient test is transferred as received. CONTROL for liquid control CALVER for cal/ver PROFICIENCY for proficiency
20	Filler Field 1 +	20	K16014	Reagent (cartridge) lot number
34	Technician +	30	95	Operator ID

Transmitted to Host example:

OBR|1|||i-STAT EC8+|||20160629211347-04:00||||O||||Capillary|||||K16014||||||||||||95

3.4 Observation Result Segment

The Observation Result Segment is used to transmit a single observation or observation fragment. Info HQ Manager is capable of transmitting Patient test results to the Host system. The following table details the exact format of the Observation Result Segment sent from Info HQ Manager to the Host.

Fields listed below are supported:

Table 4: Observation Result Segment: Info HQ Manager System to Host (OBX)

HL7 Field	Field Name	Maximum Characters	Field Contents/Example	Comments
1	Set ID- OBX	3	1	Sequence Number
2	Value Type	2	ST	Default to “ST”
3	Observation Identifier	20	d4374c7a-56ed-4fdf-be9f-4ba91a306cf9^ CL	Unique observation identifier^ Analyte Name
5	Observation Value	705	45.7	Value observed during collection
6	Units	50	mmol/L	Measurement units
7	References Range	50	1.12-1.32	References Range (only normal reference range)
8	Abnormal Flag	10	HH	Support L, H, LL, HH, <, >
11	Observation Result Status	24	F	Final results; can only be changed with corrected result
16	Responsible Observer	705	2222	Individual responsible for observation
18	Equipment Instance Identifier	50	123	Device serial number
19	Date/Time of the Analysis	26	20131029010746-04:00	Format: YYYY[MM[DD[HH[MM[SS]]]]][+/-ZZ:ZZ]

Transmitted to Host example:

OBX|3|ST|827252df-8b02-45e0-b315-d32087b22045^ICA||2.09|mmol/L|1.12-1.32|HH|||F|||||001||123|20131029010746-04:00

3.5 NTE

The Comment Segment is used for sending notes and comments that accompany test result data. The following table details the exact format of the Comment Segment sent from Info HQ Manager to the Host.

Table 5: Comment Segment: Info HQ Manager System to Host (NTE)

HL7 Field	Field Name	Maximum Characters	Field Contents/Example	Comments
1	Set ID - NTE	3	1	Sequence Number
4	Comment Type	201	CPB=Yes	Name/Value Pair
6	Entered Date / Time	26	20131029010746-04:00	Format: YYYY[MM[DD[HH[MM[SS]]]]][+/-ZZ:ZZ]

Transmitted to Host example:

NTE|1|||CPB=Yes||20131029010746-04:00

3.6 Common Order Segment

The ORC segment is used to add order information. The following table details the exact format of the Order Record sent from the Info HQ Manager to host.

All field names below are filled according to the * in the column.

Table 6: Common Order Segment (ORC)

HL7 Field	Field Name	Maximum Characters	Field Contents/Example	Description
1	Order Control	2	NW	NW
18	Entering Device	50	123	Device Serial#

Transmitted to Host example:

ORC|NW||||||||||||||||123

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4 - Patient Administration (ADT-A01, ADT-A02, ADT-A03 and ADT-A08)

4.1 Patient Administration

The Patient Administration transaction set provides for the transmission of new or updated demographic and visit information about patients from a Host to Info HQ Manager.

Message Segments

Message Header Segment (MSH)

The MSH segment defines the intent, source, destination, and some specifics of the syntax of a message. The following table details the exact format of the Message Header Segment sent from a Host to Info HQ Manager.

