

OTObase HL7 Integration

Reference Manual

Doc no. 7-50-1560-EN/00

Part no. 7-50-15600-EN



otometrics

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Published in Denmark by GN Otometrics A/S, Denmark

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Version release date

2014-12-05

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Table of Contents

1	HL7 General Overview	4
2	OTObase EMR connector for HL7 interface	5
3	Supported HL7 messages types	6
3.1	ORM (Observation/Order Request Order Message)	6
3.1.1	Placing a new Order request	6
3.1.1.1	Message Header (MSH) segment	6
3.1.1.2	Patient Identification (PID) segment	8
3.1.1.3	Common Order (ORC) segment	9
3.1.1.4	Observation Request (OBR) segment	10
3.1.2	Example of ORM Message for a new order request	12
3.2	ACK (Acknowledgment) message for ORM	12
3.2.1	Message Header (MSH) segment	12
3.2.2	Message Acknowledgment (MSA) segment	14
3.2.3	Example of ORM Acknowledgment (ACK) message in case of success	14
3.2.4	Example of ORM Acknowledgment (ACK) message in case of failure	14
3.3	QRY_A19 (Patient Query Request message)	14
3.3.1	Message Header (MSH) segment	14
3.3.2	Query Definition (QRD) segment	16
3.3.3	Example of QRY_A19 message	16
3.4	ADR_A19 (Patient Query Response message)	16
3.4.1	Message Header (MSH) segment	17
3.4.2	Message Acknowledgment (MSA) segment	18
3.4.3	Query Definition (QRD) segment	18
3.4.4	Patient Identification (PID) segment	19
3.4.5	Patient Visit (PV1) segment	21
3.4.6	Example of ADR_A19 message when patient found	23
3.4.7	Example of ADR_A19 message when patient not found	23
3.5	ORU (Observation Result Unsolicited message)	24
3.5.1	Message Header (MSH) segment	24
3.5.2	Common Order (ORC) segment	25
3.5.3	Observation Request (OBR) segment	26
3.5.4	Observation Result (OBX) segment	27
3.5.5	Example of ORU message	28
3.6	ACK (Acknowledgment message for ORU)	29
3.6.1	Message Header (MSH) segment	29
3.6.2	Message Acknowledgment (MSA) segment	30
3.6.3	Example of ORU Acknowledgment (ACK) message in case of success	31
3.6.4	Example of ORU Acknowledgment (ACK) message in case of failure	31
4	Communication protocol	32
5	Opening existing order	33

1 HL7 General Overview

The HL7 (Health Level Seven) standard was developed by a community of healthcare subject matter experts and information scientists collaborating to create standards for the exchange, management and integration of electronic healthcare information.

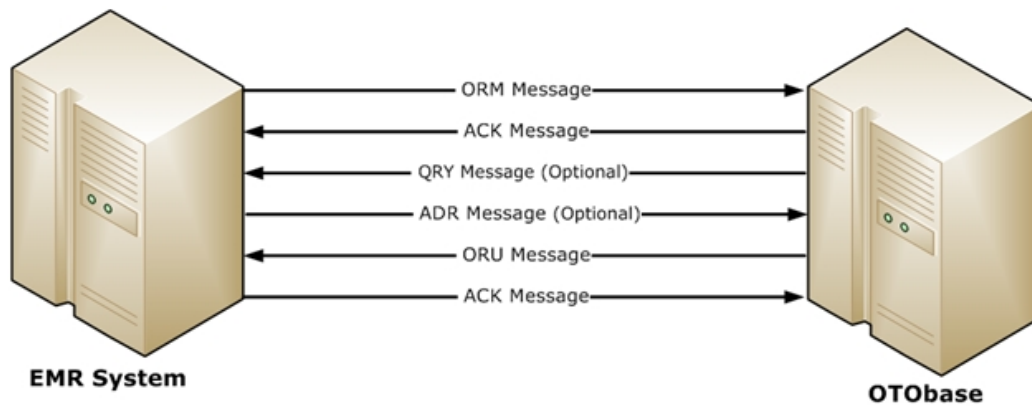
The HL7 refers to the highest level of the international Standards Organization's (ISO) communication model for Open System Interconnection (OSI).

The application level addresses the data definition to be exchanged, the interchange timing, and the communication of certain errors to the application. The seventh level supports such functions as security checks, participant identification, availability checks, exchange mechanism negotiations and, most importantly, it supports the standard for exchange of data among healthcare applications.

2 OTObase EMR connector for HL7 interface

The OTObase EMR connector for HL7 interface provides a standard messaging format for transferring information from system to system. The OTObase EMR Connector provides a work flow to interchange the electronic data of patients such as demographic data and audiology measurement reports.

