cobas® infinity central lab

Host Interface Manual version 6.0
ASTM for PSM
Software version 3.02

Publication information

Publication version	Software version	Revision date	Change description
1.0	1.2.10	August 2015	First version
2.0	2.0	May 2016	Updates of the HL7 default interface Description of the following default interfaces in separate manuals: • Information Manager™ HL7 • Information Manager ASTM • PSM ASTM
2.1	2.0	June 2016	Updates and corrections
3.0	2.1	May 2017	• New manual available describing the HL7 PSM default interface • Updated message structures and segment usage • Correction of errors What is new in publication version 3.0 (9)
4.0	2.2	November 2017	Disclaimer added regarding availability of products in different markets. Otherwise, no changes.
4.1	2.3	March 2018	Minor update • No change to the ASTM interface for PSM
4.2	2.4	September 2018	No changes
4.3	2.5	November 2018	No changes
5.0	3.0	March 2019	No changes
5.1	3.01	May 2019	No changes
6.0	3.02	October 2019	Minor change • Change of configuration for the repetition of record blocks for patient result message What is new in publication version 6.0 (8)

Revision history

Edition notice

This publication is intended for Host Interface programmers and Roche field engineers of the **cobas® infinity** central lab application.

Every effort has been made to ensure that all the information contained in this publication is correct at the time of publishing. However, the manufacturer of this product may need to update the publication information as output of product surveillance activities, leading to a new version of this publication.

Where to find information

The **User Guide** and the **User Assistance** focus on routine operation and configuration. The chapters are organized according to the normal operation workflow.

⚠ General attention

To avoid incorrect results, ensure that you are familiar with the instructions and safety information.

- Pay particular attention to all safety notices.
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- Do not use the software in a way that is not described in this publication.
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Intended use

The **cobas® infinity** central lab software is intended to be used for:

- the configuration and connectivity management of instruments and software systems
- The management of data regarding
  - Samples
  - Technical validation including automatic release
  - Quality Control (both qualitative and quantitative)
  - Test results and their entry (offline workplaces)
- The management and storing of information, such as
  - Samples Archiving Storage information
  - Rule engine for technical validation
  - Notifications from any part of the system
  - Reagent and Calibrator management
  - Turn Around Time management
  - Production statistics

In addition to the above intended use, the **cobas® infinity** central lab software is intended for:

- The management of data regarding
  - Order Data
  - Patient Data
  - Medical Validation support
  - Result Consolidation and Reporting
  - Billing support
- The management and storing of information, such as
  - General statistics (Data Warehouse)
- Microbiology workflows and data for: (Microbiology module)
  - Human samples

Scope of publication version 1.0

This publication only documented the configuration of the HL7 default host interface provided by the system.

If you require information about the configuration of other communication protocols supported by the system, talk to your Roche Service representative.

What is new in publication version 6.0

The following changes have been made.

Patient result message

The configuration for the repetition of record blocks has been modified for the patient result message.

Patient result message (33)

What is new in publication version 5.1

There are no changes in publication version 5.1 affecting the ASTM_PSM host interface.

What is new in publication version 5.0

There are no changes in publication version 5.0 affecting the ASTM_PSM host interface.

What is new in publication version 4.1

There are no changes in publication version 4.1 affecting the ASTM_PSM host interface.

What is new in publication version 4.0

A disclaimer has been added in the front matter, regarding the availability of products in different markets. Otherwise, there are no changes in the publication version 4.0.

What is new in publication version 3.0

Changes include the following:

Patient ID in sample event message

Field P-4 in the patient record of the sample event message is disabled by default.

Patient record in a sample event message (43)

What is new in publication version 2.1

Changes include minor updates of the default HL7 interface, and the documentation of 3 additional default interfaces provided by **cobas® infinity** central lab.

Additional default interfaces

The **cobas® infinity** central lab now provides the following 4 default host interfaces.

Default interface(1)	Description
IM_ASTM	ASTM interface from Instrument Manager™
IM_HL7	HL7 interface from Instrument Manager™
ASTM_PSM	ASTM interface from PSM
HL7_default	Default HL7 interface (as available in version 1.0, plus minor updates)

Default interfaces

(1) A separate host interface manual is available for the each default interface.

Symbols and abbreviations

Product names

Except where the context otherwise requires, the following product names and abbreviations are used.

Product name	Abbreviation
cobas® infinity central lab	System
PSM	Preanalytic Systems Manager

Product names

Symbols

The following symbols are used.

Symbol	Explanation
	Code example. Used in code titles and cross-references to codes.
•	List item
	Tip. Extra information on correct use or useful hints.
	Related topics containing further information
	Figure. Used in figure titles and cross-references to figures.
	Table. Used in table titles and cross-references to tables.

Symbols

Abbreviations

The following abbreviations are used.

Abbreviation	Definition
ANSI	American National Standards Institute
ASTM	American Society for Testing andMaterials
CLSI	Clinical and Laboratory StandardsInstitute (formerly known as theNational Committee for ClinicalLaboratory Standards [NCCLS])
GUID	Global Unique Identifier
HL7	Health Level 7
IM	Instrument Manager ™
ISO	International Standards Organization
LIS	Laboratory Information System
LOINC	Logical Observation Identifiers Names and Codes
MLLP	Minimal Lower Layer Protocol
OSI	Open System Interconnection
TCP/IP	Transmission Control Protocol / Internet Protocol
UCUM	Unified Code for Units of Measure
UL	Underwriters Laboratories Inc.

Abbreviations

ASTM reference

CLSI/ASTM standards

This chapter describes the CLSI/ASTM standards for exchanging information between the system and the LIS.

In this chapter 1

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About this document

This document describes the ASTM_PSM host interface provided by **cobas® infinity** central lab, which is designed to replace the original PSM interface. The ASTM_PSM interface contains a set of preconfigured messages for the exchange of information between **cobas® infinity** central lab and a host system. The structure and syntax of the default messages are detailed in the following sections.

A separate host interface manual is available for the each of the following default interfaces. Use the manual that applies to your interface.

Default interface	Description
HL7 default	Default HL7 interface
HL7_PSM	HL7 interface from PSM
IM_HL7	HL7 interface from Instrument Manager™
ASTM_PSM	ASTM interface from PSM
IM_ASTM	ASTM interface from Instrument Manager™
PBP	PBP (Protocol Based on Pipes) interface
Omega	Default interface for data exchange between **cobas® infinity** central lab and Omega LIS
BIO_RAD	Default interface for data exchange between **cobas® infinity** central lab and the UnityConnect™ software from BIORAD.
eQC	Default interface designed to send QC results to a LIS/HIS via FTP server.

Default interfaces

⚠ WARNING

Incorrect message format

If an external host sends messages not according to the communication standards used by **cobas® infinity** central lab, it can lead to delayed and/or incorrect results.

- When exchanging data with **cobas® infinity** central lab, ensure that the message format complies with the communication standards used by **cobas® infinity** central lab.

⚠ CAUTION

Host connection

Incorrect configuration of the host connection can cause loss of data, or delay patient results.

- Ensure correct host connection at all time.

Note: The default interface is configurable. If you wish to modify the default messages, or add additional messages, talk to your Roche Service representative.

Note: cobas® infinity central lab supports multiple protocols. If you require a protocol other than ASTM, talk to your Roche Service representative.

About CLSI/ASTM standards

CLSI provides standards for the two-way transmission of information between laboratory instruments and computers systems and specifies the content and structure of the messages to be exchanged.

LIS1-A2

CLSI document LIS1-A2 specifies the standards for the electronic transmission of digital information between clinically laboratory instruments that measure 1 or more parameters from 1 or multiple samples and computer systems that are configured to accept instrument results for further processing, storage, or reporting.

