
July 2018

HL7 LIMS Interface Specifications

For use with QIAlink® software version 2.0

Contents

Introduction	4
HL7 interface description.....	4
Reference to standard.....	4
Transport layer.....	5
Message structure	6
Request.....	6
Results.....	10
Message structure	10
Result values	16
Dynamic behavior	18
Configuration of optional fields.....	18
OBX records for invalid results.....	19
Index target results	19
Revert target results	19
Preferred concentration unit.....	20
Optional fields for Rotor-Gene Q software	20
Optional fields for Rotor-Gene AssayManager.....	20
Examples HL7 2.4	21
Two quantitative HCV/HIV assays for same sample	21
Qualitative multiplex influenza A and B assays for same sample.....	22
Single HCV assay with only one target HCV	22
Single HCV assay with only one target HCV, results reported in multiple units	23
Rotor-Gene AssayManager result with all optional fields (Epsilon/Gamma/Delta plug-in, QIAlink 2.0.2)	24
Rotor-Gene AssayManager result with error flags (<i>artus</i> Basic/UDT plug-in).....	25
Examples HL7 2.5	27
Two quantitative HCV/HIV assays for same sample	27
Qualitative multiplex influenza A and B assays for same sample.....	28
Single HCV assay with only one target HCV	28

Single HCV assay with only one target HCV, results reported in multiple units29

Rotor-Gene AssayManager result with all optional fields (Epsilon/Gamma/Delta plug-in, QIAlink 2.0.2)30

Rotor-Gene AssayManager result with error flags (*artus* Basic/UDT plug-in).....31

Document Revision History	
Revision 1 PROM-8351-001 08/2015	Initial release. Document applies to QIAlink software version 2.0.
Revision 2 PROM-8351-002 07/2018	Section "Results/Result values/Quantitative analyses" added Gamma and Delta plug-in information. Section "Configuration of optional fields" added subsections "Index target results" and "Revert target results". Section "Examples HL7 2.4" corrected typographical errors.

Introduction

This document is intended for use by Host Interface programmers and QIAGEN Field Service Specialists to support the configuration of an HL7 interface between LIMS and QIALink® version 2.0.

QIALink is a middleware software that is intended to provide bi-directional connectivity with a Laboratory Information Management System (LIMS) and specific QIAGEN® instruments and software:

- QIASymphony® SP/AS with QIASymphony Management Console
- Rotor-Gene® Q or Rotor-Gene Q MDx instrument with Rotor-Gene AssayManager®
- Rotor-Gene Q or Rotor-Gene Q MDx instrument with Rotor-Gene Q software

The QIALink software creates work lists and transfers results between the instruments and the LIMS. The QIALink software archives instrument result files from the above mentioned instruments and software.

QIALink is intended for use by professional users trained in molecular biology techniques and the operation of QIASymphony SP/AS instruments and software, Rotor-Gene Q or Rotor-Gene Q MDx instruments and software, the laboratory's particular LIMS and QIALink.

HL7 interface description

Reference to standard

The interface between QIALink and LIMS is based on version 2.4 or 2.5 of the Health Level Seven (HL7) Standard for electronic data exchange in all healthcare environments. QIALink can accept messages in both versions, and it can be configured to send messages in either version 2.4 or 2.5.

This interface implements only a small subset of the HL7 Standard, namely the OML message for ordering of tests, the ORL message for acknowledging orders, and the OUL message for results transmission. The contents of these messages as used by this interface are described in detail in the following sections.

Transport layer

Message transfer is based on the TCP/IP protocol. The Minimal Lower Layer Protocol (MLLP) is used to separate the messages:

Header	Payload	Trailer
0x0B	HL7 message	0x1C 0x0D

For the transmission of test orders from LIMS to QIALink, QIALink acts as server and the LIMS acts as client. For the transmission of results from QIALink to LIMS, the LIMS acts as server and QIALink acts as client. This means that two TCP/IP connections are required (see Figure 1, below).

It is possible that multiple clients may connect to the LIMS TCP/IP server. This depends on the number of connected instrument types. QIALink can manage unidirectional and bidirectional connections. For unidirectional connections, QIALink will either only accept test orders or will only send test results. For bidirectional connections, QIALink will accept test orders and send test results.

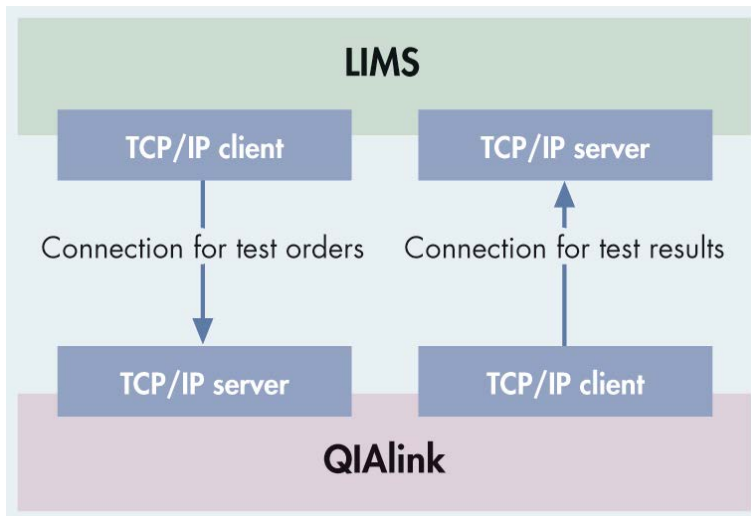


Figure 1. Required TCP/IP connections.

