Managing orders from Host systems via HL7 (INST003)

Rev 16 – December 2022

21 December, 2022

387 Avenue Jean Kuntsmann, 38330 Montbonnot, France

Table of Contents

Introduction

Change history

Confidentiality Notice

This interface specification is confidential and is strictly reserved for communication with a Hospital Information System. An End User Agreement containing the text provided here must be agreed by the Customer (End User).

This interface specification is for the exclusive use of sites covered by an End User Agreement. Use of this interface specification implies full acceptance of the terms and conditions of the End User Agreement.

Document change history

This document is applicable to TDNexLabs, TD-Synergy Technidata products.

For TDHistoCyto product, a dedicated document is available, refer to INST087 - *Managing orders on TDHistoCyto (Electronic requesting feature)*

For earlier versions of the TD-Synergy history, refer to the previous release of this document.

Product Version	Document Revision, Date	Short description of the modifications	Internal code
TDNexLabs from V02.10	Revision 16 *July 2022*	Version availability of Site Device Property > Management of Workstation code in order messages When there is no Laboratory and no Location, then the **Site** defined in the *Order Reception* stream of the HL7 Reception device will be used to calculate the workstations.	RADOC 141487
TDNexLabs from V02.01	Revision 16 *June 2022*	In Transmission of HL7 Order messages to Host > Settings in the Deviceslist.ini file > Example of PON management and tables TESTS.ORDERPLACERNUMBER recovered from SP_TESTS.ORDERPLACERNUMBER table.	RADOC 127670
TDNexLabs from V02.01	Revision 16 *June 2022*	First names and Alternate first names are received, saved, and transmitted. Refer to notes in Segment Descriptions > PID-5	NIRIN2
TDNexLabs from V01.21 TD-Synergy from V12.21	Revision 15	Sub-section Updating VMD script to convert formatting commands moved under Chameleon Section instead of Technical Information Section. New sub-section Updating HL7OrderReception.VMD to change mapping of ORC-3 of ORL^O22 added under Chameleon Section.	RADOC 88665
TDNexLabs from V02.00	Revision 15	In Reception of HL7 Order messages from the Host system >Type of stream: *Sample reception:* addition of autoPSR comments to Note 6.	RADOC 138573 (DR 45224)

TDNexLabs from V02.00	Revision 15	The *Identifiant National de Santé* (INS) is now supported by this communication for ORM messages, in PID segment. This feature is limited to the French market	NIRINS
TDNexLabs from V02.10	Revision 14 *September 2021*	Revise the use of the device property **Automatic number for orders** and TDNT counters. In Reception of HL7 Order messages from the Host system >Type of stream: *Order reception:* addition of **Automatic number for orders** property In **ORM reception algorithm**, addition of reception algorihtm part 2.	RNSL
TDNexLabs from V01.52.B	Revision 14 *September 2021*	In Reception of HL7 Order messages from the Host system > Type of stream: *Order reception* Update of the property **Flag the collection date as being temporary**	RADOC 135076 (DR 43871)
TDNexLabs from V01.52.B	Revision 14 *September 2021*	In Segment descriptions for OML messages > SPM segment: Update of SPM-17 (Specimen Collection Date/Time) In Example of OML and ORL messages > Positive acknowledgement: Addition of the NOTE about the tube.	RADOC 135572 (DR 44087)
TDNexLabs from V01.52.B	Revision 14 *September 2021*	In Defining a device for the Reception of HL7 Order messages > Type of stream: *Sample reception,* the information about the **Laboratory** property is updated with the text: "Sample reception uses laboratory from ORC-21 of the received HL7 message."	RADOC 132360 (DR 43270)
TDNexLabs from V01.52.B	Revision 14 *December 2020*	More information about "keepalive" mechanism (Note B) has been provided for the property **Idle time before keepalive transmission (in minutes)** placed in the type of stream "All" of the following pages: "Transmission of HL7 Order messages to Host" and "Reception of HL7 Order messages from Host".	RADOC 129943
TDNexLabs from V01.52.B	Revision 14 *December 2020*	Additional information about communication behavior when transmitting a message that use the **National Code** but contains DEFLOC/DEFDOC without National code assigned. New information is found in segments PV1-3,7,8,9,17, ORC-12,13 and OBR-16.	RADOC 129408
TDNexLabs from V01.52.B	Revision 13	Addition of the **Site** device property in Reception of HL7 Order messages from the Host system > *Order reception* stream. Update of ORC-13 and ORC-21 segment description with Site information. Update of the Management of Workstation code in order messages topic.	RADOC 127102
TDNexLabs from V01.52	Revision 13	OBX-2 Value Type: updated information in ST value description: 'dilution (e.g. "> 300")' replaced by 'dilution (e.g. "/25")'.	RADOC 126078

TDNexLabs from V01.52	Revision 13	The **Risk of infection** indicator is now managed by the LIS application. This information can be retrieved from the received HL7 OML order messages, in the SPM-16 field (Specimen Risk Code) now supported.	HASAM
TDNexLabs from V01.51	Revision 13 *January 2020*	In Reception of HL7 Order messages from the Host system >Type of stream: *Sample reception* Addition of the device property **Allow sending of duplicate messages** Not used for this connection.	RADOC 122287
TDNexLabs from V01.52	Revision 13 *September 2019*	The *Patient Death Date and Time* and *Patient Death Indicator* are now supported by this communication in ORM messages, respectively in PID-29 and PID-30 fields.	HL7ADD
TDNexLabs from V01.51 also in V01.32	Revision 12 *July 2019*	An increased number of spy files can be saved on disk by configuring a new device property **Maximum number of old spy file** displayed in **Type of stream: All>General**.	ENTSK3
TDNexLabs from V01.21 TD-Synergy from V12.21	Revision 12 *July 2019*	Update of ORC-7.4, OBR-7 and SPM-17 segment descriptions for OML messages: added details on the collection date information.	RADOC 117791
TDNexLabs	Revision 12 *July 2019*	"Source laboratory" replaced by "Requesting laboratory" in ORC-21.	RADOC 114515 (DR 41134)
TDNexLabs from V01.51 also in V01.32	Revision 11 *March 2019*	With the reinforced security of Technidata's products, all file-transfer based communications currently using the ftp protocol can now use the sftp protocol. The SFTP low level protocol can now be used for internal ASTM connections and it is defined in the new **Service** property of the Connections dictionary (DCX).	SFTP
TDNexLabs from V01.41 also in V01.32	Revision 11 March 2019	Addition of the new device properties **Allow instruction length greater than 250 characters** and **Send collection and transport instructions** in the Order reception stream of the HL7 ORM reception device.	MACC
TDNexLabs from V01.41	Revision 11	In Reception of Order messages from Host > Type of stream: Sample reception: The **Host name of web service for sample reception** and **Web service port for sample reception** /**Sample reception Web service URL** device properties are no longer required and then no longer visible.	RADOC 103594
TDNexLabs	Revision 11	In segment description, the ORC-21 field is updated to manage the Requesting Laboratory.	RADOC 114515 (DR 41134)

TDNexLabs	Revision 11	Precision about OBX-2 result value (ST type) management received in ORM message.	RADOC 104429
TDNexLabs	Revision 11	Information about AutoCreate support for Doctors and Locations has been added in the Mapping section of the **Devices** dictionary (Order reception stream) and in the "Segment descriptions for OML messages" > OBR-16, ORC-12 and ORC-13.	RADOC 101314
TDNexLabs	Revision 11	In Reception of Order messages from Host > Type of stream: Patient information reception: Added complementary information for **Allow patient update** device property.	RADOC 99950
TDNexLabs from V01.31.B	Revision 11	Device definition > "Order reception" stream: mapping is used to map laboratory codes. The ORC-21 field is now supported to manage the source laboratory of the request.	DR 40872
TDNexLabs from V01.21.B	Revision 11	New topic under **Troubleshooting** section concerning Automatic TDCnxDevice restart on autorectube Oracle database errors.	RADOC 98635 (DR 40758)
TDNexLabs	Revision 11 March 2019	**Specimen collector** information in the mapping table: the firstname and lastname are saved in DICT_COLLECTORS.NAME. See Reception of HL7 Order messages from Host > Type of stream: Order reception.	RADOC 91068
TDNexLabs from V01.41 also in V01.22	Revision 10, March 2018	The Host order number (HON) sent in the messages (in the ORC-4 field) can now be managed on a maximum of 22 characters.	L2LH75
TDNexLabs from V01.31	Revision 10, March 2018	The **Web service port for sample reception** device property (in Sample transmission stream) has been changed to **Sample reception Web service URL**. The default values must be modified to correspond to the Sample reception Web service URL defined in the IIS manager.	SREGI
TDNexLabs from V01.21.B	Revision 10, March 2018	Update of the Collection date status of the request: Addition of a new device property **Flag the collection date as being temporary** in Reception of HL7 Order messages from Host > Type of stream: Order reception. The information set in the ORC-7.4 segment field has also been updated.	DR 39650
	Revision 10, March 2018	The following information has been added/updated: - "Tube type" mapping is supported - Update of SPM segment fields for OML - Added a new subsection under Technical Information: Editing Chameleon VMD file	RADOC 92756

	Revision 10, March 2018	Updated information in Reception of HL7 Order messages from Host > Type of stream: Order reception > **Automatic number for orders** device property.	RADOC 90342
TDNexLabs from V01.22	Revision 10, March 2018	The **Merge and modifications on existing patients only** device property is now visible in the Patient information reception stream of the HL7 ORM reception device, but this property is NOT USED by this communication.	FMTWE
TDNexLabs from V01.31 TDHisto/Cyto from V13.31	Revision 10, March 2018	The "Electronic requesting" feature used on the TDHisto/Cyto product allows the creation of a Histology/Cytology request from a request received by HL7 order reception message (ORM) directly from the HIS. A specific VMD file is delivered. The corresponding device property has been updated. The following topics have been updated: ORM reception algorithm, and Segment descriptions for ORM messages (OBR-7)	PCDH RADOC 84265
All	Revision 10,	The supported length for Telephone Numbers (contained in PID-13) is limited to 15 characters.	RADOC 88279
All	Revision 10,	Update of the HL7.vmd file name used for Pon Query: replaced by HL7OrderTransmission.vmd	RADOC 86406
All	Revision 10, April 2017	In the description of ORM messages, PV1 segment, a NOTE is added to clearly indicate the code length supported for Doctors and Locations.	RADOC 82738
TDNexLabs from V01.21 TD-Synergy from V12.21	Revision 10, April 2017	In Segment descriptions for ORM messages, the following fields have been updated with additional information about SC transmission fields: ORC-2, ORC-3, ORC-4 and ORC-7 OBR-2, OBR-3, OBR-7 and OBR-14	RADOC 81126
All	Revision 10, April 2017	PID-3 Patient identifier list field: the inbound script has been updated, the Outbound script is documented.	RADOC 79581
TDNexLabs from V01.21 TD-Synergy from V12.21	Revision 9, October 2016	This new revision supports HL7 OML^O21 messages which are received from an external system and which contain sample (SPM) information linked to the order. The Sample Number assigned by the Host system is limited to 14 characters. This document has been updated where applicable.	ESM3
All	Revision 9, October 2016	Updated by various minor modifications in **Segment descriptions** section.	RADOCs 61919, 69407, 61959, 71040

TDNexLabs from V01.21 TD-Synergy from V12.21, also in V11.83	Revision 9, October 2016	Management of the volume calculation in requests created/modified in OEN/OMN sessions or via communication. The configuration of the volume calculation is described in the topic Reception of HL7 Order messages from Host > Setting properties in the Configuration window section.	FRMM
TDNexLabs from V01.21 TD-Synergy from V12.21, also in V11.83	Revision 9, October 2016	The **TCP/IP socket transport** layer has been updated to improve robustness. In the **Devices** dictionary, the properties corresponding to the updated **Transport** section ("Type of stream = All") have been documented.	NSMTC
TDNexLabs from V01.21 TD-Synergy from V12.21, also in V11.83	Revision 9, October 2016	Addition of a new device property **Allow patient update** in the Patient information reception stream of the HL7 ORM reception device.	NUPI
	Revision 8, September 2015	**This document is applicable to TDNexLabs.**	NTTNL
TDNexLabs from V01.11	Revision 8, September 2015	In the **Devices** dictionary, when you define the properties related to VMD and SPY files, now you just have to enter the filename, without the path.	MSSN
TDNexLabs from V01.11 TD-Synergy from V12.01	Revision 8, March 2015	Updated Segment descriptions > MSH field 7 to monitor the delay between message creation and processing of messages.	HICLP
TDNexLabs from V01.11 TD-Synergy from V12.01	Revision 8, February 205	Addition of a new parameter in the HL7 Patient information reception stream.	GIEFFC
TD-Synergy from V12.01	Revision 8, May 2015	Updated the segment description for the ORC-9 field.	RADOC 56932
All	Revision 8	The HL7 separators described in Message Header segment MSH 1-2 have been updated.	RADOC 59495
From V11.91	Revision 8, February 205	The Reception of HL7 Order messages device is updated with the device parameter **Send positive ACK for collected specimen** in the Order reception stream.	RADOC 55349
From V11.82	Revision 8, January 2015	Modification of Order Transmission: SC and OC messages in Transmission of HL7 Order messages to the host system.	RADOC 52206
All	Revision 8, December 2014	Modification of Segment descriptions for Inbound / Outbound Order Messages - Patient visit information and ORC Common Order Segment	RADOC 51999

All	Revision 8, December 2014	Modification of NTE Notes and Comments in Segment descriptions for Inbound / outbound order messages	RADOC 51766
All	Revision 8, December 2014	Minor modifications of the management of additional doctor mnemonic in OBR-28. Updated the Segment description for the OBR-28 field. Modification of Order Reception flow.	RADOC 51283 RADOC 50876
All	Revision 8, November 2014	Corrected information in Transmission of HL7 Order Messages to Host	RADOC 50775
All	Revision 8, October 2014	Updated the Segment Description for the PID-3 field	RADOC 48544

Managing orders from Host systems

This installation guide describes how to install and configure the Technidata LIS to receive orders (ORM^O01 or OML^O21 messages) in HL7 format from a Host, and if required, transmit orders to a Host. The Technidata LIS can request a PON for laboratory-generated orders.

- For ORM messages the protocol version supported is HL7 2.3
- Reception of OML messages is managed by TDNexLabs from V01.21 and TD-Synergy from V12.21
  For OML messages the protocol version supported is HL7 2.5. OML^O21 messages contain sample information (Sample ID + Sample type) received in the SPM segment from the host.
- Transmission of HL7 2.5 OML message format supported by TDNexLabs from V01.21 from V01.71

The following features are supported:

- Management of Placer Order Number (PON)
- Management of order cancelation or duplicate order messages
  - Generation of a '**Order Canceled**' message to inform the HIS that a test initially ordered by the Host has been canceled.
  - Generation of a '**Status Change**' message to the Host when a sample is "collected" or "received at the laboratory" for tests that were initially requested via an HL7 ORM message from the Host. The management of sample Status Change messages (SC) requires the definition of rules in the **Expert rules** dictionary.
- Management of workstation code in ORM messages

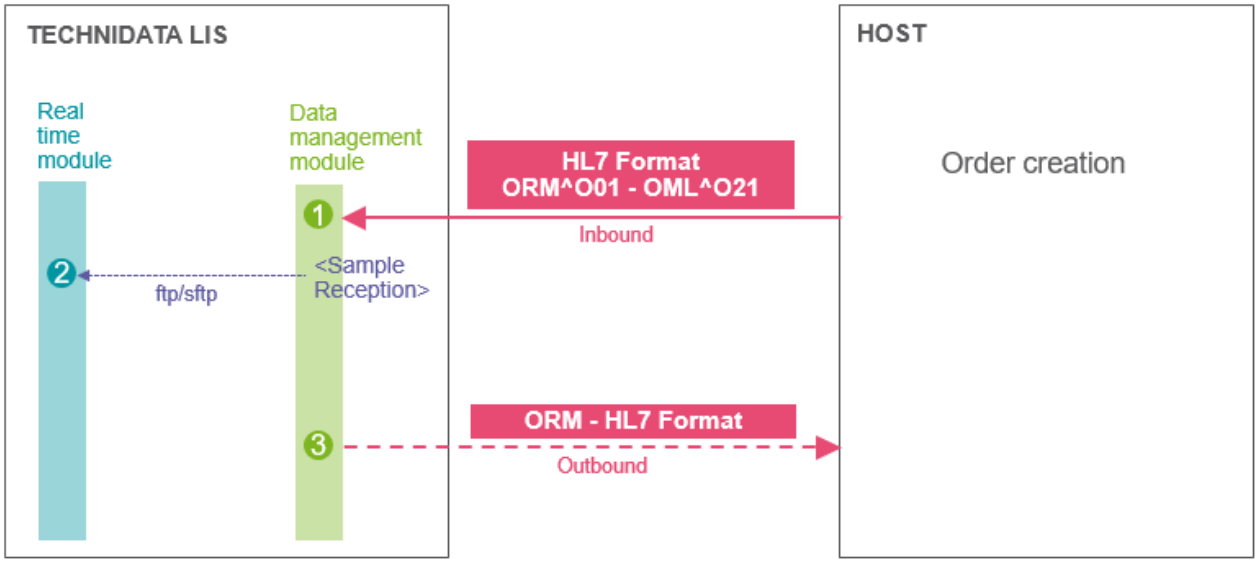
Communications described in this document

This document describes the following communications:

- (Required) Reception of Orders from a Host (inbound HL7 messages).
- (Required) PSR/Auto-PSR module used for Primary Sample Reception.
  or
  TD-Web Rectube (Tube Reception tool) can be used. See **NOTE 1** below.
- (Optional) Transmission of orders to a Host (outbound HL7 messages). Can be used to manage:
  - Order Cancelation or Duplicate order messages
  - Status Change messages (SC)
  - Placer Order Number query from the LIS to a HIS

  This communication must be defined if you set the **Process order cancelation or duplicate order message** property to **Yes** in the "HL7: Transmission of Orders" communication device and the **Accept assigned message number** property to **Yes** in the "HL7: Reception of Orders" communication device.

Communication Diagram



(1) The Host system transmits HL7 ORM^O01 or OML^O21 messages to the Technidata LIS. These messages are processed by the Communication Engine using Device 1. The order is created in the database (pre-analytical tables).

For details, see ORM reception algorithm and Access number managed by HIS.

(2) The PSR/Auto-PSR module is used to make the order available throughout the LIS database via ftp or sftp.

NOTE 1:
For TD-Synergy versions lower than V01.81, the TD-Web Tube Reception tool (Rectube) can be used. Rectube can be configured either in "manual" or "automatic" mode.
From version V11.81 of TD-Synergy, the use of Rectube/Auto-Rectube is no longer recommended. It is recommended to use the **Primary sample reception** (PSR) session for samples to be collected. Refer to the Technical guide for complete PSR details.
The version V12.21 of TD-Synergy already supports auto-PSR for OML^O21 orders only. Refer to *Sample reception stream* section in this documentation.

(3) *Optionally*, if this communication (Device 3) is defined and enabled, the Technidata LIS can transmit messages via HL7 protocol to the Host, in the following context:

- Management of Order Cancelation or Duplicate order messages
- Management of Placer Order Number query
- Management of Status Change messages

NOTE 2: When "Status Change" and "PON query" messages are generated, the tasks created for the Order transmission device (D2) will:
Transmit in the OBX segment, in addition to level 0 tests, all the PAR tests (complementary parameters), with or without results.
Transmit the hospitalization numbers back to the Host system in the same format in which they were received, provided the device property **Send original format of hospitalization number** is set to **Yes** in "Order transmission" and in "Placer order number query" data stream.

Installation

Prerequisites

- The communications must be set up on a computer connected to the network 24 hours/day, 7 days/week and on which the connection service is installed.
- The computer must comply with the recommendations specified in the *Description of System Components*, available on the TECHNIDATA website (www.technidata-web.com).
- For the TCP/IP connection:
  - The listening and outgoing communication ports must be known.
  - The administrative port used by the connection service (needed for internal purposes), is automatically set by the service but can be defined manually if needed. For more information, refer to Administrative port definition.
  - The type of TCP/IP lower layer protocol used (hybrid or minimal) must be defined. For more information, refer to Data block structure.
- Chameleon software:
  On all computers used for communications requiring Chameleon software, it is necessary to register the new version of Chameleon software with Interfaceware before you can use it. To do so, **you must call the TECHNIDATA Support team** in order to obtain a registration code. For more information, refer to Chameleon files (VMD files).
- The Task creation process requires additional components (Microsoft® Windows® Message Queuing) to be implemented.
  For more information about the implementation of the "task creation process", refer to the Technical Guide: INSTALLATION > Specific Procedures > Automatic tasks > Prerequisites for implementing automatic tasks.

From TDNexLabs V01.51 and also for V01.32:

With the reinforced security of Technidata's products, all file-transfer based communications that were using the **ftp** protocol can now use the **sftp** protocol. Technidata recommends the use of **sftp** instead of **ftp** for security reasons (the login and password used for such communications need to be crypted).

- (Recommended) An SFTP Windows server must be installed on the Windows server. Depending on the version of your Windows Server, refer to:
  - **TIB #202** - Settings for Windows Server 2016, Chapter "*Implement SFTP windows server*", or
  - **TIB #191** - Settings for Windows Server 2012 and Windows 8.1, Chapter "*Implement SFTP windows server*"

  For earlier Windows Server versions, the installation of an SFTP Windows server is possible, in this case refer to TIB 202, Chapter 7. Implement SFTP windows server.

  These documents are available on the website (www.technidata-web.com) > TECHNICAL SUPPORT > Technical bulletins.
- (Optional) Although SFTP server is highly recommended, an FTP server can be installed on the Windows server. For more details please refer to the document **TIB #150** - *Installation of FTP Server on Windows*. This document is available on the website (www.technidata-web.com) > TECHNICAL SUPPORT > Technical bulletins.

To start installation, go to Installation procedure

Installation procedure

This Installation Guide (INST003) explains how to receive/transmit orders from/to a Host system in HL7 format.

IMPORTANT: If you are updating your Technidata LIS, the new Chameleon files (VMD files) can be delivered and copied to your disk.
These new VMD files do not overwrite the old files, but are copied to a reference directory.
The old VMD files can contain modifications.

- Before the update, they are stored in the client installation directory:
  `C:\Technidata\TD-<Product>Client_InstanceName`
- At the installation time or during the latest update, they are stored in:
  `C:\Technidata\TD-<Product>Client_InstanceName\Reference`

After an update, it is therefore imperative that the Installation engineer copies the new VMD files from the Reference directory to the directory containing the old VMD files, but before doing this, the Installation engineer must copy the modifications manually, if any.

Install the communication by performing the following steps in the order listed:

1. Select features

   For TDNexLabs and from version V11.91.A of TD-Synergy, this step (selecting features) is no longer needed. The Chameleon software and all the files required to implement the communications are always automatically installed on the computer when you run the Client setup.

   However, if your software version is lower than V11.91.A, this step is necessary to install the communications. In this case, see Selecting features

2. Start the Connection Service

   Use the Windows Service Manager to start the **TDConnection** service.
   The connection service appears under the name **TDCnx_InstanceName**.
   Start this service before defining devices in the **Devices** dictionary.

3. Define the TDNT counters

   See Define the TDNT counters that will be used by this communication on the **TDNT Server Control Panel**.
   It is important to define the counters before you define the communication devices because you will be asked later to enter the counter number in the Devices dictionary. It is advisable to note this number as soon as it is created, not to forget it.

4. According to the Product/Version, install and configure the sample reception tool:

   - The **PSR** module (Primary Sample Reception) must be installed and configured (autoPSR mode needed). Refer to the Technical Guide in: Installation > Primary Sample Reception for an order > Implementation and settings > *Configuring the Primary Sample Reception (PSR) window* topic.

     NOTE 1: From TDNexLabs V01.31, as the **TDConfigurationManagement** service is no longer used, setting the DotNet properties is no longer required. It is replaced by SOA services managed by IIS. Refer to the Technical Guide > *Basics on service management* topic > *Services managed in the IIS window: application pool (SOA) services and Web Services (WS)* paragraph.

     NOTE 2: For TDNexLabs versions lower than V01.31 and for TD-Synergy from version V12.01 and V12.21: The .NET Framework V4.0 is required to install the PSR module and run this communication. Refer to the topic "Setting properties for .NET configuration files" in the Technical Guide.

5. Define settings in the Doctors/Locations dictionary (DCR session)

   See Settings in the Doctors/Locations dictionary (DCR sesssion)

   See also: Management of order messages with additional doctors.

6. Define a device to receive order messages (ORM^O01 and OML^O21) from the Host system

   See HL7 Reception of Order messages from the Host system.

7. *(optional)* Define a device to transmit a Placer Order Number query from a LIS to a Host

   See HL7 Transmission of Order messages to the Host system.

   See also:

   - Management of Placer Order Number (PON)
   - Management of order cancelation or duplicate order messages

8. Test the connection

   Use the Chameleon simulator to test the connection.

Selecting features

This topic only applies to TD-Synergy versions lower than V11.91.A. On higher versions, the Chameleon software and all the files required to implement the communications are always automatically installed on the computer when you run the client setup.

The Communication Engine must be installed with a Client instance.

For more details about this action, refer to the Technical Guide: Installation > Core System > Technical installation > Running the Client Setup on the Server PC.

To select the features at the same time as installing TD-Synergy

During installation of the Client instance, when the **Feature Selection** screen is displayed:

1. Select by left-clicking on the corresponding line:
   - **HL7: Order Reception** (required)
   - **HL7: Transmission of orders** (if needed)
2. Choose the option **This feature will be installed on local hard drive**.

To select the features at a later date

It is also possible to select these features at a later date, using the Windows **Programs and Features** utility. To do this:

1. From the Windows Control Panel, select **Programs and Features.**
2. Select **TD-<*Product*> Client_<*InstanceName*>.**
3. Click **Change.**
4. In the InstallShield Wizard, select **Modify.**
5. Select the features you need (listed above).
6. Follow the on-screen instructions to complete the installation.

Next step:

- Defining the TDNT counters

Defining the TDNT counters

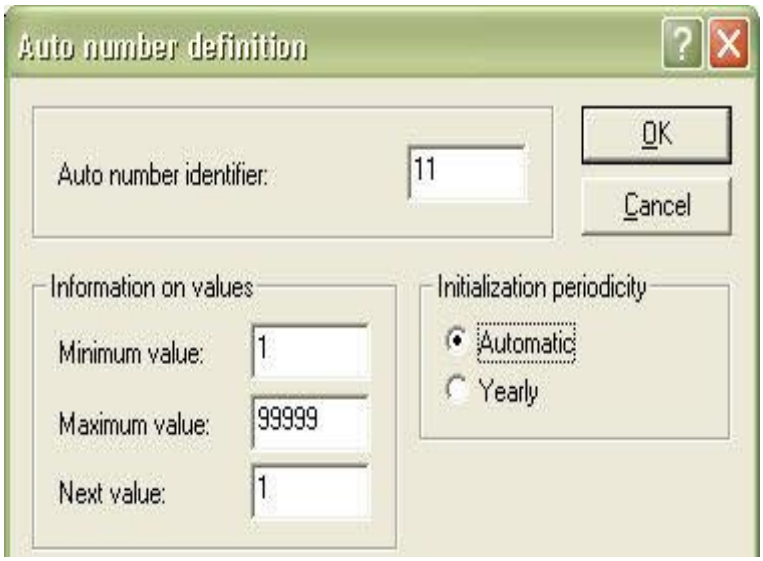
The TDNT counters that will be used by this communication must be defined beforehand in the **TDNT Server Control Panel**.

- One counter is needed for the following communication device: HL7 Reception of Order messages from Host
- One counter is needed for this communication device, if it is configured: HL7 Transmission of Order messages to Host

NOTE: It is important to define the counters before you define the communication devices because you will be asked, later in the installation process, to enter the created counter number in the **Device** dictionary > Data stream: All > **Message control ID** or **Internal counter** property.

To define the TDNT counters

1. From the **Control Panel**, open the **TDNT Server Control Panel** by selecting: **System Management** > **Advanced System Setup** > **TDNT Server Control Panel**.
2. In the **Tools** menu, select **Auto numbers**. The **Auto numbers** window opens. Click **Add** to create a new counter in the **Auto number definition** window. You can set the same values as in the example below.



The **Auto number identifier** field (or **Counter ID**) is filled automatically by the system with the next available Counter ID.

TIP: It is advisable to note this number as soon as it is created, so that you can select it later, when you will be asked for it, in the Device dictionary.

For more information about this feature, refer to the *User online help*, **System Management** > **TDNT Server Control Panel**.

Settings in the Doctors/Locations dictionary (DCR session)

This setting is applicable for TD-Synergy from V11.21 or for TDNexLabs

When receiving a patient admission message (ADT) or a request order message (ORM), in which the doctor or location code is not defined in the **Doctors**/**Locations** dictionary, the unknown doctor or location is automatically replaced by a default one to enable the creation of the patient and/or the request.

Before starting this communication, you must create a default doctor and default location in the **Doctors** and **Locations** dictionary (if they do not already exist), using **DCR** session:

- Type LOC, a location with the code **DEFLOC**
- Type DOC, a doctor with the code **DEFDOC**

These codes are not customizable. Their related **Name** field must not be empty. It is advised to enter an intuitive name (for example, Unknown doctor).

> **IMPORTANT**: If the Default doctor or Default location does not exist in the dictionary when starting the communication, a message is inserted in the spy file of the device and the **device is set to the error status**.
> When an unknown doctor or location is received and replaced by the default corresponding code, a message is inserted in the spy file of the device concerned, to warn the user.

This applies to all doctors (or locations) managed by the communication: Reference, Attending, Admitting and Ordering doctors (or Locations) as well as to additional doctors who receive a copy of result reports.

It also applies to the reception of an unknown national code for the doctor (or location), if this feature is enabled in the **Device** dictionary (**Use National Code for doctor/Location identification** property=Yes).

See also: Management of order messages with additional doctors.

Next step:

- HL7 Reception of Order messages from Host

Reception of HL7 Order messages from the Host system

This section explains how to:

- Set the properties in the **Configuration** window
- Create a new device to receive order messages (ORM^O01/OML^O21) containing the Placer Order Number (PON) from the Host system by means of the HL7 protocol
- Set the properties on the device you have just created

Setting properties in the Configuration window

1. In the **Configuration** window (USE session) > **General** section:
   You must verify some properties before starting the implementation. Make sure that the lengths of the following fields are the same as defined in the **Properties** zone (**GST** block).

   These properties are:

   - Patient number length
   - Alternate patient number length
   - Hospitalization number length
   - Reduced access number length
   - Database name (see **NOTE**)

   NOTE: The database name is the logical name of the database. It is used both by the Web module and this communication protocol. It must be the same for both. Refer to the Web module properties to verify it (**Administration** tool > **File** menu > **Databases** > **Name** field).

2. In the **Configuration** window (USE session) > **Sample management** section:

   Check the property **Volume calculation applied to all locations** to enable the volume calculation either per location or for all the locations when orders are created/modified in OEN/OMN sessions or created/modified by communication.

   - If it is set to **1**, the volume calculation is performed for all the locations (default value).
   - If it is set to **0**, the volume calculation depends on the property set in the **Locations** dictionary.
     - If the property **Volume calculation** is set to **Yes** in the **Locations** dictionary, the volume calculation (Filling rate) is enabled and applies to the location of the request.
     - If the property **Volume calculation** is set to **No** in the **Locations** dictionary, the volume calculation (Filling rate) is disabled.

   Note that the calculation volume (filling rate) is performed, if a location exists in the SP_REQUESTS table.

Settings required to create temporary patients

See Management of temporary patients.

Creating a new device in the Devices dictionary

Create a new device (for example, IN_ORMHL7). To do this:

- In the **Control Panel**, select **System Management** > **System Setup (Dictionaries) > General dictionaries**

- Double-click on **Devices** in the left pane
- In the menu bar, click the **+** button
- Complete the values of the fields which define the device. The following definition of the communication device in the **Devices** dictionary is given as an example:

TIP: Specific and mandatory properties used by the communication device are indicated in **bold**.

Add / Update		
Name	Value	Comment
Code	IN_ORMHL7	This is an example for inbound HL7 order messages (ORM). 10 characters max
Device type	Connection	Must be set to **Connection**
Service	TDCnx_InstanceName_Computername	Name of the computer where the service is installed
Name	HL7 ORM inbound	Enter an intuitive text
Abbreviated text	HL7 ORM inbound	Enter an intuitive short text
Full text	HL7 ORM inbound from HIS	-
Protocol	HL7 Low Layer Protocol	You must select **HL7 Low Layer Protocol**
Format	HL7 Format Patients/Orders/Results	You must select **HL7 Format Patients/Orders/Results**
Transport	TCP/IP socket transport 2	For TDNexLabs from V01.21, TD-Synergy from V12.21, and for TD-Synergy V11.83, You must select **TCP/IP socket transport 2**
Application	Patients/Orders/Results processing	You must select **Patients/Orders/Results processing**
Properties	More	-

The Protocol, Transport, Format and Application properties give the user-friendly names of the various DLLs used for the communication. These DLLs are automatically installed by the software setup program. If the filename of the DLL is displayed instead of the user-friendly name, stop installation and go to Naming of DLLs to resolve the problem.

NOTE A: Note that for existing devices, it is recommended to re-check the properties of the device when changing any of the Protocol, Format, Transport, or Application properties. Changing any of these will reset the related device properties to their default values and they might be different.

Before setting the properties, you must click the **OK** button so that the **Properties** displayed will correspond to the device you have just created. This will close the current window.

Setting the Properties of the device

The **Properties** item is used to define the properties specific to a type of stream. The data streams used by this device are:

- **All** (displayed by default).
- **Order reception**. This data steam is dependent on the type of communication.
- **Sample reception**. This data stream is dependent on the type of communication.
- **Patient information reception**. This data stream must be completed if you use the "creation of temporary patients" feature.

To start setting the properties, in the **Devices** dictionary double-click the device you have just created. Set the properties as indicated in the following examples:

> **Possible differences between documentation and user screen**
> The properties defined in the **Devices** dictionary are regularly updated, in line with new software and documentation enhancements. Consequently, for some properties, the text displayed on your screen may differ from the text indicated in the documentation. You could also find new properties described in the documentation that are not present on your screen. To help you find your way, these properties are clearly identified in the documentation with the corresponding version when they were introduced. New properties are also announced in the *Change history* table.

Type of stream: All

Device properties IN_ORMHL7		
Name	Value	Comment
General		
Interval before task purging (days)	5	If this property is not defined here, the same property defined in the laboratory Configuration window is applied
Logical acknowledgement management	Yes	-
Maximum number of old spy files	10	Available for TDNexLabs from V01.51 also in V01.32 Maximum number of old spy files that can be generated. If maximum number is reached and another old spy file needs to be created, the oldest old spy file will be deleted. Default value = 10 Minimum value = 1 Maximum value = 100 Spy files have the following format: <spy name>_<date>_<time>.old
Maximum size of spy file (KB)	10000	To be customized on site.
Message control ID	12	Select the TDNTServer counter number, used to generate the message ID in the MSH-10 field. This counter must have been previously defined in the **TDNTServer Control Panel** window.
Number of insertion retries in the database	5	From 3 to 10
Path of spy file	<DeviceName>.spy	Enter the filename, without path. For example, `in_ormhl7.spy`. The location directory is applied as follows: 1. Location directory defined for SPY files in the **SPY** property (accessible from the **Properties and Users** (USE) > Properties > All computers level > **General** section).

		2. If the **SPY** property is empty, default location directory for SPY files. For more information, see the property description in the Technical guide. For TD-Synergy versions, enter the absolute path and filename (e.g. C:\technidata\TD-*Product* Client_<*InstanceName*>\`in_ormhl7.spy` It advisable to give an intuitive file name (for example the name of the device) and .spy for the extension.
Spy traces enabled	Yes	Once the installation is finished and you have checked it is running correctly, set it to **No**.
Trace level of spy file	Regular	Three trace levels are available (maximum, regular, minimum)
Use national code for doctor identification	No	Change to **Yes** if you want to use the national code instead of the mnemonic code as the external identification.
Use national code for location identification	No	Change to **Yes** if you want to use the national code instead of the mnemonic code as the external identification.
Web service port		Specify a valid port to start the Web service. See **Note 1** and **2**. Only applicable when the Web module is connected to GP software and is used only for Patient update/create.
Format		
HL7 version	2.4	-
Message recipient code	TDR	-
Message sender code	HOST	-
Unicode messaging	No	Do not modify
Transport Properties available for TDNexLabs from V01.21, and TD-Synergy from V12.21, also in V11.83		
Checksum type	Checksum for HL7 Low Layer Protocol	Must be set to this value.
End of block character	1C	Do not modify
Idle time before keepalive transmission (in minutes)		Blank means disabled. A value greater than 0 is interpreted as the amount of time of inactivity before the socket starts sending keepalive packets. Note that the Windows default setting for this property is 2 hours. See **Note B**
Keepalive interval (in seconds)	1	Determines the interval between two TCP keepalive retransmissions until a response is received.
Listening address		This property is used only when **Transmission mode** is set to Mono client

		server transmission mode. This property contains the value of the IP address of the network interface where this transport layer listens to incoming connections. This is useful if the computer has multiple network interfaces. For example, one for wireless and another one for wired. When the value for this property is empty, the socket server will listen to all available interfaces. For versions earlier than TDNexLabs V01.21 and TD-Synergy V12.21 (not in V11.83): This property is named **Sender network address** and contains the IP address or logical name of the sender.
Listening port	9107	Input port. This is an example. Make sure that the port you enter is not already used by another application.
Message timeout	30	Period of time (in seconds) during which data is expected on the socket. After this time, the server considers the link broken.
Outgoing port		Output port. Make sure that the port you enter is not already used by another application.
Protocol version	23	For ORM^O01 the protocol version supported is HL7 2.3 For OML^O21 the protocol version supported is HL7 2.5
Recipient network address	localhost	IP address or logical name of the receiver.
Start of block character	0B	**Do not modify**. Corresponds to the first character of the socket (**<0B>** in the definition of the socket frame).
TCP/IP Lower Layer Protocol	Minimal	Refer to Data block structure.
Transmission mode	Mono client server transmission mode	**Do not modify**. Defines the mode used by the socket connection.
File location		
Folder for processed input files	C:\technidata\<*TD-Product*> Client_<*InstanceName*>\Processed	Directory where the processed files are to be moved. If not completed, the files are deleted after successful processing.
VMD file path	hl7.vmd	Enter the filename without path. For example, `hl7.vmd`. The location directory is applied as follows: 1. Location directory defined for VMD files in the **VMD** property (accessible from the **Properties and Users** (USE) > Properties > All computers level > **General** section). 2. If the **VMD** property is empty, default location directory for VMD files. For more information, see the property

		description in the Technical guide. For TD-Synergy versions, enter the absolute path and filename of the Chameleon file (e.g. C:\technidata\TD-*Product* Client_<*InstanceName*>\hl7.vmd See Chameleon files (VMDs)

NOTE B: More details about "keep alive" mechanism:
A TCP / IP server can close the connection after a period of inactivity. This may cause the connection to malfunction afterwards. By default, in Windows Server, this disconnection time is set to 2 hours, but it can be changed via the registry key `HKLM\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters` (see https://docs.microsoft.com/en-us/previous-versions/windows/it-pro/windows-2000-server/cc957549(v=technet.10)?redirectedfrom=MSDN).
To avoid a disconnection, it is possible to send "keep alive" messages to indicate that the connection must remain active. The **Idle time before keep alive transmission (in minutes)** property is used to indicate how often a "keep alive" message should be sent. This frequency must be less than the disconnection time. For example, if the disconnection occurs after 2 hours, a frequency of 60 minutes to send a “keep alive” message is sufficient.

NOTE 1 : When selecting a port (either listening, outgoing or Web service), make sure that the port is not already used by another application.
NOTE 2: By default there is no port assigned to the Web service, which causes the web service not to be started. If the Web service fails to start due to invalid port, the event log will be updated.

Type of stream: Order reception

Device properties IN_ORMHL7		
Name	Value	Comment
General		
Enable data stream	**Yes**	Do not modify
Accept assigned message number (NA)	**Yes**	This property must be set to **Yes** to receive the Placer Order Number (PON). NA=Number assigned
Acknowledgement mode for unknown tests	Negative Acknowledgement	Possible values: Positive Acknowledgement or Negative Acknowledgement (default setting). See **NOTE 1**
Allow instruction length greater than 250 characters		For TDNexLabs from V01.32 or V01.41 Used to enable (answer **Yes**) or disable (answer **No**) the transmission of a text greater than 250 characters for collection and transport instructions in the OBX segment.

		Default value is **No** = Text is limited to 250 characters (defined in HL7 standard) **Yes** = More than 250 characters can be sent for collection and transport instructions. See **NOTE 6**..
Automatic activation for immediate orders	**No**	See **NOTE 2**
Automatic activation for routine orders	**No**	See **NOTE 2**
Automatic activation for urgent orders	**No**	See **NOTE 2**
Automatic number for orders	1	Select the TDNTServer counter number, used to generate the Access number. This counter must have been previously defined in the TDNTServer Control Panel window. If you want to generate contiguous numbers, make sure that this number is not used by another connection. For TDNexLabs versions V02.10 and higher When the received HL7 message has no access number, the existing **Automatic number for orders** device property is used to determine how the access number is generated: - when the device property has counter value, TDCOM generates the access number based on TDNT counter value (previous behavior, per category with all categories linked to the same counter) - when device property is empty, TDCOM calls a centralized service to generate the access number (new behavior: per category and for a given scope, such as the whole configuration, a specific site or list of sites, a specific laboratory or list of laboratories).
Delete requested test if contained in another requested test		Used to enable (answer **Yes**) or disable (answer **No**) the deletion of duplicate tests (redundant tests) when they are included in another test which is also requested. See **NOTE 3**.
Exam grouping	Yes	Select **Yes** to enable grouping of several tests into a single order. See **NOTE 4**.
Exam grouping timeframe (minutes)	30	See **NOTE 4**.
Flag the collection date as being temporary	No	Updates the Collection date status of the request (SP_REQUESTS.COLLDATESTATUS).

		Select **Yes** to set the Collection date status as temporary in SP_REQUESTS and SP_TUBES. **No** = nothing is set (default value). Temporary Collection date status is updated in SP_TUBES with the user generated date and time once Collection date is received from SPM-17.
Order update allowed for already received samples	No	NOT USED by TDNexLabs and TDHisto/Cyto products. **No** is the default value. Do not modify.
Output devices	OUT_ORMHL7	This is an example. Click [**...**] to select the Device and the data flow it is used for. 1- Specify an output device corresponding to the communication **Transmission of Orders**. 2- Select the flow **Order sending** in the field **used for** of the output device selection window (drop-down list). Orders transmitted are always in ORM^O01 format. Transmission of orders in OML format is not currently supported.
Process order cancelation or duplicate order message	Yes	Used to enable (answer **Yes**) or disable (answer **No**) the processing of order cancelation or duplicate order messages. When this property is enabled, a message is sent to the Host to notify the deletion. See **NOTE 3**
Processing type	Test orders	Do not modify.
Sample reception DLL file path		See **NOTE 2**
Send collection and transport instructions		TDNexLabs from V01.32 or V01.41 Used to enable (answer **Yes**) or disable (answer **No**) the transmission of collection and transport instructions in an OBX segment associated with the SPM segment. See **NOTE 6**.
Send positive ACK for collected specimen	Yes	From V11.91 Select **Yes** to send positive acknowledgement for orders with already collected specimen. Select **No** to send negative acknowledgement for orders with already collected specimen.
Site		TDNexLabs from V01.52.B Mandatory device property. Code of the default Site used to calculate the

		workstation code during order reception. For more details see Management of Workstation code in order messages.
Time allowed for test addition (minutes)	0	Indicate the period of time (in minutes) during which an order can be modified (addition of test) following the order entry. 0 = no modifications allowed (default value). Maximum time = 50000 minutes. ***for OML messages only addition of test with new sample is allowed. See Modification of OML orders in Order Reception flow with PSR See Modification of ORM orders in Order Reception flow
Time allowed for test deletion (minutes)	0	Indicate the period of time (in minutes) during which an order can be modified (deletion of test) following the order entry. 0 = no modifications allowed (default value). Maximum time = 50000 minutes. ***for OML messages only deletion of test with uncollected sample is allowed. See Modification of OML orders in Order Reception flow with PSR See Modification of ORM orders in Order Reception flow
Update local database	Yes	The default value is **No**. You must change this to **Yes** so that the LIS database is updated.
Use ref. Hospitalization # (if no Hosp. number)	Yes	Available for TDNexLabs from V01.51 If an Hospitalization number from PV1 exists, it will be linked to the request in ERM session. This setting is applicable only if no Hospitalization number from PV1 was set as link to the request in ERM session. Select **Yes**, so that when a received order has no hospitalization number (no PV1 or PV1 without number) but the patient has a reference hospitalization number, then the reference hospitalization number will be linked to the request in ERM session. Select **No** so that when a received order has no hospitalization number; the reference hospitalization number will not be linked to the request in ERM session. The default value is **No**.

