



NEMS-Q HL7 Integration Engine HL7 Conformance Statement

VERSION 1

1 Introduction

1.1 Purpose of this Document

This document is an HL7 conformance statement, describing the HL7 message structures supported by the HL7 Integration Engine component of the Norav NEMS-Q system. The HL7 Interface handles incoming and outgoing HL7 messages.

The reader of this document is assumed to have a working understanding of the concepts that are used in the HL7 2.xx standard, and this document should be read in conjunction with that standard.

2 Communication Protocols

2.1 Socket Interface

Norav NEMS-Q HL7 Integration Engine supports a TCP/IP socket based interface, using the Minimal Lower Layer Protocol (MLLP). Messages received via a socket are expected to conform to the MLLP format.

2.2 File Interface

Norav NEMS-Q HL7 Integration Engine supports a file based interface, whereby each incoming/outgoing HL7 message is stored in individual file and placed into shared directory in network. Files are processed with no preference order. The naming convention requires the .HL7 filename extension (case insensitive).

2.3 Message Structure

Messages are structured as specified in the HL7 v2.xx standard, with a message consisting of a number of segments, each of which consists of a number of fields. Segments may be terminated with a Line Feed code (0x0A) or a Carriage Return/Line Feed pair (0x0D + 0x0A). Characters are expected to be in 8-bit ASCII format; any characters with a code lower than 0x20 other than file or line terminators are ignored.

2.4 Delimiters and Escape Sequences

The delimiters used when processing HL7 messages are locked to the following Encoding Characters:

Encoding Character	ASCII Code	Function
	0x7C	Field Separator
^	0x5E	Component Separator
&	0x26	Sub-Component Separator
~	0x7E	Repetition Separator

3 Acknowledgement Messages

3.1 Acknowledgement Method

On socket-based interface the Norav NEMS-Q HL7 Integration Engine can be configured to return the acknowledgement message. On file-based interfaces the HL7 Interface can be configured to return the acknowledgement by placing the HL7 file in an outgoing directory which it is the responsibility of an external system to monitor.

3.2 Acknowledgement Format

The acknowledgement message has the code **AA** in the MSA-1 field, indicating that the message was successfully received by the Interface.

4 HL7 Messages

4.1 Methods

Methods supported by the Norav NEMS-Q HL7 Integration Engine are:

- Query Patient Demographics
- Receive Booking Orders
- Send Observation Results

The following sections detail the information that is required for each of the above methods and the HL7 message types and fields that may be used to supply it. Any HL7 message types that are not noted in the Norav NEMS-Q HL7 Integration Engine are ignored when the message is read.

The Interface is highly configurable in that different fields in the HL7 Inbound/Outbound messages can be freely associated (mapped) with information stored in the NEMS-Q database tables.

4.2 Required Segments

Segments MSH, PID are required in HL7 messages to be handled by the Norav NEMS-Q HL7 Integration Engine.

4.3 Query Patient Demographics

The table below details the information that is required and optional for query patient demographics method on the Norav NEMS-Q HL7 Integration Engine. Suggested HL7 message fields are noted where relevant.

Suitable HL7 message types for supplying this information include QRY messages (but are not limited to).

NEMS-Q Data Field	R/O	Suggested HL7 Field
Time Stamp	R	QRD-1
Format Code	R	QRD-2 (is always 'R')
Priority	R	QRD-3 (is always 'I')
Query ID	O	QRD-4
Quantity	R	QRD-7 (is always '1^RD')
Who Subject	R	QRD-8 (required patient ID)
What Subject	R	QRD-9 (is always 'DEM')

The patient demographics expected in the ADR acknowledgment following the **AA** code in the MSA-1 field.

NEMS-Q Data Field	R/O	Suggested HL7 Field in the ADR acknowledgement
Patient ID	R	PID-3
Patient Name	R	PID-5
Date of Birth	O	PID-7
Sex	O	PID-8
Patient Address	O	PID-11
Who Subject	R	QRD-8 (required patient ID)
What Subject	R	QRD-9 (is always 'DEM')

4.4 Receive Booking Orders

The table below details the information that is required and optional for the booking orders input method on the Norav NEMS-Q HL7 Integration Engine. Suggested HL7 message fields are noted where relevant.

HL7 message types for supplying this information include the ORM^O01 booking orders (but are not limited to).

