

cobas[®] Liat[®] system
Host Interface Manual HL7
Version 8.2
Software version 3.3



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Due to the increasing complexity of laboratories and the increase in types of tests being run, it is critical to use unique host download codes for each test when mapping codes on your Laboratory Information System (LIS). It is also strongly recommended to use alpha or alphanumeric codes on your LIS. If unique LIS test codes are not used when mapping on the LIS, this could cause a test result from one test to be reported for a different test.

Required actions when using this host interface manual:

- ***Ensure that the LIS test codes mapped to your LIS are unique for each test.***
- ***Always identify the instrument source of the results on your LIS.***
- ***Please disregard any application code numbers in this host interface manual. Refer to the appropriate method sheet, package insert or application code numbers document for the most current application code number information.***

cobas[®] Liat[®] System

Host Interface Manual HL7

Version 8.2

Software version 3.3



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3.0	2.0	December 2014	Software version
4.0	2.1	December 2015	First publication in Roche user documentation format.
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6.0	3.0	June 2016	Software update. Edition notice updated. Approvals section updated.
6.1	3.1	May 2017	Software update. Secure communications Observation (test) names updated so as to include the script used to process them, e.g.: Influenza A (FABA)
7.0	3.2	February 2018	Minor corrections. <ul style="list-style-type: none"> NB: In field NTE-3, Tube ID, Tube=<tube_id>, contains only the tube ID, without the serial number. Minor terminology corrections Correction to supported workflows.
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☰ Revision history

Edition notice

This publication is intended for operators of the **cobas[®] Liat[®] Analyzer**.

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 **cobas[®] Liat[®] System User Guide** contains all information about the product, including the following:

- Safety
- Installation
- Routine operation
- Maintenance and calibration
- Troubleshooting information
- Configuration information
- Background information
- Approvals
- Contact addresses

The **cobas[®] Liat[®] Quick Start Guide** is intended as a reference during the **cobas[®] Liat[®] Analyzer** setup.

The **cobas[®] Liat[®] Cleaning Tool Guide** is intended as an instruction for using the **cobas[®] Liat[®] Cleaning Tool** with the **cobas[®] Liat[®] Analyzer**.

The **cobas[®] Liat[®] Advanced Tools Guide** is intended as reference for performing various functions, including archiving data and syncing assay tube lots between **cobas[®] Liat[®] Analyzers**.

The **cobas[®] Liat[®] System Host Interface Manual HL7** contains all necessary information about the HL7 interface.

The **cobas[®] Liat[®] System Host Interface Manual POCT1-A (DML)** contains all necessary information about the DML interface.

The **cobas[®] Liat[®] System User Assistance** is the online help version of the **cobas[®] Liat[®] System User Guide**.

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- ▶ Do not use the software in a way that is not described in this publication.
- ▶ Store all publications in a safe and easily retrievable place.

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- ▶ Inform your Roche representative and your local competent authority about any serious incidents which may occur when using this product.

Images

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Example communication messages

Any software version, build number and variable data included in the example communication messages is for illustration purposes only. It might not match what is actually transmitted by the analyzer or DMS.

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Any customer modification to the analyzer and the use of unauthorized assay tubes or accessories renders the warranty null and void.

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Feedback

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In the U.S., call the following number: 1-800-800-5973.

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Preface

Intended use

Refer to the **cobas**[®] Liat[®] System User Guide.

Symbols and abbreviations

Product names

Except where the context clearly indicated otherwise, the following product names and descriptors are used.

Product name	Descriptor
cobas [®] Liat [®] Analyzer	analyzer
cobas [®] Liat [®] Assay Tube	assay tube

☰ Product names

Symbols used in the publication

Symbol	Explanation
•	List item
📖	Cross-reference to related topics containing further information.
💡	Tip. Extra information on correct use or useful hints.
▶	Start of a task or cross-reference to a task.
📌	Extra information within a task
🖼️	Figure. Used in figure titles and cross-references to figures.
☰	Table. Used in table titles and cross-references to tables.