Format		
Collection source parameter code	COLSO	Code of the complementary parameter used with results received in OBR-15.1 To be defined if needed by the HIS. See **NOTE 5**
Topography parameter code		Code of the complementary parameter used with results received in OBR-15.4 To be defined if needed by the HIS. See **NOTE 5**
File location		
VMD file path	hl7OrderReception.vmd	Name of the directory where the `hl7OrderReception.vmd` Chameleon file is stored. Note that when an upgrade is performed, new VMDs are located in the Reference folder. The Installation engineer **must** check the new fields managed in the new VMDs against the VMDs from the previous version. For TDHistoCyto from V13.31 Enter `HL7OrderReceptionHC.vmd` as filename.

NOTE 1:
Positive Acknowledgement
The test order message is partially integrated in the LIS database and a positive logical acknowledgement is sent to the Host. The task is set to *completed* status and the request is created but a warning message is generated in the spy file and event viewer.
Negative acknowledgement
- The test order message is partially integrated in the LIS database and a negative logical acknowledgement is sent to the Host.
- In the negative logical acknowledgement sent, the MSA-1 field Acknowledgement code is set to AR (application acknowledgement Reject) and the ERR-1 field, subfield 4, "Error code" and "ERR-1" fields are set to the error code 207.
- 207: Application internal error: *A catchall for internal errors not explicitly covered by other codes*.
The error message in case of NAK is no longer located in MSA-3 but in ERR-1.

NOTE 2:
- These properties are used for triggering auto-rectube for ORM^O01
- Auto-rectube is not recommended to be used from version V11.81 and higher
- These properties are not applicable to OML^O21
- Auto-PSR is used instead of Rectube ONLY for OML^O21 (starting from V12.21)

NOTE 3: Some laboratories prefer not to cancel duplicate tests when a single test, requested separately (for example, Total protein) is also requested in a combined test (for example,

Electrophoresis). It is possible to disable the deletion of duplicate tests when they are included in a combined test that has also been requested.
When the **Process order cancelation or duplicate order message** property is set to **No** and the **Delete requested test if contained in another requested test** property is set to **Yes**, duplicate tests are deleted but the Host is not notified that the test has been deleted. See Management of order cancelation or duplicate order messages for more information.

NOTE 4: An algorithm is used to group together several tests into the same order. This grouping algorithm respects the following rules:
- Same patient and same hospital stay for the test order.
- The location of the new test must be the same as for the other tests.
- The reference collection date/time corresponds to the scheduled collection date/time of the first received test (with +/- 'n' minutes) definable in the **Exam grouping timeframe** property.
- No tube reception procedure has been carried out on the tube associated with the test to be added.
- If the properties **Time allowed for test addition/deletion** are populated and enabled at the same time as **Exam grouping** property:
  > The time set for **Time allowed for test addition/deletion** will be used to verify if the test addition/deletion is allowed.
  > If the tube reception procedure has been carried out for one of the tubes of the order, addition of test will be allowed only on tubes not yet collected.

NOTE 5: Both data elements will be stored as coded text type results and are associated with two complementary parameters. These complementary parameters are used to store the corresponding information.

Example:
```
OBR||||31152|||||||A||||52^^^KNEE|Dr1||||||||||||^^^^^R
```
Collection source parameter code = PARA3
Topography parameter code= TOPO
Will be equivalent to:
```
OBR||||31152|||||||A|||||Dr1||||||||||||^^^^^R
OBX||CE|PARA3||52
OBX||CE|TOPO||KNEE
```

NOTE 6: When the **Send collection and transport instructions** property is set to **Yes**, collection and transport instructions are added to the HL7 message, in an OBX segment associated with the SPM segment. By default, collection and transport instructions are not added.
There is one SPM segment per sample (one per tube). The collection and transport instructions (full text) of each test associated with the sample are created as OBX segments attached to the related SPM segment. One OBX segment per instruction is created. Instructions are read from the **Collection instructions** and **Transport instructions**.
The tube full text is sent in the SPM-7 segment (as usual).
Collection and transport instructions must have been previously entered in the **Collection instructions** and **Transport instructions** dictionaries. They must be assigned to tests in the **Single tests** and **Combined tests** dictionaries.

Example:
```
ORC|OK|6438|6102198001|AXID001|||^^^20161021000925|||||TD^Dr
TEST^Technidata|UFTEST
OBR||6438|6438|TRANS^TRANSAMINASES||20161021000925||||||||||||||||||||^^^2016
1021000925^^R
```

```
SPM||00298001||002^PlamaHEP^L|||VERT|||||||||20161021000925|||||||||1|002^BIO
CHIMIE^L^^""^99ALT|1
OBX|1|TX|COLL|1|Invert tubes to ensure proper mixing
OBX|2|TX|TRAN|1|No freezing for transport|
```

OBX-3 = "COLL" or "TRAN" (hard-coded segment type value and not the instruction code)
When the instruction full text is empty, OBX-5 is populated with the instruction code
In case of deletion (ORC-1 = CA), the instruction OBX segment is not generated.

Name	Value	Comment
Mapping	-	From V11.31, see (1)
Coded texts	None	Code of the coding system used to map coded text codes. Create/select the code of a coding system. **(1)**
Doctors	Doctors	Code of the coding system used to map doctor codes. Create/select the code of a coding system. **(1)** Mapping is ignored if **Use National Code for doctor identification** property is enabled. Note that the creation of doctor is supported for order message of OML type when "AutoCreate" mode is enabled in the mapping. The doctor code is limited to 6 characters.
Laboratories	None	Code of the coding system used to map laboratory codes. Create/select the code of a coding system **(1)** AutoCreate is not supported.
Locations	None	Code of the coding system used to map location codes. Create/select the code of a coding system. **(1)** Mapping is ignored if the **Use National Code for location identification** property is enabled. Note that the creation of location is supported for order message of OML type when "AutoCreate" mode is enabled in the mapping. The location code is limited to 6 characters.
Patient identifiers	None	Code of the coding system used to map multiple patient identifiers. Create/select the code of a coding system. **(2)**
Sample type	None	Code of the coding system used to map sample types from host. AutoCreate is not supported for this map (cannot link sample to test and tube).
Specimen Collector	None	Code of the coding system used to map Phlebotomists from host When received, Phlebotomist is not registered yet and AutoCreate is set in mapping parameter, Phlebotomist is created in DICT_COLLECTORS table. When AutoCreate is enabled, OBR-10.1 value is saved in DICT_COLLECTORS.COLLCODE, OBR-10.2 and OBR-10.3 values are concatenated and saved in DICT_COLLECTORS.NAME.

		For each request with sample, value of received Phlebotomist is saved in SP_TUBES.COLLECTOR.
Tests	None	Code of the coding system used to map test codes. Create/select the code of a coding system. **(1)**
Titles	None	Code of the coding system used to map title codes. Create/select the code of a coding system. **(1)**
Tube type		Code of the coding system used to map the tube type. Supported in outbound mode only (e.g.: ORL transmission)

(1) Mapping is used to associate code values (local codes and alternate codes) on the Technidata LIS database with Host systems. You can find the description of *Mapping alternate codes* in the *Technical Guide* (in the *Installation* book).

(2) TD-Synergy has no inbound mapping for tube type for OML^O21 (SPM-27)
(For sites that use OML^O33 please refer to the documentation described in INST059.chm - *Transmission of collection information to a Care plan*).

Type of stream: Sample reception

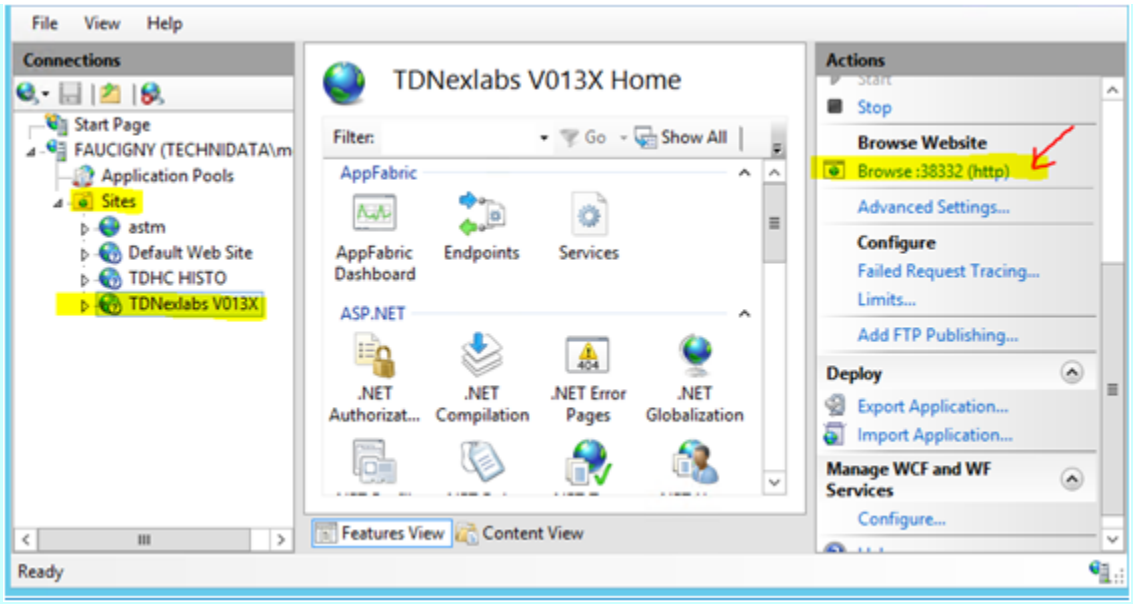
Available for TDNexLabs from V01.21 and for TD-Synergy from V12.21

Device properties IN_ORMHL7		
Name	Value	Comment
General		
Enable data stream	**Yes**	Must be set to **Yes**
Allow sending of duplicate messages	**No**	Not used by this communication.
Host name of web service for sample reception	**localhost**	From TDNexLabs V01.41: This property is no longer used and then no longer visible. For lower versions: Host name or IP address of the server where the auto Primary Sample Reception web service is running. **localhost** is the default value. See **NOTE 6**
Laboratory	Lab1	You must select a laboratory. The definition of a laboratory is required for the auto PSR process. Sample reception uses the laboratory retrieved from ORC-21 of the received HL7 message. If no value is received from the Host, the laboratory defined in device parameter is used.

		If no laboratory is defined (the field is left empty), the task is interrupted. As many sample reception devices as laboratories concerned must be defined.
Output devices	**None**	Auto-PSR has its own device that forwards requests to the real time module. (see Technical Guide for details)
For TDNexLabs from V01.31 Sample reception Web service URL OR For lower versions: Web service port for sample reception		From TDNexLabs V01.41: This property is no longer used and then no longer visible. For TDNexLabs lower than V01.31and for TD-Synergy from V12.01 and V12.21 Port number used for the auto Primary Sample Reception web service. See **NOTE 6**

NOTE 6: Sample Reception tool
For TDNexLabs from V01.51 and higher:
Tube status is set to collected when received HL7 2.5 message has collection date in SPM-17.
When sample reception stream is enabled and valid laboratory code is set, automatic sample reception (autoPSR) is performed by order connection device for tube associated with the request.
- AutoPSR is called only for tubes with tube status not received at lab yet.
- In case of order modification, autoPSR is not called when tube status is received at lab already.

For TDNexLabs from V01.41: the two device properties "**Host name of web service for sample reception"** and "**Web service port for sample reception** " are no longer needed. They are no longer displayed.
For TDNexLabs from V01.31
The **Web service port for sample reception** device property is renamed into **Sample reception Web service URL**.
In this field you must enter the following URL:
http://serverName:MyHttpPort/TDNexLabsInstanceName/SampleSpecimenManagement/AutoPrimarySampleReceptionService.svc
where:
`serverName` = Server where the service is started.
`MyHttpPort` = http port number of the instance defined during the setup. See Getting HTTP and Net.tcp port numbers in IIS to retrieve the port number.
`TDNexLabsInstanceName` = Instance name (always in this format) without spaces. It is not case sensitive.
Refer to the Technical Guide > *Basics on service management* topic > *Services managed in the IIS window: application pool (SOA) services and Web Services (WS)* paragraph.
The default values must be modified to correspond to the **http port defined in the IIS manager**.
Launch the IIS manager, select your InstanceName, then look at the browse (http port), as illustrated in our example below.
The http port number is different for each instance. In our example the number is **38332**.



For TDNexLabs lower than or equal to V01.21
For sample reception, the auto Primary Sample Reception functionality is used by this communication instead of auto rectube (TD-Web Tube Reception tool).
The default value for the sample reception host name is blank. If the web service is running on the same machine, the host name can be **localhost**. The default value for the sample reception port is **9090**. The default values can be modified but must correspond to those defined in the configuration file `BaseServiceEndPointAddress.properties`, stored in the `DotNet\ConfigService` folder on the server. The value is displayed in the following line:
`BaseServiceEndPointAddressHttp=http://localhost:9090`
Refer to the Technical guide > *Setting properties for DotNet configuration files* topic.

Comparison between OML and ORM

- ORM^O01 and OML^O21 share the same order reception device. If the site wants to have different device settings for ORM and OML, separate order reception devices must be created.
- OML^O21 with no sample information behaves in the same manner as ORM^O01.
- Important differences between ORM and OML:
  - ORM supports HTC (order modification after auto-rectube).
  - OML supports order modification after sample reception (PSR) only if the tube linked to the test is not yet received. Order modification is allowed only if the addition of a new test uses a new sample and for the deletion of a test where the associated sample has not yet been collected.

NOTE:
- In reception streams, multiple alternate codes can be mapped to the same LIS mnemonic code for each mapping.
- In transmission streams, multiple LIS mnemonic codes can be mapped to the same alternate code for each mapping.
See example below to get a better understanding.
When defining the device, a message asks whether or not you want to confirm the code duplication, which will result in:
- For reception streams, the related task is set to "error" when multiple LIS codes are mapped to the same alternate code.
- For transmission streams, the related task is set to "error" when multiple alternate codes are mapped to the same LIS code.

EXAMPLE: For reception streams

This mapping is correct This mapping is not correct

LIS 1 --> ALT 1
ALT 2

For transmission streams:

This mapping is correct This mapping is not correct

LIS 1 --> ALT 1 LIS 1 --> ALT 1

LIS 2 ALT 2

Type of stream: Patient information reception

This data steam must be completed if you use the "creation of temporary patients" feature.

Device properties IN_ORMHL7		
Name	Value	Comment
General		
Enable data stream	Yes or No	The default value is **No**. Set it to **Yes** if you use the "creation of temporary patients" feature.
Allow patient update	Yes or No	Available for TDNexLabs from V01.21 and for TD-Synergy from V12.21 **Yes** (default value): when the patient already exists, the patient is updated, provided that the **Update local database** property is also set to Yes and the ORC-7.4 Collection Date and Time field in the received HL7 message is later than the request Collection date stored in the database. **No**: when the patient already exists, the patient is NOT updated. See **NOTE 5**
Hospitalization creation and update	No	-
Management of billing information	No	-
Merge and modifications on existing patients only	No (default value)	Available for TDNexLabs from V01.22 NOT USED by this communication.
Output devices	None	-
Patient merge	No	-
Prefix of alternate patient number on the Host		-

Prefix of hospitalization number on the Host		-
Prefix of patient number on the host		-
Scoring properties to compare the source and the target patients		-
Threshold for patient merge	0	-
Update local database	Yes	The default value is **No**. Change this to **Yes** if you want the LIS database to be updated with the patient demographic data.
Format		
Patient differences	4 differences	This is the default value. To be customized on site, if needed. See **NOTE 6**
Update Patient reference (Doc/Loc)	No	-

NOTE 5: This property is available for TDNexLabs from V01.21 and for TD-Synergy from V12.21.
Note that when the patient does not exist in the LIS database, the patient is created, whatever the value set in this property.
For v11.83.S10, this device property is "hidden" and must be set manually in the database. A parameter "TDI_Allow_patient_update" is added to the PARAM_VALUES table with a default value of 1 (Yes). To modify the behavior, the PARAMVALUE must be updated to have a value of 0 for NO or 1 for YES.

NOTE 6: If the patient data must be set in the Technidata LIS database, checks are performed on the patient's demographic fields before the LIS database can be updated with the new received data.
This checking consists in comparing the differences in demographic information against the maximum number of differences that are authorized to update the database (**Patient differences**). Five fields are checked on reception of a patient demography message: Patient's last name, Patient's first name, Patient's maiden name, Patient's date of birth and Patient sex. The contents of these fields are compared with the contents of the same fields in the database. The number of authorized differences between the data on the LIS database and the data in the HL7 ADT message is set in **Patient differences**.
The patient record in the database is updated with the data of the HL7 ADT message only if the number of differences is less than or equal to the maximum number of authorized differences. If the number of fields modified exceeds the authorized number of changes, the HL7 ADT message is not processed (the creation of the request is rejected).

Restarting the Connection service

The service associated with the device must be restarted after each modification of the **Device** dictionary.

Next step: HL7 Transmission of Order messages to Host

Access number managed by HIS

Prerequisites

- Device that accepts ORM and OML HL7 (refer to INST003, Reception of HL7 Order messages from the Host system)
- Rectube
- Sample message

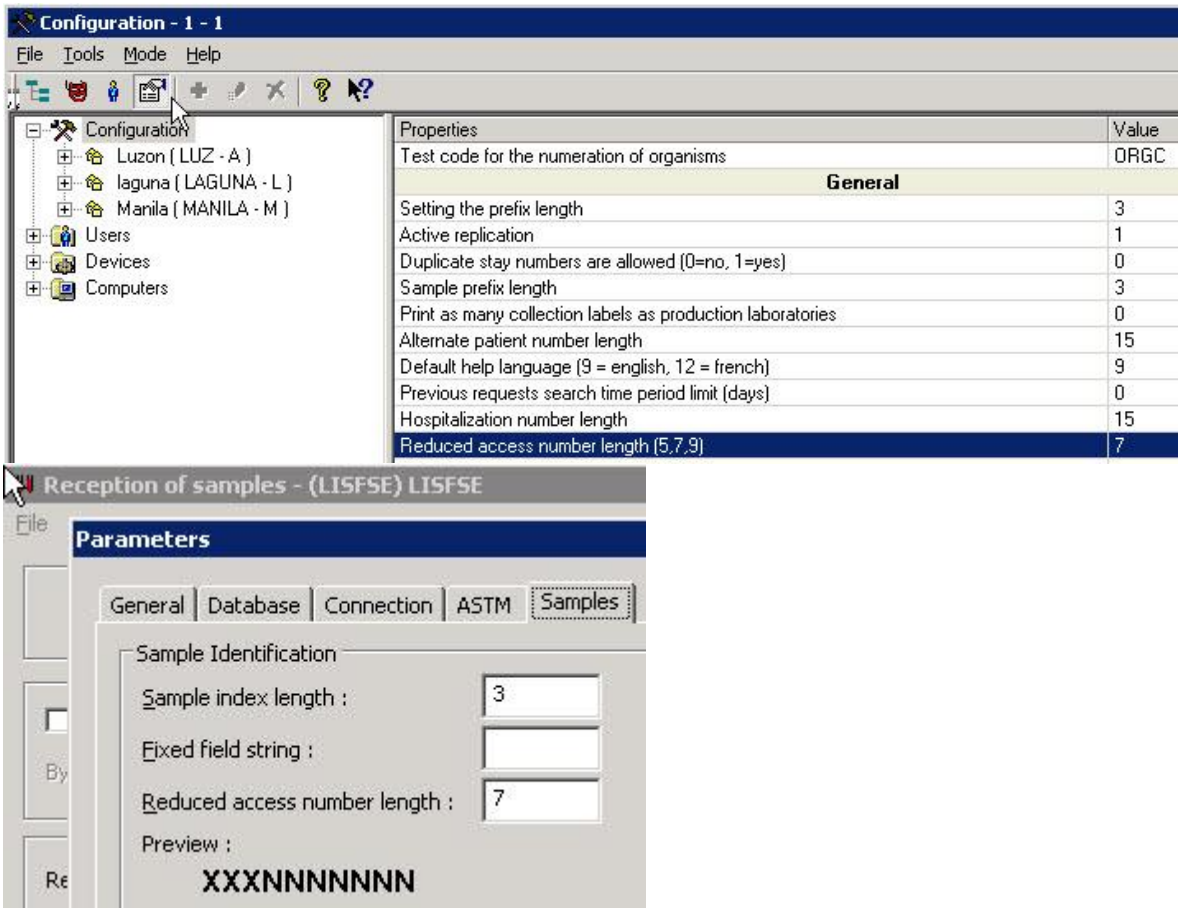
```
MSH|^~\&|LIS||HOST||20110410151515||ORM^O01^ORM_O01|TD0000000479|P|2.3|||||||||
PID|1||7657^^^^PATNUMBER~|1CT3|CESAR^Philip||19800206000000|F|||7493 Bagtikan St^San Antonio Village^Makati City|||
PV1|||LCCL|||DEFDOC||||||||||
ORC|NW|PON||<ORC-4>|||||||TEST|||<ORC-15>|
OBR|1|FON||CA|||||||A|||||TEST||||||||||^^^20051220165400^^R|
ORC-4 -- Placer Group Number/PGN (5, 7, and 9 characters only); unique
ORC-15 -- Order Effective Date/Time (YYYYMMDDHHMMSS)
MSH|^~\&|LIS||HOST||20110410151515||ORM^O01^ORM_O01|TD0000000479|P|2.3|||||||||
PID|1||7657^^^^PATNUMBER~|1CT3|CESAR^Philip||19800206000000|F|||7493 Bagtikan St^San Antonio Village^Makati City|||
PV1|||LCCL|||DEFDOC||||||||||
ORC|NW|12345||7777788|||||00010101191814|||TEST|||20110422151515|
OBR|1|12345||CA|||||||A|||||TEST||||||||||^^^20051220165400^^R|
```

The following `.vmd` must be updated:

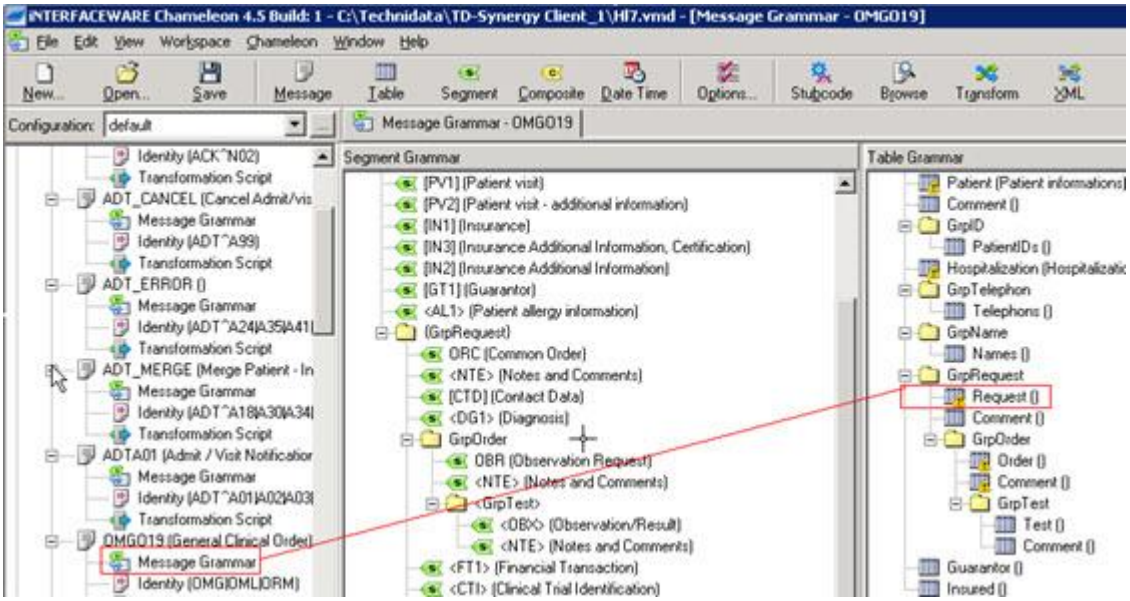
- `HL7.vmd` (for V03)
- `HL7.vmd` and `HL7OrderReception.vmd` (for v11 onwards)

Procedure

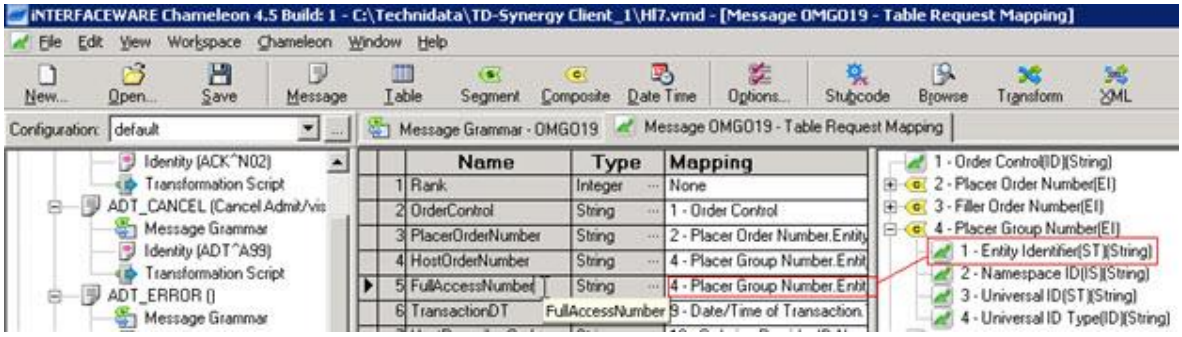
1. Identify the number of characters used for the reduced access number in **USE > Properties > Reduce access number length (5, 7, 9)**, and in Rectube properties.



2. Open the required VMD files depending on the version used.
   a. Go to **OMG019 (General Clinical Order)** located on the left side pane and expand the selection.
   b. Double click **Message Grammar** and double click again **Request().**



3. Expand **Placer Group Number(EI)** and drag **1 - Entity Identifiers(ST)(String)** to the mapping of **FullAccessNumber.** Steps 2 and 3 should be performed also on another VMD for V11 onwards.



Restart the CNX service every time changes are made in VMD, rectube parameters, USE, and device.

4. Use Chameleon to send the sample message.

Access the **sp_request** table to check if the access number was customized using ORC-4 and 15. Below shows two (2) examples of custom access number sent from HIS. Note that characters used in PGN are seven (7) and five (5) respectively.

> select **sp_accessnumber**, **hostordernumber**, **patid**, **reqdate** from sp_request order by logdate desc.

SP_ACCESSNUMBER	HOSTORDERNUMBER	PATID	REQDATE
1047777788	7777788	121	4/22/2011 3:15:15 PM
1042277777	77777	121	4/22/2011 3:15:15 PM

Note: Access number should be minimum of ten (10) characters. The values are based from ORC-4 and ORC-15. The system identifies first the value of reduced access number (5, 7, or 9) and use it as a suffix. The remaining characters to complete the requirement is taken from five (5) characters of date part of ORC-15 starting from right to left.

```
Last five (5) characters of date

201104222151515
YYYYMMDDHHMMSS
[-Date-][time]
```

Example 1

ORC|NW|12345||7777788|||||||TEST|||20110422151515|
Access number = 1047777788
104 (first 3 characters from the last characters of the date: 10422) plus 7777788 (reduced access number - 7)

Example 2

ORC|NW|12345||77777|||||||TEST|||20110422151515|
Access number = 1042277777
10422 (first 5 characters from the last characters of the date: 10422) plus 77777 (reduced access number - 5)

Transmission of HL7 Order messages to the Host system

This section is applicable to transmission of ORM and OML messages.
Note that OML messages are managed by TDNexLabs from V01.21 and TD-Synergy from V12.21

This section explains how to:

- Create a new device to transmit orders to the Host system by HL7
- Set the properties on the device you have just created
- Settings in the `Deviceslist.ini` file
  - To send a **Placer order number** (PON) query from an LIS to a Host.
  - To generate an **Order Canceled** message to notify the HIS that a test initially ordered has been canceled.
- Settings in the **Expert rules** dictionary if you use the following features:
  - Generation of a 'Status Change' message to the HIS when a sample is received at the laboratory for tests that were initially requested via an HL7 ORM message from the HIS.
  - Generation of a 'Order Canceled' message to inform the HIS that a test initially ordered by the HIS has been canceled.

Creating a new device in the Device dictionary

Create a new device (for example, OUT_ORMHL7). To do this:

- In the **Control Panel**, select **System Management** > **System Setup (Dictionaries) > General dictionaries**
- Double-click on **Device** in the left pane.
- In the menu bar, click the **+** button
- Complete the values of the fields which define the device. The following definition of the communication device in the **Device** dictionary is given as an example:

TIP: Specific and mandatory properties used by the communication device are indicated in **bold**.

Add / Update		
Name	Value	Comment
Code	OUT_ORMHL7	This is an example for outbound HL7 Order messages (10 characters max)
Device type	Connection	Must be set to **Connection**
Service	TDCnx_InstanceName_Computername	Select the name of the service_Instance_computer in the list.
Name	HL7 ORM TRANSMISSION	Enter an intuitive text
Abbreviated text	HL7 ORM TRANSMISSION	Enter an intuitive short text
Full text	HL7 ORM TRANSMISSION TO HOST	Enter an intuitive text
Protocol	HL7 Low Layer Protocol	Must be set to **HL7 Low Layer Protocol**
Format	HL7 format Patients/Orders/Results	Must be set to **HL7 format Patients/Orders/Results**
Transport	TCP/IP socket transport 2	For TDNexLabs from V01.21, TD-Synergy from V12.21, and for TD-Synergy V11.83,

		You must select **TCP/IP socket transport 2**
Application	Orders/Results transmission	Must be set to **Orders/Results transmission**
Properties	More	-

The Protocol, Transport, Format and Application properties give the user-friendly names of the various DLLs used for the communication. These DLLs are automatically installed by the software setup program. If the filename of the DLL is displayed instead of the user-friendly name, stop installation and go to Naming of DLLs to resolve the problem.

> **NOTE A**: Note that for existing devices, it is recommended to re-check the properties of the device when changing any of the Protocol, Format, Transport, or Application properties. Changing any of these will reset the related device properties to their default values and they might be different.

Before setting the properties, you must click the **OK** button so that the **Properties** displayed will correspond to the device you have just created. This will close the current window.

Setting the Properties of the device

The **Properties** item is used to define the properties specific to a type of stream. The data streams used by this device are:

- **All** (displayed by default)
- **Order transmission**
- **Placer order number query** (this flow must be defined if the LIS works with PONs)

To start setting the properties, in the **Device** dictionary, double-click the device you have just created. Set the properties as indicated in the following examples:

> **Possible differences between documentation and user screen**
> The properties defined in the **Devices** dictionary are regularly updated, in line with new software and documentation enhancements. Consequently, for some properties, the text displayed on your screen may differ from the text indicated in the documentation. You could also find new properties described in the documentation that are not present on your screen. To help you find your way, these properties are clearly identified in the documentation with the corresponding version when they were introduced. New properties are also announced in the *Change history* table.

Type of stream: All

Device properties OUT_ORMHL7		
Name	Value	Comment
General		
Interval before task purging (days)	5	If this property is not defined here, the same property defined in the Laboratory configuration is applied
Logical acknowledgement management	Yes	Do not modify
Maximum number of old spy files	10	Available for TDNexLabs from V01.51 also in V01.32

		Maximum number of old spy files that can be generated. If maximum number is reached and another old spy file needs to be created, the oldest old spy file will be deleted. Default value = 10 Minimum value = 1 Maximum value = 100 Spy files have the following format: <spy name>_<date>_<time>.old
Max size of spy file (KB)	10000	To customize on site
Message control ID	3	Select the TDNTServer counter number, used to generate the message ID in the MSH-10 field. This counter must have been previously defined in the **TDNTServer Control Panel** window. If you want to generate contiguous numbers, make sure that this number is not used by another connection.
Number of insertion retries in the database	5	From 3 to 10.
Retry interval (500 ms minimum)	500	Interval between retries. Currently applied to Order number retrieval retries. Default value is 500 ms. If the input value is less than 500 ms, the value reverts to the previous value when the focus on the grid is changed.
Path of spy file	<DeviceName>.spy	Enter the filename, without path. For example, `OUT_ORMHL7.spy`. The location directory is applied as follows: 1. Location directory defined for SPY files in the **SPY** property (accessible from the **Properties and Users** (USE) > Properties > All computers level > **General** section). 2. If the **SPY** property is empty, default location directory for SPY files. For more information, see the property description in the Technical guide. For TD-Synergy versions, enter the absolute path and filename (e.g. C:\technidata\TD-*Product* Client_<*InstanceName*>\`OUT_ORMHL7.spy` It advisable to give an intuitive file name (for example the name of the device) and .spy for the extension.

Prefix of alternate patient number on the host	ALT	Prefix applied to the alternate patient identification, e.g. ALT
Prefix of hospitalization number on the host	HOS	Prefix applied to the hospitalization identification, e.g. HOS
Spy traces enabled	Yes	Once the installation is finished and you have checked it runs well, set it to **No**.
Trace level of spy file	Maximum	Three trace levels are available: minimum, regular, maximum. Maximum level should not be used in production
Use national code for doctor identification	No	Change to **Yes** if you want to use the national code instead of the mnemonic code as external identification
Use national code for location identification	No	Change to **Yes** if you want to use the national code instead of the mnemonic code as external identification
Format		
HL7 version	2.3	To customize on site
Message recipient code	HOST	Receiving application in Header segment
Message sender code	SYN	Sending application in Header segment
Unicode messaging	No	Do not modify
Transport Properties available for TDNexLabs from V01.21, and TD-Synergy from V12.21, also in V11.83		
Checksum type	Checksum for HL7 low layer protocol	Do not modify
End of block character	**1C**	Do not modify
Idle time before keepalive transmission (in minutes)		Blank means disabled. A value greater than 0 is interpreted as the amount of time of inactivity before the socket starts sending keepalive packets. Note that the Windows default setting for this property is 2 hours. See **Note B**
Keepalive interval (in seconds)	1	Determines the interval between two TCP keepalive retransmissions until a response is received.
Listening address		This property is used only when **Transmission mode** is set to Mono client server transmission mode. This property contains the value of the IP address of the network interface where this transport layer listens to incoming connections. This is useful if the computer has multiple network interfaces. For example, one for wireless

		and another one for wired. When the value for this property is empty, the socket server will listen to all available interfaces. For versions earlier than TDNexLabs V01.21 and TD-Synergy V12.21 (not in V11.83): This property is named **Sender network address** and contains the IP address or logical name of the sender.
Listening port	8100	This is an example.
Message timeout	30	Do not modify
Outgoing port	8101	This is an example. Server port defined on host system. To customize on site
Protocol version	24	Do not modify
Recipient network address	localhost	IP address or logical name of the receiver (host). To customize on site.
Start of block character	0B	Do not modify
TCP/IP Lower Layer Protocol	Minimal	Do not modify Refer to Data block structure
Transmission mode	Client transmission mode	Do not modify
File location		
Folder for processed input files	C:\technidata\<*TD-Product*> Client_<*InstanceName*>\Processed	Directory where the processed files are to be moved. If this property is not completed, the files are deleted after successful processing. Do not forget to clean this directory regularly.
VMD file path	hl7.vmd	Enter the filename without path. For example, `hl7.vmd`. The location directory is applied as follows: 1. Location directory defined for VMD files in the **VMD** property (accessible from the **Properties and Users** (USE) > Properties > All computers level > **General** section). 2. If the **VMD** property is empty, default location directory for VMD files. For more information, see the property description in the Technical guide. For TD-Synergy versions, enter the absolute path and filename of the Chameleon file (e.g. C:\technidata\TD-*Product* Client_<*InstanceName*>\`hl7.vmd` See Chameleon files (VMDs)
Patient identification		
Prefix of patient number on the host	-	NOT USED

NOTE B: More details about "keep alive" mechanism...
A TCP / IP server can close the connection after a period of inactivity. This may cause the connection to malfunction afterwards. By default, in Windows Server, this disconnection time is set to 2 hours, but it can be changed via the registry key `HKLM\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters` (see https://docs.microsoft.com/en-us/previous-versions/windows/it-pro/windows-2000-server/cc957549(v=technet.10)?redirectedfrom=MSDN).
To avoid a disconnection, it is possible to send "keep alive" messages to indicate that the connection must remain active. The **Idle time before keep alive transmission (in minutes)** property is used to indicate how often a "keep alive" message should be sent. This frequency must be less than the disconnection time. For example, if the disconnection occurs after 2 hours, a frequency of 60 minutes to send a “keep alive” message is sufficient.

Type of Stream: Order Transmission

Device properties OUT_ORMHL7		
Name	Value	Comment
General		
Enable data stream	Yes	The default value is **No**. You must change this to **Yes.**
Management of billing information	Yes	Enter **Yes** to enable the reception of information about the patient's Insurance and Guarantor and to enable management of the Medical Necessity indicator. Enter **No** if you do not need to manage this information. See **Note 1**
Order message format to transmit	ORM^R01 or OML^O21 Or OML^O33	Available for TDNexLabs from V01.71 Determines the type of message to transmit.
SC and OC messages only for test and requests with external number	Yes	From V11.82 **Yes** - messages of type **OC** (Order Cancel) and **SC** (Status Change) are sent to the Host only if the test or request contains an external number (PON) and the test is printable. If there is no PON, **filtered** is added at the start of the task name, and the task is set to **completed** but the message is NOT transmitted. If the test is not printable, the task's status is set to **error** and the message is NOT transmitted. **No** – All OC and SC messages are transmitted to the Host with PON if it exists in the LIS database, if it does not

		exist, OC and SC messages are transmitted without PON. If the test is not printable, the task status is set to **error** and the message is not transmitted. For earlier versions: **Yes** - messages of type **OC** (Order Canceled) and **SC** (Status Change) are sent to the Host only if the test or request contains an external number (PON). If there is no PON, the task's status is set to **error** and the message is not transmitted. **No** - All the OC and SC messages are transmitted to the Host with or without PON.
Send only one item per message	Yes	Select **Yes** to send only one ORC/OBR by message. See **Note 2**
Send original format of hospitalization number	Yes	see **Note 3** No = The padded format for hospitalization number is used. Yes = The original format for the hospitalization number is used.
Transmit multiple alternate patient identifiers	Filtered	see **Note 4** (below) Must be set to **Filtered**.

NOTE 1: The **Medical Necessity Required** indicator is managed if the property **Management of billing information** is enabled (set to **Yes**). This information can be obtained in three ways: for more details refer to the section Segment description, IN1 - Insurance segment paragraph.

NOTE 2: If the answer to **Send only one item per message** property = **No**, then, as many messages as level zero tests contained in the tube for which PSR (Primary Sample Reception) or rectube has been performed, will be sent. See Example of SC messages.

NOTE 3: Management of the Hospitalization number
The Technidata LIS Hospitalization number length is padded with leading zeros when shorter. The Hospitalization number received from a Host (in ADT/Order messages) is stored in its original format in a specific field in the database (EXTERNALHOSNUM field stored in the HOSPITALIZATIONS table).
- When the **Send original format of hospitalization number** property is set to **No**, the Hospitalization number with leading zeros is transmitted to the Host.
- When the **Send original format of hospitalization number** property is set to **Yes**, the Hospitalization number in its original format is transmitted to the Host.

Caution:
If the property is enabled (set to **Yes**) and the Hospitalization number with original formatting (stored in EXTERNALHOSNUM field) is empty (due to a Host communication failure), the task for the transmission of results via HL7 is not processed and is placed in the “Standby” queue. In this case, the user will have to set the task manually to “Ready” to be processed.

If the EXTERNALHOSNUM field is still empty, the task will automatically return to the “Standby” queue and the user will have to repeat the operation later, that is, set the task to "Ready" once again until the original formatting is stored successfully by the communication.

NOTE 4: Management of the multiple alternate patient identifiers. The three possible values are:
None = no transmission of multiple alternate patient identifiers.
All = all alternate identifiers linked to the patient are transmitted.
Filtered = Default value. According to the case, the following alternate identifiers linked to the patient are transmitted:
-1) Alternate identifiers not associated with a LOCATION or SITE
-2) Alternate identifiers associated with the SITE of the source laboratory of the request
-3) Alternate identifiers associated with the LOCATION of the request

Name	Value	Comment
File location	-	See **NOTE A**
VMD file path	HL7OrderTransmission.vmd	Enter the filename without path. For example, `HL7OrderTransmission.vmd`. The location directory is applied as follows: 1. Location directory defined for VMD files in the **VMD** property (accessible from the **Properties and Users** (USE) > Properties > All computers level > **General** section). 2. If the **VMD** property is empty, default location directory for VMD files. For more information, see the property description in the Technical guide. For TD-Synergy versions, enter the absolute path and filename of the Chameleon file (e.g. C:\technidata\TD-*Product* Client_<*InstanceName*>\`HL7OrderTransmission.vmd`
Mapping		
Coded texts	None	Create/select the code of a coding system used to map coded text codes. (1)
Doctors	None	Create/select the code of a coding system used to map doctor codes. (1) Mapping is ignored if **Use National Code for doctor identification** property is enabled.
Locations	None	Create/select the code of a coding system used to map location codes. (1) Mapping is ignored if **Use National Code for location identification** property is enabled.
Tests	None	Create/select the code of a coding system used to map test codes. (1)
Titles	None	Create/select the code of a coding system used to map title codes. (1)

(1) Mapping is used to create correspondences between the values of codes on the Technidata LIS database and Host systems (local codes and alternate codes). You can find the description of *Mapping alternate codes* in the *Technical Guide* (in the *Installation* book).

NOTE:
- In reception streams, multiple alternate codes can be mapped to the same LIS mnemonic code for each mapping.
- In transmission streams, multiple LIS mnemonic codes can be mapped to the same alternate code for each mapping.
See example below to get a better understanding.
When defining the device, a message asks whether or not you want to confirm the code duplication, which will result in:
- For reception streams, the related task is set to "error" when multiple LIS codes are mapped to the same alternate code.
- For transmission streams, the related task is set to "error" when multiple alternate codes are mapped to the same LIS code.

EXAMPLE: For reception streams

This mapping is correct This mapping is not correct

LIS 1 --> ALT 1
ALT 2

For transmission streams:

This mapping is correct This mapping is not correct

LIS 1 --> ALT 1 LIS 1 --> ALT 1

LIS 2 ALT 2

Type of Stream: Placer order number query

Device properties OUT_ORMHL7		**-**
Name	Value	Comment
General		
Enable data stream	Yes	The default value is **No**. You must change this to **Yes.**
Send only one item per message	Yes	Select **Yes** to send only one ORC/OBR by message. See **Note 2 (above).**
Send original format of hospitalization number	Yes	From V11.51 - see **Note 3** (above) - Management of the Hospitalization number **Yes** = The original format for the hospitalization number is used. **No** = The padded format for hospitalization number is used. (Default value)
Transmit multiple alternate patient identifiers	Filtered	From V11.91 - see **Note 4** (above) Must be set to **Filtered**.

