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B	See Description of Change	Section 1.2, 2, 3.1, 4.2, 5.2 – Added Clinician Query Interface and added Middle Initial. Section 5.1 – Updated Comment column for when a field is required for IHE compliance. Section 5.1.2 – Updated PID - Last Name and First Name as Optional. Section 5.1.4 – Updated OBR-3 Conditional. Section 5.1.5 – Updated OBX-4 Conditional; OBX-6 O; OBX-18 O.	Updated to add clinician query workflow and other fields updated for HL7 and IHE compliance.	2014-05-12	CMK & PT
C	Section 7	Updated configuration to support Patient List	Patient List is now working.	2014-06-05	CMK

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# 1 Introduction

## 1.1 Purpose

This document is the technical specification for the CSK HL7 interface between the Welch Allyn vitals device(s) and a HL7 host system.

## 1.2 Scope

The scope of this interface specification is to define the messaging between a Welch Allyn CSK application and a HL7 host system to achieve the following bidirectional communication:

1. Query / Response of a clinician/user (Clinician query)
2. Query / Response of a single Patient (Patient demographics query)
3. Query / Response of a Patient List (Patient list query)
4. Send vitals data from the vitals device to the HL7 host system

## 1.3 Definitions

Term	Definition
<b>CVSM</b>	Connex Vital Signs Monitor: a Welch Allyn device that supports NIBP; Temperature (SureTemp and Braun); SpO2 (Nellcor & Masimo); CO2 (Oridion); Weight, Height and BMI; Pain, etc. This system is a mobile version of the CIWS.
<b>CIWS</b>	Connex Integrated Wall System: a wall mounted version of the CVSM. It supports all the parameters of the CVSM but also provides additional management for handles and disposables.
<b>CSK</b>	Connectivity Solutions Kit: a suite of software applications to facilitate connectivity with a range of Welch Allyn medical devices
<b>DataCatcher</b>	A software application available within CSK that acts as a gateway between medical devices and external information hosts/third party software applications.
<b>Gateway Software</b>	A software application that is capable of receiving data from a device and converting the data to HL7 messages and then transmitting that data via a TCP/IP socket. Examples include: Connex CSK, Connex VM and/or Connex CS. This specification specifies Connex CSK.
<b>HL7</b>	Health Level 7 - A framework for the exchange, integration, sharing, and retrieval of electronic health information
<b>Host HL7 System</b>	Software System that is connected to the host side of the gateway software.
<b>IDS</b>	Interface Design Specification
<b>Vitals Device</b>	A generic name for CVSM, CIWS and future vitals devices. This generic name does not cover the following: Spot, Spot LXi, VSM 5200, VSM 5300, ProBP 3400.
<b>WACP</b>	Pronounced "Wake-Up": Welch Allyn Communications Protocol – a binary protocol for communication with Welch Allyn medical devices.

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## 2 Overview

Welch Allyn devices communicate via WACP. The Gateway Software provides a simple interface that allows information hosts (third party software applications) to communicate with Welch Allyn devices. It achieves this by having the ability to translate a WACP data format to a format that is understood by the third party application which the Gateway Software can subsequently send to the third party application via TCP or HTTP.

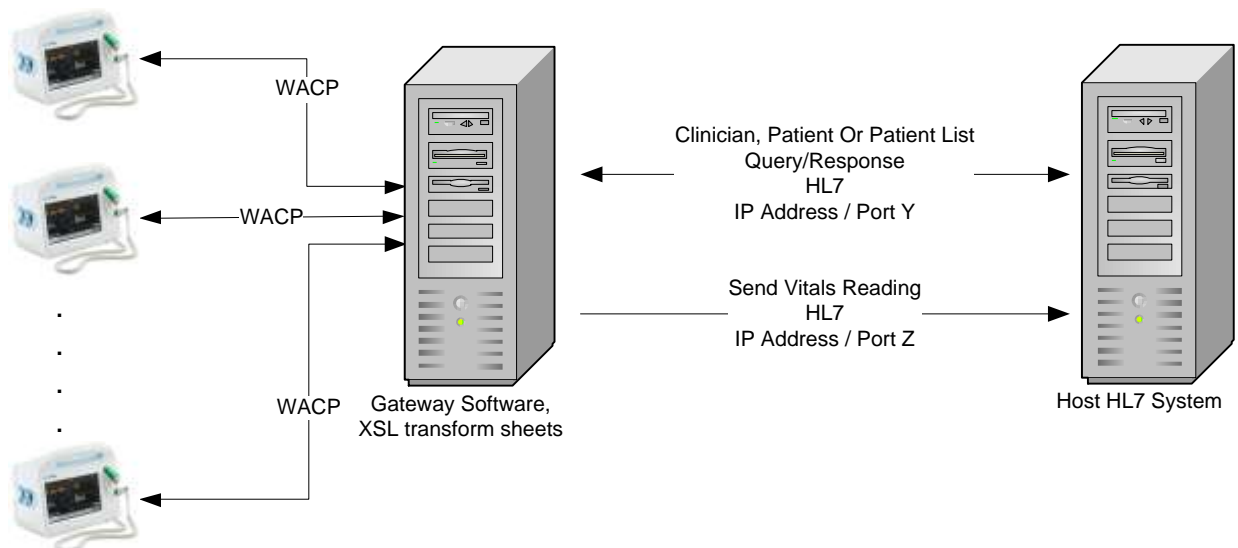
Similarly, the Gateway Software has the ability to receive & translate third party data formats into WACP, which it can then send to the device.