The LIS1-A2 specifications address the low-level protocol used for the exchange of serial binary data and TCP/IP data. LIS1-A2 is a revision of the former ASTM document **E1381-02**. For detailed documentation on the LIS1-A2 standard, refer to the following publication.

Clinical and Laboratory Standards Institute (CLSI). *Specification for Low-Level Protocol to Transfer Messages Between Clinical Laboratory Instruments and Computer Systems - Second Edition*. CLSI document LIS01-A2 (ISBN 1-56238-665-4). CLSI, 940 West Valley Road, Suite 1400, Wayne, Pennsylvania 19087-1898, USA, 2008.

LIS2-A2

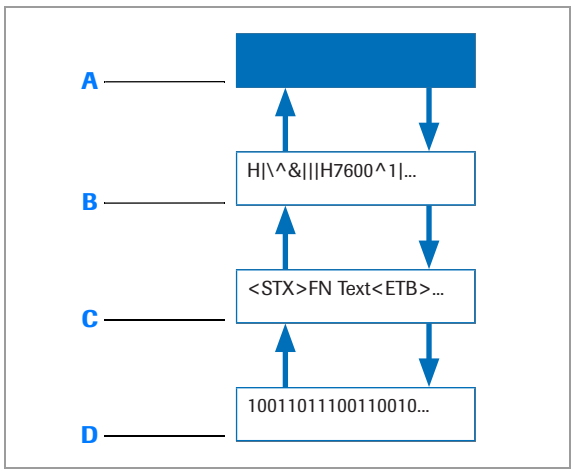
CLSI document LIS2-A2 defines the content and structure of the messages exchanged between clinical laboratory instruments and computer systems (high level protocol). It enables any 2 such systems to establish a logical link to communicate text messages including results, requests or patient demographics in a standardized and interpretable manner.

LIS2-A2 is a revision of the former ASTM document **E1394-97**. For detailed documentation on the LIS2-A2 standard, refer to the following publication.

NCCLS. *Specification for Transferring Information Between Clinical Laboratory Instruments and Information Systems: Approval Standard—Second Edition*. NCCLS document LIS2-A2 (ISBN 1-56238-550-X). NCCLS, 940 West Valley Road, Suite 1400, Wayne Pennsylvania 19087-1898, USA, 2004.

About processing layers

The communication process between the **cobas**® **infinity** central lab and the LIS is divided into 4 layers, as shown on the left.



A Application layer. Server specification of host communication

B ASTM Upper Layer (LIS1-A2)

C ASTM Lower Layer (LIS2-A2)

D Physical Layer

About ASTM lower layer

ASTM lower layer receives messages for a transmission request from the upper layer. These messages are then split into frames and sent to a communication medium to be transmitted to other parties. ASTM lower layer also constructs frames received from a communication medium to recreate messages to be transferred to the ASTM upper layer as reception messages.

Data packaging

The LIS1-A2 standard defines 2 methods of how data are packed into frames.

- *Unpacked method:* Each frame contains 1 record. If a record exceeds 240 bytes, it is split across multiple frames.
- *Packed method:* Each frame contains the maximum amount of data allowed (240 bytes). A frame can consist of more than 1 record.

By default, the system supports the unpacked method. You can configure the packaging method in **Administration > HCA > (Select host) > ASTM tab**.

- Low level = unpacked
- High level = packed

Configuration and communication procedures for sending and receiving frames are explained in the following sections.

About frames

For transmission, messages are split in 1 or multiple frames. Frames consist of the text message and a set of transmission control characters defining type, number, and start and end of the frame.

Frames are data packages with limited size.

- The maximum size for 1 ASTM frame is 246 characters.
- Messages equal to or less than 246 characters are transmitted as 1 final frame.
- Messages greater than 246 characters are split into multiple frames of equal or less than 246 characters.
- The only or final frame becomes the end frame and is indicated by <ETX>. All others are intermediate (middle) frames and are indicated by <ETB>.
- Multiple messages are never combined in a single frame.
- Each message must begin with a new frame.

Frame type

2 types of frames exist: intermediate frames and end frames. They differ in syntax as illustrated below.

[STX]	FN	Text first char ... Text last char	ETB	CH	CL	[CR]	[LF]

Intermediate frame

[STX]	FN	Text first char ... Text last char	ETX	CH	CL	[CR]	[LF]

End frame

Syntax

The table below explain the framing syntax.

Characters[1]	ASCII code	Explanation
<STX>	2	Indicates the beginning of a frame transmission (HEX 02).
<ETB>	23	Indicates the end of the text block of an intermediate frame (HEX 17).
<ETX>	3	Indicates the end of the text block of the final frame (HEX 03).
<CR>	13	Carriage return, indicates end of record/message (HEX 0D).

ASTM (LIS2-A2) message framing

Characters[1]	ASCII code	Explanation
<LF>	10	New line, indicates end of record (HEX 0A)
FN		FN is a single ASCII number. It indicates the sequence number for a frame (the frame number modulus 8). Frames of a single transmission phase are consecutively numbered beginning with 1, so FN runs from 1 to 7, then continues with 0, 1, and so on.
CH, CL		When 1 byte resulting from adding each byte, FN to <ETB> for the middle frame and FN to <EXT> for the last frame, is expressed in hexadecimal, the upper character (161) is CH and the lower character (160) is CL. Characters used are '0' to '9' or 'A' to 'F'.

ASTM (LIS2-A2) message framing

(1) Control characters are enclosed in < >

If the host does not support the standard framing characters, they are configurable in **Administration > HCA > Protocols**.

The system only sends 1 message block at a time.

Time intervals

The system defines the following time intervals when communicating with a host.

Parameter	Interval	Description
Reading time	3 sec	Maximum time allowed for the sending/receiving system to check whether a connection can be established. Configurable in **Administration > HCA > Protocols**
Waiting time	15 sec	Interval required to elapse before the system sends or reads a message. Configurable in **Administration > HCA > Protocols**

Time intervals

Checksum calculation

The checksum is an ASCII transmission control character allowing the receiver to detect a corrupt frame.

Checksum definition

The checksum is an integer represented by 8 bits, which can be considered as 2 groups of 4 bits. The groups of 4 bits are converted to ASCII characters of hexadecimal representation.The 2 ASCII characters, `CH` and `CL`, are then transmitted as the checksum, with the most significant character first.

Checksum calculation

The checksum is calculated by adding the binary values of the characters in a frame excluding <STX>, CH, CL, <CR>, and <LF>.

Calculation starts with the frame number (FN), and each character of the text message is then successively added.

[STX]	The ASCII code 2, indicating the beginning of a frame transmission.
FN	The frame number modulus 8. Frames of a single Transmission Phase are consecutively numbered beginning with 1. So FN runs from 1 to 7, continues with 0, 1, and so on. Use ASCII codes for the digits '0' to '7' (48-55).
Text	The data content of a frame (max. 63993 characters). Records are sub-divided into intermediate frames with 63993 characters. Maximum is indicated by [ETB]. The only or last remaining frame is indicated by [ETX]. Different records must be sent in different frames.
[ETB]	The ASCII code 23 (17hex), indicating the end of the text block of an intermediate frame.
[ETX]	The ASCII code 3, indicating the end of the text block of an end frame.
CH, CL	Represents the high nibble (most significant 4 bit) and the low nibble (least significant 4 bit) of the 8-bit checksum respectively. CH and CL are represented as 2 digits of hex numbers. The checksum is the modulus 8 of the sum of ASCII values of the frame characters starting with and including 'FN' and completing with [ETX] respectively [ETB].