Message structure

The following sections explain the details of the messages that are used for test ordering and results transmission.

The following abbreviations are used in the tables describing the message structure:

Abbreviation	Description
M	Mandatory For messages from LIMS to QIALink, this means that the component must be included in the message. For messages from QIALink to LIMS, this means that the component will always be present.
O	Optional For messages from LIMS to QIALink, this means that the component is not required by QIALink, but will be evaluated, if present. For messages from QIALink to LIMS, this means that the component will only be present under certain circumstances.
N	Not supported For messages from LIMS to QIALink, this means that the component will be ignored by QIALink, if present. For messages from QIALink to LIMS, this means that the component will never be used.

Request

The LIMS can use the following message formats to order tests to be performed on Rotor-Gene Q and QIAAsymphony SP/AS:

HL7 version	Message type	Message structure
2.4	OML^O21	MSH { SAC { ORC OBR } }
2.5	OML^O21	MSH { ORC OBR { SPM } }
2.5	OML^O33	MSH { SPM { ORC OBR } }

Note: “{}” denotes repeating segments, “[]” denotes optional segments

The message structure gives the supported sequence of message segments. All additional components that comply with the message structure defined in the HL7 standard will be ignored by QIALink.

The following tables specify the details of each message component.

Table 1. MSH for OML messages

Seq.	M/O/N	Element name	Content
1	M	Field separator	Shall be defined by the LIMS in accordance with the HL7 standard
2	M	Encoding characters	Shall be defined by the LIMS in accordance with the HL7 standard
3	O	Sending application	Can be used to identify the sending system
4	O	Sending facility	Can be used to identify the sending system
5	M	Receiving application	Shall be set to QIALink Messages with a different or no receiving application will be ignored
6	N	Receiving facility	Not used
7	M	Date/time of message	Timestamp of when the message was created by the sending system Format: YYYYMMDDHHMMSS
8	N	Security	Not used
9	M	Message type	OML^O21 or OML^O33 (v2.5 only)
10	M	Message control ID	Unique identifier for each message
11	M	Processing ID	<processing ID>^<processing mode> Only messages with the processing ID P will be processed, all other messages will be ignored The processing mode is not evaluated by QIALink
12	M	Version ID	<version ID (ID)> ^ <internationalization code (CE)> ^ <internal version ID (CE)> Only the version ID is evaluated by QIALink, the internationalization code and internal version ID are ignored The only supported version IDs are 2.4 and 2.5
13-17	N	Misc.	Not used
18	O	Character set	The following character sets are supported: <ul style="list-style-type: none"> ● ASCII ● UNICODE ● UNICODE UTF-8 If no character set is defined, UNICODE is assumed
19-21	N	Misc.	Not used

Table 2. SAC for OML messages (HL7 v2.4)

Seq.	M/O/N	Element name	Content
1	N	External accession identifier	Not used
2	N	Accession identifier	Not used
3	M	Container identifier	ID corresponding to bar code on the sample
4	N	Primary (parent) container identifier	Not used
5	N	Equipment container identifier	Not used
6	M	Specimen source	Specifies the specimen either by using one of the predefined codes from the HL7 2.4 specification or a customer defined string
7-44	N	Misc.	Not used

Table 3. SPM for OML Messages (HL7 v2.5)

Seq.	M/O/N	Element name	Content
1	N	Set ID	Not used
2	M	Specimen ID	ID corresponding to bar code on the sample
3	N	Specimen parent IDs	Not used
4	M	Specimen type	Shall specify the specimen type.
5-29	N	Misc.	Not used

Table 4. ORC for OML messages

Seq.	M/O/N	Element name	Content
1	M	Order control	Only NW (New order) is supported, all others will be ignored
2	O	Placer order number	Will not be evaluated by QIAlink
3	O	Filler order number	Will not be evaluated by QIAlink
4-25	N	Misc.	Not used

Table 5. OBR for OML messages

Seq.	M/O/N	Element name	Content
1-3	N	Misc.	Not used
4	M	Universal service identifier	Identifier of required test
5-47	N	Misc.	Not used

QIAlink will acknowledge each OML^O21 message by sending a corresponding ORL^O22 message, and each OML^O33 message by sending a corresponding ORL^O34 message.

The acknowledgement confirms receipt of the message, and gives error messages for basic message format errors; it does not imply that the message will be processed successfully.

The ORL^O22 or ORL^O34 message will comply with the following structure:

MSH MSA

The following tables specify the details of each message component.