☰ Symbols used in the publication

Abbreviations

The following abbreviations are used.

Abbreviation	Definition
CLSI	Clinical and Laboratory Standards Institute
DML	Device Messaging Layer
EC	European Community
EDI	Electronic Data Interface
HIS	Hospital information system
HL7	Health Level 7 An organization that provides connectivity standards for the healthcare industry. http://www.hl7.org/

☰ Abbreviations used in this publication

Abbreviation	Definition
IHE	Integrating Healthcare Enterprises An organization that provides implementation guidelines for connectivity standards in the healthcare environment.
IVD	In vitro diagnostic
LIS	Laboratory information system
LPOCT	Laboratory Point Of Care Testing IHE profile covering diagnostic tests performed at the point of care in a healthcare institution
MAC	Media Access Control. Typically referred to as MAC Address, a unique identifier assigned to a wired or wireless network interface controller used to identify a connected device.
NCCLS	National Committee for Clinical Laboratory Standards
ORI	Observation Reporting Interface
POCT	Point of Care Testing. Diagnostic testing performed near or at the patient care facility or bedside.
UL	Underwriters Laboratories Inc.
UTC/GMT	Universal Time Coordinated / Greenwich Mean Time
UTF-8	Unicode (or Universal Coded Character Set) Transformation Format – 8-bit. A character encoding capable of encoding all possible characters.
UUID	Universally unique identifier. A 128-bit number used to identify information in computer systems.
XML	Extensible Markup Language

☒ Abbreviations used in this publication

Supporting documents

This document makes references to or assumes familiarity with the information contained in the following documents.

Name	Type	Description
[1] HL7 implementation guide	External	HL7 Version 2.5.1 Implementation Guide: Electronic Laboratory Reporting to Public Health, Release 1. http://www.hl7.org/
[2] User Guide	Internal	cobas [®] Liat [®] System User Guide
[3] IHE Laboratory (LAB) Technical Framework, Volume 2b	External	IHE Laboratory (LAB) Technical Framework, Volume 2b, IHE International, Inc. Accessed: https://www.ihe.net/uploadedFiles/Documents/Laboratory/IHE_LAB_TF_Rev6.0_Vol2b_FT_2015-07-14.pdf

☰ Supporting documents and citations

About the analyzer functions

The analyzer and the associated disposable assay tubes are for in vitro diagnostic use. The analyzer identifies and/or measures the presence of genetic material in a biological sample. The analyzer automates all nucleic acid test (NAT) processes, including reagent preparation, target enrichment, inhibitor removal, nucleic acid extraction, amplification, real-time detection, and result interpretation in a rapid manner.

Overview

The assay tube uses a flexible tube as a sample processing vessel. It contains all assay reagents pre-packed in tube segments separated by seals. Multiple sample processing actuators in the analyzer compress the assay tube to selectively release reagents, move the sample from one segment to another, and control reaction conditions. A detection module monitors the reaction in real time, while an on-board computer analyzes the collected data and outputs an interpreted result.

In a typical assay, a sample is first mixed with an internal control and then with lysis reagents. Magnetic glass particles are incubated with the lysed sample for nucleic acid enrichment, and are then captured and washed to remove possible inhibitors. Subsequently, nucleic acid is eluted from the magnetic glass particles and transferred alternately between tube segments at different temperatures for rapid PCR amplification and real-time detection.

For more detailed information about the analyzer, refer to the **cobas® Liat® System User Guide**, chapter **About the analyzer**.