An example for the checksum calculation is provided below.

- Frame structure:

  <STX> FN (text) <ETX> CH CL <CR> <LF>

- Example message:

```
[STX]1Test[ETX]
```

Character	Value (hex)	Sum (hex)
[STX]	02	00
'1'	31	31
'T'	+54	85
'e'	+65	EA
's'	+73	15D
't'	+74	1D1
[ETX]	+03 = 1D4 Checksum = D4	1D4

Checksum calculation

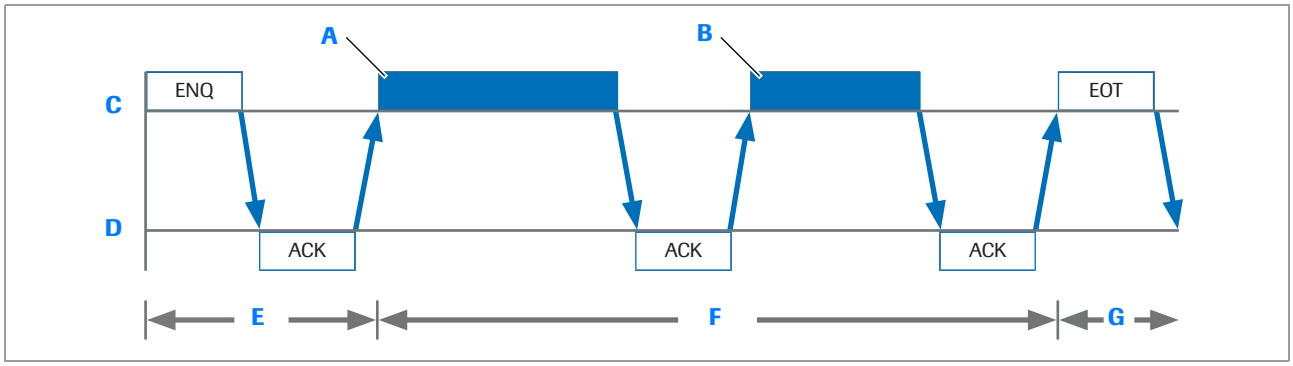
Thus the message to be sent is:

```
[STX]1Test[ETX]D4[CR][LF]
```

Message transmission phases

To establish which system sends and which system receives information, and to assure that the actions of sender and receiver are well coordinated, there are 3 distinct phases in transferring information.

- Establishment phase
- Transfer phase
- Termination phase



A Intermediate frame
B End frame
C Sender
D Receiver
E Establishment phase (ACK must be sent within 10 ms.)
F Transfer phase
G Termination phase

Establishment phase

The direction of information flow is determined and the receiver prepared to accept information.

- After the sender determines the data link is in a neutral state, it transmits the <ENQ> transmission control character to the intended receiver to establish a link connection.
- Upon receiving <ENQ>, the receiver prepares to receive information. All other characters are ignored.
- If the receiver is ready to receive data, it responds with <ACK>. This event ends the establishment phase and initiates the transmission phase.
- If the receiver is not ready to accept data, it replies with <NAK>. Upon receiving <NAK>, the sender must wait 15 sec before retransmitting <ENQ>.

Transmission phase

The sender transmits messages to the receiver. Messages are sent in frames to enhance data transmission. After sending a frame, the sender stops the transmission until receiving a reply from the sender. The receiver can reply with the following 2 transmission control characters.

- <ACK> to indicate that the last frame was received successfully
- <NAK> to indicate that the last frame was received not successfully.

Termination phase

The termination phase returns the data link to the neutral state. The sender notifies the receiver that all messages have been sent.The sender transmits <EOT> and then regards the data link to be in neutral state. Upon receiving <EOT>, the receiver also regards the data link to be in neutral state, thereby terminating the communication.

If no acknowledgment character is received within 15 seconds, a time-out occurs, and the sender enters the termination phase by transmitting <EOT>, which returns the connection to the idle state.

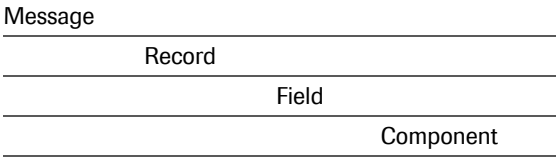
More details

Further details on error handling are available in the document: Clinical and Laboratory Standards Institute (CLSI). S*pecification for Low-Level Protocol to Transfer Messages Between Clinical Laboratory Instruments and Computer Systems - Second Edition*. CLSI document LIS01-A2

About the LIS2-A2 (high-level) protocol

The LIS2-A2 protocol defines the structure and content of the messages transmitted between the system and the LIS.

Data in an ASTM message is organized hierarchically.



Message hierarchy

Message

A message is defined as an entire unit of data transmitted between sender and receiver. A message is triggered by a real event which generates a workflow. Messages begin with a 'Message Header Record' that indicates the beginning of a message and end with a 'Message Termination Record' that indicates the end of a message.

Records

Each line of an ASTM message is a record. A record consists of several fields and serves a single purpose (such as to specify result reports or test requests). In a message, records can be required or optional, and occur only once or repeatedly. The code that indicates the purpose of a record is noted in the first character of that record.

Fields

Each record consists of multiple fields. A field contains information about 1 specific attribute of the segment. Fields may be required, optional, or conditional, and may occur only once or repeatedly.

Components

Fields are subdivided into components that refer to a logical set of characters within a field.

Size and content of frames is defined.

- ASCII characters 32-126 are allowed. The system also reads the characters 128-254 according to Latin-1 (ISO/IEC 8859), but when transmitting data, the system escapes characters in the range 128-254.
- If not otherwise stated, the content is case-sensitive.
- Text in text data fields cannot contain delimiters.
- No storage is allocated for a null field (except for delimiters).
- The maximum length of a field is not defined but depends on the receiver's buffer capacity and the logical layer's transport facilities.

Delimiters

Encoding characters, or delimiters, define how data is separated in a message. Delimiters are not part of the message content

When sending messages:

- The system sends the following delimiters in the field H-2.

Delimiter	ASCII code	Function
|	124	Separates fields
\	93	Separates repetitions
^	94	Separates components
&	38	Indicates the escape character

Delimiters

When receiving messages:

- The system reads the delimiters from the incoming message.
- It is not necessary to send the delimiters in H-2. The system ignores this field.

The field and component delimiters are configurable in **Administration > HCA > Protocols**.

Note: the system does not support the escape and repetition delimiters.

Data type

The following table defines the data type that can be included in the message fields.

Data type	Record identifier
Char	Single character. Content specified by “Received from Host” or “Transmitted to Host” field.
String	String with a maximum of 32000 characters

Data types

Data type	Record identifier
Integer	0 to 2,000,000,000
Datetime	Time Stamp. The default format is: `YYYYMMDDHHMMSS` • `YYYY` is the four-digit Gregorian year • `MM` is the month • `DD` is the day. • `HH` is the hour, as 24-hour military time. • `MM` is the minute. • `SS` is the second. **Note:** Seconds (SS) are optional. **Note:** by default, the system does not support the addition of the time zone (`+HHMM/-HHMM`). LIS2-A2, section 5.6.2
Date	Date as specified by ASTM: `YYYYMMDD`

Data types

Coding rules

Some fields must always be present, others may never be present, and others may only be present under certain circumstances. The following codes are used to indicate the usage of fields in a record.