Table 6. MSH for ORL messages

Seq.	M/O/N	Element name	Content
1	M	Field separator	Always
2	M	Encoding characters	Always ^~\&
3	M	Sending application	Always QIAlink
4	N	<i>Sending facility</i>	<i>Not used</i>
5	M	Receiving application	Always LIMS
6	N	<i>Receiving facility</i>	<i>Not used</i>
7	M	Date/time of message	Timestamp of when the message was created by the sending system Format: YYYYMMDDHHMMSS
8	N	<i>Security</i>	<i>Not used</i>
9	M	Message type	ORL^O22 or ORL^O34
10	M	Message control ID	Unique identifier for each message
11	M	Processing ID	Always P
12	M	Version ID	2.4 or 2.5
13-17	N	<i>Misc.</i>	<i>Not used</i>
18	M	Character set	For v2.4, UNICODE. For v2.5, UNICODE UTF-8
19-21	N	<i>Misc</i>	<i>Not used</i>

Table 7. MSA for ORL messages

Seq.	M/O/N	Element name	Content
1	M	Acknowledgement code	AA, AR or AE (see below)
2	M	Message control ID	Message control ID of the OML message that is being acknowledged
3	M	Text message	If AA, "Message will be processed". Otherwise, an error or warning message
4-6	N	Misc.	Not used

The acknowledgment code is:

- AA for an accepted message.
- AR if the message was rejected or ignored. This can happen if:
 - The receiving application is not "QIALink"
 - The HL7 version is not "2.4" or "2.5"
 - The encoding is not "ASCII", "UNICODE" or "UNICODE UTF-8"
 - The message type is not OML^O21 or OML^O33 (v2.5 only)
- AE if the message cannot be parsed by the HL7 parser

Results

Message structure

QIALink will use the following message types to report results to LIMS, according to the configured HL7 version.

Table 8. Supported LIMS Result Message Types

HL7 version	Message Type	Message structure
2.4	OUL^R21	MSH [{{SAC OBR [{{OBX}} [{{SID}} [{{NTE}}]]}}]
2.5	OUL^R22	MSH [{{SPM [SAC] OBR [{{OBX}} [{{SID}} [{{NTE}}]]}}]

Note: "{}" denotes repeating segments, "[" denotes optional segments.

Results from Rotor-Gene Q software and the *artus* Basic and UDT plug-ins* of Rotor-Gene AssayManager are reported target by target. This means one "SAC OBR [{{OBX}} [{{SID}} [{{NTE}}]]" or "SPM [SAC] OBR [{{OBX}} [{{SID}} [{{NTE}}]]" is created for each target of each sample.

* For QIALink 2.0.1, results from the Epsilon plug-in are also reported in this manner.

Results from the Gamma, Delta and (if using QIALink 2.0.2 or higher) Epsilon plug-ins of Rotor-Gene AssayManager are reported on sample level. This means there will be one SPM/SAC and one OBR for every sample.

Note: The OBX component can be repeated (e.g., to report results in different units or from multiple targets). In this case, the SID and NTE segments are repeated after each OBX, according to the standard.

Some values are denoted as optional. These are only used if configured in the QIALink Interface Engine configuration by QIAGEN Field Service.

The following tables specify the details for each message component.

Table 9. MSH for OUL messages

Seq.	M/O/N	Element name	Content
1	M	Field separator	Always
2	M	Encoding characters	Always ^~\&
3	M	Sending application	Always QIALink
4	N	<i>Sending facility</i>	<i>Not used</i>
5	M	Receiving application	Always LIMS
6	N	<i>Receiving facility</i>	<i>Not used</i>
7	M	Date/time of message	Timestamp of when the message was created by the sending system Format: YYYYMMDDHHMMSS
8	N	<i>Security</i>	<i>Not used</i>
9	M	Message type	OUL^R21 (for v2.4) or OUL^R22 (for v2.5)
10	M	Message control ID	Unique identifier for each message
11	M	Processing ID	Always P
12	M	Version ID	2.4 or 2.5
13-14	N	<i>Misc.</i>	<i>Not used</i>
15	M	Accept acknowledgement type	Always AL
16	M	Application acknowledgement type	Always NE
17	N	<i>Country code</i>	<i>Not used</i>
18	M	Character set	For v2.4, UNICODE. For v2.5, UNICODE UTF-8
19-21	N	<i>Misc.</i>	<i>Not used</i>

Table 10. SPM for OUL^R22 Messages (HL7 v2.5)

Seq.	M/O/N	Element name	Content
1	N	Set ID	Not used
2	M	Specimen ID	ID corresponding to bar code on the sample
3	N	Specimen parent IDs	Not used
4	M	Specimen type	This field indicates the type of the sample For Rotor-Gene AssayManager Test Control Empty For Rotor-Gene Q software Unknown Standard NTC
5-10	N	Misc.	Not used
11	M	Specimen role	This field indicates the role of the sample P – Patient Q - Control specimen
12-13	N	Misc.	Not used
14	O	Specimen description	Optionally, target type For Rotor-Gene AssayManager* InternalControl Qualitative Quantitative For Rotor-Gene Q software InternalControl Target
15-29	N	Misc.	Not used

* Not reported for Gamma and Delta plug-ins. Only reported for Epsilon plug-in in QIALink 2.0.1.