The Gateway Software achieves this data translation by implementing configurable XSL style sheets.

The integration consists of several transaction types:

- Clinician Query / Response
- Patient demographics Query / Response
- Patient List Query / Response
- Send Vitals readings

Communication between the Gateway Software and the HL7 host system is via TCP/IP sockets, via dedicated ports. This will be represented in the Gateway Software as several Information Host indexes. HL7 V2.5 shall be the messaging standard between the Gateway Software and the HL7 host system.



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### 3 Supported Workflows

This solution will leverage the device driven network workflow.

#### 3.1 Clinician ID Query

The Clinician Query workflow allows a clinician to scan their own barcode (clinician barcode) or enter a clinician identifier. The device then sends a clinician query message to the HL7 host system and the clinician details are then displayed on the device.

NOTE: Not all workflows require Clinician ID Query.

NOTE: For the Clinician ID query to work, the “Search by Clinician ID” option must be checked in the device settings.

Detailed sequence steps:

1. The Clinician **scans** a clinician barcode, or manually enters a clinician identifier into device. If required a password may be entered.
2. The Device **sends** a request for clinician details using the clinician identifier and the password (if the password has been entered by the user)
3. The Gateway Software **converts** the device’s request for the clinician query into an HL7 formatted request message and sends the message to the HL7 host system
4. The HL7 host system **responds** with the HL7 formatted clinician demographics message
5. The Gateway Software **converts** the HL7 formatted clinician response and sends the clinician data back to the device
6. The device **displays** the clinician information

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### 3.2 Patient ID Query

The Patient Query workflow allows the clinician to scan a patient’s wristband or manually enter a patient identifier. The vitals device then sends a query message to the HL7 host system and the patients details are then displayed on the device.

NOTE: Not all workflows would require Patient ID Query, use where applicable.

Detailed sequence steps:

7. The Clinician **scans** a barcode, or manually enters a patient identifier into device
8. The Device **sends** a request for patient details using the patient identifier
9. The Gateway Software **converts** the device’s request for the patient query into an HL7 formatted request message and sends the message to the HL7 host system
10. The HL7 host system **responds** with the HL7 formatted patient demographics message
11. The Gateway Software **converts** the HL7 formatted patient response and sends the patient data back to the device
12. The device **displays** the patient information
13. The clinician **takes** vitals
14. The clinician **validates** the vitals
15. The clinician **presses** “save”
16. The device **sends** the vitals data to the Gateway Software
17. The Gateway Software **converts** the device formatted vitals data into HL7 formatted data and sends the HL7 data to the HL7 host system
18. The HL7 host system **sends** back a HL7 ACK/NACK

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### 3.3 Patient List Query

The Patient List Query workflow allows the clinician to press the “Retrieve List” button and then select the desired patient from the list.

NOTE: Not all workflows would require Patient List Query, use where applicable.

Detailed sequence steps:

1. The Clinician **presses** the “Retrieve List” button to receive the list of patient IDs and names
2. The Device **sends** a request for a list of patients based on location (WACP query message)
3. The Gateway Software **converts** the device’s request for patient list into an HL7 formatted request message and sends the message to the HL7 host system
4. The HL7 host system **responds** with the HL7 formatted patient list
5. The Gateway Software **converts** the HL7 formatted patient list response and sends the patient list to the device
6. The Device **displays** the patient list on the device’s display
7. The Clinician **selects** the desired patient from the list
8. The Clinician **takes** vitals
9. The Clinician **validates** the vitals
10. The Clinician **presses** “save”
11. The Device **sends** the vitals data to the Gateway Software
12. The Gateway Software **converts** the device formatted vitals data into HL7 formatted data and sends the HL7 data to the HL7 host system
13. The HL7 host system **sends** back a HL7 ACK/NACK

### 3.4 Location Workflow

The location workflow allows the clinician to not worry about identification of the patient or worry about working from a list. This workflow requires the device’s location ID to be programmed and the host HL7 system will associate the reading marked with location to the proper patient. The location data is transmitted with the vitals.

