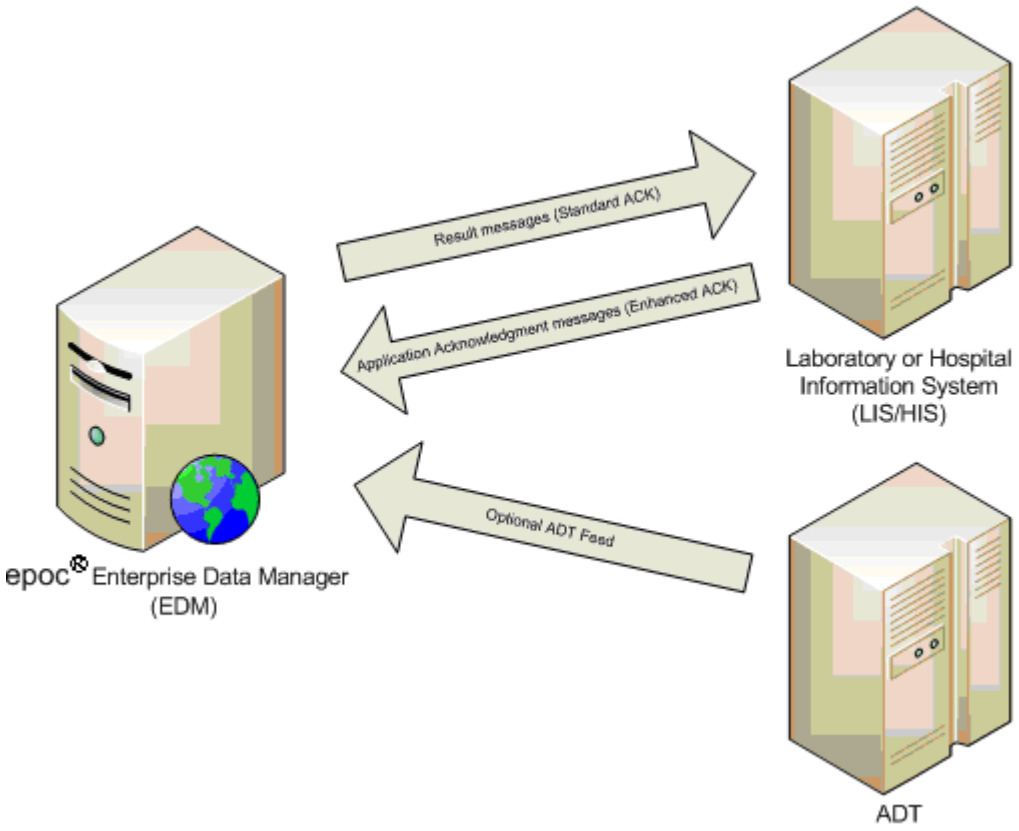
epoc HL7 Interface

Overview

The **epoc®** HL7 Interface is a customizable interface used to send patient test results from the epoc Enterprise Data Manager (EDM) to Laboratory or Hospital Information Systems. This document describes the standard HL7 messaging format that can support the following:

- Sending unsolicited test results to the LIS/HIS with standard acknowledgements;
- Optionally receive Enhanced Acknowledgements initiated by the LIS/HIS indicating success or failure to process a test result;
- Optionally receive ADT information containing patient demographic information.



Low-Level Protocol

The epoc HL7 Interface uses the minimal lower layer protocol (LLP) as described in Appendix B, section B.4 of the HL7 version 2.6 specifications.

Result Messages – Unsolicited Observation Message Structure

Test results are sent using ORU messages based on the standard structure as defined in the HL7 Specification version 2.6. The basic ORU message structure is as follows:

MSH – Message Header Segment
PID – Patient Identification Segment
OBR – Observation Request Segment
[{OBX}] – Observation/Result Segments

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MSH – Message Header Segment

Field	Description	Format	Value(s)
MSH.1	**Field Separator**	**[text]**	**|**
MSH.2	**Encoding Characters**	**[text]**	**^~\&**
MSH.3	**Sending Application**	**[text]**	**epoc**
MSH.4	**Sending Facility**	**[text]**	**Epocal**
MSH.5	**Receiving Application**	**[text]**	**LAB**
MSH.6	**Receiving Facility**	**[text]**	**LAB**
MSH.7	**Date/Time of Message**	**[yyyymmddhhmmss]**	**Message Date/Time**
MSH.8	Security	<not used>	<not used>
MSH.9	**Message Type^Trigger Enent**	**[text]**	**ORU^R01** (Unsolicited Observation Message)
MSH.10	**Message Control ID**	**[unique ID]**	**Unique message identifier**
MSH.11	**Processing ID**	**[text]**	**P**
MSH.12	**Version ID**	**[text]**	**2.6**
MSH.13	Sequence Number	<not used>	<not used>
MSH.14	Continuation pointer	<not used>	<not used>
MSH.15	**Accept acknowledgement type**	**[text]**	**AL**
MSH.16	**Application acknowledgement type**	**[text]**	**NE** – Enhanced Acknowledgement disabled **AL** – Enhanced Acknowledgement enabled
MSH.17 : MSH.25	Country Code : Receiving Network Address	<not used> : <not used>	<not used> : <not used>