Table 11. SAC for OUL messages

Seq.	M/O/N	Element name	Content
1	N	External accession identifier	Not used
2	N	Accession identifier	Not used
3	M (v2.4) N (v2.5)	Container identifier	ID corresponding to barcode on the sample (OUL^R21 only)
4	N	Primary (parent) container identifier	Not used
5	N	Equipment container identifier	Not used
6	O (v2.4) N (v2.5)	Specimen source	<p>The 1st component of this field contains the sample type</p> <p>For Rotor-Gene AssayManager Test Control Empty</p> <p>For Rotor-Gene Q software Unknown Standard</p> <p>The 7th component of this field indicates the role of the sample</p> <p>P – Patient Q - Control specimen</p> <p>(OUL^R21 only)</p>
7-10	N	Misc.	Not used
11	O	Position in carrier	This field indicates the well position.
12-44	N	Misc.	Not used

In HL7 v2.5 OUL^R22 messages, the SAC segment is only used if the well position is exported. Otherwise, this segment is omitted. In HL7 v2.4 OUL^R21 messages, the SAC segment is mandatory.

If a sample occupies more than one well position, the first and last positions are reported and are separated by a caret, e.g. "11^13".

Table 12. OBR for OUL messages

Seq.	M/O/N	Element name	Content
1	M	Set ID - OBR	Ascending IDs starting with 1 Increments of 1 for each OBR record within the same OUL message
2-3	N	Misc.	Not used
4	M	Universal service identifier	Target identifier or assay name (when using QIALink 2.0.2 or higher and the Epsilon, Gamma or Delta plug-in)
5-6	N	Misc.	Not used
7	M	Observation date/time	Date when result was released from the instrument software Format: YYYYMMDDHHMMSS
8-19	N	Misc.	Not used
20	O	Filler field 1	Optionally, the release status of the sample
21	O	Filler field 2	Optionally, the approval status of the sample
22-24	N	Misc.	Not used
25	M	Result status	Supported values: F — Analysis was successful; valid results are available X — A problem or error occurred during analysis; no valid results could be produced
26-33	N	Misc.	Not used
34	O	Technician	Contains the identification of the user who released the results This field is only used if operator identification is supported by the software of the instrument used
35-47	N	Misc.	Not used

Table 13. OBX for OUL messages

Seq.	M/O/N	Element name	Content
1	M	Set ID - OBX	Ascending IDs starting with 1 Increments of 1 for each OBX record related to the same OBR record
2	M	Value type	Supported values: NM – Numeric result for quantitative analyses ST – String result for qualitative analyses
3	M	Observation identifier	Target identifier
4	N	<i>Observation sub-ID</i>	<i>Not used</i>
5	M	Observation value	Result of the analysis. For possible values, refer to the “Result values” section
6	O	Units	Unit of result value. Only used if the result is numeric, otherwise the unit field is left empty. CT – when C _T value is reported. Analytical Result – for analytical results, only used with Rotor-Gene AssayManager Delta, Gamma and Epsilon plug-ins
7–10	N	<i>Misc.</i>	<i>Not used</i>
11	M	Observation result status	Supported values: F – Analysis has been successful, valid results are available X – A problem or error occurred during analysis, no valid results could be produced It can be configured by QIAGEN Field Service whether OBX segments shall be reported or omitted for incorrect results
12–17	N	<i>Misc.</i>	<i>Not used</i>
18	O	Equipment instance identifier	Contains the cycler serial number This field is only used if serial number transmission is supported by the software of the used instrument
19	N	<i>Date/time of the analysis</i>	<i>Not used</i>

Table 14. SID for OUL Messages

Seq.	M/O/N	Element name	Content
1	O	Application/method identifier	Optionally, the used assay
2	O	Substance lot number	Optionally, the assay lot number
3	N	<i>Substance container identifier</i>	<i>Not used</i>
4	N	<i>Substance manufacturer identifier</i>	<i>Not used</i>

This segment is only reported if used assay or assay lot number are configured to be reported.

Table 15. NTE for OUL Messages

Seq.	M/O/N	Element name	Content
1	N	Set ID – NTE	Not used
2	N	Source of comment	Not used
3	O	Comment	Name of the flag
4	O	Comment type	GR for error flags, RE for warning flags

NTE for OUL messages are only reported if the flags are configured to be reported.

After each result message, the LIMS acknowledges receipt with an ACK message.

Result values

This section describes the possible values that can occur as OBX Observation value.

Quantitative analyses

- String “TargetNotDetected”: no viral load could be defined.
- Numeric value in scientific format (e.g., 1.23E+02): viral load represented in scientific format. Decimal separator is always “.”.*
- Numeric value in decimal format (e.g., 123.456): viral load represented in decimal format. Decimal separator is always “.”.†
- Numeric value in decimal format with a leading “<” or “>” (e.g., < 100): if the lower or upper limit of quantification is exceeded.

Note: For quantitative results from the Rotor-Gene Q software and Rotor-Gene AssayManager *artus* Basic and UDT plug-ins, “in sample” concentrations are reported. For Rotor-Gene AssayManager Epsilon, Gamma and Delta plug-ins, the concentrations in the eluates are reported.

