Instructions for use

Infinity® Gateway Suite

WARNING
To properly use this medical device, read and comply with these instructions for use.

HL7 Simulator Reference Guide
Software VF9.0

General Information

Trademarks

The Dräger name and logo are registered trademarks of Dräger.

Infinity® Gateway Suite is a registered trademark of Dräger.

HL7® is a registered trademark of Health Level Seven International.

Open-source software

Dräger devices that use software may use open-source software, depending on their setup. Open-source software may be subject to different terms of license. Additional information regarding the open-source software used in this device is available at the following web page:

www.draeger.com/opensource

User group requirements

The term "user group" describes the personnel responsible who have been assigned by the operating organization to perform a particular task on a product.

Duties of the operating organization

The operating organization must ensure the following:

– Every user group has the required qualifications (e.g., has undergone specialist training or acquired specialist knowledge through experience).

– Every user group has been trained to perform the task.

– Every user group has read and understood the relevant chapters in this document.

User groups

Clinical users

This user group operates the product in accordance with the intended use.

Users have medical specialist knowledge in the application of the product.

Service personnel

This user group installs the product and performs the service activities.

Service personnel have specialist knowledge in software systems and applications. Service personnel also have experience in the servicing of medical devices.

Where product specific knowledge or tools are required, the service activities must be carried out by specialized service personnel. The specialized service personnel was trained by Dräger for these service activities on this product.

Operating characteristics

Classification

Classification Medical Device Europe	Class IIa

Symbols

The following table lists the Infinity Gateway symbols. Additional information about the symbols is available on the following web page: www.draeger.com/md-symbols

Symbol	Description
	Read accompanying IFU for specific safety information.
	WEEE (Waste Electrical and Electronic Equipment) Do not dispose of at municipal collection points for waste electrical and electronic equipment. Dräger has authorized a company to collect and dispose of this device.
Rx only	**Caution**: Federal law restricts this device to sale by or on the order of a physician
	European Union Representative
	Device part number and revision
	Manufacturer
	Date of manufacture
	Complies with the European Medical Device Regulation (EU) 2017/745
	Complies with applicable EU regulations and directives

Symbol	Description
	Quantity
	China RoHS mark
	Unique Device Identifier, barcode
	Lot/batch number
	Medical device
	Importer
	Importer
	Revision index

Safety

Mandatory reporting of adverse events

Serious adverse events with this product must be reported to Dräger and the responsible authorities.

Instructions for use

WARNING

Strictly follow these Instructions for Use. Any use of the software requires a full understanding and strict observation of all portions of these instructions. The software is only to be used for the purpose specified under "Intended use" on page 9 and in conjunction with appropriate patient monitoring. Observe all WARNING and CAUTION statements as rendered throughout this manual, and all statements on device labels.

Definitions

Certain paragraphs within these instructions are highlighted as WARNING, CAUTION, or NOTE as follows:

WARNING

A WARNING statement provides important information about a potentially hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION

A CAUTION statement provides important information about a potentially hazardous situation that, if not avoided, may result in minor or moderate injury to the user or patient or in damage to the equipment or other property.

NOTE

A NOTE provides additional information intended to avoid inconvenience during operation.

Connections to IT networks

Many medical devices manufactured by Dräger use networks to transmit patient data. Hospitals should refer to IEC 80001-1 before attempting to connect such medical devices to their IT networks.

Intended purpose

Intended use

The Infinity Gateway software applications are intended to provide clinicians with the capability of viewing patient data remotely via the Infinity network and for data exchange of select clinical and administrative information between the Infinity network and the hospital network.

Indications

The Infinity Gateway software applications are intended to provide clinicians with the capability of viewing patient data remotely via the Infinity network and for data exchange of select clinical and administrative information between the Infinity network and the hospital network.

Contraindications

There are no known contraindications for the Infinity Gateway software applications.

Environments of use

The Infinity Gateway software applications are intended for use in a healthcare environment.

Patient population

The Infinity Gateway software applications are applicable to all patient populations.

Intended application

The intended application of the Infinity Gateway software applications is data exchange between the Infinity network and the hospital network. This device is an active, reusable, and non-implantable medical device. It does not come into direct contact with the patient’s body.

Contents

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HL7 Simulator

Features

The HL7 Simulator (HL7Sim) can be used to emulate almost any HL7 interface. It is a pre-packaged configuration specific to Dräger interfaces that can emulate either the Infinity Gateway or the external system.

Using HL7Sim, an Infinity network, and an Infinity Gateway with the HL7 Access option, all HL7 features of the Infinity Gateway can be demonstrated without the need of any hospital, clinical, or laboratory system.

Feature	Description
Analysis of existing HL7 interface	HL7Sim can determine whether an existing interface accepts our message formats.
Capture/playback capabilities	HL7Sim can capture messages sent by outside devices to be analyzed for conformance to our specifications.
Message Readability Enhancement	The ***Message editor*** labels HL7 message fields and eliminates the need to count field delimiters.
Develop/Test Message Conversion Rules	The ***Specify Message Conversion Rules dialog*** lets you define rules to be applied on any HL7 interface and to test the effect of the rule on a message.
Troubleshooting/Testing	When a particular message causes problems for a server, the message can be sent to HL7Sim and stored to disk. This message can later be restored from disk and retransmitted to the server, without all the setup required to create the original condition.

Any HL7 interface has two participants: the master and the slave. The master opens the connection, and the slave listens on a well-known port and accepts the connection. In Dräger HL7 unsolicited interfaces, the system sending the data is the master and the receiver is the slave. In Dräger HL7 solicited interfaces, the system requesting the data is the master, and the responding system is the slave.

Communication Between Master and Slave Interfaces

To send a message:

1. Select the message from the list in the ***Message Name*** dialog.
2. Edit the message. See Message Editor/Select Message on page 18.
3. Click ***Send Message*** in the ***Transmit*** section of the HL7 Simulator main screen.
   A string appears in the status box indicating success (“Message Received”) or failure.
4. If a valid message was received, ***View Last Received Message*** in the ***Receive*** section of the main screen is enabled. Click it to view the response message (Message editor).

The HL7 simulator responds to messages sent by the master. To respond, the slave needs:

- A base message.
- A set of response rules that dictate how to combine the incoming message and base message to produce the output message
- To enable ***Auto Response Enabled***

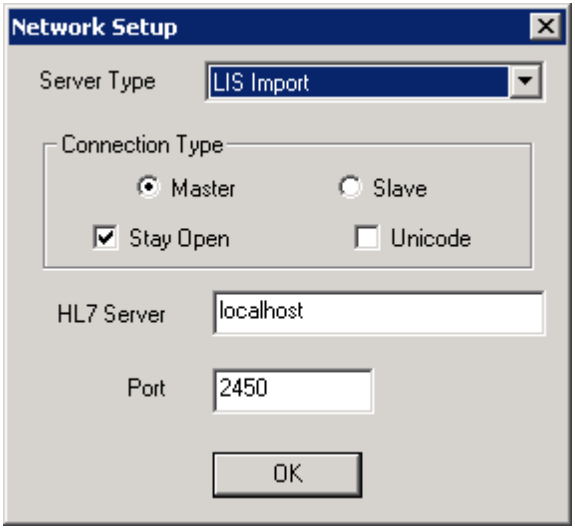
Whenever a message is received:

- The HL7 Simulator automatically creates a response message by modifying the base message according to the configured response rules and sends the new message.
- The message ***Auto Response Sent*** appears in the status box of the main screen.
- ***View Last Response Message Sent*** is enabled. Click it to view the output message using the Message editor.

HL7 Simulator configuration

CAUTION
If the HL7 Simulator is used to communicate with the outside system instead of the Infinity Gateway, stop the HL7 service on the Gateway to avoid conflicts. A conflict may prevent a process from receiving messages.

When the HL7 Simulator is started, the ***Network Setup*** dialog appears.



Network Setup screen selections

Option	Description
Server Type	
ADT Solicited ***ADT Unsolicited*** ***LIS Import*** ***LIS Export*** ***Stat Lab*** ***Vital Signs – Solicited*** ***Vital Signs – Unsolicited*** ***Alarms Export***	From the drop-down list, select the interface to be emulated
Connection Type	
Master	System that initiates the connection.
Slave	System that listens for the connection.

Unicode	Enables unicode messaging. When enabled, messages are sent in unicode and all incoming messages are interpreted as unicode.When disabled, all messages are sent in ANSI and all incoming messages are interpreted as ANSI. **NOTE:** By default, HL7Sim configures itself to emulate the external system. For emulating the external system (LIS, CIS or HIS), make no changes to ***Connection Type***. For emulating the Infinity Gateway, if ***Master*** is selected, select ***Slave***. if ***Slave*** is selected, select ***Master***.
HL7Server	Name or IP address of the system that is to be communicated with. This field is disables for slave connections.
Port	HL7Sim automatically sets the default port for the selected interface. For emulating the external system (LIS, CIS, HIS), enter the port number used by the Infinity Gateway for the interface. If the Infinity Gateway is configured using default ports, then no changes are required. For emulating the Infinity Gateway, enter the port number that the external system has configured for this interface.
OK	Once ***Network Setup*** selections are complete, click ***OK***.