Table 7: Message Header Segment (MSH)

HL7 Field	Field Name	Maximum Characters	Field Contents/Example	Comments
1	Field Separator	1	| - Field	Field delimiter: vertical bar
2	Encoding Characters	4	^ - Component	Component delimiter: caret
			~ - Repeat	Repeat delimiter: tilde
			\ - Escape	Escape delimiter: backslash
			& - Sub Component	Sub Component: ampersand
3	Sending Application	227	Abbott Point of Care	Abbott Point of Care
4	Sending Facility	227	Abbott Point of Care	Abbott Point of Care
7	Date/Time of Message	26	20131126030935	YYYY[MM[DD[HH[MM[SS]]]]][+/-ZZ:ZZ]
9	Message Type	15	ADT^A08	Message Code ^ Trigger Event ^ Message Structure
10	Message Control ID	199	String	Unique ID
11	Processing ID	3	P	Production indicator
12	Version ID	60	2.6	HL7 version of the message

Received from Host example:

MSH|^~\&|Abbott Point of Care|Abbott Point of Care|||20131126030935||ADT^A08|
9f162fa0-83d5-4bbf-9e63-25|P|2.6

Patient Identification

The Patient Identification segment is used as the primary means of communicating patient identification information. This segment contains permanent patient identifying and demographic information. The following table details the exact format of the Patient Identification Segment sent from a Host to Info HQ Manager.

Table 8: Patient Identification

HL7 Field	Field Name	Maximum Characters	Field Contents/Example	Comments
1	Set ID - PID	3	1	Segment sequence
3	Patient Identifier List	250	32147	Patient ID
5	Patient Name	Last Name: 50 First Name: 50 Middle Name: 50	EVERYMAN1 ^AD AM1 ^A	Patient Full Name Last Name ^ First Name ^ Middle Name
7	Date/Time of Birth	26	19610615	YYYY[MM[DD[HH[MM[SS]]]]][+/-ZZ:ZZ]
8	Administrative Sex	1	F, M,U or O	Patient Gender
11	Patient Address	250	2222 HOME STREET ^^GREENS BORO ^NC ^27401-1020	Patient Home Address Street ^ ^ City ^ State ^ Zip ^ Country
13	Phone Number – Home	250	(555) 555-2004	Patient Home Phone
14	Phone Number – Business	250	(555) 555-2004	Patient Work Phone
18	Patient Account Number	250	PATID12345001^2^ 10^ADT1^AN^A	Patient account number to which charges, payments, etc. are recorded

Received from Host example:

PID|1||32147||EVERYMAN1^ADAM1^A^III||19610615|M|||2222 HOME STREET^^GREENSBORO^NC^27401-1020|GL|(555) 555-2004|(555)555-2004||S|| PATID12345001^2^M10^ADT1^AN^A

4.2 PV1 Segment

The Patient Visit Information segment is used to communicate information that is specific to a patient visit. The following table details the exact format of the Patient Visit Information sent from a Host to Info HQ Manager.

Table 9: PV1 Segment

HL7 Field	Field Name	Maximum Characters	Field Contents/Example	Comments
1	Set ID – PV1	3	1	Sequence number
3	Assigned Patient Location	50	2000 ^2012 ^01	Patient's initial assigned location or location to which patient is being moved. Important: This HOST 'FacilityLocation' must be mapped to the actual Info HQ Manager facility when configuring the system. FacilityLocation ^Room ^Bed ^DeptLocation ^^^Building name ^Floor
7	Attending Doctor	320	004777 ^ATTEND ^A ARON^A	PhysicianID ^LastName ^FirstName
44	Admit Date/Time	26	200701102300	Format: YYYY[MM[DD[HH[MM[SS]]]]][+/-ZZ:ZZ]
45	Discharge Date/ Time	26	Discharge Date/Time (A03 message only, normally blank)	Format: YYYY[MM[DD[HH[MM[SS]]]]][+/-ZZ:ZZ]

Received from Host example:

PV1|1|I|2000^2012^01||||004777^ATTEND^AARON^A^title|||||||1|||||||||||||||||||||||||||||200701102300

5 - Acknowledgement Messages

5.1 Acknowledgement Messages

The Info HQ Manager supports both general acknowledgement message (ACK) and an application level acknowledgement ACK-R33 for observation reporting.

HL7 v2 specifies two major message acknowledgement modes, original and enhanced. As specified by IHE, the Info HQ Manager will support the original acknowledgement mode for all Patient Administration messages. For observation reporting, the Info HQ Manager will support the enhanced acknowledgement mode.

General Acknowledgement

The simple general acknowledgement (ACK) can be used where the application does not define a special application level acknowledgement message or where there has been an error that precludes application processing. It is also used for accept level acknowledgements.