The following response paradigms relate to the communication between an EMR System and the OTObase HL7 interface.



- The EMR system sends ORM (Observation/Order Request Message) messages to OTObase. OTObase replies with an ACK (Acknowledgment) message and then OTObase sends an ORU (Observation Result Unsolicited) message containing the finished transcriptions back to the EMR system. The EMR system should send an ACK message to OTObase in reply to the ORU message.
- OTObase sends a QRY (Patient Query) message to the EMR System. The EMR System should send an ADR (Patient Query Response) message back to OTObase.

3 Supported HL7 messages types

The following HL7 message types are supported by the OTObase EMR Connector for HL7 Interface:

- [ORM \(Observation/Order Request Order Message\) ▶ 6](#)
- [ACK \(Acknowledgment\) message for ORM ▶ 12](#)
- [QRY_A19 \(Patient Query Request message\) ▶ 14](#)
- [ADR_A19 \(Patient Query Response message\) ▶ 16](#)
- [ORU \(Observation Result Unsolicited message\) ▶ 24](#)
- [ACK \(Acknowledgment message for ORU\) ▶ 29](#)

The tables in the following sections of the manual describe the elements in each of the message types.

The table rows are color coded to indicate whether the element is Required, Optional or Unused, as follows:

Row type	Use Identifier	Description
1	O	Optional
2	R	Required
3	U	Unused

3.1 ORM (Observation/Order Request Order Message)

The function of this message is to initiate the transmission of information about an order/observation. This includes placing a new observation request and registering a patient in OTObase.

3.1.1 Placing a new Order request

The HL7 Order message (ORM) should contain the following information in order to place a new observation/order request in OTObase.

3.1.1.1 Message Header (MSH) segment

Position	Element	Use	Example
1	Field Separator	R	Pipe symbol -
2	Encoding Characters 1. Component 2. Repeat 3. Escape 4. Sub component	R	^^\& ^ ~ \ &
3	Sending Application Name	R	OTObase (User defined during configuration)

Position	Element	Use	Example
4	Sending Facility Name	R	OTObase (User defined during configuration)
5	Receiving Application	R	EMR System (User defined during configuration)
6	Receiving Facility	R	EMR System (User defined during configuration)
7	Date and Time of Message	R	YYYYMMDDhhmmss 20130125052045
8	Security	U	
9	Message Type 1. Message Type 2. Trigger Event	R	ORMO01 ORM O01
10	Message Control Identifier	R	ORM20130125052045
11	Processing ID	O	P = Production T= Training D= Debugging
12	HL7 Version	R	2.4,2.5,2.6,2.7.
13	Sequence Number	U	A non-null value in this field implies that the sequence number protocol is in use. This numeric field is incremented by one for each subsequent value.
14	Continuation Pointer	U	This field is used to define continuations in application-specific ways.
15	Accept Acknowledgment Type	U	AL = Always NE = Never ER = Erroneous conditions SU = Successful completion
16	Application Acknowledgment Type	U	AL = Always NE = Never ER = Erroneous conditions SU = Successful completion
17	Country Code	U	ISO 3166 provides a list of country codes.
18	Character Set	U	Alternate character sets not used.
19	Principle Language of Message	U	ISO 639 provides a list of codes.

3.1.1.2 Patient Identification (PID) segment

Position	Element	Use	Example
1	Set ID	U	
2	Patient ID – External ID	O	
3	Patient ID – Internal ID	R	00004
4	Alternate Patient ID	U	
5	Patient Name 1. Last Name 2. First Name 3. Middle Name 4. Suffix 5. Prefix	R	Mr. Fischer Martin
6	Mother’s Maiden Name	U	
7	Date and Time of Birth	R	YYYYMMDDhhmmss 19730704063200
8	Sex	R	M
9	Patient Alias 1. Last Name 2. First Name 3. Middle Name 4. Suffix 5. Prefix	U	
10	Race	U	
11	Patient Address 1. Street Or Mailing Address 2. Other destination 3. City 4. State 5. Postal Code 6. Country	R	123 West St. Denver CO 80020 USA.
12	County Code	U	
13	Phone Number – Home	R	01-22010-4520

Position	Element	Use	Example
14	Phone Number – Business	R	01-22011-4520
15	Primary Language	O	
16	Marital Status	O	
17	Religion	O	
18	Patient Account Number	O	
19	Social Security Number	O	
20	Driver's License Number	U	
21	Mother's Identifier	U	
22	Ethnic Group	U	
23	Birth Place	U	
24	Multiple Birth Indicator	U	
25	Birth Order	U	
26	Citizenship	U	
27	Veteran's Military Status	U	
28	Nationality	U	
29	Patient Death and Time	U	
30	Patient Death Indicator	U	