PID - Patient Identification Segment

Field	Description	Format	Value(s)
PID.1	**Set ID – PID**	**[number]**	**1**
PID.2	Patient ID	<not used>	<not used>
PID.3	**Patient Identifier List**	**[text]**	**[patient ID]** – as entered in the epoc Host
PID.4	**Alternate Patient ID – PID**	**[text]**	**[ID2]** – as entered in the epoc Host
PID.5	Patient Name	<not used>	<not used>
PID.6	Mother's Maiden Name	<not used>	<not used>
PID.7	Date/Time of Birth	<not used>	<not used>
PID.8	Administrative Sex	<not used>	<not used>
PID.9 : PID.17	Patient Alias : Religion	<not used> : <not used>	<not used> : <not used>
PID.18	Patient Account Number	<not used>	<not used>
PID.19 : PID.39	SSN Number - Patient : Tribal Citizenship	<not used> : <not used>	<not used> : <not used>

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OBR – Observation Request Segment

Field	Description	Format	Value(s)
OBR.1	Set ID – OBR	[number]	1
OBR.2	Placer Order Number	[text]	<not used>
OBR.3	Filler Order Number	[text]	<not used>
OBR.4.1	**Universal Service ID – Identifier**	**[text]**	**BGEM**
OBR.4.2	**Universal Service ID – Text**	**[text]**	**BGEM Test Card**
OBR.5	Priority	<not used>	<not used>
OBR.6	Requested Date/Time	<not used>	<not used>
OBR.7	**Observation Date/Time**	**[yyyymmddhhmmss]**	**[test date/time]**
OBR.8 : OBR.13	Observation End Date/Time : Relevant Clinical Information	<not used> : <not used>	<not used> : <not used>
OBR.14	**Specimen Received Date**	**[yyyymmddhhmmss]**	**[test date/time]**
OBR.15.1	**Specimen Source**	**[text]**	**Sample Type –** as selected on the epoc Host. **QA –** Quality control test
OBR.15.2	**Control lot** (QA tests only)	**[text]**	**<lot #>** for **QA** tests only
OBR.15.3	**Control level** (QA tests only)	**[text]**	**<level>** for **QA** tests only
OBR.16 : OBR.33	Ordering Provider : Assistant Result Interpreter	<not used> : <not used>	<not used> : <not used>
OBR.34	**Technician**	**[text]**	**[operator ID]**
OBR.35 : OBR.50	Transcriptionist : Parent Universal Service Identifier	<not used> : <not used>	<not used> : <not used>

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OBX – Observation/Result Segment

Field	Description	Format	Value(s)
OBX.1	**Set ID – OBX**	**[number]**	**[incremental value starting at 1]**
OBX.2	**Value Type**	**[text]**	**ST** – String Data **NM** – Numeric
OBX.3	**Observation Identifier**	**[text]**	**See table OBX-1 and OBX-2**
OBX.4	Observation Sub-ID	<note used>	<not used>
OBX.5	**Observation Value**	**[number]** if **NM** Value Type **[text]** if **ST** Value Type	**Value associated with OBX.3** NOTE: The value can report as follows: **±#.#** Numeric result **< ±#.#** Result below instrument range. **> ±#.#** Result above instrument range. **Failed iQC** Sensor failed quality check. **cnc** Result could not be calculated.
OBX.6	**Units**	**[text]**	**See table OBX-1 and OBX-2**
OBX.7	**Reference Ranges**	**[text]**	**[reference low]-[reference high]**
OBX.8	**Abnormal Flags**	**[text]**	**L** Below low normal **H** Above high normal **LL** Below lower critical limit **HH** Above upper critical limit **<** Below absolute low-off instrument scale **>** Above absolute high-off instrument scale
OBX.9	Probability	<not used>	<not used>
OBX.10	Nature of Abnormal Test	<not used>	<not used>
OBX.11	**Observation Result Status**	**[text]**	**F**
OBX.12	Effective Date of Reference Range	<not used>	<not used>
OBX.13	User Defined Access Checks	<not used>	<not used>
OBX.14	**Observation Date/Time**	**[yyyymmddhhmmss]**	**[test date/time]**
OBX.15 : OBX.17	Producer's ID : Observation Method	<not used> : <not used>	<not used> : <not used>
OBX.18	**Equipment Instance Identifier**	**^^[text]**	**^^<Host SerialNum>~<Reader Serial Num>**
OBX.19 : OBX.25	Date/Time of the Analysis : Performing Organization Medical Director	<not used> : <not used>	<not used> : <not used>

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Table OBX-1: Test Codes for test results.

Test Code	Type	Description	Units	Value format
pH	Measured	pH	<no units>	#.###
pCO2	Measured	pCO2	mmHg kPa	#.# #.##
pO2	Measured	pO2	mmHg kPa	#.# #.##
pH(T)	Measured, Corrected	pH corrected for Patient Temperature	<no units>	#.###
pCO2(T)	Measured, Corrected	pCO2 corrected for Patient Temperature	mmHg kPa	#.# #.##
pO2(T)	Measured, Corrected	pO2 corrected for Patient Temperature	mmHg kPa	#.# #.##
HCO3-act	Calculated	Bicarbonate ($cHCO_3$-)	mmol/L mEq/L	#.# #.#
BE(ecf)	Calculated	Base Excess (extra-cellular fluid)	mmol/L mEq/L	±#.# ±#.#
BE(b)	Calculated	Base Excess (blood)	mmol/L mEq/L	±#.# ±#.#
O2SAT	Calculated	Oxygen Saturation (cSO_2)	%	#.#
TCO2	Measured	Total Carbon Dioxide	mmol/L mEq/L	#.# #.#
cTCO2	Calculated	Calculated Total Carbon Dioxide	mmol/L mEq/L	#.# #.#
BUN	Measured	Blood Urea Nitrogen	mg/dL	#
Urea	Measured	Urea	mmol/L mg/dL g/L	#.# # #.##
BUN/Crea	Calculated	BUN to Creatinine Ratio	mg/mg	#.#
Urea/Crea	Calculated	Urea to Creatinine Ratio	mmol/mmol mg/mg	#.# #.#
A	Calculated	Alveolar Oxygen	mmHg	#.#
A-a	Calculated	Arterial Alveolar Oxygen Tension Gradient	mmHg	#.#
a/A	Calculated	Arterial Alveolar Oxygen Tension Ratio	% Fraction	#.# #.###
A(T)	Calculated, Corrected	Alveolar Oxygen	mmHg	#.#
A-a(T)	Calculated, Corrected	Arterial Alveolar Oxygen Tension Gradient	mmHg	#.#
a/A(T)	Calculated, Corrected	Arterial Alveolar Oxygen Tension Ratio	% Fraction	#.# #.###