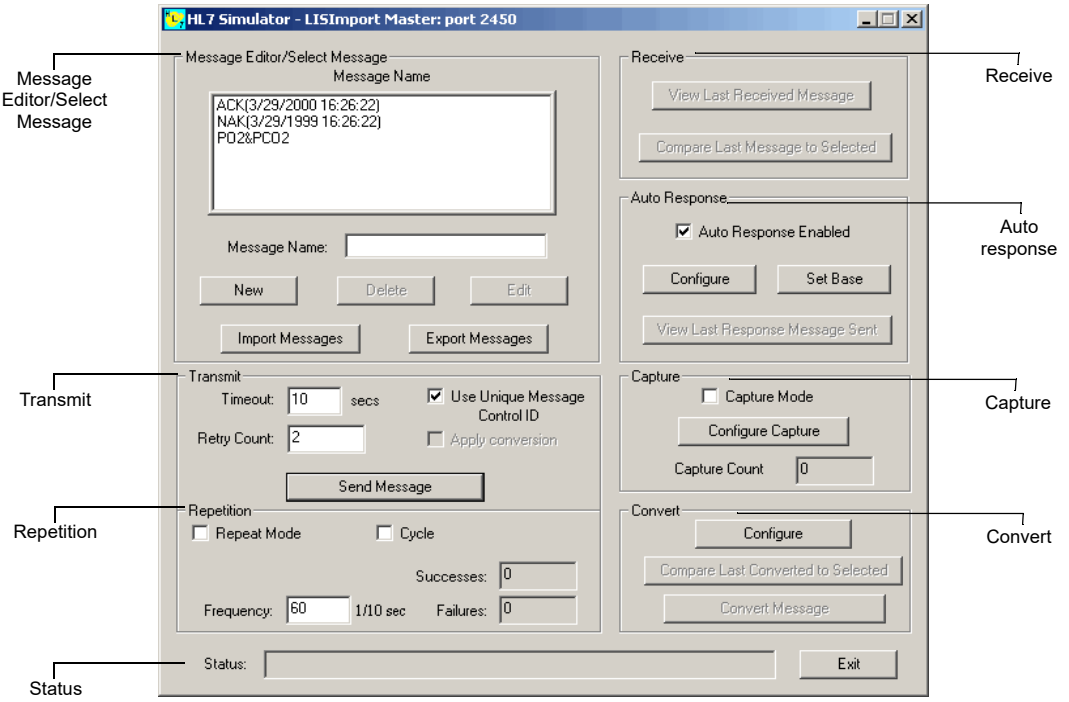
CAUTION

– The unicode setting must match the messages that are in unicode setting in the HL7 configuration dialog for communication to be properly established.

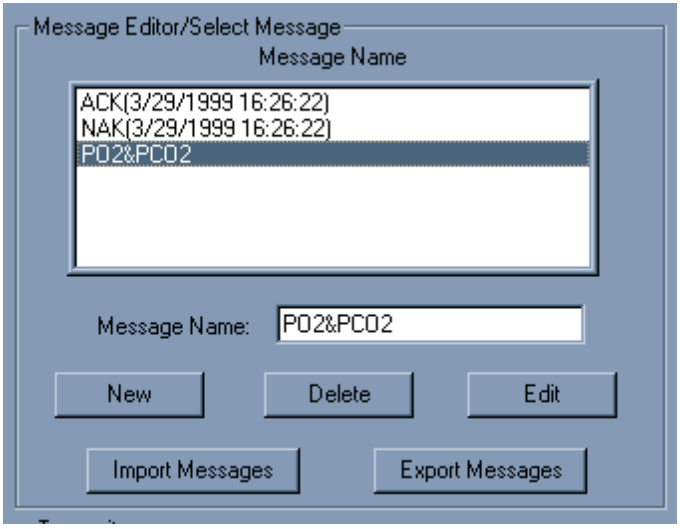
– If the unicode setting is disabled and a unicode character (non-ANSI) is entered into a message, when that message is transmitted, only the lower byte of the unicode character is transmitted.

After ***Network Setup*** is configured, the main screen of the HL7 Simulator appears.

HL7 Simulator main screen



Message Editor/Select Message



Option	Description
Message Name	Displays selected message name from the ***Message Name*** list.
New	Creates a new message and opens the ***Message editor***. If no message is highlighted when ***New*** is clicked, the created message is blank. If a message is highlighted, the new message is created based on the existing message.
Delete	Deletes selected message from ***Message Name*** list.
Edit	Opens the ***Message editor***.
Import Messages	Imports messages from a file of previously exported messages (file type *.hl7). The imported messages can either be appended or replace the list of messages displayed in the ***Message Name*** list.
Export Messages	Saves all messages listed to disk.

NOTE
When HL7Sim is started, the HL7 file specific to the selected interface is automatically imported into the ***Message Name*** list.

Selecting or deselecting a message

- Click a message name to select it. When the message is selected, it is highlighted.
- Click a highlighted message to deselect it. The highlight disappears.

Creating a new message

1. Deselect any selected message.
2. Next to ***Message Name***, enter a name for the new message.
3. Click ***New***. The ***Message editor*** dialog appears.

Creating a new message using an existing message

1. Select the message to base the new one on.
2. Enter a unique name in the ***Message Name*** field.
3. Click ***New***. The ***Message editor*** dialog appears.

Deleting an existing message

1. Select the message to delete.
2. Click ***Delete***. The message is removed from the ***Message Name*** list.

Editing an existing message

1. Select the message to modify.
2. Click ***Edit***, or double click the message. The ***Message editor*** dialog appears.

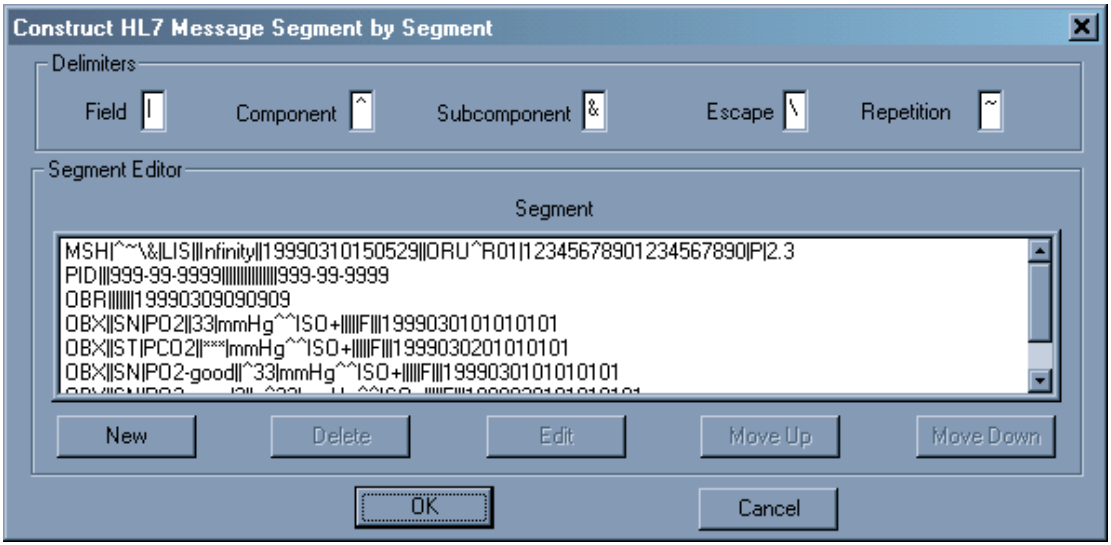
Importing messages from an HL7 file

1. Click ***Import Messages***.An ***Open*** dialog appears that lets you select an HL7 file.
2. Select a file to import.
3. You will be prompted: ***Append to existing messages?***
   - ***No*** causes the messages contained in the file to replace all messages currently in the list.
   - ***Yes*** causes the messages in the file to be appended to the messages in the list. If there are messages in the file and in the list with the same name, the name of those message placed in the list from the file are modified slightly to make the name unique.

Exporting messages to an HL7 file

1. Click ***Export Messages***.
2. A ***Save as*** dialog appears.Give the new file a name and select the directory in which to place the file. If you do not change the default file name, the messages exported are automatically imported the next time HL7Sim is started with the same interface selected.
3. Save the file.

Message editor



The ***Construct HL7 Message Segment by Segment*** dialog is a message editor that you can use to view, edit, or create HL7 messages, segment by segment. The ***Delimiters*** section shows the delimiters in use for the message. The ***Segment Editor*** section shows a list of segments contained in the message.

Selecting or deselecting a segment

1 Click a segment to select it. When the segment is selected, it is highlighted.

2 Click a highlighted segment to deselect it. The highlight disappears.

Creating a new segment

1 Deselect any selected segment.

2 Click ***New***. The ***Segment Editor*** dialog appears.

Creating a new message using an existing message

1 Select the segment to base the new one on.

2 Click ***New***.
The ***Segment Editor*** dialog appears.

Deleting an existing segment

1 Select the segment to delete.

2 Click ***Delete***.The segment is deleted.

Editing an existing segment

1 Select the segment to modify.

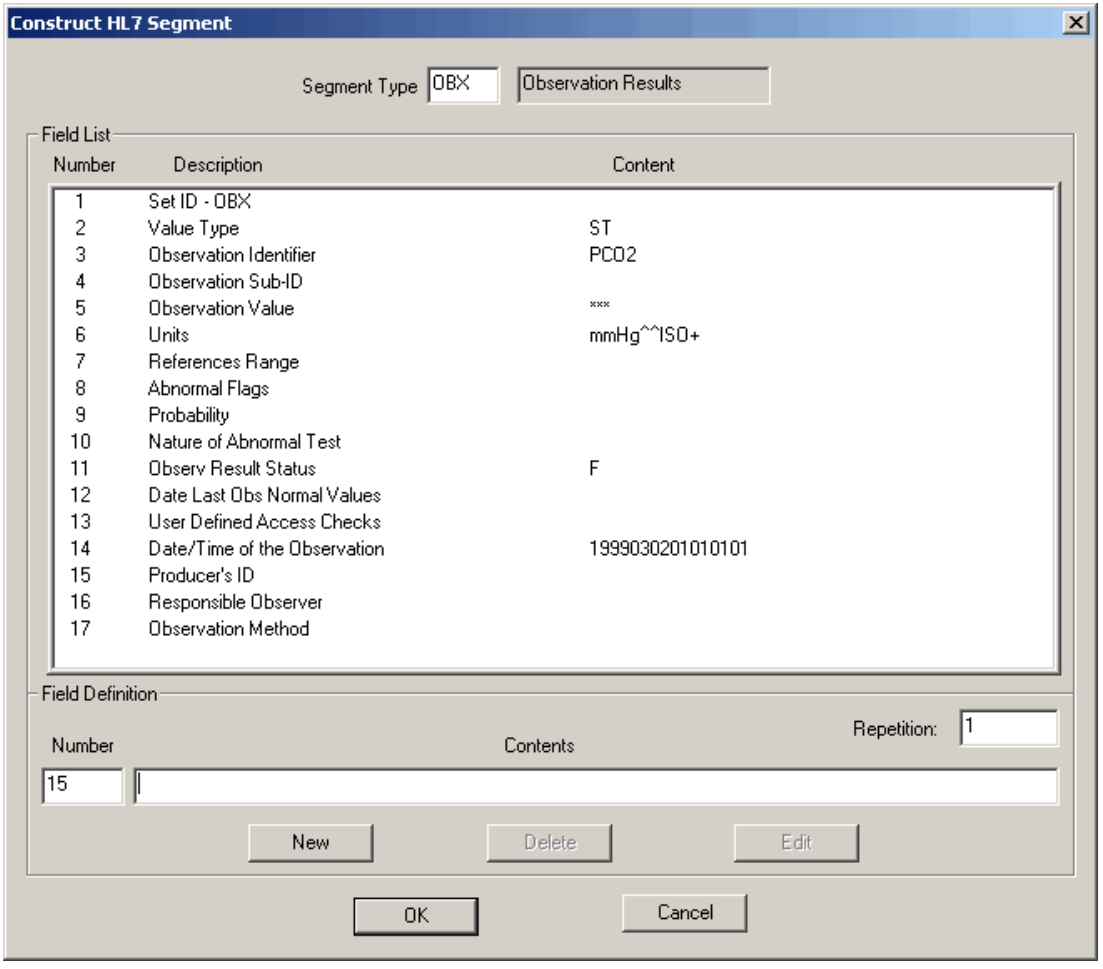
2 Click ***Edit***, or double click the segment.
The ***Segment Editor*** dialog appears.