About the POCT1-A communication standard

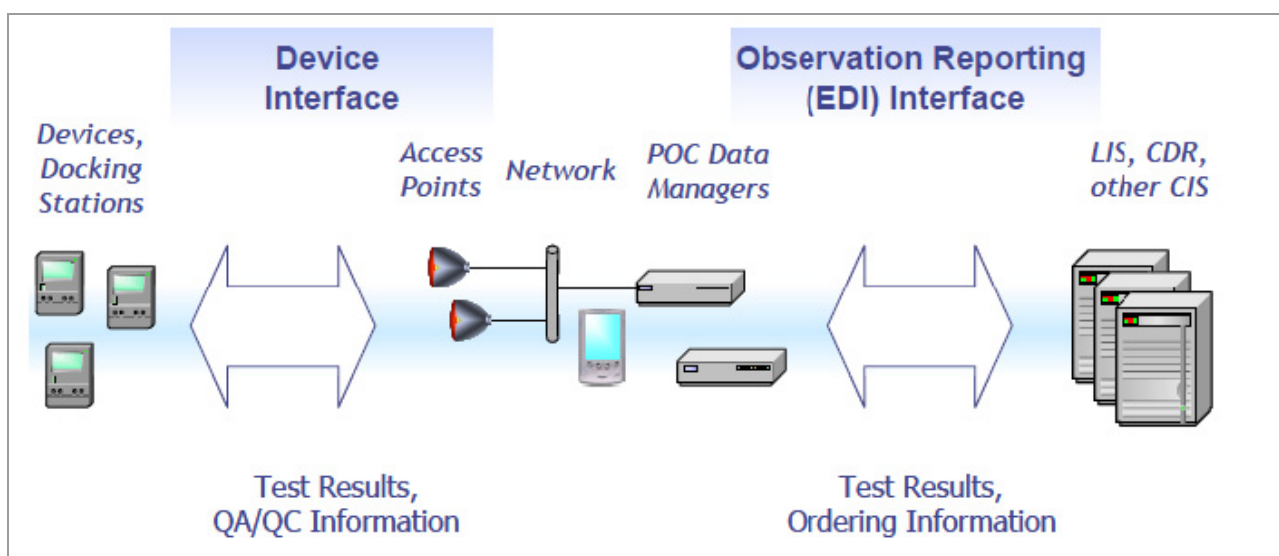
The analyzer provides connectivity for transferring patient results to a customer's laboratory information system (LIS), a hospital information system (HIS) or Point-Of-Care (POC) Management System.


The analyzer is a POCT device for Molecular Diagnostics and it implements a widely used communication standard for POCT called POCT1-A standard, which was published by the CLSI (formerly NCCLS).


The POCT1-A standard describes 2 types of communication interfaces for the data exchange:

- *Device Interface:* controls the flow of information between POC devices and Observation Reviewers.
- *Observation Reporting Interface:* describes messaging between Observation Reviewers and Observation Recipients (Hospital or Laboratory Information System) based on HL7 version 2.5.1. messages. This interface is used to send test and QC results from the analyzer to the HIS or LIS.

 This publication only describes the HL7 protocol. For information about the device interface, refer to the **cobas® Liat® System Host Interface Manual POCT1-A (DML)**.



 Overview of POCT1-A interfaces

 - As the analyzer supports both communication interfaces, it can optionally connect directly to a host without a data manager in between.

About connectivity


For connectivity related information, refer to the **cobas® Liat® System User Guide**, chapter **Connectivity**, which covers the following topics:

- How to connect the analyzer manually to the network
- How to connect the analyzer to the Roche remote service
- How to connect the analyzer to a host system
- Conceptual information about security, monitoring host connectivity, and data exchange with a LIS.
- How to define and configure network resources
- How to back up result
- How to use the share lot folder
- How to configure the share lot function


Secure certification validation

The analyzer uses TCP/IP based communication with the LIS through a wired LAN connection. The TCP/IP stack handles most of the lower-level communication protocol.

The analyzer can establish a secure connection with LIS hosts that support the Transport Layer Security (TLS) protocol version 1.2. TLS is enabled by default.

 TLS is enabled by default.

The secure communications server's certificate needed for establishing the secure TLS v1.2 connection shall be manually acknowledged on the analyzer by the Administrator. This acknowledgment just needs to be done once, prior to the first secure connection to the LIS. All upcoming secure connections will “remember” this first manual Acknowledgment, and will use the stored value to verify the identity of the LIS host.