* Scientific format is used for results that are produced by the Rotor-Gene Q software.

† Decimal format is used for results that are produced by Rotor-Gene AssayManager.

Qualitative analyses

- String "TargetNotDetected" or "NoSignal": no PCR reaction took place.
- String "TargetDetected" or "SignalDetected": a PCR reaction took place.
- String "Invalid": for invalid results. *
- String "UserDeselected": for results that have been deselected by the user. †
- Depending on the Assay Profile used with Rotor-Gene AssayManager, additional String values are possible (check the "Result Configuration" for the Assay Profile in the QIAlink Result Manager).

* Used by Rotor-Gene AssayManager software. Only applicable if QIAlink is configured to report OBX segments for incorrect results.

† Used by Rotor-Gene Q software. Only applicable if QIAlink is configured to report OBX segments for incorrect results.

Dynamic behavior

Figure 2 below shows the message flow from test order to transmission of results.

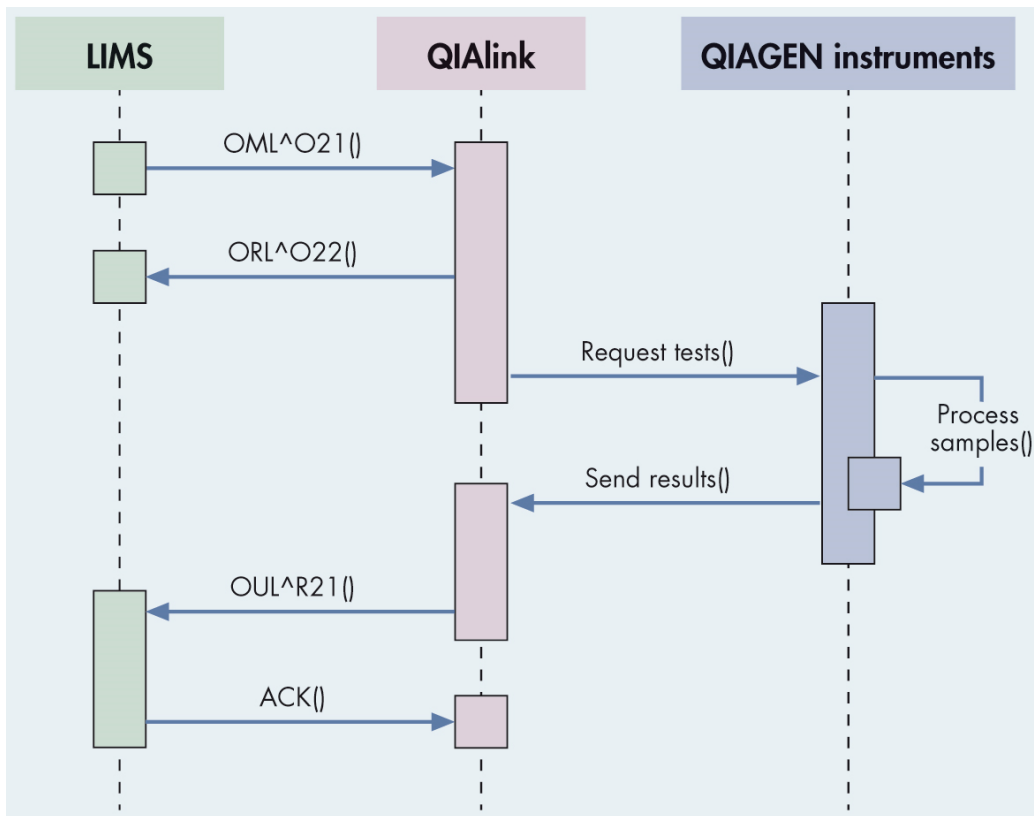


Figure 2. Message flow from test order to transmission of results.

Configuration of optional fields

The LIMS result can be configured to contain some optional fields or behave differently. All configurable items of the LIMS result interface are described in this section.

Note: This configuration is done by QIAGEN Technical Services or QIAGEN Field Services Specialists only.

HL7 Version

The HL7 version can be set to 2.4 (will send OUL^R21 messages) or 2.5 (will send OUL^R22 messages).

OBX records for invalid results

If the PCR result is invalid it can be configured such that no OBX records are sent (default) or that OBX records are sent. The status will be "X" in OBX-11.

The following values are transferred by default for invalid PCR results:

String "UserDeselected" for Rotor-Gene Q software

String "Invalid" for Rotor-Gene AssayManager

Note: Result strings can be configured in the QIALink Result Manger.

Index target results *

The LIMS result can be configured to add an index "i" (e.g., ^2) to the field OBX-3, where "i" starts at "1" for the first OBX segment that is reported for a target. It is increased by 1 for the next OBX segment of the same target and so on. This way, every OBX segment has a unique Observation Identifier.

Revert target results *

For Rotor-Gene AssayManager Epsilon, Gamma and Delta plug-ins, the sort order of targets can be inverted compared to the original result file. Rotor-Gene AssayManager reports the physical targets first and analytical results of the highest abstraction level (e.g., "% mutation") last. Some LIMS require OBX to be sent in a descending order of value to a medical practitioner.