Repositioning a segment

1 Select a segment to move.

2 Click ***Move Up*** or ***Move Down*** until the segment is in the desired position.

Segment editor



The ***Construct HL7 Segment*** dialog is a segment editor that you can use to view, edit, or create HL7 segments, field by field.

The current ***Segment Type*** is shown above. If the ***Segment Type*** is a recognized type, a description is provided, such as ***Observation Results*** in the figure above.

The ***Field List*** contains a list of fields that are contained in the segment, as well as the field ***Number***, the field ***Description*** (if the ***Segment Type*** is known) and field ***Content***, if any.

Selecting a field

- Click a field in the ***Field List***.
  The number and content of the selected field appear in the ***Number*** and ***Contents*** fields under ***Field Definition***. The contents include all components and sub-components.

Creating a field using an existing field

1. Select the field to base the new one on.
2. Enter a number for the new field in the ***Number*** text box.
3. Click ***New***.
   The ***Segment Editor*** dialog appears.

NOTE

If you enter a duplicate number of an existing field and the existing field has contents, a notification appears indicating that you have entered a duplicate field number. If the existing field is empty, however, clicking ***New*** is identical to clicking ***Edit***.

Creating a repetition field

1. Enter a number for the repetition field in the ***Number*** field.
2. Enter a repetition number in the ***Repetition*** field.
3. Click ***New***.The ***Field editor*** dialog appears.
   You cannot create a field with a repetition other than 1 until the base field has been created. If you attempt to do so, a message appears indicating that you must enter a base field before any repetition.

Deleting the contents of an existing field

1. Select the field to delete.
2. Click ***Delete***.
   If you are deleting the last field in the list and it does not contain any repetitions, the selected field is removed from the Field list. However, if the field is not the last in the list or it contains a repetition, only the contents of the field are removed.

Deleting the contents of a field repetition

1. Select the field.
2. Enter the repetition number in the ***Repetition*** field.
3. Click ***Delete***.
   If the repetition is the last repetition for the field, the ***Repetition*** field is removed. However, if the repetition is not the last repetition, only the contents of the repetition is removed.

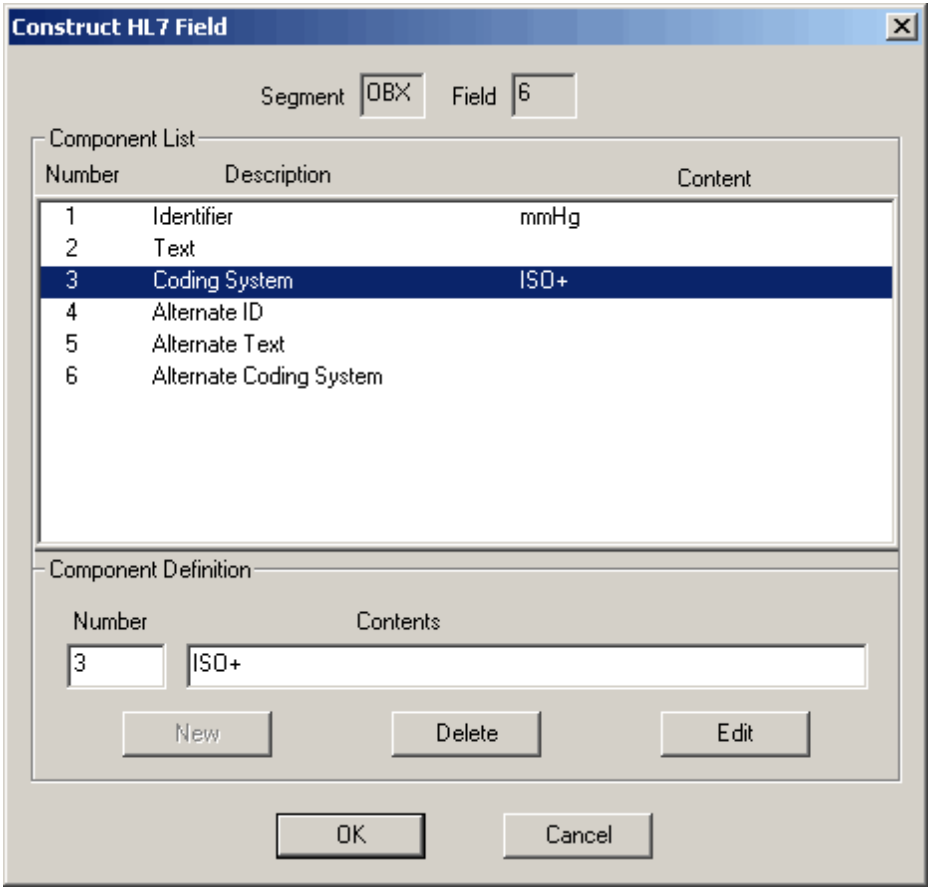
Editing an existing field

1. Select the field.
2. Click ***Edit*** button, or double click the field.
   The ***Field Editor*** dialog appears.
3. Edit the ***Contents*** field as desired.
4. Click ***Change*** to save.

Editing a field repetition

1. Select the field to modify.
2. Enter the repetition number in the ***Repetition*** field.
3. Click ***Edit***.
   The ***Field Editor*** dialog appears.
4. Edit the ***Contents*** field as desired.
5. Click ***Change*** to save.

Field editor



Use the ***Construct HL7 Field*** dialog to view, edit, or create HL7 fields, component by component. Here you can view the ***Segment*** type, current ***Field*** number, ***Component List*** and ***Component Definition***, if any.

Selecting a component

Click on a component.

The number of the selected component appears in the ***Number*** field. The contents of the component appear in ***Contents*** (including all subgroups.)

Creating a component using an existing component or editing a component

1 Select the desired existing component.

2 Click ***New***.
The ***Component editor*** dialog appears. Assign a unique number to the new component. If the number of the existing component is used, and it already has contents, a warning message appears; however, if the existing component is empty, ***New*** functions as ***Edit***.

Deleting the contents of a component

1 Select the component to delete.

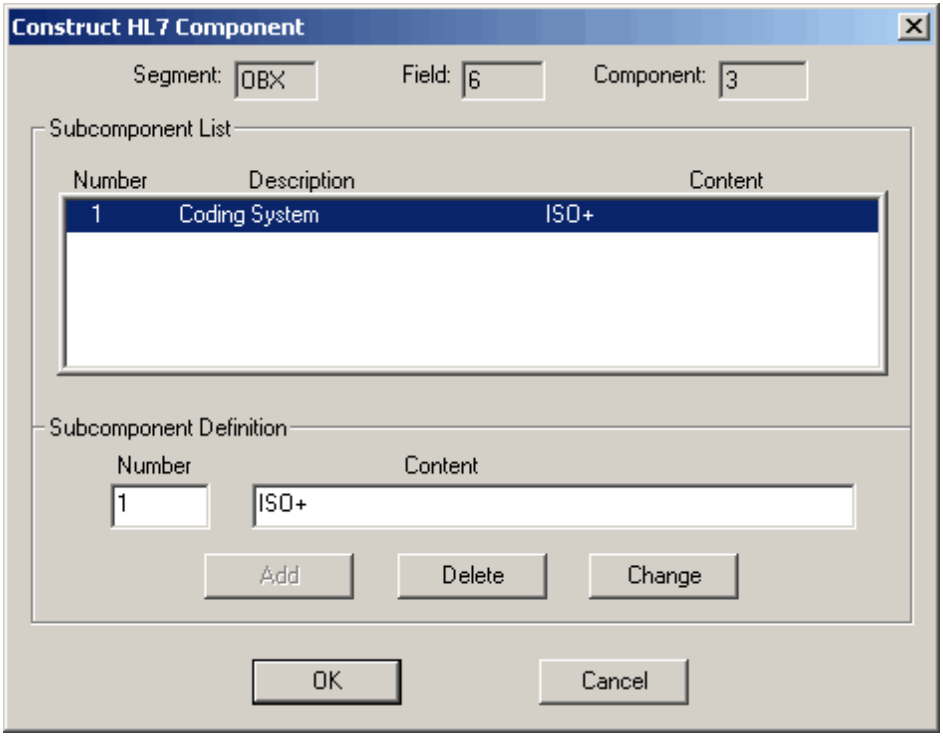
2 Click ***Delete***.
If the component is the last component in the list, it is removed from the ***Component List***. If it is not the last one in the list, only the contents of the component are removed.

Editing an existing component or the *Contents* field

1 Select the component to modify.

2 Click ***Edit***, or double click the component.
The ***Component editor*** dialog appears. The following section describes the ***Component Editor*** functions.

Component editor



Use the ***Construct HL7 Component*** dialog to view, edit, or create HL7 components. Here you can view the current ***Segment*** type, ***Field*** number, and ***Component*** number. The ***Subcomponent List*** and ***Subcomponent Definition*** sections show the subcomponents that are contained in the field, as well as the subcomponent ***Number*** and ***Content***, if any.