Transmit status of all tests prescribed in cancelation message	Yes/No	Answer **Yes** if you want that in cancelation messages, all the tests prescribed are transmitted to the HIS. Answer **No** if you want that in cancelation messages only the Order Canceled (OC) and Unable to Cancel (UC) tests are transmitted to the HIS.
VMD file path	C:\technidata\<*TD-Product*> Client_<*InstanceName*>\ HL7OrderTransmission.vmd	Directory where the .vmd Chameleon file is stored. Enter the filename: HL7OrderTransmission.vmd To customize on site.

Settings in the Deviceslist.ini file

IMPORTANT: This file must be handled with care and must be opened with a text editor (**Notepad** for example).

Two lines must be added in the `Deviceslist.ini` file to determine:

- the correct device to use when creating the task each time a test is deleted on the LIS database.

```
[CancelOrderMgtDevice1]
DeviceCode=<Device Name>
Where: <Device Name> = Communication engine device that will send the ORM message to the Host
```

- the correct device to use to send a Placer Order Number query (PON) to the HOST

Example:
If the device used is named PONORDER, in the `deviceslist.ini` file, enter:

```
[OrderMgtDevice1]
Devicecode = PONORDER
```

On reception of the PON, it is placed in SP_TESTS.ORDERPLACERNUMBER table.
When the PON is managed with the setting [OrderMgtDevice1] that indicates the device code, then, as the test request is created, TESTS.ORDERPLACERNUMBER field is recovered from SP_TESTS.ORDERPLACERNUMBER table.
From version V11.81.A of TD-Synergy or for TDNexLabs, if this property is not completed, the PON management will be disabled because before performing a task creation, the system checks for the device definition in the `Deviceslist.ini` file. The possibility to disable the PON process is useful for the sites which do not manage the PON.

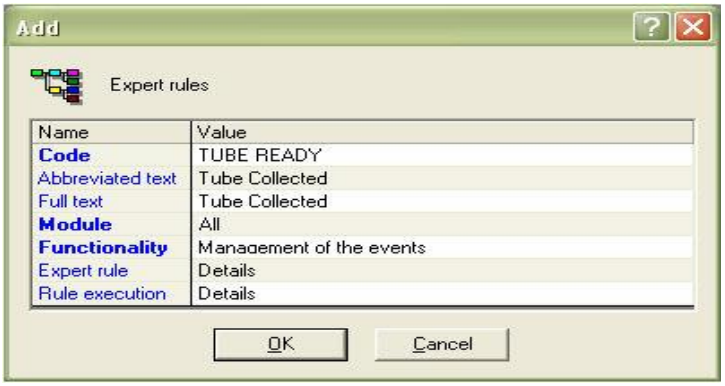
NOTE:
From version V11.81.A of TD-Synergy or for TDNexLabs, the modifications made in the `devicelist.ini` are taken into account after restarting the **TDEventManager** and T**DEventConnection** services.
For earlier versions of TD-Synergy, the modifications made in the `devicelist.ini` are taken into account only after restarting the replication service.

Settings in the Expert rules dictionary

The management of the sample Status Change messages (SC) requires the definition of rules in the **Expert rules** dictionary. The purpose is to send a task to an HL7 Order transmission device, to notify the HIS that a sample has been collected or received in the laboratory ("Status Change" message).

Two rules, one for the sample collection and one for the status reception must be defined.

For both rules you must select **All** for the **Module** property and **Event Management** for the **Functionality** property.



1. In the Expert rule editor window:

- From the rule conditions, select **SampleStatus** to have the status of a collection sample. Possible values are:
  - Collected
  - ReceivedAtLab (the sample has been marked as received in LIS database)

Example: if (SampleStatus = Collected) then { action_list }

When a rule containing this condition is triggered by the CHSAMPSTAT event (sample status changed), the execution of the rule will generate a task allowing the transmission of a "sample status change" message to inform the Host system that the sample has been "collected" or has been "received at the laboratory".

- From the rule actions, select the **TransmitMessage** action to ask the processing service to create a task for the specified device.

  TransmitMessage (device, task_type)

  where:

  - *device* is the code of the device used to transmit the message of sample status change to a Host system (mandatory). If the device code contains an underscore character "_" (e.g., DEV_REC), this device code must be set between brackets.
  - *task_type* is the name of the task, for example, "ChangedSampleStatus" (mandatory).

Example of rules:
It is possible to define two devices: one device named for example, DEVCOL, used to inform that samples are Collected, and a second device named for example, DEVREC, used to inform that samples are received at the laboratory. The related rules to define should be, respectively:
“if (SampleStatus = Collected) then { TransmitMessage([DEVCOL], ChangedSampleStatus)}”
“if (SampleStatus = ReceivedAtLab) then { TransmitMessage([DEVREC], ChangedSampleStatus)}”

2. In the Rule execution window

Select the following event: **CHSAMPSTAT Sample status changed**

This event contains the Order Accessnumber, the tube ID (from SP_TUBES table), and previous status.

Restarting the Connection service

The service associated with the device must be restarted after each modification of the **Device** dictionary.

Technical information

Management of Placer Order Number (PON)

The transmission of orders from a Laboratory Information System (LIS) to a Host Information System (HIS) can be used, for example, to send a Placer Order Number query from a Laboratory Information System to a Host Information System.

To understand how it works, it is necessary to first define the context in which it is used and describe all the different steps necessary to its functioning.

For all orders initiated by the laboratory (Tests requests entered at the laboratory and tests added by the laboratory), the Laboratory Information System will transmit a message to the Host Information System in order to obtain a Placer Order Number (PON) for each new requested test.

1. Placer Order Number query

> **NOTE**: Since the Placer Order Number (PON) can only be managed at the Battery level (OBR) and it is a mandatory field in the ORC and OBR segments, all "level 0" tests in the Laboratory Information System must be associated with a Placer Order Number, and it must not be possible to manage a Placer Order Number for a test that is inserted in a combined test.

When an order is directly entered on the LIS or a test is added (manually or by rule based) in an existing request, a task is triggered to request a Placer Order Number from the HIS.

2. Triggering of the Placer Order Number query

The task processing consists in transmitting order messages -where the Order Control field (ORC-1) is completed with SN (for Send Order Service Number)- to the HIS via a dedicated TCP/IP socket.

The LIS generates a message for each laboratory request. Each message can then contain several ORC/OBR segments for a given patient if several tests of the same request have no Placer Order Number.

Upon reception of this message, the HIS allocates a Placer Order Number to each test and returns this number in an order message where the Order Control field (ORC-1) is filled with "NA" (Number Assigned).

Upon reception of this "NA" order message, the LIS stores the Placer Order Number together with the requested test.

3. Reception of the Placer Order Number

Refer to the definition of the device related to the following communication: HL7 Reception of Order messages from Host.

4. Management of PON / FON by the Technidata LIS in HL7 Result Transmission communication

For HL7 Result Transmission, the following diagram illustrates the algorithm used for the PON/FON management.

Management of the Identifiant National de Santé (INS)

This section is available only for the French market.

This feature is available for TDNexLabs from V02.00.

French regulations require that the *Identifiant National de Santé* (referenced as INS in the document) is used to reference medical data. To comply with these requirements, the *Identifiant National de Santé* (INS) and related identity attributes are supported on reception of ADT messages.

The *Identifiant National de Santé* (INS) may have following value:

- NIR (*Numéro d'inscription au Répertoire national d'identification des personnes physiques*). The NIR is commonly called *Numéro de Sécurité Sociale*). The NIR can be qualified as INS only when it is used to reference medical data for heath and medical care.

  The NIR is only valid when it is associated with following required identity attributes: Name of birth, Firstname, Date of birth, Sex, Place of birth). It is the whole of this information that ensures unique patient identification.

- NIA (*Numéro identifiant d'attente*) - for people waiting for a NIR

Prerequisites

In order that the INS is processed in ADT messages, the following properties are required:

- Property **Patient identification with French INS number (0=No, 1=Yes in AltPat#, 2=Yes in INS data)** must be set to **1** or **2** in the **Configuration** (USE) window > **General** section
- Property **Manage INS identity** must be set to **Yes** in the **Devices** dictionary > **Reception of patients demographic** stream.

Management of the INS

The following information is managed in ADT messages:

- INS (13 characters + check key)
- OID (INS assigning authority)
- INS nature (NIR or NIA deducted from the OID)
- Identity status

PID segment

- The INS is received in a repeatable PID-3 field.
  - PID fields related to the management of the INS are:
    - PID.3.1 - Id number
    - PID.3.4- Assigning Authority

      PID.3.4.2 - Universal ID

      PID.3.4.3 - Universal Id Type
    - PID.3.5 - Identifier Type Code
    - PID.11 - Place of birth.

      PID.11.7 - Address type is set to *BDL* when the place of birth is available.

PID 11.9 - Code of birth place. **77004** in France (= code INSEE). For people who are not born in France, the code will correspond to the country birth place.

- PID.32 - Identity Reliability Code. The status *VALI* in PID.32 ensures that the identity is at the status *Validé*. The presence of both the INS and PID.32 valued to *VALI* in the message allow to deduct that the status is *Qualifé*.

- The INS received in PID segment is forwarded to a dedicated INS management service by the ADT connection. This web service requires the following data for the INS creation: PatientID, Name, FirstName, BirthDate, Sex, INSNumber, OID, Place of birth

Additional notes

- The INS identifier is not processed when:
  - Identifier is not qualified (*Qualifée*): PID-32 is not equal to "VALI"
  - Invalid INS OID is received
  - INS identifier type code is invalid. Then, an error is logged in a spy file and other patient data is saved The job is set to *Completed* in the **Task manager** (TSK) session.
- If the INS management service cannot be reached, the connection logs an error in a spy file. Other patient data is saved. The job is set to *Interrupted* in the **Task manager** (TSK) session.

Management of order cancelation, duplicate order and status change messages

Order cancelation and duplicate order messages are managed when you answer **Yes** to the **Process order cancelation or duplicate order message** property, available in the **Devices** dictionary, **Order reception** data stream (device defined to receive order messages from Host).

When this feature is enabled, the following cases are processed:

- Duplicate order requested by the HIS
- Order cancelation requested by the HIS
- Addition of a test requested by the HIS
- Status Change management

It is possible not to delete redundant tests, if so required. Some laboratories prefer not to cancel duplicate tests when a single test requested separately (for example, Total protein) is also requested in a combined test (for example, Electrophoresis). Duplicate tests are systematically deleted when detected, however it is possible to disable the deletion of duplicate tests when they are included in a combined test that has also been requested.

To do this, the **Delete requested test if contained in another requested test** property must be set to **Yes**, in the **Devices** dictionary > **Order reception** data stream.

Duplicate order requested by the HIS

When the Technidata LIS receives an additional test code for an existing request, the Communication engines checks whether the newly-received test already exists at any level in the existing request (not only at level zero).

As only the level zero tests are associated with a PON, the tests contained in a combined test are not associated with a PON.

> **NOTE**: Note that in the given examples, **ST** = Single Test and **CT** = Combined Test
> In the following part, the notation (ST1, PON1) means that the level zero test code **ST1** is associated with the Placer Order Number **PON1**. The notation (ST1, xxx) means that the test ST1 is not associated with a PON.

Duplicate orders can be received in two different ways:

- In a single message containing two duplicate tests. For example, the message received contains the test ST1 twice.
- In several messages, each containing the same test. For example, the first message received contains ST1, the 2nd message received for the same patient also contains ST1.

Duplicate test codes

The following cases of duplicate test codes are processed

- Level zero test codes
  - Example 1: ST1 is ordered twice for the same request
  - Example 2: CT1 is ordered twice for the same request
- Level zero and 1st level test codes
  - Example 1: CT1 contains the elementary test ST1. ST1 and CT1 are ordered for the same request

- Example 2: CT2 contains the combined test CT1. CT2 and CT1 are ordered for the same request

- Level zero and 2nd level tests codes
  - Example: CT1 contains the elementary test ST1
  - CT2 contains the combined test CT1

Duplicate orders

Two types of duplicate orders can be received:

- Duplicate test code with the same PON. For example, (ST1, PON1) received twice
- Duplicate test code with different PON. For example, (ST1, PON1) and (ST1, PON2) are received

Management of Duplicated Tests in Host (MDTH) system orders algorithm

Available for version V03.13 and from V11.11

The MDTH algorithm can be used to manage the reception of:

1. A new order message with duplicate tests in the message
2. An "Add test" message for a request already present in the database

When an order is received from the Host:

- If this order contains the same level 0 test more than once, the duplicate level 0 tests are deleted. This test is run only once
- If this order contains a level 0 test which already exists in the database for the order, the duplicate level 0 tests are deleted. The test is run only once.

With the new MDTH algorithm (Management of Duplicated Tests in Host system orders) the program searches for duplicate tests or duplicate combined tests in the order or in the database.

All the duplicate single tests or combined level 0 tests are deleted. The test is run only once. A message (order cancel message) is sent to the Host to it of the test deletion.

NOTE: A non level zero test is never deleted by this algorithm.

1. Reception of a new order message with duplicate tests in the message

If a level zero test received in the message is also found in the 0, 1st or 2nd level in the same message, the test is not inserted in the database and an “Order cancel” HL7 message is sent to inform the host that the test has been deleted. This message is structured as follows:

- MSH-9 = ORM^O01 or OML^O21 or OML^O33
- ORC-1 = OC (Order Canceled)
- ORC-2 and OBR-2 = test PON
- OBR-4 = test code
- Example 1. To see it, ***click here***.

The received message contains (ST1, PON1) and (ST1, PON2), so the test code ST1 is duplicated in the message.

Actions triggered:

A task is created with the "completed" status for the **order reception** device

A positive acknowledgement message is sent to the host

The test (ST1, PON2) is not inserted in the database

The deletion of the test (ST1, PON2) is traced in the spy file of the order reception device and in the Event viewer

A task is created with the "completed" status for the **order transmission** device

An order cancel message is sent to the host for the level zero test (ST1, PON2) with the following characteristics: ORC-2 and OBR-2 = PON2, OBR-4 = ST1

- Example 2. To see it, *click here*.

The combined test (CT1, PON_CT1) contains the elementary test (ST1, xxx).

The received message contains (ST1, PON1) and (CT1, PON_CT1).

Actions triggered:

A task is created with the "completed" status for the **order reception** device

A positive acknowledgement message is sent to the host

The test (ST1, PON1) is not inserted in the database

The deletion of the test (ST1, PON1) is traced in the spy file of the order reception device and in the Event viewer

A task is created with the "completed" status for the **order transmission** device

An order cancel message is sent to the host for the level zero test (ST1, PON1) with the following characteristics: ORC-2 and OBR-2 = PON1, OBR-4 = ST1

NOTE: A level zero test is not necessarily an elementary test. It can also be a combined test.

- Example 3. To see it, ***click here***.

The combined test (CT2, PON_CT2) contains the combined test (CT1, xxx).

The received message contains (CT2, PON_CT2) and (CT1, PON_CT1).

Actions triggered:

A task is created with the "completed" status for the **order reception** device

A positive acknowledgement message is sent to the host

The test (CT1, PON_CT1) is not inserted in the database

The deletion of the test (CT1, PON_CT1) is traced in the spy file of the order reception device and in the Event viewer

A task is created with the "completed" status for the **order transmission** device

An order cancel message is sent to the host for the zero level test (CT1, PON_CT1) with the following characteristics: ORC-2 and OBR-2 = PON_CT1, OBR-4 = CT1

2. Reception of an "Add Test" message for a request already present in the database

For every level zero test received in the message, the system checks if this test is already present in the 0, 1st or 2nd level of the request already existing in the database. If this test is present, two cases are supported:

- The received message contains a level zero test that already exists in the request (at 0, 1st or 2nd level). In this case, the level zero test is not inserted in the database and an “Order cancel” HL7 message is sent to inform the host that the test has been deleted.

  Example. To see it, ***click here***.

The request in the database contains (CT1, PON_CT1) (combined test which contains (ST1, xxx)).

The new message received contains (ST1, PON1).

Actions triggered:

A task is created in the completed status for the order reception device

A positive acknowledgement message is sent to the host

The test (ST1, PON1) is not inserted in the database

The deletion of the test (ST1, PON1) is traced in the spy file of the order reception device and in the Event viewer

A task is created in the completed status for the order transmission device

An order cancel message is sent to the host for the level zero test (ST1, PON1) with the following characteristics : ORC-2 and OBR-2 = PON1, OBR-4 = ST1

- The received message contains a test at the 1st or 2nd level (but not 0), that already exists at the level zero in the request. In this case, the level zero test is deleted from the database and the combined test is inserted in the request.

  Example. To see it, ***click here***.

The request in the database contains (ST1, PON1).

The new message received contains (CT1, PON_CT1) (combined test which contains (ST1, xxx)).

Actions triggered:

A task is created in the completed status for the order reception device

A positive acknowledgement message is sent to the host

The test (ST1, PON1) is deleted from the database

The deletion of the test (ST1, PON1) is traced in the spy file of the order reception device and in the Event viewer

A task is created in the completed status for the order transmission device

An order cancel message is sent to the host for the level zero test (ST1, PON1) with the following characteristics : ORC-2 and OBR-2 = PON1, OBR-4 = ST1

The PON (Placer Order Number) does not exist in the request

When the Technidata LIS receives a test code already present in the order **with a PON different from the already received order**:

- If the order contains a **Placer Group Number** (PGN), an order message is sent to the HIS with the field ORC-1=OC (Order Canceled). This message is sent whatever the tube status may be (collected or not collected). The HIS has to acknowledge this message.
- If the order does not contain a **Placer Group Number**, the 'grouping' algorithm is applied:
  - if no tube associated with the request has been collected, an order message is sent to the HIS with the field ORC-1 = OC (Order Canceled). The 'MDTH' algorithm is applied if necessary
  - if at least one tube associated with the request has been collected, a new request is created.

The PON already exists in the request

When the Technidata LIS receives a test code already present in the order **with a PON already received**:

- If at least one tube associated with the request has been collected, the LIS does not take into account this new order, but no cancelation message (order message with ORC-1 = OC) is sent to the HIS.

- If no tube associated with the request has been collected, the test is updated normally.

Order cancelation requested by the HIS

When the HIS wants to cancel a test, it sends an order message with the field ORC-1=CA (Cancel Order). Then, verifications are made:

- If the PON already exists and the tube associated with the test B is already collected or declared arrived at the laboratory, the test cannot be canceled. Then an order message is transmitted to the HIS with the field ORC-1=UC (Unable to Cancel).
- If the PON already exists and the tube associated with the test B is not collected, the requested cancelation is done.

Example 1: The request contains the tests A and B
- Test A is associated with tube 1 (collected)
- Test B is associated with tube 2 (not collected)
The HIS sends a cancelation message for test B, and test B is canceled.

Example 2: The request contains the tests A and B
- Test A is associated with tube 1 (collected)
- Test B is associated with tube 1 (collected)
The HIS sends a cancelation message for the test B:
- test B is NOT canceled
- an order message with ORC-1=UC (Unable to Cancel) is sent to the HIS
In this case, test B is not canceled because, in some cases, tests are invoiced as soon as the sample is collected.

Addition of a test requested by the HIS

When the HIS wants to add a test to an existing order, it sends an order message with the field ORC-1=NW (New). After verification, if the test cannot be added (the order contains a tube already "collected") an order message is transmitted to the HIS with the field ORC-1=OC (Order Canceled).

When this management is enabled an **Output device** must be specified to transmit orders to the HIS.

Where?	In the Devices dictionary (device created to receive order messages containing the Placer Order Number from the HIS), **Order reception** data stream, **Output device** property).

Status Change management

When the HIS has sent a request and the sample has been collected or is received at the laboratory, it sends an order message with the field ORC-1=SC (Status Change). The following cases are managed:

- If the tube has been collected:
  - ORC-7 contains the request collection date
  - OBR-7 contains the tube collection date
  - OBR-14 is empty
- If the tube has been received in the laboratory:
  - ORC-7 contains the request collection date
  - OBR-7 contains the tube collection date
  - OBR-14 contains the last modification date of the test linked to the tube

Example: The request contains the tests A and B
- Test A is associated with tube 1 (not collected)

- Test B is associated with tube 2 (not collected)
Tests A and B have been collected. An order 'Status Change' (SC) message is sent to the HIS with the request collection date and the tube collection date in the message.
Then, Test A is received in the laboratory. An SC message will be transmitted to the HIS with the request collection date, the tube collection date, and with the tube reception date (from the last modification date of Test A).
Test B has no tube reception date yet.

See also:

- Example of SC messages

Management of temporary patients

When an order message is received for a patient who exists in the database, but patient details in the order message do not match those in the database, a temporary patient can be created, and the order is created for this patient (instead of being rejected) so that the laboratory can process the order without delay.

- The patient numbers for temporary patients are generated with a particular prefix (user-definable in the **Configuration** window).
- In the **Patient search** window (PAT session), you can use the wildcard characters (*) in the patient number field to find all the created temporary patients and fix the patient identifications (using patient Merge function) before reporting results.

Implementation

To enable the *Management of temporary patients* feature proceed as follows:

1. In the **Device** dictionary: The communication device used for the reception of orders must be installed and running.

   IMPORTANT: To use this feature, you must specify the maximum number of differences that are authorized to update the database (Patient differences property in the Patient information reception stream).

   Five fields are checked on reception of a patient demography or an order message: Patient's last name, Patient's first name, Patient's maiden name, Patient's date of birth and Patient's sex. The contents of these fields are compared with the contents of the same fields in the database. The patient record in the database is updated only if the number of differences is less than or equal to the maximum number of authorized differences specified in the **Patient differences** property.

   Refer to HL7 Reception of Order messages from Host to configure it.

2. In the **Configuration** window (**USE** session > **Properties** item> **Patient file** section), complete the following properties:

   - **Create temporary patient on patient mismatch)**. Answer 1 (=Yes) to enable the creation of a temporary patient when there is a patient mismatch and continue with the creation of the order.
   - **Counter for temporary patient number**. Counter used to generate temporary patient numbers. Enter a value for this counter. By default, it is empty. This temporary number is displayed next to the prefix.
   - **Prefix for temporary patient number**. Enter a prefix of 3 characters maximum (for example, TMP). This prefix is used to generate the temporary patient number. The default value for this property is the $ character.

   NOTE: The temporary patient number generated has the maximum length of the patient number (20), padded with 0s depending on the Patient number length defined in the user configuration. For example, 0000000000TMP0001234 in the database gives TMP0001234 when displayed.

Grouping algorithm

An order number is a number that groups a set of tests under a unique order. This number is called:

- Host Order Number or Placer Group Number when it is sent by the host
- Request access number in the Technidata LIS

Some hosts do not send Host Order Numbers but only numbers that identify the 0 level tests. These numbers are called Placer Order Numbers (PON).

To reduce the number of orders created in the Technidata LIS, and in particular, the number of samples collected, a grouping algorithm is applied.

This algorithm is the following:

When a new PON is received, the corresponding test order is grouped with an existing order if:

1. The following elements of the request are similar:
   - The **patient** (*Patient differences* algorithm). Checks are performed on the patient's demographic fields. Five fields are checked on reception of a patient demography message (ADT): Patient's last name, Patient's first name, Patient's maiden name, Patient's date of birth and Patient's sex. The contents of these fields are compared with the contents of the same fields in the database. The number of authorized differences between the data in the LIS database and the data in the HL7 ADT message is set in the *Patient differences* property of the Device dictionary.
   - The **hospitalization** (received in PV1-19 field)
   - The **location** (received in the ORC-13 field)
2. The forecasted collection date and time (received in the field ORC-7, sub-field 4) corresponds to the forecasted collection date and time of the request +/- n minutes (n being definable).
   - If no request corresponds to these criteria, a new request is created. The access number is generated by the Communication Engine, based on the forecasted collection date and time.
   - If a request corresponds to these criteria, but a PSR (Primary sample reception) or rectube (Web module sample reception tool) has already been performed for at least one tube of this request, the existing request is not updated and a new request is created.
   - If the **Time allowed for test addition/deletion** properties are populated and enabled at the same time as Exam grouping property, the following applies:
     – the "No tube collected" rule is modified so that Exam grouping is still possible considering that the tube associated with the test to be added is not yet collected.
     – the time set for time allowed for test addition/deletion will be used to verify if test addition/deletion is allowed.

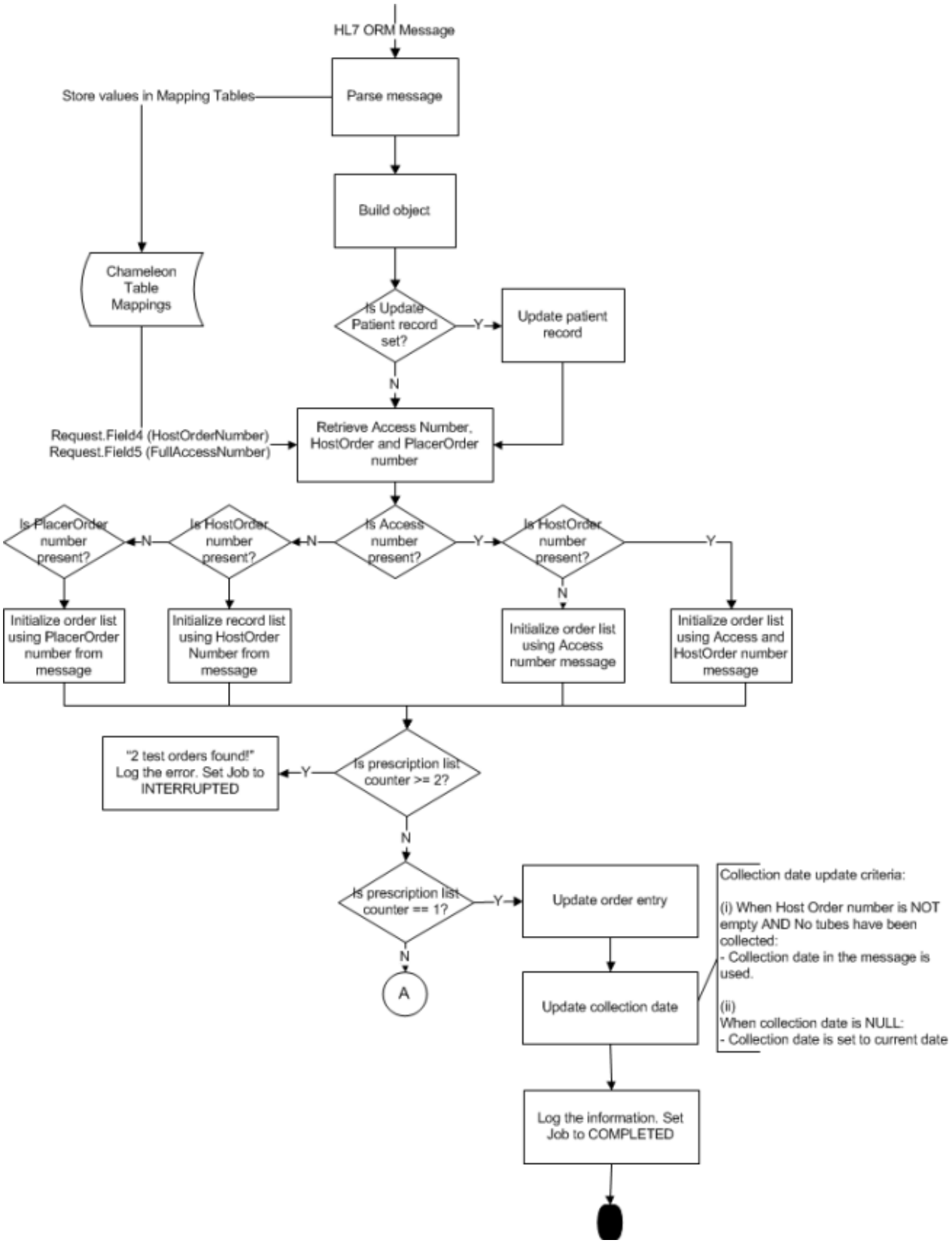
How to implement it

The grouping algorithm is managed when you answer **Yes** to the **Exam grouping** property, available in the **Device** dictionary, **Order reception** device (device defined to receive order messages from Host).

Order reception algorithm

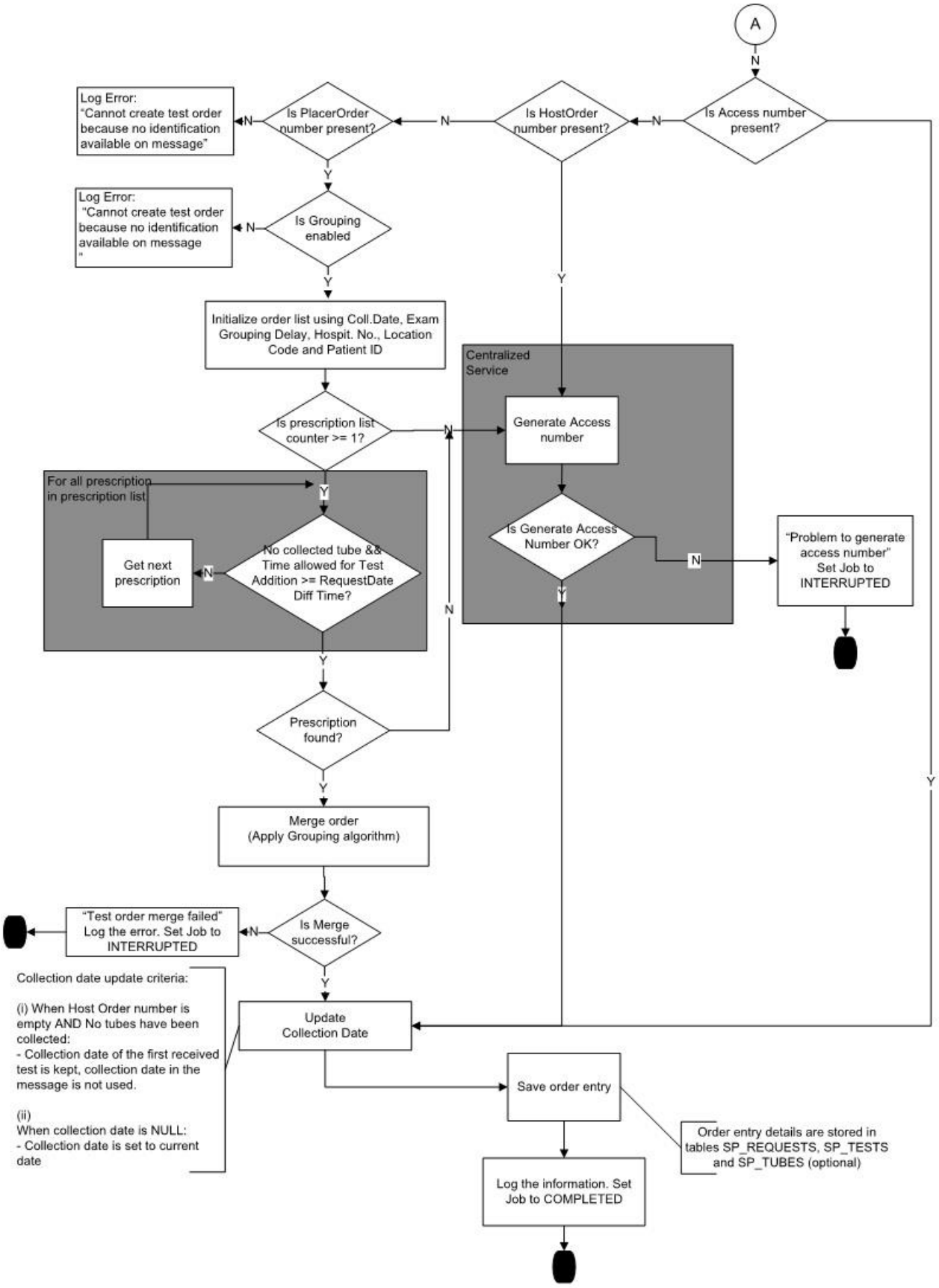
The following flow charts describe in detail the order reception algorithm. This topic is for use by experienced installation and support engineers only.

Part 1 - order reception algorithm


HL7 ORM Message
Parse message
Store values in Mapping Tables
Build object
Chameleon Table Mappings
Is Update Patient record set?
Y
Update patient record
N
Request.Field4 (HostOrderNumber)
Request.Field5 (FullAccessNumber)
Retrieve Access Number, HostOrder and PlacerOrder number
Is PlacerOrder number present?
N
Is HostOrder number present?
N
Is Access number present?
Y
Is HostOrder number present?
Y
N
Initialize order list using PlacerOrder number from message
Initialize record list using HostOrder Number from message
Initialize order list using Access number message
Initialize order list using Access and HostOrder number message
"2 test orders found!" Log the error. Set Job to INTERRUPTED
Y
Is prescription list counter >= 2?
N
Is prescription list counter == 1?
Y
Update order entry
N
A
Update collection date
Collection date update criteria:
(i) When Host Order number is NOT empty AND No tubes have been collected:
- Collection date in the message is used.
(ii)
When collection date is NULL:
- Collection date is set to current date
Log the information. Set Job to COMPLETED

Part 2 - ORM reception algorithm

This algorithm is applicable from TDNexLabs version V02.10


A
N
Is Access number present?
Is HostOrder number present?
Is PlacerOrder number present?
Log Error:
"Cannot create test order because no identification available on message"
Is Grouping enabled
Log Error:
"Cannot create test order because no identification available on message
"
Initialize order list using Coll.Date, Exam Grouping Delay, Hospit. No., Location Code and Patient ID
Centralized Service
Generate Access number
Is Generate Access Number OK?
"Problem to generate access number"
Set Job to INTERRUPTED
Is prescription list counter >= 1?
For all prescription in prescription list
No collected tube && Time allowed for Test Addition >= RequestDate Diff Time?
Get next prescription
Prescription found?
Merge order
(Apply Grouping algorithm)
Is Merge successful?
"Test order merge failed"
Log the error. Set Job to INTERRUPTED
Collection date update criteria:
(i) When Host Order number is empty AND No tubes have been collected:
- Collection date of the first received test is kept, collection date in the message is not used.
(ii)
When collection date is NULL:
- Collection date is set to current date
Update Collection Date
Save order entry
Order entry details are stored in tables SP_REQUESTS, SP_TESTS and SP_TUBES (optional)
Log the information. Set Job to COMPLETED
Y
N

Management of order messages with additional doctors

The information provided in this document topic has not yet been qualified by the TECHNIDATA Qualification team.

Additional doctors are managed by the **OBR-28** field (<ID Number> first sub-field). If HL7 order message has Main doctor (ORC-12), additional doctors in OBR-28 are processed. Sites that have no main doctor and require additional doctors as recipients can set a a default to doctor to enable processing of additional doctors. The VMD file must be modified. See Management of additional doctors with no main doctor.

On reception of order messages containing additional doctors, messages are processed as follows:

- The request is created/updated in the SP_REQUEST table.
- Additional doctors are stored in the SP_REQUEST_DOCTORS table, in the order the Host has transmitted them. A rank number is assigned to each additional doctor.

When the **Tube reception** tool of the Web module transmits requests to the LIS database, it recovers the codes of the additional doctors stored in the SP_REQUEST_DOCTORS table according to their rank number and sends them in the **ASTM 9.20.1** sub-field in this order. This ensures that additional codes are sent in the Host order.

The order of additional doctors is important because:

- The number of additional doctors on the LIS database is limited to five.
- The number of additional doctors that can be processed depends on the number of reports defined for doctors and locations.

On the LIS database, the number of reports is limited to 8. It is possible to define up to 4 reports for a location and up to 2 reports for a doctor in the dictionary.

Examples:
If one report is defined for each doctor and two reports are defined for the location, then:
- Location = 2 reports
- Doctor = 1 report
- 5 additional doctors with one report each

If one report is defined for each doctor and four reports are defined for the location, then:
- Location = 4 reports
- Doctor = 1 report
- 3 additional doctors can be managed and only the first 3 doctors are processed. In this case, the order of the additional doctors is important.

Updating additional doctors

When order update messages are received, it is only possible to update the additional doctors if the request update is allowed:

- If an order with ORC-1 = NW (New order) is received with a test that has already been received in the LIS database, additional doctors are updated on a delete/replace basis, but only if:
  - No specimens associated with the request have been collected yet
  - The test is not a duplicated test (with a different Placer Order Number or included in a combined test)
- If an order with ORC-1 = NW (New order) is received with a test that has not yet been received in the LIS database, but that will be inserted in an existing request, additional doctors are updated on a delete/replace basis, but only if no specimens linked to the request have already been collected.

  If one specimen or more has been collected, a new SP_REQUEST is created to manage this test. Additional doctors will be managed according to the content of the message in this new SP_REQUEST.

- If an order with ORC-1 = NW (New order) is received with a test that has already been received and no specimens have been collected, this test is considered as a "duplicate" test. The order (Prescription header) is updated, the additional doctors are also updated, but the test is not updated. In this case, a task is created to inform the Host that this test was deleted (because it was duplicated).
- If an order with ORC-1 = CA (Cancel order) is received with a test that has already been received in the LIS database, then additional doctors are not updated and the test is deleted only if no specimens associated with this test in the request have been collected. Otherwise a task is created to inform the Host that this test was not deleted (*Unable to cancel order*) because at least one specimen has been collected.

NOTE: The user must check all the tasks named “Unable to cancel order” to verify whether additional doctors must be updated manually on the database using the **Order entry** (ENR) session.

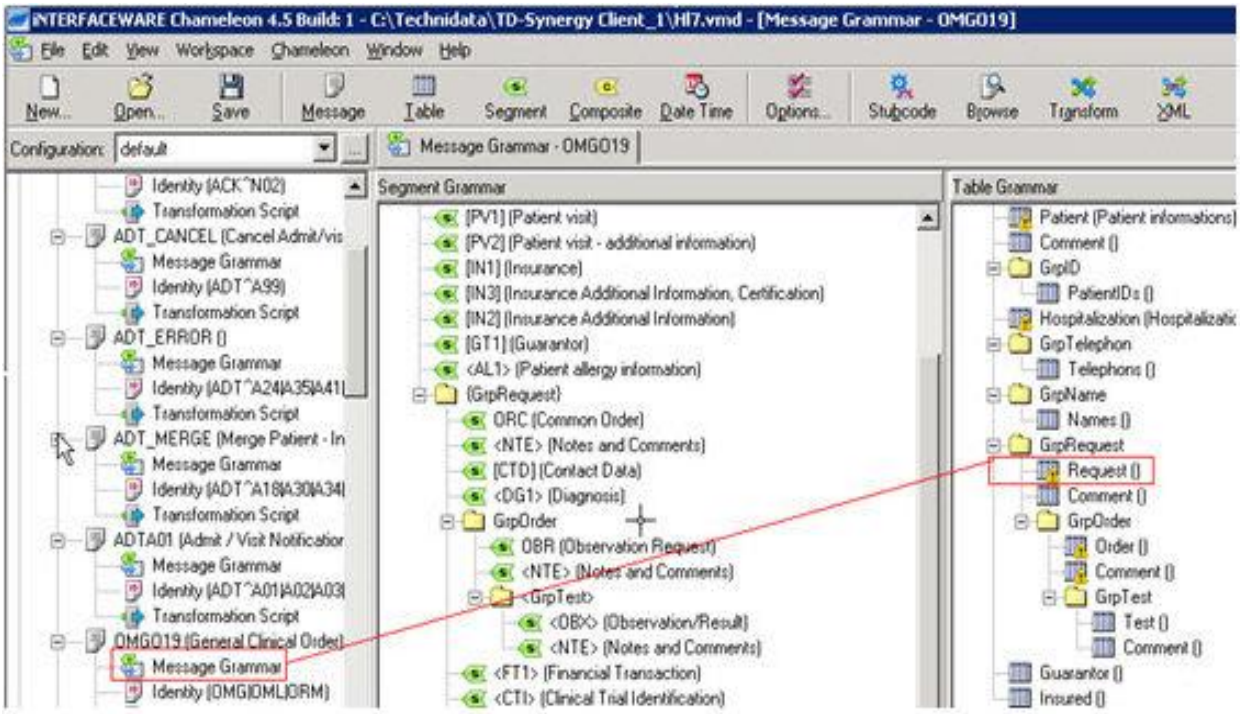
Management of additional doctors with no main doctor (ORC-12 is empty)

Prerequisites

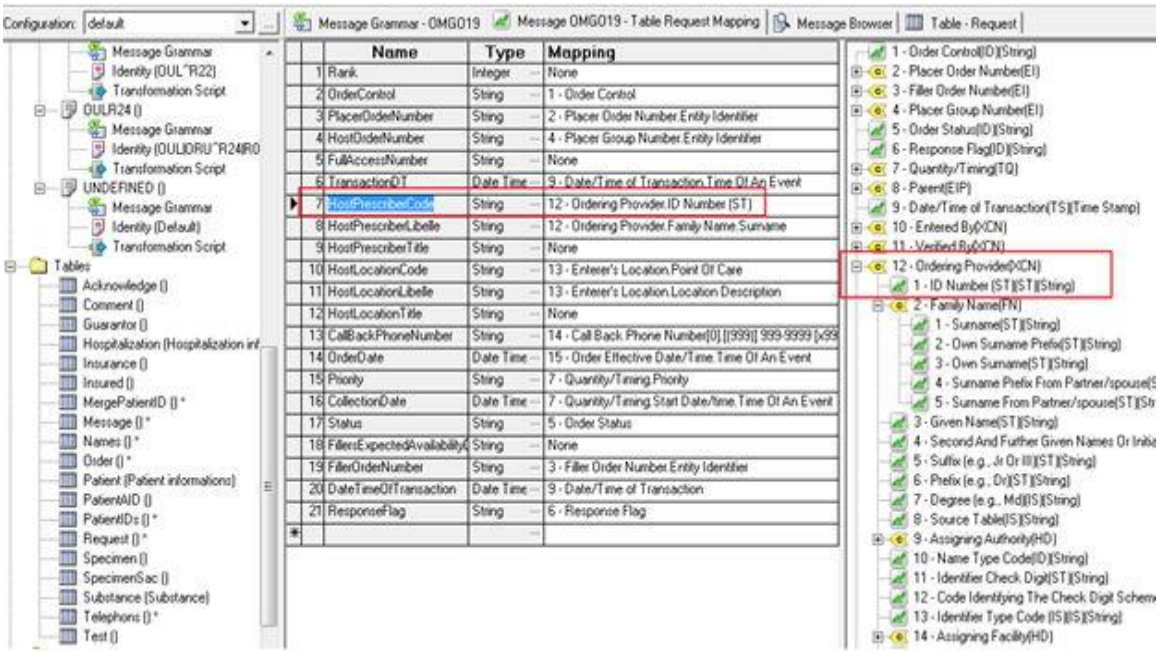
If a default doctor does not exist, create a one in the **Doctors and Locations** dictionary, using a DCR session. In this example the default doctor has the code DEFDOC.