Value	Description
R	Required
C	Conditional
O	Optional
-	Not supported

Field usage

Directionality

This publication visualizes the directionality of ASTM segments/messages by different colors as illustrated below:

```
Incoming message (system<-host)
```

```
Outgoing message (system->host)
```

```
Message with unspecified directionality
```

ASTM_PSM default messages

This chapter describes the structure and syntax of the messages preconfigured by the ASTM_PSM interface.

In this chapter 2

2 ASTM_PSM default messages

Messages sent by the system

This section describes the default messages sent from the system to the host.

Changing field values

To change the default value of a field, do the following:

1. Choose **Administration > HCA > Host message config.**.
2. Select a configuration.
3. Choose the **Send** button.
4. Change the value of the field you wish to change.

Fields that are not supported by the system are omitted in the following message structure tables.

In this section

Patient result message

The system sends a message with the following records, to inform the host of patient test results.

Record type ID	Record name	Link
H	Header record	Header record in a result message (34)
P	Patient record	Patient record in a result message (34)
C	Comment on patient record	Patient comment record in an order message (35)
O	Order record	Order comment record in a result message (37)
C	Comment on order record	Order comment record in a result message (37)
R	Result record	Result record in a result message (37)
C	Comment on result record	Result comment record in a result message (38)
L	Termination record	Terminator record in a result message (39)

Structure of patient result message

```
H|\^&|7||cobas infinity ^Roche Diagnostics^^2.0|||||cobas infinity ^Roche
Diagnostics||P||20160404101951
P|1|MGP1504|||Pérez Esteban^Raúl||19670101|M
C|1|L|Coded comment 02|G
O|1|T2T20160404000004||^^^120\^^^122|R||||||X||||||||||0||||F
R|1|^^^120^5^^^c6k|12|||TV,TPNR,TH||F||||20160404101907
R|2|^^^122^5^^^c6k|255|||||F||||20160404101907
L|1|N
```

Patient result message

Field	Component	Data type	Max size	Usage	Field name	Comments
H-1		Char	1	R	Record type ID	Identifier for Header record (H)
H-2		String	4	R	Delimiter definition	Specification of the delimiters used in the message. LIS2-A2 default values are: • | : Field delimiter = vertical bar [124 • \ : Repeat delimiter = backslash [92 • ^ : Component delimiter = caret [94 • & : Escape delimiter = ampersand [38
H-3		String	50	R	Message control	Internally-generated ID for the message. Increments by 1 for each message.
H-5				R	Sender name or ID	
	H-5.1	String	255			Value = `cobas infinity` Ask the Roche Service representative if you would like to change this.
	H-5.2	String	255			Value = `Roche Diagnostics`
	H-5.4					Version number (`2.0`)
H-10				R	Receiver ID	
	H-10.1	String	255			Value = `cobas infinity` Ask the Roche Service representative if you would like to change this.
	H-10.2	String	255			Value = `Roche Diagnostics`
H-12		Char	1	O	Processing ID	Value = `P`
H-14		Datetime	14	R	Date and Time	Date/time when message was generated. Follows the format YYYYMMDD24MMSS, specified in CLSI LIS02-A2

Header record in a result message

Field	Component	Data type	Max size	Usage	Field name	Comments
P-1		Char		R	Record type ID	Identifier for Patient record (P)
P-2		Integer		R	Sequence number	
P-3		String	50	O	External patient ID	Patient ID. Patient demographic value If you require a different value, talk to your Roche Service representative. The field is configurable in **HCA** > (message type) > **Send**.
P-6				O	Patient name	Patient demographic value. This field automatically supports either Hispanic naming conventions or standard European or international naming conventions. **Note:** If you upgrade from PSM, you need no special configuration.
	P-6.1	String	80		Last name	Patient's family name
	P-6.2	String	80		Second surname	Patient's second surname. Both surnames, if Hispanic naming conventions are used.
	P-6.3	String	80		First name	Patient's first name

Patient record in a result message

Field	Component	Data type	Max size	Usage	Field name	Comments
P-8		Date	8	O	Date of birth	If sent, the system uses this value in addition to name and gender to identify a patient. Format YYYYMMDD.
P-9		Char	1	O	Gender	Patient demographic value • M = Male • F = Female • U = Unknown
P-10					Race / Ethnicity	*Not supported. Empty.* If upgrading from PSM, note that this field is no longer supported.
P-19					Diagnosis	Order demographic value
	P-19.1	String	255	O		Diagnosis code
	P-19.2	String	255	O		Text description of the diagnosis
P-24		Datetime			Registered date and time	Used to identify the sample uniquely, together with the sample ID. Format: YYYYMMDD24MMSS. The system only fills this if the instrument sends a value in this field.
	P-24.1	Datetime	14	R	Register date and time	Date and time when the system registered the tube. Format: YYYYMMDD24MMSS.
	P-24.2	Datetime	14	R	Extraction date and time	Format: YYYYMMDD24MMSS.
P-26				O	Origin	Orderer, requester, or ward. Order demographic value
	P-26.1	String	50	O		Orderer code
	P-26.2	String	255	O		Text description of orderer
P-27					Invoicing Group	
	P-27.1	String	50	O		Invoicing group code
	P-27.2	String	255	O		Text description of invoicing group
P-33				O	Hospital service	Order demographic value
	P-33.1	String	50	O		Service code
	P-33.2	String	255	O		Text description of service
P-34				O	Destination	Order demographic value
	P-34.1	String	50	O		Hospital institution code
	P-34.2	String	255	O		Text description of hospital institution

Patient record in a result message

Field	Component	Data type	Max size	Usage	Field name	Comments
C-1		Char		R	Record type ID	Identifier for Comment record (C)
C-2		Integer		R	Sequence number	

Patient comment record in an order message

Field	Component	Data type	Max size	Usage	Field name	Comments
C-3		c	1		Comment source	Origin of comment: • L = instrument comment or **cobas**® infinity system rules • I = clinical instrument system
C-4		String	3200 0		Comment text	
C-5		String	1		Comment type	• G = generic or free text comment • I = instrument alarm or comment

Patient comment record in an order message

Field	Component	Data type	Max size	Usage	Field name	Comments
O-1		Char	1	R	Record type ID	Identifier for Order record (O)
O-2		Integer		R	Sequence number	
O-3		String	50	R	External container ID	Sample ID, or tube barcode ID
O-4				O	Rack and position	
	O-4.1					*Not supported. Empty.*
	O-4.2	Integer				Rack number
	O-4.3	Integer				Numeric position on rack
O-5				R	Test ID	
	O-5.1					*Not supported. Empty.*
	O-5.2					*Not supported. Empty.*
	O-5.3					*Not supported. Empty.*
	O-5.4	String	50	R	Host test ID	
	O-5.5					*Not supported. Empty.*
	O-5.6					*Not supported. Empty.*
	O-5.7					*Not supported. Empty.*
	O-5.8					*Not supported. Empty.*
O-6		String	1	O	Priority / Application ID	Priority • R = Routine (default) • S = STAT • M = Microbiology
O-7		Datetime	14	O	Requested / ordered date and time	Used with the sample ID to identify the sample. The system only fills this if the instrument sends a value in this field.
O-8		Datetime	14	O	Specimen collection date and time	
O-12		String	1	R	Action code	Value = X. (Samples or tests are in processing.)
O-16		String	50	O	Sample type (Specimen type)	Code for the Sample type (urine, serum, etc.) If you require a different value, talk to your Roche Service representative. The field is configurable in **Import / Export** > **Assign host config.** > **Sample types**.

Order record in a result message

Field	Component	Data type	Max size	Usage	Field name	Comments
O-21						The system does not support this field. **Note:** PSM supports this field.
O-22		String	1	O	Rerun flag	Empty, except for rerun results.
O-26		String	1	R	Report type	Instruction code. Value = `F` (final results)..