NOTE: Not all workflows require location, use where applicable.

Detailed sequence steps:

1. The clinician **takes** vitals on the device
2. The clinician **saves** the vitals on the device
3. The vitals device **sends** vitals to the Gateway Software
4. The Gateway Software **sends** the vitals (via IHE HL7 messages) to the HL7 host software



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## 4 Requirements

### 4.1 General

- [4.1.1] Communication between WA devices and the host HL7 system shall be via the WA Gateway Software which is available as part of the gateway software.
- [4.1.2] Communication between WA the Gateway Software and the host HL7 system shall be performed via TCP/IP & port interface.
- [4.1.3] The message format for communication between the WA Gateway Software and host HL7 system shall be IHE compliant HL7 messages.

### 4.2 Query for clinician (as applicable)

- [4.2.1] When a user enters a clinician ID/number either manually or by a bar code scanner, the vitals device shall send a clinician query message to the host HL7 system using the clinician ID/number as the clinician identifier.
  - [4.2.1.1] The password (if entered on the device) is passed to the host HL7 system as part of the clinician query.
- [4.2.2] When the result (clinician details) is returned back from the host HL7 system, the vitals device shall be able to store the following clinician information:
  - [4.3.2.1] Clinician Identifier
  - [4.3.2.2] Last Name
  - [4.3.2.3] First Name
  - [4.3.2.4] Middle Initial

### 4.3 Query for Patient List (as applicable)

- [4.2.1] When a user presses the “Retrieve List” button on the vitals device, the Gateway Software shall send a patient list query message to the host HL7 system.
- [4.2.2] The Location ID of the vitals device shall be sent as part of the patient list query message from DC to the host HL7 system. (Location ID: Settings->Advanced->Other->Location ID)
- [4.2.3] For each patient in the patient list result from the host HL7 system, the vitals device shall be able to store the following patient demographic fields:
  - [4.2.3.1] Patient Identifier (can be displayed in the vitals device)
  - [4.2.3.2] Last Name (can be displayed in the vitals device)
  - [4.2.3.3] First Name (can be displayed in the vitals device)
  - [4.2.3.4] Middle Initial (can be displayed in the vitals device)
  - [4.2.3.5] Gender (is stored in the vitals device, but not displayed)
  - [4.2.3.6] Date of Birth (is stored in the vitals device, but not displayed)
- [4.2.4] The list of patients received from the host HL7 system in response to a user pressing the “Retrieve List” button shall be automatically displayed in the Patients tab on the vitals device.
- [4.2.5] The maximum number of patients allowed in the patient list is 50.

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#### **4.4 Query for specific patient (as applicable)**

- [4.3.1] When a user enters a patient ID/number either manually or by a bar code scanner, the vitals device shall send a patient query message to the host HL7 system using the patient ID/number as the patient identifier.
- [4.3.2] When the result (patient details) is returned back from the host HL7 system, the vitals device shall be able to store the following patient information:
- [4.3.2.1] Patient Identifier (can be displayed in the vitals device)
  - [4.3.2.2] Last Name (can be displayed in the vitals device)
  - [4.3.2.3] First Name (can be displayed in the vitals device)
  - [4.3.2.4] Middle Initial (can be displayed in the vitals device)
  - [4.3.2.5] Gender (is stored in the vitals device, but not displayed)
  - [4.3.2.6] Date of Birth (is stored in the vitals device, but not displayed)

#### **4.5 Send Vitals Data**

[4.4.1] The following fields shall be sent as part of a vitals data sent from a vitals device to the host HL7 system:

- [4.4.1.1] Date/Time of when the reading was saved in the vitals device
- [4.4.1.2] Patient ID
- [4.4.1.3] Patient Last Name
- [4.4.1.4] Patient First Name
- [4.4.1.5] Patient Middle Initial
- [4.4.1.6] Clinician ID
- [4.4.1.7] Device Serial number
- [4.4.1.8] Device Model Name
- [4.4.1.9] Device Location ID
- [4.4.1.10] Blood Pressure – Systolic
- [4.4.1.11] Blood pressure – Diastolic
- [4.4.1.12] Blood pressure – Mean Arterial Pressure
- [4.4.1.13] Blood pressure – Heart Rate
- [4.4.1.14] Temperature
- [4.4.1.15] SpO2 – Saturation
- [4.4.1.16] SpO2 – Heart Rate
- [4.4.1.17] Weight
- [4.4.1.18] Height
- [4.4.1.19] Respiration
- [4.4.1.20] Pain
- [4.4.1.21] BMI (if produced by a connected scale)

[4.4.2] Where applicable, for each field specified in [4.4.1] a unit of measure shall be sent.