 If the certificate or the LIS host itself changes (i.e. a different server), all the analyzers within the customer premises shall re-validate the new host certificate.

Ethernet connection

The Ethernet connection does not need to be configured. The **cobas® Liat® System** is capable of communicating at 10/100 Mbps, at full or half duplex. The highest common speed between the connected devices is used.

Workflows

In this section

About workflows (14)

Communication scenarios (14)

Sending results to the LIS (15)

About workflows

The analyzer can send HL7 messages directly to a remote host. Unlike the POCT1-A protocol, which requires a "Hello" and "End" protocol, HL7 message just need to have the correct structure.

For more information regarding HL7 messages refer to the [1] HL7 implementation guide. (*HL7 Version 2.5.1 Implementation Guide: Electronic Laboratory Reporting to Public Health*, Release 1. <http://www.hl7.org/>)

The Analyzer is able to send patient test results.

The Analyzer also sends an Acknowledgment message.

Note that the **cobas**[®] Liat[®] Analyzer is a client, the host is the server. The analyzer establishes a connection before sending result messages. When the host has acknowledged the message, the analyzer closes the network connection. The host has to return to the listening state.

Communication scenarios

Results can be sent automatically or manually.

The following table shows the communication scenarios as they are currently supported by the analyzer.

Name	Description
Auto send results	The analyzer sends patient results to the host automatically after measurement.
Send results manually	The user selects patient results that are stored on the analyzer and triggers the transmission to the host.

☒ Supported communication scenarios

Sending results to the LIS

Sending results manually

How the operator sends manual results

Date	Sample ID	Assay	Result
2015-07-22	POS	SASA	+ ✓ ✉
2015-07-22	POS	FABA	+ ✓ ✉
2015-07-22	NEG	SASA	- ✉
2015-07-22	NEG	FABA	- ✉
2015-09-02	CAL012	FABA	! ✉ ✖
2015-09-02	CAL011	FABA	! ✓
2015-09-02	CAL009	FABA	!
2015-09-02	CAL008	SASA	!

The analyzer can generate valid, invalid, and indeterminate results. The negative and positive results can be sent whereas the aborted, indeterminate and invalid results cannot be sent.

The operator can release or reject each result with the “Approval” option from the **Result report** screen or the **Results** screen. Rejected results cannot be sent to a LIS.

An icon on the right-hand column of the **Results** screen shows the status of the result.

To send a result the operator selects a stored result on the analyzer and sends a released result (sent results = orange envelope icon) to a LIS host. The host (e.g. HL7) stores the result and sends back an acknowledgment. The result is marked as “acknowledged by host” on the **cobas® Liat® Analyzer UI** (orange envelope icon turns white).

The acknowledgment is logically linked by the control ID from the Test Result message. When the host encounters an error, the acknowledgment contains information about the error condition. When the host does not send an acknowledgment, the analyzer times out. In either error condition, the analyzer marks the results as “not acknowledged” (marked as an orange envelope).



Results can only be marked and sent individually. Sending multiple results is not supported.

For information on performing assays, refer to the [2] **cobas® Liat® System Operator's Manual**.

► To configure manual results

- 1 Navigate to the **Connectivity settings** screen.
- 2 For the **Type** option, select “HL7”.
- 3 For the **Auto send results** option, select “No”.

Sending results automatically

The **Auto send results** option allows the analyzer to automatically send valid results (negative or positive) to the host once the results are generated. Aborted, indeterminate, or invalid results are detected and are not sent to the host.

When the analyzer completes a run, it automatically sends the results to the host. The host processes and stores the received results and sends back an acknowledgment so that the analyzer can mark the results as “acknowledged by Host” without them being manually released.

The acknowledgment is logically linked by the received message control id from the Test Result message. When the host encounters an error, the acknowledgment contains information about the error condition. When the host does not send an acknowledgment, the analyzer times out. In either error condition, the analyzer marks the results as “not acknowledged” (marked as an orange envelope).