Order record in a result message

Field	Component	Data type	Max size	Usage	Field name	Comments
C-1		Char	1	R	Record type ID	Identifier for Comment record (`C`)
C-2		Integer		R	Sequence number	
C-3		String	1	R	Comment source	Origin of comment: • `L` = instrument comment or **cobas**® infinity system rules • `I` = clinical instrument system
C-4		String	32000	O	Comment text	
C-5		String	1	R	Comment type	Value = `G` (generic or free text comment)

Order comment record in a result message

Field	Component	Data type	Max size	Usage	Field name	Comments
R-1		Char		R	Record type ID	Identifier for Result record (`R`)
R-2		Integer		R	Sequence number	
R-3				R	Universal test ID	
	R-3.1					*Not supported. Empty.*
	R-3.2					*Not supported. Empty.*
	R-3.3					*Not supported. Empty.*
	R-3.4	String	50	R	Host test ID	
	R-3.5	String	50	O	Dilution	As received from analyzer.
	R-3.6					*Not supported. Empty.*
	R-3.7					*Not supported. Empty.*
	R-3.8	String	102	O	Instrument ID	Instrument code
R-4		String	50	R	Result value	
R-7		String	50	O	Result abnormal flags	For supported alarm codes, see table below.

Result record in a result message

Field	Component	Data type	Max size	Usage	Field name	Comments
R-9		String	50	R	Result type	Supported codes: • P = preliminary results. Shows that final results will be sent later. • F = Final results. Further results not expected.
R-13		Datetime	14	R	Date/time test completed	Format: YYYMMDD24MMSS
R-14		String	102	O	Instrument ID	Instrument code

Result record in a result message

Result abnormal flags

The flags in R-7 show if the result is in the normal range or not. The system supports the following flags by default:

Flag	Explanation
L	below low normal
H	above high normal
LL	below panic normal
HH	above panic high
<	below absolute low that is off low scale on an instrument
>	above absolute high, that is off high scale on an instrument

Result flags

You can define new alarms in **Administration > Validation > Alarm types.**

You can map external alarm codes to internal alarm codes in **Administration > Import\export > Assign host config** (select host)**Notificaitons**.

Field	Component	Data type	Max size	Usage	Field name	Comments
C-1		Char	1	R	Record type ID	Identifier for Comment record (C)
C-2		Integer	1	R	Sequence number	
C-3		String	1	R	Comment source	Origin of comment: • L = instrument comment or **cobas**® infinity system rules • I = clinical instrument system
C-4		String	32000	O	Comment text	
C-5		String	1	R	Comment type	• G = generic or free text comment • I = instrument alarm or comment

Result comment record in a result message

Field	Component	Data type	Max size	Usage	Field name	Comments
L-1		Char	1	R	Record type ID	Identifier for Terminator record (`L`)
L-2		Integer	1	R	Sequence number	Value = `1`
L-3		String	1	R	Termination code	Value = `N` (normal termination)

Terminator record in a result message

Quality control result message

Quality control results are uploaded to the host in a message as follows.

Record type ID	Record name	Link
H	Header record	Header record in a quality control result message (39)
P	Patient record	Patient record in a quality control result message (40)
O	Order record	Order record in a quality control result message (40)
R	Result record	Result record in a quality control result message (41)
L	Termination record	Terminator record in a quality control result message (41)

Structure of quality control result message

```
H|\^&|8||cobas infinity ^Roche Diagnostics^^2.0|||||cobas infinity ^Roche
Diagnostics||Q||20160404111224
P|1
O|1|C1||ALL|||||||X\Q|||||||||||||||F
R|1|^^^121^^^^c6K|155|||||F||||20160404111204|c6K
L|1|N
```

Quality control result message

Field	Component	Data type	Max size	Usage	Field name	Comments
H-1		Char	1	R	Record type ID	Identifier for Header record (H)
H-2		String	4	R	Delimiter definition	Specification of the delimiters used in the message. LIS2-A2 default values are: • `|` : Field delimiter = vertical bar [124 • `\` : Repeat delimiter = backslash [92 • `^` : Component delimiter = caret [94 • `&` : Escape delimiter = ampersand [38
H-3		String	50		Message control	Internally-generated ID for the message. Increments by 1 for each message.

Header record in a quality control result message

Field	Component	Data type	Max size	Usage	Field name	Comments
H-5				R	Sender name or ID	XXXXXXX
	H-5.1	String	255			Value = `cobas infinity` If you require a different value, talk to your Roche Service representative.
	H-5.2	String	255			Value = `Roche Diagnostics`
	H-5.4					Version number (`2.0`)
H-10					Receiver ID	
	H-10.1	String	255			Value = `cobas infinity` If you require a different value, talk to your Roche Service representative.
	H-10.2	String	255			Value = `Roche Diagnostics`
H-12		Char	1	O	Processing ID	Value = `Q`
H-14		Datetime	14	R	Date and Time	Date/time when message was generated. Follows the format YYYYMMDD24MMSS, specified in CLSI LIS02-A2

Header record in a quality control result message

Field	Component	Data type	Max size	Usage	Field name	Comments
P-1		Char	1	R	Record type ID	Identifier for Patient record (P)
P-2		Integer	1	R	Sequence number	Fixed value = `1`

Patient record in a quality control result message

Field	Component	Data type	Max size	Usage	Field name	Comments
O-1		Char	1	R	Record type ID	Identifier for Order record (`O`)
O-2		Integer		R	Sequence number	
O-3		String	255	R	External container ID	Sample ID, or tube barcode ID
O-5		String	3	R	Test ID	Value = `ALL`
O-12		String	3	R	Action code	Value = `X\Q`
O-26		Char	1	R	Report type	Instruction code. Value = `F` (final results)

Order record in a quality control result message

Field	Component	Data type	Max size	Usage	Field name	Comments
R-1		Char	1	R	Record type ID	Identifier for Result record (`R`)
R-2		Integer		R	Sequence number	
R-3				R	Universal test ID	
	R-3.1					*Not supported. Empty.*
	R-3.2					*Not supported. Empty.*
	R-3.3					*Not supported. Empty.*
	R-3.4	String		R	Host test ID	
	R-3.5					*Not supported. Empty.*
	R-3.6					*Not supported. Empty.*
	R-3.7					*Not supported. Empty.*
	R-3.8	String		O	Instrument ID	Instrument code
R-4		String		R	Result value	
R-7		String		O	Result abnormal flags	Quality control alarms. Alarm codes are sent as configured at the instrument. Result abnormal flags (38)
R-9		String		R	Result type	`F` = final results. Further results not expected.
R-13		Datetime		R	Date/time test completed	Format: YYYMMDD24MMSS
R-14		String		O	Instrument ID	Instrument code

Result record in a quality control result message

Field	Component	Data type	Max size	Usage	Field name	Comments
L-1		Char	1	R	Record type ID	Identifier for Terminator record (`L`)
L-2		Integer	1	R	Sequence number	Value = `1`
L-3		String	1	R	Termination code	Value = `N` (normal termination)

Terminator record in a quality control result message

Sample event message

Sample event messages tell the host that a specific event has occurred to a specific sample.

The system interface supports two sample events.

- **Sample seen** - This event tells the host that the sample has been seen on an instrument in the laboratory.
- **Sample distribution** - This event tells the host that a sample distribution instrument has distributed the sample or an aliquot to an instrument or other target.

You can configure codes for instruments or targets in **Import/Export > Assign Host Config > Instruments and Targets**.