3.1.1.3 Common Order (ORC) segment

Position	Element	Use	Example
1	Order Control	O	NW
2	Placer Order Number	O	3071014
3	Filler Order Number	U	
4	Placer Group Number	U	
5	Order Status	U	
6	Response Flag	U	

3 Supported HL7 messages types

Position	Element	Use	Example
7	Quantity/Timing	U	
8	Parent	U	
9	Date and Time of Transaction	U	
10	Entered By	U	
11	Verified By	U	
12	Ordering Provider	U	
13	Enterer's Location	U	
14	Callback Phone Number	U	
15	Order Effective Date and Time	U	
16	Order Control Code Reason	U	
17	Entering Organization	U	
18	Entering Device	U	
19	Action By	U	

3.1.1.4 Observation Request (OBR) segment

Position	Element	Use	Example
1	Set ID	O	1
2	Placer Order Number	R	20060307110
3	Filler Order Number	O	0109
4	Universal Service Identifier	U	
5	Priority	U	
6	Requested Date and Time	U	
7	Observation Date and Time	U	
8	Observation End Date and Time	U	
9	Collection Volume	U	

Position	Element	Use	Example
10	Collector Identifier	U	
11	Specimen Action Code	U	
12	Danger Code	U	
13	Relevant Clinical Information	U	
14	Specimen Received Date and Time	U	
15	Specimen Source	U	
16	Ordering Provider	U	
17	Order Callback Phone Number	U	
18	Placer Field 1	U	
19	Placer Field 2	U	
20	Filler Field 1	U	
21	Filler Field 2	U	
22	Results Report/Status Change Date and Time	U	
23	Charge to Practice	U	
24	Diagnostic Service Section ID	U	
25	Result Status	U	
26	Parent Result	U	
27	Quantity / Timing	U	
28	Result Copies to	U	
29	Parent	U	
30	Transportation Mode	U	
31	Reason for Study	U	
32	Principal Result Interpreter	U	
33	Assistant Result Interpreter	U	
34	Technician	U	

Position	Element	Use	Example
35	Transcriptionist	U	
36	Scheduled Date and Time	U	
37	Number of Sample Containers	U	
38	Transport Logistics of Collected Samples	U	
39	Collector's Comment	U	
40	Transport Arrangement Responsibility	U	
41	Transport Arranged	U	
42	Escort Required	U	
43	Planned Patient Transport Comment	U	

3.1.2 Example of ORM Message for a new order request

The following is an example of an ORM message :

```
MSH|^~\&|EMR|EMR|OTObase|OTObase|20060307110114||ORM^O01|ORM20130125110113|P|2.7
PID|||00004||Fischer^Martin^^Mr.||19670824|M|||123 West St. ^^Denver^CO^80020^USA|||||
PV1||O|OP^PAREG^|||2342^Jones^Bob||OP|||||||2|||||||20060307110111|
ORC|NW|20060307110114
OBR|1|20060307110114||003038^Urinalysis^L||20060307110114
```

3.2 ACK (Acknowledgment) message for ORM

OTObase sends acknowledgment (ACK) messages for all ORM messages. The structure of the ACK is as follows:

3.2.1 Message Header (MSH) segment

Position	Element	Use	Example
1	Field Separator	R	Pipe symbol -

Position	Element	Use	Example
2	Encoding Characters 1. Component 2. Repeat 3. Escape 4. Sub component	R	^~\& ^ ~ \ &
3	Sending Application Name	R	OTObase (User defined during configuration)
4	Sending Facility Name	R	OTObase (User defined during configuration)
5	Receiving Application	R	EMR System (User defined during configuration)
6	Receiving Facility	R	EMR System (User defined during configuration)
7	Date and Time of Message	R	YYYYMMDDhhmmss 20130125052045
8	Security	U	
9	Message Type	R	ACK
10	Message Control Identifier	R	ORM20130125052045
11	Processing ID	O	P = Production T= Training D= Debugging
12	HL7 Version	R	2.4,2.5,2.6,2.7.
13	Sequence Number	U	
14	Continuation Pointer	U	
15	Accept Acknowledgment Type	U	
16	Application Acknowledgment Type	U	
17	Country Code	U	
18	Character Set	U	
19	Principle Language of Message	U	

3.2.2 Message Acknowledgment (MSA) segment

Position	Element	Use	Example
1	Acknowledgment Code	R	AA = Success AE = Error AR = Reject
2	Message Control ID	R	ORM20130125052045
3	Text Message	O	Success, Or Failure
4	Expected Sequence Number	U	
5	Delayed Acknowledgment Type	U	
6	Error Condition	O	