► To configure auto-send results

- 1 Navigate to the **Connectivity settings** screen.
- 2 For the **Type** option, select “HL7”.
- 3 For the **Auto send results** option, select “Yes”.

HL7 Protocol

In this section

Message types (17)

Observations (18)

Universal service identifier (19)

Minimal layer protocol (20)

HL7 result report message (21)

HL7 acknowledgment message (24)

Message types

The analyzer sends and accepts messages according to the HL7 Version 2.5.1 standard. These are text-based messages consisting of segments and fields.

Test result report

The test result report is sent by the analyzer. The definition follows the IHE's "LPOCT" profile definition^(a), which provides guidance for the implementation of the observation reporting (HL7) interface.


ORU^R30:	MSH	Message Header
	PID	Patient Identification
	ORC	Common Order Information
	OBR	Observation Request
	NTE	Comment for result
	{	
	OBX	Observation result related to OBR
	NTE	Comment for observation
	OBX	Observation result interpretation
	}	

With { } = repeatable segment

(a) IHE Technical Framework LAB TF-2b, chapter 3.32 "Accepted Observation Set (LAB-32)"

Universal service identifier

The universal service in OBR-4 of the observation message (ORU^R20) identifies the assay.

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OBR-4: universal service id


Cdiff

Liat Flu/RSV Assay

Liat Influenza Assay

Liat Strep A Assay

Liat SARS-CoV-2/Flu

 Values for universal_service_id (OBR-4)

Minimal layer protocol

The test result message and the acknowledgment are transmitted over TCP/IP using the MLLP or LLP protocol as defined by HL7. This is a simple data framing protocol without any handshake or checksum calculation.



With the particular message content shown as DATA and

<VT>: ASCII "Vertical Tabulator" 0x0B

<FS>: ASCII "File Separator" 0x1C

<CR>: ASCII "Carriage Return" 0x0D

The analyzer always acts as the TCP/IP client. The host can listen on any port but the host's IP address and port must be configured in the analyzer's settings.

HL7 result report message


In this section

HL7 Result message details (21)

Example HL7 result messages (23)

HL7 Result message details

Segment	Field	Field name	Data: data type, description or example	Remark
MSH	-	Field separator		Fixed text
MSH	1	Encoding characters	^~\&	fixed text
MSH	2	Sending Application	cobas Liat	Fixed text (config.)
MSH	3	Sending Facility	Roche	Fixed text (config.)
MSH	4	Receiving Application	Host	Fixed text (config.)
MSH	5	Receiving Facility	Healthcare Provider	Fixed text (config.)
MSH	6	Date/Time of message	Message Time in UTC	in UTC ^(a)
MSH	8	Message Type	ORU^R30^ORU_R30	Fixed text
MSH	9	Message Control ID	UUID	
MSH	10	Processing ID	P	Fixed text
MSH	11	Version	3.3.0	Fixed text
MSH	17	Character Set	UNICODE UTF-8	Fixed text
PID	3	Patient ID List	Patient / Sample ID	
PID	5	Patient Name	unknown	Fixed text
PID	8	Administrative Sex	U	Fixed text
PID	12	Country Code	Country Code	Always empty
ORC	1	Order Control	NW	Fixed text
OBR	4	Universal Service ID	Assay code for request	Assay code for request. For supported values in version 3.3.0, follow the link. Universal service identifier (19)
OBR	11	Specimen Action Code	O	Fixed text
OBR	25	Order Result Status	F	Fixed text
OBR	32	Principal Result Interpreter	Approver	Manually-sent results: login name of the approver. Auto-send results: empty.
OBR	34	Technician	User	Login name of the user that performed the result.