[4.4.3] The device shall act accordingly when the following response messages are received from the host HL7 system in response to a Vitals send:

- [4.4.4.1] ACK (reading will be removed from the device)
- [4.4.4.2] NACK (reading will not be removed from the device)

## 5 Interface Design – HL7 Message Formats

All HL7 messages (including patient ID and patient list) are based on IHE HL7 standards.

The specifications are available by clicking the following link: [IHE specification](#) and then select Patient Care Device (PCD).

Optionality (Usage) column – defines if this is a Welch Allyn Required, Optional or Conditional component of the HL7 Segment/Field.

“R” = Required. This must be present in the HL7 Message.

“O” = Optional. This can be present in the HL7 Message.

“C” = Conditional. If this is present then this shall be populated. If not present, this will not be populated.

### 5.1 Message Segments Detailed Descriptions

#### 5.1.1 MSH Segment

Example:

```
MSH|^~\&|Connex CSK|WelchAllyn|EMR|HIS|20140308152017||
ORU^R01^ORU_R01|20140308202025103001270212|P|2.6|||AL|NE||||
IHE_PCD_ORU_R01^IHE_PCD^1.3.6.1.4.1.19376.1.6.1.1.1^ISO
```

Field	Description	Usage	Comment OR Example
MSH-1	Field Separator	R	
MSH-2	Encoding Characters	R	^~\&
MSH-3	Sending Application	O	ConnexCSK IHE = Required
MSH-4	Sending Facility	O	LocationID (Vitals ORU Messages) WelchAllyn (Query PDQ Messages) IHE = Required
MSH-5	Receiving Application	O	Generic Name for Receiving Application EMR IHE = Required
MSH-6	Receiving Facility	O	Generic Name for Receiving Facility HIS IHE = Required
MSH-7	Date/Time of Message	R	Format: YYYYMMDDHHMMSS
MSH-9	Message Type	R	<Message Code (ID)> ^ <Trigger Event (ID)> ^ <Message Structure (ID)> Example: ORU^R01^ORU_R01
MSH-10	Message Control ID	R	An identifier that uniquely identifies the message Usage: Reading Date/Time & Device Serial Number
MSH-11	Processing ID	R	P for Production. D for Debugging
MSH-12	Version ID	R	HL7 Version; Usage: 2.6
MSH-15	Accept	R	AL

Field	Description	Usage	Comment OR Example
	Acknowledgement Type		IHE = Required
MSH-16	Application Acknowledgement Type	R	NE IHE = Required
MSH-21	Message Profile Identifier	C	<Entity Identifier> ^ <Namespace ID> ^ <Universal ID> ^ <Universal ID Type> Usage: IHE_PCD_ORU_R01^ IHE_PCD^1.3.6.1.4.1.19376.1.6.1.1.1^ISO IHE = Required

### 5.1.2 PID Segment

Example: PID|||147852369||Callaghan^Harold^P||19451225|M

Field	Description	Required	Comments
PID-3	Patient Identifier	R	Can be displayed on the device
PID-5-1	Last Name or Surname	O <sup>1</sup>	Can be displayed on the device <sup>1</sup> Required if EMR requires Last Name for match criteria. IHE = Required
PID-5-2	First Name	O <sup>1</sup>	Can be displayed on the device <sup>1</sup> Required if EMR requires First Name for match criteria. IHE = Required
PID-5-3	Middle Initial	O	Can be displayed on the device
PID-7	Date of Birth (YYYYMMDD)	C <sup>1</sup>	Not displayed on the device, but can be sent as part of the ORU result. <sup>1</sup> Required if EMR required DOB for match criteria. IHE = Required
PID-8	Gender (M=male, F=female)	C <sup>1</sup>	Not displayed on the device, but can be sent as part of the ORU result. <sup>1</sup> Required if EMR required Gender for match criteria. IHE = Required

### 5.1.3 PV1 Patient Visit Segment

Example: PV1||I|MedSurg-3^Room^Bed

Field	Description	Required	Comments
PV1-2	Patient Class	R	I = Inpatient IHE = Required
PV1-3	Assigned Location	R	Can be displayed on the device Data comes from device's fields for: LocationID (PV1-3-1) Room (PV1-3-2) Bed fields (PV1-3-3) Example: Location^Room^Bed IHE = Required