3.2.3 Example of ORM Acknowledgment (ACK) message in case of success

OTObase sends an ACK message to acknowledge receipt of an ORM. If the received ORM message is accepted by OTObase, then OTObase sends a Success Acknowledgment message to the EMR system. The following is an example of a Success Acknowledgment (ACK) message:

```
MSH|^~\&|OTObase | OTObase | EMR | EMR | 20130128012045||ACK| ORM20130125110114 |P|2.7
MSA|AA|ORM20130125110114|Success|||
```

3.2.4 Example of ORM Acknowledgment (ACK) message in case of failure

If the received ORM message is not accepted by OTObase, then OTObase sends a Failure Acknowledgment message to the EMR system. The following is an example of a Failure Acknowledgment (ACK) message:

```
MSH|^~\&|OTObase | OTObase | EMR | EMR | 20130128012045||ACK| ORM20130125110114 |P|2.7
MSA|AE|ORM20130125110114|Failure|||
```

3.3 QRY_A19 (Patient Query Request message)

The function of this message is to send a query for patient information to the EMR system. This message will contain the patient number for unique identification.

3.3.1 Message Header (MSH) segment

Position	Element	Use	Example
1	Field Separator	R	Pipe symbol -

Position	Element	Use	Example
2	Encoding Characters 1. Component 2. Repeat 3. Escape 4. Sub component	R	^~\& ^ ~ \ &
3	Sending Application Name	R	OTObase (User defined during configuration)
4	Sending Facility Name	R	OTObase (User defined during configuration)
5	Receiving Application	R	EMR System (User defined during configuration)
6	Receiving Facility	R	EMR System (User defined during configuration)
7	Date and Time of Message	R	YYYYMMDDhhmmss 20130125052045
8	Security	U	
9	Message Type 1. Message Type 2. Trigger Event	R	QRY^A19 QRY A19
10	Message Control Identifier	R	QRY20130125052045
11	Processing ID	O	P = Production T = Training D= Debugging
12	HL7 Version	R	2.4,2.5,2.6,2.7.
13	Sequence Number	U	
14	Continuation Pointer	U.	
15	Accept Acknowledgment Type	U	
16	Application Acknowledgment Type	U	
17	Country Code	U	
18	Character Set	U	
19	Principle Language of Message	U	

3.3.2 Query Definition (QRD) segment

Position	Element	Use	Example
1	Query Date Time	R	YYYYMMDDhhmmss 201301251911
2	Query Format Code	R	R (record oriented response)
3	Query Priority	R	I (Immediate)
4	Query ID	U	
5	Deferred Response Type	U	
6	Deferred Response Date Time Quantity	U	
7	Quantity	U	
8	Who Subject Filter 1. Patient ID Number 2. Family Name 3. Given Name	R	10204
9	What Subject Filter	U	
10	What Department Data Code	U	
11	What Data Code Value	U	
12	Query Result Level	U	

3.3.3 Example of QRY_A19 message

The following is an example of a patient query request message (for Patient Number: 10204) :

```
MSH|^~\&|OTObase|OTObase|EMR|EMR|20130125191110||QRY^A19|QRY20130125191110|P|2.7
QRD|201301251911|R|||10204|||
```

This message queries for the demographics information for a patient based upon the patient id/number (medical record number). The Patient ID Number is specified in the QRD-8 element: Who Subject Filter.

3.4 ADR_A19 (Patient Query Response message)

This message is sent by the EMR system in response to the Patient Query Request (QRY_A19) message sent by OTObase. This message contains the patient demographic information for a particular patient based upon the patient ID Number (medical record number).

3.4.1 Message Header (MSH) segment

Position	Element	Use	Example
1	Field Separator	R	Pipe symbol -
2	Encoding Characters 1. Component 2. Repeat 3. Escape 4. Sub component	R	^~\& ^ ~ \ &
3	Sending Application Name	R	OTObase (User defined during configuration)
4	Sending Facility Name	R	OTObase (User defined during configuration)
5	Receiving Application	R	EMR System (User defined during configuration)
6	Receiving Facility	R	EMR System (User defined during configuration)
7	Date and Time of Message	R	YYYYMMDDhhmmss 20130125052045
8	Security	U	
9	Message Type 1. Message Type 2. Trigger Type	R	ADR^A19 ADR A19
10	Message Control Identifier	R	QRY20130128145136
11	Processing ID	O	P = Production T= Training D= Debugging
12	HL7 Version	R	2.4,2.5,2.6,2.7.
13	Sequence Number	U	
14	Continuation Pointer	U	
15	Accept Acknowledgment Type	U	
16	Application Acknowledgment Type	U	

Position	Element	Use	Example
17	Country Code	U	
18	Character Set	U	
19	Principle Language of Message	U	