Table OBX-1 continues on the next page

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Table OBX-1 (continued): Test Codes for test results.

Test Code	Type	Description	Units	Value format
Na+	Measured	Sodium	mmol/L mEq/L	# #
K+	Measured	Potassium	mmol/L mEq/L	#.# #.#
Ca++	Measured	Ionized Calcium	mmol/L mg/dL mEq/L	#.## #.# #.#
Glu	Measured	Glucose	mmol/L mg/dL g/L	#.# # #.##
Lact	Measured	Lactate	mmol/L mg/dL g/L	#.## #.# #.##
Hct	Measured	Hematocrit	%PCV L/L	# #.##
cHgb	Calculated	Hemoglobin	mmol/L g/dL g/L	#.# #.# #
Cl-	Measured	Chloride	mmol/L mEq/L	# #
AGap	Calculated	Anion Gap	mmol/L mEq/L	# #
AGapK	Calculated	Anion Gap with Potassium	mmol/L mEq/L	# #
Crea	Measured	Creatinine	mg/dL µmol/L	#.## #.##
eGFR	Calculated	Estimated Glomerular Filtration Rate (Japanese equation)	mL/m/1.73m^2	#
GFRmdr	Calculated	Estimated Glomerular Filtration Rate (IDMS-traceable MDRD type)	mL/m/1.73m^2	#
GFRmdr-a	Calculated	Estimated Glomerular Filtration Rate (IDMS-traceable MDRD type), if African American	mL/m/1.73m^2	#
GFRckd	Calculated	Estimated Glomerular Filtration Rate (CKD-EPI equation)	mL/m/1.73m^2	#
GFRckd-a	Calculated	Estimated Glomerular Filtration Rate (CKD-EPI equation), if African American	mL/m/1.73m^2	#
GFRswz	Calculated	Estimated Glomerular Filtration Rate (Bedside Schwartz equation)	mL/m/1.73m^2	#

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Table OBX-2: Test codes for optional user entered test attributes.

Test Code	Description	Units	Value(s)
Patient temperature	Patient temperature as entered by the operator	F, C	[number]
Hemodilution	Hemodilution correction factor applied.	<empty>	Yes No
Sample type	Sample type as chosen by the operator	<empty>	Arterial Capillary Cord Cord-Arterial Cord-Venous Mixed-Venous Venous Unknown Unspecified
Draw site	Draw site as chosen or entered by the operator.	<empty>	[text]
Allen's test	Allen's test as chosen by the operator.	<empty>	Positive Negative N/A Not Entered
Delivery system	Airway delivery system as chosen or entered by the operator.	<empty>	[text]
Mode	Ventilator mode as chosen or entered by the operator.	<empty>	[text]
FiO2	Fractional Inspired Oxygen as entered by the operator	lpm, %	[number]
Vt	Tidal Volume	<empty>	[number]
RR	Respiratory Rate	<empty>	[number]
TR	Total Rate	<empty>	[number]
PEEP	Positive End Expiratory Pressure	<empty>	[number]
PS	Pressure Support	<empty>	[number]
IT	Inspiratory Time	<empty>	[number]
ET	Expiratory Time	<empty>	[number]
PIP	Peak Inspiratory Pressure	<empty>	[number]
MAP	Mean Airway Pressure	<empty>	[number]
RQ	Respiratory Quotient	<empty>	[number]
Comments	Free text comment	<empty>	[text]

Table OBX-2 continues on the next page

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Table OBX-2 (continued): Test codes for optional user entered test attributes.

Test Code	Description	Units	Value(s)
Criticals present	Indicates whether or not critical results are present in the record	<empty>	Yes No
Critical action	Critical action taken if critical results are present	<empty>	Notify physician Notify RN Repeated Test Sent to Lab Expected values Other
Critical notify	Information regarding who was notified of critical results	<empty>	[text]
Read back	Indicates whether or not critical results were read back	<empty>	Yes No
Notify date	Critical value notification date and time	<empty>	[yyyyMMddHHmmss]
Ordering physician	Ordering physician entered by user	<empty>	[text]
Order time	Order time entered by user	<empty>	[dd-MMM-yy HH:mm:ss]
Collected by	Sample collected by entered by the user	<empty>	[text]
Collection time	Collection time entered by user	<empty>	[dd-MMM-yy HH:mm:ss]
Reject test	Indicates whether or not the user intended to reject the test record	<empty>	Yes No
Patient Name	Patient Name entered by user	<empty>	[text]
Patient location	Patient location field entered by user	<empty>	[text]
Patient age	Patient Age entered by user (x years)	<empty>	[text]
Patient gender	Patient Gender selected by user.	<empty>	Male Female Not entered
Patient height	Patient Height selected by user.	<empty>	[number] cm [number] inches
LookupGender	Patient Gender as received by real-time Positive Patient ID Lookup (if enabled).	<number>	0 - Male 1 - Female 2 - Unknown

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Table OBX-3: Test codes for non-user related test attributes.