### 5.1.4 OBR – Observation Segment – Outbound Data

Example: OBR|||20140308152017213|S^S|||20140308202025  
 |||12398756|||||||||||||F|||||||||12398756|||||||||

Field	Description	Required	Comments
OBR-3	Filler Order Number	C	Usage: Filled with local time of when the message was processed. IHE = Required
OBR-4	Universal Service ID	R	Type of data in the ORU message where: S = Episodic data; C = Continuous
OBR-7	Observation Date/Time	R	YYYYMMDDHHMMSS IHE = Required
OBR-10	Collector Identifier	O	Usage: Clinician ID
OBR-25	Result Status	R	Confirmed (F) or Unconfirmed (R)
OBR-34	Technician	O	Usage: Clinician ID

### 5.1.5 OBX – Observation Segment – Outbound Data

Example:

OBX|1|NM|150021^MDC\_PRESS\_BLD\_NONINV\_SYS^MDC|1.0.1.1|100|  
266016^MDC\_DIM\_MMHG^MDC||||F|||20140308202025||12398756||  
103001270212^PMP^CVSM 6000 Series||0|0|0

Field	Description	Required	Comments
OBX-1	Set ID	R	Sequence Number of the OBX in the message IHE = Required
OBX-2	Value Type	R	Examples usage: NM (Numeric); ST (String) IHE = Required
OBX-3	Observation Identifier	R	A triplet describing the value that is being sent. See OBX-3 table below
OBX-4	Observation Sub-ID	C	See OBX-4 table below IHE = Required
OBX-5	Observation Value	C	The value associated with OBX-3
OBX-6	Units	O	Describes units for value in OBX-5 See OBX-5 table below IHE = Required
OBX-11	Observation Result Status	R	F = Confirmed; C = Continuous / Unconfirmed
OBX-14	Date/Time of the Observation	R	YYYYMMDDHHMMSS
OBX-16	Responsible Observer	O	Usage: Clinician ID
OBX-18	Equipment Instance Identifier	O	Description of the system sending the data. Contains SerialNumber^ProductName^Model
OBX-20	Observation Site (Modifier Field 1)	O	NIBP: Cuff Location TEMPERATURE: Mode SpO2: Site / O2 Method HR: Source (e.g. NIBP, SpO2, etc.)
OBX-21	Modifier Field 2	O	NIBP: Cuff Size SpO2: O2 Flow Rate
OBX-22	Modifier Field 3	O	NIBP: Patient Position SpO2: O2 Concentration

Value	OBX-3 - Observation Identifier
NIBP SYS	150021^MDC_PRESS_BLD_NONINV_SYS^MDC
NIBP DIA	150022^MDC_PRESS_BLD_NONINV_DIA^MDC
NIBP MAP	150023^MDC_PRESS_BLD_NONINV_MEAN^MDC
Temperature	150344^MDC_TEMP^MDC
SpO2 SAT	150456^MDC_PULS_OXIM_SAT_O2^MDC
Heart Rate	149546^MDC_PULS_RATE_NON_INV^MDC
Weight	68063^MDC_ATTR_PT_WEIGHT^MDC
Height	68060^MDC_ATTR_PT_HEIGHT^MDC
Respiration Rate	151562^MDC_RESP_RATE^MDC
Pain	PAIN^PAIN LEVEL^L
BMI	BMI^BMI^L

Value	OBX-4 - Observation Sub-ID
NIBP SYS	1.0.1.1
NIBP DIA	1.0.1.2
NIBP MAP	1.0.1.3
Temperature	1.10.1.1
SpO2 SAT	1.1.1.12
Heart Rate	1.0.0.1
Weight	1.1.2.209
Height	1.1.2.25
Respiration Rate	1.1.1.25
Pain	N/A
BMI	N/A

Value	OBX-6 – Units
NIBP	266016^MDC_DIM_MMHG^MDC
Temperature	268192^MDC_DIM_DEGC^MDC
SpO2 SAT	262688^MDC_DIM_PERCENT^MDC
Heart Rate	264864^MDC_DIM_BEAT_PER_MIN^MDC
Weight	263875^MDC_DIM_KILO_G^MDC
Height	263441^MDC_DIM_CENTI_M^MDC
Respiration Rate	264928^MDC_DIM_RESP_PER_MIN^MDC
Pain	N/A
BMI	N/A

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## 5.2 Clinician Query (as applicable)

### 5.2.1 Query Request

The clinician query that is sent from the Gateway Software to the HL7 host system uses the IHE compliant QBP^Q22 query message type. This message corresponds to Transaction ITI-21 of the IHE Technical Framework.