3.4.2 Message Acknowledgment (MSA) segment

Position	Element	Use	Example
1	Acknowledgment Code	R	AA = Success AE = Error AR = Reject
2	Message Control ID	R	QRY20130128145136
3	Text Message	O	Success or Failure
4	Expected Sequence Number	U	
5	Delayed Acknowledgment Type	U	
6	Error Condition	O	

3.4.3 Query Definition (QRD) segment

Position	Element	Use	Example
1	Query Date Time	R	YYYYMMDDhhmmss 201301251911
2	Query Format Code	R	R (record oriented response)
3	Query Priority	R	I (Immediate)
4	Query ID	U	
5	Deferred Response Type	U	
6	Deferred Response Date Time Quantity	U	
7	Quantity	U	

Position	Element	Use	Example
8	Who Subject Filter 1. Patient ID Number 2. Family Name 3. Given Name	R	10204
9	What Subject Filter	U	
10	What Department Data Code	U	
11	What Data Code Value	U	
12	Query Result Level	U	

3.4.4 Patient Identification (PID) segment

Position	Element	Use	Example
1	Set ID	U	
2	Patient ID – External ID	O	
3	Patient ID – Internal ID	R	00004
4	Alternate Patient ID	U	
5	Patient Name 1. Last Name 2. First Name 3. Middle Name 4. Suffix 5. Prefix	R	Mr. Fischer Martin
6	Mother's Maiden Name	U	
7	Date and Time of Birth	R	YYYYMMDDhhmmss 19730704063200
8	Sex	R	M

3 Supported HL7 messages types

Position	Element	Use	Example
9	Patient Alias 1. Last Name 2. First Name 3. Middle Name 4. Suffix 5. Prefix	U	
10	Race	U	
11	Patient Address 1. Street Or Mailing Address 2. Other destination 3. City 4. State 5. Postal Code 6. Country	R	123 West St. Denver CO 80020 USA.
12	County Code	U	
13	Phone Number – Home	R	01-22010-4520
14	Phone Number – Business	R	01-22011-4520
15	Primary Language	O	
16	Marital Status	O	
17	Religion	O	
18	Patient Account Number	O	
19	Social Security Number	O	
20	Driver’s License Number	U	
21	Mother’s Identifier	U	
22	Ethnic Group	U	
23	Birth Place	U	
24	Multiple Birth Indicator	U	
25	Birth Order	U	
26	Citizenship	U	

Position	Element	Use	Example
27	Veteran's Military Status	U	
28	Nationality	U	
29	Patient Death and Time	U	
30	Patient Death Indicator	U	

3.4.5 Patient Visit (PV1) segment

Information present in the Patient Visit segment is not used in the current version of OTObase.

Position	Element	Use	Example
1	Set ID	U	
2	Patient Class	U	
3	Assigned Patient Location	U	
4	Admission Type	U	
5	Pre admit Number	U	
6	Prior Patient Location	U	
7	Attending Doctor 1. Last Name 2. First Name 3. Middle Initial	U	
8	Referring Doctor 4. Last Name 5. First Name 6. Middle Initial	U	
9	Consulting Doctor 7. Last Name 8. First Name 9. Middle Initial	U	
10	Hospital Service	U	
11	Temporary Location	U	
12	Pre-admit Test Indicator	U	

3 Supported HL7 messages types

Position	Element	Use	Example
13	Re-admission Indicator	U	
14	Admit Source	U	
15	Ambulatory Status	U	
16	VIP Indicator	U	
17	Admitting Doctor	U	
18	Patient Type	U	
19	Visit Number	U	
20	Financial Class	U	
21	Charge Price Indicator	U	
22	Courtesy Code	U	
23	Credit Rating	U	
24	Contract Code	U	
25	Contract Effective Date	U	
26	Contract Amount	U	
27	Contract Period	U	
28	Interest Code	U	
29	Transfer to Bad Debt Code	U	
30	Transfer to Bad Debt Date	U	
31	Bad Debt Agency Code	U	
32	Bad Debt Transfer Amount	U	
33	Bad Debt Recovery Amount	U	
34	Delete Account Indicator	U	
35	Delete Account Date	U	
36	Discharge Disposition	U	
37	Discharged to Location	U	
38	Diet Type	U	

Position	Element	Use	Example
39	Servicing Facility	U	
40	Bed Status	U	
41	Account Status	U	
42	Pending Location	U	
43	Prior Temporary Location	U	
44	Admit Date and Time	U	
45	Discharge Date and Time	U	
46	Current Patient Balance	U	
47	Total Charges	U	
48	Total Adjustments	U	
49	Total Payments	U	
50	Alternative Visit ID	U	
51	Visit Indicator	U	
52	Other Healthcare Provider	U	

3.4.6 Example of ADR_A19 message when patient found

The following is an example of a patient query response message (for Patient Number: 10204) :

```
MSH|^~\&|AWS1|ZISSERVER|OTObase|OTObase|20130128145137||ADR^A19|QRY20130128145136|P|2.7||
MSA|AA|QRY20130128145136
QRD|201301281451|R|||10204
PID||00004||Fischer^Martin^^Mr.||19670824|M||123 West St. ^^Denver ^CO ^80020 ^USA|||||
PV1||I|A5TA^5014^||0019^Jonge^^MWC^^de^Jhr.Dr.|||||||O|0000519145|||||||20040-
5201030|
```

The above message contains patient demographic and visit information.