For the general acknowledgement (ACK) message, the value of MSH-9-2 Trigger event is equal to the value of the MSH-9-2 Trigger event in the message being acknowledged. The value of MSH-9-3-Message structure for the general acknowledgement message is always ACK.

Application Acknowledgement, With Accession Number

This trigger event supports the use case of a response to any of the three ORU trigger events, communicating an accession number if appropriate. Because HL7 does not in general support communicating structured information in NTE segments, the ACK^R33 message trigger has been reserved to accommodate this use case in future versions of the HL7 specification.

Message Segments

Message Header (MSH)

The MSH segment defines the intent, source, destination, and some specifics of the syntax of a message.

Table 10: Message Header

HL7 Field	Field Name	Maximum Characters	Field Contents/Example	Comments
1	Field Separator	1	| - Field	Field delimiter: vertical bar
2	Encoding Characters	4	^ - Component	Component delimiter: caret
			~ - Repeat	Repeat delimiter: tilde
			\ - Escape	Escape delimiter: backslash
			& - Sub Component	Sub Component: ampersand
3	Sending Application	227	Abbott Point of Care	Abbott Point of Care

HL7 Field	Field Name	Maximum Characters	Field Contents/Example	Comments
4	Sending Facility	227	Abbott Point of Care	Abbott Point of Care
7	Date/Time of Message	26	20131126030935	YYYY[MM[DD[HH[MM[SS[.S[S[S[S]]]]]]]]][+/-ZZ:ZZ]
9	Message Type	15	ACK ^R33	Message Code ^ Trigger Event ^ Message Structure
10	Message Control ID	199	string	Unique ID
11	Processing ID	3	P	Production indicator
12	Version ID	60	2.6	HL7 version of the message

Example:

```
MSH|^~\&|JResultNet|JResultNet|||20140916160659||ACK^R33^ACK-R33|11739|P|2.6
```

Message Acknowledgement (MSA)

The MSA segment contains information sent while acknowledging another message. The following table details the exact format of the Message Header sent from Info HQ Manager to a Host or from a Host to Info HQ Manager.

Table 11: Message Acknowledgement (MSA)

HL7 Field	Field Name	Maximum Characters	Field Contents/Example	Comments
1	Acknowledgement Code	2	AA	Acknowledgement Code
2	Message Control ID	38	234	Unique ID
3	Text Message	1000	NO ERROR	If AE, AR, CE, CR, specify detailed error message.
6	Error Condition	250	ACK MessageAccepted	Descriptive – normally empty

```
MSA|AA|234|NO ERROR
```

Error (ERR)

The ERR segment is used to add error comments to acknowledgement messages.

Table 12: Error

HL7 Field	Field Name	Maximum Characters	Received (From Host)	Description
2	Error location	18	PID ^1 ^3 ^ ^1	^ Segment ID ^ Segment Sequence ^ Field Position ^ Field Repetition ^ Component Number ^ Subcomponent Number
3	HL7 Error Code	105	204	HL7 Error Code
5	Severity	2	E	Severity

```
ERR||PID^1^3^^1|204|E
```

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HL7 Message Examples

Info HQ Manager to HOST

ORU^R30 Result without LOINC:

MSH|^~\&|Abbott Point of Care|Abbott Point of Care|||20170117084223-05:00||ORU^R30^ORU-R30|125|P|2.6
PID|1
ORC|NW|||||||||||||||S1001
OBR|1|||CHEM8+|||20130113172743-05:00||||O|||||||||229C101930999|||||||||||||5
OBX|1|ST|a6271d63-09e7-4218-81ee-3ab82881e2c8^GLU||***|mg/dL|||||F|||||5||S1001|20130113172743-05:00
OBX|2|ST|790d951c-0df0-4d43-aa4b-4237245886d9^BUN||***|mg/dL|||||F|||||5||S1001|20130113172743-05:00
OBX|3|ST|009c542e-8494-42a5-8168-203584e4aff7^CREA||***|mg/dL|||||F|||||5||S1001|20130113172743-05:00
OBX|4|ST|ded9217a-c5b8-46dd-9611-d72890cdcce0^NA||***|mmol/L|||||F|||||5||S1001|20130113172743-05:00
OBX|5|ST|0bc5c52e-18ce-49c5-b2ac-1f2955c3fec5^K||***|mmol/L|||||F|||||5||S1001|20130113172743-05:00
OBX|6|ST|26f92d87-b0b2-4648-879a-26ae1d0134b7^CL||***|mmol/L|||||F|||||5||S1001|20130113172743-05:00
OBX|7|ST|145b4fa5-3a52-4a42-b07e-680c2e5ce213^TCO2||***|mmol/L|||||F|||||5||S1001|20130113172743-05:00
OBX|8|ST|98841d62-b521-4b42-a890-46a7c580c6ce^ANGAP||***|mmol/L|||||F|||||5||S1001|20130113172743-05:00
OBX|9|ST|0a9d902d-33e6-4117-b05c-0f40b3e8cc14^ICA||***|mmol/L|||||F|||||5||S1001|20130113172743-05:00
OBX|10|ST|7ebe1558-6b2e-49f0-a7a6-6607fb60fb75^HCT||***|%PCV|||||F|||||5||S1001|20130113172743-05:00
OBX|11|ST|e2b21602-41f8-4229-ac15-3b28df961157^HB||***|g/dL|||||F|||||5||S1001|20130113172743-05:00
NTE|1|||Allen's Test=||20130113172743-05:00
NTE|2|||PtTemp=||20130113172743-05:00
NTE|3|||DelSys=||20130113172743-05:00
NTE|4|||CPB=No||20130113172743-05:00
NTE|5|||Site=||20130113172743-05:00
NTE|6|||Sample Type=||20130113172743-05:00
NTE|7|||CMT=reviewed||20130113172743-05:00
NTE|8|||DSN=S1001||20130113172743-05:00

MSH|^~\&|JResultNet|JResultNet|||20140916160659||ACK |11739|P|2.6
MSA|AA|1|NO ERROR

ORU^R30 Result with LOINC (Chem8+)

MSH|^~\&|Abbott Point of Care|Abbott Point of Care|||20170117074147-05:00||ORU^R30^ORU-R30|4|P|2.6
PID|1||---|||||U
ORC|NW|||||||||||||||0
OBR|1|||i-STAT CHEM8+|||20160629103334-04:00||||O||||BldA|||||H16029|||||||||||||---
OBX|1|ST|41650-3^CL^LN||73|mmol/L|||||F|||||---||0|20160629103334-04:00
OBX|2|ST|32713-0^K^LN||2.9|mmol/L|||||F|||||---||0|20160629103334-04:00
OBX|3|ST|32717-1^NA^LN||122|mmol/L|||||F|||||---||0|20160629103334-04:00
OBX|4|ST|12961-9^BUN^LN||53|mg/dL|||||F|||||---||0|20160629103334-04:00
OBX|5|ST|34581-9^ICA^LN||0.83|mmol/L|||||F|||||---||0|20160629103334-04:00
OBX|6|ST|41651-1^GLU^LN||274|mg/dL|||||F|||||---||0|20160629103334-04:00
OBX|7|ST|2026-3^TCO2^LN||14|mmol/L|||||F|||||---||0|20160629103334-04:00
OBX|8|ST|^ANGAP^LN||39|mmol/L|||||F|||||---||0|20160629103334-04:00
OBX|9|ST|^Hb*^LN||5.4|g/dL|||||F|||||---||0|20160629103334-04:00
OBX|10|ST|32354-3^HCT^LN||16|%PCV|||||F|||||---||0|20160629103334-04:00
OBX|11|ST|21232-4^CREA^LN||3.9|mg/dL|||||F|||||---||0|20160629103334-04:00
NTE|1|||Note1=BUN||20160629103334-04:00
NTE|2|||Note1=kEDTA3||20160629103334-04:00
NTE|3|||Note2=Non-CPB||20160629103334-04:00

MSH|^~\&|JResultNet|JResultNet|||20140916161300||ACK |11741|P|2.6
MSA|AA|1|NO ERROR