Creating a default doctor

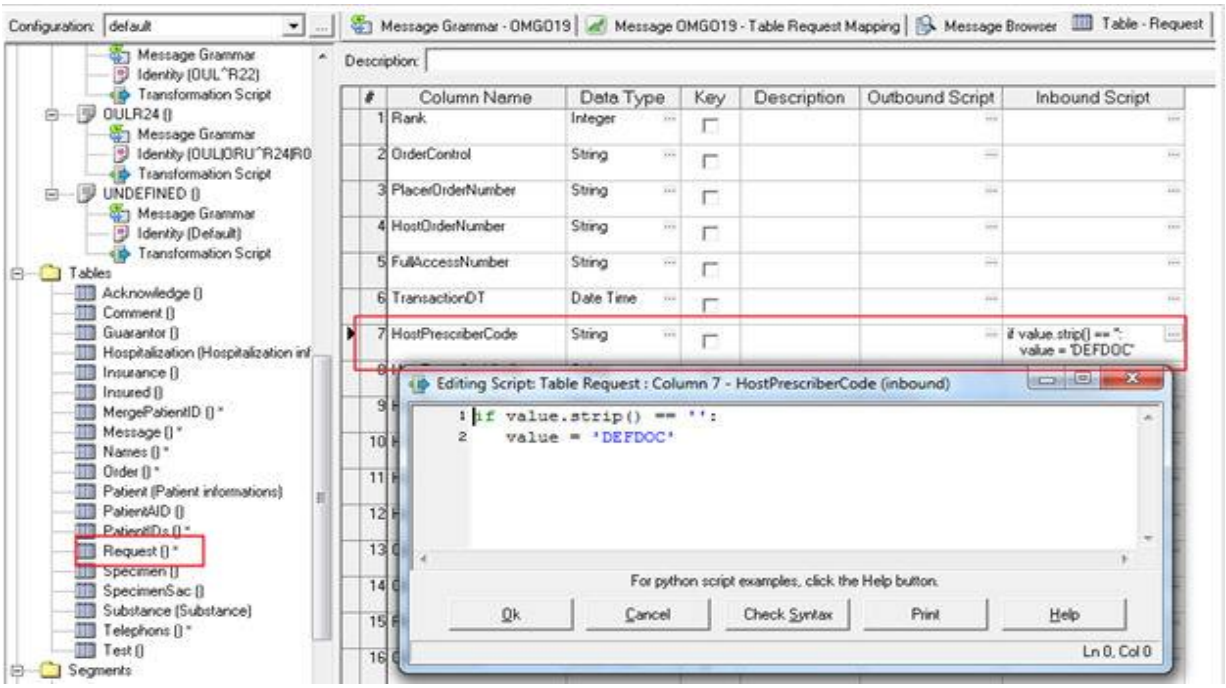
1. Open the VMD file for order reception.
2. On the left side of the pane, expand the selection and select **OMG019 (General Clinical Order)**.
3. Double-click **Message Grammar**, and then double-click **Request()**.



4. Make sure that **HostPrescriberCode** is mapped with ORC-12.



5. On the left side of the pane, expand the selection and select **Tables**.
6. In the **HostPrescriberCode** field, double-click the '… ' icon at the top-right side of the **Inbound Script** cell.
7. Replace DEFDOC by the default doctor code registered in DCR.

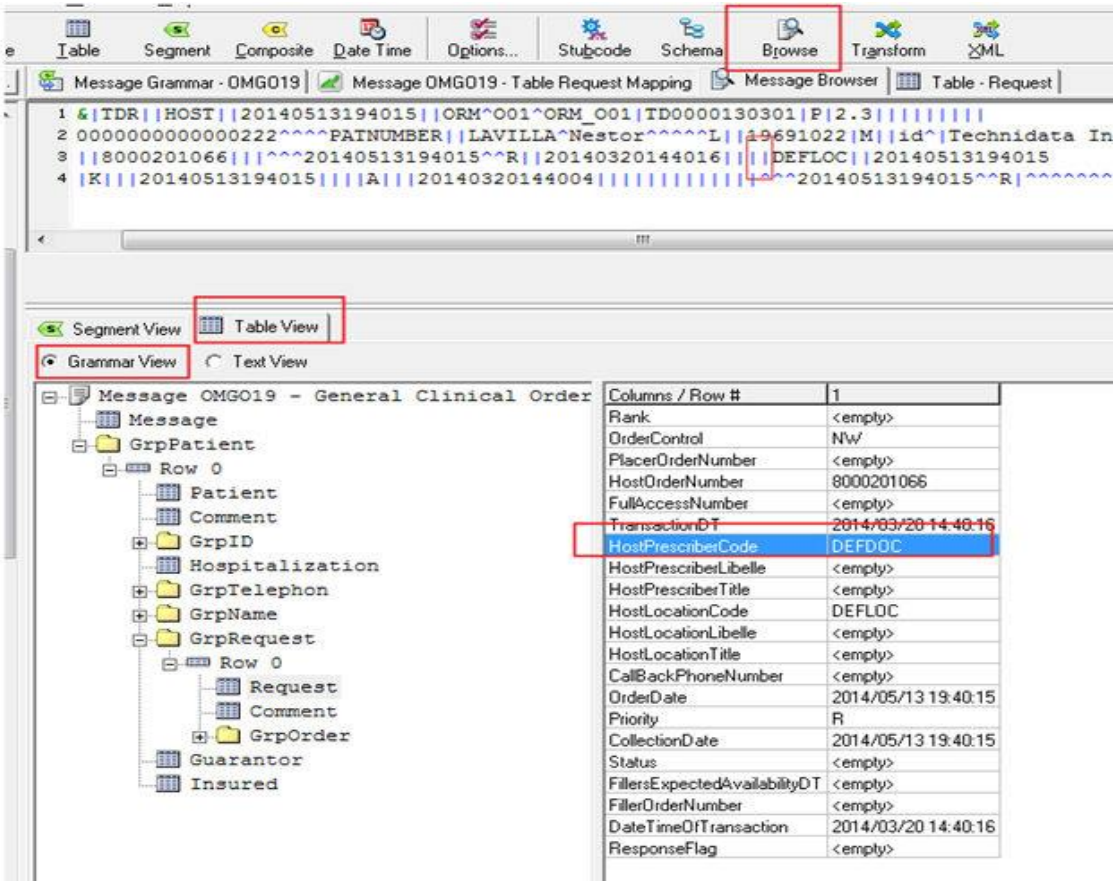


Checking the script

1. In the upper-right pane, click **Browse**.
2. Input the following sample ORM message (notice that ORC-12 is empty):

```
MSH|^~\&|LS||HOST||20140513194015||ORM^O01^ORM_O01|TD0000130301|P|2.3|
||||||||
PID|||0000000000000222^^^^PATNUMBER||LAVILLA^Nestor^^^^^L||19691022|M
||id^|Technidata In.c^^^"" "" "" "" "" "" "" "" ""
""^^PH||||||id^||||||||||||||||
ORC|NW|||8000201066|||^^^20140513194015^^R||20140320144016||||DEFLOC||
20140513194015
OBR|1|||K|||20140513194015||||A|||20140320144004||||||||||||^^^201405
13194015^^R|^^^^^^^^^ABE^^^^^^^^^~DEONAD^^^^^^^^^||||||||
```

3. Click **Table View** and then click **Grammar View**.
4. Make sure that **HostPrescriberCode** has the same default value as set in the Inbound script of the Request table, **HostPrescribeCode**.



Management of Workstation code in order messages

The "workstation" information is not received directly through the HL7 Order/Result messages.

From TDNexLabs V01.52.B

The **workstation code** is deducted from either the **Laboratory** or **Location** data received in the request message.

1. When the Laboratory is available in the request message (ORC-21), the **laboratory site** is used to calculate the workstations.
2. When there is no Laboratory but a Location is available in the request message (ORC-13) the **location site** is used to calculate the workstations.
3. [From TDNexLabs V02.10] When there is no Laboratory and no Location, then the **Site** defined in the *Order Reception* stream of the HL7 Reception device will be used to calculate the workstations.

Note that:

- If the laboratory (ORC-21) is used for workstation calculation but no site is linked to it, the **Site** defined in the *Order Reception* stream of the HL7 Reception device will be used instead.
- If the location (ORC-13) is used for workstation calculation but no site is linked to it, the **Site** defined in the *Order Reception* stream of the HL7 Reception device will be used instead.
- If the Site is not defined in the *Order Reception* stream of the HL7 Reception device, an error will be raised in the spy file.

The calculation of workstation code also takes into account the test code, the site of the location, the priority level and the workstation status, stored in the following table:

Workstation is searched in DICT_TEST_PERF_ON table based on (Test+Site+Priority+Status)

- Test
- Site of laboratory or location - based on site retrieved from point 1, 2 or 3 above
- Priority level
- Workstation status

The following algorithm is used:

- If no Location is received or if the Location received is unknown (not found in the table), it is possible to assign a default location. If the default location is associated with a site in DCR/LOC, the workstation association can be done.

The **Priority** information is received by the Communication Engine in the 6th subfield (Priority) of the OBR-27 field (Quantity/timing). The values that are processed are:

The Priority information is received by the Communication Engine in the 6th subfield (Priority) of the OBR-27 field (Quantity/timing). The values that are processed are:

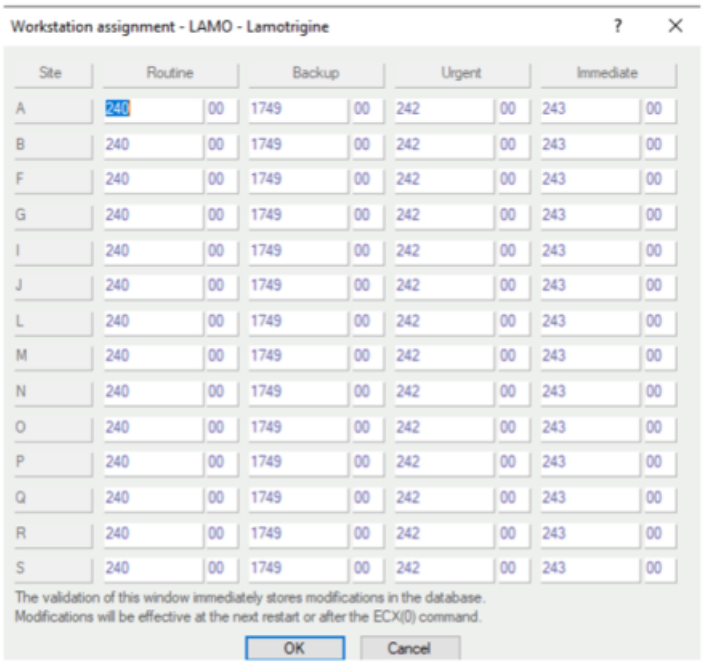
- **S** (Stat)
- **A** (ASAP)
- **R** (Routine)
- **P** (Preoperative) is processed as R
- **C** (Call back) is processed as S
- **T** (Timing Critical) is processed as S

Three levels of priority are supported by the Communication Engine:

- Urgent (S, C or T)
- Routine (R or P)
- Immediate (A)

The assignment of a Workstation is based on the current status (STNSTATUS) of the Workstation to be assigned.

Example: Workstation Assignment for the Test LAMO



If priority = immediate (value **A**) and:

- If the "Immediate" workstation status is active (**A**), then "**Immediate**" workstation is assigned
- If the "Immediate" workstation status is suspended (**S**), then "**Urgent**" workstation is assigned
- If both "Immediate" and “Urgent” workstations statuses are suspended (**S**), then "**Routine**" workstation is assigned
- If the "Immediate", “Urgent” and "Routine" workstations statuses are suspended (**S**), then "**Backup**" workstation is assigned

If priority = routine (value **R** or **P**),

- If the "Routine" workstation status is active (**A**), then "**Routine**" workstation is assigned
- If the "Routine" workstation status is suspended (**S**), then "**Backup**" workstation is assigned
- If both "Routine" and “Backup” workstations statuses are suspended (**S**), then "**Urgent**" workstation is assigned
- If the "Routine", “Backup” and "Urgent" workstations statuses are suspended (**S**), then "**Immediate**" workstation is assigned

If priority = urgent (value S, C or T),

- If the "Urgent" workstation status is active (**A**), then "**Urgent**" workstation is assigned
- If the "Urgent" workstation status is suspended (**S**), then "**Immediate**" workstation is assigned
- If both "Urgent" and “Immediate” workstations statuses are suspended (**S**), then "**Routine**" workstation is assigned

- If the "Urgent", “Immediate” and "Routine" workstations statuses are suspended (**S**), then "**Backup**" workstation is assigned

Modification of ORM orders in Order Reception flow

This section only applies to ORM orders with Auto-rectube.

This feature is applicable to TDNexLabs and to TD-Synergy version V11.32 and from V11.51.

It is possible to enable updates (addition/deletion of tests) from a Host, for requests whose samples have already been collected and received.

Addition/deletion of tests

The requested modification is processed if:

a. The collection date of the request to be modified (from the database) matches the collection date in the message.

b. The difference between the current system date / time and the request creation date / time is less than or equal to the period of time specified in the related device property.

Note: The date/time of a request creation is retrieved first from ORC-15. If ORC-15 has no value, the algorithm retrieves the request creation date from database. (SP_REQUESTS.REQDATE).

The following cases can be met:

Scenario	Is at least one tube collected?	Time allowed to test Addition/Deletion > 0	Collection date of request == Collection date of message (see *)	Difference between system date and time and request creation date and time =< Time allowed for test addition/deletion	Is test modification allowed?
1	NO	N/A*	N/A	N/A	YES
2	YES**	YES	YES	YES	YES
3	YES**	NO	N/A	N/A	NO
4	YES**	YES	NO	N/A	NO
5	YES**	YES	YES	NO	NO

* Only dates are compared, the time may be different - N/A = Not applicable

Scenario 1 applies to TD-Synergy Versions other than V11.32 and V11.51 (modification allowed only if no tube associated with the request has been collected)

** Applies to RECTUBE only

Addition of tests

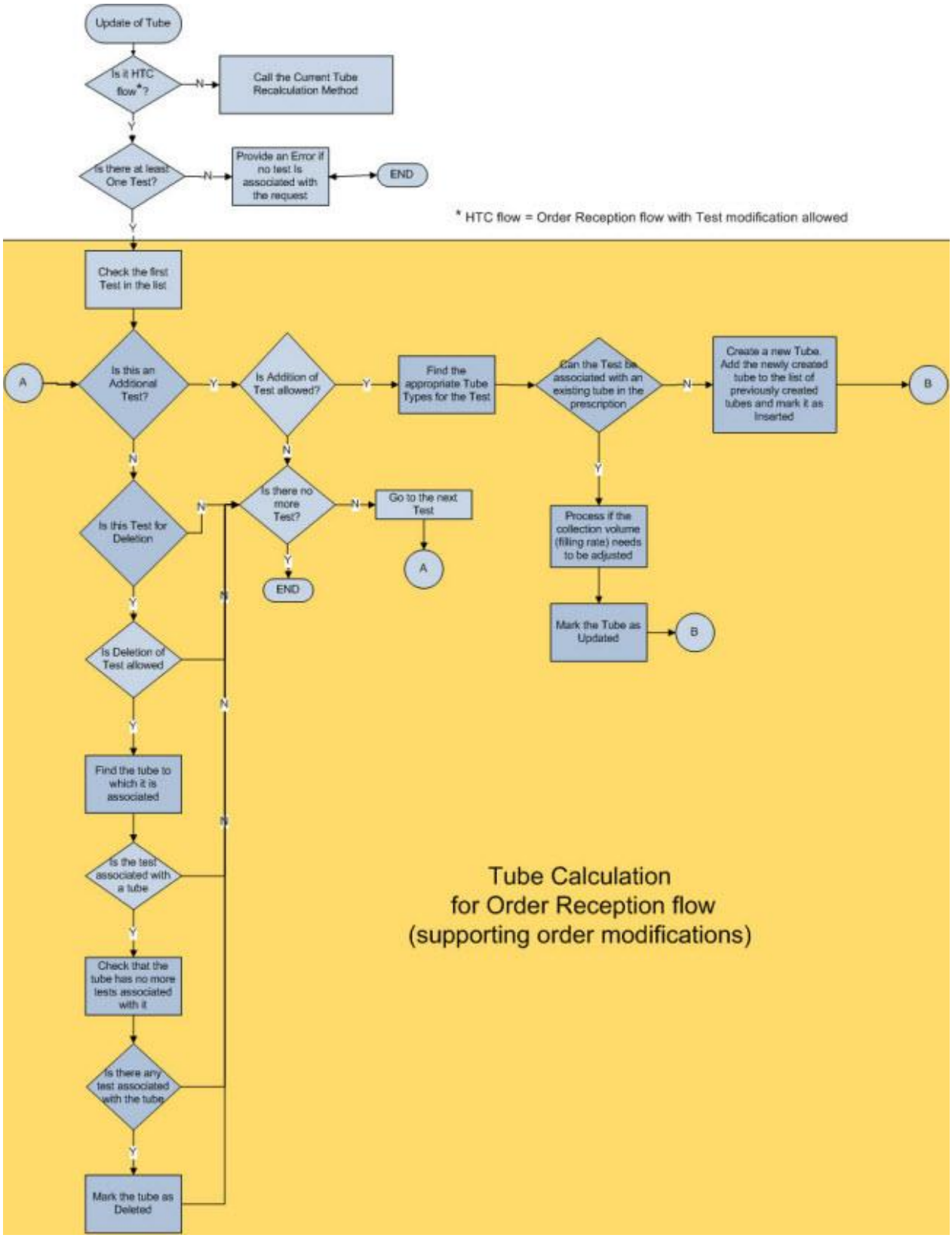
- If addition of test is requested and test modification is allowed, the following algorithm applies:
  - If the test can be associated with a tube, then check if the filling rate needs to be increased.
  - If the filling rate increases, then a new label has to be printed otherwise no action will be done.
  - If the test cannot be associated with a tube in the request, then a new tube with appropriate type will be created, and a new label has to be printed.
  - Update the request with the new test being inserted, or new tube is inserted or modified.

Deletion of tests

- If deletion of test is requested and test modification is not allowed, no update will be done on the request if at least one tube is collected.
- If deletion of test is requested and test modification is allowed, the following algorithm applies:
  - First, search for a tube in the request for which this test is associated.
  - Check if the tube has no other associated test in addition to the one that must be deleted.
  - If there is no other test associated, then mark the tube as deleted, otherwise just delete the test and its association
  - Update the request taking into account the test to be deleted and/or the tube to be deleted.
- If the last test of the request is deleted, the whole request will be deleted and a request deletion message is sent to the LIS database via the auto-rectube.

Tube calculation after order modification

When the modifications of the request cause a modification of the necessary tubes for this request (based on the filling rate of tubes defined in the **Tests** dictionary), the processing mechanism ensures that the labels previously printed are not discarded, erased, or overwritten, and additional labels can be printed, if needed.


Update of Tube
Is it HTC flow*?
N
Call the Current Tube Recalculation Method
Y
Is there at least One Test?
N
Provide an Error if no test is associated with the request
END
Y
* HTC flow = Order Reception flow with Test modification allowed
Check the first Test in the list
A
Is this an Additional Test?
Y
Is Addition of Test allowed?
Y
Find the appropriate Tube Types for the Test
Can the Test be associated with an existing tube in the prescription
N
Create a new Tube. Add the newly created tube to the list of previously created tubes and mark it as Inserted
B
N
Y
N
Is this Test for Deletion
N
Is there no more Test?
N
Go to the next Test
A
Y
END
Y
Process if the collection volume (filling rate) needs to be adjusted
Mark the Tube as Updated
B
N
Is Deletion of Test allowed
Y
N
Find the tube to which it is associated
N
Is the test associated with a tube
Y
Check that the tube has no more tests associated with it
Is there any test associated with the tube
Y
Mark the tube as Deleted
Tube Calculation
for Order Reception flow
(supporting order modifications)

Modification of OML orders in Order Reception flow with Auto-PSR/Manual PSR

OML messages are managed by TDNexLabs from V01.21 and TD-Synergy from V12.21

It is possible to enable updates (addition/deletion of tests) from a Host, for requests with already collected and received samples.

Note that Auto-rectube parameters are not set (Automatic activation parameters)

Addition/deletion of tests

The requested modification is processed if:

a. The collection date of the request to be modified (from the database) matches the collection date in the message.

b. The difference between the current system date/time and the request creation date/time is less than or equal to the period of time specified in the related device property.

Note: The date/time of a request creation is retrieved first from ORC-15. If ORC-15 has no value, the algorithm retrieves the request creation date from database. (SP_REQUESTS.REQDATE).

The following cases can be met:

Scenario	Is tube associated with test already collected?	Time allowed to test Addition /Deletion > 0	Collection date of request == Collection date of message (see *)	Difference between system date and time and request creation date and time =< Time allowed for test addition/deletion	Is test modification allowed?
1	NO	N/A*	N/A	N/A	YES
2	YES**	N/A	N/A	N/A	NO
3	NO	NO	N/A	N/A	NO
4	NO	YES	NO	N/A	NO
5	NO	YES	YES	NO	NO
6	NO	YES	YES	YES	YES

* Only dates are compared, the time may be different - N/A = Not applicable

** Applies to manual PSR/auto-PSR

Addition of tests

- If addition of test is requested and test modification is allowed, the following algorithm applies:
  - If the test can be associated with a tube, then check if the filling rate needs to be increased.

- If the filling rate increases, then a new label has to be printed otherwise no action will be done.
- If the test cannot be associated with a tube in the request, then a new tube with appropriate type will be created, and a new label has to be printed.
- Update the request with the new test being inserted, or new tube is inserted or modified.

Deletion of tests

- If deletion of test is requested and test modification is not allowed, no update will be done on the request if at least one tube is collected.
- If deletion of test is requested and test modification is allowed, the following algorithm applies:
  - First, search for a tube in the request for which this test is associated.
  - Check if the tube has no other associated test in addition to the one that must be deleted.
  - If there is no other test associated, then mark the tube as deleted, otherwise just delete the test and its association
  - Update the request taking into account the test to be deleted and/or the tube to be deleted.
- If the last test of the request is deleted, the whole request will be deleted.

Tube calculation after order modification

When the modifications of the request cause a modification of the necessary tubes for this request (based on the filling rate of tubes defined in the **Tests** dictionary), the processing mechanism ensures that the labels previously printed are not discarded, erased, or overwritten, and additional labels can be printed, if needed.

Message descriptions

Segment descriptions for ORM (Inbound / Outbound) order messages

This topic is intended for use by experienced installation and support engineers only. It lists the segments and fields supported in the exchange of messages.

- MSH - Message Header segment. Defines the type, the event of the message and indicates other information such as sender, receiver.
- EVT - Event Type segment. *Not used by this communication*.
- PID - Patient identification segment. Contains patient identification information exchanged between the sender and the receiver.
- PV1 - Hospitalization information segment. Contains hospitalization visit information exchanged between the sender and the receiver.
- ORC - Common Order Segment. Contains information necessary to create or update prescriptions.
- OBR - Observation request segment. Contains data related to the test request such as: Access number, Prescriber code…
- OBX - Observation / result segment. Contains data related to results.
- NTE - Notes and Comments. The message can contain NTE segments. The NTE segment contains comment data related to the previous segment. It can be placed underneath the following segments:
  - Patient (PID)
  - Request (either OBR or ORC but not both segments)

NOTE: NTE segment under the ORC segment is not compliant with the HL7 standard.

Note that:

- **TD** in the column header below stands for Technidata LIS.
- If the Technidata LIS codes are different from the HIS codes, then MAPPING TABLES are available for: Doctor codes, Location codes, Test codes, and Coded text codes.

MSH - Message Header Segment

Seq	HL7 field length	DT	HL7 field name	TD field name (if applicable)	TD supported length	Comments
1	1	ST	Field Separator	Used to parse the HL7 message	1	See related information below
2	4	ST	Encoding Characters	Used to parse the HL7 message	4	See related information below
3	180	HD	Sending Application	Used for message acknowledgment	180	Determines the Host connected. The content of this field is returned in MSH-5 for acknowledgment message.
4	180	HD	Sending Facility	Not supported	-	-
5	180	HD	Receiving Application	Used for message acknowledgment	180	Determines the receiving application.

6	180	HD	Receiving Facility	Not supported	-	-
7	26	TS	Date/Time Of Message	From V12.01: Message creation date and time format: YYYYMMDDHHMMSS	-	From TD-Synergy V12.01: If the received HL7 message is parsed with no formatting errors, the message date and time is stored in the database together with the created task to monitor the delay between message creation and the processing of the message, (MESSAGEDATE column of the JOBS table).
8	40	ST	Security	Not supported	-	-
9	13	CM	Message Type	Used to determine the message type	13	Determines the message type (Message type code + event code). See related information below
10	20	ST	Message Control ID	Used to identify the rejected message in case of error (task information)	20	-
11	3	PT	Processing ID	Not supported	-	-
12	60	VID	Version ID	Not supported	-	-
13	15	NM	Sequence Number	Not supported	-	-
14	180	ST	Continuation Pointer	Not supported	-	-
15	2	ID	Accept Acknowledgment Type	Not supported	-	-
16	2	ID	Application Acknowledgment Type	Not supported	-	-
17	3	ID	Country Code	Not supported	-	-
18	16	ID	Character Set	Not supported	-	-
19	250	CE	Principal Language Of Message	Not supported	-	-
20	20	ID	Alternate Character Set Handling Scheme	Not supported	-	-
21	10	ID	Conformance Statement ID	Not supported	-	-

MSH-1 / MSH- 2 Field Separator / Encoding Characters

Defines the message delimiters.

The first five-character set following the H character: |^~\& defines which field separators are used. The following ones are preferred:

- | = Field delimiter
- ^ = Component (i.e. subfield) delimiter
- ~ = Repeater delimiter. Separates occurrences of a field
- \ = Escape character
- & = Subcomponent delimiter

MSH-9 Message Type

Determines the message type (Message type code + event code).

- ORM : General order message (event O01)
- OMG : General clinical order message (event O19)

PID - Patient identification segment

The PID segment contains patient identification information exchanged between the sender and the receiver.

Seq	HL7 field length	DT	HL7 field name	TD field name (if applicable)	TD supported length	Comments
1	4	SI	Message counter	Not supported	-	-
2	20	CX	Patient ID	Not supported	-	-
3	250	CX	Patient Identifier List	Patient Number, and/or Alternate Patient Number	Max 20 Max 20	Both Patient Number and Alternate Patient number can be received in this field. See related information below.
4	20	CX	Alternate Patient ID - PID	Not supported	-	-
5	250	XPN	Patient Name	First name Surname Maiden name	Max 80 Max 80 Max 80	This field contains all patient names. It is repeatable and each element contains one name. The database can hold entries up to 80 characters - longer entries are truncated. Note that the lengths are also limited by the macros in the `.vmd` file (see related information below). See additional information below.
6	250	XPN	Mother's Maiden Name	Not supported	-	-
7	26	TS	Date/Time of Birth	Patient birth date	-	-

8	1	IS	Administrative Sex	Patient sex	-	This field is used for the patient sex. The only supported values are: F = Female M = Male O = Other U = Unknown
9	250	XPN	Patient Alias	Not supported	-	-
10	250	CE	Race	Patient ethnic origin	Max 40	See related information below
11	250	XAD	Patient Address	1st repetition (Primary address): 1st: Address 1st line	Max 65	Technidata LIS supports only one address per patient. Available from TDNexLabs from V02.00 1st address repetition contains the primary address. 2nd address repetition contains the Birth place. Only used on the French market. See **NOTE**.
				2nd: Address 2nd line	Max 65	
				3rd: City	Max 50	
				4th: State Province	Max 50	
				5th: Postal code	Max 20	
				6th: Country	Max 50	
				2nd repetition: 7th: Address type 9th: Birth of place	 3 5	
12	4	IS	County Code	Not supported	-	-
13	250	XTN	Phone Number - Home	Telephone number	Max 15	See related information below.
				Telephone 2	Max 15	
				Fax	Max 15	
				Email	Max 255	
14	250	XTN	Phone Number - Business	Not supported	-	-
15	250	CE	Primary Language	Not supported	-	-
16	250	CE	Marital Status	Not supported	-	-
17	250	CE	Religion	Religion	40 (for the evaluated <Religion Text>)	See related information below
18	250	CX	Patient Account Number	Not supported	-	-
19	16	ST	SSN Number - Patient	Not supported	-	-

20	25	DLN	Driver's License Number - Patient	Not supported	-	-
21	250	CX	Mother's Identifier	Not supported	-	-
22	250	CE	Ethnic Group	Not supported	-	-
23	250	ST	Birth Place	Not supported	-	-
24	1	ID	Multiple Birth Indicator	Not supported	-	-
25	2	NM	Birth Order	Not supported	-	-
26	250	CE	Citizenship	Not supported	-	-
27	250	CE	Veterans Military Status	Not supported	-	-
28	250	CE	Nationality	Not supported	-	-
29	26	TS	Patient Death Date and Time	Patient Death Date and Time		Available from TDNexLabs V01.52 See related information below
30	1	ID	Patient Death Indicator	Patient Death Indicator		Available from TDNexLabs V01.52 Used to indicate whether the patient is deceased. **Y** (yes) = the patient is deceased **N** (no) = the patient is not deceased. This field can be empty. See related information below
31	1	ID	Identity Unknown Indicator	Not supported	-	-
32	20	IS	Identity Reliability Code	Not supported	-	-
33	26	TS	Last Update Date/Time	Not supported	-	-
34	40	HD	Last Update Facility	Not supported	-	-
35	250	CE	Species Code	Not supported	-	-
36	250	CE	Breed Code	Not supported	-	-
37	80	ST	Strain	Not supported	-	-
38	250	CE	Production Class Code	Not supported	-	-

PID-3 Patient identifier list field

For each component, the Assigning Facility should be transmitted.

> **Example**: 403O^^^N^FACILITY1~261055502^^^060^FACILITY2
> FACILITY1and FACILITY2 identify each identification type.
> 403O, 261055502 are the identification ID for each identification.

The Patient identifier list field contains all patient identifications.

The inbound script for PID-3 must be updated if the site uses different identifier for PATNUMBER and ALTNUMBER

For example, assume the following representation:

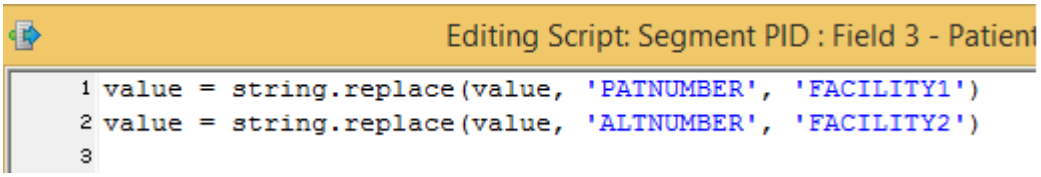
FACILITY1 = PATNUMBER

FACILITY2 = ALTNUMBER

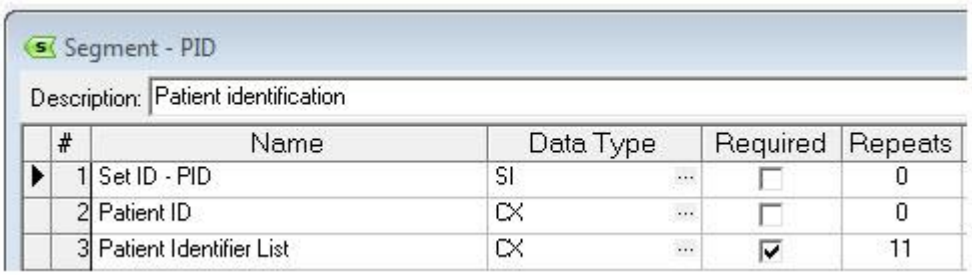
Inbound Script must be updated as follows:

```
varPATNUMBER_IdentifierCode = 'FACILITY1'
varALTNUMBER_IdentifierCode = 'FACILITY2'

for LineIndex in range(0, field.count_of_repeat()):
    if field.repeat_field(LineIndex).subfield(4).value == varPATNUMBER_IdentifierCode:
        field.repeat_field(LineIndex).subfield(4).value = 'PATNUMBER'
    elif field.repeat_field(LineIndex).subfield(4).value == varALTNUMBER_IdentifierCode:
        field.repeat_field(LineIndex).subfield(4).value = 'ALTNUMBER'
    log(field.repeat_field(LineIndex).subfield(4).value)
```

Outbound Script must be updated as follows:



The list is repeatable and each element contains one identification. By default, the maximum number of repeats is ten. However, more repeats can be accommodated by adjusting the value of the repeats for the PID segment in the VMD file as shown in the figure:



PID-5 Patient name field

Components: In Version 2.3, replaces the PN data type.

<family name (FN)> ^ <given name (ST)> ^ <second and further given names or initials thereof (ST)> ^ <suffix (e.g., JR or III) (ST)> ^ <prefix (e.g., DR) (ST)> ^ <degree (e.g., MD) (IS)> ^ <name type code (ID) > ^ <name representation code (ID)> ^ <name context (CE)> ^ <name validity range (DR)> ^ <name assembly order (ID)>

Subcomponents of family name: <family name (ST)> & <own family name prefix (ST)> & <own family name (ST)>

& <family name prefix from partner/spouse (ST)> & <family name from partner/spouse (ST)>

This field contains all patient names. It is repeatable and each element contains one name.

Each name is identified by a type code:

From TDNexLabs V02.01: First names and Alternate first names are received, saved, and transmitted. The names mapped are dependent on the property *Always use birth name as legal name.*

1. When the property *Always use birth name as legal name i*s set to: ***false***

NOTE: For Cases 1 and 3 - Legal names are country-specific and dependent on different legal system requirements.

Case 1:

When Legal name is used:

L is mapped to NAME, M is mapped to MAIDENNAME

The name field contains the Legal name.

|SMITH^Kate^Kate Kat^^MRS^^**L**~WALTER^^^^MRS^^**M|**

Name = SMITH

Maiden name= WALTER

First name= Kate

Alternate First Name = Field empty

Given names = Kate Kat

NOTE: When married name is considered as legal name, set *Use birth name as legal name* to **false**.

Case 2:

This case represents the most common configuration in France.

When Alternate Name is provided it is mapped. Alternatively, the Legal name is used.

L is mapped to either ALTERNATENAME***** (if provided), or Legal name & D is mapped to NAME

Example: |WALTER^Kate^Kate Kat^^MRS^^**L**~SMITH^Kat^^^MRS^^**D**|

Name = SMITH

Maiden name= WALTER

First name= Kate

Alternate first name = Kat

Given names = Kate Kat

*****MAIDENNAME

2. When the property *Always use birth name as legal name i*s set to: **true**

Case 3:

If the Maiden Name is provided, it is mapped to Name. Alternatively, the Legal name used.

L is mapped to Alternate name (if provided) or Birth name, M is mapped to Legal name if the Alternate Name exists. Alternatively, the field is empty.

| WALTER^Kate^Kate Kat^^MRS^^**L**~SMITH^^^^MRS^^**M**|

Name = SMITH

Alternate name= WALTER

First name= Kate

Alternate first name= <empty>

Given names = Kate Kat

Case 4:

This case reflects target configuration in France.

Name is mapped to Legal name and Alternate name is mapped to a Alternate name.

Example: |SMITH^Kate^Kate Kat^^MRS^^**L**~WALTER^Kat^^^MRS^^**D**|

Name = SMITH

First name= Kate

Alternate name = WALTER

Alternate first name = Kat

Given names = Kate Kat

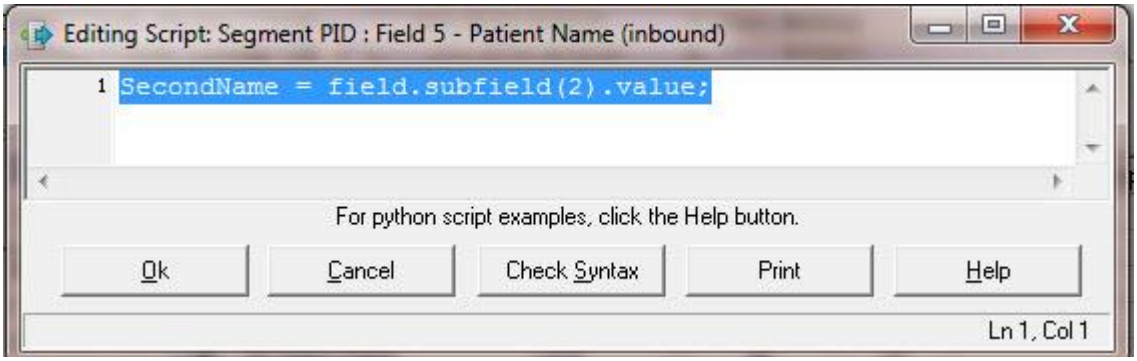
Equivalent French/English terminology:

English	French
Birth name	Nom de naissance
Alternate surname	Nom d'usage
First name	Premier prénom de naissance
Given names	Prénoms de naissance
Alternate first name	Prénom utilisé

To store PID-5.3 second and further given names

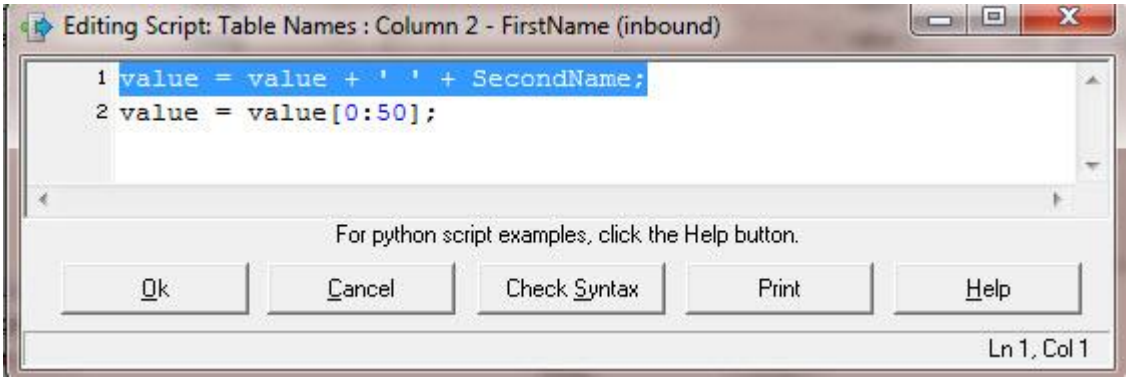
This section is for inbound messages only.

3. Enter this Inbound script for “Segment PID : Field 5 – Patient name”: `SecondName = field.subfield(2).value;`



4. Enter this Inbound script for “Table Names: Column 2 – FirstName”:

```
value = value + ' ' + SecondName;
value = value[0:50];
```

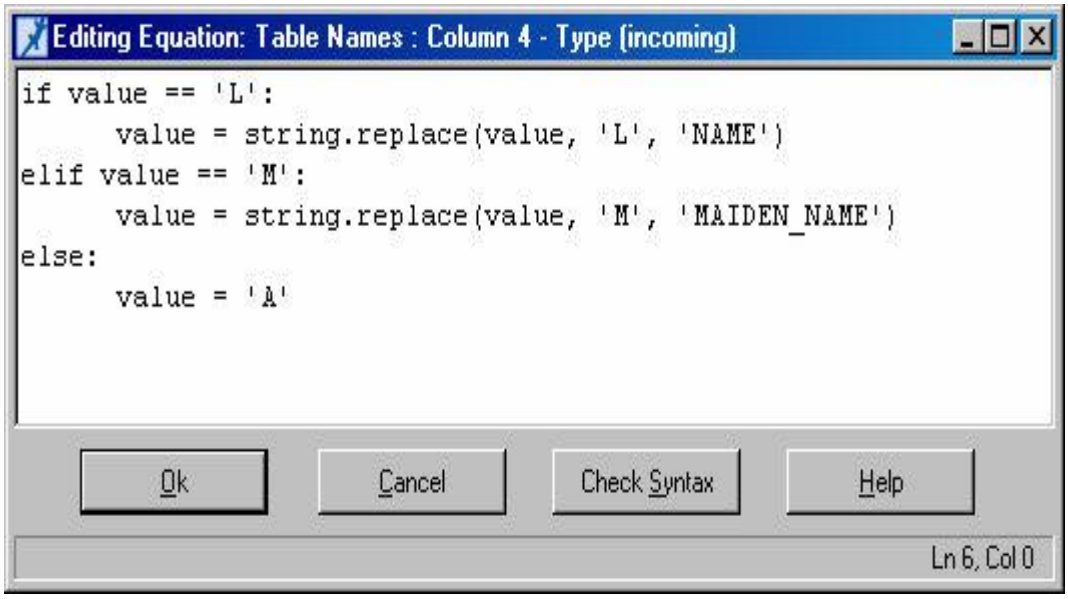


Note that the second line is already an existing inbound script. Concatenate first the SecondName before truncating it to the maximum number of characters.

Association between Host patient name type codes and LIS database patient names

On Chameleon, there is an association between the Host patient name type codes and the two LIS database patient names.

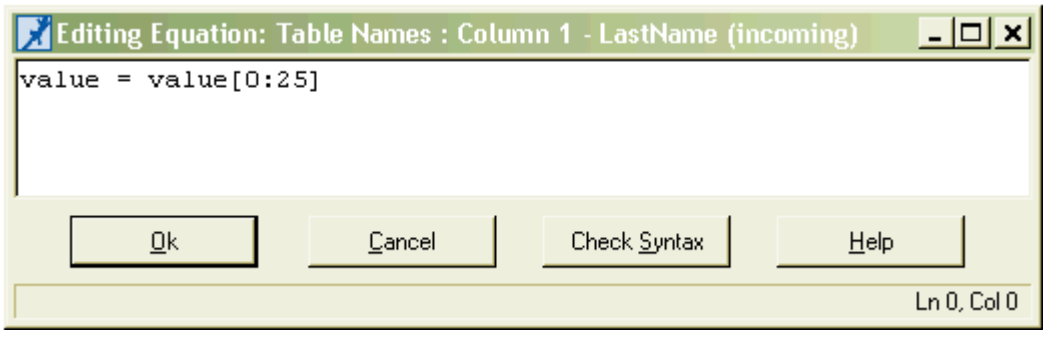
This association can be changed by the Field Service Engineer during the installation of this communication, using python scripting in the Chameleon Names table:



Depending on the site (first installation or update), the `HL7.vmd` file must be adapted as described below. The length of the patient name, that is to say, last name and first name must be truncated in accordance with the values defined on the database.

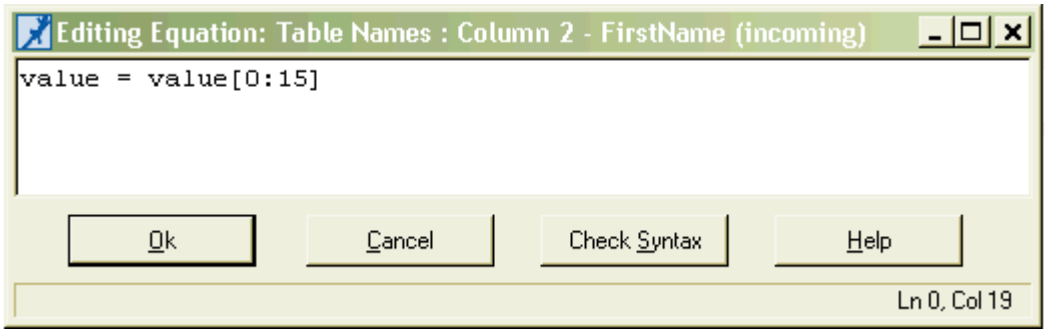
NAME Possible sizes: 25 or 60 characters max.

If required, adapt the `HL7.vmd` file by adding a macro python incoming (incoming = "in Equation") to the column LASTNAME of the NAMES table, as described in the example below (example with length=25):



FIRSTNAME Length: 15 characters max.

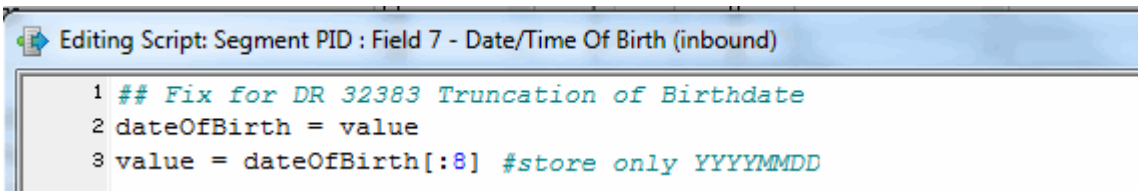
Modify the `HL7.vmd` file by adding a macro python incoming (incoming = "in Equation") to the column FIRSTNAME of the NAMES table, as described in the example below:



This modification must be performed if the delivered `HL7.vmd` file has been adapted on site in order to answer specific needs.