Note: The overall sample result (if available) is always reported first by QIALink, regardless of this setting.

* Field only available for use with QIALink version 2.0.2.

Preferred concentration unit

The Rotor-Gene AssayManager software reports target concentrations in several units at once. It can be configured so that all concentration values are reported in several OBX records for the same target (default), or only the preferred unit of the concentration value is reported, if present. If the preferred unit (e.g., "InternationalUnitsPerMicroliter") is not among the result values presented by Rotor-Gene AssayManager, all values are reported.

Optional fields for Rotor-Gene Q software

Table 16. Optional fields for Rotor-Gene Q software

Field name	Position in HL7 message
Well position	SAC-11
Sample type	V2.4: SAC-6
C _T value	Additional OBX record with unit (OBX-6) "C _T "

Note: In HL7 v2.5 the sample type (SPM-4) and sample role (SPM-11) are always reported.

Optional fields for Rotor-Gene AssayManager

Table 17. Optional fields for Rotor-Gene AssayManager

Field name	Position in HL7 message
Well position	SAC-11
Sample type	V2.4: SAC-6
C _T value	Additional OBX record with unit (OBX-6) "C _T "
Flags	NTE segment. NTE-3 flagname, NTE-4 flag type
Release status	OBR-20
Approval status	OBR-21
Assay used	SID-1
Assay lot number	SID-2

Note: In HL7 v2.5 the sample type (SPM-4) and sample role (SPM-11) are always reported.

Examples HL7 2.4

Two quantitative HCV/HIV assays for same sample

Request (LIMS → QIAlink)

```
MSH|^~\&|LIMS|QIAlink|20121101152100|OML^O21|555|P|2.4||AL|NE|UNIC  
ODE|
```

```
SAC|||123||BLD|
```

```
ORC|NW|
```

```
OBR|||HIV|
```

```
ORC|NW|
```

```
OBR|||HCV|
```

Results (QIAlink → LIMS)

```
MSH|^~\&|QIAlink|LIMS|20121101171000|OUL^R21|476|P|2.4||AL|NE|UNICODE|
```

```
SAC|||123|
```

```
OBR|1||HIV||20121101165505||||||||||||F|||||testuser|
```

```
OBX|1|NM|HIV||5.00E-01|copies/ml||||F|
```

```
SAC|||123|
```

```
OBR|2||HCV||20121101165505||||||||||||F|||||testuser|
```

```
OBX|1|NM|HCV||4.00E+02|copies/ml||||F|
```

Qualitative multiplex influenza A and B assays for same sample

Request (LIMS → QIAlink)

MSH|^~\&|LIMS|QIAlink||20121101152100||OML^O21|555|P|2.4||AL|NE||UNICODE|

SAC|||123||BLD|

ORC|NW|

OBR|||Influenza|

Results (QIAlink → LIMS)

MSH|^~\&|QIAlink|LIMS||20121101171000||OUL^R21|476|P|2.4||AL|NE||UNICODE|

SAC|||123|

OBR|1||INA||20121101165505|||||||||||||F|||||||testuser|

OBX|1|ST|INA||TargetDetected|||||F|

SAC|||123|

OBR|2||INB||20121101165505|||||||||||||F|||||||testuser|

OBX|1|ST|INB||TargetNotDetected|||||F|

Single HCV assay with only one target HCV

Request (LIMS → QIAlink)

MSH|^~\&|LIMS|QIAlink||20121101152100||OML^O21|555|P|2.4|||||UNICODE|

SAC|||123||BLD|

ORC|NW|

OBR|||HCV|

SAC|||124|||BLD|

ORC|NW|

OBR|||HCV|

Results (QIALink → LIMS)

MSH|^~\&|QIALink||LIMS||20121101171000||OUL^R21|476|P|2.4|||AL|NE||UNICODE|

SAC|||123|

OBR|1|||HCV|||20121101165505|||F|||testuser|

OBX|1|NM|HCV||2.5E-02|copies/ml|||F|

SAC|||124|

OBR|2|||HCV|||20121101165505|||F|||testuser|

OBX|1|ST|HCV||TargetNotDetected|||F|

Single HCV assay with only one target HCV, results reported in multiple units

Request (LIMS → QIALink)

MSH|^~\&|LIMS||QIALink||20121101152100||OML^O21|555|P|2.4|||UNICODE|

SAC|||123|||BLD|

ORC|NW|

OBR|||HCV|

SAC|||124|||BLD|

ORC|NW|

OBR|||HCV|

Results (QIAlink → LIMS)

MSH|^~\&|QIAlink||LIMS||20121101171000||OUL^R21|476|P|2.4||AL|NE||UNICODE|

SAC|||123|

OBR|1|||HCV|||20121101165505|F|testuser|

OBX|1|NM|HCV||0,025|CopiesPerMilliliter|F|0112101|

OBX|2|NM|HCV||25|CopiesPerMicroliter|F|0112101|

SAC|||124|

OBR|2|||HCV|||20121101165505|F|testuser|

OBX|1|ST|HCV||TargetNotDetected|F|0112101|

Rotor-Gene AssayManager result with all optional fields
(Epsilon/Gamma/Delta plug-in, QIAlink 2.0.2)*

