Annexes

The annexes are—

- 1. Installation Data Requirements
- 2. Illustrative Implementation and Training Time Requirements
- 3. Sample RxSolution Support Task Log Form
- 4. Special Medicine Unit Setup Issues
- 5. Automated Stock Reorder Calculation
- 6. Customizing Purchase Order and Invoice Reports

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ANNEX 1. INSTALLATION DATA REQUIREMENTS

The following information is required for the software installation and configuration to go smoothly when installing RxSolution at your site. The RxSolution team will be in touch with you before installation to discuss these requirements in greater detail.

- A current product list with the—
 - Local stock code(s)
 - Generic name
 - o Form
 - Pack size
 - o Bin number
 - Group definition
 - Supplier and trade name
 - Prescriber levels
- A list of all the suppliers with their contact details
- A list of the hospital bin locations
- A list of demanders (clients) with—
 - Contact details
 - o Names of people who are authorized to order
 - o Budget information, if applicable
- Any groupings of items that you might want to define
- Prescriber levels with a description of each level
- A list of all prescribers, including the prescribing level for each
- A list of all dispensers, including the dispensing level for each
- A list of all system users, including what their institution function is, so as to assign system access levels
- The purchase period per item
- The expected lead time per supplier
- A list of clinics and their route details (if applicable)
- A list of accounts used

At the time of installation, or very soon after it, the site must also have—

- An accurate current stock count to enter stock levels in the system
- Pack prices
- Batch and expiry date information for the products

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ANNEX 2. ILLUSTRATIVE IMPLEMENTATION AND TRAINING TIME REQUIREMENTS

Implementation of RxSolution

A typical implementation requires the steps shown in Table A2-1; the schedule is adjusted for each installation site, as required.

Table A2-1. Implementation Steps for RxSolution

Activity	Approximate Duration
Install software	1 hour
Update demander table	1/4 day
Update supplier table	30 minutes
Update product table	1/2 day
Capture stock on hand information	1 day
Update prescribers and dispenser tables	1/4 day
Transfer existing patient data, if electronically available	1/2 day
Review report requirements	1 day
Estimated time per site	4 days

Training to Use RxSolution

The RxSolution interface is almost identical from module to module, so once users can use one module, learning the others is much easier—and faster.

Training is optimal when participants from the various institutions who will use the program are jointly trained in a computer laboratory session. Assuming that the participants have at least basic computer skills, the typical timeframe is shown in Table A2-2.

Table A2-2. Timeframe for RxSolution Training

Activity	Approximate Duration
Learning stores functions	2 days
Learning dispensing and down-referral procedures and protocols	1 day
Estimated time per site	3 days

ANNEX 3. SAMPLE RXSOLUTION SUPPORT TASK LOG FORM

Please fax to	o	or e-mail this forr	n to
Your reference number	:	If you have one	
CLIENT (SITE NAME)	:		
Date and time	:		
Task category	: Select Cate	egory	
Logged by :	Contac	t phone number	:
Cell number :		E-mail	:
Requested by :		Contact number	:
Cell number :		E-mail	:
Detail description of probl	em with attached s	upporting screensh	ots:
Software version	:		
Problem started (date & tir	me) :	Previously rep	ported date, if applicable:
Frequency of problem	: Select Fred	juency	
	RPM P	lus Official Use	
Plus Task Number: Progress In Progress	Date Logged:		
Date Completed:			

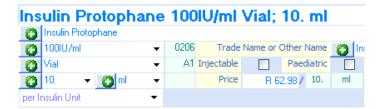
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ANNEX 4. SPECIAL MEDICINE UNIT SETUP ISSUES

How Do I Set Up an Item to Dispense in the Correct Units and Calculate the Correct Number of Packs to Dispense?

This task may be simple for solids and liquids, but when units such as insulin units, drops, and inhalation units are dispensed, the task may be more complicated. The two key fields are the strength (how many dispensing units in a formulation unit) and the pack size (how many dispensing units in one pack). The following examples explain the setup of insulin and eye drops.