3.4.7 Example of ADR_A19 message when patient not found

The following is an example of a patient query response message (for Patient Number: 10204) if patient information is not found:

```
MSH|^~\&|AWS1|ZISSERVER|OTObase|OTObase|20130128145137||ADR^A19|QRY20130128145136|P|2.7||
MSA|AE|QRY20130128145136|Patient Not found.
```

3.5 ORU (Observation Result Unsolicited message)

OTObase returns finished transcriptions (a PDF report containing the latest Tone, Speech and Impedance measurement for both ears) to the EMR system using an Observation Result Unsolicited (ORU) message that is triggered by OTObase when the patient is Signed Off (either manually or automatically). The HL7 message will contain the following information:

3.5.1 Message Header (MSH) segment

Position	Element	Use	Example
1	Field Separator	R	Pipe symbol -
2	Encoding Characters 1. Component 2. Repeat 3. Escape 4. Sub component	R	^~\& ^ ~ \ &
3	Sending Application Name	R	OTObase (User defined during configuration)
4	Sending Facility Name	R	OTObase (User defined during configuration)
5	Receiving Application	R	EMR System (User defined during configuration)
6	Receiving Facility	R	EMR System (User defined during configuration)
7	Date and Time of Message	R	YYYYMMDDhhmmss 20130125052045
8	Security	U	
9	Message Type 1. Message Type 2. Trigger Event	R	ORU^R01 ORU R01
10	Message Control Identifier	R	ORU20130128145120
11	Processing ID	O	P = Production T= Training D= Debugging
12	HL7 Version	R	2.4,2.5,2.6,2.7.
13	Sequence Number	U	
14	Continuation Pointer	U	
15	Accept Acknowledgment Type	U	

Position	Element	Use	Example
16	Application Acknowledgment Type	U	
17	Country Code	U	
18	Character Set	U	
19	Principle Language of Message	U	

3.5.2 Common Order (ORC) segment

Position	Element	Use	Example
1	Order Control	O	NW
2	Placer Order Number	O	3071014
3	Filler Order Number	O	105400
4	Placer Group Number	U	
5	Order Status	U	
6	Response Flag	U	
7	Quantity/Timing	U	
8	Parent	U	
9	Date and Time of Transaction	U	
10	Entered By	U	
11	Verified By	U	
12	Ordering Provider	U	
13	Enterer's Location	U	
14	Callback Phone Number	U	
15	Order Effective Date and Time	U	
16	Order Control Code Reason	U	
17	Entering Organization	U	
18	Entering Device	U	
19	Action By	U	

3.5.3 Observation Request (OBR) segment

Position	Element	Use	Example
1	Set ID	O	1
2	Placer Order Number	R	3071014
3	Filler Order Number	R	105400
4	Universal Service Identifier	U	
5	Priority	U	
6	Requested Date and Time	O	
7	Observation Date and Time	U	
8	Observation End Date and Time	U	
9	Collection Volume	U	
10	Collector Identifier	U	
11	Specimen Action Code	U	
12	Danger Code	U	
13	Relevant Clinical Information	U	
14	Specimen Received Date and Time	U	
15	Specimen Source	U	
16	Ordering Provider	U	
17	Order Callback Phone Number	U	
18	Placer Field 1	U	
19	Placer Field 2	U	
20	Filler Field 1	U	
21	Filler Field 2	U	
22	Results Report/Status Change Date and Time	U	
23	Charge to Practice	U	

Position	Element	Use	Example
24	Diagnostic Service Section ID	U	
25	Result Status	U	
26	Parent Result	U	
27	Quantity / Timing	U	
28	Result Copies to	U	
29	Parent	U	
30	Transportation Mode	U	
31	Reason for Study	U	
32	Principal Result Interpreter	U	
33	Assistant Result Interpreter	U	
34	Technician	U	
35	Transcriptionist	U	
36	Scheduled Date and Time	U	
37	Number of Sample Containers	U	
38	Transport Logistics of Collected Samples	U	
39	Collector's Comment	U	
40	Transport Arrangement Responsibility	U	
41	Transport Arranged	U	
42	Escort Required	U	
43	Planned Patient Transport Comment	U	