Creating a new subcomponent

1. Click the ***subcomponent***.
   The number of the selected subcomponent appears in the ***Number*** field. The content of the selected subcomponent appears in the ***Content*** field.
2. Modify the ***Number*** field.
3. Modify the ***Content*** field with the data you would like the new subcomponent to contain.
4. Click ***Add***.
   The new subcomponent is added to the list.

Deleting the contents of a subcomponent

1 Select the subcomponent to delete.

2 Click ***Delete***.

If the subcomponent is the last one in the list, it is removed from the ***Subcomponent List***. If it is not the last in the list, only the contents of the subcomponent are removed.

Editing an existing subcomponent

1 Select the subcomponent to modify.

2 Modify the ***Content*** field.

3 Click ***Change***.

Message viewer

The ***Message Viewer*** is similar to the ***Message editor***, however, messages cannot be modified using the ***Message Viewer***

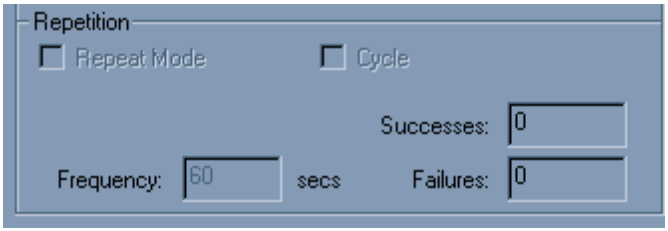
Transmit

In Master mode, use the ***Transmit*** section of the main screen to control how individual messages are transmitted.

Option	Description
Timeout:	Wait time (in seconds) for a response after message transmission.
Retry Count:	Number of message retransmissions when there is no response.
Use Unique Message Control ID	When checked, a unique Message Control ID is automatically created before the message is transmitted. During a retry, the same Message Control ID is used in all automatic retransmissions. This field is also available on a slave interface and applies to automatic responses.
Apply Conversion	Applies the configured message conversion rules to the selected message. See "Convert" for more information.
Send Message	Sends the message selected in the ***Message Name*** list.

Repetition

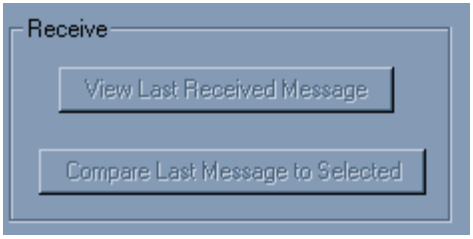
In Master or Slave mode, you can use the ***Repetition*** section of the main screen to script a series of message transmissions.



Option	Description
Repeat Mode	When checked, HL7Sim repeatedly transmits the currently selected message at a fixed interval determined by the ***Frequency*** setting defined below.
Cycle	This setting is only available when ***Repeat Mode*** is enabled. When ***Cycle*** is checked, the message selection is automatically advanced to the next message in the list after the transmission of a message. When the selection reaches the bottom of the list, the selection then returns to the top of the list.
Frequency	The number of seconds between repeat transmissions. Note that this number should always be greater than the maximum number of seconds needed to transmit a single message, including all retries. For example, if ***Timeout*** is set to 10 seconds and ***Retry Count*** is set to 2, the transmission of a single message can take up to 30 seconds: – First message is sent – Wait up to 10 seconds for a response – First retry is sent – Wait up to 10 seconds for a response· – Second retry is sent – Wait up to 10 seconds for a response With these settings, the ***Frequency*** setting should be set at > 30 seconds.
Successes	Counts the number of messages sent for which a valid response was received. A valid response must: – Use Minimal Lower Layer Protocol (MLLP) formatting – Have a properly formatted MSH segment – Have a properly formatted MSA segment containing the Message Control ID of the message being responded to in field 2.
Failures	Counts the number of messages that were sent for which no valid response was received. See "Successes" for the definition of a valid response.

Receive

In either Master or Slave mode, use the Receive section of the main screen to examine the last received message.

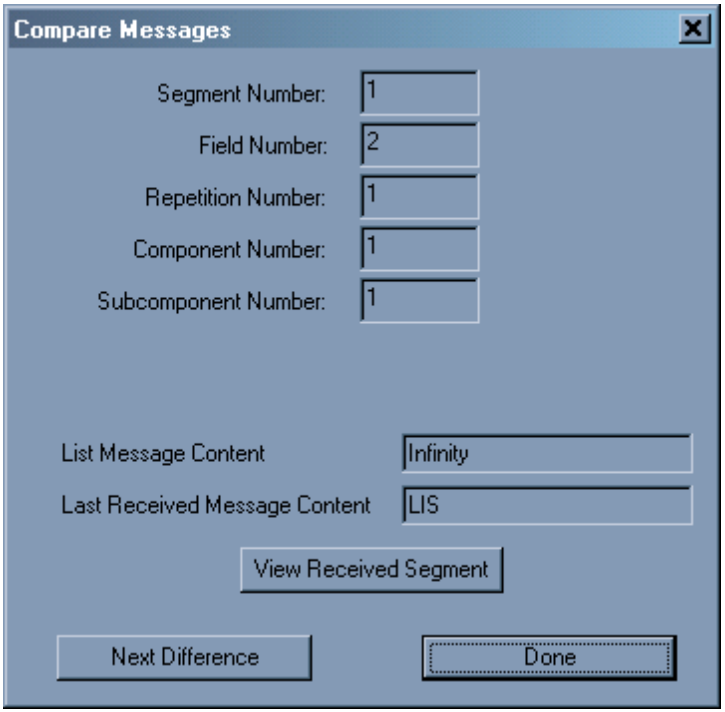


View Last Received Message	This button is enabled when a message has been received. After a message has been received, this button lets the user view the last message that was received with the ***Message editor***.
Compare Last Message to Selected	This button is enabled when a message has been received and another message has been selected from the ***Message Name*** list of messages. When clicked, a ***Message comparison*** dialog opens and displays the differences between the last message received and the selected message.

Message comparison

There are two message comparison buttons on the HL7 Simulator main screen: ***Compare Last Message to Selected*** which is located in the ***Receive*** section, and ***Compare Last Converted to Selected*** which is located in the ***Convert*** section. When activated, both of these buttons cause the message selected in the ***Message Name*** list to be compared with either the last message received or the message created during the last convert operation.

If no differences exist between the two messages being compared, a message displays indicating that the two HL7 messages are identical. If at least one difference exists, the following dialog appears, showing the first difference found.



The top section of the dialog specifies where the difference was found by ***Segment Number***, ***Field Number***, ***Repetition Number***, ***Component Number***, and ***Subcomponent Number***.

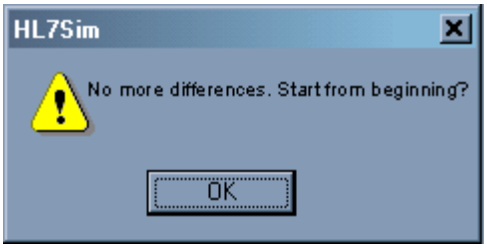
The ***List Message Content*** field contains the corresponding content of the different part found in the message selected in the ***Message Name*** list. The ***Last Received Message Content*** field contains the content of the other message.

CAUTION

If both the ***List Message Content*** and ***Last Received Message Content*** are blank, it indicates a difference in the existence of a segment, field, component or subcomponent between the two messages.

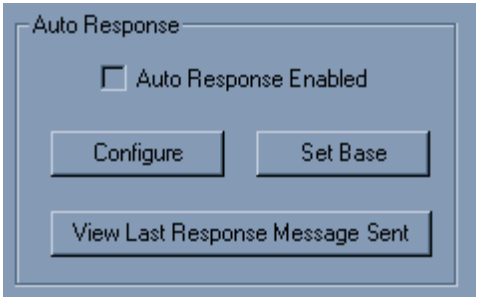
1. Click on the ***View Received Segment*** to view the segment where the difference was found in the received or converted message.
2. Click ***Next Difference***. If any, the dialog displays the next difference found in the messages.
3. Click ***Done*** to exit the ***Compare Messages*** dialog.

   If no further differences exist, the following dialog displays:



Auto response

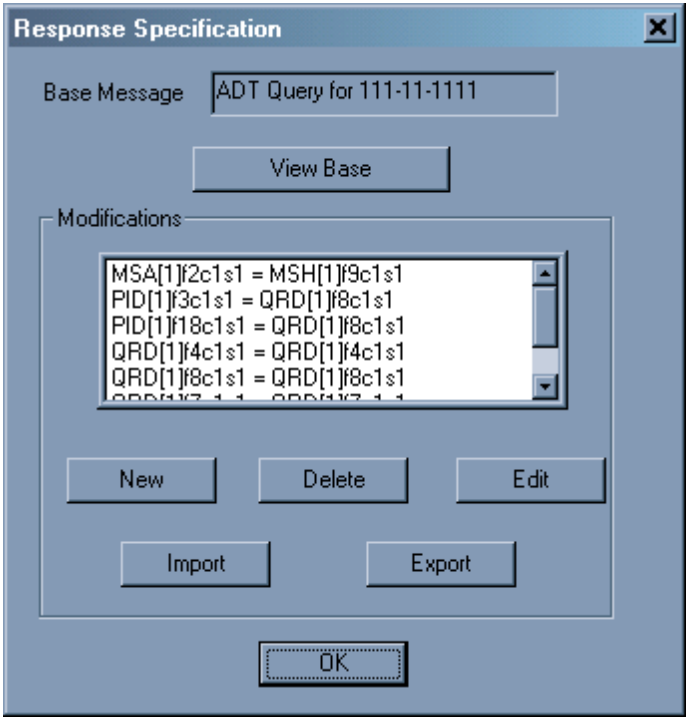
The HL7Sim automatically responds to any received message, if configured to do so. The ***Auto Response*** section of the main screen controls whether or not HL7Sim automatically responds, and if so, how the auto response message is created. The HL7Sim automatically configures itself for ***Auto Response***.



Option	Description
Auto Response Enabled	Enables automatic response to an incoming message using the configured set of rules.
Configure	Opens the ***Configure Auto response*** dialog.
Set Base	Sets the base message to the selected message in the ***Message Name*** list. The base message, in combination with the defined response rules, determines the format of the message sent in Auto Response mode. Before clicking this button, select a message from the ***Message Name*** list of messages.
View Last Response Message Sent	Permits viewing of the message actually sent by the Slave after the response rules have been applied to the base message. The message is viewed with the ***Message viewer***.