The following is a sample of the message:

```
MSH|^~\&|ConnexCSK|WelchAllyn|EMR|HIS|20140123094459||QBP^Q22^QBP_Q21|20140123094459728|P|2.6
||AL|NE
QPD|IHE PDQ Query|20140123094459728|@PID.3.1^321456~@PID3.4^EMR~PASSWORD^1234~TYPE^PHYSICIAN
RCP|I|1^RD
```

The **321456** value in the QPD segment is the Clinician ID that is either scanned or manually entered into the device.

The **1234** value in the QPD segment is the clinician password that is optionally entered into the device.

These two values can be used by the HL7 host to search for the clinician/return the clinician details.

The **TYPE^PHYSICIAN** entry in the QPD segment is used to distinguish the clinician query from a patient query

Note that RCP-2.1 is set to 1 to indicate that at most only one clinician should be returned in the result.

### 5.2.2 Response

The clinician response that is sent from the HL7 host to the Gateway Software uses the IHE compliant RSP^K22 message type. This message corresponds to Transaction ITI-21 of the IHE Technical Framework.

The following is a sample of the message:

```
MSH|^~\&|ConnexCSK|WelchAllyn|EMR|HIS|20140123094559||RSP^K22|20140123094559728|P|2.6||AL|NE
MSA|AA|20140122123838853
QAK|20140122123838853|OK
QPD|IHE PDQ Query|20140123094459728|@PID.3.1^321456
PID|||321456||Howser^Doogie||19700423|M
```

If no clinician can be found, the RSP^K22 message should be returned but have no PID segment, or have a code in MSA-1 that is not AA, e.g. AE:

```
MSH|^~\&|ConnexCSK|WelchAllyn|EMR|HIS|20140123094559||RSP^K22|20140123094559728|P|2.6||AL|NE
MSA|AE|20140122123838853
QAK|20140122123838853|OK
QPD|IHE PDQ Query|20140123094459728|@PID.3.1^321456
```



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### 5.3 Patient List (as applicable)

#### 5.3.1 Query Request

The patient list query that is sent from the Gateway Software to the HL7 host system uses the IHE compliant QBP^ZV1 query message type. This message corresponds to Transaction ITI-22 of the IHE Technical Framework.

The last value in the QPD segment (**Ward 2**) is the location that is set in the device. This value can be used by the HL7 host system to filter the returned patient list.

The following is a sample of the message:

```
MSH|^~\&|ConnexCSK|WelchAllyn|EMR|HIS|20140123091949||QBP^ZV1^QBP_Q21|20140123091949758|P|2.6||AL|NE
QPD|IHE PDVQ Query|20140123091949|@PV1.3^Ward 2
RCP||50^RD
```

If the location is not set in the device the QPD-3.2 shall be blank. In this example all patients would be returned but limited to 50 (see RCP-2).

```
MSH|^~\&|ConnexCSK|WelchAllyn|EMR|HIS|20140123091949||RSP^ZV2^RSP_ZV2|20140123091949758|P|2.6||AL|NE|
QPD|IHE PDVQ Query|20140123091949|@PV1.3^
RCP||50^RD
```

#### 5.3.2 Response

The patient query response that is sent from the HL7 host system to the Gateway Software uses the IHE compliant RSP^ZV2 message type. This message corresponds to Transaction ITI-22 of the IHE Technical Framework.

The following is a sample of the message:

```
MSH|^~\&|EMR|HIS|ConnexCSK|WelchAllyn|20140122123638||RSP^ZV2^RSP_ZV2|20140122123638860|P|2.6||AL|NE
MSA|AA|20140122123838853
QAK|20140122123838853|OK
QPD|IHE PDVQ Query|20140122123633|@PV1.3^Ward 2
PID||582267||Riggs^Martin^T||19790321|M
PV1|1||Ward 2|||||||3167317|||||||20140121090000
PID||123645323||Starling^Clarise^R||19850909|F
PV1|1||Ward 2|||||||3148857|||||||20140121100100
PID||P12A45||Kane^Charles^F||19640711|M
PV1|1||Ward 2|||||||3100213|||||||20140121091500
PID||8700245||O'Hara^Scarlett^W||19531225|F
PV1|1||Ward 2|||||||3193502|||||||20140121100200
PID||9033426A||Edwards^Ethan^Q||19770527|M
PV1|1||Ward 2|||||||3168341|||||||20140121093400
```