Record type ID	Record name	Link
H	Header record	Header record in a sample event message (42)
P	Patient record	Patient record in a sample event message (43)
O	Order record	Order record in a sample event message (44)
L	Termination record	Terminator record in a sample event message (45)

Structure of sample event message

```
H|\^&|9||cobas infinity ^Roche Diagnostics^^2.0|||||cobas infinity ^Roche
Diagnostics||P||20160405084147
P|1|923502|||Smith^John||19630101|M|||||||||||||20160405081500
O|1|923502|^230^1|^^^^^^^c6k18||20160405081500|||||X|||20160405084147|2|||||||||c6k18|P
L|1|N
```

Sample event result message

Field	Component	Data type	Max size	Usage	Field name	Comments
H-1		Char	1	R	Record type ID	Identifier for Header record (H)
H-2		String	4	R	Delimiter definition	Specification of the delimiters used in the message. LIS2-A2 default values are: • | : Field delimiter = vertical bar [124 • \ : Repeat delimiter = backslash [92 • ^ : Component delimiter = caret [94 • & : Escape delimiter = ampersand [38
H-3		String	50		Message control	Internally-generated ID for the message. Increments by 1 for each message.

Header record in a sample event message

Field	Component	Data type	Max size	Usage	Field name	Comments
H-5				R	Sender name or ID	
	H-5.1	String	255			Value = `cobas infinity` If you require a different value, talk to your Roche Service representative.
	H-5.2	String	255			Value = `Roche Diagnostics`
	H-5.3					*Not supported. Empty.*
	H-5.4					Version number (`2.0`)
H-10					Receiver ID	
	H-10.1	String	255	R		Value = `cobas infinity` If you require a different value, talk to your Roche Service representative.
	H-10.2	String	255	R		Value = `Roche Diagnostics`
H-12		Char	1	R	Processing ID	Value = `P` (Sample in processing)
H-14		Datetime	14	R	Date and Time	Date/time when message was generated. Follows the format YYYYMMDD24MMSS, specified in CLSI LIS02-A2

Header record in a sample event message

Field	Component	Data type	Max size	Usage	Field name	Comments
P-1		Char	1	R	Record type ID	Identifier for Patient record (P)
P-2		Integer		R	Sequence number	
P-3		String	50	O	External container ID	Sample ID. The is the number on the barcode of the sample tube. If you require a different value, talk to your Roche Service representative. The field is configurable in **HCA** > (message type) > **Send**.
P-4		String	50	O	PatientID1	Patient ID. Patient demographic value By default, this field is disabled in the “sample seen” and “sample distribution” message. If you require this value, talk to your Roche Service representative. The field is configurable in **HCA** > (message type) > **Send**.
P-6				O	Patient name	Patient demographic value. This field automatically supports either Hispanic naming conventions or standard European or international naming conventions. **Note:** If you upgrade from PSM, you need no special configuration.
	P-6.1	String	80		Last name	Patient’s family name
	P-6.2	String	80		Second surname	Patient’s second surname. Both surnames, if Hispanic naming conventions are used.
	P-6.3	String	80		First name	Patient’s first name

Patient record in a sample event message

Field	Component	Data type	Max size	Usage	Field name	Comments
P-8		Date	8	O	Date of birth	If sent, the system uses this value in addition to name and gender to identify a patient. Format `YYYYMMDD`.
P-9		Char	1	O	Gender	Patient demographic value • `M` = Male • `F` = Female • `U` = Unknown
P-24		Datetime	14	O	Registered date and time	Used to identify the sample uniquely, together with the sample ID. Format: YYYYMMDD24MMSS. The system only fills this if the instrument sends a value in this field.

Patient record in a sample event message

Field	Component	Data type	Max size	Usage	Field name	Comments
O-1		Char	1	R	Record type ID	Identifier for Order record (`O`)
O-2		Integer		R	Sequence number	
O-3		String	50	R	External container ID	Sample ID, or tube barcode ID
O-4				O	Rack and position	
	O-4.1					*Not supported. Empty.*
	O-4.2	Integer				Rack number
	O-4.3	Integer				Numeric position on rack
O-5				R	Test ID	
	O-5.1					*Not supported. Empty.*
	O-5.2					*Not supported. Empty.*
	O-5.3					*Not supported. Empty.*
	O-5.4					*Not supported. Empty.*
	O-5.5					*Not supported. Empty.*
	O-5.6					*Not supported. Empty.*
	O-5.7					*Not supported. Empty.*
	O-5.8	String	50	O	Instrument ID	In the sample seen message, the system sends the External Instrument ID. In the distribution message, the system sends the External Target ID if known. Otherwise, it sends the External Instrument ID.
O-7		Datetime	14	O	Requested / ordered date and time	Used with the sample ID to identify the sample. The system only fills this if the instrument sends a value in this field. In a Send Distribution message, this field is empty.
O-12		String	1	R	Action code	Value = `X` (Samples or tests are in processing.)
O-15		Datetime	14	R	Date and time sample received	Date and time the system receives notification of the sample event. In a Send Distribution message, this field is empty.

Order record in a sample event message

Field	Component	Data type	Max size	Usage	Field name	Comments
O-16		String	50	O	Sample type (Specimen type)	Code for the Sample type (urine, serum, etc.) Configurable in **Import/export** > **Assign host config.** > **Sample types**.
O-21					specimen quality	The system does not support this field. **Note:** PSM supports this field. If you wish to enable the field, talk to your Roche Service representative.
O-25		String	101	O	Instrument ID	In the sample seen message, the system sends the External Instrument ID. In the distribution message, the system sends the External Target ID if known. Otherwise, it sends the External Instrument ID. Configurable in **Import/export > Assign Host Config > Instruments and Targets**.
O-26		String	1	R	Report type	Instruction code. Value = `P` (Preliminary results)..

Order record in a sample event message

Field	Component	Data type	Max size	Usage	Field name	Comments
L-1		Char	1	R	Record type ID	Identifier for Terminator record (`L`)
L-2		Integer	1	R	Sequence number	Value = `1`
L-3		String	1	R	Termination code	Value = `N` (normal termination)

Terminator record in a sample event message

Messages received by the system

This section describes the default messages sent from the host to the system.

Fields that are ignored by the system are omitted in the following message structure tables.

Order download

The host downloads test orders with an unsolicited order message.

The system does not support query messages. Therefore the host must send orders for tests on a sample without waiting for a query message.

Record type ID	Record name	Link
H	Header record	Header record in an order message (47)
P	Patient record	Patient record in an order message (47)
O	Order record	Order record in an order message (48)
L	Termination record	Termination record (50)

Structure of Order message

```
H|\^&|||ASTM-Host|||||||P||20160405081500
P|1||4637463G66||Smith^John||19630101|M|||||||||| |||||20160405081500||||||||||
O|1|923501||^^^121\^^^122|||||||A|||||||||||||O
L|1|F
```

Order download

Field	Component	Data type	Max size	Usage	Field name	Comments
H-1		Char	1	R	Record type ID	Identifier for Header record (H) **Note:** the system ignores this field.
H-2		String	4	R	Delimiter definition	Specification of the delimiters used in the message. LIS2-A2 default values are: • | : Field delimiter = vertical bar [124 • \ : Repeat delimiter = backslash [92 • ^ : Component delimiter = caret [94 • & : Escape delimiter = ampersand [38 **Note:** the system ignores this field when receiving messages. The system does not support the escape and repeat delimiters. Delimiters (29)
H-12		Char	1	O	Processing ID	Indicates how this message is to be processed and applies to all child records (i.e., orders or results). The following values are supported: • P Production: (Default value) Treats message as an active message to be completed according to standard processing. • Q Quality Control: Message is initiated for the purpose of transmitting quality control/quality assurance or regulatory data.
H-14		Datetime	14	R	Date and Time	Date/time when message was generated. Follows the specified format in CLSI LIS02-A2