PID-7 Date/Time of Birth

Stores date of birth. Only date is saved in the database (YYYYMMDD). If time of birth is included (HHMMSS), the time is truncated before saving the date in the database. For example, 20090326101010 is saved as 20090326. If the HIS sends time, the following should be set in the Inbound Script of Segment PID : Field 7



PID-10 Patient Race

Components: in Version 2.3, Race fields are defined as follows: <Race Identifier (ID)> ^ <Race Text (ST)> ^….etc…(other components not used)

This field contains the Race information (ethnic origin of the patient) that has an identifier field.

Example valid HL7 message for PID-10:

- |Race_ID^Hispanic^^^|
- |Race_ID^Hispanic|
- |Hispanic|
- |^Hispanic|

All examples above are handled by chameleon with a script when assigning data to the fields. The case for example (c) has data only for the Race field and no ID is present in the HL7 message. The script performs a check to see if there is actual data for the Race field, if none then the script will use the value in component <Race Identifier> as the value for <Race Text>.

PID-11 - Patient address

NOTE: If the property **Manage INS identifier** is set to **Yes** in the **Devices** dictionary in **Reception of patient demographics** stream for order and ADT communications, PID.11 contains the birth place:
PID. 11.7 - Address type is set to BDL when the birth place is available
PID.11.9 - Code of birth place. 58001 in France (= code INSEE). For people who are not born in France, the code will correspond to the country birth place.

In order that the INS number is processed, the property **Patient identification with French INS number (0=No, 1=Yes in AltPat#, 2=Yes in INS data)** must be set to **1** or **2** in the **Configuration** (USE) window > **General** section.

PID-13 Patient phone numbers (Home)

Components:

[NNN] [(999)]999-9999 [X99999] [B99999] [C any text] ^ <telecommunication use code (ID)> ^ <telecommunication equipment type (ID)> ^ <e-mail address (ST)> ^ <country code (NM)> ^ <area/city code (NM)> ^ <phone number (NM)> ^ <extension (NM)> ^ <any text (ST)>

This field contains all patient's phone numbers. This field is repeatable and each element contains one phone number. Each phone number can be identified by a phone type code (Subfield 3) : "TELEPHON", "TELEPHON2", "FAX", "EMAIL". E.g., `9993743839^^TELEPHON~542365^^TELEPHON2`

In Chameleon, there is an association between the Host phone type codes and the LIS database phones.

This association can be changed by the Field Service Engineer during the installation of the communication, using python scripting in the chameleon Telephones table :

Data	Telecommunication equipment type (ID)
Telephone	PH (Telephone)
Telephone 2	CP (Cellular phone)
Fax	FX (Fax)
Email address	Internet (Internet address)

If the type of phone is not specified, the phone number is not integrated in the Technidata LIS database.

If no phone type code is sent by the host, and if there is only one phone number in the flow, the type 'TELEPHON' can be associated by default with the phone number.

PID-17 Patient Religion

Components: in Version 2.3, Religion fields are defined as follows: <Religion Identifier (ID)> ^ <Religion Text (ST)> ^….etc…(other components not used)

This field contains the Religion information of the patient and has an identifier field.

Example valid HL7 message for PID-17:

- |Religion_ID^Orthodox^^^|
- |Religion_ID^Orthodox|
- |Orthodox|
- |^Orthodox|

All examples above are handled by chameleon with a script when assigning data to the fields. The case for example (c) has data only for the Religion field and no ID is present in the HL7 message. The script performs a check to see if there is actual data for the Religion field, if none then the script will use the value in component <Religion Identifier> as the value for <Religion Text>.

PID-29 Patient Death Date and Time
PID-30 Patient Death Indicator

Available from TDNexLabs V01.52

If PID-29 has a value and PID-30 has a value of **N**, patient is not deceased.

If PID-29 has a value and PID-30 has a value of **Y** and PID-29 **>** PID-7, patient is deceased.

If PID-29 has a value and PID-30 is empty and PID-29 **>** PID-7, patient is deceased.

If PID-29 is empty and PID-30 has a value, patient is not deceased.

The patient's date of death is updated when the following conditions are satisfied:

- PID-29 has a valid date value
- PID-30 has a value of Y
- The date in PID-29 is later than the patient's date of birth (in PID-7)

PV1 - Patient visit information

Seq	HL7 field length	DT	HL7 field name	TD field name (if applicable)	TD supported length	Comments
1	4	SI	Message counter	Not supported	-	-
2	1	IS	Patient Class	Visit patient class	1	This field is managed as the Visit patient class (Inpatient, Outpatient, …) by the communication.
3	80	PL	Assigned Patient Location	Reference Location ID (subfield 1)	See **Note** below	This field contains the location where the patient is currently staying. This field can contain the **National code** of the location (if enabled on the LIS Device dictionary, **Use National Code for location identification** property=Yes). Otherwise, this field contains the mnemonic code of the location. If the **Use National Code for location identification** property = **Yes**, and the location is DEFLOC without assigned **National Code**, DEFLOC will always be sent. Reference Location ID value is saved in PATIENTS.REFLOCATION. The corresponding LOCID for the PATIENTS.REFLOCATION is saved in HOSPITALIZATIONS.LOCID. Room number value is saved in HOSPITALIZATIONS.ROOMNUMBER.
				Room number (subfield 2)	Max 6, but 20 in database	
4	2	IS	Admission Type	Not supported	-	-
5	250	CX	Preadmit Number	Not supported	-	-
6	80	PL	Prior Patient Location	Not supported	-	-

7	250	XCN	Attending Doctor	Attending doctor	See **Note** below	This field is managed as the attending doctor by the communication. This field can contain the **National code** of the doctor (if enabled on Technidata LIS Devices dictionary, **Use National Code for doctor identification** property=Yes). Otherwise, this field contains the mnemonic code of the doctor. If the **Use National Code for doctor identification** property = **Yes**, and the doctor is DEFDOC without assigned National Code, DEFDOC will always be sent.
8	250	XCN	Referring Doctor	Reference doctor	See **Note** below	This field is managed as the Patient reference doctor (Family Doctor) by the communication. This field can contain the **National code** of the doctor (if enabled on Technidata LIS Devices dictionary, **Use National Code for doctor identification** property=Yes). Otherwise, this field contains the mnemonic code of the doctor. If the **Use National Code for doctor identification** property = **Yes**, and the doctor is DEFDOC without assigned National Code, DEFDOC will always be sent.
9	250	XCN	Consulting Doctor	Consulting doctor	See **Note** below	This field can contain the **National code** of the doctor (if enabled on Technidata LIS Devices dictionary, **Use National Code for doctor identification** property=Yes).. Otherwise, this field contains the mnemonic code of the doctor. If the **Use National Code for doctor identification** property = **Yes**, and the doctor is DEFDOC without assigned National Code, DEFDOC will always be sent.
10	3	IS	Hospital Service	Hospital service	-	This field is managed as the Visit hospital service (Medical discipline, e.g., Cardiology) by the communication.
11	80	PL	Temporary Location	Not supported	-	-
12	2	IS	Preadmit Test Indicator	Not supported	-	-

13	2	IS	Re-admission Indicator	Not supported	-	-
14	6	IS	Admit Source	Not supported	-	-
15	2	IS	Ambulatory Status	Not supported	-	-
16	2	IS	VIP Indicator		-	This field is managed as the Patient VIP by the communication. See further information in related field below.
17	250	XCN	Admitting Doctor	Admitting doctor	See **Note** below	This field is managed as the Visit admitting doctor by the communication. This field can contain the **National code** of the doctor (if enabled on Technidata LIS Devices dictionary, **Use National Code for doctor identification** property=Yes). Otherwise, this field contains the mnemonic code of the doctor. If the **Use National Code for doctor identification** property = **Yes**, and the doctor is DEFDOC without assigned National Code, DEFDOC will always be sent.
18	2	IS	Patient Type	Not supported	-	-
19	250	CX	Visit Number	Hospitalization Number	Max 15	This field is managed as the Hospitalization number by the communication. It is defined In the **Configuration** window > **Properties** dialog, by the following property: **Duplicate stay numbers are allowed (0=No 1=Yes)**. This property must be set to 1 if Hospitalization numbers are not unique. The default value is 0. The original Hospitalization number is stored in the EXTERNALHOSNUM field in the Hospitalization table.
20	50	FC	Financial Class	Hospitalization financial class (subfield 1) Date when the financial class is taken into account (subfield 2)	-	-

21	2	IS	Charge Price Indicator	Not supported	-	-
22	2	IS	Courtesy Code	Not supported	-	-
23	2	IS	Credit Rating	Not supported	-	-
24	2	IS	Contract Code	Not supported	-	-
25	8	DT	Contract Effective Date	Not supported	-	-
26	12	NM	Contract Amount	Not supported	-	-
27	3	NM	Contract Period	Not supported	-	-
28	2	IS	Interest Code	Not supported	-	-
29	1	IS	Transfer to Bad Debt Code	Not supported	-	-
30	8	DT	Transfer to Bad Debt Date	Not supported	-	-
31	10	IS	Bad Debt Agency Code	Not supported	-	-
32	12	NM	Bad Debt Transfer Amount	Not supported	-	-
33	12	NM	Bad Debt Recovery Amount	Not supported	-	-
34	1	IS	Delete Account Indicator	Not supported	-	-
35	8	DT	Delete Account Date	Not supported	-	-
36	3	IS	Discharge Disposition	Not supported	-	-
37	25	CM	Discharged to Location	Not supported	-	-
38	250	CE	Diet Type	Not supported	-	-
39	2	IS	Servicing Facility	Not supported	-	-
40	1	IS	Bed Status	Not supported	-	-
41	2	IS	Account Status	Not supported	-	-
42	80	PL	Pending Location	Not supported	-	-
43	80	PL	Prior Temporary Location	Not supported	-	-

44	26	TS	Admit Date/Time	Admission Date Time	-	This field is managed as the Admission Date / Time of the hospital stay.
45	26	TS	Discharge Date/Time	Discharge Date Time	-	This field is managed as the Discharge Date / Time of the hospital stay.
46	12	NM	Current Patient Balance	Not supported	-	-
47	12	NM	Total Charges	Not supported	-	-
48	12	NM	Total Adjustments	Not supported	-	-
49	12	NM	Total Payments	Not supported	-	-
50	250	CX	Alternate Visit ID	Not supported	-	-
51	1	IS	Visit Indicator	Not supported	-	-
52	250	XCN	Other Healthcare Provider	Not supported	-	-

NOTE: Code length supported for Doctors and Locations:
- Mnemonic code = 6 (10 in database)
- Host code = 5 (6 in database)
- National code = 11 (20 in database)

For the management of unknown doctors or locations received in this segment, refer to *Define settings in the Doctors/Locations dictionary paragraph.*

PV1-16 VIP Indicator

This field is managed as the Patient VIP and the Patient Secret Result by the communication protocol.

But it is possible to manage either the Patient VIP or the Patient Secret Result, if needed. Then, the information to be managed in this field can be indicated by the FSE during the communication installation using the Chameleon mapping logic on the Patient table.

In Chameleon, there is an association between the different values of Patient VIP on the LIS database (Yes or No) and HL7 code. This association can be changed by the Field Service Engineer during the communication installation using python scripting in the Chameleon Patient table.

Data (VIP)	PV1-16 VIP Indicator
1 (yes)	Yes
0,null (no)	No

ORC - Common order segment

Seq	HL7 field length	DT	HL7 field name	TD field name (if applicable)	TD supported length	Comments
1	2	ID	Order Control	Order control	Max 2	**NW** (New order), causes the creation of the Test Order. **CA** (Cancel order), causes the cancelation/deletion of the order if the

						associated specimen are not yet received at the laboratory. **OC** (Order Canceled), same as CA but does not require acknowledgement. **SC** (Status Change) for sample status. Generates an ORM 'Status Change' message to the Host when a sample is "collected" or "received at the laboratory". See details in Status change management paragraph. **UC** (Unable to Cancel), See details in Order cancellation requested by the HIS.
2	20	EI	Placer Order Number	PON (if managed by the Order Placer system)	Max 20	The PON must be 20 characters long maximum and is stored in SP_TESTS and TESTS tables. This field is also transmitted during SC transmission. See related information, below.
3	22	EI	Filler Order Number	FON	Max 20	This field is also transmitted during SC transmission. See related information, below
4	22	EI	Placer Group Number	LIS Access# or Host Order Number	Max 11	This field supports the HON (Host Order Number), also called: Placer Group Number or External order number. The HON is limited to 11 characters when it is transmitted and used on the Technidata LIS database for result identification. This field is **mandatory** to get a real update of the collection date and time. This field is also transmitted populated during SC transmission. See related information, below. For TDNexLabs from V01.41 (also in V01.22): The Host order number (HON) sent in this field can be managed on 22 characters maximum (instead of 11). To be customized according to the HON size used on site. See **Note A**
5	2	ID	Order Status	Not supported	-	-
6	1	ID	Response Flag	Not supported	-	-
7	200	TQ	Quantity/Timing	Collection date and time in subfield 4	-	**ORC-7.4** This field contains the Collection date and time (Start date/time). If the specimen is "To Be collected", this field

						indicates the date and time when it should be collected. This date is mandatory. The value of this field is retrieved from SP_REQUESTS.COLLECTIONDATE. Value after sample reception: - When the request has 1 sample: SP_REQUESTS.COLLECTIONDATE = SP_TUBES.COLLECTIONDATE - When the request has 2 or more samples: SP_REQUESTS.COLLECTIONDATE = COLLECTIONDATE of the first sample Note that if the **Flag the collection date as being temporary** device property is set to **Yes**, the collection date/time will be identified as a temporary collection date (SP_REQUESTS.COLLDATESTATUS=4) See also related information below
8	200	CM	Parent	Not supported	-	-
9	26	TS	Date/Time of Transaction	Not supported	-	
10	250	XCN	Entered By	Not supported	-	-
11	250	XCN	Verified By	Not supported	-	-
12	250	XCN	Ordering Provider	Ordering Doctor	See **Note** below	This field can contain the **National code** of the doctor (if enabled on the LIS Device dictionary, **Use National Code for doctor identification** property=Yes). Otherwise, it contains the mnemonic code of the doctor (Dr1). If the **Use National Code for doctor identification** property = **Yes**, and the doctor is DEFDOC without assigned National Code, DEFDOC will always be sent. This field should be identical to the OBR-16 field.
13	80	PL	Enterer's Location	Requesting Location	See **Note** below	This field can contain the **National code** of the location (if enabled on the LIS Device dictionary, **Use National Code for location identification** property=Yes). Otherwise, it contains the mnemonic code of the location (CR). If the **Use National Code for location identification** property = **Yes**, and if the location is DEFLOC without assigned

						National Code, DEFLOC will always be sent. Requesting Location is saved in SP_REQUESTS.SP_LOCCODE. See related information below. From TDNexLabs V01.61: The site associated with this Location code can be used to calculate the workstation code for order reception. For more details see Management of Workstation code in order messages.
14	250	XTN	Call Back Phone Number	Test order comment	Max 2000	As there is no dedicated field in the LIS database to store this information, the content of this field is stored in **Clinical Details** field (RCO).
15	26	TS	Order Effective Date/Time	Order date	-	Request date/time, i.e. system date/time when the request record was created. See related information below.
16	250	CE	Order Control Code Reason	Not supported	-	-
17	250	CE	Entering Organization	Not supported	-	-
18	250	CE	Entering Device	Not supported	-	-
19	250	XCN	Action By	Not supported	-	-
20	250	CE	Advanced Beneficiary Notice Code	Not supported	-	-
21	250	XON	Ordering Facility Name	Requesting laboratory		This field can contain the Source Laboratory Code and is used as a Station Code for order reception if Requesting Location is not available. Requesting Laboratory is saved in SP_TESTS.SP_STNCODE From TDNexLabs V01.61: The site associated with this Laboratory code is used to calculate the workstation code for order reception. The workstation code is saved in SP_TESTS.SP_STNCODE For more details see Management of Workstation code in order messages.
22	250	XAD	Ordering Facility Address	Not supported	-	-

23	250	XTN	Ordering Facility Phone Number	Not supported	-	-
24	250	XAD	Ordering Provider Address	Not supported	-	-
25	250	CWE	Order Status Modifier	Not supported	-	-

NOTE A: ORC-4 - For TDNexLabs from V01.41 (also in V01.22)
For sites already using the HON with its previous size limitation, they can continue printing the HON from the Real-time reports without any change.
Print keywords @HOSTORDNUM, @HOSTID, @CNXTUB are updated to manage the HON with size up to 22 characters.
Delivery reports on unix (e.g., `COM11.rpw`) are not modified and length is still up to 11 to not erase data present after keyword. To manage the HON up to 22 characters, a keyword alias must be created in the `.rpw` file.
Example for CNXTUB keyword to manage a HON on 15 characters:

```
  @CNXTUB = @CNXTUB ( 15, 1, ' ' )
@HOSTORDNUM = @HOSTORDNUM ( 15, 1, ' ' )
@HOSTID = @HOSTID ( 15, 1, ' ' )
```

NOTE: Code length supported for Doctors and Locations:
- Mnemonic code = 6 (10 in database)
- Host code = 5 (6 in database)
- National code = 11 (20 in database)

For the management of unknown doctors or locations received in this segment, refer to Define settings in the Doctors/Locations dictionary paragraph.

For the management of Workstation codes deducted from the **Location** information received in the **ORC-13** field, refer to Management of Workstation code in ORM messages

ORC-2 Placer Order Number (PON)
ORC-3 Filler Order Number (FON)
ORC-4 Placer Group Number (HON)

This section provides further information about the management of the PON by the Technidata LIS in HL7 result transmission. It is defined in the Device dictionary by the **Management of PON** property (Yes=enabled, No=disabled).

Management of PON	Only one item per message	ORC2 (Placer Order Number)	ORC3 (Filler Order Number)	ORC4 (Placer order group number)
YES	YES	PON (see Note)	FON	Host Order Number if exists, Full Accessnumber if not
YES	NO	PON (see Note)	FULL ACCESSNUMBER	Host Order Number if exists, Full Accessnumber if not
NO	YES	PON if present on database,	FON	Host Order Number if exists, Full Accessnumber if not

		Empty if not found (no error generated).		
NO	NO	PON if present on database, Empty if not found (no error generated).	FULL ACCESSNUMBER	Host Order Number if exists, Full Accessnumber if not

NOTE:
- When the **Management of PON** property is set to YES and the PON is not found on the database, the task is set to “error” status and the result message is not transmitted.
- When the **Management of PON** property is set to NO and the FON is not found on the database, the task is set to “error” status and the result message is not transmitted.
See the diagram illustrating the algorithm used for the PON/FON management.
To ensure that the Host Order Number received in ORC-4 is transmitted to the LIS database (internal communication via ASTM), the Web module rectube process must be installed. The following properties in the **Connections** dictionary (DCX), **Data flow control** folder must be set as indicated:
Requests processed by tube = **No**
Management of Tube number = **Yes**
See also *ASTM: Order reception (ORM message)* interface specification (CNXR021) and *ASTM protocol applied to the Web module* interface specification (CNXL040).

ORC-4 Placer Group Number

Multiple non unique PGN’s in the ORC segment of a single message will also generate the same number of requests in the Technidata LIS.

Example of ORM message:

```
MSH|^~\&|HIS||LIS||20100321113823||OMG^O19|9916454877201003211138 23|P|2.4
PID|||9452353^^^^PATNUMBER||PATIENT^TEST^^^^^L~A^^^^^^M||19800829|F
PV1||1|DEFLOC^388||||DEFDOC|DEFDOC|||||||||DEFDOC||1110039626
0|||||||||||||||||||||||||20100320202600
ORC|NW|1645501||7774478001|||||||DEFDOC|DEFLOC||20100321113700
OBR|1|16452501||GLU^GLUCOSE|||||||A|||||DEFDOC||||||||||^^^^^R
ORC|NW|1645502||7774478001|||||||DEFDOC|DEFLOC||20100321113700
OBR|2|16452502||CA^CALCIUM|||||||A|||||DEFDOC||||||||||^^^^^R
ORC|NW|1645503||7774478002|||||||DEFDOC|DEFLOC||20100321113700
OBR|3|16452503||K^POTASSIUM|||||||A|||||DEFDOC||||||||||^^^^^R
```

For this example two requests will be created.

For **HL7 Order reception**, add a custom mapping for Request.Field5 by following the procedure in Access number managed by HIS.

ORC-7 (Quantity/Timing)

Contains the following sub-fields:

ORC-7.1 Quantity (transmission)

ORC-7.4 Start Date/Time - Supported by Technidata LIS and contains the Collection date/time. See below

ORC-7.6 Priority

ORC-7.4 Collection date / ORC-15 Order date/time

ORC-7.4 (Collection date) and **ORC-15** (Order date/time) fields can be used to generate the Access number.

Reminder: How the ACCESSNUMBER is generated:

1. If the **Access number** is present in the message and properly mapped in the VMD file, the length of the Access number is checked.
   - If it is greater than or equal to 10, it is used as the Access number.
   - If it is less than 10 or empty it is compared with the **Reduced access number** length defined in the **Configuration** window. The Access number from the message must be less than the reduced access number, otherwise it will generate an error.
   - If it is less than the Reduced access number:
     – the system calculates the Access number using the **Collection Date** (ORC-7.4) and the RedAccNum.
     – If the Collection Date is not present, the **Order Date** (ORC-15) is used instead.
     – If the Collection Date and Order Date are not present, the current date will be used instead
2. If the **Access number** is empty, the same process as described above is applied.

OBR - Observation request segment

Seq	HL7 field length	DT	HL7 field name	TD field name (if applicable)	TD supported length	Comments
1	4	SI	Message counter	Not supported	-	-
2	22	EI	Placer Order Number	PON (if managed by the Order Placer system)	Max 20	Same as ORC-2 field. If this information is present in the ORC segment, then it is ignored in the OBR segment. This field is also transmitted during SC transmission (Status Change).
3	22	EI	Filler Order Number	FON	Max 20	Same as ORC-3 field. If this information is present in the ORC segment, then it is ignored in the OBR segment. This field is also transmitted populated during SC transmission.
4	250	CE	Universal Service Identifier	Test Code^Test Abbreviated text^L	Test Code - Max 10 Test Abbreviated text - Max 20	The first subfield contains the mnemonic code and the second subfield contains the abbreviated text of the test. See related information below.
5	2	ID	Priority - OBR	Not supported	-	-
6	26	TS	Requested Date/Time	From V11.82: Yes For earlier versions: No	-	Contains the request date if ORC-1 is **OC** (Order Canceled).

7	26	TS	Observation Date/Time #	Yes	-	Contains the tube collection date if ORC-1 is **SC** (Status Change). The value is retrieved from SAMPLES.COLLECTIONDATE. For combined tests linked with multiple samples, the collection date of the 1st sample is used. From V11.82: Contains the request collection date if ORC-1 is **OC** (Order Canceled). For TDHisto/Cyto product only (from V13.21) The value of OBR-7 is saved in SP_TUBES.COLLECTIONDATE
8	26	TS	Observation End Date/Time #	Yes	-	-
9	20	CQ	Collection Volume	Not supported	-	-
10	250	XCN	Collector Identifier	Collector code	Max 8	This field is managed as the Specimen Collector Code
11	1	ID	Specimen Action Code	Action code	-	The Technidata LIS only manages the **A** (Added test) and **R** (Revised Order) action codes. See related information, below
12	250	CE	Danger Code	Not supported	-	-
13	250	ST	Relevant Clinical Information	Prescription comment	Max 2000	The content of this field is stored in Clinical Details field (**RCO**) on the LIS database for the first OBR segment of the test order.
14	300	TS	Specimen Received Date/Time	Yes	-	When ORC-1 is **SC** (Status Change) and the tube status has changed from 'collected' to 'received at the laboratory', this field contains the date when the sample is received in the laboratory. The value is retrieved from SP_TUBES.LABRECEPTIONDATE From V11.82: When ORC-1 is **OC** (Order Canceled) , this field contains the request received date. In V11.82, and from V12.01: When ORC-1 is SC (Status Change) and UC (Unable to Cancel), and the sample is received through PSR (Primary Sample Reception), this

						field contains LABRECEPTIONDATE column value of SP_TUBES table. Note that second part of this date value is truncated. When a sample is received via Rectube, this field contains an empty date value. Note that you are advised not to use Rectube from V11.81 and higher.
15	26	CM	Specimen Source	Collection source parameter code in Subfield 1		Value stored as coded text type result of the complementary parameter defined in the **Collection source parameter code** property of the HL7 Order reception device.
				Topography parameter code in Subfield 4		Value stored as coded text type result of the complementary parameter defined in the **Topography parameter code** property of the HL7 Order reception device.
16	300	XCN	Ordering Provider	Prescriber code	See **Note** below	The first subfield contains doctor code of the Prescriber (Dr1 in DCR). This field can contain the **National code** of the doctor (if enabled on the LIS Devices dictionary, **Use National Code for doctor identification** property=Yes). Otherwise, it contains the mnemonic code of the doctor. If the **Use National Code for doctor identification** property = **Yes**, and the doctor is DEFDOC without assigned National Code, DEFDOC will always be sent.
17	250	XTN	Order Callback Phone Number	Not supported	-	-
18	60	ST	Placer Field 1	User Field #1	-	From V11.81: Contains the **User Field 1** value (25 characters long) received from HIS.
19	60	ST	Placer Field 2	User Field #2	-	From V11.81: Contains the **User Field 2** value (25 characters long) received from HIS.
20	60	ST	Filler Field 1 +	Not supported	-	-
21	60	ST	Filler Field 2 +	Not supported	-	-
22	26	TS	Results Rpt/Status Chng - Date/Time +	Not supported	-	-
23	40	CM	Charge to Practice +	Not supported	-	-

24	10	ID	Diagnostic Serv Sect ID	V11.61.E and from V11.81: Service ID (subfield 1) From V11.82: Group of chapters (subfield 2) Chapter number (subfield 3) Test printing rank number (subfield 4)	Service ID - Max 20	See related information below. Only used when ORC-1 is **OC** (Order Canceled).
25	1	ID	Result Status +	Not supported	-	-
26	400	CM	Parent Result +	Not supported	-	-
27	200	TQ	Quantity/Timing	Priority	Max 1	See related information, below
28	250	XCN	Result Copies To	Additional doctor codes (5 max.)(first sub-field) No (for earlier versions)	See **Note** below	See related information, below This field can contain the **National code** of the doctors (if enabled on the LIS Devices dictionary, **Use National Code for doctor identification** property=Yes). Otherwise, this field contains the mnemonic code of the doctor. If the **Use National Code for doctor identification** property = **Yes**, and the doctor is DEFDOC without assigned National Code, DEFDOC will always be sent.
29	200	CM	Parent	Not supported	-	-
30	20	ID	Transportation Mode	Not supported	-	-
31	250	CE	Reason for Study	Not supported	-	-
32	200	CM	Principal Result Interpreter +	Not supported	-	-
33	200	CM	Assistant Result Interpreter +	Not supported	-	-
34	200	CM	Technician +	Not supported	-	-
35	200	CM	Transcriptionist +	Not supported	-	-

36	26	TS	Scheduled Date/Time +	Not supported	-	-
37	4	NM	Number of Sample Containers	Not supported	-	-
38	250	CE	Transport Logistics of Collected Sample	Not supported	-	-
39	250	CE	Collector's Comment	Not supported	-	-
40	250	CE	Transport Arrangement Responsibility	Not supported	-	-
41	30	ID	Transport Arranged	Not supported	-	-
42	1	ID	Escort Required	Not supported	-	-
43	250	CE	Planned Patient Transport Comment	Not supported	-	-
44	250	CE	Procedure Code	Not supported	-	-
45	250	CE	Procedure Code Modifier	Not supported	-	-
46	250	CE	Placer Supplemental Service Information	Not supported	-	-
47	250	CE	Filler Supplemental Service Information	Not supported	-	-

NOTE: Code length supported for Doctors and Locations:
- Mnemonic code = 6 (10 in database)
- Host code = 5 (6 in database)
- National code = 11 (20 in database)

OBR-4 Universal Service Identifier

- When no alternate code is defined for the test in the mapping table:
  - **OBR4-1** contains the Test code defined in DICT_TESTS
  - **OBR4-2** contains the abbreviated text defined in DICT_TESTS
- When an alternate code is defined in the mapping table but no text is defined:
  - **OBR4-1** contains the Alternate code defined in the mapping table
  - **OBR4-2** contains the abbreviated text defined in DICT_TESTS
- When both alternate code and text are defined in the mapping table:
  - **OBR4-1** contains the Alternate code defined in the mapping table
  - **OBR4-2** contains the text defined in the mapping table

OBR-11 Specimen Action Code

The management of revised orders by specimen action code uses a "cancel and replace" algorithm.

This algorithm is applied when the following conditions are satisfied:

1. There is no grouping of tests (Device property **Exam grouping** = No)
2. All ORC-1 are **NW** (New order)
3. All OBR-11 are **R** (Revised order)
4. None of the tubes for this order have been collected yet

When the above conditions are true, the Communication Engine deletes all the tests in the database related to this order and inserts all the tests received in the new message for this order.

For example, if the HIS transmits first Test1 Test2 and Test3 for a given order, and then transmits Test2, Test3 and Test4 later on for the same request, the final order will contain Test2, Test3 and Test4.

If one ORC-1 is not NW or one OBR-11 is not R, the "cancel and replace" algorithm is not applied.

NOTE: If some HIS can manage specimen action codes with “R” but do not want the "cancel and replace" behavior, all you have to do is to delete the specimen action code by modification of the Chameleon VMD file.

OBR-24 Field Diagnostic Serv Sect ID

For Order Cancellation messages:

- For V11.61.E and from V11.81:
  - **OBR-24.1** contains the **Service ID** of the Technical group, Department or Laboratory to which the workstation of the cancelled test is attached.

  This field is populated with:

  - The Service ID of the Technical group if defined in the **Technical groups**
  - Or if the above is not **Departments** dictionary.
  - Or if the above are not defined, the Service ID of the Laboratory defined in the **Laboratories** dictionary.

If all the linked Technical group, Department and Laboratory have no defined Service ID, this field will not contain any value.

If the Technical group/Department/Laboratory is deleted or updated in the Site configuration window after a test is ordered, the Service ID returned to the HIS might be incorrect.

- From V11.82:
  - **OBR-24.2** contains the **group of chapters** using two characters.
  - **OBR-24.3** contains the **chapter number** using two characters.
  - **OBR-24.4** contains the **test printing rank number** using three characters.

OBR-27 Quantity/Timing

Contains the following sub-fields:

OBR-27-7.1 Quantity (transmission)

OBR-27-7.4 Start Date/Time

OBR-27-7.6 Priority - Supported by Technidata LIS. See below

The OBR-27.6 (Priority) supported values are:

- **S** (Stat)
- **A** (ASAP)
- **R** (Routine)
- **P** (Preoperative) is processed as R
- **C** (Call back) is processed as S
- **T** (Timing Critical) is processed as S

OBR-28 Result Copies To

The first repeatable sub-field that contains an additional doctor represents the first additional doctor. If the first repeatable field is not filled in, the next non-empty repeatable field represents the first additional doctor, and so on.

Each additional doctor code is identified in the message by the first sub-field <ID Number)>.

The device manages only five additional doctors because the OBR-28 field can be repeated only five times. If a sixth doctor is present in the message sent by the HIS, this doctor will be ignored.

The Communication engine manages up to 10 characters of the additional doctor code, although only 6 characters are managed on the LIS database (real time module). In autocreate mode, the HIS must make sure that the doctor code is limited to 6 characters.

For the management of unknown doctors or locations received in this segment, refer to *Define settings in the Doctors/Locations dictionary paragraph.*

OBX - Observation / result

Seq	HL7 field length	DT	HL7 field name	TD field name (if applicable)	TD supported length	Comments
1	4	SI	Message counter	Not supported	-	-
2	2	ID	Value Type	Result type	Max 2	See related information, below.
3	250	CE	Observation Identifier	Test Code	Max 10	The first subfield must contain the Host System text of the Complementary parameter.
4	20	ST	Observation Sub-ID	Not supported	-	-
5	26	TS	Observation Value	Result Value	Max 26	If the result is of the type "Coded Text" (CE), the information transmitted may be the mnemonic code or the full text of the coded text. It depends on which processing of results/comments is defined in the Laboratory Information System (Connection Dictionary (DCX)).
6	250	CE	Units	Not supported	-	-
7	60	ST	Reference Range	Not supported	-	-

8	5	IS	Abnormal Flags	Not supported	-	-
9	5	NM	Probability	Not supported	-	-
10	2	ID	Nature of Abnormal Test	Not supported	-	-
11	1	ID	Observation Result Status	Not supported	-	-
12	26	TS	Date Last Observation Normal Value	Not supported	-	-
13	20	ST	User Defined Access Checks	Not supported	-	-
14	26	TS	Date/Time of the Observation	Not supported	-	-
15	250	CE	Producer's ID	Not supported	-	-
16	250	XCN	Responsible Observer	Not supported	-	-
17	250	CE	Observation Method	Not supported	-	-
18	22	EI	Equipment Instance Identifier	Not supported	-	-
19	26	TS	Date/Time of the Analysis	Not supported	-	-

OBX-2 Value Type

Type of result. For complementary parameters, the Communication Engine supports the following values:

- **CE** for Coded text. Corresponds to the coded text mnemonic as defined on the Laboratory Information System.
- **DT** for Result expressed in date format, Hours/Minutes or Minutes/Seconds. Only the complete date is accepted by the communication (YYYYMMDD). The partial date is not integrated correctly.
- **NM** for Numeric result. The decimal separator must be "." and not the comma.
- **ST** for Alphanumeric result (String data). Result expressed in limit, dilution (e.g. "/25"). This result format is used for all other Laboratory Information System result types (alphanumeric, dilution type result, limits type result, known result ...).

  If the received OBX-2 field contains the value **ST**, the received data is processed as a limit type result if starting by the "**<**" or "**>**" character.
  If the received data is not a limit type result and starts with "/", "1/" or is numeric, the received data is processed as a dilution.
  If it is alphanumeric (e.g. "123a") and its size is less than 5 digits, it is processed as an alphanumeric result and as a free text result if its size is equal to or greater than 5 digits.
- **SN** for structured numeric. Structured Numeric result is stored as "Limit" result type if the result is in the format <^xxxx or >^xxxx and xxxx is numeric, else it is stored as a free text.
- **TX** for Free text.

NTE - Notes and Comments

Seq	HL7 field length	DT	HL7 field name	TD field name (if applicable)	TD supported length	Comments
1	2	ID	Message counter	Processed/Not processed	-	-
2	22	EI	Source of Comment	Not processed	-	-
3	22	EI	Comment	Comment	Max 4000	No value is served if the comment exceeds the maximum number of characters.
4	22	EI	Comment Type	Not processed	-	-

Segment descriptions for OML messages

OML messages are managed by TDNexLabs from V01.21 and TD-Synergy from V12.21

All the segments and fields supported by the Technidata LIS in ORM^O01 message are supported in OML^O21 message. This section contains additional details for the fields processed for OML support.

- MSH - Message Header segment. Defines the type, the event of the message and indicates other information such as sender, receiver.
- PID - Patient identification segment. Contains patient identification information exchanged between the sender and the receiver.
- ORC - Common Order Segment. Contains information necessary to create or update prescriptions.
- OBR - Observation request segment. Contains data related to the test request such as: Access number, Prescriber code…
- NTE - Notes and Comments.
- TQ1 - Timing/Quantity segment.
- OBX - Observation / result segment. Contains data related to results.
- SPM - Specimen segment. Contains sample information.

Structure of supported messages

NOTE: R/O in the column header is set for: Required/Optional.

Inbound message: OML^O21

Segment			Card	Description	R/O	Processed?	
MSH			1..1	Message Header	**R**	Yes	
PID			1..1	Patient Identification	**R**	Yes	
:....	**NTE**		0..n	Notes and Comments for PID	O		
PV1			0..1	Patient Visit	O	Yes	
ORC			1..n	Common Order segment	**R**	Yes	
:....							
:....	**TQ1**		0..1	Timing/Quantity segment	O	Yes	
	OBR		1..1	Observation Request segment	**R**	Yes	
	:....	**NTE**	0..n	Order level comments	O		

	:....	**OBX**	0..n	Observation Result segment	O	Processed by the Technidata LIS as results of additional parameters that could be part of the ordered procedure. Only result of complementary parameter (PAR) is supported. Previous results not supported (same as ORM support)	
		:.... NTE	**0..n**	Notes for results of additional parameters	O		
	:....	**SPM**	0..n	Specimen segment	O	Must have at least one segment to have the Primary sample number assigned by the host. • If SPM segment is not available, the OML message will be treated like the ORM message. • If OML message contains multiple tests, OML message must have an SPM segment for each OBR/ORC group OR no SPM segment at all.	

						• Combination of ORC/OBR group with SPM segment and ORC/OBR group without SPM segments is NOT supported.	

Segment descriptions for OML^O21 message

- MSH - Message Header segment. Defines the type, the event of the message and indicates other information such as sender, receiver.
- PID - Patient identification segment. Contains patient identification information exchanged between the sender and the receiver.
- ORC - Common Order Segment. Contains information necessary to create or update prescriptions.
- OBR - Observation request segment. Contains data related to the test request such as: Access number, Prescriber code…
- NTE - Notes and Comments.
- TQ1 - Timing/Quantity segment.
- OBX - Observation / result segment. Contains data related to results.
- SPM - Specimen segment. Contains sample information.

MSH - Message Header Segment

Same as ORM messages, see description of MSH in ORM messages except for MSH-9 field (Message type).

MSH-9 Message Type

Determines the message type (Message type code + event code).

- OMG : General clinical order message (event O19)
- OML : Laboratory order message (event O21)

PID - Patient identification segment

Same as ORM messages, see description of PID in ORM messages.

ORC - Common order segment

Unspecified fields are managed the same way as for ORM messages. Refer to Desciption of ORC segment for ORM messages.

Fields described below are managed differently for OML^O21 messages.

Seq	Data type	Field name	TD field name (if applicable)	R/O	Comments

01	ID	Order Control	Order control	R	NW - new order CA - cancel order SC - status change NA - number assigned code See also ORL^O22 description OK - Order Accepted (confirmation for NW) UA - Unable to accept (confirmation for NW) CR - Cancelled as requested (confirmation for CA) UC - Unable to cancel (confirmation for CA)
07	TQ	Observation date/time	Collection date and time in subfield 4	O	Used as request collection date. If the value is different in OBR-7 and SPM-17, the request collection date will be different from tube/sample collection date.
12	XCN	Ordering Provider	Ordering Doctor		Same as for ORM messages. Note that the creation of doctor is supported for order message of OML type when "AutoCreate" mode is enabled in the mapping (**Order Reception** data stream). The doctor code is limited to 6 characters.
13	PL	Enterer's Location	Requesting Location		Same as for ORM messages. Note that the creation of location is supported for order message of OML type when "AutoCreate" mode is enabled in the LIS mapping (**Order Reception** data stream). The location code is limited to 6 characters.

OBR - Observation Request segment

Unspecified fields are managed the same way as for ORM messages. Refer to Desciption of OBR segment for ORM messages.

Fields described below are managed differently for OML^O21 messages.

Seq	Data type	Field name	TD field name (if applicable)	R/O	Comments
07	TQ	Observation date/time		O	Used as tube collection date if SPM-17 is empty. If the value is different in ORC-7, the request collection date will be different from tube collection date.
10	XCN	Collection Identifier		O	Mapping is available in **Order reception** data stream.
16	XCN	Ordering Provider	Prescriber code		Same as for ORM messages. Note that the creation of doctor is supported for order message of OML type when "AutoCreate" mode is enabled in the LIS mapping (**Order Reception** data stream). The doctor code is limited to 6 characters.

NTE - Notes segment

For the inbound messages, refer to the Segment description for ORM in this document INST003.

TQ1 - Timing/Quantity segment

Seq	Data type	Field name	R/O	Comments
09	ID CWE Table 0485	Priority	O	Contains the priority for this order. • R and P values are processed as Routine requests on the Technidata LIS. • A and C values as Urgent requests on the Technidata LIS. • S and T as Immediate request on the Technidata LIS. If this field is blank, the default value is R. Note that although they may be received in different messages, all ordered procedures must have the same priority. The LIS keeps the highest priority of all order messages. If OBR-27 is populated with a value, this value must be the same as in TQ1-9 segment. Otherwise, the value in TQ1-9 is used as priority value.

OBX - Observation result segment

Contain the results of additional parameter (results of tests of type PAR). Refer to the description of the segment in description of OBX segment in ORM messages.

SPM - Specimen segment

Only the fields supported by the Technidata LIS are described below.

Seq	Format	Field name	R/O		Comments
02	EIP	Specimen ID	**R**		Primary Sample Number. Limited to 14 characters maximum. The Primary Sample Number can be re-used when the request using this number is already CLOSED. Note that: When the sample number is assigned by the Technidata LIS during transmission of this field value, it contains information about the date, with the following format: TTT**Y**NNNNNNNNN, TTT**YMM**NNNNNNN or TTT**YMMDD**NNNNN, which is based on the Reduced Access number length property (USE session > General parameters).

					The "date" information must be removed to get the sample number. TTT refers to the tube type.
04	CWE	Specimen Type	**R**	4.1	Sample type New mapping implementation Subfield 1 : Sample type code
	CWE			4.2	Subfield 2 : Abbreviated sample type text
	CWE			4.3	Subfield 3 :Coding system. Can be local general code VMD customization on site Refer to Editing Chameleon VMD file
07	CWE	Specimen Collection Method		7.1	Contains the full text of the tube which may contain specific instructions for the sample. VMD customization is needed for site specific length. E.g.: truncate first 40 characters Refer to Editing Chameleon VMD file
16	CWE	Specimen Risk Code			Managed from TDNexLabs V01.52 See related information below
17	DR	Specimen Collection Date/Time	O		Planned date and time of the collection. Field format is YYYYMMDDHHMMSS If ORC-7.4, OBR-7 and SPM-17 are all populated with collection dates, SPM-17 value is used as tube collection date. Having a different ORC-7.4 value will generate different Request collection and Tube collection date values. Tube is marked as collected (SP_TUBES.TUBESTATUS=1) when SPM-17 has a valid Collection date value
26	NM	Number of Specimen Containers			Calculated from the tubes filling rate. =Round Up (filling rate/100) If filling rate is less than 100, number of tubes is set to 1.
27	CWE	Container Type		27.1	CWE-1 (Identifier): Mnemonic code of the tube type (3 numeric characters). Outbound mapping is available (e.g., for ORL transmission)
	CWE			27.2	CWE-2 (Text): Tube text
	CWE			27.3	CWE-3 (Name of Coding System) VMD customization on site E.g.: **L**, standing for Locally defined

					Refer to Editing Chameleon VMD file
	CWE			27.4	CWE-4 (Alternate Identifier): Host code of the tube type
	CWE			27.5	CWE-5 (Alternate Text): Host text of the tube type
	CWE			27.6	CWE-6 (Name of Alternate Coding System) VMD customization on site E.g.: **99ALT** Refer to Editing Chameleon VMD file

SPM-16 Specimen Risk Code

Managed from TDNexLabs V01.52

If the code received in the SPM-16 field corresponds to a risk code specified in the "User-defined Table 0489 – Risk Codes" (shown below), then the **Risk of infection** flag is set for the order.

> **NOTE**: The **Risk of infection** flag is set for the order as soon as a sample attached to the order is received with one of the specified risk codes.

If the received code does not correspond to a specified risk code, a warning is traced in the spy file and the **Risk of infection** flag is not set for the order.

If the sample cannot be saved in the request (sample type not known for example), a warning is generated in the **Primary Sample Reception** (PSR) window, and the **Risk of infection** flag is set.

> **NOTE**: The risk of infection (at request level) is set at order creation. No update of the risk is made when the update message contains an additional test. The only case managed in order update is for the reception of an additional sample with a risk set to *high* for an order without risk. In this case, the risk is modified in the order.