ORU^R31 Result without LOINC

MSH|^~\&|Abbott Point of Care|Abbott Point of Care|||20170117074921-05:00||ORU^R30^ORU-R30|126|P|2.6
PID|1||QC101021^0
ORC|NW|||||||||||||||S1001
OBR|1|||CHEM8+|||20130114173232-05:00|||||||CONTROL|||||216C101930999|||||||||||||5
OBX|1|ST|e1b26ec0-36f4-44f1-b57f-a5103f7a799a^GLU||163|mg/dL|||||F|||||5||S1001|20130114173232-05:00
OBX|2|ST|28bd6d90-7580-4077-98d9-d219b7cf4ac0^BUN||38|mg/dL|||||F|||||5||S1001|20130114173232-05:00
OBX|3|ST|9559e766-22c0-4b6d-8f7e-190c52d558dc^CREA||2.4|mg/dL|||||F|||||5||S1001|20130114173232-05:00
OBX|4|ST|0e8253fe-8fb6-454b-ae77-3ff878bf5d15^NA||142|mmol/L|||||F|||||5||S1001|20130114173232-05:00
OBX|5|ST|3999b233-e787-4177-98b6-f90943b5771f^K||4.7|mmol/L|||||F|||||5||S1001|20130114173232-05:00
OBX|6|ST|d6fee065-afa6-46fd-b7b3-208a7d60d24c^CL||96|mmol/L|||||F|||||5||S1001|20130114173232-05:00
OBX|7|ST|a6fc3b6f-3eb9-425d-b5d2-e6e298b7fea3^TCO2||22|mmol/L|||||F|||||5||S1001|20130114173232-05:00
OBX|8|ST|a5ef4a02-b229-4ffb-86b0-d7fe74dbdc8c^ANGAP||30|mmol/L|||||F|||||5||S1001|20130114173232-05:00
OBX|9|ST|97f134f0-8edf-450d-bb1b-18722e789f00^ICA||1.10|mmol/L|||||F|||||5||S1001|20130114173232-05:00
OBX|10|ST|d15c1b04-f66d-48a2-82a6-7b0dbe91a794^HCT||<15%PCV|||||F|||||5||S1001|20130114173232-05:00
OBX|11|ST|caee93b2-3a34-4ff0-8fca-e5016f097950^HB||<>|g/dL|||||F|||||5||S1001|20130114173232-05:00
NTE|1|||DSN=S1001||20130114173232-05:00

MSH|^~\&|JResultNet|JResultNet|||20140916161521||ACK |11743|P|2.6
MSA|AA|1|NO ERROR

ORU^R31 Result with LOINC (CHEM8+)

```
MSH|^~\&|Abbott Point of Care|Abbott Point of Care|||20110529130917-04:00||ORU^R31^ORU-
R31|11731| P|2.6
PID|1||P9001||Smith^O^A
ORC|NW
OBR|1|||CHEM8+
OBX|1||^HCT^LN||<15|%PCV|||||F|||||APOC3214|||20110529130917-04:00|MIX
OBX|2||41651-1^GLU^LN||28|mg/dL|||||F|||||APOC3214|||20110529130917-04:00|MIX
OBX|3||^BUN^LN||139|mg/dL|||||F|||||APOC3214|||20110529130917-04:00|MIX
OBX|4||^CREA^LN||15.5|mg/dL|||||F|||||APOC3214|||20110529130917-04:00|MIX
OBX|5||^NA^LN||100|mmol/L|||||F|||||APOC3214|||20110529130917-04:00|MIX
OBX|6||^K^LN||2.1|mmol/L|||||F|||||APOC3214|||20110529130917-04:00|MIX
OBX|7||^CL^LN||76|mmol/L|||||F|||||APOC3214|||20110529130917-04:00|MIX
OBX|8||^TCO2^LN||11|mmol/L|||||F|||||APOC3214|||20110529130917-04:00|MIX
OBX|9||^ANGAP^LN||16|mmol/L|||||F|||||APOC3214|||20110529130917-04:00|MIX
OBX|10||^ICA^LN||2.23|mmol/L|||||F|||||APOC3214|||20110529130917-04:00|MIX
OBX|11||^HB^LN||<>|g/dL|||||F|||||APOC3214|||20110529130917-04:00|MIX
NTE|1|||Sample Type=MIX||20110529130917-04:00
NTE|2|||CPB=Yes||20110529130917-04:00
NTE|3|||DSN=314237||20110529130917-04:00
NTE|4|||HCT=LOW||20110529130917-04:00

MSH|^~\&|JResultNet|JResultNet|||20140916163225||ACK |11731|P|2.6
MSA|AA|1|NO ERROR
```