Results (QIAlink → LIMS)

MSH|^~\&|QIAlink||LIMS||20150217171034||OUL^R21|5188867|P|2.4||AL|NE||UNICODE|

SAC|||Sample1|||Test^^^^^P|||1^2|

OBR|1|||ipsogen_JAK2_blood_PHC1|||20171212171600|ReleasedWithoutSignature |Accepted|F|BZ|

OBX|1|ST|Overall Sample Result||Mutation Detected|F|1209103|

SID|ipsogen_JAK2_blood_PHC1|34567|

OBX|2|NM|FAM_Wild||24877.95|CopiesPerReaction|F|1209103|

* For Rotor-Gene Q software fewer fields are presented.

SID|ipsogen_JAK2_blood_PHC1|34567|

OBX|3|NM|FAM_Wild||25.51|CT|||||F|||||||1209103|

SID|ipsogen_JAK2_blood_PHC1|34567|

OBX|4|ST|FAM_Mut||Signal detected|||||F|||||||1209103|

SID|ipsogen_JAK2_blood_PHC1|34567|

OBX|5|ST|HEX_Wild||Signal detected|||||F|||||||1209103|

SID|ipsogen_JAK2_blood_PHC1|34567|

OBX|6|NM|HEX_Mut||33.62|CT|||||F|||||||1209103|

SID|ipsogen_JAK2_blood_PHC1|34567|

OBX|7|ST|TCN_sample||Signal detected|||||F|||||||1209103|

SID|ipsogen_JAK2_blood_PHC1|34567|

OBX|8|NM|% Mutation||30.00|Analytical result|||||F|||||||1209103|

SID|ipsogen_JAK2_blood_PHC1|34567|

Rotor-Gene AssayManager result with error flags (*artus* Basic/UDT plug-in)

Results (LIMS → QIAlink)

MSH|^~\&|QIAlink||LIMS||20150217171034||OUL^R21|5188867|P|2.4|||AL|NE||U
NICODE|

SAC|||Test 1|||Test^^^^^P|||||1|

OBR|1|||test|||20140626120400|||ReleasedWithoutSignature|Accepted|||
X|||su|

OBX|1|ST|test||Invalid|||X|||0112101|

SID|APT_1P_ValidCheck|7890123456|

NTE|||CurveShapeAnomaly|GR|

NTE|||StrongNoise|GR|

SAC|||Test 1|||Test^^^^^P|||1|

OBR|2|||control|||20140626120400|||ReleasedWithoutSignature|Accepted|
||X|||su|

OBX|1|ST|control||Invalid|||X|||0112101|

SID|APT_1P_ValidCheck|7890123456|

NTE|||CurveShapeAnomaly|GR|

NTE|||StrongNoise|GR|

NTE|||FlatBump|GR|

Examples HL7 2.5

Two quantitative HCV/HIV assays for same sample

Request (LIMS → QIAlink)

```
MSH|^~\&|LIMS|QIAlink|20121101152100|OML^O33|555|P|2.5|||||UNICODE  
UTF-8|
```

```
SPM||123|BLD|
```

```
ORC|NW|
```

```
OBR|||HIV|
```

```
ORC|NW|
```

```
OBR|||HCV|
```

Results (QIAlink → LIMS)

```
MSH|^~\&|QIAlink|LIMS|20121101171000|OUL^R22|476|P|2.5||AL|NE||UNICO  
DE UTF-8|
```

```
SPM||123|Test|||||P|
```

```
OBR|1||HIV||20121101165505|||||||||||||F|||||testuser|
```

```
OBX|1|NM|HIV||5.00E-01|copies/ml||||F|
```

```
SPM||123|Test|||||P|
```

```
OBR|2||HCV||20121101165505|||||||||||||F|||||testuser|
```

```
OBX|1|NM|HCV||4.00E+02|copies/ml||||F|
```

Qualitative multiplex influenza A and B assays for same sample

Request (LIMS → QIAlink)

MSH|^~\&|LIMS|QIAlink|20121101152100|OML^O33|555|P|2.5||AL|NE|UNIC
ODE UTF-8|

SPM||123|BLD|

ORC|NW|

OBR|||Influenza|

Results (QIAlink → LIMS)

MSH|^~\&|QIAlink|LIMS|20121101171000|OUL^R22|476|P|2.5||AL|NE|UNIC
ODE UTF-8|

SPM||123||Test|||||P|

OBR|1||INA||20121101165505|||||||||||||F|||||testuser|

OBX|1|ST|INA||TargetDetected|||||F|

SAC|||123||Test|||||P|

OBR|2||INB||20121101165505|||||||||||||F|||||testuser|

OBX|1|ST|INB||TargetNotDetected|||||F|

Single HCV assay with only one target HCV

Request (LIMS → QIAlink)

MSH|^~\&|LIMS|QIAlink|20121101152100|OML^O21|555|P|2.5|||||UNICODE
UTF-8|

ORC|NW|

OBR|||HCV|

SPM||123||BLD|

SPM||124||BLD|

Results (QIALink → LIMS)