Configure Auto Response

The ***Response Specification*** dialog is accessed by clicking ***Configure*** in the ***Auto response*** section of HL7 Simulator main screen, after a base message is defined.



The ***Base Message*** field displays the name of the message in the ***Message Name*** list that was defined as the base message.

View Base lets you view the base message in the ***Message viewer***.

The response message is created by making a copy of the base message, then modifying it according to the rules in the ***Modification*** list.

You can click a modification to select or deselect it. The modification is highlighted when it is selected.

Deleting a modification

1 Select the modification to delete.

2 Click ***Delete***.

Creating a new modification

1 Deselect any selected modification.

2 Click ***New***.
The ***Modification editor*** dialog appears.
Assign a unique number to the existing component. If the number of the existing component is used and it already has contents, a warning message appears; however if the existing component is empty, ***New*** functions as ***Edit***.

Creating a new modification from another modification

1 Select an existing modification to base the new one on.

2 Click ***New***.
The ***Modification editor*** dialog appears.
Assign a unique number to the existing component. If the number of the existing component is used and it already has contents, a warning message appears; however, if the existing component is empty, ***New*** functions as ***Edit***.

Importing modifications to an HLM

1 Click ***Import***.
An Open dialog appears. Select the HLM file type.

2 Select a file. You are prompted ***Append to existing modifications?***

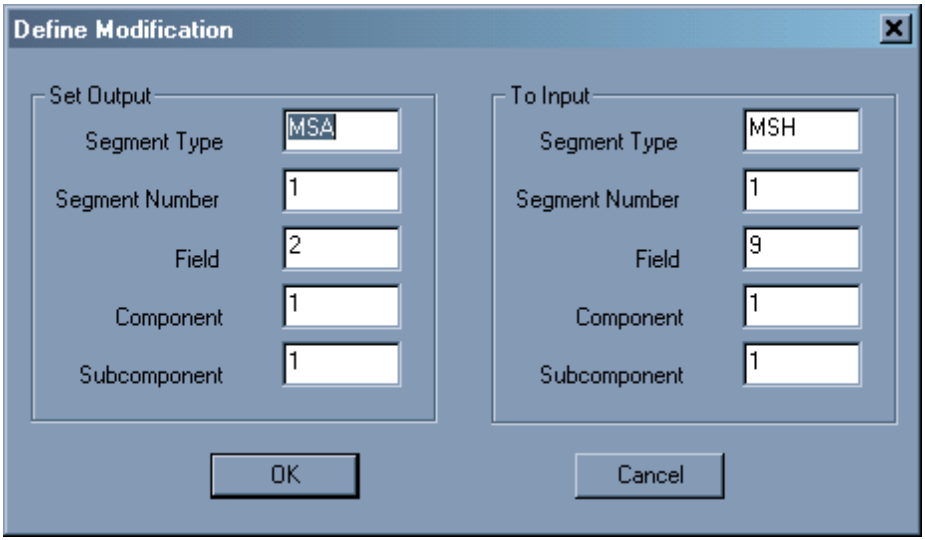
- ***No*** causes the modifications contained in the file to replace all modifications currently in the list.
- ***Yes*** causes the modifications in the file to be appended to the modifications in the list.

Exporting modifications to an HLM file

1 Click ***Export.***
A ***Save as*** dialog appears.Name the new file and save it in the desired directory.
If you do not change the default file name, the modifications exported are automatically imported the next time HL7Sim is started with the same interface selected.

2 Save the file.

Modification editor



Use the ***Define Modification*** dialog to view, edit, or create the modifications that are used to create a response message from the base message, using input from the incoming message. The output message is the message to be sent; the input message is the message received that is being responded to.

The sample modification shown below instructs HL7Sim to modify the contents of the ***Field*** 2, ***Component*** 1, ***Subcomponent*** 1 of the first MSA segment in the response message by setting it to the contents found in the ***Field*** 9, ***Component*** 1, ***Subcomponent*** 1 of the first MSH segment found in the incoming message.

If the base message is the following message:

MSH|^~\&|Infinity||MEDAT-18||199903291626||ACK^R01|99022916262200068097|P|2.3

MSA|AA||[999-99-9999]Message Delivered

And the message received is:

(field 9 of the first MSH is highlighted)

MSH|^~\&|LIS||Infinity||19990310150529||ORU^R01|123456789012345678901234567890|P|2.3

PID|||999-99-9999||||||||||||||||999-99-9999

OBR|||||||19990309090909

OBX||SN|PO2||33|mmHg^^ISO+|||||F|||1999030101010101

OBX||ST|PCO2||***|mmH^^ISO+|||||F|||1999030201010101

OBX||SN|PO2-good||^33|mmHg^^ISO+|||||F|||1999030101010101

OBX||SN|PO2-good2||=^33|mmHg^^ISO+|||||F|||1999030101010101

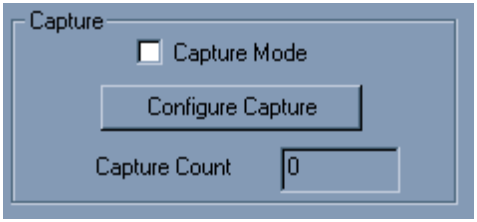
OBX||SN|PO2-bad||=<^33|mmHg^^ISO+|||||F|||1999030101010101

Then, the example modification would cause the following response message to be sent.

MSH|^~\&|Infinity||MEDAT-18||199903291626||ACK^R01|990229162622000680 97|P|2.3

MSA|AA|12345678901234567890|[999-99-9999]Message Delivered

Capture

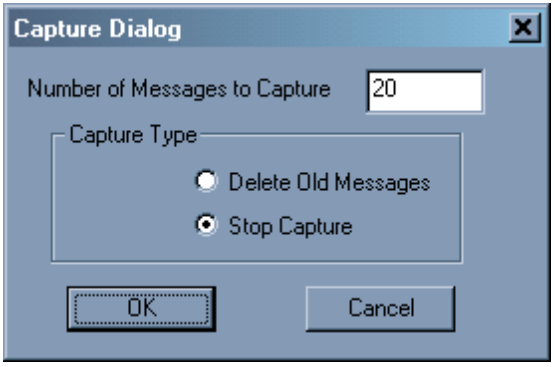


Use ***Capture*** to control how incoming messages are captured. When ***Capture Mode*** is enabled, any valid message received is added to the list of messages. This mechanism can be used to capture and save messages to disk for later analysis or use.

Option	Description
Capture Mode	Enables or disables ***Capture Mode***.
Configure Capture	Opens the ***Capture Dialog***.
Capture Count	Counts the number of captured messages.

Capture configuration

Click ***Configure Capture*** to display the ***Capture Dialog***.

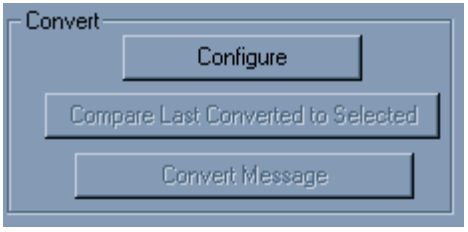


Option	Description
Number of Messages to Capture	Determines how many response messages should be saved in the ***Message Name*** list of messages.
Capture Type	There are two capture types available that determine the action to be taken when the ***Number of Messages to Capture*** limit has been reached: – ***Delete Old Messages*** – In this mode, when the ***Number of Messages to Capture*** limit has been reached, older captured messages are deleted from the Message Name list of messages in order to make room for newer messages. – ***Stop Capture*** – In this mode, when the ***Number of Messages to Capture*** limit has been reached, capture mode is automatically disabled.
OK	Saves the configuration.
Cancel	Does not save the new configuration.

If a configuration is changed and there are previously captured messages in the ***Message Name***, the user is prompted as follows:

Click ***OK*** to delete all previously captured messages from the ***Message Name*** list.

Convert



To simplify integration with an external system, all of the Infinity Gateway's HL7 interfaces provide the ability to define message conversions. Message conversions can be defined for incoming or outgoing messages and can be tailored to the specific interface.

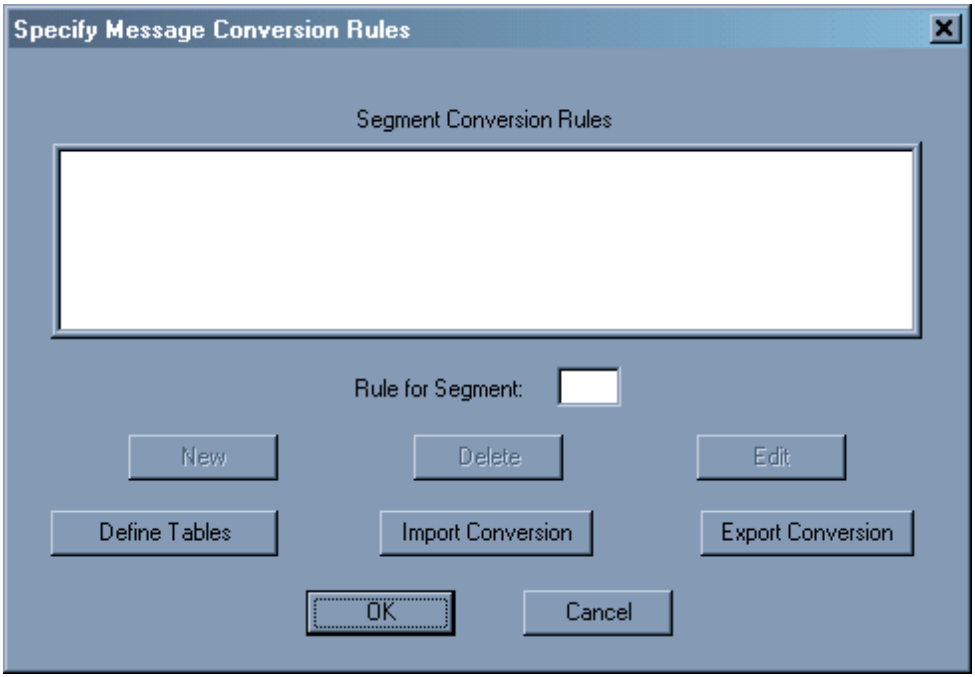
CAUTION

Before a message conversion is applied to an interface, these message conversions must be tested using HL7Sim.