User-defined Table 0489 – Risk Codes

Code	Description	Comment/Usage Note/Definition
BIO	Biological	The dangers associated with normal biological materials. I.e. potential risk of unknown infections. Routine biological materials from living subjects.
COR	Corrosive	Material is corrosive and may cause severe injury to skin, mucous membranes and eyes. Avoid any unprotected contact.
ESC	Escape Risk	The entity is at risk for escaping from containment or control.
AGG	Aggressive	A danger that can be associated with certain living subjects, including humans.
IFL	Material Danger Inflammable	Material is highly inflammable and in certain mixtures (with air) may lead to explosions. Keep away from fire, sparks, and heat.
EXP	Explosive	Material is an explosive mixture. Keep away from fire, sparks, and heat.
INF	Material Danger Infectious	Material known to be infectious with human pathogenic microorganisms. Those who handle this material must take precautions for their protection.

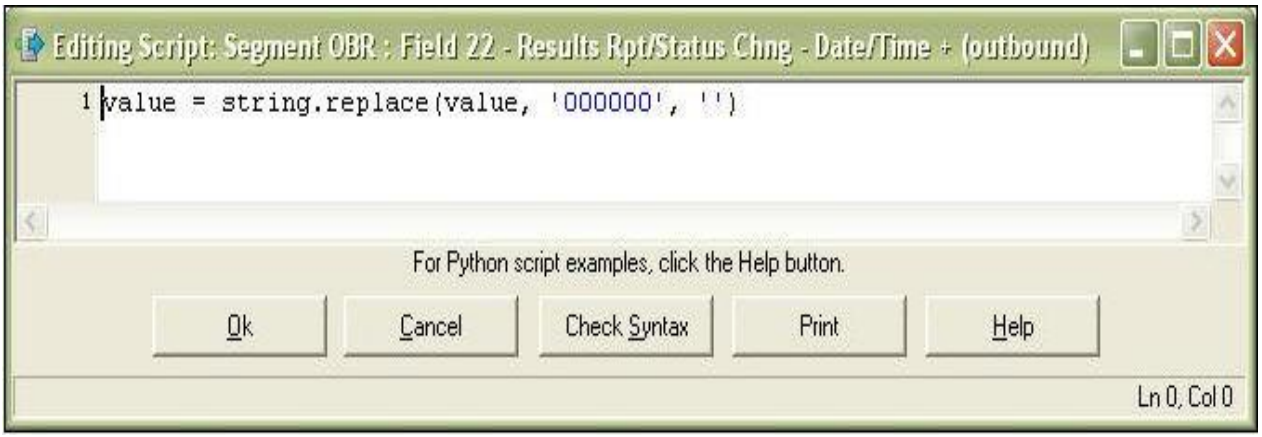
BHZ	Biohazard	Material contains microorganisms that is an environmental hazard. Must be handled with special care.
INJ	Injury Hazard	Material is solid and sharp (e.g., cannulas.) Dispose in hard container.
POI	Poison	Material is poisonous to humans and/or animals. Special care must be taken to avoid incorporation, even of small amounts.
RAD	Radioactive	Material is a source for ionizing radiation and must be handled with special care to avoid injury of those who handle it and to avoid environmental hazards.

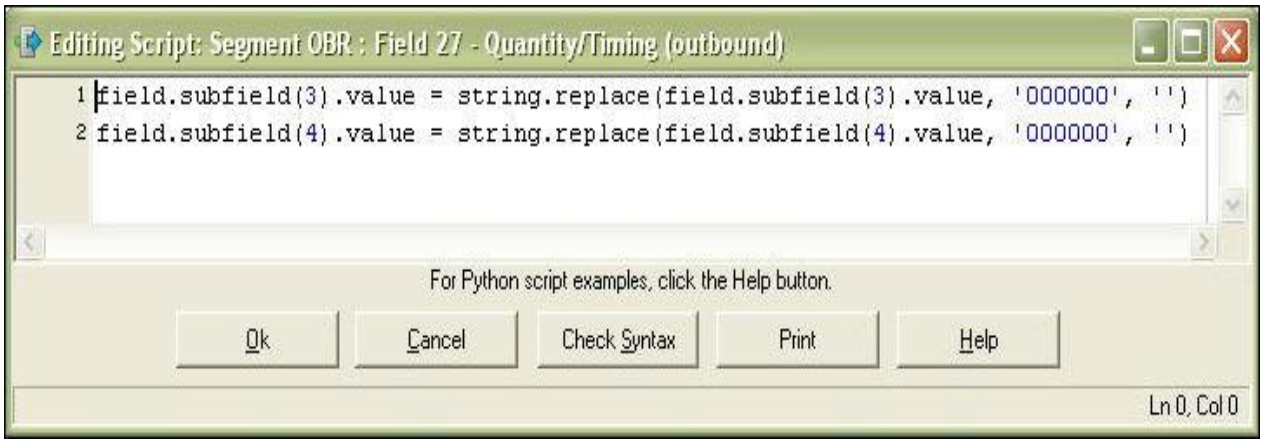
Management of fields in TS (TimeStamp) format

Fields in TS (TimeStamp) format included in most segments (MSH, PID, OBR, OBX, ORC, etc.), are received with zeros.

EXAMPLE: Date/Time field
20081022000000 (YYYYMMDDHHMMSS)
20081022000000 must be formatted as 20081022 in the outbound HL7 messages.

The zeros in the Timestamp, which either mean that it has no time part or it is midnight time 000000, are removed by default with the use of the following python scripts:





Acknowledgement

If no problem occurs during the management of the message, a positive logical acknowledgement is sent to the Host and the created task is set to the "Completed" status.

In the positive logical acknowledgement sent, the MSA-1 field **Acknowledgment code** is set to **AA** (application acknowledgement Accept) and the ERR-1 field, subfield 4, "Error code" is set to the no error code **0**.

Code	Message	Description
0	Message accepted	Success. Optional, as the **AA** conveys success. Used for systems that must always return a status code.

During the management of the ADT message, some errors can occur. In such cases, the created task is set to the "Error" status.

List of Incidents that are managed

The incidents managed are:

Case 1

Significant differences are detected between the demographic data of the patient in the Technidata LIS database and the transmitted demographic data (the checks on the demographic data are done on the first name and last name, the maiden name, the sex and the birth date of the patient). In this case, the OMG / OML / ORM message is not integrated in the LIS database and a negative logical acknowledgement is sent to the host.

In the negative logical acknowledgement sent, the MSA-1 field **Acknowledgment code** is set to **AR** (application acknowledgement Reject) and the ERR-1 field, subfield 4, "Error code" and the "ERR-1" fields are set to the error code **207**.

Code	Message	Description
207	Application internal error	A catchall for internal errors not explicitly covered by other codes.

Before V03.13.B: The MSA-3 field is filled in with the string: *A catchall for internal errors not explicitly covered by other codes*.

From V03.13.B: The error message in case of NAK is no longer located in MSA-3 but in ERR-1.

Case 2

The previous check is correct two different patients are detected with the same "Alternate number" in the Technidata LIS database. In such a case, the OMG / OML / ORM message is not integrated in the LIS database and a negative logical acknowledgement is sent to the host.

In the negative logical acknowledgement sent, the MSA-1 field **Acknowledgement code** is set to **AR** (application acknowledgement Reject) and the ERR-1 field, subfield 4, "Error code" and the "ERR-1" fields are set to the error code **205**.

Code	Message	Description
205	Duplicate key identifier	The ID of the patient, order, etc., already exists. Used in response to addition transactions (Admit, New Order, etc.).

Before V03.13.B: The MSA-3 field is filled in with the string: *The ID of the patient, order, etc., already exists. Used in response to addition transactions (Admit, New Order, etc.)*.

From V03.13.B: The error message in case of NAK is no longer located in MSA-3 but in ERR-1.

Case 3

The OMG / OML / ORM message sent by the Host cannot be parsed properly, because of a problem with the HL7 structure. In this case, the OMG / OML / ORM message is not integrated in the Technidata LIS database and a negative logical acknowledgement is sent to the Host.

In the negative logical acknowledgement sent, the MSA-1 field **Acknowledgement code** is set to **AE** (application acknowledgement Error) and the ERR-1 field, subfield 4, "Error code" and the "ERR-1" fields are set to the error code **100**.

Code	Message	Description
100	Segment sequence error	The message segments were not in the proper order, or required segments are missing.

Before V03.13.B: The MSA-3 field is filled in with the string: *The message segments were not in the proper order, or required segments are missing.*

*F*rom V03.13.B: The error message in case of NAK is no longer located in MSA-3 but in ERR-1.

Case 4

The OMG / OML / ORM message sent by the Host is parsed and managed properly but the LIS database is locked/not available or the patient record to update is protected. In such a case, the OMG / OML / ORM message cannot be integrated in the Technidata LIS database and a negative logical acknowledgement is sent to the Host.

In the negative logical acknowledgement sent, the MSA-1 field **Acknowledgment code** is set to **AR** (application acknowledgement Reject) and the ERR-1 field, subfield 4, "Error code" and the "ERR-1" fields are set to the error code **206**.

Code	Message	Description
206	Application record locked	The transaction could not be performed at the application storage level, e.g. database locked.

Before V03.13.B: The MSA-3 field is filled in with the string: *The transaction could not be performed at the application storage level, e.g. database locked.*

*F*rom V03.13.B: The error message in case of NAK is no longer located in MSA-3 but in ERR-1.

Case 5

The test order message sent by the Host is parsed but some data are no correct, for example:

- A test or an additional parameter is unknown
- A test is not requestable
- A test is duplicate
- A results of type coded text is expected and the coded results is not defined

In such a case, the test order message is partially integrated in the Technidata LIS database and a negative logical acknowledgement is sent to the Host.

In the negative logical acknowledgement sent, the MSA-1 field **Acknowledgement code** is set to **AR** (application acknowledgement Reject) and the ERR-1 field, subfield 4, "Error code" and "ERR-1" fields are set to the error code **207**.

Code	Message	Description
207	Application internal error	A catchall for internal errors not explicitly covered by other codes.

Before TD-Synergy V03.13.B: The MSA-3 field is filled in with the string: *A catchall for internal errors not explicitly covered by other codes*. *(Test order : #XXXXXXXXXX).*" where XXXXXX corresponds to the access number or external order number if it is transmitted by the Host.

From V03.13.B: The error message in case of NAK is no longer located in MSA-3 but in ERR-1.

Case 6

The update test order message sent by the Host is received successfully but for this test order the corresponding specimen is already received in the laboratory.

In such a case, the test order message cannot be integrated in the Technidata LIS database and a negative logical acknowledgement is sent to the Host.

In the negative logical acknowledgement sent, the MSA-1 field **Acknowledgment code** is set to **AR** (application acknowledgement Reject) and the ERR-1 field, subfield 4, "Error code" and "ERR-1" fields are set to the error code **207**.

Code	Message	Description
207	Application internal error	A catchall for internal errors not explicitly covered by other codes.

Before TD-Synergy V03.13.B: The MSA-3 field is filled in with the string "*A catchall for internal errors not explicitly covered by other codes (Specimen received for test order: #XXXXXXXXXX).*" where XXXXXX corresponds to the access number or external order number if it is transmitted by the Host.

From V03.13.B: The error message in case of NAK is no longer located in MSA-3 but in ERR-1.

Acknowledgement for OML^O21 order message

An acknowledgement message ORL^O22^ORL_O22 is managed in response to an OML^O21 message.

ORL^O22 contains the result of the Technidata LIS processing for the received OML^O21 message.

For errors encountered during order processing, MSA and ERR segments contain the details of the error.

Existing scenarios managed by ORM^O01 support is also managed in OML^O21 support, with additional cases not limited to the following:

- OML message does not contain SPM-4 (sample type) information
- OML message with inconsistent use of SPM segment for each ORC/OBR group
- OML message contains invalid SPM-4 (sample type) information
- OML message contains multiple specimen for elementary test
- OML message contains incomplete number of specimen
- OML message contains invalid/already used PRIMARYSAMPLENUMBER (SPM-2)

If an error is encountered when processing some of the tests in the request, request creation continues and a correct order control status is used to replace the value of ORC-1 in the generated ORL^O22. For further details refer to the table *Message structure of OML Acknowledgement* below.

When an order has been created and certain tests are missing, an indicator is added to SIMPLE_NONCOFORMITY_TABLE, and either SP_REQUESTS_NC and SP_TUBES_NC tables to report the issue.

A message is displayed in the PSR session to warn the user that tests have been discarded. For more details refer to the Technical guide.

ORL^O22 has a similar structure to inbound messages and can be differentiated by the presence of additional MSA and ERR segments inserted between MSH and PID segments.

Message structure of OML Acknowledgement

Note: R/O/C in the column header is set for: Required/Optional/Conditional.

Segment		Card	Description	R/O/C	Processed?
MSH		1..1	Message Header	**R**	Yes
MSA		1..1	Message Acknowledgment	**R**	Yes
ERR		0..1	Error segment	**C**	Mandatory if MSA-1 is AE, AR, CE or CR
:....	**NTE**	0..n	Notes and Comments for Header	O	
PID		1..1	Patient Identification	**R**	Yes
ORC		1..n	Common Order segment	**R**	Yes

:.... :....	**TQ1**			0..1	Timing/Quantity segment	O	
	OBR			1..1	Observation Request segment	**R**	
	:....	**SPM**		0..n	Specimen segment	O	If OML message contains multiple tests, OML message must have SPM segment for each OBR/ORC group, OR no SPM segment at all.
		:...	**OBX**	0..n	Observation Result segment	O	Contains the test collection and transport instructions (full text). One OBX segment per instruction is created. As many OBX segments as there are instructions are added.

Segment descriptions for ORL^O22 message

MSA, ERR

Same as ORM^O01 support, refer to Acknowledgement for ORM

MSH, PID, TQ1, OBR

Same as received OML^O21 message

ORC - Common order segment

Seq	Data type	Field name	R/O	Comments

01	ID	Order Control	R	For ORL^O22, the following values can be used in ORC-1: OK - Order Accepted (confirmation for NW) UA - Unable to accept (confirmation for NW) CR - Cancelled as requested (confirmation for CA) UC - Unable to cancel (confirmation for CA)

SPM - Specimen segment

Only the fields supported by the Technidata LIS are described below.

Seq	Format	Field name	R/O	Comments
02	EIP	Specimen ID	**R**	Primary Sample Number. When the received OML has no sample information, this field contains: SP_TUBES.TUBENB When the received OML has sample information, this field contains: SP_TUBES.PRIMARYSAMPLENUMBER
04	CWE	Specimen Type	**R**	Sample type Mapping implementation Subfield1: DICT_SAMPLES_TYPES.SAMPCODE
17	TQ	Specimen Collection Date/Time	O	When the received OML has no sample information, this field is empty When the received OML contains sample information, same as value received
26	NM	Number of Specimen Container	O	Calculated from the volume: =Round Up(Volume/100) When calculated volume is equal to zero, SPM segment is not transmitted.
27	CWE	Container Type	O	Ignored in reception. In transmission: value is equal to tube type linked to sample type

Note that when the device property **Acknowledgement mode for unknown test** (in the **Order reception** data stream) is set to **Positive Acknowledgement** value, the following applies:

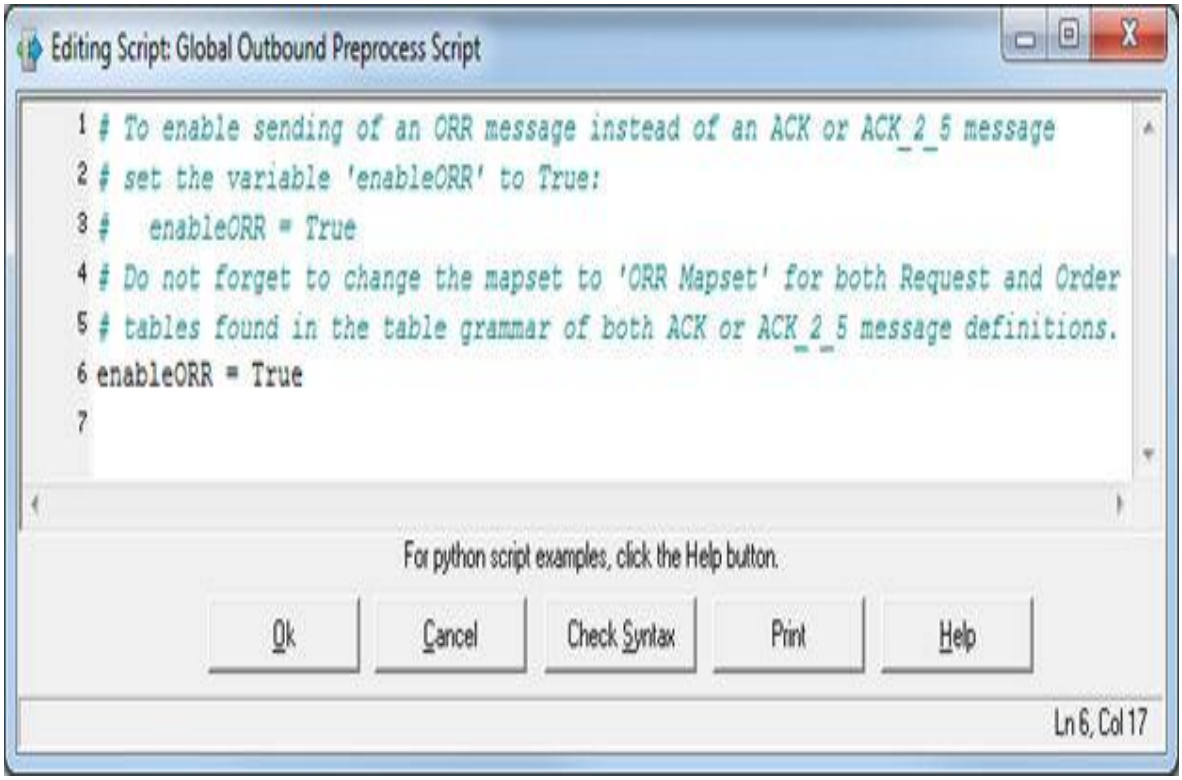
- ORL^O22 message always contains positive acknowledgement
- MSA-1 field is always positive (AA instead of AR even if test is unknown)

General order response message (ORR)

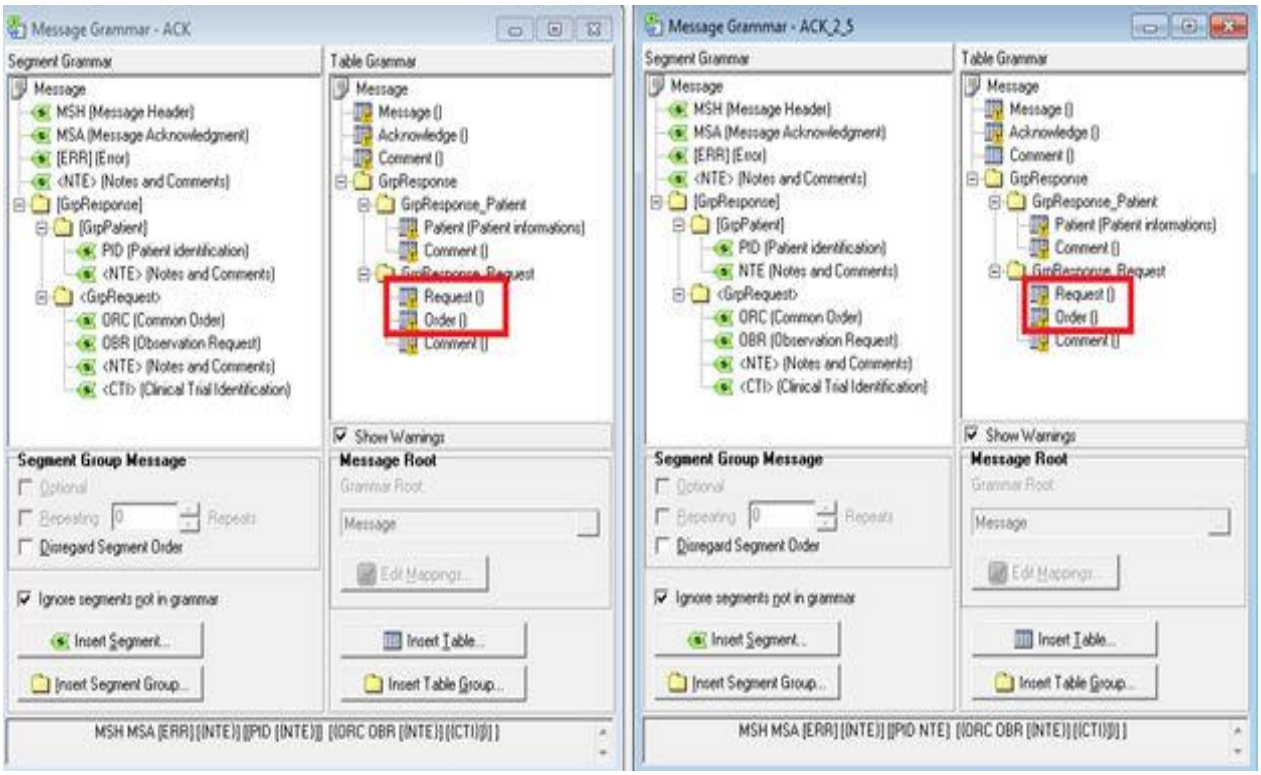
From version 11.82, the order reception device can respond with an ORR message instead of the default ACK message. Use this topic to activate a response with an ORR message.

Activating a response with an ORR message

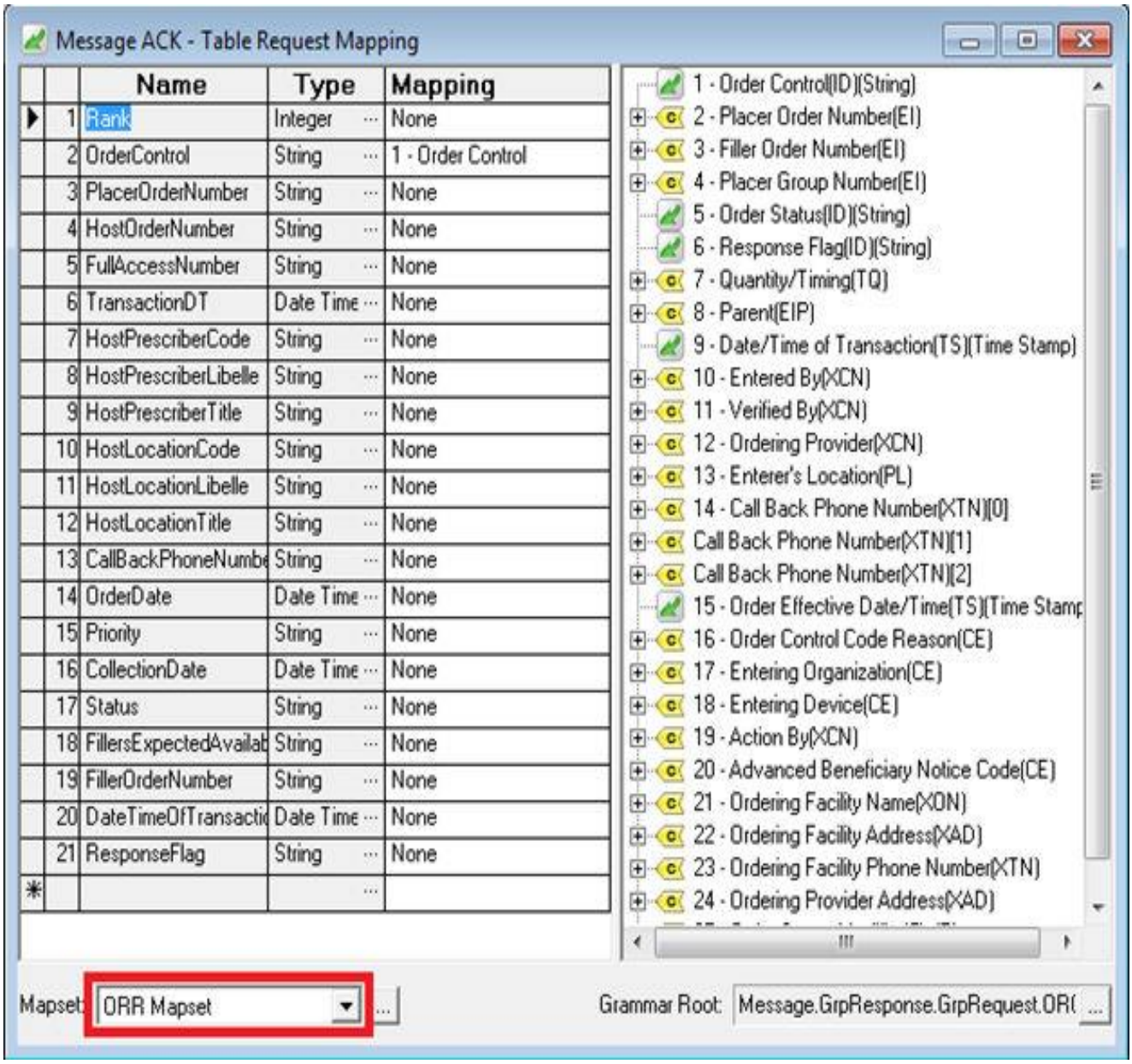
1. Set the variable `enableORR` found in the Global Outbound Preprocess Script to `True`.

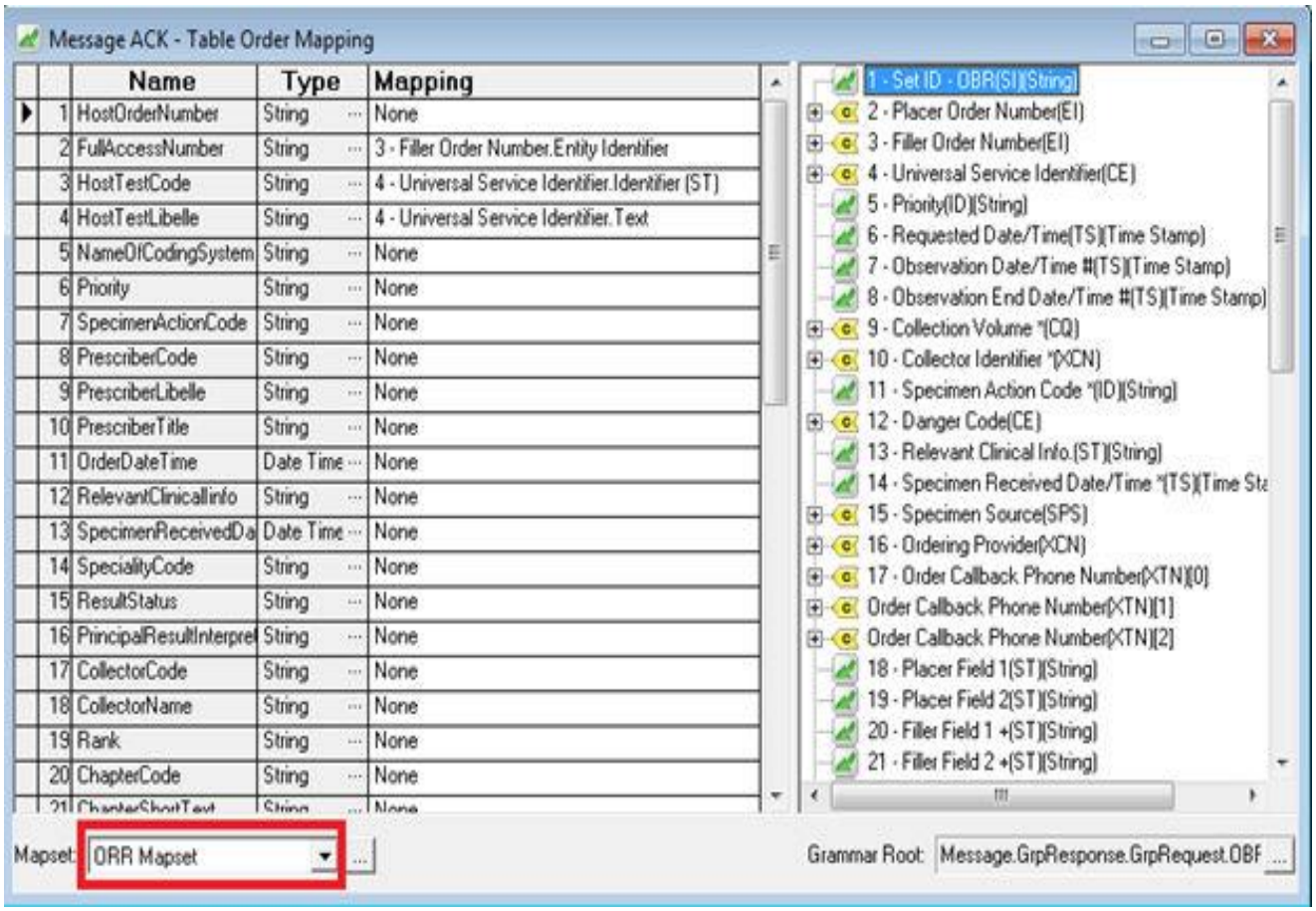


2. Change the **Mapset** to **ORR Mapset** in the **Order** and **Request** tables for the **ACK** and **ACK_2_5** message definitions.



By default they are set to **NoMapping**, for each **Request** and **Order** table of each message.


Message ACK - Table Request Mapping
Name
Type
Mapping
1 Rank Integer None
2 OrderControl String 1 - Order Control
3 PlacerOrderNumber String None
4 HostOrderNumber String None
5 FullAccessNumber String None
6 TransactionDT Date Time None
7 HostPrescriberCode String None
8 HostPrescriberLibelle String None
9 HostPrescriberTitle String None
10 HostLocationCode String None
11 HostLocationLibelle String None
12 HostLocationTitle String None
13 CallBackPhoneNumbe String None
14 OrderDate Date Time None
15 Priority String None
16 CollectionDate Date Time None
17 Status String None
18 FillersExpectedAvailat String None
19 FillerOrderNumber String None
20 DateTimeOfTransactic Date Time None
21 ResponseFlag String None
1 - Order Control(ID)(String)
2 - Placer Order Number(EI)
3 - Filler Order Number(EI)
4 - Placer Group Number(EI)
5 - Order Status(ID)(String)
6 - Response Flag(ID)(String)
7 - Quantity/Timing(TQ)
8 - Parent(EIP)
9 - Date/Time of Transaction(TS)(Time Stamp)
10 - Entered By(XCN)
11 - Verified By(XCN)
12 - Ordering Provider(XCN)
13 - Enterer's Location(PL)
14 - Call Back Phone Number(XTN)(0)
Call Back Phone Number(XTN)(1)
Call Back Phone Number(XTN)(2)
15 - Order Effective Date/Time(TS)(Time Stamp
16 - Order Control Code Reason(CE)
17 - Entering Organization(CE)
18 - Entering Device(CE)
19 - Action By(XCN)
20 - Advanced Beneficiary Notice Code(CE)
21 - Ordering Facility Name(XON)
22 - Ordering Facility Address(XAD)
23 - Ordering Facility Phone Number(XTN)
24 - Ordering Provider Address(XAD)
Mapset: ORR Mapset
Grammar Root: Message.GrpResponse.GrpRequest.ORI



3. Save the VMD after this modification

Default mapping entries for ORR Mapset

The default mapping entries for the **ORR Mapset** are only those for fields that are required. Additional table fields have been populated to give more choice for mapping. The following list contains the fields that are available for mapping.

- Table Request:
  - OrderControl
  - FullAccessNumber
  - HostOrderNumber
  - HostLocationCode
  - HostPrescriberCode
  - PlacerOrderNumber
  - FillerOrderNumber
- Table Order:
  - HostOrderNumber
  - FullAccessNumber
  - HostTestCode

- HostTestLibelle
- PlacerOrderNumber
- FillerOrderNumber

Example ORR messages

Example of a received ORM message

```
MSH|^~\&|HOST|R|LS||20131025090141||ORM^O01|201310250901421817|P|2.3
PID|1||222^^^^PATNUMBER||PTEST00093^^^^^^L||19300921|M|||||(819)374-7010^^PH
PV1|||GX^
ORC|NW||4045180018|4045180018|||^^^201404071053|||||05271|R0031
OBR|0001||4045180018|NAGR1^Acide valproique serique
?^L|||201404071053||||R|||||05271||||||||||^^^^^R
```

Example of a sent ORR message

```
MSH|^~\&|LIS||HOST|R|20140414161049||ORR^O02^ORR_O02|TD0000000055|P|2.3||||||||||
MSA|AA|201310250901421817|
ERR|^^^0||||
ORC|OK|
OBR|||4045180018|NAGR1^Acide valproique serique ?|
```

Example of ORM messages

To help you understand the Order processing workflow, the given examples of ORM messages have been included in a scenario.

Single-procedure orders - Placer Order Number Management / One test per message

1. New order received with Electrolytes (ELEC) and Full Blood Count (FBC) tests

```
MSH|^~\&|SI|AT|LIS|TD|20100816185312||ORM^O01|20100816185312595000|P|2
.3||||
EVN|O01|20100816185250|
PID|1||0000030552^^^^PATNUMBER||SMITH^Jane^^^^^L|^^^^|19390821|F|^^^^|
W|14 GRAY VIEW COURT^^SPRINGFIELD^PA^17870^^P^^SB|SB|(570)374-
3839|(570) 543-1235||M|LUTH|0005217123^^^^^1|185303171||||||||
PV1|1|I|SDU^2612^^1|01|||1023^MARTIN,MD CHRIS
W.||CAR||||07|||1023^MARTIN,MD CHRIS
W.|R|0008217157^^^^^1|M|||||||||||||||49|||||||20100816174903|||||||
|
ORC|NW|002909520001|||||1^^^20100816185200^^R^^^^||20100816185200|CAS1
|CAS1|1023^MARTIN,MD, CHRIS|SDU||20100816185200|||||
OBR|1|002909520001||ELEC^ELECTROLYTES|R||||||O||||^^^^^|1023^MARTIN,MD
, CHRIS|||07020^CLINICAL
LABORATORY||||||||1^^^20100816185200^^R^^^^||||||||||||||||||

MSH|^~\&|SI|AT|LIS|TD|20100816185312||ORM^O01|20100816185312595000|P|2
.3||||
EVN|O01|20100816185250|
PID|1||0000030552^^^^PATNUMBER||SMITH^Jane^^^^^L|^^^^|19390821|F|^^^^|
W|14 GRAY VIEW COURT^^SPRINGFIELD^PA^17870^^P^^SB|SB|(570)374-
3839|(570) 543-1235||M|LUTH|0005217123^^^^^1|185303171||||||||
PV1|1|I|SDU^2612^^1|01|||1023^MARTIN,MD CHRIS
W.|||CAR||||07|||1023^MARTIN,MD CHRIS
W.|R|0008217157^^^^^1|M|||||||||||||||49|||||||20100816174903|||||||
|
ORC|NW|002909520002|||||1^^^20100816185200^^R^^^^||20100816185200|CAS1
|CAS1|1023^MARTIN,MD, CHRIS|SDU||20100816185200|||||
OBR|1|002909520002||FBC^FULL BLOOD
COUNT|R||||||O||||^^^^^|1023^MARTIN,MD, CHRIS|||07020^CLINICAL
LABORATORY||||||||1^^^20100816185200^^R^^^^||||||||||||||||||
```

Access #	Filler Order#	Order Control	Placer Order#	Order Effective Date & Time	Universal Service Identifier
0080000046	0080000046ELEC	NW	002909520001	20100816185200	ELEC
	0080000046FBC	NW	002909520001	20100816185200	FBC

The Technidata LIS groups the tests into a single request if:

- No samples have been collected yet
- The effective date and time (forecast collection date and time) is the same (more or less xx minutes)
- The requesting location (from which the test is ordered) is the same

2. Later on, addition of tests ESR and GLUC to the order

```
MSH|^~\&|SI|AT|LIS|TD|20100816185312||ORM^O01|20100816185312595000|P|2
.3||||
EVN|O01|20100816185250|
PID|1||0000030552^^^^PATNUMBER||SMITH^Jane^^^^^L|^^^^|19390821|F|^^^^|
W|14 GRAY VIEW COURT^^SPRINGFIELD^PA^17870^^P^^SB|SB|(570)374-
3839|(570) 543-1235||M|LUTH|0005217123^^^^^1|185303171||||||||
PV1|1|I|SDU^2612^^1|01|||1023^MARTIN,MD CHRIS
W.|||CAR||||07|||1023^MARTIN,MD CHRIS
W.|R|0008217157^^^^^1|M|||||||||||||||49|||||||20100816174903|||||||
|
ORC|NW|002909520356|||||1^^^20100816185200^^R^^^^||20100816185200|CAS1
|CAS1|1023^MARTIN,MD, CHRIS|SDU||20100816185200|||||
OBR|1|002909520356||ESR^ERYTHROCYTE SEDIMENTATION
RATE|R||||||O||||^^^^^|1023^MARTIN,MD, CHRIS|||07020^CLINICAL
LABORATORY||||||||1^^^20100816185200^^R^^^^||||||||||||||||||

MSH|^~\&|SI|AT|LIS|TD|20100816185312||ORM^O01|20100816185312595000|P|2
.3||||
EVN|O01|20100816185250|
PID|1||0000030552^^^^PATNUMBER||SMITH^Jane^^^^^L|^^^^|19390821|F|^^^^|
W|14 GRAY VIEW COURT^^SPRINGFIELD^PA^17870^^P^^SB|SB|(570)374-
3839|(570) 543-1235||M|LUTH|0005217123^^^^^1|185303171||||||||
PV1|1|I|SDU^2612^^1|01|||1023^MARTIN,MD CHRIS
W.|||CAR||||07|||1023^MARTIN,MD CHRIS
W.|R|0008217157^^^^^1|M|||||||||||||||49|||||||20100816174903|||||||
|
ORC|NW|002909520365|||||1^^^20100816185213^^R^^^^||20100816185200|CAS1
|CAS1|1023^MARTIN,MD, CHRIS|SDU||20100816185200|||||
OBR|1|002909520365||GLUC^GLUCOSE|R||||||O||||^^^^^|1023^MARTIN,MD,
CHRIS|||07020^CLINICAL
LABORATORY||||||||1^^^20100816185200^^R^^^^||||||||||||||||||
```

Access #	Filler Order#	Order Control	Placer Order#	Order Effective Date & Time	Universal Service Identifier
0080000046	0080000046ELEC	NW	002909520001	20100816185200	ELEC
	0080000046FBC	NW	002909520001	20100816185200	FBC
	0080000046ESR	NW	002909520356	20100816185200	ESR
	0080000046GLUC	NW	002909520365	20100816185213	GLUC

The Technidata LIS groups the tests into a single request if:

- No samples have been collected yet
- The effective date and time (forecast collection date and time) is the same (more or less xx minutes)
- The requesting location (from which the test is ordered) is the same

3. Later on, addition of test K which is already ordered in ELEC combined test

```
MSH|^~\&|SI|AT|LIS|TD|20100816185312||ORM^O01|20100816185312595000|P|2
.3||||
EVN|O01|20100816185250|
PID|1||0000030552^^^^PATNUMBER||SMITH^Jane^^^^^L|^^^^|19390821|F|^^^^|
W|14 GRAY VIEW COURT^^SPRINGFIELD^PA^17870^^P^^SB|SB|(570)374-
3839|(570) 543-1235||M|LUTH|0005217123^^^^^1|185303171||||||||
```

```
PV1|1|I|SDU^2612^^1|01|||1023^MARTIN,MD CHRIS
W.|||CAR||||07|||1023^MARTIN,MD CHRIS
W.|R|0008217157^^^^^1|M|||||||||||||||49|||||||20100816174903|||||||
|
ORC|NW|002909520421|||||1^^^20100816185213^^R^^^^||20100816185213|CAS1
|CAS1|1023^MARTIN,MD, CHRIS|SDU||20100816185200|||||
OBR|1|002909520421||K^POTASSIUM|R||||||O||||^^^^^|1023^MARTIN,MD,
CHRIS|||07020^CLINICAL
LABORATORY|||||||||1^^^20100816185200^^R^^^^|||||||||||||||||||
```

Access #	Filler Order#	Order Control	Placer Order#	Order Effective Date & Time	Universal Service Identifier
0080000046	0080000046ELEC	NW	002909520001	20100816185200	ELEC
	0080000046FBC	NW	002909520001	20100816185200	FBC
	0080000046ESR	NW	002909520356	20100816185200	ESR
	0080000046GLUC	NW	002909520365	20100816185213	GLUC
	-	NW	002909520421	20100816185213	K
	-	OC	002909520421	20100816185213	K

Since Potassium is part of the Electrolytes group of tests, the LIS does not add the test. Instead, it sends a message to the HIS to indicate that this order has been cancelled (OC):

```
MSH|^~\&|LIS||SI||20100816144525||ORM^O01^ORM_O01|TD0000023498|P|2.3||
||||||||
PID|1||0000030552^^^^PATNUMBER||SMITH^Jane^^^^^L|^^^^|19390821|F|^^^^|
W|14 GRAY VIEW COURT^^SPRINGFIELD^PA^17870^^P^^SB|SB|(570)374-
3839|(570) 543-1235||M|LUTH|0005217123^^^^^1|185303171||||||||
PV1||I|SDU^2612^^^^^^^SDU LOCATION||||1023^MARTIN,MD CHRIS
W|||CAR||||||||000000007217123|M|||||||||||||||||||||||2010081317490
3||
ORC|OC|002909520421|0080000046K
||||^^^20100816185200^^R||20100816144525||||||20100816185200|
OBR|1|002909520421|0080000046K
|K^POTASSIUM|||20100816144512||||A|||20100816144512||||||||||||^^^201
00816185200^^R|||||||||
```

4. Later on, ESR is not needed any more by HIS

```
MSH|^~\&|SI|AT|LIS|TD|20100816185312||ORM^O01|20100813185312595000|P|2
.3||||
EVN|O01|20100813185250|
PID|1||0000030552^^^^PATNUMBER||SMITH^Jane^^^^^L|^^^^|19390821|F|^^^^|
W|14 GRAY VIEW COURT^^SPRINGFIELD^PA^17870^^P^^SB|SB|(570)374-
3839|(570) 543-1235||M|LUTH|0005217123^^^^^1|185303171||||||||
PV1|1|I|SDU^2612^^1|01|||1023^MARTIN,MD CHRIS
W.|||CAR||||07|||1023^MARTIN,MD CHRIS
W.|R|0007217157^^^^^1|M|||||||||||||||49|||||||20100813174903|||||||
|
ORC|CA|004309520356|||||1^^^20100813185200^^R^^^^||20100813185200|CAS1
|CAS1|1023^MARTIN,MD, CHRIS|SDU||20100813185200|||||
OBR|1|004309520356||ESR^ERYTHROCYTE SEDIMENTATION
RATE|R||||||O||||^^^^^|1023^MARTIN,MD, CHRIS|||07020^CLINICAL
LABORATORY|||||||||1^^^20100813185200^^R^^^^|||||||||||||||||||
```

Access #	Filler Order#	Order Control	Placer Order#	Order Effective Date & Time	Universal Service Identifier

0080000046	0080000046ELEC	NW	002909520001	20100816185200	ELEC
	0080000046FBC	NW	002909520001	20100816185200	FBC
	0080000046GLUC	NW	002909520365	20100816185213	GLUC
	-	CA	002909520356	20100816185200	ESR

The Technidata LIS deletes ESR and acknowledges the message.