 HL7 result segment details

Segment	Field	Field name	Data: data type, description or example	Remark
NTE	3	Comment	Run no. Device S/N> Version Tube TubeExp TubeLot PatientVerificationFailureIgnored	Semi-colon-separate list of values. Syntax: Run = <value>; Device = <value>; Version = <value>; Tube = <value>; TubeExp = <value>; TubeLot = <value>; PatientVerificationFailureIgnored = <value> For example: Run=89;Device=M1-E-00301;Version=3.3 .0.4027;Tube=215;TubeExp=2015-11-30; TubeLot=41202A When the Patient Verification has been overridden by the user, then PatientVerificationFailureIgnored is set to "Run has been performed without patient verification". For example: Run=89;Device=M1-E-00301;Version=3.3 .0.4027;Tube=215;TubeExp=2015-11-30; TubeLot=41202A;PatientVerificationFailureIgnored=Run has been performed without patient verification
OBX	2	Value Type	NM	Fixed text. Shows that the first occurrence of the OBX record contains the numerical result.
OBX	3	Observation Identifier	Assay Code	Assay for result. Supported values: Observations (18) e.g.: Strep A (Assay) etc.
OBX	5	Observation value	Result Value	
OBX	6	Units	Unit of measurement	
OBX	11	Result Status	F	Fixed text
OBX	16	Responsible Observer	User	Identical to OBR-34
OBX	18	Equipment Instance ID	MAC Address	
OBX	19	Date/Time of analysis	Analysis Date Time	In UTC*
NTE	1	Set ID	1	Fixed text
NTE	3	Comment	Use	
OBX	2	Value Type	ST	Fixed text. Shows that the second occurrence of the OBX record has a text string as the result value.
OBX	3	Observation Identifier	Assay	Assay for result. Supported values: Observations (18)
OBX	5	Observation value	Interpretation	Textual interpretation of the result. This is either: <ul style="list-style-type: none"> Detected Not detected
OBX	11	Result Status	F	Fixed text

HL7 result segment details

- (a) The Date/Time format is YYYYMMDDhhmmss+0000
with YYYY: year; MM: month; DD: day; 0000: UTC/GMT time zone; hh: hour; mm: minute; ss: second.



The analyzer supports alphanumeric sample or patient IDs. Some hosts might encounter problems when receiving non-numeric IDs.


Non-supported characters

The following characters cannot be transmitted via HL7. Do not use these characters in sample ID or a user ID.

- [Space] (ASCII: Space)
- |
- ^
- &
- \
- ~
- [CR] (ASCII: Carriage Return)
- [VT] (ASCII: Vertical Tabulator)
- [FS] (ASCII: Field Separator)

Example HL7 result messages

This section shows example result messages sent from the **cobas**[®] Liat[®] Analyzer to the host.

 The **cobas**[®] Liat[®] System and associated assays are not commercially available in all markets. Please check with local Regulatory affiliate for regulatory status.

Note: Some Segments like the MSH line are too long and are displayed line-wrapped format.

Example CDFA result message

```
MSH|^~\&|cobas Liat|Roche|Host|Healthcare Provider|20161103140106-0400||ORU^R30^ORU_R30|dab465c5-517c-4ec8-b8fa-be8b35427672|P|2.5|||||UNICODE UTF-8
PID|||Unknown||unknown|||U
ORC|NW
OBR|||Dummy description|||||O|||||F|||||N/A||SERVICE
NTE|||Run=00016;Device=M1-E-10063;Version=3.3.0.4027;Tube=0027E;TubeExp=2064-02-29;TubeLot=AAJ5
OBX|NM|Influenza A (CDFA)||0|0||||F||||SERVICE||F8:dc:7a:06:27:0c|20171014075501-0400
NTE|1||empty
OBX|ST|Influenza A (CDFA)||Not Detected||||F
```