The ***Convert*** section of HL7Sim's main screen lets you develop and test these conversions.

Option	Description
Configure	Opens the ***Specify Message Conversion Rules*** dialog
Convert Message	Applies the specified ***Segment Conversion Rules*** to the currently selected message, creating a new message that is added to the ***Message Name*** list. The newly created message will have the name: CONVERT_<name><timestamp> – <name> is the name of the message being converted – <timestamp> is the date and time of conversion This function is used to test message conversions.
Compare Last Converted to Selected	This button is enabled when a message has been converted and another message has been selected from the ***Message Name*** list. Clicking the ***Compare Last Converted to Selected*** button displays the ***Message comparison*** dialog, which shows the differences between the last message converted and the selected message.

Specify Message Conversion Rules dialog



The ***Specify Message Conversion Rules*** dialog appears when:

- You click ***Configure*** from the main screen of HL7Sim, or
- You click ***Define Conversion*** from the ***Configuration*** dialog for one of the HL7 interfaces in the Infinity Gateway Setup program.

When opened from within HL7Sim, HL7 automatically imports conversions if a conversion file exists with the appropriate name for the interface in the current working directory.

When you click ***OK***, the rules are only saved in memory. Dräger recommends that you export the rules frequently when defining rules within HL7Sim.

When this dialog is invoked from the Infinity Gateway Setup program, any currently configured conversions (either for the input or output message) are automatically loaded into the ***Segment Conversion Rules*** list. When you click ***OK*** in the ***Infinity Gateway Setup*** dialog, the registry is automatically updated and the conversion rules take immediate effect when the HL7 service is next restarted.

In the ***Specify Message Conversion Rules*** dialog you can:

- Define a new segment conversion rule for the segment
- Delete an existing segment conversion rule
- Edit an existing segment conversion rule

- Define Tables
- Importing a set of conversions from disk
- Export a set of conversions to disk

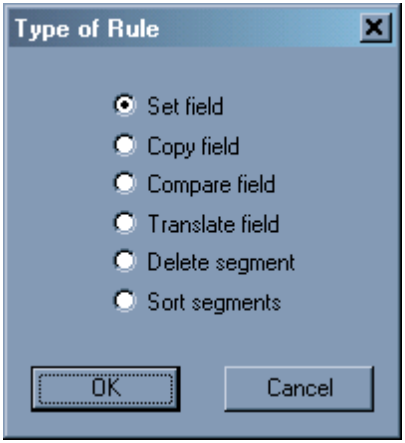
Once a rule is created for a segment, it is added to the ***Segment Conversion Rules*** list in rule notation. Each line in the list represents all the rules for the segment. The segment type for which the rule applies appears at the beginning of the line.

Define a new segment conversion rule

In order to define a new segment conversion rule, you must first enter the name of a segment in the ***Rule for Segment*** file. The created rule(s) are applied in chronological order to any segment of this type encountered in the message to be converted.

NOTE
Only one segment conversion rule can be created for a given segment type. This conversion rule may be a compound rule, however, and may contain more than one rule.

After entering the segment type, select click ***New***. The ***Type of Rule*** dialog appears:



Select the type of rule to be created and click ***OK***.

A rule type-specific dialog appears with the following radio buttons.
See "Rule specifications" for more details on the specific rule types.

- ***Set field***
- ***Copy Field***
- ***CompareField***
- ***Translate Field***
- ***Delete segment***
- ***Sort segments***

After you create and save the rule, the ***Segment rules dialog*** appears.

Deleting an existing segment conversion rule

If you select a segment conversion rule from the list in the ***Specify Message Conversion Rules*** dialog and then press the ***Delete*** button, the selected segment conversion rule is deleted.

Editing an existing segment conversion rule

Select an existing segment conversion rule from the list in the ***Specify Message Conversion Rules*** dialog.Click ***Edit***. The ***Segment rules dialog*** appears, letting you add, delete or edit the list of rules defined for the segment.

Define Tables

Tables are used by the "Translate" rule.

NOTE
You must define a table before you create the Translate rule that must use it.

Click ***Define Tables*** in the ***Specify Message Conversion Rules*** dialog. The ***Select Table*** dialog appears.

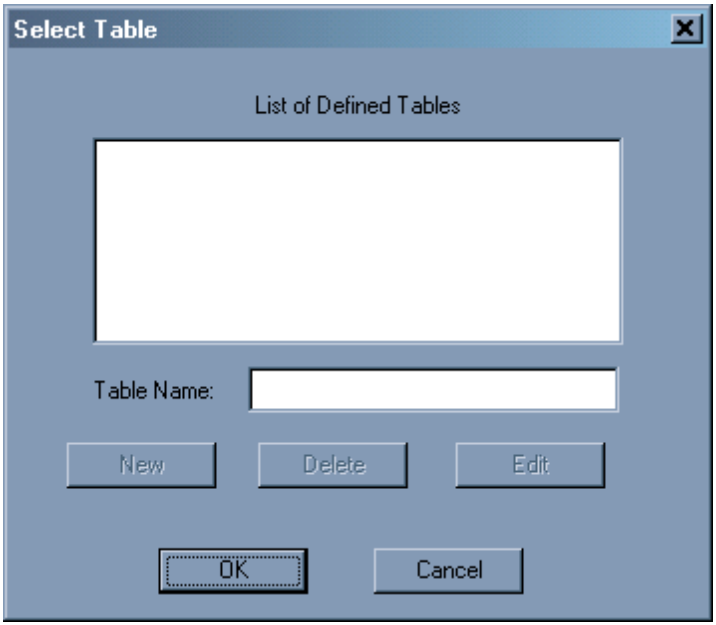
Importing a set of conversions from disk

Click ***Import Conversion*** in the ***Specify Message Conversion Rules*** dialog. You are prompted to select an HLC file. After it is selected, the file is read, and all segment conversions already existing in the ***Segment Conversion Rules*** list are replaced with the rules from the new file; all tables are also replaced with tables from the new file, if they exist.

Export a set of conversions to disk

Click ***Export Conversion*** in the ***Specify Message Conversion Rules*** dialog. The user is prompted to select a directory and name with which to create the file. The file created will be an HLC file containing all of the segment conversions listed in the S***egment Conversion Rules*** list as well as all defined tables.

Select Table



Creating a table

1 Enter a name for the table in the ***Table Name*** field.

2 Click ***New***.
The ***Defining a Table*** displays.

3 To customize the table, see Defining a Table on page 42.

Deleting a table

1 Select the table to be deleted from the ***List of Defined Tables***.

2 Click ***Delete***.
If the component is the last one in the list, it is removed from the ***Component List***. If it is not the last in the list, only the contents of the component are removed.

Editing a table

1 Select the table to be modified from the ***List of Defined Tables***.

2 Click ***Edit***.
The ***Define Table dialog*** displays.

3 To edit the table, see Defining a Table on page 42.

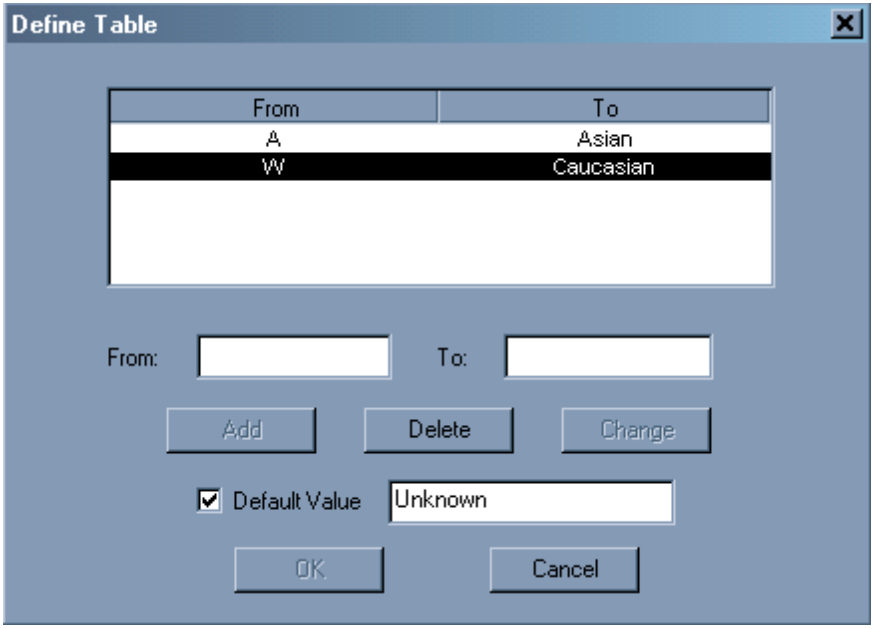
Renaming a table

1 Select the table to be modified from the ***List of Defined Tables***.

2 Click ***Edit***.
The ***Defining a Table*** displays.

3 Edit the name.

Defining a Table



A table consists of a list of entries. Each entry has a ***From*** string and a ***To*** string. Whenever the contents of the field being translated matches the contents of a ***From*** string in one of the entries, the contents of the field is replaced with the contents of the ***To*** string for the table entry in which the match was found. If no entry is found that matches the contents of the field being translated, then the contents are replaced with the contents of the table's ***Default Value***, if one is defined. If no ***Default Value*** is defined, then the contents of the field are not changed.

NOTE
Translations are not case sensitive.