Test Code	Description	Units	Value(s)
Ambient Temperature	Instrument measured ambient temperature.	C	[number]
Ambient Pressure	Instrument measured ambient pressure.	mmHg	[number]
EDM Test status	Test status field.	<empty>	Success Incomplete iQC
Card Lot	Card lot number	<empty>	[text]
Card Expiration Date	Card expiration date	<empty>	[yyyyMMdd]
ReaderSerNum	epoc Reader serial number	<empty>	[text]
HostSerNum	epoc Host serial number	<empty>	[text]
Error Text	Error information about incomplete tests	<empty>	[text]
Host Alias	epoc Host name	<empty>	[text]
Reader Alias	epoc Reader name	<empty>	[text]
Department name	Department name assigned to the epoc Host at the time of the test.	<empty	[text]
ReaderMaintenanceRequired	For internal use	<empty>	Yes No
Bubble width	For internal use	<empty>	[number]
EnforceCriticalHandling	For internal use	<empty>	Yes No
Host Mode	For internal use	<empty>	[number]
Patient Id entry method	For internal use	<empty>	[number]
Patient Id lookup code	For internal use	<empty>	[number]
Test duration	For internal use	<empty>	[number]
eQC time	Date and time of the last successful Electronic QC test.	<empty>	[dd-MMM-yy HH:mm:ss]

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Table OBX-4: Test codes for Enhanced QA related test attributes.

Note: These test codes will not be present if the epoc Enhanced QA features are disabled.

Test Code	Description	Units	Value(s)
eVAD version	Electronic Value Assignment Datasheet (eVAD) version	<empty>	[text]
QC expiry	QC Expiry date	<empty>	[YYYY-MM-DD HH:mm:ss]
QC info 1	For internal use	<empty>	[text]
QC info 2	For internal use	<empty>	[text]
CV expiry	CV Expiry Date	<empty>	[YYYY-MM-DD HH:mm:ss]
CV info 1	For internal use	<empty>	[text]
CV info 2	For internal use	<empty>	[text]
Thermal QA expiry	Thermal QA expiry date	<empty>	[text]
last Thermal QA	Date and time of the last successful Thermal QA test.	<empty>	[YYYY-MM-DD HH:mm:ss]
last Thermal QA result	Indicates if the last Thermal QA result was successful	<empty>	Yes No
QCScheduleState	For internal use	<empty>	[number]
CVScheduleState	For internal use	<empty>	[number]
TQAScheduleState	For internal use	<empty>	[number]
QAScheduleState	For internal use	<empty>	[number]
QA test type	QA testing type selected by the User. QA testing only	<empty>	**2** - Quality control **3** - Calibration verification **4** - Proficiency **7** - Other
Fluid type*	Recognized fluid lot number (i.e. “L1”, “CV1”, “HPX”, etc.). QA testing only	<empty>	[text]
Fluid expiry*	QC Fluid expiration date QA testing only	<empty>	YYYY-MM-DD HH:mm:ss
Fluid ref*	For internal use	<empty>	[text]
Fluid lot*	QC Fluid lot information QA testing only	<empty>	[text[
QA PassFail*	QA test Passed or Failed QA testing only	<empty>	**Yes** – QA Passed **No** – QA Failed

***** *Available only with Quality Assurance test records when using electronic Value Assignment Datasheets (eVADs)*

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Commit/Accept Acknowledgement Messages

The receiving system will respond to Result Messages with a Commit Acknowledgement. The Commit Acknowledgement message structure is as follows:

MSH – Message Header Segment

MSA – Message Acknowledgement Segment

Example Message:

MSH|^~\&|||epoc|Epocal|20100422183846||ACK|20100422183846|P|2.6|||NE|NE
MSA|CA|20100422183846199

MSH – Message Header Segment

Field	Description	Format	Value
MSH.1	**Field Separator**	**[text]**	**|**
MSH.2	**Encoding Characters**	**[text]**	**^~\&**
MSH.3	**Sending Application**	**[text]**	<optional>
MSH.4	**Sending Facility**	**[text]**	<optional>
MSH.5	**Receiving Application**	**[text]**	**epoc**
MSH.6	**Receiving Facility**	**[text]**	**Epocal**
MSH.7	**Date/Time of Message**	**[yyyymmddhhmmss]**	**Message Date/Time**
MSH.8	Security	<not used>	<not used>
MSH.9	**Message Type**	**[text]**	**ACK**
MSH.10	**Message Control ID**	**[unique ID]**	**Unique message identifier**
MSH.11	**Processing ID**	**[text]**	**P**
MSH.12	**Version ID**	**[text]**	**2.6**
MSH.13	Sequence Number	<not used>	<not used>
MSH.14	Continuation pointer	<not used>	<not used>
MSH.15	**Accept acknowledgement type**	**[text]**	**NE**
MSH.16	**Application acknowledgement type**	**[text]**	**NE**

MSA – Message Acknowledgement Segment

Field	Description	Format	Value
MSA.1	**Acknowledgement Code**	**[text]**	**CA – Commit Accept** **CE – Commit Error**
MSA.2	**Message Control ID**	**[text]**	**Message Control ID of the corresponding ORU Message.**

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Enhanced or Application Acknowledgement Messages (optional)