Header record in an order message

Field	Component	Data type	Max size	Usage	Field name	Comments
P-1		Char	1	R	Record type ID	Identifier for Header record (H)
P-2		Integer		R	Sequence number	
P-3		String	50	O	External container ID	Sample ID. The is the number on the barcode of the sample tube. If you require a different value, talk to your Roche Service representative. The field is configurable in **HCA** > (message type) > **Receive**.
P-4		String	50	O	External patient ID	Patient ID. Patient demographic value If you require a different value, talk to your Roche Service representative. The field is configurable in **HCA** > (message type) > **Receive**.
P-6				O	Patient name	Patient demographic value. This field automatically supports either Hispanic naming conventions or standard European or international naming conventions. **Note:** If you upgrade from PSM, you need no special configuration.
	P-6.1	String	80		Last name	Patient's family name
	P-6.2	String	80		Second surname	Patient's second surname. Both surnames, if Hispanic naming conventions are used.
	P-6.3	String	80		First name	Patient's first name

Patient record in an order message

Field	Component	Data type	Max size	Usage	Field name	Comments
P-8		Date	8	O	Date of birth	If sent, the system uses this value in addition to name and gender to identify a patient. Format follows LIS2-A2 protocol: YYYMMDD.
P-9		Char	1	O	Gender	Patient demographic value • M = Male • F = Female • U = Unknown
P-14		String	30	O	Attending physician ID	Doctor ID. Order demographic value. Ignored in order cancellation or rerun message.
P-19				O	Diagnosis	Order demographic value
	P-19.1	String	255			Diagnosis code
	P-19.2	String	255			Text description of the diagnosis
P-24		Datetime	14	O	Registered date and time	Used to identify the sample uniquely, together with the sample ID. Format: YYYYMMDD24MMSS. Seconds (SS) are optional. If empty, the system uses the requested/Ordered date time field from the order record (O-7).
P-26				O	Origin	Orderer, requester, or ward. Order demographic value
	P-26.1	String	50			Orderer code
	P-26.2	String	255			Text description of orderer
P-33				O	Hospital service	Order demographic value
	P-33.1	String	50			Service code
	P-33.2	String	255			Text description of service
P-34				O	Destination	Order demographic value
	P-34.1	String	50			Hospital institution code
	P-34.2	String	255			Text description of hospital institution
P-35				O	Location	Order demographic value **Note:** If you upgrade from PSM, this field was formerly in line with the LIS2-A2 standard.
	P-35.1	String	50			Location code
	P-35.2	String	255			Text description of location

Patient record in an order message

Field	Component	Data type	Max size	Usage	Field name	Comments
O-1		Char	1	R	Record type ID	Identifier for Header record (H)
O-2		Integer		R	Sequence number	
O-3		String	50	R	External container ID	Sample ID, or tube barcode ID
O-4				O	Rack and position	
	O-4.1					(empty)
	O-4.2	Integer				Rack number
	O-4.3	Integer				Numeric position on rack

Order record in an order message

Field	Component	Data type	Max size	Usage	Field name	Comments
O-5				R	Test ID	
	O-5.1					*Not supported. The system ignores any value in this field.*
	O-5.2					*Not supported. The system ignores any value in this field.*
	O-5.3					*Not supported. The system ignores any value in this field.*
	O-5.4	String	50	R	Host test ID	Test code
	O-5.5					*Not supported. The system ignores any value in this field.*
	O-5.6	String	50	O	Dilution factor	(used with rerun messages)
	O-5.7					*Not supported. The system ignores any value in this field.*
	O-5.8	String	50	O	Instrument ID	Instrument code
O-6		String	1	O	Priority / Application ID	Priority • `R` = routine (default) • `S` = STAT Any other value defaults to `R`.
O-7		Datetime	14	O	Requested / ordered date and time	Used with the sample ID to identify the sample. The system reads this only if the field P-24 (Registered date and time) is blank.
O-8		Datetime	14	O	Specimen collection date and time	
O-12		String	1	R	Action code	Instruction from the host to the system. Action codes detailed below. • `C` Cancel the named tests. • `A` Add the tests to the existing sample with the patient and other demographic data. • `X` Sample or tests are in processing. For more details, see the table Instructions in order messages (50).
O-16		String	50	O	Sample type (Specimen type)	Code for the Sample type (urine, serum, etc.) If you require a different value, talk to your Roche Service representative. The field is configurable in **Import / Export** > **Assign host config**.
O-21						The system does not support this field. **Note:** PSM supports this field.
O-22		Char	1	O	Rerun flag	Empty, except in order rerun messages. Value = `R` To order a rerun, send this with Action code `A`, and report type `C`. For more details, see the table Instructions in order messages (50).
O-26		Char	1	R	Report type	Instruction code. With the action code and rerun flag, tells the system what to do with the sample. • `O` Order record - perform requested tests or actions • `C` Correction. Correct previously uploaded results. • `X` Cancel previously ordered tests. For more details, see the table Instructions in order messages (50).

Order record in an order message

Instructions with the order

To instruct the system to perform an action on the sample or order, use the following codes.

Action	Action codes			
	O-5.6	O-12	O-22	O-26
Add test order	-	A	-	O
Delete test order	-	C	-	O
Delete all the sample's tests	-	C	-	X
Change in Patient ID (add, delete, change)	-	N	-	C
Rerun order	-	A	R	C
	Not empty	A	-	C

Instructions in order messages

Termination record

A termination record is provided by the LIS2-A2 protocol, but the system ignores any values in it.

Controlling system actions

This chapter describes the actions of the system in response to messages received from the host.

In this chapter 3

About system actions

The system performs certain actions depending on the order data and patient demographics received in a message from the host.

The system compares the received data with the existing data in its database. Depending on the degree of match or mismatch between the new and existing data, the system performs specific actions.

For ASTM messages using the ASTM_PSM interface, the system checks the following fields if they match with existing order data and patient demographics.

Container ID	O-3
Order demographics	• Doctor, P-14 • Diagnosis, P-19.1 • Origin, P-26.1 • Service, P-33.1 • Destination, P-34.1
Sample register date	O-7
Order status	Within the system, an order can be "open" or "closed". The system closes orders daily in the end-of-day process (**Monitoring > End of day process**). The related parameters are configured in **Administration > General > General parameters**. A closed order cannot be modified.
Patient ID	P-4
Other patient ID	Not supported in the default interface.
Patient demographics	• Last name, P-6.1 • First name, P-6.2 • Date of birth, P-8 • Gender, P-9
Demographics of another patient	As patient demographics. If the system finds another patient whose demographics match the data in the message, it processes the message as described in the tables.

The system can respond by generating a new order or patient, or modifying existing patient or order data. The systems actions are configurable in **Administration > Import/export > Assign host config. > Actions**

This section only describes the actions supported by the default ASTM_PSM interface. If you require further actions, talk to your Roche Service representative.

For matching scenarios that are not supported by the default ASTM_PSM interface, the system does not process the received message and logs an error in **Monitoring > HCA > Message monitoring** and **Monitoring > HCA > Host status > Trace**.

Actions in response to patient messages

A patient message only contains data related to a patient. The ASTM_PSM default interface does not support patient messages. If you wish to modify the interface to support patient messages, talk to your Roche Service representative.