Insulin



Strength

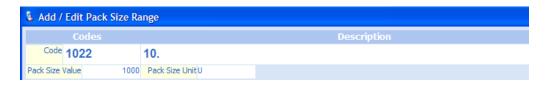


Here, 1 ml contains 100 IU. The units must be ml so that it is shown on the prescription as such.

Item Detail Insulin Protophane 0.2ml bd for 30 days - (D.D. = 0.4ml)

Strength = 100 IU/ml Value = 1 Ratio = 100 Units = ml (1ml = 100 IU)

Pack Size



Here, the vial contains 10 ml. So if 1 ml contains 100 IU, 10 ml contains 1,000 IU.

Description = 10 **Pack Size Value** = $1,000 (10 \text{ ml} \times 100 \text{ IU/ml})$ **Pack Size Unit** = U

The pack size unit (U) is displayed as the dispensing unit in dispensing.

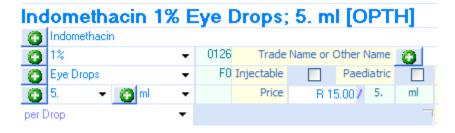


Administration Units



Administration = per Insulin Unit Amount = 1 per Unit = unit

Eye Drops



Strength



Here, 1 ml contains 20 drops. The units must be ml so that it is shown on the prescription as such.

Strength = 1% Value = 1 ml Ratio = 20 Unit = ml (1 ml = 20 drops)

Item Detail

Indomethacin 0.05ml tds OPTH for 30 days - (D.D. = 0.15ml)

Pack Size

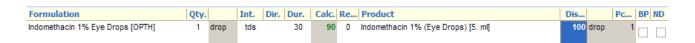


Here the eye drop bottle contains 5 ml. So if 1 ml contains 20 drops, 5 ml contains 100 drops.

Description = 5 Pack Size Value = $100 (1 \text{ ml} \times 20 \text{ drops})$ Pack Size Unit = Drop

The pack size unit (drop) is displayed as the dispensing unit in dispensing.

Annex 4. Special Medicine Unit Setup Issues



Administration Unit

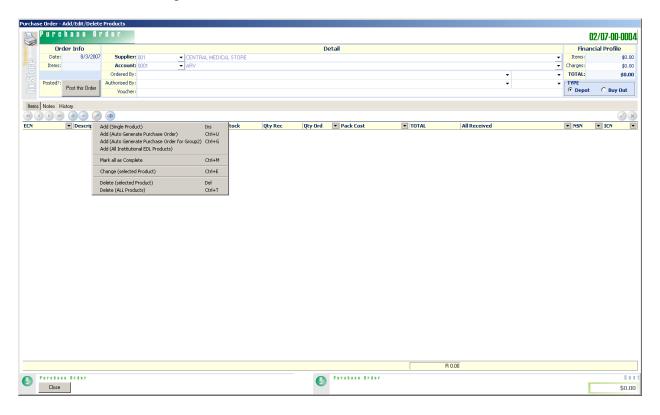


Administration = per drop Amount = 1 per unit = drop

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ANNEX 5. AUTOMATED STOCK REORDER CALCULATION

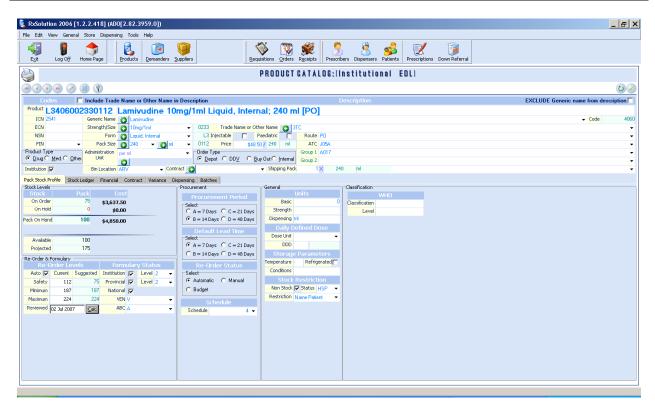
When you create a purchase order, you can run RxSolution's automated stock reorder calculation by using the **Add (Auto Generate Purchase Order)** option on the drop-down menu accessed through the edit button or by pressing Ctrl + U. You can run the automated stock reorder calculation for only those items you have categorized as Group 2 items by choosing the **Add (Auto Generate Purchase Order for Group2)** menu option. In addition to recalculating the stock levels, RxSolution corrects the quantity on hold and the quantity on order to ensure that the most updated data are used for the reorder calculations.