The receiving system can optionally send, over a second channel, an Application Acknowledgement message that indicates whether or not the test record was successfully processed. The Application Acknowledgement message structure is as follows:

MSH – Message Header Segment

MSA – Message Acknowledgement Segment

Example Application Acknowledgement Messages:

MSH|^~\&|||epoc|Epocal|20100616062433||ACK^R01|201006160624203234|P|2.6|||NE|NE
MSA|AA|201006160624203234|W13085|

Or…

MSH|^~\&|||epoc|Epocal|20100616062433||ACK^R01|201006160624203234|P|2.6|||NE|NE
MSA|AE|201006160624203234|Invalid Patient ID (12345)|

MSH – Message Header Segment

Field	Description	Format	Value
MSH.1	**Field Separator**	**[text]**	**|**
MSH.2	**Encoding Characters**	**[text]**	**^~\&**
MSH.3	**Sending Application**	**[text]**	<optional>
MSH.4	**Sending Facility**	**[text]**	<optional>
MSH.5	**Receiving Application**	**[text]**	**epoc**
MSH.6	**Receiving Facility**	**[text]**	**Epocal**
MSH.7	**Date/Time of Message**	**[yyyymmddhhmmss]**	**Message Date/Time**
MSH.8	Security	<not used>	<not used>
MSH.9	**Message Type**	**[text]**	**ACK^R01**
MSH.10	**Message Control ID**	**[unique ID]**	**Unique message identifier**
MSH.11	**Processing ID**	**[text]**	**P**
MSH.12	**Version ID**	**[text]**	**2.6**
MSH.13	Sequence Number	<not used>	<not used>
MSH.14	Continuation pointer	<not used>	<not used>
MSH.15	**Accept acknowledgement type**	**[text]**	**NE**
MSH.16	**Application acknowledgement type**	**[text]**	**NE**

MSA – Message Acknowledgement Segment

Field	Description	Format	Value
MSA.1	**Acknowledgement Code**	**[text]**	**AA** – Application Accept **AE** – Application Error
MSA.2	**Message Control ID**	**[text]**	**Message Control ID of the corresponding ORU Message.**
MSA.3	**Text Message**	**[text]**	**LIS Assigned Accession Number or Error message**

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Appendix A: Sample Messages

Sample EDM Test Record

epoc EDM — epoc Enterprise Data Manager

Connected to: EDM215
User: epocsysadmin
epoc Link @ 10.80.124.91 : 54321 ✔ DB ✔ 2.15.3 Log out

Blood tests | QA tests | Reports | Inventory | Settings

Blood tests (Last 7 days - 2/8)

Select filter type ... From 08-Feb-19 To 14-Feb-19 Refresh

Date/Time	Patient ID	ID2	Operator	Department	Host name	Reader name	Test Status	Critical	LIS
11-Feb-19 14:28:00	23dm		1111	Default	16102521400405	Rdr3610	OK	--	Not sent
11-Feb-19 14:23:02	23dm		1111	Default	16102521400405	Rdr3610	OK	--	Not sent

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Save as CSV file

Save changes | Cancel changes | Printable report | Send to LIS

Results | Equipment | QC status | CV status | RT parameters | Patient history | Test change log

Test record details

Test date/time	11-Feb-19 14:28:00
Patient ID	23dm
ID2	
Comments	
Operator name	
Operator ID	1111
Department	Default
Test Status	OK
Error Code	
LIS message	
Reject test	○ Yes ◉ No
Age	35 years (179 cm)
Patient gender	Male
Patient temperature	
Sample type	Unspecified
Hemodilution	Yes
Lookup status	Not enabled
Lookup ID	
Lookup name	
Lookup gender	
Lookup DOB	
Critical action	Not entered
Critical notify	
Notify date	(HH:mm)
Read back	○ Yes ◉ No
Patient location	
Collected by	
Collection date	(HH:mm)
Ordering physician	
Order date	(HH:mm)

Test results

Analyte	Result	Reference range	Critical range	Reportable range	Status
pH	> 8.000	7.350 - 7.450	5.500 - 9.000	6.500 - 8.000	High
pCO2	5.6 mmHg	35.0 - 48.0	4.0 - 251.0	5.0 - 250.0	Low
pO2	185.7 mmHg	83.0 - 108.0	4.0 - 751.0	5.0 - 750.0	High
Na+	151 mmol/L	138 - 146	84 - 181	85 - 180	High
K+	4.0 mmol/L	3.5 - 4.5	0.5 - 13.0	1.5 - 12.0	
Cl-	119 mmol/L	98 - 107	64 - 141	65 - 140	High
Ca++	1.04 mmol/L	1.15 - 1.33	0.00 - 5.00	0.25 - 4.00	Low
Glu	59 mg/dL	74 - 100	19 - 701	20 - 700	Low
Lac	2.13 mmol/L	0.36 - 0.75	0.00 - 21.00	0.30 - 20.00	High
Crea	0.70 mg/dL	0.51 - 1.19	0.00 - 16.00	0.30 - 15.00	
Hct	< 10 %	38 - 51	9 - 76	10 - 75	Low
cHgb	cnc	12.0 - 17.0	2.3 - 26.0	3.3 - 25.0	
cHCO3-	cnc	21.0 - 28.0	0.0 - 86.0	1.0 - 85.0	
cTCO2	cnc	22.0 - 29.0	4.0 - 51.0	5.0 - 50.0	
BE(ecf)	cnc	-2.0 - 3.0	-31.0 - 31.0	-30.0 - 30.0	
BE(b)	cnc	-2.0 - 3.0	-31.0 - 31.0	-30.0 - 30.0	
cSO2	cnc	94.0 - 98.0	-1.0 - 101.0	0.0 - 100.0	