HOST to Info HQ Manager

A01 – Admit Patient

```
MSH|^~\&|JResultNet|Device3|Abbott Point of Care|Abbott Point of Care|20140916173543||
ADT^A01^ADT-A01|85249|P|2.6
PID|1||P9001||Smith^O^A||19610615|M||PatRace|PatAddr1^^PatCity^FL^33913^USA||58594584467|
2399316004||||PatAccountNumber
PV1|1||Facility2^LocRoom^LocBed^LocDept^^^LocBuilding^LocFloor||||
DoctorCode^DoctorLast^DoctorFirst^DoctorSuffix||||||||||||||||||||||||||||||||||20140625

MSH|^~\&|Abbott Point of Care|Abbott Point of Care|||20140916173802||ACK^A01^ACK|
fc1825b5-9a46-439b-9596-47f4daeb009f|P|2.6
MSA|AA|85249
```

A02 – Transfer Patient

```
MSH|^~\&|JResultNet|Device3|Abbott Point of Care|Abbott Point of Care|20140916173848||
ADT^A02^ADT-A02|85252|P|2.6
PID|1||P9001||Smith^O^A||19610615|M||PatRace|Daniels Rd^^Bonita Springs^FL^32313^USA||
53359458467|2399316004||||67876
PV1|1||Uptown^LocRoom^LocBed^LocDept^^^LocBuilding^LocFloor||||
DoctorCode6^DoctorLast6^DoctorFirst6^DoctorSuffix6||||||||||||||||||||||||||||||||||20140625

MSH|^~\&|Abbott Point of Care|Abbott Point of Care|||20140916174107||ACK^A02^ACK|
8125b4fd-627d-46d5-9fa5-2761c2c68565|P|2.6
MSA|AA|85252
```

A08 – Update Patient

```
MSH|^~\&|JResultNet|Device3|Abbott Point of Care|Abbott Point of Care|20140916174253||
ADT^A08^ADT-8|85257|P|2.6
PID|1||P9001||NewLastName^NewFirstName^NewMidddleName||19610615|M||Asian|PatAddr1^^San
Francisco^CA^33954^USA||58594584467|2399316004||||PatAccountNumber
PV1|1||Uptown^LocRoom^LocBed^LocDept^^^LocBuilding^LocFloor||||
DoctorCode22^DoctorLast^DoctorFirst^DoctorSuffix||||||||||||||||||||||||||||||||||||20140625

MSH|^~\&|Abbott Point of Care|Abbott Point of Care|||20140916174512||ACK^A08^ACK|
39805f9c-1fe2-480b-a017-1c2e48d9bad4|P|2.6
MSA|AA|85257
```

A03 – Discharge Patient

```
MSH|^~\&|JResultNet|Device3|Abbott Point of Care|Abbott Point of Care|20140916174049||
ADT^A03^ADT-A03|85256|P|2.6
PID|1||P9001||Smith^O^A||19610615|F||Hispanic|Oxbridge Way^^Rochester^FL^33913^USA||
5859458467|2399316004||||PatAccountNumber
PV1|1||Downtown^LocRoom^LocBed^LocDept^^^LocBuilding^LocFloor||||
DoctorCode^DoctorLast^DoctorFirst^DoctorSuffix||||||||||||||||||||||||||||||||||||20140625|20140626

MSH|^~\&|Abbott Point of Care|Abbott Point of Care|||20140916174308||ACK^A03^ACK|7c6b9dc0-
accb-43e3-91bc-e6f4233452f0|P|2.6
MSA|AA|85256
```

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Cartridges and Analytes

For the tables below, please note:

- Analyte names separated by "/" indicate possible variants of analyte strings for the same analyte. Only one analyte string variant will be received in one test result.
- The tables below represent the analytes which are supported for each cartridge type. Depending on the customization of an instrument, not all analytes will always be sent.
- An asterisk (*) indicates a calculated value.