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If there are no patients in the patient list results the RSP^ZV2 message should be returned but has no PID/PV1 segments, i.e.:

```
MSH|^~\&|EMR|HIS|ConnexCSK|WelchAllyn|20140122123638||RSP^ZV2^RSP_ZV2|20140122123638860|P|2.6||
|AL|NE
MSA|AE|20140122123838853
QAK|20140122123838853|OK
QPD|IHE PDVQ Query|20140122123633|@PV1.3^Ward 2
```

## 5.4 Patient Query (as applicable)

### 5.4.1 Query Request

The patient query that is sent from the Gateway Software to the HL7 host system uses the IHE compliant QBP^Q22 query message type. This message corresponds to Transaction ITI-21 of the IHE Technical Framework.

The following is a sample of the message:

```
MSH|^~\&|ConnexCSK|WelchAllyn|EMR|HIS|20140123094459||QBP^Q22^QBP_Q21|20140123094459728|P|2.6||
||AL|NE
QPD|IHE PDQ Query|20140123094459728|@PID.3.1^135798642~@PID3.4^EMR
RCP|||1^RD
```

The last value in the QPD segment (**135798642**) is the Patient ID that is either scanned or manually entered into the device. This value will be used by the HL7 host to search for the patient/return the demographics of a single patient

Note that RCP-2.1 is set to 1 to indicate that at most only one patient should be returned in the result.

### 5.4.2 Response

The patient list response that is sent from the HL7 host to the Gateway Software uses the IHE compliant RSP^K22 message type. This message corresponds to Transaction ITI-21 of the IHE Technical Framework.

The following is a sample of the message:

```
MSH|^~\&|ConnexCSK|WelchAllyn|EMR|HIS|20140123094559||RSP^K22|20140123094559728|P|2.6||AL|NE
MSA|AA|20140122123838853
QAK|20140122123838853|OK
QPD|PatientQuery|20140123094459728|@PID.3.1^patientid
PID|||PatientID||Eastwood^Clint||19780423|M
```

If no patient can be found, the RSP^K22 message should be returned but have no PID segment, or have a code in MSA-1 that is not AA, e.g. AE:

```
MSH|^~\&|ConnexCSK|WelchAllyn|EMR|HIS|20140123094559||RSP^K22|20140123094559728|P|2.6||AL|NE
MSA|AE|20140122123838853
QAK|20140122123838853|OK
QPD|PatientQuery|20140123094459728|@PID.3.1^patientid
```

## 5.5 Vitals Data Send

The message will use the following message segments: MSH, PID, PV1, OBR and OBX.

### 5.5.1 Outbound Example

The format of the Vitals data send shall be a HL7 ORU message.

```
MSH|^~\&|Connex CSK|WelchAllyn|EMR|HIS|20140308152017||ORU^R01^ORU_R01|20140308202025103001270212|P|2.6|||AL|NE|
IHE_PCD_ORU_R01^IHE_PCD^1.3.6.1.4.1.19376.1.6.1.1.1^ISO
PID|||147852369||Keegan^Chris^M^^^L||M
PV1|||Wing-a^101^2
OBR|||20140308152017213|S^S|||20140308202025|||||||||||||F|||||||||||||
OBX|1|NM|150021^MDC_PRESS_BLD_NONINV_SYS^MDC|1.0.1.1|100|266016^MDC_DIM_MMHG^MDC||||F|||20140308202025|||103001270212^PMP^VSM 6000 Series||0|0|0
OBX|2|NM|150022^MDC_PRESS_BLD_NONINV_DIA^MDC|1.0.1.2|50|266016^MDC_DIM_MMHG^MDC||||F|||20140308202025|||103001270212^PMP^VSM 6000 Series||0|0|0
OBX|3|NM|150023^MDC_PRESS_BLD_NONINV_MEAN^MDC|1.0.1.3|0|266016^MDC_DIM_MMHG^MDC||||F|||20140308202025|||103001270212^PMP^VSM 6000 Series||0|0|0
OBX|4|NM|150344^MDC_TEMP^MDC|1.10.1.1|36.9|268192^MDC_DIM_DEGC^MDC||||F|||20140308202025|||103001270212^PMP^VSM 6000 Series||0
OBX|5|NM|150456^MDC_PULS_OXIM_SAT_O2^MDC|1.1.1.12|99|262688^MDC_DIM_PERCENT^MDC||||F|||20140308202025|||103001270212^PMP^VSM 6000 Series||0|0|0
OBX|6|NM|149546^MDC_PULS_RATE_NON_INV^MDC|1.0.0.1|60|264864^MDC_DIM_BEAT_PER_MIN^MDC||||F|||20140308202025|||103001270212^PMP^VSM 6000 Series||0
OBX|7|NM|68063^MDC_ATTR_PT_WEIGHT^MDC|1.1.2.209|68|263875^MDC_DIM_KILO_G^MDC||||F|||20140308202025|||103001270212^PMP^VSM 6000 Series||
OBX|8|NM|68060^MDC_ATTR_PT_HEIGHT^MDC|1.1.2.25|177.8|263441^MDC_DIM_CENTI_M^MDC||||F|||20140308202025|||103001270212^PMP^VSM 6000 Series||
OBX|9|NM|151562^MDC_RESP_RATE^MDC|1.1.1.25|15|264928^MDC_DIM_RESP_PER_MIN^MDC||||F|||20140308202025|||103001270212^PMP^VSM 6000 Series||
OBX|10|NM|PAIN^PAIN LEVEL^L|1|6|||||F|||20140308202025|||103001270212^PMP^VSM 6000 Series||
OBX|11|NM|BMI^BMI^L|1|39|||||F|||20140308202025|||103001270212^PMP^VSM 6000 Series||
```