Requested action	Patient ID[1] (P-4)	Patient demographics (P-6 to P-9)	Response action by the system
Add a patient	✗	✗	Create new patient
	✗	✓	
	✓	✗	Use patient data received in the order without modifying demographics stored in the database.
	✓	✓	
Modify patient demographics	✗	✓	Create new patient
	✓	✗	Use patient data received in the order without modifying demographics stored in the database.
	✓	✓	
Merge patient demographics	✗	✗	Reject
	✓	✗	
	✓	✓	Merge patients
Delete patient demographics	✗	✓	No action
	✓	✗	Delete patient
	✓	✓	

Actions in response to patient messages

(1) ✗ =no match, ✓ = match

Actions in response to order messages

Adding a new order

To add an order and patient demographics, send the action code O in field O-12, and the report type C in field O-26.

If the order message does not contain an order ID, the system reacts as follows.

Received action: O in O-12 and C in O-22	Order ID[1]	Order demographics	Sample Register date	Order status	Patient ID	Other patient ID[2]	Patient demographics	Demographics of another patient	Response action by the system on: Order	Response action by the system on: Patient
ADD	-	✓x	x	Either	x	x	✓x	✓x	Generate new	Create new
ADD	-	x	x	Either	x	✓	x	✓	Generate new	Do nothing
ADD	-	x	x	Either	x	✓	x	x	Generate new	Do nothing
ADD	-	x	x	Either	x	-	x	-	Generate new	Do nothing

Add order or tests with a new order ID

(1) x =no match, ✓ = match, ✓x = either match or no match, - = field empty in message

(2) not supported by the default interface

If the system finds a matching order ID, it reacts as follows.

Received action: O in O-12 and C in O-22	Order ID[1]	Order demographics	Sample Register date	Order status	Patient ID	Other patient ID[2]	Patient demographics	Demographics of another patient	Response action by the system on: Order	Response action by the system on: Patient
ADD	✓	✓	✓	Open	x	x	✓	✓	Add / delete and change demographics	Create new
ADD	✓	✓	✓	Open	✓	✓	x	x	Add / delete and change demographics	Use patient data received in the order without modifying demographics stored in the data bank.
ADD	✓	✓	✓	Open	✓	✓	✓	✓	Add / delete without changing demographics	Do nothing
ADD	✓	✓	✓	Open	✓	✓	-	-	Generate new	Do nothing
ADD	✓	✓	✓	Open	x	x	x	x	Add / delete without changing demographics	Create new

Add order or tests when the order ID already exists, but there is no matching patient ID

Received action: O in O-12 and C in O-22	Order ID[1]	Order demographics	Sample Register date	Order status	Patient ID	Other patient ID[2]	Patient demographics	Demographics of another patient	Response action by the system on: Order	Response action by the system on: Patient
ADD	✓	✓x	✓	Open	✓x	✓	✓x	✓x	Add / delete without changing demographics	Use patient data received in the order without modifying demographics stored in the data bank.
ADD	✓	✓	✓	Open	-	-	-	-	Add / delete without changing demographics	Do nothing
ADD	✓	✓	x	Open	-	-	-	-	Add / delete without changing demographics	Do nothing

Add order or tests when the order ID already exists, but there is no matching patient ID

(1) x =no match, ✓ = match, ✓x = either match or no match, - = field empty in message

(2) not supported by the default interface

Deleting orders and tests

To delete an order, or a test in an order, send the following code combinations:

Action	Action code O-12	Report type O-26
Delete test order	C	O
Delete test order	A	C
Delete all tests in a sample	C	X

If the system finds a matching order ID, it deletes the order or tests under the following conditions:

Received action:	Order ID[1]	Order demographics	Sample Register date	Order status	Patient ID	Other patient ID[2]	Patient demographics	Demographics of another patient	Response action by the system on: Order	Response action by the system on: Patient
DEL	✓	✓	✓	Open	✓	✓	x	✓	Delete order or test	No action
DEL	✓	✓	✓	Open	✓x	✓x	✓x	✓	Delete order or test	No action
DEL	✓	✓	✓	Open	✓	✓	✓	✓	Delete order or test	No action
DEL	✓	✓	x	Open	✓x	✓x	✓x	✓	Delete order or test	No action
DEL	✓	✓	x	Open	✓	✓	✓	✓	Delete order or test	No action

Delete an order when the order ID matches

(1) x =no match, ✓ = match, ✓x = either match or no match, - = field empty in message

(2) not supported by the default interface

If the order ID is missing in field O-3, the system rejects the deletion order and logs an error in **Monitoring > HCA > Host status > Trace**.

If the system cannot find a test code in O-5.4, it ignores the test and logs an error in **Monitoring > HCA > Host status > Trace**.

Repeating tests (rerun)

To rerun a test in an order, send the following codes:

Action	Action code O-12	Rerun flag O-22	Report type O-26
Rerun	A	R	C

To rerun multiple tests, list the test codes in field 0-5 in sequence, separated by the repeat delimiter (\). An example is shown below.

```
^^^Test_code1\^^^Test_code2\^^^Test_code3
```

Multiple tests codes in O-5

Received action:	Order ID(1)	Order demographics	Sample Register date	Order status	Patient ID	Other patient ID(2)	Patient demographics	Demographics of another patient	Response action by the system on: Order	Patient
RERUN	✓	✓	✓	Open	✓	✓x	✓	✓x	Repeat tests	No action
RERUN	✓	✓	✓	Closed	✓	✓x	✓	✓x	Repeat tests	No action
RERUN	✓	✓	✓	Open	-	-	-	-	Repeat tests	No action
RERUN	✓	✓	x	Open	-	-	-	-	Repeat tests	No action

Rerun tests when th order ID matches

(1) x =no match, ✓ = match, ✓x = either match or no match, - = field empty in message

(2) not supported by the default interface

If the order ID does not match, the system does the following message.

- It marks the received message as `Rejected` in **Monitoring > HCA > Message monitoring**.
- If traces are enabled in **Monitoring > HCA > Host status**, it looks errors in the **Trace** window.

By default, no application acknowledge message is configured. You can configure an acknowledge response for each message in **Administration > HCA > Messages**.

Appendix

Appendix

In this chapter 4

Order control codes

Order control codes determine the function of the ORC segment.

Value	Description
AF	Order/service refill request approval
CA	Cancel order/service request
CH	Child order/service
CN	Combined result
CR	Canceled as requested
DC	Discontinue order/service request
DE	Data errors
DF	Order/service refill request denied
DR	Discontinued as requested
FU	Order/service refilled, unsolicited
HD	Hold order request
HR	On hold as requested
LI	Link order/service to patient care problem or goal
NA	Number assigned
NW	New order/service
OC	Order/service canceled
OD	Order/service discontinued
OE	Order/service released
OF	Order/service refilled as requested
OH	Order/service held
OK	Order/service accepted & OK
OP	Notification of order for outside dispense
OR	Released as requested
PA	Parent order/service
PR	Previous Results with new order/service
PY	Notification of replacement order for outside dispense
RE	Observations/Performed Service to follow
RF	Refill order/service request
RL	Release previous hold
RO	Replacement order
RP	Order/service replace request
RQ	Replaced as requested
RR	Request received
RU	Replaced unsolicited
SC	Status changed
SN	Send order/service number
SR	Response to send order/service status request
SS	Send order/service status request
UA	Unable to accept order/service

Order control codes

Value	Description
UC	Unable to cancel
UD	Unable to discontinue
UF	Unable to refill
UH	Unable to put on hold
UM	Unable to replace
UN	Unlink order/service from patient care problem or goal
UR	Unable to release
UX	Unable to change
XO	Change order/service request
XR	Changed as requested
XX	Order/service changed, unsol.

Order control codes

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