3.5.4 Observation Result (OBX) segment

Position	Element	Use	Example
1	Set ID	R	

Position	Element	Use	Example
2	Value Type	R	AD = Address DT Date ED Encapsulated Data FT Formatted Text (Display) ST String Data. TM Time TN Telephone Number TS Time Stamp (Date & Time) TX Text Data (Display) 4
3	Observation Identifier	O	102012
4	Observation Sub-ID	R	PDF Report Raw data (eg. Acrobat^text^pdf^Base64^JV BE Ri0xLjQK Jcf-sj6lKNSAwIG9 iago8PC9MZ W5ndGg-gNiAwlFlvRmlsdG)
5	Observation Value	U	
6	Units	U	
7	References Range	U	
8	Abnormal Flags	U	
9	Probability	U	
10	Nature of Abnormal Test	U	
11	Observation Result Status	U	
12	Date of Last Observation Normal Values	U	
13	User-Defined Access Checks	U	
14	Date and Time of the Observation	U	
15	Producer's ID	U	
16	Responsible Observer	U	
17	Observation Method	U	

3.5.5 Example of ORU message

The following is an example of an ORU message containing embedded Pdf report data:

```
MSH|^~\&|OTObase|OTObase|EMR|EMR|20130128161405||ORU^R01|ORU20130128161405|P|2.7
PID|||0000002||Cocu^Philip||19701029
OBR|1|3071014|105400|||201301251910
OBX|1|ED|Report|1|Acrobat^text^pdf^Base64^JVBERi0xLjQKcjsj6IKNSAwIG9iago8PC9MZW5ndGg
gNiAwFivRmlsdGVyIC9GbGF0ZURlY29kZT4+CnN0cmVhbQp4nI1SyU7EMAY95ytyTA4ldtbmitEkIB
ROI0QqH1mQKkgYfl/3DZ0wibRqJJlv/fs52QrEchIHMSn0PUC5TH/G7EVLdjhGwt13PVyP4u9RZTMym
uBkFjyNNZIRoRWxoDgZO7FUmWNEByiCepeNwgmurSdetCNAQret+pVNwTGPBSVHBDkYkzmH4hb
bYGL6tSFbhyPij6oA03go3NGHWkPIbpvOLU20DKQ6k6Pu/Dup/r7ZICrvp6pIFdVtWa97TSfmYRgkWZ
E8JFUNwm8zBMVxWKQB YgVlrN +GaqaNv7ofqKbFpw13OZM03AXPqn4Fcxp8sar83FIPji10IOFy4Cgr
ubkTcWqAFilaYot8dprh/2wA+6cBgvX+VSY4IEo8JPJK34l0zYtmSoqxjaVfLEPZWR2Ike1wywu+XwAe
MqSBGVuZHNOcmVhbQplbmRvYmoKNiAwIG9iagozMjAKZW5kb2JqCjQgMCBvYmoKPDwwVHlwZS9Q
YWdlL01lZGhQm94IFswIDAgNTk1IDgOMl0KL1JvdGF0eSAwL1BhcmVudCAzIDAgUgovUmVzb3VyY2
VzPDwwUHJvY1NldFs vUERGIC9UZ Xh0XQovRm9udCA4IDAgUgovPgovQ29udGVudHMgNSAwIFIKPj4
KZW5kb2JqCjMgMCBvYmoKPDwwL1R5cGUgL1BhZ2VzIC9LaWRzIFsKNCAwIFIKXSAvQ291bnQgMQo
+PgplbmRvYmoKMSAwIG9iago8PC9UeXBlic9D YXRhbG9nIC9QYWdlcyAzIDAgUgovTWV0Y
```

The following is an example of an ORU message containing the path to the Pdf report file :

```
MSH|^~\&|OTObase|OTObase|EMR|EMR|20140109172051||ORU^R01|ORU20140109172051|P|2.7
PID|||0000002||Smith^Richard||19670824
OBR|1|20060307110114|18|||201401061241
OBX|1|ED|18|1|C:\E\Reports\E\0000002-20140109172043.pdf
```

3.6 ACK (Acknowledgment message for ORU)

The EMR System should send an acknowledgment for all ORU messages received from OTObase. The structure of the ACK message is as follows:

3.6.1 Message Header (MSH) segment

Position	Element	Use	Example
1	Field Separator	R	Pipe symbol -
2	Encoding Characters 1. Component 2. Repeat 3. Escape 4. Sub component	R	^~\& ^ ~ \ &
3	Sending Application Name	R	OTObase (User defined during configuration)
4	Sending Facility Name	R	OTObase (User defined during configuration)