Adding a new entry

1 Enter an expected string in the ***From*** text box.

2 Enter the string that is to replace the expected string in the To text box.

3 Click ***Add***.
The entry is added to the list.

Deleting an entry

1 Select an entry from the list.

2 Click ***Delete*** button.
The entry is deleted from the list.

Editing an entry

1 Select an entry from the list.

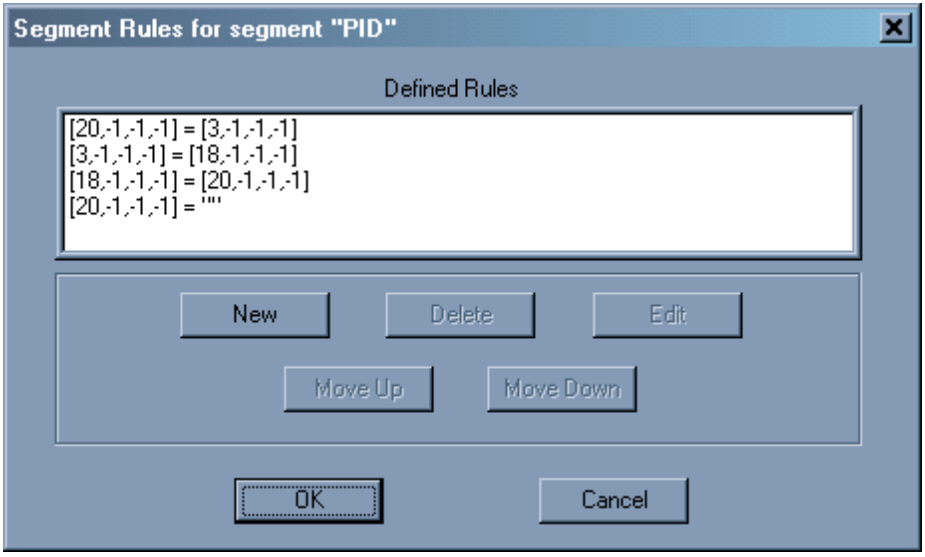
2 Click ***Change***.
The list is updated to reflect the change.

Defining a default value

1 Check the ***Default Value*** check box.

2 Enter the string to be used as default in the corresponding field.
If no default is needed, uncheck the ***Default Value*** check box.

Segment rules dialog



This dialog displays a list of rules to be applied to a particular segment, in rule notation, and represents either the Main Rules for a segment, or the rules in a ***Then use rules*** or ***Otherwise use rules*** clause of a ***Compare field*** rule. Each rule appears on a separate line. The rules are executed in the same order in which they appear in the list.

Option	Description
New	A new rule is created and appended to the end of the list. The ***Type of Rule*** dialog displays which lets you select the type of rule to create.
Delete	Deletes the selected rule.
Edit	Opens a rule type-specific ***Rule specifications*** dialog for the rule to be edited.
Move Up	Moves the selected rule up above the preceding rule, causing the selected rule to be executed earlier.
Move Down	Moves the selected rule down below the following rule, causing the selected rule to be executed later.

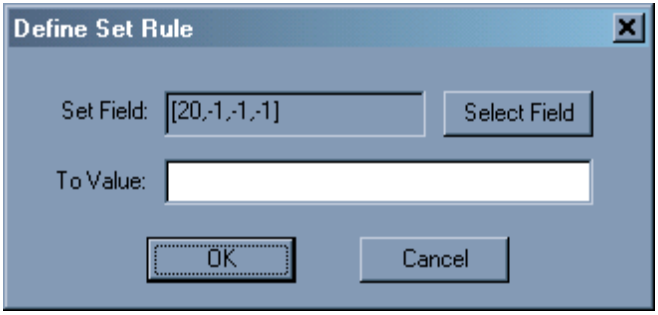
The rule notation for the list of rules consists of the rule notation for each rule in the list, separated by semicolons.

Rule specifications

The following rule types are supported:

Rule	Description
Set field	Sets a field in the current segment to a fixed value.
Copy Field	Sets a field in the current segment to the contents of another field in this or another segment.
Compare Field	Compares the contents of a field in this segment to either a fixed value or the contents of another field (in this or another segment), and defines a set of rules to be executed when the comparison is true, and, optionally, another set of rules to be executed when the comparison is false.
Translate Field	Translates the contents of a field by looking the contents up in a defined table and inserting the table value for the entry back into the field, replacing its original contents.
Delete segment	Deletes the segment from the message.
Sort segment	Sorts consecutive segments of the same type by the contents of a specific field.

Set field



This rule instructs the software to set a particular field in the current segment to a fixed value. Clicking the ***Select Field*** button displays a ***Define Field*** dialog and lets you both select from a list of fields presented and specify component, subcomponent and repetition factors. Once a field selection is made, this is represented in field description notation next to ***Set Field***.

The rule notation for this rule has the form:

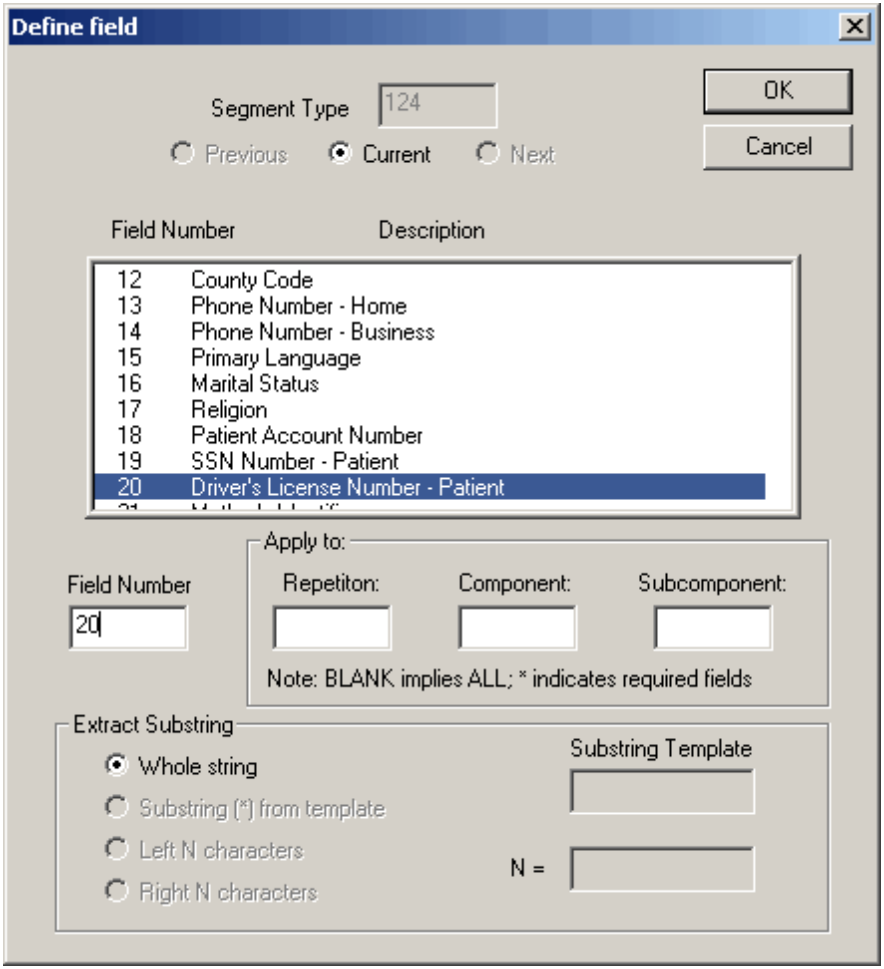
field description = “string”

where:

Field description = Contents of ***Set Field*** field

String = The string value entered in the ***To Value*** field

Define field



The ***Define Field*** dialog is used during rule specification to specify a particular field to be used by the rule.

NOTE

In some cases the field to be specified must reside in the current segment, while in other cases, it may not. If the field to be specified must reside in the current segment, then ***Segment Type***, ***Previous*** and ***Next*** are grayed out.

The ***Segment Type*** field indicates the type of segment in which the field is to be found. By default, this field is set to the segment type of the segment rules being defined.

The positional radio buttons, ***Previous***, ***Current*** and ***Next***, indicate where the segment containing the field is to be found. If, for example, the rule being created is for an OBX segment, defining a field with a ***Segment Type*** of OBR and a ***Previous*** position indicates that the field is located in the OBR segment that is closest to the OBX segment but before it in the message.

The list box contains a list of known fields and field descriptions for the segment defined by ***Segment Type***. Select a field by clicking on it in the list box.

You can use the ***Repetition***, ***Component***, and ***Subcomponent*** text boxes to specify which repetition, component, and subcomponent is to be used. A BLANK in these entries indicates that all repetitions, components or subcomponents are to be used. An asterisk (*) next to any of these entries indicates that a specific value must be entered, that is, a BLANK cannot be used to specify ALL.

The ***Extract Substring*** dialog lets you use a specific substring from a field. Use the following functions to select the desired characters:

Whole String	Select entire field that has been specified for the current command
Substring (*) from template	You can select a part or parts of the field string using wildcard characters: ‘%’ = desired characters ‘*’ = 0 or more characters ‘?’ = 1 single character ‘ ‘ = represents itself See substring examples below
Left N characters	Select ***Left N characters*** of the specified field for the current command
Right N characters	Select ***Right N characters*** of the specified field for the current command
Substring template	Defines the template used to extract a substring in substring-from-template-mode
N =	Number of characters

Substring Examples:

Field Contents	Substring Template	Results	Description
BED22A	*D%?	22	Ignore everything up to the first 'D', then take everything except the last character
	???%?	22	Ignore the first 3 characters and the last character and take the rest
MARY JANE	* %	JANE	Take everything after the first ' '
121^133	%^%	121133	Take everything except the '^' character

Field specification notation

The field specification notation is as follows:

segment specifier [field, rep, comp, sub]:L N

:R N

:"_"

where:

Segment specifier	Is one of: "LAST *segment type*" "NEXT *segment type*" (blank) where <segment type> represents contents of ***Segment Type*** text box If the segment type is the same as the segment type that the rule is being defined for, and the positional radio button is ***Current***, then there is no segment specifier
Field	The number of the field within the segment
Rep	The number of the repetition entered in the ***Repetition*** field, or -1 if BLANK
Comp	The number of the component entered in the ***Component*** field, or -1 if BLANK
Sub	The number of the subcomponent entered in the ***Subcomponent*** field, or -1 if BLANK

Examples:

[4,-1,-1,-1]	Field 4 of the current segment, including all repetitions, components and subcomponents.
LAST_OBX.[4,-1,-1,-1]	Field 4 of the previous OBX segment, including all repetitions, components and subcomponents
NEXT_OBX.[2,1,-1,-1]	Repetition 1 of field 2 of the following OBX segment, including all of its components and subcomponents.
[6,1,1,1]	The 1st subcomponent of the 1st component of the 1st repetition of field 6 of the current segment.