MSH|^~\&|QIALink||LIMS||20121101171000||OUL^R22|476|P|2.5|||AL|NE||UNICODE UTF-8|

SPM||123||Test|||||P|

OBR|1|||HCV|||20121101165505|||||||||||||F|||||testuser|

OBX|1|NM|HCV||2.5E-02|copies/ml|||||F|

SPM||124||Test|||||P|

OBR|2|||HCV|||20121101165505|||||||||||||F|||||testuser|

OBX|1|ST|HCV||TargetNotDetected|||||F|

Single HCV assay with only one target HCV, results reported in multiple units

Request (LIMS → QIALink)

MSH|^~\&|LIMS||QIALink||20131014155814||OML^O21|555|P|2.5|||UNICODE UTF-8|||

ORC|NW|

OBR|1|||HCV

SPM||123||BIO

SPM||124||BIO

Results (QIALink → LIMS)

MSH|^~\&|QIALink||LIMS||20131015104650||OUL^R22|476|P|2.5||AL|NE||UNICODE UTF-8|

SPM||123||Test|||||P|

OBR|1||HCV||20130917175500|||||||||||||F|||||testuser|

OBX|1|ST|HCV||TargetNotDetected|||||F|||||0213316|

SPM||124||Test|||||P|

OBR|2||HCV||20130917175500|||||||||||||F|||||testuser|

OBX|1|NM|HCV||0,025|CopiesPerMilliliter|||||F|||||0213316|

OBX|2|NM|HCV||25|CopiesPerMicroliter|||||F|||||0213316|

Rotor-Gene AssayManager result with all optional fields
(Epsilon/Gamma/Delta plug-in, QIALink 2.0.2)

Results (QIALink → LIMS)

MSH|^~\&|QIALink||LIMS||20121101171000||OUL^R22|476|P|2.5||AL|NE||UNICODE UTF-8|

SPM||Sample1||Test|||||P|

SAC|||||||||1^2|

OBR|1||ipsogen_JAK2_blood_PHC1||20171212171600|||||||||ReleasedWithout Signature |Accepted|||||F|||||BZ|

OBX|1|ST|OSR||Mutation Detected|||||F|||||1209103|

SID|ipsogen_JAK2_blood_PHC1|34567|

OBX|2|NM|FAM_Wild||24877.95|CopiesPerReaction||||F|||||1209103|

SID|ipsogen_JAK2_blood_PHC1|34567|

OBX|3|NM|FAM_Wild||25.51|CT||||F|||||1209103|

SID|ipsogen_JAK2_blood_PHC1|34567|

OBX|4|ST|FAM_Mut||Signal detected||||F|||||1209103|

SID|ipsogen_JAK2_blood_PHC1|34567|

OBX|5|ST|HEX_Wild||Signal detected||||F|||||1209103|

SID|ipsogen_JAK2_blood_PHC1|34567|

OBX|6|NM|HEX_Mut||33.62|CT||||F|||||1209103|

SID|ipsogen_JAK2_blood_PHC1|34567|

OBX|7|ST|TCN_sample||Signal detected||||F|||||1209103|

SID|ipsogen_JAK2_blood_PHC1|34567|

OBX|8|NM|% Mutation||30.00|Analytical result||||F|||||1209103|

SID|ipsogen_JAK2_blood_PHC1|34567|

Rotor-Gene AssayManager result with error flags (*artus* Basic/UDT plugin)

Results (QIAlink → LIMS)

MSH|^~\&|QIAlink||LIMS||20121101171000||OUL^R22|476|P|2.5|||AL|NE||UNICODE UTF-8|

SPM||Test 1||Test|||||P|||Quantitative|

SAC|111111111111|

OBR|1|||test|||20140626120400|||111111111111|ReleasedWithoutSignature|Accepted|||
X|11111111|su|

OBX|1|ST|test||Invalid|11111111|X|11111111|0112101|

SID|APT_1P_ValidCheck||

NTE|||CurveShapeAnomaly|GR|

NTE|||StrongNoise|GR|

SPM||Test 1||Test|11111111|P|11111111|InternalControl|

SAC|111111111111|

OBR|2|||control|||20140626120400|||111111111111|ReleasedWithoutSignature|Accepted|
|||X|11111111|su|

OBX|1|ST|control||Invalid|11111111|X|11111111|0112101|

SID|APT_1P_ValidCheck||

NTE|||CurveShapeAnomaly|GR|

NTE|||StrongNoise|GR|

NTE|||FlatBump|GR|

For up-to-date licensing information and product-specific disclaimers, see the respective QIAGEN kit handbook or user manual. QIAGEN kit handbooks and user manuals are available at www.qiagen.com or can be requested from QIAGEN Technical Services or your local distributor.

Trademarks: QIAGEN®, Sample to Insight®, QIAlink®, QIASymphony®, Rotor-Gene®, Rotor-Gene AssayManager® (QIAGEN Group).
Registered names, trademarks, etc. used in this document, even when not specifically marked as such, are not to be considered unprotected by law. July-18. PROM-8351-002

© 2015–2018 QIAGEN, all rights reserved.