Table 13: EC8+ supported analytes

pH
PCO2
HCO3
BE/BE,ecf/BE,bld
TCO2
Na
K
Cl
AnGap
Glu
BUN/Urea
Hct/Hct,CPB
Hb/Hb*/Hb*,CPB

Table 14: CG8+ supported analytes

pH
PCO2
PO2
HCO3
BE/BE,ecf/BE,bld
sO2
TCO2
Na
K
iCa
Glu
Hct/Hct,CPB
Hb/Hb*/Hb*,CPB

Table 15: EG7+ supported analytes

pH
PCO2
PO2
HCO3
BE/BE,ecf/BE,bld
sO2
TCO2
Na
K
iCa
Hct/Hct,CPB
Hb/Hb*/Hb*,CPB

Table 16: CHEM8+ supported analytes

Na
K
Cl
TCO2
BUN/Urea
Crea
eGFR (i-STAT Alinity only)
eGFR-a (i-STAT Alinity only)
Glu
iCa
AnGap
Hct/Hct,CPB
Hb/Hb*/Hb*,CPB

Table 17: EG6+ supported analytes

pH
PCO2
PO2
HCO3
BE/BE,ecf/BE,bld
sO2
TCO2
Na
K
Hct/Hct,CPB
Hb/Hb*/Hb*,CPB

Table 18: CG4+ supported analytes

pH
PCO2
PO2
HCO3
BE/BE,ecf/BE,bld
sO2
TCO2
Lac

Table 19: 6+ supported analytes

Na
K
Cl
Glu
BUN/Urea
Hct/Hct,CPB
Hb/Hb*/Hb*,CPB

Table 20: G3+ supported analytes

pH
PCO2
PO2
HCO3
BE/BE,ecf/BE,bld
sO2
TCO2

Table 21: EC4+ supported analytes

Na
K
Glu
Hct/Hct,CPB
Hb/Hb*/Hb*,CPB

Table 22: E3+ supported analytes

Na
K
Hct/Hct,CPB
Hb/Hb*/Hb*,CPB

Table 23: G supported analytes

Glu

Table 24: Crea supported analytes

Crea
eGFR (i-STAT Alinity only)
eGFR-a (i-STAT Alinity only)

Table 25: ACTk supported analytes

ACT WBT/ACT-K(Nonwarm)/ACT-K(Prewarm)

Table 26: ACTc supported analytes

ACT WBT/ACT-C(Nonwarm)/ACT-C(Prewarm)

Table 27: PTplus supported analytes

PT+
INR+

Table 28: PTplus/aPTT supported analytes

aPTT
PT+
INR+

Table 29: PT supported analytes

PT
INR

Table 30: β-HCG supported analytes

BhCG
hCG

Table 31: cTnI supported analytes

cTnI

Table 32: CK-MB supported analytes

CK-MB

Table 33: BNP supported analytes

BNP

Analyte Symbols sent to LIS

Analyte Value Strings

Test records may have accompanying analyte data, which is contained in the **Analyte** data table of the dataset returned to the third party data manager. The Value field is a string that may contain special characters that specify abnormal readings. The following table lists the possible values.

Value String	Comments
n	An integer or floating point with a possible negative prefix. This is the case of a successfully generated analyte value.
***	“Star Out,” measurement not possible (sensor error, etc.)
<>	Suppressed, value could not be calculated.
>n	Value is above the 'n' upper limit of the measurement range.
<n	Value is below the 'n' lower limit of the measurement range.
?n	Value manually rejected by user. (BAM only)
?***	Star out rejected by user. (BAM only)
-?-	Result manually rejected by user. (BAM only)
(+)	Positive hCG result
(-)	Negative hCG result
( )	Indeterminate hCG result

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