Example FABA result message

```
MSH|^~\&|cobas Liat|Roche|Host|Healthcare Provider|20170413123739-0700||ORU^R30^ORU_R30|ba64ccfb-d5c9-4b21-81c7-34bad912f567|P|2.5|||||UNICODE UTF-8
PID|||FABA+||unknown|||U
ORC|NW
OBR|||Liat Influenza Assay|||||O|||||F|||||ADMIN||ADMIN
NTE|||Run=00013;Device=M1-E-00449;Version=3.3.0.4027;Tube=0000A;TubeExp=2034-08-31;TubeLot=80101Z
OBX|NM|Influenza A (FABA)||0|0||||F||||ADMIN||F8:DC:7A:03:3A:B0|20170412174616-0700
NTE|1||For In vitro Diagnostic Use
OBX|ST|Influenza A (FABA)||Detected||||F
OBX|NM|Influenza B (FABA)||0|0||||F||||ADMIN||F8:DC:7A:03:3A:B0|20170412174616-0700
NTE|1||For In vitro Diagnostic Use
OBX|ST|Influenza B (FABA)||Detected||||F
```

Example FRTA result message

```
MSH|^~\&|cobas Liat|Roche|Host|Healthcare Provider|20170413154000-0400||ORU^R30^ORU_R30|2564cb3c-9391-45b8-9cb6-160a240d2b52|P|2.5|||||UNICODE UTF-8
PID|||FRTA-||unknown|||U
ORC|NW
OBR|||Liat Flu/RSV Assay|||||O|||||F|||||ADMIN|ADMIN
NTE|||Run=00016;Device=M1-E-00183;Version=3.3.0.4027;Tube=023;TubeExp=2017-07-30;TubeLot=69RC
OBX|NM|Influenza A (FRTA)||0|0||||F||||ADMIN||F8:DC:7A:03:3B:88|20170412200033-0400
NTE|1||For In vitro Diagnostic Use
OBX|ST|Influenza A (FRTA)||Not Detected||||F
OBX|NM|Influenza B (FRTA)||0|0||||F||||ADMIN||F8:DC:7A:03:3B:88|20170412200033-0400
NTE|1||For In vitro Diagnostic Use
OBX|ST|Influenza B (FRTA)||Not Detected||||F
OBX|NM|RSV (FRTA)||0|0||||F||||ADMIN||F8:DC:7A:03:3B:88|20170412200033-0400
NTE|1||For In vitro Diagnostic Use
OBX|ST|RSV (FRTA)||Not Detected||||F
```

Example SASA result message

```
MSH|^~\&|cobas Liat|Roche|Host|Healthcare Provider|20170413123912-0700||ORU^R30^ORU_R30|5d8449c9-2923-40bd-9826-ed33eb074c99|P|2.5|||||UNICODE UTF-8
PID|||SASA+||unknown|||U
ORC|NW
OBR|||Liat Strep A Assay|||||O|||||F|||||ADMIN|ADMIN
NTE|||Run=00012;Device=M1-E-00449;Version=3.3.0.4027;Tube=4A6;TubeExp=2017-07-30;TubeLot=67PZ
OBX|NM|Strep A (SASA)||0|0||||F||||ADMIN||F8:DC:7A:03:3A:B0|20170412171519-0700
NTE|1||For In vitro Diagnostic Use
OBX|ST|Strep A (SASA)||Detected||||F
```

Example SCFA result message

```
MSH|^~\&|cobas Liat|Roche|Host|Healthcare Provider|20200301131214+0100||ORU^R30^ORU_R30|898e9e28-992b-40f1-bea8-558085ea958b|P|2.5|||||UNICODE UTF-8
PID|||PAT030||unknown|||U
ORC|NW
OBR|||Liat SARS-CoV-2/Flu|||||O|||||F|||||N/A|ADMIN
NTE|||Run=00003;Device=M1-E-00345;Version=3.3.0.4027;Tube=00003;TubeExp=2030-01-31;TubeLot=20126A
OBX|NM|SARS-CoV-2 (SCFA)||0|0||||F||||ADMIN||f8:dc:7a:07:3c:22|20200301131200+0100
NTE|1||EUA/IVD
OBX|ST|SARS-CoV-2 (SCFA)||Detected||||F
OBX|NM|Influenza A (SCFA)||0|0||||F||||ADMIN||f8:dc:7a:07:3c:22|20200301131200+0100
NTE|1||EUA/IVD
OBX|ST|Influenza A (SCFA)||Not Detected||||F
OBX|NM|Influenza B (SCFA)||0|0||||F||||ADMIN||f8:dc:7a:07:3c:22|20200301131200+0100
NTE|1||EUA/IVD
OBX|ST|Influenza B (SCFA)||Not Detected||||F
```