[3,2,1,-1]	The 1st component of the 2nd repetition of field 3 of the current segment, including all subcomponents
[7,-1,-1,-1]=<[5,-1,-1,-1]:"%^%"	Prepend field 7 with the substring extracted from field 5 using the substring template "%^%"
[8,-1,-1,-1]=[3,-1,-1,-1]:L5	Copy the left 5 characters of field 3 into field 8, replacing all components

Sample conversions

Sample 1: Change OBX data type from SN to NM

OBX: IF ([2,1,1,1] == “SN”) {[5,1,1,-1] = [5,1,2,-1]; [5,1,2,-1] = “”; [2,-1,-1,-1] = “NM”}

This rule may be useful to a customer who already has an HL7 interface available and if the interface only supports the NM value type, while our interface uses the SN value type.

This rule first compares field 2 (value type) of the OBX segment to the value “SN”. If the value type is “SN”, it copies the contents of the 2nd component of field 5 (observation value) into the 1st component of field 5, empties the 2nd component of field 5, then sets the value type (field 2) to “NM”.

Sample 2: Change race identifier in the PID segment

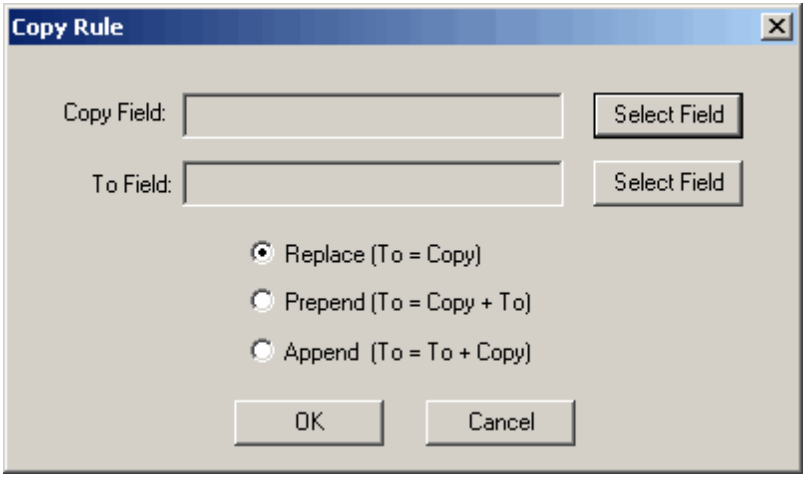
PID: [10,1,1,1] = (race)

This rule may be useful to a customer whose existing HL7 interface uses different race specifiers from what our interface requires. To use this rule, a race table would need to be created that maps their specifiers to ours, or vice versa.

Status

Status displays the status string indicating success or failure of the sent message from Master or response from Slave. Click ***Exit*** to close the screen.

Copy



This rule copies the contents from a source field (***Copy Field)*** to a destination field (***To Field***). The destination field is always contained in the same segment as the rule is defined, however the source field can be contained in a different segment.

The source and destination fields are specified using the ***Define Field*** dialog, which is invoked by clicking on one of the ***Select Field*** buttons. The fields ***Copy Field*** and ***To Field*** update to contain field description notation after the corresponding ***Select Field*** button has been used to specify the field.

The rule notation for this rule has the form:

to field description = copy field description (replace)

to field description =< copy field description (prepend)

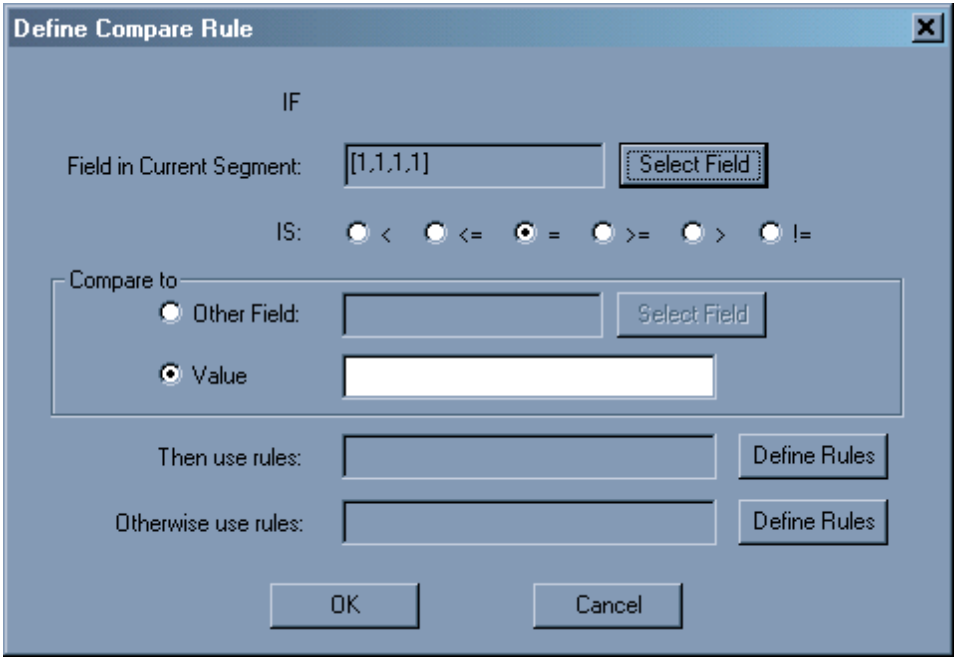
to field description => copy field description (append)

where:

To Field description = Contents of ***To Field*** field

Copy Field description = Contents of ***Copy Field*** text box

Compare



This rule takes different actions depending on the contents of a field in the current segment. The rule compares the contents of the specified field to either a fixed value or to another field.

When you click ***Select Field***, a ***Define Field*** dialog displays, which lets you both select from a list of presented fields, and specify component, subcomponent and repetition factors. Once you click these buttons, the corresponding field (i.e. either ***Field in Current Segment***, or ***Other Field***) updates to contain the Field Specification Notation that describes the selected field.

The ***Define Rules*** button invokes the ***Segment rules dialog***, which is used to create a list of rules. Once a list of rules is defined in this way, the corresponding field (either ***Then use rules*** or ***Otherwise use rules***) updates to contain the rule notation of the set of rules defined.

NOTE
A ***Then use rules*** entry is required. An ***Otherwise use rules*** entry is optional.

The rule notation for this rule has the form:

IF (field description comparator value) {then rules} ELSE {otherwise rules}

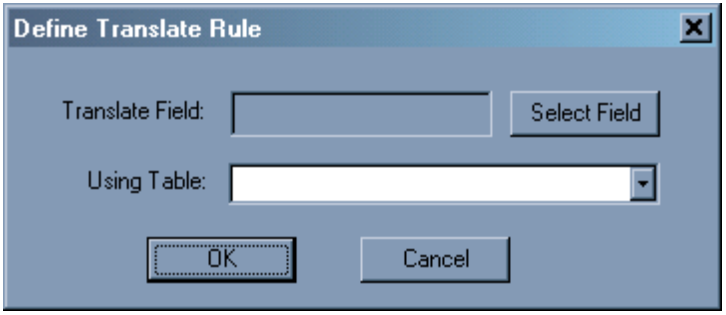
or

IF (field description comparator value) {then rules}

where:

To Field Description	Contents of ***Field in Current Segment*** text box
Comparator	Selection following ***IS***: – Less than < – Less than or equal to <= – Equal to = – Greater than or equal to >= – Greater than > – Not equal to !=
Value	Either the ***Contents of Other field*** text box, or a string (with surrounding quotes) entered in the ***Value*** field, depending on the ***Compare to*** radio button selected
Then rules	Contents of ***Then use rules*** text box
Otherwise rules	Contents of ***Otherwise use rules*** text box

Translate



This rule instructs the software to translate the contents of a particular field in the current segment based on the contents of the pre-defined table referenced in the ***Using Table*** selection. See the ***Define Tables*** dialog for more details.

Select Field is used to specify the field to be translated and displays ***Define Field*** dialog. Once a field selection is made, it is represented in Field Specification Notation in the ***Translate Field*** text box.

The rule notation for this rule has the form:

field description = table name, where

Field description	Contents of ***Translate Field*** text box
Table name	Name of table to be used during translation

Delete segment

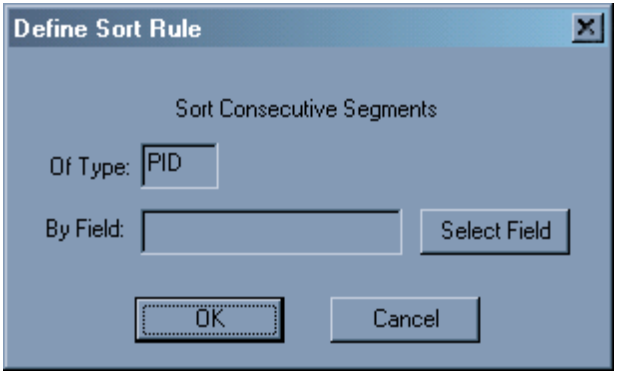
This rule instructs the software to delete the current segment. Unlike all other rules, no dialog is displayed to define this rule.

CAUTION
A ***Delete Segment*** rule must be the last rule executed for the segment.

The rule notation for this rule has the form:

DEL

Sort segment



The ***Sort Segments*** rule causes all consecutive segments of the same type as the current segment rule to be sorted by the contents of a particular field.

When you press the ***Select Field*** button the ***Define Field*** dialog displays, which allows you to select from a list of presented fields and to specify component, subcomponent and repetition factors. Once you click on this button, the ***By Field*** text box updates to contain the field description notation describing the selected field.

The rule notation for this rule has the form:

sort by field description

where:

Field description = Contents of ***By Field*** text box

These Instructions for Use only apply to **Infinity® Gateway Suite HL7 Simulator Reference Guide VF9.0**
with the Serial No.:
If no Serial No. has been filled in by Dräger, these Instructions for Use are provided for general information only and are not intended for use with any specific machine or unit.

CE 0123

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3703520 – RI 02 en

Edition: 3 – 2023-02
(Edition: 1 – 2019-03)

3 7 0 3 5 2 0

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