3 Supported HL7 messages types

Position	Element	Use	Example
5	Receiving Application	R	EMR System (User defined during configuration)
6	Receiving Facility	R	EMR System (User defined during configuration)
7	Date and Time of Message	R	YYYYMMDDhhmmss 20130125052045
8	Security	U	
9	Message Type	R	ACK
10	Message Control Identifier	R	ORU20130128161405
11	Processing ID	O	P = Production T = Training D= Debugging
12	HL7 Version	R	2.4,2.5,2.6,2.7.
13	Sequence Number	U	
14	Continuation Pointer	U.	
15	Accept Acknowledgment Type	U	
16	Application Acknowledgment Type	U	
17	Country Code	U	
18	Character Set	U	
19	Principle Language of Message	U	

3.6.2 Message Acknowledgment (MSA) segment

Position	Element	Use	Example
1	Acknowledgment Code	R	AA = Success AE = Error AR = Reject
2	Message Control ID	R	ORU20130128161405
3	Text Message	O	Success, Or Failure
4	Expected Sequence Number	U	

Position	Element	Use	Example
5	Delayed Acknowledgment Type	U	
6	Error Condition	O	

3.6.3 Example of ORU Acknowledgment (ACK) message in case of success

OTObase sends an ACK message to acknowledge receipt of an ORU. If the received ORU message is accepted by OTObase, then OTObase sends a Success Acknowledgment message to the EMR system. The following is an example of a Success Acknowledgment (ACK) message:

```
MSH|^~\&|EMR|EMR|OTObase|OTObase|20130128012045||ACK|ORU20130128161405|P|2.7
MSA|AA|ORU20130128161405|Success|||
```

3.6.4 Example of ORU Acknowledgment (ACK) message in case of failure

If the received ORU message is not accepted by OTObase, then OTObase sends a Failure Acknowledgment message to the EMR system. The following is an example of a Failure Acknowledgment (ACK) message:

```
MSH|^~\&|EMR|EMR|OTObase|OTObase|20130128012045||ACK|ORU20130128161405|P|2.7
MSA|AE|ORU20130128161405|Failure|||
```

4 Communication protocol

The OTObase EMR Connector for HL7 interface uses the TCP/IP protocol for communication and information exchange. TCP/IP Protocol means that the data just start coming in a stream and there is no set size. Some messages are quite concise with a couple of segments. Other HL7 standard messages are extremely long with multiple observation segments that each contain an entire patient report.

Hence in order to identify where one HL7 message starts and ends, the Minimal Lower Layer Protocol (MLLP) is used to wrap the HL7 message. The HL7 message is wrapped with a header and footer to insure you know where a message starts, where a message stops, and where the next message starts. These header and footers are non-printable characters that would not typically be in the content of HL7 messages.

Description	Character
The header is a vertical tab character.	<VT>(Hex 0x0b)
The footer is a field separator character, immediately followed by a carriage return.	<FS> (Hex 0x1c) <CR> (Hex 0x0d)

The message being transported via TCP/IP will look like this:

<VT> HL7 message <FS> <CR>

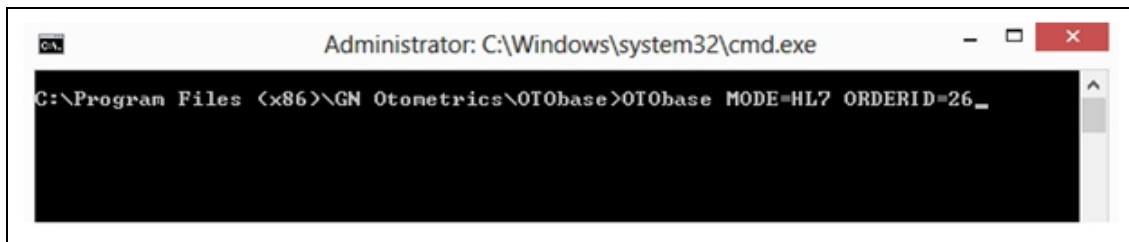
5 Opening existing order

It is possible to open OTObase and an existing order in OTObase from the EMR system. This can be done by invoking the OTObase executable from command line parameters.

The following command can be used to invoke OTObase from the EMR system and open the measurement linked with a specific order.

Syntax:-

OTObase MODE=HL7 ORDERID=<Order_Id>



The above command will:

- Open OTObase in HL7 mode.
- Automatically select the patient linked with Order Id 26.
- Automatically open the latest measurement linked with the order Id 26 .

MODE

OTObase mode to run. The value would be HL7 as we are opening OTObase in HL7 mode to open the measurement linked with the specific order.

ORDERID

OTObase sends a unique identification number (see [Observation Request \(OBR\) segment ▶ 26](#)) to the EMR system in ORU messages. This identification number is referred to as "Order Id" in OTObase.