NEMS-Q Data Field	R/O	Suggested HL7 Field	
Patient ID	O(*)	PID-2 or PID-3	(*) Note: patient data cannot be blank 100%. Therefore at least one of the PID-2/PID-3 fields or the PID-5.1 field must be filled
Patient Last Name	O(*)	PID-5.1	
Patient First Name	O(*)	PID-5.2	
Date of Birth	O	PID-7	
Sex	O	PID-8	
Patient Address	O	PID-11	
Height	O	OBX-4 (requires the OBX-2 = 'NM', OBX-3 = 'HT', OBX-5 = 'CM' or 'IN')	
Weight	O	OBX-4 (requires the OBX-2 = 'NM', OBX-3 = 'WT', OBX-5 = 'KG' or 'LBS')	
Patient Location	O	PV1-3.4 (the office requesting or performing the examination)	
Consulting Doctor	O	PV1-9	
Patient Class	O	PV1-2 (Inpatient, Outpatient etc.)	
Order Control	R	ORC-1 (the value must be 'NW', 'SC' or 'CA')	
Order ID	O	ORC-2 or OBR-2	
Test Priority	O	ORC-7.6	
Test Type	R	OBR-4	
Test Reason	O	OBR-31	
Scheduled Date	R	OBR-6 or OBR-7 or OBR-27 (when the ordered test has to be performed)	

4.5 Send Observation Results

The table below details the information that is required and optional for the observation results send method on Norav NEMS-Q HL7 Integration Engine. Suggested HL7 message fields are noted where relevant.

The HL7 message type for supplying this information is ORU^R01 observation results message.

NEMS-Q Data Field	R/O	Suggested HL7 Field	
Patient ID	O(*)	PID-2, PID-3, and PID-18	(*) Note: patient data cannot be blank 100%. Therefore at least PID-2/PID-3/PID-18 fields or the PID-5 field will be filled
Patient Last Name	O(*)	PID-5.1	
Patient First Name	O(*)	PID-5.2	
Date of Birth	O	PID-7	
Set ID of OBR segment	R	OBR-1	
Order ID	O	OBR-2 and OBR-3	
Test Type	R	OBR-4	
Test Time	R	OBR-7	
Ordering Provider	O	OBR-16	
Result Status	R	OBR-25 and OBX-11	
Set ID of OBX segment	R	OBX-1	
Report Type	R	OBX-2	
Result Type	R	OBX-3	
Result Value	R	OBX-5	
Result Units	O	OBX-6	

Appendix: Example Messages

Query Patient Demographics (QRY^A19)

NEMS-Q:

MSH|^~\&|Norav|Norav|HIS|HIS|20150609152125.000|0|QRY^A19|20150609152125|P|2.3||
QRD|20150609152125.000|R|||123|||1^RD|123456789|DEM|||

Acknowledgment from HIS:

MSH|^~\&|HIS|HIS|Norav|Norav|20150609152126||ADR^A19|20150609152125|P|2.3||
MSA|AA|20150609152125|HIS||Patient Found|
QRD|20150609152126|R|||1|123456789^Doe^John|||
PID|1||123456789||Doe^John^^Mr.||19600119|M|||99 Street addr.^City|||||

New Order (ORM^O01)

HIS:

MSH|^~\&|HIS|HIS|Norav|Norav|20150609150358||ORM^O01|20150609155803834|P|2.3||
PID|1||123456789^^CUH||Doe^John^^Mr.||19600119|M|||99 Street addr.^City||||Married||||
PV1|1|CAT02|^^^Cardiology^CARD2||||EE128^Smith^John|||||||||||||||||||||NA||||20150609150358|20150609150358||||
ORC|NW|001BQXKKR|001BQXKKR|||^2.032||20150609150358|EE128^Smith^John|||20150910|||
OBR|1|001BQXKKR|001BQXKKR|1331^24 hour BP monitor||20150910094500||||20150910|||261704|||||^20150910094500|||Hypertension||||

Acknowledgment from NEMS-Q:

MSH|^~\&|Norav|Norav|HIS|HIS|201506091503||ACK^O01|1|P|2.3||
MSA|AA|20150609155803834|||

Observation Results (ORU^R01)

NEMS-Q:

MSH|^~\&|Norav|Norav|HIS|HIS|20150609144545.000|0|ORU^R01|12345|P|2.3||
PID|||9876543||Doe^Johanna||19390424000000.000|F|||||||
OBR|1||N_262046|1126^Physician supervised Stress Test||201506091429|||||||||||||F|||||
OBX|1|RP|EKG|1|\\SERVER\NEMSECGDATA\$\ECGDbase\Reports\987654320150609142932STR0.pdf||PDF Report|||F||20150609142932.000|||

Acknowledgment from HIS:

MSH|^~\&|TCI|TCI|Norav|Norav|20150609144546||ADT^ACK|12345|P|2.4||
MSA|AA|12345|Results received and added to import queue||