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ORU Message Sample 1 – Patient Test

```
MSH|^~\&|epoc|Epocal|LAB|LAB|20130823124229||ORU^R01|EDM201308231242296|P|2.6|||AL|NE
PID|||P1234567890|654321||||||||||||||||||||||
OBR|1|||BGEM^BGEM Test Card|||20130823080533|||||||20130823080533|Arterial|||||||||||||||||||12345||
OBX|1|NM|pH||7.465||7.350-7.450|HH|||F|||20130823080533||||^^01234567890123~91234
OBX|2|NM|pCO2||45.7|mmHg|35.0-48.0||||F|||20130823080533||||^^01234567890123~91234
OBX|3|NM|pO2||88.0|mmHg|83.0-105.0||||F|||20130823080533||||^^01234567890123~91234
OBX|4|NM|pH(T)||7.359||7.350-7.450||||F|||20130823080533||||^^01234567890123~91234
OBX|5|NM|pCO2(T)||46.4|mmHg|35.0-48.0||||F|||20130823080533||||^^01234567890123~91234
OBX|6|NM|pO2(T)||94.2|mmHg|83.0-105.0||||F|||20130823080533||||^^01234567890123~91234
OBX|7|NM|Na+||143|mEq/L|138-146||||F|||20130823080533||||^^01234567890123~91234
OBX|8|NM|K+||4.2|mEq/L|3.5-4.5||||F|||20130823080533||||^^01234567890123~91234
OBX|9|NM|Ca++||1.15|mmol/L|1.12-1.32||||F|||20130823080533||||^^01234567890123~91234
OBX|10|NM|Hct||42|%|38-51||||F|||20130823080533||||^^01234567890123~91234
OBX|11|NM|Glu||92|mg/dL|74-100||||F|||20130823080533||||^^01234567890123~91234
OBX|12|NM|Lact||4.6|mg/dL|4.1-6.8||||F|||20130823080533||||^^01234567890123~91234
OBX|13|NM|cHgb||12.7|g/dL|12.0-17.0||||F|||20130823080533||||^^01234567890123~91234
OBX|14|NM|HCO3-act||24.5|mmol/L|21.0-28.0||||F|||20130823080533||||^^01234567890123~91234
OBX|15|NM|cTCO2||27.7|mmol/L|22.0-29.0||||F|||20130823080533||||^^01234567890123~91234
OBX|16|NM|BE(b)||-1.3|mmol/L|-2.0-3.0||||F|||20130823080533||||^^01234567890123~91234
OBX|17|NM|O2SAT||96.4|%|95.0-98.0||||F|||20130823080533||||^^01234567890123~91234
OBX|18|NM|Test duration||228.2||||||F|||20130823080533||||^^01234567890123~91234
OBX|19|NM|Patient temperature||99.9|F|||||F|||20130823080533||||^^01234567890123~91234
OBX|20|ST|Comments||Sample Comment||||||F|||20130823080533||||^^01234567890123~91234
OBX|21|ST|Sample type||Arterial||||||F|||20130823080533||||^^01234567890123~91234
OBX|22|ST|Hemodilution||No||||||F|||20130823080533||||^^01234567890123~91234
OBX|23|NM|Ambient Temperature||23.6|C|||||F|||20130823080533||||^^01234567890123~91234
OBX|24|NM|Ambient Pressure||761.6|mmHg|||||F|||20130823080533||||^^01234567890123~91234
OBX|25|ST|Draw site||Art Line||||||F|||20130823080533||||^^01234567890123~91234
OBX|26|ST|Allen's test||Negative||||||F|||20130823080533||||^^01234567890123~91234
OBX|27|ST|Delivery system||HFOV||||||F|||20130823080533||||^^01234567890123~91234
OBX|28|ST|Mode||SIMV||||||F|||20130823080533||||^^01234567890123~91234
OBX|29|NM|Vt||45||||||F|||20130823080533||||^^01234567890123~91234
OBX|30|NM|RR||23||||||F|||20130823080533||||^^01234567890123~91234
OBX|31|NM|TR||33||||||F|||20130823080533||||^^01234567890123~91234
OBX|32|NM|PEEP||33.6||||||F|||20130823080533||||^^01234567890123~91234
OBX|33|NM|PS||22.6||||||F|||20130823080533||||^^01234567890123~91234
OBX|34|NM|IT||86.4||||||F|||20130823080533||||^^01234567890123~91234
OBX|35|NM|ET||36||||||F|||20130823080533||||^^01234567890123~91234
OBX|36|NM|PIP||65||||||F|||20130823080533||||^^01234567890123~91234
OBX|37|NM|MAP||19||||||F|||20130823080533||||^^01234567890123~91234
OBX|38|NM|FiO2||65|%|||||F|||20130823080533||||^^01234567890123~91234
OBX|39|ST|EDM Test status||Success||||||F|||20130823080533||||^^01234567890123~91234
OBX|40|ST|Criticals present||Yes||||||F|||20130823080533||||^^01234567890123~91234
OBX|41|ST|Critical notify||Dr. Doctor||||||F|||20130823080533||||^^01234567890123~91234
OBX|42|ST|Critical action||Notify physician||||||F|||20130823080533||||^^01234567890123~91234