During the reorder calculation routine, the computer searches the product database for all products that meet the following criteria—

- The institutional formulary status is checked to true.
- The auto reorder level is checked to true.
- The default lead time and procurement period (A, B, C, and D) under **Systems Settings** are greater than zero.

Note: Any product that does not meet these criteria will not be reviewed. Therefore it is important to check that you have set the correct parameters for each product. You set these parameters on the **Product Catalog:** [Institutional EDL] screen for the item, as shown in the following image.



Please bear in mind that the computer is going through every product and collecting the statistics before calculating the stock level, so depending on how large your database is, this process may take a few minutes. A status bar on the screen will show the progress.

Calculations

If there is a reliable 95 percent confidence interval (CI),¹ the RxSolution calculation routine uses the CI instead of the average.

¹ The confidence interval is determined as follows:

[•] The *t* distribution as determined by the degrees of freedom. $CI = Avg + (t(SD/\sqrt{n}))$ where $t = the \ t \ value$ from tables and $SD = standard \ deviation$.

[•] The regression coefficient or beta $CI = Avg + ((t value*R SD Con)/((X2 - ((X*X)/N))/(N-1))*(\sqrt{(n-1)}))$.

Safety Stock

The safety stock (SS) formula can be one of the following—

- 1. The CI of both the lag time and the consumption are unreliable.
 - SS = Average consumption * Average lead time
- 2. The CI of the lead time is reliable but the consumption is unreliable.
 - SS = Average consumption * CI interval lead time
- 3. The CI of the consumption is reliable but the lag time is unreliable.
 - SS = CI consumption * Average lead time
- 4. The CI of both the lead time and consumption are reliable.
 - SS = CI consumption * CI interval lead time

If the shipper pack is greater than 1, then this value is rounded up to the nearest multiple of the shipper pack. In addition, where the *average* has been used, the safety stock is multiplied by a factor of 1.5 to account for variations in consumption and lead time.

Minimum Stock Level

The minimum stock level is calculated as—
Minimum = (Average consumption * Average lag time) + SS

The total is rounded up to the nearest multiple of the shipper pack.

Maximum Stock Level

The maximum stock level is determined as follows:

Maximum = Minimum + (Procurement period * Average consumption)

The total is rounded up to the nearest multiple of the shipper pack.

For a detailed description of the basic principles and method of determining the stock levels, please consult the MSH publication *Managing Drug Supply*, chapter 15, "Inventory management," pages 208 to 231 (1997 edition).

Parameters

Shipper Pack

Many suppliers do not wish to dispatch single units and prefer to issue cartons that contain a set number of units. In certain instances, financial penalties may be associated with breaking a shipper pack for issue. Setting the shipper pack in advance at the institutional level makes

receiving the stock easier. The shipper pack is set for each product on the product catalogue form and is a multiple of the basic unit of issue—for example, 10×60 tablets. The default is 1. These data can be obtained from the following sources—

- The tender document
- Consultation with the supplier
- Observation of the size of the shipper packs dispatched to you

Review the size of the shipper pack whenever there is a change in tender or supplier. With split tenders, tracking the shipper pack may be difficult, and a decision should be made whether to allow the computer to manage this or to set the shipper pack size to 1 and manually round the numbers up or down during the review of the automated purchase order.