HL7 acknowledgment message

In this section

HL7 Acknowledgment message details (25)

Example HL7 acknowledgment messages (26)

HL7 Acknowledgment message details

Upon reception of the ORU^R30 result message the host processes the message and answers with an acknowledgment message ACK^R33. Depending on the processing status, the host sends an appropriate acknowledgment code and where applicable also a detailed error message.

Code	Meaning	Comment
AA	Application Acknowledge	Result stored and processed by host
AE	Application Error	Host failed to store and process result
AR	Application Reject	Syntax error in message or message incomplete

HL7 acknowledgment codes

If the host sends back an AE or AR, send also an ERR segment populated with detailed error information.

Segment	Field	Field name	Data	Remark
MSH	-	Field separator		Only this is supported
MSH	1	Encoding characters	^~\&	Only this is supported
MSH	2	Sending Application		Optional
MSH	3	Sending Facility		Optional
MSH	4	Receiving Application		Optional
MSH	5	Receiving Facility		Optional
MSH	6	Date/Time of message		In UTC ^(a)
MSH	8	Message Type	ACK^R33^ACK	Fixed text
MSH	9	Message Control ID	UUID	
MSH	10	Processing ID	P	Fixed text
MSH	11	Version	3.3.0	Fixed text
MSH	17	Character Set	UNICODE UTF-8	Fixed text
MSA	1	Acknowledgment Code	AA, AE or AR	
MSA	2	Message Control Id	UUID	UUID that has been previously send to host
ERR	1	HL7 Error Code	HL7_Error_Code^Error_Text	Host needs to provide error code according to HL7 table 0357 and a host specific error information in form of a free text. • Error codes according to HL7 table 0357 (25)
ERR	2	Severity	E	Fixed text

HL7 acknowledgment segment details

(a) See HL7 Result message details (21)

Error codes according to HL7 table 0357

Error code	Meaning
101	Required field missing
102	Data type error
103	Table value not found
200	Unsupported message type
201	Unsupported event code


HL7 table 0357 - error codes

Error code	Meaning
202	Unsupported processing id
203	Unsupported version id
204	Unknown key identifier
205	Duplicate key identifier
206	Application record locked
207	Application internal error

HL7 table 0357 - error codes

Example HL7 acknowledgment messages

Here are some examples for a HL7 Acknowledgment messages sent back from the host to the analyzer as a response to a received HL7 result message.

 Some Segments like the MSH line are too long and are displayed in line-wrapped format.

Example 1

The host accepted the result message and processed the result.

```
MSH|^~\&|Host|Healthcare Provider|cobas Liat|Roche|20140716195357+0000||ACK^R33^ACK|E6BDAFD0-E22B-485B-B124-A26174D4434D|P|2.5|||||UNICODE UTF-8
MSA|AA|25fdc862-9a41-45b5-a710-7579038fe168
```

Example 2

The host rejected the received result message due to a duplicate key:

```
MSH|^~\&|Host|Healthcare Provider|cobas Liat|Roche|20140716195357+0000||ACK^R33^ACK|E6BDAFD0-E22B-485B-B124-A26174D4434D|P|2.5|||||UNICODE UTF-8
MSA|AR|612b7a6b-8190-4c09-9de6-9a5b01228587
ERR|||205|I
```

Example 3

The host rejected the received result message due to an unknown key:

```
MSH|^~\&|Host|Healthcare Provider|cobas Liat|Roche|20140716195357+0000||ACK^R33^ACK|E6BDAFD0-E22B-485B-B124-A26174D4434D|P|2.5|||||UNICODE UTF-8
MSA|AE|612b7a6b-8190-4c09-9de6-9a5b01228587
ERR|||204|E
```