OBX|43|ST|Read back||Yes||||||F|||20130823080533||||^^01234567890123~91234
OBX|44|ST|Notify date||20130823013400||||||F|||20130823080533||||^^01234567890123~91234
OBX|45|ST|ReaderMaintenanceRequired||No||||||F|||20130823080533||||^^01234567890123~91234
OBX|46|NM|Bubble width||0.35||||||F|||20130823080533||||^^01234567890123~91234
OBX|47|ST|eQC time||N/A||||||F|||20130823080533||||^^01234567890123~91234
OBX|48|ST|Card Lot||00-00000-00||||||F|||20130823080533||||^^01234567890123~91234
OBX|49|NM|Card Expiration Date||20131231||||||F|||20130823080533||||^^01234567890123~91234
OBX|50|ST|HostSerNum||01234567890123||||||F|||20130823080533||||^^01234567890123~91234
OBX|51|ST|Host Alias||NICU1||||||F|||20130823080533||||^^01234567890123~91234
OBX|52|ST|ReaderSerNum||91234||||||F|||20130823080533||||^^01234567890123~91234
OBX|53|ST|Reader Alias||Rdr91234||||||F|||20130823080533||||^^01234567890123~91234
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epoc HL7 Interface

ORU Message Sample 2 – QA Test

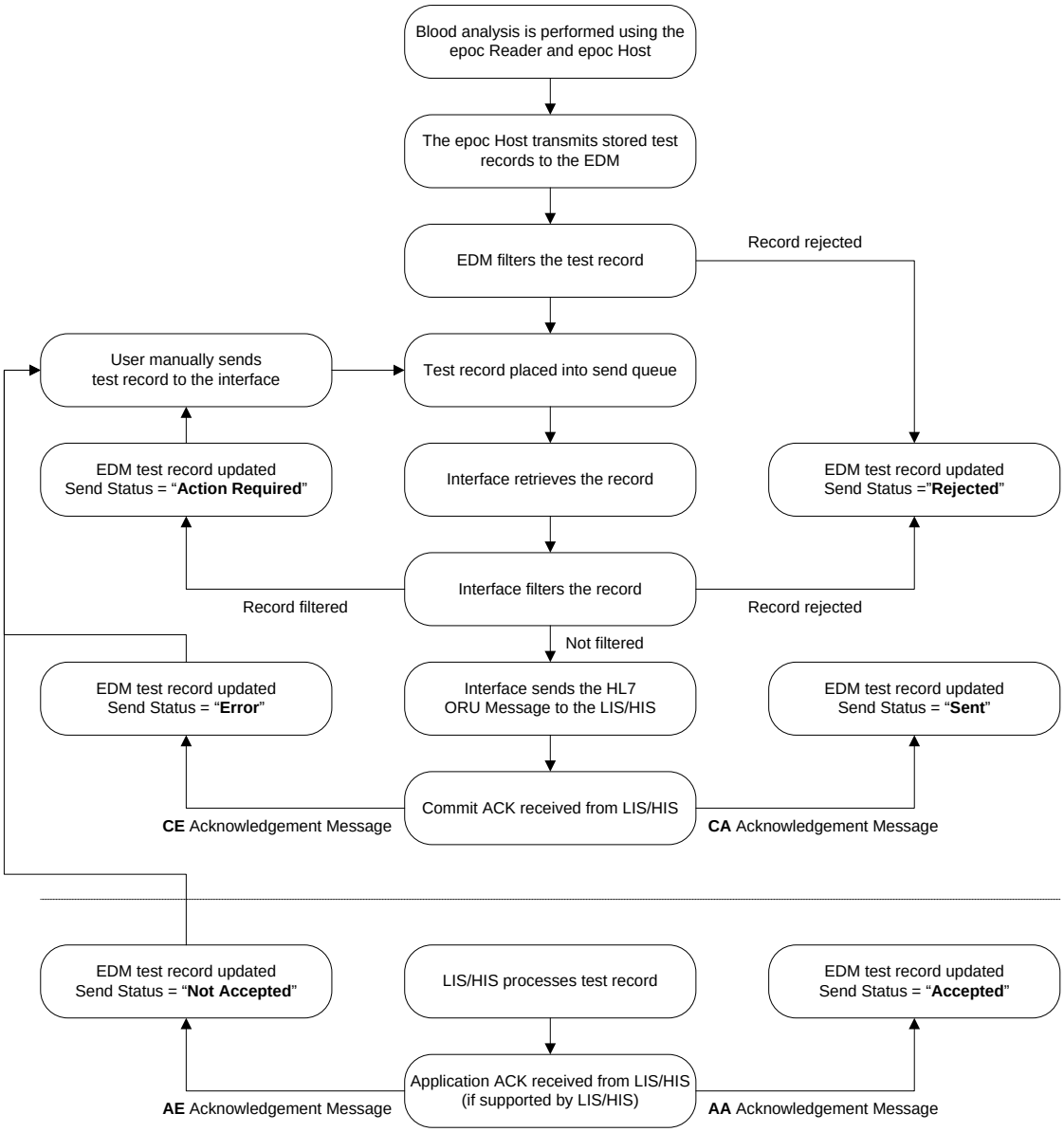
```
MSH|^~\&|epoc|Epocal|LAB|LAB|20130823124229||ORU^R01|EDM201308231242297|P|2.6|||AL|NE
PID|||L1:179-1-B235|||||||||||||||||||||||
OBR|1|||BGEM^BGEM Test Card|||20130823081733|||||||20130823081733|QA^179-1-
B235^L1|||||||||||||||||12345||
OBX|1|NM|pH||7.036||||||F|||20130823081733||||^^01234567890123~91234
OBX|2|NM|pCO2||68.8|mmHg|||||F|||20130823081733||||^^01234567890123~91234
OBX|3|NM|pO2||63.9|mmHg|||||F|||20130823081733||||^^01234567890123~91234
OBX|4|NM|Na+||112|mEq/L|||||F|||20130823081733||||^^01234567890123~91234
OBX|5|NM|K+||2.0|mmol/L|||||F|||20130823081733||||^^01234567890123~91234
OBX|6|NM|Ca++||1.40|mmol/L|||||F|||20130823081733||||^^01234567890123~91234
OBX|7|NM|Hct||-3|%|||||F|||20130823081733||||^^01234567890123~91234
OBX|8|NM|Glu||258|mg/dL|||||F|||20130823081733||||^^01234567890123~91234
OBX|9|NM|Lact||0.40|mmol/L|||||F|||20130823081733||||^^01234567890123~91234
OBX|10|ST|cHgb||cnc|g/dL|||||F|||20130823081733||||^^01234567890123~91234
OBX|11|NM|HCO3-act||21.2|mmol/L|||||F|||20130823081733||||^^01234567890123~91234
OBX|12|NM|cTCO2||23.3|mmol/L|||||F|||20130823081733||||^^01234567890123~91234
OBX|13|NM|BE(ecf)||-8.3|mmol/L|||||F|||20130823081733||||^^01234567890123~91234
OBX|14|ST|BE(b)||cnc|mmol/L|||||F|||20130823081733||||^^01234567890123~91234
OBX|15|NM|O2SAT||85.0|%|||||F|||20130823081733||||^^01234567890123~91234
OBX|16|NM|Test duration||228.2||||||F|||20130823081733||||^^01234567890123~91234
OBX|17|ST|Comments||Sample Comment||||||F|||20130823081733||||^^01234567890123~91234
OBX|18|ST|Hemodilution||No||||||F|||20130823081733||||^^01234567890123~91234
OBX|19|NM|Ambient Temperature||23.6|C|||||F|||20130823081733||||^^01234567890123~91234
OBX|20|NM|Ambient Pressure||761.6|mmHg|||||F|||20130823081733||||^^01234567890123~91234
OBX|21|ST|EDM Test status||Success||||||F|||20130823081733||||^^01234567890123~91234
OBX|22|ST|Criticals present||No||||||F|||20130823081733||||^^01234567890123~91234
OBX|23|ST|eQC time||N/A||||||F|||20130823081733||||^^01234567890123~91234
OBX|24|ST|Card Lot||00-00000-00||||||F|||20130823081733||||^^01234567890123~91234
OBX|25|NM|Card Expiration Date||20131231||||||F|||20130823081733||||^^01234567890123~91234
OBX|26|ST|HostSerNum||01234567890123||||||F|||20130823081733||||^^01234567890123~91234
OBX|27|ST|Host Alias||NICU1||||||F|||20130823081733||||^^01234567890123~91234
OBX|28|ST|ReaderSerNum||91234||||||F|||20130823081733||||^^01234567890123~91234
OBX|29|ST|Reader Alias||Rdr91234||||||F|||20130823081733||||^^01234567890123~91234
```

ORU Message Sample 3 – Error Message