### 5.5.2 Response

In response to a vitals data send, the HL7 host shall return back an ACK/NACK type HL7 message:

- An ACK to signify successful processing
- A NACK to signify the processing was not successful

The Gateway Software can then send an equivalent ACK/NACK message back to device. An ACK message shall have the following structure:

```
MSH|^~\&|EMR|HIS|Connex|WelchAllyn|20131016055244||ACK^A01|20131016055248|P|2.6|||AL|NE
MSA|AA|20131004110527014
```

A NACK message shall have a similar structure as an ACK message; the only difference being the MSA 1 field is set to AE

```
MSH|^~\&|EMR|HIS|Connex|WelchAllyn|20131016055244||ACK^A01|20131016055248|P|2.6|||AL|NE
MSA|AE|20131004110527014
```

## 6 Available Modifiers / Enumerations

Each modifier shall be contained within its own OBX segment. When they exist in the segment they will be communicated as their enumerated value.

<b>Modifier name</b>	<b>Possible values</b>
Cuff site (NIBP)	0 = None 2 = L Arm 3 = R Arm 4 = L Leg 5 = R Leg
Cuff size (NIBP)	0 = None 2 = Neo 1 3 = Neo 2 4 = Neo 3 5 = Neo 4 6 = Neo 5 7 = Small Infant 8 = Infant 9 = Small Child 10 = Child 11 = Small Adult 12 = Adult 13 = Adult Long 14 = Large Adult 15 = Large Adult Long 16 = Thigh
Patient Position (NIBP)	0 = None 2 = Lying 3 = Sitting 4 = Standing
O2 Method	0 = None 2 = Aerosol/humidified mask 3 = Face tent 4 = Mask 5 = Nasal Cannula 6 = Nonrebreather 7 = Partial rebreather 8 = T piece 9 = Tracheostomy collar 10 = Ventilator 11 = Venturi Mask 12 = Room air 13 = Oxymizer
Temperature (Mode or Site)	0 = None 1 = Unknown 10 = Oral 11 = Rectal 12 = Pediatric Axillary 13 = Calibration Key 14 = Adult Axillary 15 = Tympanic

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## 7 Configuration & Transform Sheets



50011306C Connex CSK HL7 Configuration.zip

## 8 Installation Steps

1. Install Connex CSK
2. Stop the DataCatcher windows service
3. Delete the DataCatcherConfig.xml file in the DataCatcher working directory
4. Delete the TransformSheets folder in the DataCatcher working directory
5. Unzip "50011306 Connex CSK HL7 Configuration.zip" to a temp folder
6. Copy DataCatcher Configuration.xml file into the DataCatcher working directory
7. Copy the TransformSheets folder into the DataCatcher working directory
8. Start the DataCatcher windows service
9. Open DataCatcher Configuration (DataCatcherTray.hta in the DataCatcher working directory)
10. Select the "Information Network" option
11. Configure the Host Address & Host Port as required in Host Index 1 (Vitals Send)
12. Configure the Host Address & Host Port as required in Host Index 2 (Patient Query)
13. Configure the Host Address & Host Port as required in Host Index 3 (Clinician Query)
14. Configure the Host Address & Host Port as required in Host Index 4 (Patient List Query)
15. Save the changes
16. Restart the DataCatcher windows service

NOTE: (DataCatcher working directory: C:\Program Files (x86)\Welch Allyn\DataCatcher)