5. The GLUCOSE test is deleted on the LIS

Access #	Filler Order#	Order Control	Placer Order#	Order Effective Date & Time	Universal Service Identifier
0080000046	0080000046ELEC	NW	002909520001	20100816185200	ELEC
	0080000046FBC	NW	002909520001	20100816185200	FBC
	0080000046GLUC	OC	002909520365	20100816185213	GLUC

A message is transmitted to the HIS to indicate that the GLUCOSE test has been cancelled:

```
MSH|^~\&|LIS||SI||20100816145603||ORM^O01^ORM_O01|TD0000023551|P|2.3||
||||||||
PID|1||0000000000000030552^^^^PATNUMBER||SMITH^Jane^^^^^L||19390821|F
|||14 GRAY VIEW COURT^^SPRINGFIELD
PA^PA^17870|||||||000000008217157|||||||||||||||
PV1|||SDU^^^^^^^^SDU
LOCATION|||||||||||||||000000008217157|||||||||||||||||||||201008
16||
ORC|OC|002909520365|0080000046GLUC||||^^^20100816135800^^R||2010081614
5603|||1023^MARTIN,MD CHRIS W|SDU^^^^^^^^SDU LOCATION||20100816185256|
OBR|1|002909520365|0080000046GLUC|GLUC^GLUCOSE|||||||A|
```

6. Later on, a reflex testing rule adds Total Protein to the original order

Access #	Filler Order#	Order Control	Placer Order#	Order Effective Date & Time	Universal Service Identifier
0080000046	0080000046ELEC	NW	002909520001	20100816185200	ELEC
	0080000046FBC	NW	002909520001	20100816185200	FBC
	0080000046TPRO	SN	-	20100816185822	TPRO

The Technidata LIS allocates a Filler Order Number (0080000046TPRO) to this test and sends a message to the HIS to request a Placer Order number for this test:

```
MSH|^~\&|LS||HOST||20100816185822||ORM^O01^ORM_O01|TD0000000052|P|2.3|
||||||||
PID|1||0000000000000030552^^^^PATNUMBER||SMITH^Jane^^^^^L||19390821|F
|||14 GRAY VIEW COURT^^SPRINGFIELD
PA^PA^17870|||||||000000008217157|||||||||||||||
PV1|||SDU^^^^^^^^SDU
LOCATION|||||||||||||||000000008217157|||||||||||||||||||||201008
16||
ORC|SN||0080000046TPRO||||^^^20100816185822^^R||20100816185822|||1023^
MARTIN,MD CHRIS W|SDU^^^^^^^^SDU LOCATION||20100816185822|
OBR|1||0080000046TPRO|TPRO^TOTAL PROTEINS|||||||A|||||1023^MARTIN,MD
CHRIS W|||||||CH01|||^^^20100816185822^^R||||
```

7. The HIS allocates a PON (002909522421) to this test and returns it to the LIS

```
MSH|^~\&|LIS||HOST||20100816185822||ORM^O01^ORM_O01|TD0000000052|P|2.3
||||||||||
PID|1||0000000000000030552^^^^PATNUMBER||SMITH^Jane^^^^^L||19390821|F
|||14 GRAY VIEW COURT^^SPRINGFIELD
PA^PA^17870|||||||0000000008217157|||||||||||||||
PV1|||SDU^^^^^^^^SDU
LOCATION|||||||||||||||0000000008217157|||||||||||||||||||||201008
16||
ORC|NA|002909522421|0080000046TPRO||||^^^20100816185822^^R||2010081618
5822|||1023^MARTIN,MD CHRIS W|SDU^^^^^^^^SDU LOCATION||20100816185822|
OBR|1|002909522421|0080000046TPRO|TPRO^TOTAL
PROTEINS|||||||A|||||1023^MARTIN,MD CHRIS
W|||||||CH01|||^^^20100816185822^^R||||
```

Access #	Filler Order#	Order Control	Placer Order#	Order Effective Date & Time	Universal Service Identifier
0080000046	0080000046ELEC	NW	002909520001	20100816185200	ELEC
	0080000046FBC	NW	002909520001	20100816185200	FBC
	0080000046TPRO	NA	002909522421	20100816185822	TPRO

8. After test has been received in the Laboratory a status change message (SC) is sent to the host

```
MSH|^~\&|LIS||SI||20100813164552||ORM^O01^ORM_O01|TD0000023528|P|2.3||
||||||||
PID|1||0000000000000030552^^^^PATNUMBER||SMITH^Jane^^^^^L||19390821|F
|||14 GRAY VIEW
COURT^^SPRINGFIELD^PA^17870|||||||0000000007217157|||||||||||||||
PV1||I|SDU^2612^^^^^^^SDU LOCATION||||1023^MARTIN,MD CHRIS
W|||CAR|||||||||0000000007217157|M|||||||||||||||||||||||2010081317490
3||
ORC|SC|004309520001|0080000035ELEC||||^^^20100813185200^^R||2010081316
4552||||||20100813185200|
OBR|1|004309520001|0080000035ELEC|ELEC^ELECTROLYTES|||20100813160816||
||A|||20100813160816||||||||||||^^^20100813185200^^R||||||||||
```

Multiple-procedure orders - Host Order Number Management / Several tests per message

1. The HIS creates a lab request and assigns a Placer Group Number to this request (Host Order Number)

```
MSH|^~\&|SI|AT|LIS|TD|20100820105312||ORM^O01|20100820105312595000|P|2
.3||||
EVN|O01|20100820105250|
PID|1||0000030552^^^^PATNUMBER||SMITH^Jane^^^^^L|^^^^|19390821|F|^^^^|
W|14 GRAY VIEW COURT^^SPRINGFIELD^PA^17870^^P^^SB|SB|(570)374-
3839|(570) 543-1235||M|LUTH|0005217123^^^^^1|185303171|||||||||
PV1|1|I|SDU^2612^^1|01|||1023^MARTIN,MD CHRIS
W.|||CAR||||07|||1023^MARTIN,MD CHRIS
W.|R|0008219957^^^^^1|M|||||||||||||||49|||||||20100816174903|||||||
|
ORC|NW|||08201020123|||1^^^20100820105200^^R^^^^||20100820105200|CAS1|
CAS1|1023^MARTIN,MD, CHRIS|SDU||20100820105200|||||
```

```
OBR|1|||ELEC^ELECTROLYTES|R||||||O||||^^^^^|1023^MARTIN,MD,
CHRIS|||07020^CLINICAL
LABORATORY||||||||1^^^20100820105200^^R^^^^|||||||||||||||||||
ORC|NW|||08201020123|||1^^^20100820105200^^R^^^^||20100820105200|CAS1|
CAS1|1023^MARTIN,MD, CHRIS|SDU||20100820105200|||||
OBR|2|||FBC^FULL BLOOD COUNT|R||||||O||||^^^^^|1023^MARTIN,MD,
CHRIS|||07020^CLINICAL
LABORATORY||||||||1^^^20100820105200^^R^^^^|||||||||||||||||||
```

Access #	Order Control	Placer Group Number#	Order Effective Date & Time	Universal Service Identifier
0080000055	NW	08201020123	20100820105200	ELEC
	NW	08201020123	20100820105200	FBC

2. Later on, the doctor adds two tests (ESR and GLUC) to the existing order

```
MSH|^~\&|SI|AT|LIS|TD|20100820105312||ORM^O01|20100820105312595000|P|2
.3||||
EVN|O01|20100820105250|
PID|1||0000030552^^^^PATNUMBER||SMITH^Jane^^^^^L|^^^^|19390821|F|^^^^|
W|14 GRAY VIEW COURT^^SPRINGFIELD^PA^17870^^P^^SB|SB|(570)374-
3839|(570) 543-1235||M|LUTH|0005217123^^^^^1|185303171||||||||
PV1|1|I|SDU^2612^^1|01|||1023^MARTIN,MD CHRIS
W.|||CAR||||07|||1023^MARTIN,MD CHRIS
W.|R|0008219957^^^^^1|M|||||||||||||||49|||||||201008161749O3|||||||
|
ORC|NW|||08201020123|||1^^^20100820105200^^R^^^^||20100820105200|CAS1|
CAS1|1023^MARTIN,MD, CHRIS|SDU||20100820105200|||||
OBR|1|||ELEC^ELECTROLYTES|R||||||O||||^^^^^|1023^MARTIN,MD,
CHRIS|||07020^CLINICAL
LABORATORY||||||||1^^^20100820105200^^R^^^^|||||||||||||||||||
ORC|NW|||08201020123|||1^^^20100820105200^^R^^^^||20100820105200|CAS1|
CAS1|1023^MARTIN,MD, CHRIS|SDU||20100820105200|||||
OBR|2|||FBC^FULL BLOOD COUNT|R||||||O||||^^^^^|1023^MARTIN,MD,
CHRIS|||07020^CLINICAL
LABORATORY||||||||1^^^20100820105200^^R^^^^|||||||||||||||||||
ORC|NW|||08201020123|||1^^^20100820105200^^R^^^^||20100820105200|CAS1|
CAS1|1023^MARTIN,MD, CHRIS|SDU||20100820105200|||||
OBR|3|||ESR^ ERYTHROCYTE SEDIMENTATION
RATE|R||||||O||||^^^^^|1023^MARTIN,MD, CHRIS|||07020^CLINICAL
LABORATORY||||||||1^^^20100820105200^^R^^^^|||||||||||||||||||
ORC|NW|||08201020123|||1^^^20100820105200^^R^^^^||20100820105200|CAS1|
CAS1|1023^MARTIN,MD, CHRIS|SDU||20100820105200|||||
OBR|4|||GLUC^GLUCOSE|R||||||O||||^^^^^|1023^MARTIN,MD,
CHRIS|||07020^CLINICAL
LABORATORY||||||||1^^^20100820105200^^R^^^^|||||||||||||||||||
```

Access #	Order Control	Placer Group Number#	Order Effective Date & Time	Universal Service Identifier
0080000055	NW	08201020123	20100820105200	ELEC
	NW	08201020123	20100820105200	FBC
	NW	08201020123	20100820105200	ESR
	NW	08201020123	20100820105200	GLUC

3. Later on, ESR is no longer needed by the HIS

```
MSH|^~\&|SI|AT|LIS|TD|20100820105312||ORM^O01|20100820105312595000|P|2
.3||||
EVN|O01|20100820105250|
PID|1||0000030552^^^^PATNUMBER||SMITH^Jane^^^^^L|^^^^|19390821|F|^^^^|
W|14 GRAY VIEW COURT^^SPRINGFIELD^PA^17870^^P^^SB|SB|(570)374-
3839|(570) 543-1235||M|LUTH|0005217123^^^^^1|185303171||||||||
PV1|1|I|SDU^2612^^1|01|||1023^MARTIN,MD CHRIS
W.|||CAR||||07|||1023^MARTIN,MD CHRIS
W.|R|0008219957^^^^^1|M|||||||||||||||49|||||||20100816174903|||||||
|
ORC|NW|||08201020123|||1^^^20100820105200^^R^^^^||20100820105200|CAS1|
CAS1|1023^MARTIN,MD, CHRIS|SDU||20100820105200|||||
OBR|1|||ELEC^ELECTROLYTES|R||||||O||||^^^^^|1023^MARTIN,MD,
CHRIS|||07020^CLINICAL
LABORATORY||||||||1^^^20100820105200^^R^^^^||||||||||||||||||
ORC|NW|||08201020123|||1^^^20100820105200^^R^^^^||20100820105200|CAS1|
CAS1|1023^MARTIN,MD, CHRIS|SDU||20100820105200|||||
OBR|2|||FBC^FULL BLOOD COUNT|R||||||O||||^^^^^|1023^MARTIN,MD,
CHRIS|||07020^CLINICAL
LABORATORY||||||||1^^^20100820105200^^R^^^^||||||||||||||||||
ORC|CA|||08201020123|||1^^^20100820105200^^R^^^^||20100820105200|CAS1|
CAS1|1023^MARTIN,MD, CHRIS|SDU||20100820105200|||||
OBR|3|||ESR^ ERYTHROCYTE SEDIMENTATION
RATE|R||||||O||||^^^^^|1023^MARTIN,MD, CHRIS|||07020^CLINICAL
LABORATORY||||||||1^^^20100820105200^^R^^^^||||||||||||||||||
ORC|NW|||08201020123|||1^^^20100820105200^^R^^^^||20100820105200|CAS1|
CAS1|1023^MARTIN,MD, CHRIS|SDU||20100820105200|||||
OBR|4|||GLUC^GLUCOSE|R||||||O||||^^^^^|1023^MARTIN,MD,
CHRIS|||07020^CLINICAL
LABORATORY||||||||1^^^20100820105200^^R^^^^||||||||||||||||||
```

Access #	Order Control	Placer Group Number#	Order Effective Date & Time	Universal Service Identifier
0080000055	NW	08201020123	20100820105200	ELEC
	NW	08201020123	20100820105200	FBC
	NW	08201020123	20100820105200	GLUC
	CA	08201020123	20100820105200	ESR

The Technidata LIS retrieves the request using the Host Order Number and updates it.

Example of SC messages

The following examples illustrate the impact of the **Send only one item per message** device property in ORM 'Status Change' message to the HIS.

'Send only one item per message' = NO

The following test/combined tests BT, CT and MG are requested and must be processed on the same tube.

As many messages as level zero tests contained in the tube for which PSR or rectube has been processed, will be sent.

SC Message

1. Message received

```
MSH|^~\&|LIS||HOST||20100211142522||ORM^O01^ORM_O01|TD0000038858|P|2.0
4|||||||||
PID|1||XYPD.0000201937^^^^PATNUMBER||SMITH^John^^^^^L||20080721|M|||Ad
dress line 1^Address line 2^^Address line
3|||||||xPA1001280016|||||||||||||||
PV1||IN|TNC CLINIC^^^^^^^^TNC
Clinic||||A00103^SUNARTOHARIMANSpPK|A00103^SUNARTOHARIMANSpPK|||||||||
||xPA1001280016|||||||||||||||||||||||||
ORC|SC|X19386|0020300014BT||||^^^20100211142458^^R||20100211142522||||
||20100203113114|
OBR|1|X19386|0020300014BT|0201000014^BLEEDING
TIME|||20100211142514||||A|||20100211142514||||||||||||^^^20100211142
458^^R|||||||||

MSH|^~\&|HOST||LIS||||ACK|ATD0000038858|P|2.04|
MSA|AA|TD0000038858|
```

2. Message received

```
MSH|^~\&|LIS||HOST||20100211142522||ORM^O01^ORM_O01|TD0000038859|P|2.0
4|||||||||
PID|1||XYPD.0000201937^^^^PATNUMBER||SMITH^John^^^^^L||20080721|M|||Ad
dress line 1^Address line 2^^Address line
3|||||||xPA1001280016|||||||||||||||
PV1||IN|TNC CLINIC^^^^^^^^TNC
Clinic||||A00103^SUNARTOHARIMANSpPK|A00103^SUNARTOHARIMANSpPK|||||||||
||xPA1001280016|||||||||||||||||||||||||
ORC|SC|X19386|0020300014CT||||^^^20100211142458^^R||20100211142522||||
||20100203113114|
OBR|1|X19386|0020300014CT|0201000015^CLOTTING
TIME|||20100211142514||||A|||20100211142514||||||||||||^^^20100211142
458^^R|||||||||

MSH|^~\&|HOST||LIS||||ACK|ATD0000038859|P|2.04|
MSA|AA|TD0000038859|
```

3. Message received

```
MSH|^~\&|LIS||HOST||20100211142522||ORM^O01^ORM_O01|TD0000038860|P|2.0
4|||||||||
```

```
PID|1||XYPD.0000201937^^^^PATNUMBER||SMITH^John^^^^^L||20080721|M|||Ad
dress line 1^Address line 2^^Address line
3|||||||xPA1001280016|||||||||||||||
PV1||IN|TNC CLINIC^^^^^^^^TNC
Clinic||||A00103^SUNARTOHARIMANSpPK|A00103^SUNARTOHARIMANSpPK|||||||||
||xPA1001280016|||||||||||||||||||||||||
ORC|SC|X19386|0020300014MG||||^^^20100211142458^^R||20100211142522||||
||20100203113114|
OBR|1|X19386|0020300014MG|0201000160^MAGNESIUM|||20100211142514||||A||
|20100211142514||||||||||||^^^20100211142458^^R|||||||||

MSH|^~\&|HOST||LIS||||ACK|ATD0000038860|P|2.04|
MSA|AA|TD0000038860|
```

'Send only one item per message' = YES

The following tests: DRUT, BT and CT are requested and must be processed on the same “tube”/specimen.

The Communication Engine sends only one message for the first test requested for this “tube”/specimen.

SC Message

Message received

```
MSH|^~\&|LIS||HOST||20100211142121||ORM^O01^ORM_O01|TD0000038855|P|2.0
4|||||||||
PID|1||XYPD.0000201937^^^^PATNUMBER||SMITH^John^^^^^L||20080721|M|||Ad
dress line 1^Address line 2^^Address line
3|||||||xPA1001280016|||||||||||||||
PV1||IN|TNC CLINIC^^^^^^^^TNC
Clinic||||A00103^SUNARTOHARIMANSpPK|A00103^SUNARTOHARIMANSpPK|||||||||
||xPA1001280016|||||||||||||||||||||||||
ORC|SC|X19385|0020300013DRUT||||^^^20100211141949^^R||20100211142121||
||||20100203113114|
OBR|1|X19385|0020300013DRUT|0201000001^Routine
Hematology|||20100211142111||||A|||20100211141949||||||||||||^^^20100
211141949^^R|||||||||
```

Example of OML^O21 and ORL^O22 messages

OML messages are managed by TDNexLabs from V01.21 and TD-Synergy from V12.21

Positive acknowledgement

Single test

```
MSH|^~\&|OP|Entero-
gastric|OF|Chemistry|201507060820||OML^O21^OML_O21|msgOP123|P|2.5
PID|1||1234567890^^^PATNUM^PI||SMITH^John^^^MR^^L||19660818|M|||123 Main
road^^TOWN^^99999||0476041300
PV1|1|I|LOC^35^12||||ADOC^Attending doctor|RDOC^Referring
doctor|CDOC^Consulting doctor
ORC|NW|||13001123456|||||201507060810|||DOC^Doctor|LOC^35^12
OBR|1|||IONO^Ionogram^L
SPM|1|13001123456||SER^Serum||||||||||||201507060800|||||||||101^Yellow Tube
```

```
SPM-2 => used as SP_TUBES.PRIMARYSAMPLENUMBER
SPM-4 => checked against SAMPLE type associated with a test in Technidata LIS
dictionary
SPM-17 => saved in SP_TUBES.COLLECTIONDATE
OBR-10 => saved in SP_TUBES.COLLECTOR
TUBENB => TUBETYPE + FULL ACCESSNUMBER
```

NOTE: Tube is marked as collected (SP_TUBES.TUBESTATUS=1) when SPM-17 has a valid Collection date value.

TUBENB	SP_ACCESSNUMBER	SAMPLETYPE	TUBETYPE	PRIMARYSAMPLENUMBER
1015070612345	5070612345	SER	101	13001123456

```
MSH|^~\&|HOST||TDR||20160414191142||ORL^O22^ORL_O22^O22|TD0000065814|P|2.3||||
|||||| MSA|AA|TD0000130301| ERR|||0||
PID|1||1234567890^^^PATNUM^PI||SMITH^John^^^MR^^L||19660818|M|||123 Main
road^^TOWN^^99999||0476041300
ORC|OK|||13001123456|||||201507060810|||DOC^Doctor|LOC^35^12
OBR|1|||IONO^Ionogram^L
SPM|1|13001123456||SER^Serum||||||||||||201507060800|||||||||1|101^Yellow
Tube
```

Multiple single tests having different samples

```
MSH|^~\&|OP|Entero-
gastric|OF|Chemistry|201507060820||OML^O21^OML_O21|msgOP123|P|2.5
PID|1||1234567890^^^PATNUM^PI||SMITH^John^^^MR^^L||19660818|M|||123 Main
road^^TOWN^^99999||0476041300
PV1|1|I|LOC^35^12||||ADOC^Attending doctor|RDOC^Referring
doctor|CDOC^Consulting doctor
ORC|NW|||13001123456|||||201507060810|||DOC^Doctor|LOC^35^12
OBR|1|||ES^^L
SPM|1|13001013243451||SER^Serum||||||||||||201507060800|||||||
ORC|NW|||13001123456|||||201507060810|||DOC^Doctor|LOC^35^12
OBR|1|||ES2^^L
SPM|2|13001013243452||URI^Urine||||||||||||201507060800|||||||
```

```
MSH|^~\&|HOST||TDR||20160414191146||ORL^O22^ORL_O22^O22|TD0000065818|P|2.3||||
||||||
MSA|AA|TD0000130301| ERR|||0||
PID|1||1234567890^^^PATNUM^PI||SMITH^John^^^MR^^L||19660818|M|||123 Main
road^^TOWN^^99999||0476041300
ORC|OK|||13001123456|||||201507060810|||DOC^Doctor|LOC^35^12
OBR|1|||ES^^L
SPM|1|13001013243451||SER^Serum||||||||||||201507060800||||||1|
ORC|OK|||13001123456|||||201507060810|||DOC^Doctor|LOC^35^12
OBR|1|||ES2^^L
SPM|2|13001013243452||URI^Urine||||||||||||201507060800||||||1|
```

Combined test with multiple samples

```
MSH|^~\&|OP|Entero-
gastric|OF|Chemistry|201507060820||OML^O21^OML_O21|msgOP123|P|2.5
PID|1||1234567890^^^PATNUM^PI||SMITH^John^^^MR^^L||19660818|M|||123 Main
road^^TOWN^^99999||0476041300
PV1|1|I|LOC^35^12||||ADOC^Attending doctor|RDOC^Referring
doctor|CDOC^Consulting doctor
ORC|NW|||13001123456|||||201507060810|||DOC^Doctor|LOC^35^12
OBR|1|||CRECR^Creatinine Clearance^L
OBX|1|NM|VOLUM^Volume of Urine^L||1270|ml
SPM|1|13001013243451||SER^Serum||||||||||||201507060800|||||||
SPM|2|13001013243452||URI^Urine||||||||||||201507060800|||||||
```

TUBENB	SP_ACCESSNUMBER	SAMPLETYPE	TUBETYPE	PRIMARYSAMPLENUMBER
1015070612345	5070612345	SER	101	13001013243451
1025070612345	5070612345	URI	102	13001013243452

```
MSH|^~\&|HOST||TDR||20160414191146||ORL^O22^ORL_O22^O22|TD0000065818|P|2.3||||
||||||
MSA|AA|TD0000130301| ERR|||0||
PID|1||1234567890^^^PATNUM^PI||SMITH^John^^^MR^^L||19660818|M|||123 Main
road^^TOWN^^99999||0476041300
ORC|OK|||13001123456|||||201507060810|||DOC^Doctor|LOC^35^12
OBR|1|||CRECR^Creatinine Clearance^L
OBX|1|NM|VOLUM^Volume of Urine^L||1270|ml
SPM|1|13001013243451||SER^Serum||||||||||||201507060800||||||1|
SPM|2|13001013243452||URI^Urine||||||||||||201507060800|||||||1
```

Multiple single tests having the same samples

```
MSH|^~\&|HOST||TDR||20160414191146||ORL^O22^ORL_O22^O22|TD0000065818|P|2.3||||
|||||| MSA|AA|TD0000130301| ERR|||0||
PID|1||1234567890^^^PATNUM^PI||SMITH^John^^^MR^^L||19660818|M|||123 Main
road^^TOWN^^99999||0476041300
ORC|NW|||13001123456|||||201507060810|||DOC^Doctor|LOC^35^12
OBR|1|||ES^^L
SPM|1|13001013243451||SER^Serum||||||||||||201507060800|||||||
ORC|NW|||13001123456|||||201507060810|||DOC^Doctor|LOC^35^12
```

```
OBR|1|||GCT^^L
SPM|2|13001013243451||SER^Serum ||||||||||||201507060800|||||||


MSH|^~\&|HOST||TDR||20160414191146||ORL^O22^ORL_O22^O22|TD0000065818|P|2.3||||
|||||| MSA|AA|TD0000130301| ERR|||0||
PID|1||1234567890^^^PATNUM^PI||SMITH^John^^^MR^^L||19660818|M|||123 Main
road^^TOWN^^99999||0476041300
ORC|OK|||13001123456|||||201507060810|||DOC^Doctor|LOC^35^12
OBR|1|||ES^^L
SPM|1|13001013243451||SER^Serum||||||||||||201507060800||||||1|
ORC|OK|||13001123456|||||201507060810|||DOC^Doctor|LOC^35^12
OBR|1|||GCT^^L
SPM|2|13001013243451||SER^Serum ||||||||||||201507060800||||||1|
```

Negative acknowledgement for missing sample type

```
MSH|^~\&|OP|Entero-
gastric|OF|Chemistry|201507060820||OML^O21^OML_O21|msgOP123|P|2.5
PID|1||1234567890^^^PATNUM^PI||SMITH^John^^^MR^^L||19660818|M|||123 Main
road^^TOWN^^99999||0476041300
ORC|NW|||13001123456|||||201507060810|||DOC^Doctor|LOC^35^12
OBR|1|||IONO^Ionogram^L
SPM|1|13001123456||SERX^Serum||||||||||||201507060800|||||||||101^Yellow
Tube
```

Outbound message

```
MSH|^~\&|OP|Entero-
gastric|OF|Chemistry|201507060820||OML^O21^OML_O21|msgOP123|P|2.5
MSA|AR|msgOP123|
ERR|^^^207&A catchall for internal errors not explicity covered by other codes
(Request Placer Group Number #13001123456)||||
PID|1||1234567890^^^PATNUM^PI||SMITH^John^^^MR^^L||19660818|M|||123 Main
road^^TOWN^^99999||0476041300
ORC|UA|||13001123456|||||201507060810|||DOC^Doctor|LOC^35^12
OBR|1|||IONO^Ionogram^L
SPM|1|13001123456||SERX^Serum||||||||||||201507060800|||||||||101^Yellow
Tube
```

Negative acknowledgement for deletion of test for already collected sample

```
MSH|^~\&|OP|Entero-
gastric|OF|Chemistry|201507060820||OML^O21^OML_O21|msgOP123|P|2.5
PID|1||1234567890^^^PATNUM^PI||SMITH^John^^^MR^^L||19660818|M|||123 Main
road^^TOWN^^99999||0476041300
ORC|CA|||13001123456|||||201507060810|||DOC^Doctor|LOC^35^12
OBR|1|||IONO^Ionogram^L
SPM|1|13001123456||SER^Serum||||||||||||201507060800|||||||||101^Yellow Tube
```

Outbound message

```
MSH|^~\&|OP|Entero-
gastric|OF|Chemistry|201507060820||OML^O21^OML_O21|msgOP123|P|2.5
MSA|AR|msgOP123|
ERR|^^^207&A catchall for internal errors not explicity covered by other codes
```

```
(Request Placer Group Number #13001123456)||||
PID|1||1234567890^^^PATNUM^PI||SMITH^John^^^MR^^L||19660818|M|||123 Main
road^^TOWN^^99999||0476041300
ORC|UC|||13001123456|||||201507060810|||DOC^Doctor|LOC^35^12
OBR|1|||IONO^Ionogram^L
SPM|1|13001123456||SER^Serum||||||||||||201507060800||||||||||101^Yellow Tube
```

Chameleon

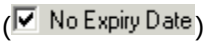
About Chameleon files (VMD files)

Registration

During the customer setup, the previous version of Chameleon (if any) is removed and the new version is installed.

On all computers used for communications requiring Chameleon software, it is now necessary to register the new version of Chameleon software with Interfaceware before you can use it. To do so, you must call the TECHNIDATA Support team in order to obtain a registration code.

Proceed as follows:

- After upgrading the Technidata LIS Client software, open a `.vmd` file, for example `HL7.vmd`. A window is displayed inviting you to obtain a free registration code from Interfaceware. DO NOT USE the 'Get Free Member's Account via Internet' button.
- Call the TECHNIDATA Support team.
  - The TECHNIDATA Support team will ask you to give them the **Machine ID** information, displayed at the bottom of the window on your PC.
  - Then, in return, the TECHNIDATA Support team will give you a registration code. Enter this code in the **Registration Code** field. This code is specific to the computer: a registration code obtained on one computer is not valid on another computer.
  - *IMPORTANT*: Select **No expiry date** option (

), and click the **Ok** button.

Upgrade

WARNING: If you are upgrading your software, new Chameleon files (VMD files) can be delivered and copied to your disk. These new VMD files do not overwrite the old files, but are copied to a `reference` directory, because the old VMD files can contain modifications.

- Before the upgrade, the VMD files currently used are stored in the client installation directory: `C:\Technidata\<TD-Product> Client_InstanceName`
- At the installation time or during the latest upgrade, they are stored in: `C:\Technidata\<Product> Client_InstanceName\Reference`
- After an upgrade, it is therefore imperative that the Installation engineer copies the new VMD files from the `Reference` directory to the `<TD-Product> Client_InstanceName` directory. But before doing this, the Installation engineer must copy the modifications manually if any, in the new VMD files, (See NOTE below).

NOTE: You should not modify the delivered vmd file. If you cannot avoid modifying it, it is recommended to make a note of all modifications (for example, keep a file containing details of all macros added and the fields where they have been added).
For later upgrades, if you want to find the modifications easily, you can, for example, create a dedicated file named "HL7_modifications.doc" or create a "VMD modifications" directory under the client installation directory.

Editing Chameleon VMD file

By default, HL7 message fields contain the values documented under **Segment descriptions** of this document.

If site needs different values in the HL7 message, the FSE can customize values that will be used in the concerned field.

This section contains information on how to customize field values in the VMD file.

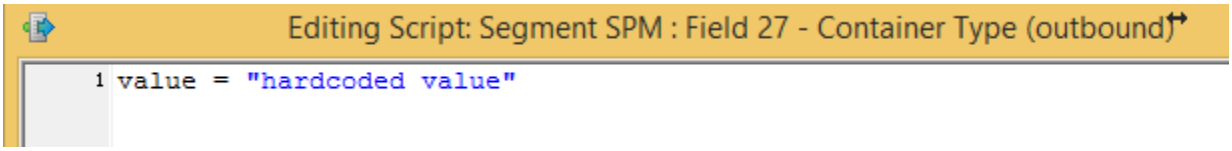
- Customize/hard code fixed value
- Remove field and subfield value
- Truncate field value

Customize/hard code fixed value during transmission

The values sent by the Technidata LIS can be customized before the transmission of HL7 message.

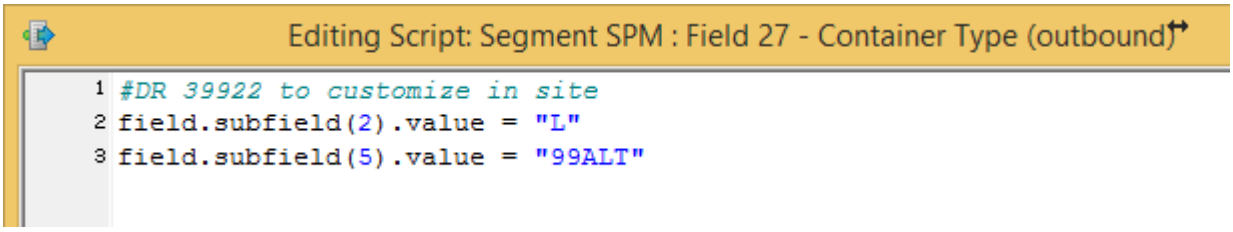
A. Steps to follow to hard-code value of entire field (e.g, SPM.27)

1. Open the **HL7OrderReception.vmd** file
2. Go to **Segments** section on the left pane of Chameleon browser
3. Double-click on **SPM** segment
4. Add the following outbound script under **27. Container Type**



B. Steps to follow to hard-code value of sub-fields (eg SPM.27.3 and SPM.27.5)

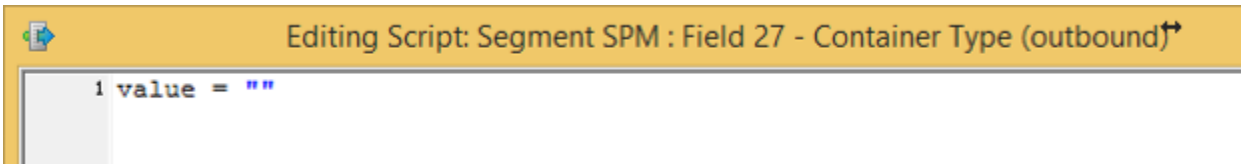
- SPM-27.3 Coding system --> use hard coded value **L**
- SPM-27.6 Name of alternate coding system --> use hard coded value **99ALT**



Note that in the above script, only SPM-27.3 and SPM-27.6 will be customized.
Values of other subfields will not be changed.

Remove field and subfield value

A. Steps to follow to clear value of field

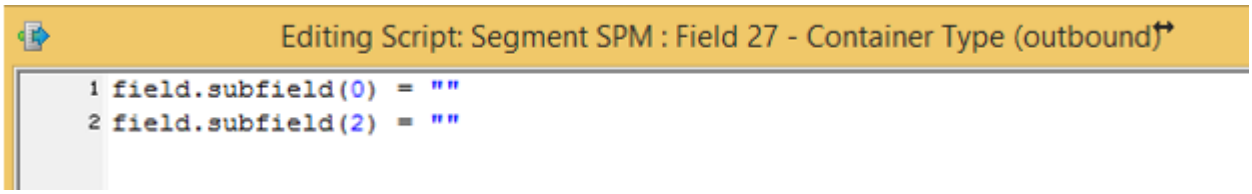


Script above will clear value of entire SPM-27.

B. Steps to follow to clear value of sub-field

E.g., clear value of SPM-27.4 sub-fields 1 and 3

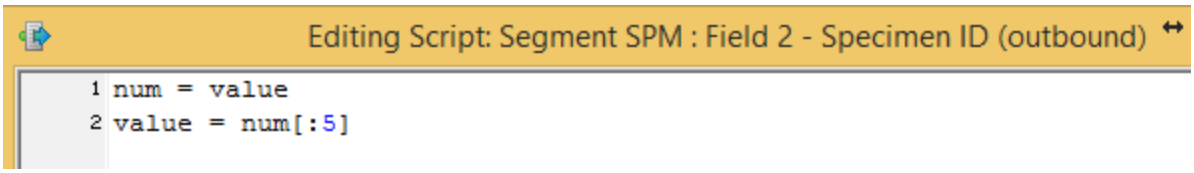
Use `field.subfield(index)`, note that Index starts with 0



Truncate field value

Values sent can be truncated depending on length requested by site.

E.g., truncate field value to length 5



Using the Chameleon simulator

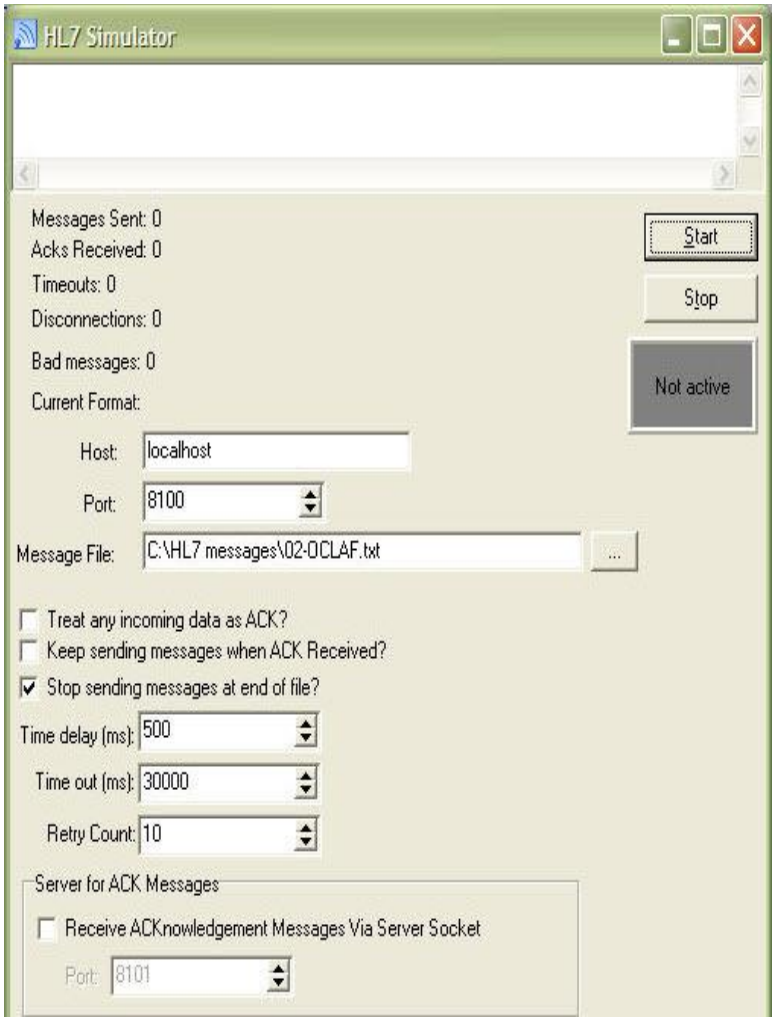
The Chameleon "Simulator" and "Listener" tools are used to simulate a Host, in order to test whether the communication you have installed is running well.

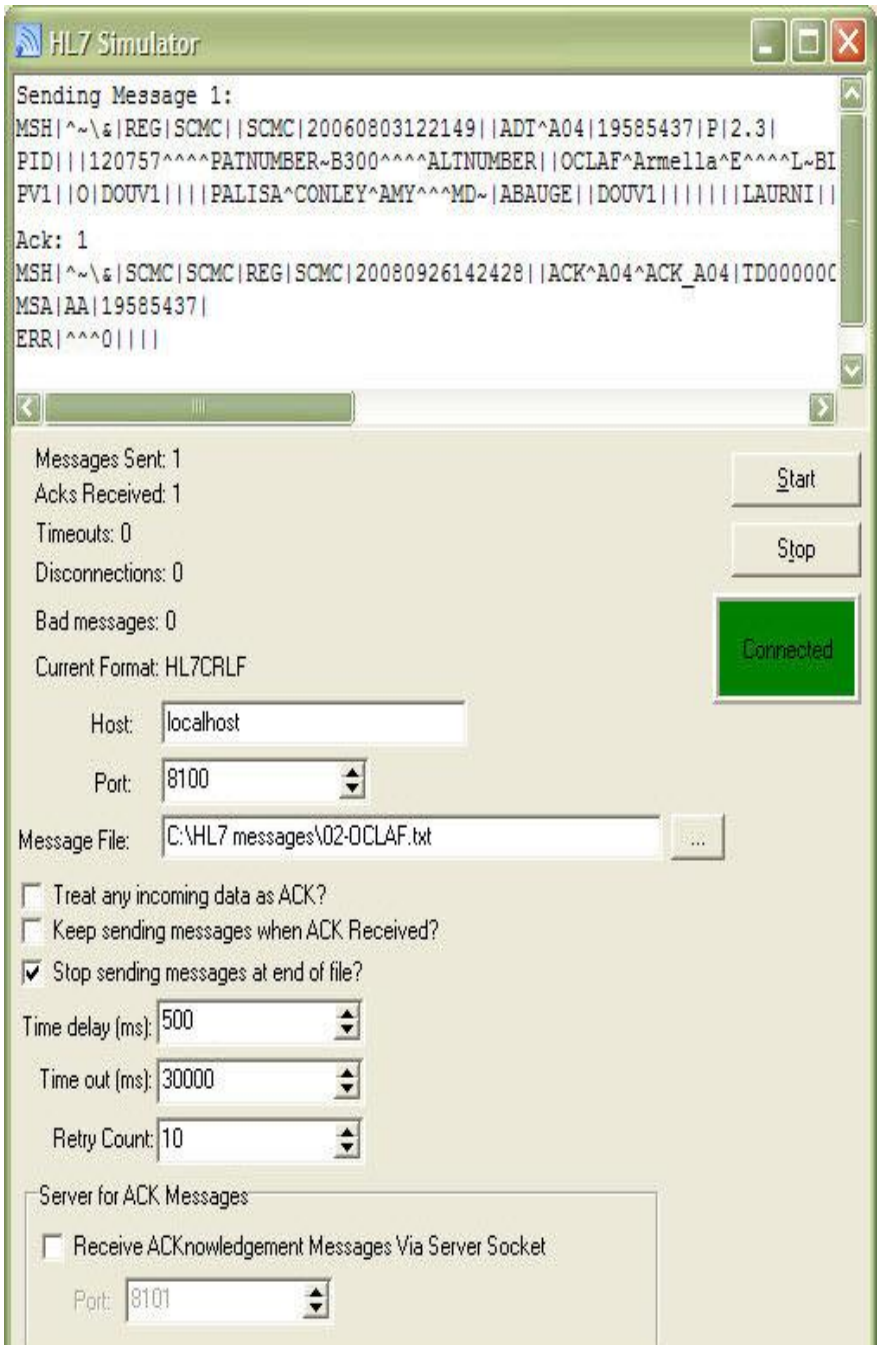
- The *simulator* is used to transmit HL7 messages to the Communication engine via TCP/IP socket.
- The *listener* is used to receive HL7 messages from the Communication engine via TCP/IP socket.

You can use either, depending on whether you are acting as a transmitter or receiver.

Using the Simulator

To start the HL7 simulator, run the `Simulator.exe` file, stored in `C:\Program Files\iNTERFACEWARE\Chameleon\Simulator.exe`

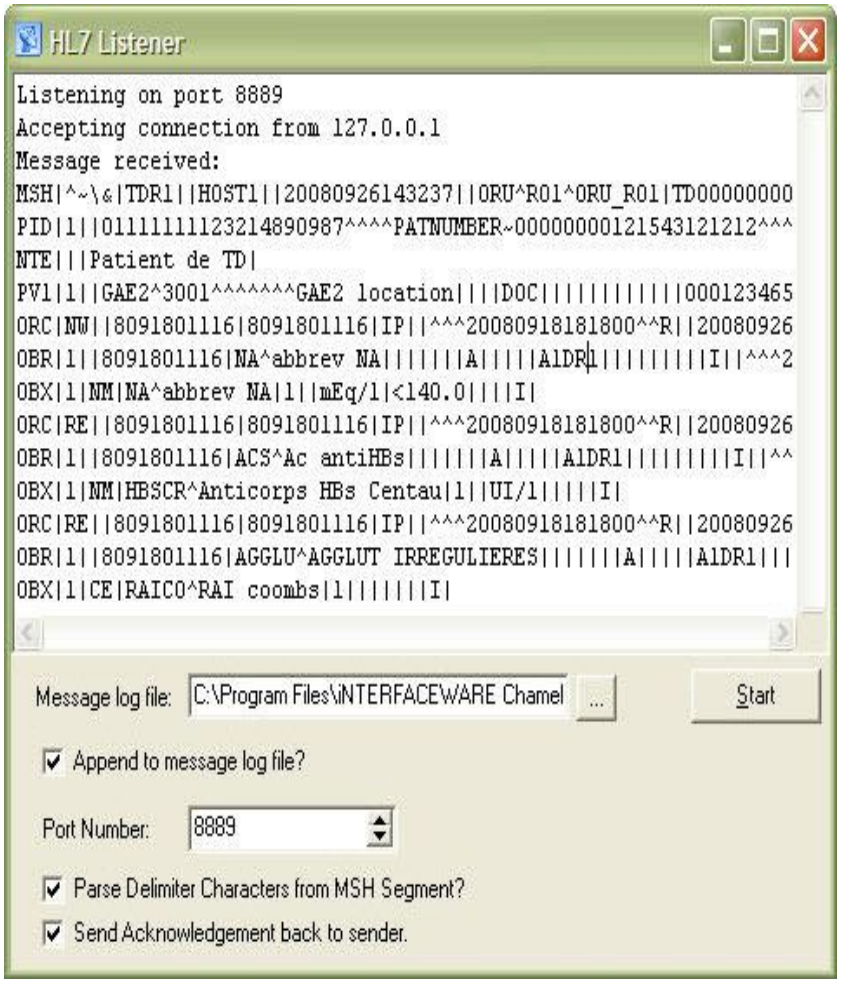




Using the Listener

To start the HL7 Listener, run the `Listener.exe` file, stored in: `C:\Program Files\iNTERFACEWARE\Chameleon\Listener.exe`


HL7 Listener
Listening on port 8887
Message log file:
C:\Program Files\INTERFACE
...
Stop
Append to message log file?
Port Number:
8887
Parse Delimiter Characters from MSH Segment?
Send Acknowledgement back to sender.