```
MSH|^~\&|epoc|Epocal|LAB|LAB|20130823124230||ORU^R01|EDM201308231242308|P|2.6|||AL|NE
PID|||P1234567890|654321|||||||||||||||||||||||
OBR|1|||BGEM^BGEM Test Card|||20130823082733|||||||20130823082733|Blood|||||||||||||||||12345||
OBX|1|NM|Test duration||228.2||||||F|||20130823082733||||^^01234567890123~91234
OBX|2|NM|Patient temperature||99.9|F|||||F|||20130823082733||||^^01234567890123~91234
OBX|3|ST|Comments||Sample Comment||||||F|||20130823082733||||^^01234567890123~91234
OBX|4|ST|Hemodilution||No||||||F|||20130823082733||||^^01234567890123~91234
OBX|5|NM|Ambient Temperature||23.6|C|||||F|||20130823082733||||^^01234567890123~91234
OBX|6|NM|Ambient Pressure||761.6|mmHg|||||F|||20130823082733||||^^01234567890123~91234
OBX|7|ST|Draw site||Art Line||||||F|||20130823082733||||^^01234567890123~91234
OBX|8|NM|FiO2||65|%|||||F|||20130823082733||||^^01234567890123~91234
OBX|9|ST|EDM Test status||Incomplete||||||F|||20130823082733||||^^01234567890123~91234
OBX|10|ST|Criticals present||No||||||F|||20130823082733||||^^01234567890123~91234
OBX|11|ST|eQC time||N/A||||||F|||20130823082733||||^^01234567890123~91234
OBX|12|ST|Error Text||Missing data: Sample type||||||F|||20130823082733||||^^01234567890123~91234
OBX|13|ST|Card Lot||00-00000-00||||||F|||20130823082733||||^^01234567890123~91234
OBX|14|NM|Card Expiration Date||20131231||||||F|||20130823082733||||^^01234567890123~91234
OBX|15|ST|HostSerNum||01234567890123||||||F|||20130823082733||||^^01234567890123~91234
OBX|16|ST|Host Alias||NICU1||||||F|||20130823082733||||^^01234567890123~91234
OBX|17|ST|ReaderSerNum||91234||||||F|||20130823082733||||^^01234567890123~91234
OBX|18|ST|Reader Alias||Rdr91234||||||F|||20130823082733||||^^01234567890123~91234
```

epoc HL7 Interface

Appendix B: Epocal Interface Process Flow



Questions

If you have any questions, please contact your Siemens Customer Care Center or your local Siemens technical support representative.

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