HL7 Listener
Listening on port 8889
Accepting connection from 127.0.0.1
Message received:
MSH|^~\&|TDR1||HOST1||20080926143237||ORU^R01^ORU_R01|TD00000000
PID|1||011111111123214890987^^^^PATNUMBER~00000000121543121212^^^
NTE|||Patient de TD|
PV1|1||GAE2^3001^^^^^^^GAE2 location||||DOC||||||||||||000123465
ORC|NW||8091801116|8091801116|IP||^^^20080918181800^^R||20080926
OBR|1||8091801116|NA^abbrev NA|||||||A|||||A1DR1|||||||||I||^^^2
OBX|1|NM|NA^abbrev NA|1||mEq/l|<140.0||||I|
ORC|RE||8091801116|8091801116|IP||^^^20080918181800^^R||20080926
OBR|1||8091801116|ACS^Ac antiHBs|||||||A|||||A1DR1|||||||||I||^^
OBX|1|NM|HBSCR^Anticorps HBs Centau|1||UI/l|||||I|
ORC|RE||8091801116|8091801116|IP||^^^20080918181800^^R||20080926
OBR|1||8091801116|AGGLU^AGGLUT IRREGULIERES|||||||A|||||A1DR1|||
OBX|1|CE|RAICO^RAI coombs|1|||||||I|
Message log file:
C:\Program Files\INTERFACEWARE Chamel
...
Start
Append to message log file?
Port Number:
8889
Parse Delimiter Characters from MSH Segment?
Send Acknowledgement back to sender.

Updating VMD script to convert formatting commands

Overview

As for HL7 Standards, the OBX-5 (Observation value) can contain formatted text as values.

If the value of the field value is formatted text, formatting commands that begin with dot (.) and are surrounded by escape character (e.g. \.br\) can be included in the observation value.

By default, formatting commands listed in Chapter 2 of the HL7 standards are not supported by the Technidata LIS. Current VMDs must be updated to support conversion of the formatting command to its equivalent character.

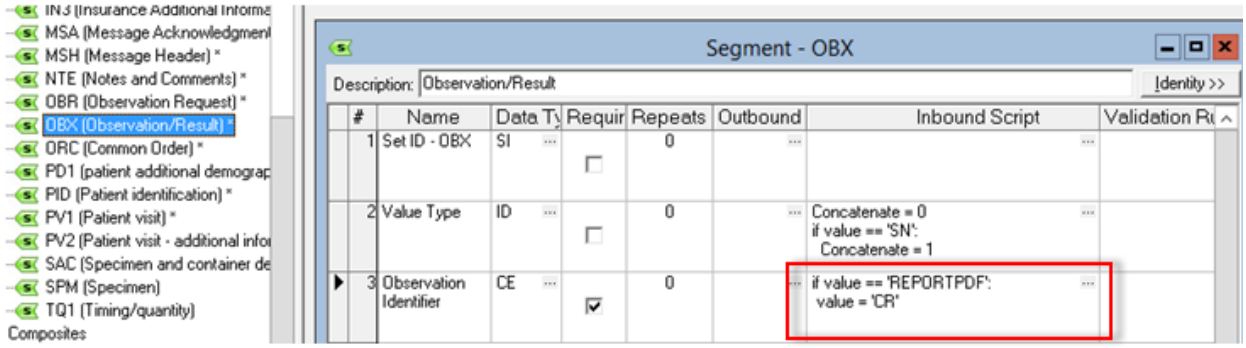
Updating the VMD script

Updating the OBX-3 value in the inbound script

Supported from TDNexLabs V01.31 (also in V01.22) and from TD-Synergy V12.31

This procedure updates the OBX-3 value when the site wants to receive attached PDF result reports from reference laboratories.

If the site wants to customize the 'REPORTPDF 'test code in the OBX-3, the `HL7ReferenceLabResultReception.vmd` file must be modified as follows:



1. Expand to "Segments - OBX" (left side of Chameleon browser)
2. Open Inbound Script editor of #3 Observation Identifier
3. Add the following python script:

```
if value == 'REPORTPDF':
 value = 'CR'
```

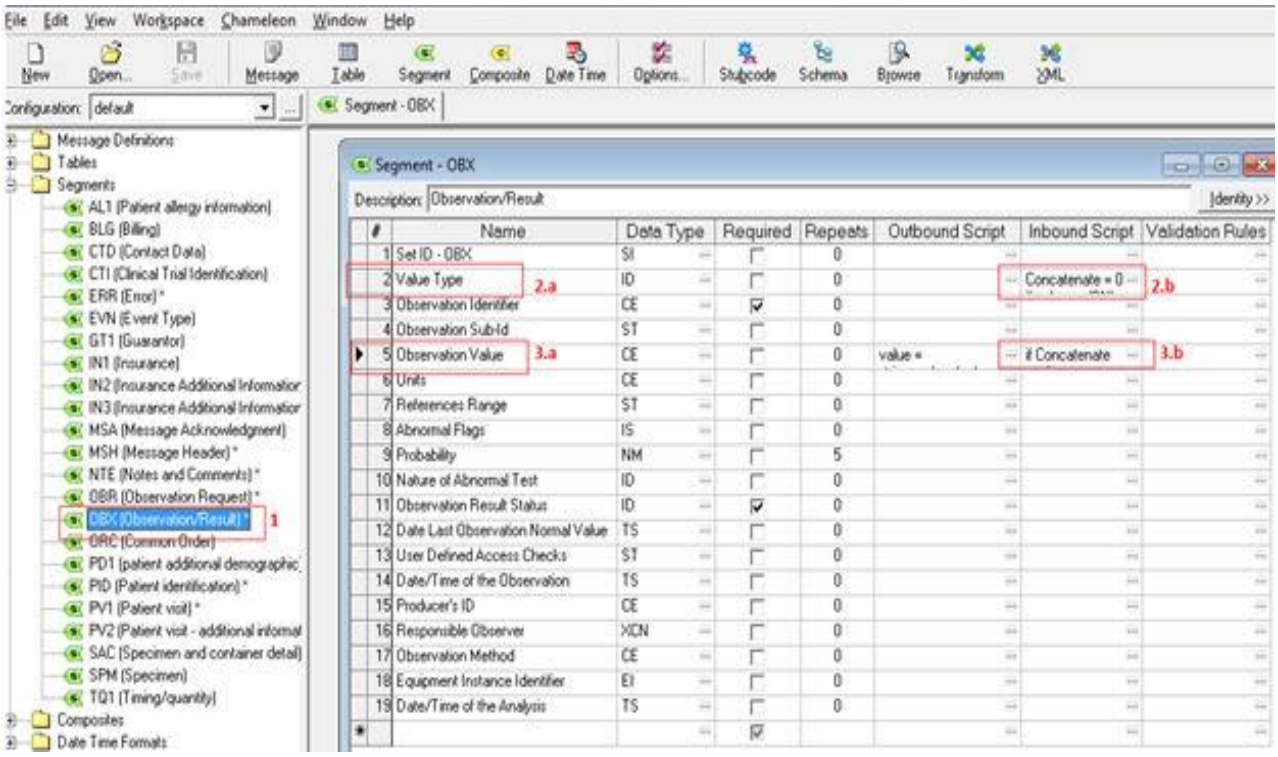
IMPORTANT! CR is the test code of a single test. The CR test code must be in a combined test.

Updating the OBX-5 value in the inbound script

This procedure updates the OBX-5 value when the `\.br\` command is included in the field value.

This script converts instances of `\.br\` to `\r\n` in the observation value when the value type in OBX-2 is TX.

1. Open the VMD file that contains OBX-segment (result reception VMD).
2. Double click **Segments**, on the left panel of the screen. See the following screenshot.

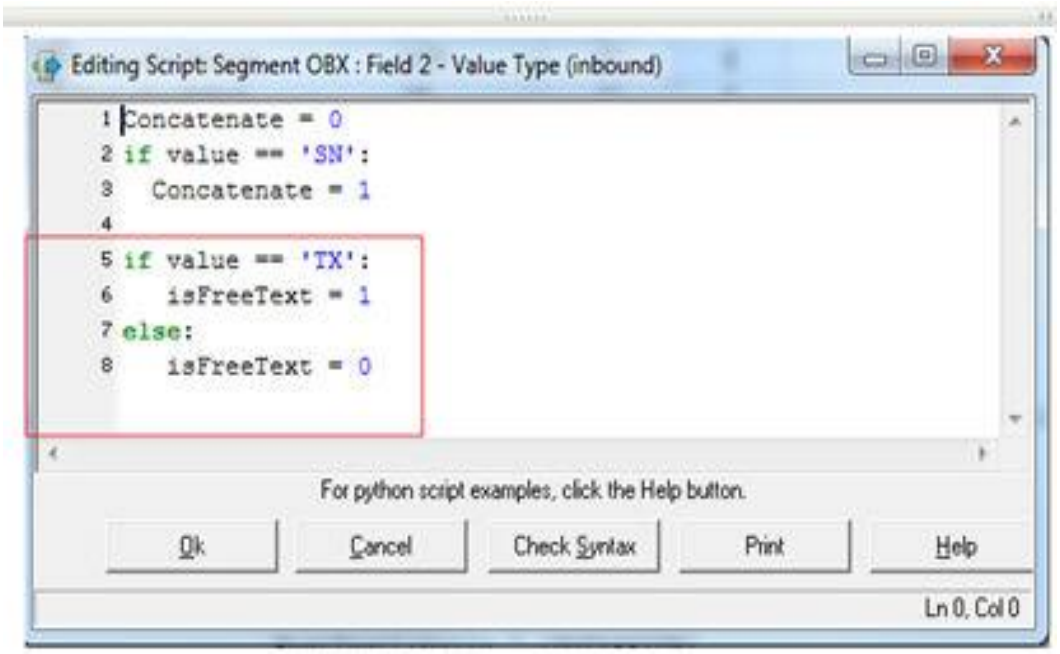


3. Modify the **Inbound Script** column of the **Value Type** row (double click the '… ' icon in the upper-right side of the **Inbound Script** cell). Refer to items #2.a and #2.b in the previous screenshot.

   Paste the following script:

```
if value == 'TX':
   isFreeText = 1
else:
   isFreeText = 0
```

Note: The previous action is required so that the \.br\ formatting command is converted to a new line (\r\n) only when the OBX-2 (value type) is TX (Free Text).



4. Modify the **Inbound Script** column of the **Observation Value Type** row (double click the '… ' icon icon in the upper-right side of the **Inbound Script** cell). Refer to items #3.a and #3.b in the screenshot above.

   Paste the following script:

```
if isFreeText == 1:
    value = string.replace(value, '\\.br\\', '\r\n')
```

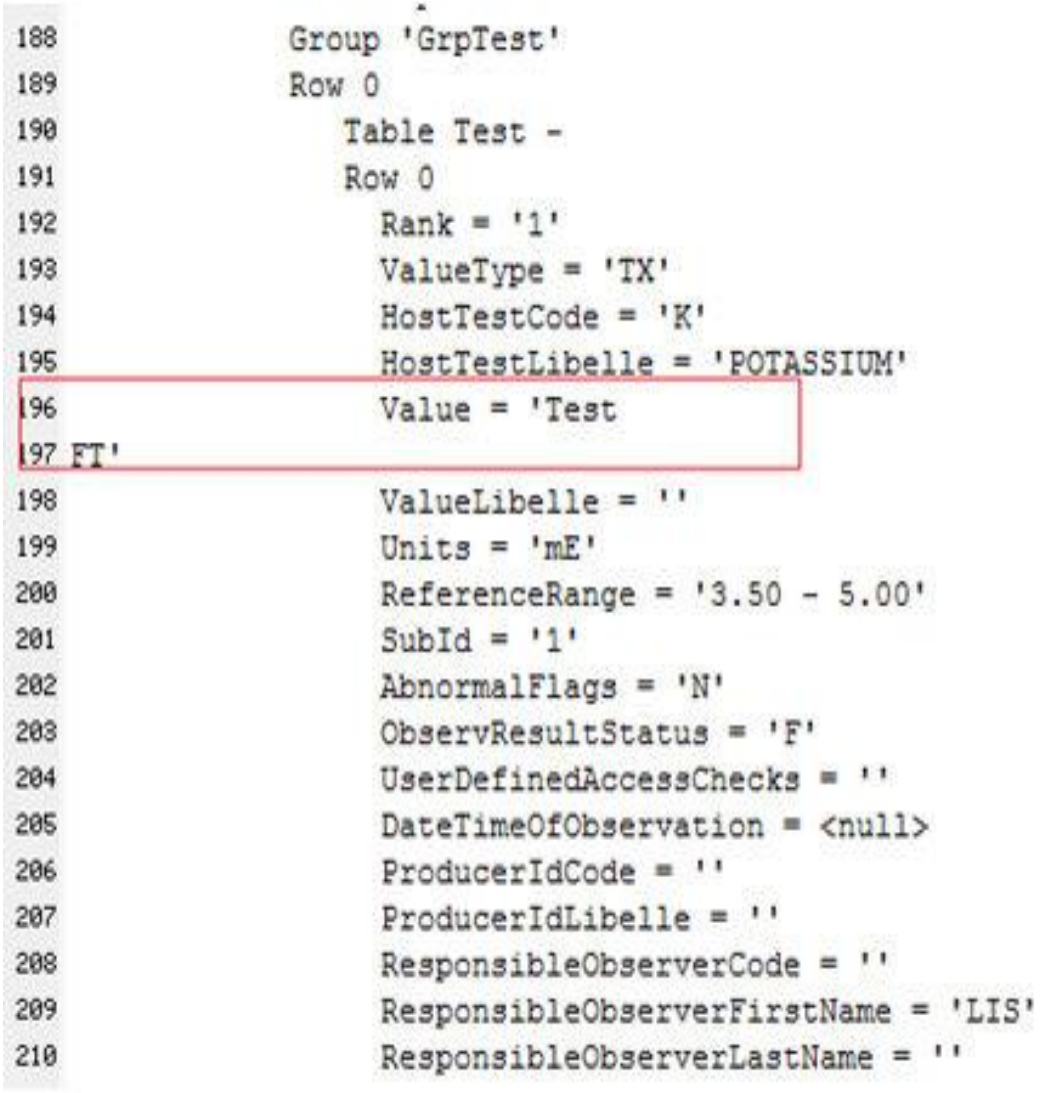
Checking the VMD script

1. Click Browse at the upper right pane
2. Input the sample OUL message below:

```
MSH|^~\&|LIS||HOST||20140603130815||OUL^R24^OUL_R24|TD0000130301|P|2.3||
|||||||

PID|||00000000000000222^^^^PATNUMBER||SMITH^John^^^^^L||19691022|M||id^|
Technidata In.c^^^"" "" "" "" "" "" "" "" ""
""^^PH||||||id^|||||||||||||||

PV1|||DEFLOC^^^^^^^^MEDICINA|||||||||||||||00000HOSTTESTSS||||||||||||
||||||||||||20130520|20140214

ORC|NW|8000201080||8000201080|||^^^20140603130815^^R||20140320144016|||D
EFDOC|DEFLOC||20140603130815

OBR|1|||K|||20140603130815||||A|||20140320144004||DEFDOC||||||||||^^^20
140603130815^^R|||||||||

OBX|1|TX|K^POTASSIUM|1|Test \.br\FT|mE|3.50 - 5.00|N|||F|||||LIS|||
```

Note: This sample message is applicable if the modified VMD is a result reception VMD.

3. Click Table View then click Text View. Look for GrpTest and its corresponding Value (notice that newline is inserted within the actual value)



```
188              Group 'GrpTest'
189              Row 0
190                 Table Test -
191                 Row 0
192                   Rank = '1'
193                   ValueType = 'TX'
194                   HostTestCode = 'K'
195                   HostTestLibelle = 'POTASSIUM'
196                   Value = 'Test
197 FT'
198                   ValueLibelle = ''
199                   Units = 'mE'
200                   ReferenceRange = '3.50 - 5.00'
201                   SubId = '1'
202                   AbnormalFlags = 'N'
203                   ObservResultStatus = 'F'
204                   UserDefinedAccessChecks = ''
205                   DateTimeOfObservation = <null>
206                   ProducerIdCode = ''
207                   ProducerIdLibelle = ''
208                   ResponsibleObserverCode = ''
209                   ResponsibleObserverFirstName = 'LIS'
210                   ResponsibleObserverLastName = ''
```

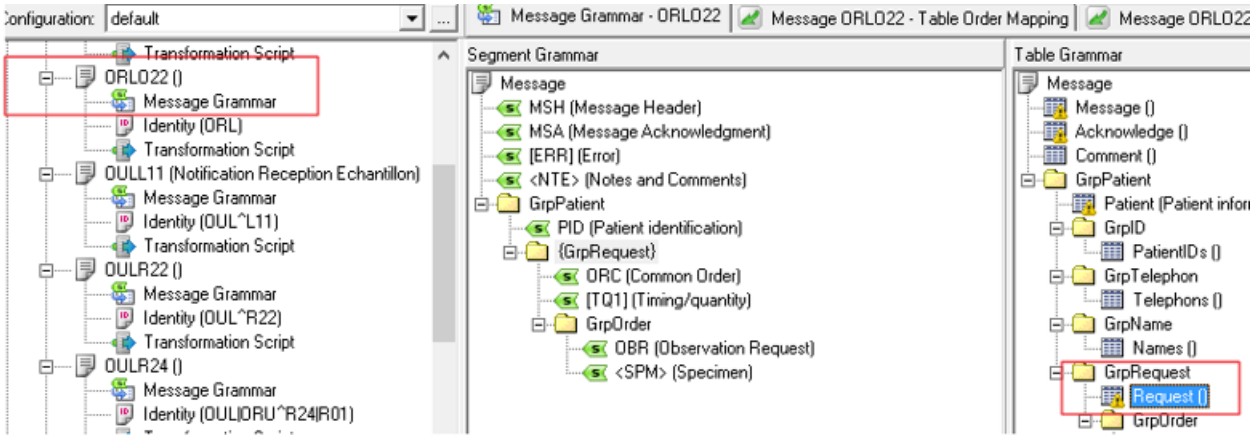
Note: If it is difficult to search for **'GrpTest' 'Value**' inside the VMD parser, copy the contents of the **Text View** into Notepad or another text editor to search more easily.

Updating HL7OrderReception.VMD to change mapping of ORC-3 of ORL^O22

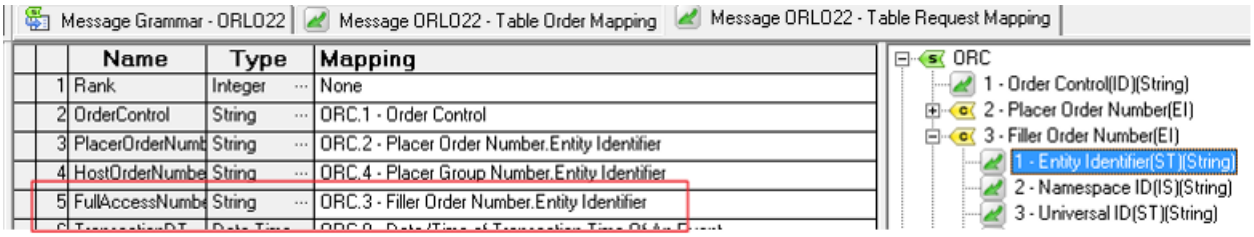
ORC-3 of ORL is by default mapped with FillerOrderNumber.

For using FULLACCESSNUMBER in ORC-3, please follow the following steps to update the mapping:

1. Under **Message Definitions** (left side of Chameleon browser), go to **ORLO22() > Message Grammar**.
2. Double-click "**Request"** in **Table Grammar** (right side of Chameleon browser)



3. Under "**Request**" in Table Grammar, click on "**3- Filler Order Number >** "**1- Entity Identifie**r" and drag/map with "**5 FullAccessNumber**"



TCP/ IP transport layer

Description of TCP/IP information exchange

TCP/IP socket low-level protocol is the transport layer used for exchanging data through devices located on the same network. The purpose of this section is to describe the mechanisms for data exchange between a Host and the Communication engine when TCP/IP socket is implemented as low-level protocol.

Overview

Data is exchanged between the Host and Communication engine by transmission of data blocks through a socket.

To enable data exchange, a socket (connection) must first be established. One part is the *server*, the other part the *client*. The client asks the server permission to connect to a specific port. The server on its side must be listening to this port.

The operations must be performed in the following order:

1. The server must be created and must be listening to a specific port.
2. The client asks the server permission to connect to this port.
3. If permission is granted, a socket is established between the client and the server.
4. Data can be sent back and forth through the previously established socket.

When finished, the client disconnects.

The Communication engine can act either as a client or as a server.

See also:

- Transmission diagram
- Data block structure
- Administrative port definition
- Incident management on the TCP/IP socket

TCP/IP transmission diagram

After the communication has been established between the client and the server, data is sent to the server by the client.

The TCP/IP client establishes the connection and transmits data to the server.

The following diagrams show how the transmission proceeds, depending on the result of the physical integrity check.

Connection phase between the client and the server

This phase includes socket creation, establishment of the connection etc (see Description of TCP/IP information exchange).

Successful information exchange with acknowledgement

Client		Server
<SB>tvv<CR>ddddccccccxxx<EB><CR>	➡	Data block sent by the client with an HL7 message embedded in it. After checking for correct data transfer (physical integrity), the HL7 message is parsed and managed. An HL7 ACK message is then sent, with or without an error code depending on the result of this processing.
Data block sent by the server with a HL7 ACK message embedded in it	⬅	<SB>tvv<CR>ddddccccccxxx<EB><CR> "dddd" contains the various HL7 messages composing the logical acknowledgement (MSH,MSA and ERR segments)

The Client is responsible for closing the connection upon receipt of the Acknowledgement.

Exchange with a transmission error

Client		Server
<SB>tvv<CR>ddddccccccxxx<EB><CR>	➡	Data block sent by the client with an HL7 message embedded in it. During the physical integrity check, an incorrect block format has been detected. A special data block is sent (NAK block).
Data block sent by the server with a physical NAK message embedded into it (character 'C')	⬅	<SB>Nvv<CR>C/000EBxxx<EB><CR> Negative physical acknowledgement sent by the connection if something is wrong with the physical transmission (incorrect checksum, incorrect count of characters)
The Client is responsible for sending the data block back or simply discarding it and executing its own error handling routine.		
<SB>tvv<CR>ddddccccccxxx<EB><CR>	➡	Data block sent by the client with an HL7 message embedded in it. After checking for correct data transfer (physical integrity), the HL7 message is parsed and managed. An HL7 ACK message is then sent, with or without an error code depending on the result of this processing.

Data block sent by the server with a HL7 ACK message embedded into it		<SB>tvv<CR>ddddcccccxxx<EB><CR> "dddd" contains the various HL7 messages composing the logical acknowledgement (MSH,MSA and ERR segments).

The Client is responsible for closing the connection upon reception of the Acknowledgement.

For more information on data blocks, see Data block structure.

See also:

- Troubleshooting TCP/IP communications

Data block structure

Depending upon the TCP/IP Lower Layer Protocol property in the **Devices** Dictionary, two Data Block structures are possible: Hybrid and Minimal.

Hybrid HL7 Low Layer Protocol

There are two types of block: data blocks and NAK blocks.

HL7 messages are transmitted in single data blocks.

NAK blocks are used to signal physical transmission errors.

Both block types have the same format: <SB>tvv<CR>ddddccccxxx<EB><CR>

Blocks consist of the following fields.

Field	Description
<SB> =	Start Block character (1 byte). Configurable on a site specific basis. Unless there is a conflict, the value should be ASCII <VT>, i.e. <0x0B>. This should not be confused with the SOH or STX ASCII characters. **This character must be the same as that configured as "Start of block character" in the Devices dictionary.**
t =	Block Type (1 byte). "D" = Data block "N" = NAK block
vv =	Protocol ID (2 bytes). Characters "2" "4" for this version.
<CR> =	Carriage Return (1 byte). The ASCII carriage return character, i.e. <0x0D>.
dddd =	Data (variable number of bytes). In a data block, it corresponds to the data content of the block. The data can contain any displayable ASCII characters and the carriage return character, <CR>. Carriage returns that are not part of the HL7 message may be inserted as described in "Carriage Return Stuffing." In a NAK block, this field contains a 1-byte reason code as follows: 'C' - character count wrong in previous data block received 'X' - checksum wrong in previous data block received 'B' - data too long for input buffer in previous block received 'G' - Error not covered elsewhere.
ccccc =	Block Size (5 bytes). Character count of all characters so far in the data block up to and including the last data character. For this protocol version, it corresponds to 5 + the size of the "dddd" field. **Note:** HL7 message ends with a <CR> character. This character is considered as part of the data.
xxx =	Checksum (3 bytes). Exclusive-OR checksum of all characters in the block up to and including the last data character. The checksum is expressed as a decimal number in three ASCII digits. If the value of this field is 999, the checksum should not be computed. Processing will proceed as if it were correct. This feature is used for applications where the messages will be translated from one character set to another during transmission. **The "Checksum type" property in the Devices dictionary must be set to "Checksum for HL7 low layer protocol".**

<EB> =	End Block character (1 byte). Configurable on a site specific basis. Unless there is a conflict, the value should be ASCII <FS>, i.e. <0x1C>. This should not be confused with the ETX or EOT ASCII characters. **This character must be the same as that configured as "End of block character" in the Devices dictionary.**
<CR> =	Carriage Return (1 byte). The ASCII carriage return character, i.e., <0x0D>.

Minimal HL7 Low Layer Protocol

HL7 messages are enclosed by special characters to form a block. The format is as follows:

Field	Description
-	<SB>dddd<EB><CR>
<SB> =	Start Block character (1 byte) ASCII <VT>, i.e., <0x0B>. This should not be confused with the ASCII characters SOH or STX. **This character must be the same as that configured as "Start of block character" in the Devices dictionary.**
dddd =	Data (variable number of bytes) This is the HL7 data content of the block. The data can contain any displayable ASCII characters and the carriage return character, <CR>.
<EB> =	End Block character (1 byte) ASCII <FS>, i.e., <0x1C>. This should not be confused with the ASCII characters ETX or EOT.
<CR> =	Carriage Return (1 byte) The ASCII carriage return character, i.e., <0x0D>. **This character must be the same as that configured as "End of block character" in the Devices dictionary.**

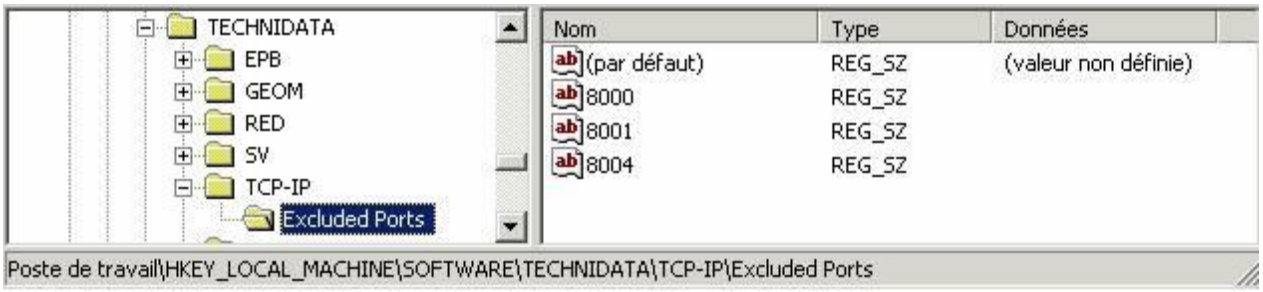
Administrative port definition

The TCP/IP address of the communication port (needed for internal use) is allocated dynamically when the Connection service is started (search for an available address on the concerned computer). It uses the first port available, starting at 8000.

NOTE: The port indicated in this section is used by the TDCnx service. It must not be confused with the ports defined in the **Device** properties (listening port or outgoing port).

Excluding ports

A list of excluded ports by computer can be specified. It must be set up in the registry as in the following example:



Specifying the port for a service

You can also specify the port to be used by the service:

1. In regedit, go to: `HKLM\SYSTEM\CurrentControlSet\Services\<Service name>-<instance name>`
2. Modify the value of **Image path**, adding the port number at the end of the line.

EXAMPLE: `c:\technidata\ProductClient-Appli1\servcnx.exe TDCnx1 8011`

FTP transport layer

Description of FTP/SFTP information exchange

ASTM files can be transferred by the File Transfer Protocol (FTP) or Secure File Transfer Protocol (SFTP).

File Transfer Protocol (FTP)

The FTP low-level protocol is a transport layer used for exchanging data via the network. FTP low-level protocol appears as a standard tool for the network. The purpose of this section is to describe data exchange between the Communication engine and a receiver (Host system, database or other applications) when the FTP low-level protocol is implemented.

Data is exchanged between the Communication engine and the receiver by exchanging files. One file can be transferred at a time and it must be identified. The file is transferred from the Communication engine to the receiver, and stored in the final directory.

There is no flow control between Communication engine and the receiver: the files are sent as soon as the FTP connection is established and as long as there is enough space on the reception disk to store the files.

Secure File Transfer Protocol (SFTP) (available from TDNexLabs V01.41 also in V01.32)

SFTP transport is the transport layer used when exchanging files in a secure connection.

It is used on communications where the Secure File Transfer Protocol (SFTP) is supported or implemented.

In SFTP transfer, the data transferred to and from the server is encrypted - no user login credentials or file data are transferred in plain text.

File identification

When FTP or SFTP low-level protocol is implemented, all file identification must follow the same rule: Sender and receiver must be identified so that a file name is given only once.

The length of the file name must be defined as n characters (where n is defined by the **Counter length for files to handle** device property in the **Devices** dictionary), with an additional 3-character extension (`.XXX`). This extension is defined by the **Generated file extension** property in the **Devices** dictionary.

The characters identifying the file name can be alphanumeric (A to Z, and 0 to 9).

The file name is composed of:

- The sender/receiver identifier, defined by the **Generated file prefix** property in the **Devices** dictionary
- A sequential number
- Extension

EXAMPLE: TDR00123.AST
where:
TDR = sender
00123 = sequential number
AST = extension

The sequential number is managed by the counter defined in the **Internal Counter** property in the **Devices** dictionary. If this counter is not defined or cannot be used, the job requesting the transmission is set to the "INTERRUPTED" error status and the following incident is generated:

"Could not get a proper value from counter %s : GetAutoCounter() returned %d"

The size of this counter is defined by the **Counter length for files to handle** property in the **Devices** dictionary (this property is set to 5 by default).

The result files are sent to the Host in the directory defined by the **FTP remote host** and **FTP remote output directory** properties in the **Devices** dictionary.

At first, the Communication engine produces and sends a `TDRxxxxx.AST` file and then an associated `TDRxxxxx.ok` file meaning that the `TDRxxxxx.AST` file is available. The Host tries to find the oldest `TDRxxxxx.ok` file. If this file exists, the Host reads and processes the associated request file, that is, the `TDRxxxxx.AST` file. After processing the result file, the Host must delete both files (that is, `TDRxxxxx.AST` and `TDRxxxxx.ok` files).

Each ASTM 1238 file contains the data of one patient.

See also:

- FTP transmission diagram
- Troubleshooting FTP communications

FTP transmission diagram

Transmission diagram

The following diagram shows the data flow:

Sender (Communication engine)	-	Receiver
TDR00001.AST		-
TDR00001.ok		-

-

Sender (Communication engine)	-	Receiver
TDR00002.AST		-
TDR00002.ok		-

-

Sender (Communication engine)	-	Receiver
TDR00003.AST		-
TDR00003.ok		-

See also:

- Troubleshooting FTP communications

Troubleshooting

TD-Com diagnostic tools

Tracking incidents

To get useful information about communication incident management, refer to the following topic available in the **Technical guide**:

Troubleshooting > Communication engine diagnostic tools > **Tracking incidents**

In that page, the following information is provided to assist in troubleshooting incidents:

- Spy files for devices
- Spy file for TDCnx service
- Starting the service in debug mode
- Event Viewer

Database information

Use the database possibilities when the Task Manager is not sufficient.

In the **Task Manager** window, when the tasks are in the "Ready" status (), they cannot be changed. You must use an SQL query. Use for example:

- `Select * from DICT_DEVICES.` This query gives all the devices of the dictionary
- `Select * from JOBS where deviceid = <deviceid of DICT_DEVICES>.` This query gives all the tasks associated with a device of the dictionary

Statuses

- 1 = ready
- 2 = in progress 
- 3 = stand by
- 4 = completed
- 5 = interrupted

To run the tasks again, set them to status 2. Device status:

- 0 Undefined
- 1 Ready
- 2 Pause
- 3 Error

Autorectube Oracle database connection errors

When using Autorectube with an Oracle database, an issue has been observed wherein used resources are not properly freed up after every call to Autorectube.

Performing around ~6,500 calls to Autorectube will keep around ~13,000 ODBC related modules loaded in memory which causes succeeding calls to Autorectube to fail with database errors.

Errors logged in the Autorectube log file:

```
DATABASE ~ 04/13/2018 12:09:18 PM ~ IP: (null) ~ UID: (null) ~"SESS:
SQLDriverConnect"~"MSG: tdr1 : Retcode=-1 (IM006) [Microsoft][ODBC Driver
Manager] Driver's SQLSetConnectAttr failed"
```

```
DATABASE ~ 04/13/2018 12:09:21 PM ~ IP: (null) ~ UID: (null) ~"SESS:
SQLDriverConnect"~"MSG: tdr1 : Retcode=-1 (IM003) Specified driver could not
be loaded due to system error  1114: A dynamic link library (DLL)
initialization routine failed. (Microsoft ODBC for Oracle,
C:\Windows\system32\msorcl32.dll)."
```

Restarting the connection solves these database related errors.

Starting from TDNexLabs V01.21.B:

Instead of manually restarting the connection as a workaround on the issue described above, a hidden parameter `'TDI_Hid_rectube_DB_error_count_before_restart'` has been added to perform an automatic restart of the TDCnxDevice process that is linked to the connection having database errors when calling Autorectube.

The parameter is automatically created for TDCOM devices that have Autorectube enabled. The device needs to started at least once for the hidden parameter to be created in the database.

The value of the parameter is 0 by default which means that the automatic restart is disabled.

To update the value, run the sql query below:

```
UPDATE PARAM_VALUES SET PARAMVALUE = 3
WHERE PARAMID = 'TDI_Hid_rectube_DB_error_count_before_restart';
```

The TDCom device needs to be restarted for changes to take effect.

To check the current value:

```
SELECT PARAMVALUE FROM PARAM_VALUES
WHERE PARAMID = 'TDI_Hid_rectube_DB_error_count_before_restart';
```

If the value is 0 (the default value) - no TDCnxDevice restart is performed in case of Autorectube database errors.

If the value is greater than 0, the TDCnxDevice will be restarted after the specified number of Autorectube database errors encountered in succession.

For example, when the value is 3, if Autorectube is performed with database errors 3 times in a row, TDCnxDevice will be automatically restarted.

If Autorectube is performed 3 times, the first 2 having database errors, and the third time the Autorectube succeeded, then TDCnxDevice will not be restarted. Counter of database errors will start again from 0.

Example logs as seen in the spy file of the device:

1. Showing current parameter value (logged in Maximum trace level):

```
COMMENT 4/13/2018-19:06:26.799 HL7 ORM Inbound
TDI_Hid_rectube_DB_error_count_before_restart: 3
```

2. Trace in case automatic restart is performed (logged in any trace level):

```
WARNING 4/13/2018-19:06:16.324 HL7 ORM Inbound RECTUBE DB ERRORS had been
detected. Device will be restarted!
```

Troubleshooting TCP/IP communications

The following information is provided to assist in troubleshooting incidents.

Message	Description of incident
More than one connection has been opened on the server!	This incident is generated if the server tries to accept a client connection while already having a client connected to it.
Invalid client socket retrieved!	This incident is generated if the server could not instantiate a client socket upon creation.
Couldn't accept connection!	This incident is generated if the server cannot accept a client connection.
Couldn't receive data through socket!	This incident is generated if an exception occurs while reading from the socket.
Connection couldn't create socket server. Connection Couldn't be successfully opened!	This incident is generated when the port defined in the Device properties (for example, listening or outgoing port) is already used.

Troubleshooting FTP / SFTP communications

The following information is provided to assist in troubleshooting incidents:

Message	Description of incident
Could not get a proper value from counter %s : GetAutoCounter() returned %d	The sequential counter used for the names of the files is not defined or cannot be used. When this incident occurs, the device communication is stopped.
Could not create file (%s)	The data file cannot be created on the local disk before its transmission via FTP.
Could not create file (%s)	The associated file (*.ok file) cannot be created on the local disk before its transmission via FTP.
User %s couldn't be logged onto host %s	The user cannot connect to the FTP Server.
The target directory couldn't be changed to %s	The target directory does not exist or is protected.
Could not create file %s on remote host	The user is not allowed to write in the target directory.
Unable to retrieve any PatientRecord from CTDOrder for Device %s	The Patient information is not available by the communication.
Invalid message type configured in the dictionary	The **Message Type** property is not defined in the **Device** dictionary. When this incident occurs, the device corresponding to the communication is set to Error status.

Each time one of the above incidents occurs, the task requesting the transmission is set to the "Interrupted" status (JOBSTATUS_INTERRUPTED).

Error messages when using SFTP transport (from TDNexLabs V01.41 also in V13.32)

- If the server does not support SSH/SFTP connections or an incorrect port number is used, the following error is encountered:
  User <user id> couldn't be logged onto host: <remote host>. Connection failed! RetCode:(-1) - Timeout connecting to <remote host>.
- If the server is invalid, the following error is encountered:
  User <user id> couldn't be logged onto host: <remote host>. Connection failed! RetCode:(-1) - Failed to resolve hostname <remote host> (No such host is known.)
- If the SFTP user ID and password is incorrect, the following error is encountered:
  User <user id> couldn't be logged onto host: <remote host>. User authentication error! RetCode:(1) - Access denied. Authentication that can continue: publickey,gssapi-keyex,gssapi-with-mic,password.
- If the local temporary folder is invalid and application is unable to create the temporary file, the following error is encountered:
  Could not create file : <local temporary folder><filename>. Could not send file to remote host.
- If the remote output path does not exist, the following error is encountered:
  Could not send file to remote host. Can't create file '<output file>' for writing: SFTP server: No such file

- If the remote output path is write protected, the following error is encountered:
  Could not create file on remote host. Can't create file '<output file>' for writing: SFTP server: Permission denied
- If the remote input directory is invalid or the SFTP user has no rights to browse the directory, the following error is encountered:
  Could not look for files on remote host. Failed to open directory '<directory>'!
- If the removal of file in the remote directory failed, the following error is encountered:
  Could not remove the data file from the remote host. Deletion of '<filename> failed!
- If the renaming of file in the remote directory failed, the following error is encountered:
  Could not retrieve file from remote host. Rename of '<old filename>' to '<new filename>' failed.
- If a file cannot be transmitted completely, the incomplete file is deleted on the remote host and the following error is encountered:
  Could not send file to remote host. Failed to completely transmit file '<filename>' (<bytes sent>/<total number of bytes>). Removing file '<filename>'...

Each time one of the above incidents occurs, the task requesting the transmission is set to the "Interrupted" status (JOBSTATUS_INTERRUPTED).

Incident related to the device property "FTP remote output directory" that is misinterpreted (from TDNexLabs V01.51.B)

A hidden device parameter is available to change the directory path format using absolute path instead of relative path.

To implement this mechanism, relative had to be converted to absolute path using the FTP current directory which is in absolute path format based on local testing.
For example, if FTP current directory is "`/cible/files`" and FTP remote output directory is "`../`" then converted absolute path for output directory will be "`/cible/`".

The use of absolute path for output directory is applicable only if the current directory is in absolute path format.

This feature is disabled by default. To enable this feature, the hidden device parameter PARAMVALUE must be updated to **1**, as described below:

UPDATE PARAM_VALUES SET PARAMVALUE = 1 WHERE PARAMID = 'TDI_Convert_relative_path_to_absolute_parameter'

To disable the feature set PARAMVALUE to **0**.

Naming of DLLs used in managing orders from Host systems

The management of orders (ORM messages) requires several different communications to be installed. Each communication needs four different DLLs, for the Application, Protocol, Format and Transport layers.

For TDNexLabs and for TD-Synergy from version V11.91.A

These DLLs are always installed automatically when you install the Client.

If your TD-Synergy software version is lower than V11.91.A

These DLLs are installed automatically when you install the TD-Synergy Client and select the corresponding communication. When you create the connection device in the **Device** dictionary, the user-friendly names of the DLLs should be displayed. If the filename of the DLL is displayed instead of the user-friendly name, use the Windows **Programs and Features** utility to reinstall the DLL before proceeding with installation. To do this:

1. From the Windows Control Panel, select **Programs and Features**.
2. Select **TD-Synergy Client_*<InstanceName>.***
3. Click **Change.**
4. In the InstallShield Wizard, select **Modify.**
5. Select the feature you need to reinstall by choosing the correct user-friendly name.
6. Follow the on-screen instructions to complete the installation.
7. Return to the creation of the device in the **Device** dictionary: you will see that the user-friendly name of the DLL is now displayed. You can now continue with your installation.

For reference purposes, the tables which follow list the filenames of the DLLs and their user-friendly names:

Reception of HL7 ORM messages from the Host

This device is used for the reception of orders (new or updated information about orders).

When you install the Client, and select this communication, the following four DLLs required for the communication are installed automatically:

Layer	DLL	User-friendly name
Application	TDCnxAppWRH.dll	Patients/Orders/Results transmission
Protocol	TDCnxProtoHISADT.dll	HL7 Low Layer Protocol
Format	TDCnxFormHL7.dll	HL7 format Patients/Orders/Results
Transport	TDCnxTransTCPIPSocket.dll	For TDNexLabs from V01.21, TD-Synergy from V12.21, and for TD-Synergy V11.83, TCP/IP socket transport 2

Transmission of HL7 ORM messages to the Host

This device is used to send an HL7 ORM message to the Host.

When you install the Client, and select this communication, the following four DLLs required for the communication are installed automatically:

Layer	DLL	User-friendly name
Application	TDCnxAppResult.dll	Orders/Results transmission
Protocol	TDCnxProtoHISADT.dll	HL7 Low Layer Protocol
Format	TDCnxFormHL7.dll	HL7 format Patients/Orders/Results
Transport	TDCnxTransTCPIPSocket.dll	For TDNexLabs from V01.21, TD-Synergy from V12.21, and for TD-Synergy V11.83, TCP/IP socket transport 2

Appendix

End User Agreement

The interface specification described in the attached Communication Installation Guide is confidential and is strictly reserved for communication with a Hospital Information System. An End User Agreement containing the text hereunder must be agreed by the Customer (End User). This interface specification is for the exclusive use of sites covered by an End User Agreement. Use of this interface specification implies full acceptance of the terms and conditions of the End User Agreement hereunder.

End User Agreement for Communication Installation Guide # .....

PLEASE READ THIS AGREEMENT CAREFULLY.
THE USE OF THE INTERFACE SPECIFICATION SHALL IMPLY ACCEPTANCE OF THIS AGREEMENT.
IF YOU DO NOT AGREE, YOU MUST NOT USE THE INTERFACE SPECIFICATION.

Ownership

TECHNIDATA shall retain all titles and intellectual property rights of the attached interface specification. The interface specification is protected under international laws related to intellectual property rights.

The Customer agrees that it does not have any title or ownership on the attached interface specification.

Use

The Customer may use the Interface Specification, provided that the product license has been properly acquired.

The Customer shall only use the Interface Specification for his own needs.

The Customer shall only use the Interface Specification for the purpose of communication with a Hospital Information System. Consequently, Customer is not authorized, in any way, to use the Interface Specification for any other type of communication or for any other purpose.

The Customer shall not use any portion of the said Interface Specification for the purpose of interfacing or creating new software programs to be made available to any third party, either free of charge or for pecuniary benefit.

The Customer shall not disclose, communicate or use for the benefit of any third party any portion of the said Interface Specification

The Customer must be aware that the Interface Specification is likely to evolve. The Customer therefore agrees that any software that relies on this Interface Specification may require to be updated to maintain existing functionality.

Upon termination of this Agreement, the Customer shall return all materials which contain information related to the Interface Specification, including written notes, photographs, memoranda or notes taken.