Procurement Period

Under **Systems Settings** on the systems default tab, the user can set four default procurement period (PP) values labeled A through D. The security setting for this feature should limit editing access to senior staff members only. The values for these four settings will be determined by the institution's procurement strategies, patient dynamics, and tender specifications. For example, you may choose to add the following—

- A—For large-volume parenterals where space is a problem and if good lead times can be guaranteed, you may select a PP of 14 days.
- B—If patients return for follow-up visits every 28 days, then chronic medication items should have a PP of 28 days.
- C—Certain oncology items and therapies such as the TB regimen should be procured as a therapeutic intervention; hence, you may have a setting of 96 days or 168 days.
- D—Certain emergency stock may require review only every 6 months or annually, so another setting may be 180 or 365 days.

We recommend that these default procurement periods be determined in consultation with the institutional pharmacy and therapeutics committee and the relevant procurement agency.

Consumption

Back to Basics

- The inventory cycle is based on the assumption that past consumption is a reasonable reflection of future consumption. If you think that this is unlikely to be true, do not use the automated stock reorder calculation.
- The strength of the forecasting is to a large extent based upon smooth continuous consumption. Since this does not always happen, RxSolution uses linear regression to "smooth out" the data and, where the data allow for it, the 95 percent confidence interval.

To protect against faulty calculations caused by, for example, data errors or large shifts in
consumption resulting from weak stock management by demanders, RxSolution stores the
previous consumption data and compares it with the current consumption. If the current
consumption is more than three times the last consumption, then the stock levels are not
updated.

Where Do the Data Come From?

- The data are obtained from the audit table in the database and are determined by issues.
- The consumption is expressed in consumption days, although many suppliers and depots use months. The reason for this is that we are dealing at the institutional level with demand that is directly determined by patient care. A consumption day is the sum of all issues for a given day, so if on Tuesday, for example, 10 units were issued to ICU and 45 units were issued to the operating theater, the day's consumption = 10 + 45 = 55 units.
- Days out of stock are subtracted from the number of days during the review period. We do this because during the out-of-stock days, there will be no consumption. If we include these days, we end up with a consumption that is lower than the actual clinical consumption and we run the risk of further out-of-stock episodes.
- The automated stock reorder calculation reviews the history from the current date back to three times the PP. A shorter review period may mean that seasonal variations in consumption are missed, leading to overstocking. However, this needs to be balanced against failure of the safety stock to buffer an increase in demand. The value of three times the PP is generally accurate. For example, if the PP is 1 month, the formula will sample back 3 months. If this review does not provide a sound sample size, the review period is then increased to 6 times the PP and, failing that, 12 times the PP.

How is the Average Consumption Calculated?

Consumption is derived from two methods—

- The simple descriptive statistic of the average.
- Linear regression, in which a straight-line graph is drawn with accumulative consumption on the y axis and the number of days on the x axis. The r value is a statistical test to measure how tightly the data fit a straight line, with a value of 1.0 reflecting a perfect straight line and 0.9 a good fit.

Which Value Is Used in the Calculation?

The statistical strength of the different parameters is reviewed, and the strongest data used. The principle is that the confidence interval gives us the upper limit that describes the daily consumption 95 percent of the time. In other words, we are confident that if consumption behaves as it did during the last review period (e.g., 3 months for a 1-month PP), then we are 95 percent certain that we are covering the usual fluctuation in consumption.

We select the parameter to reflect consumption as follows—

- The last average is stored in the computer. If the consumption at 3 times the PP is more than 3 times the current average, the stock level will not be changed.
- If the sample size is greater than 10 consumption days (not 10 transactions) and the *r* value is greater than 0.9, the linear regression data provide good potential for forecasting future consumption. In this instance, the 95 percent CI will be used.
- Where there is a smaller sample size of 5 consumption days and we still have an *r* value greater than 0.9, then the best fit slope of the graph is used as the average consumption because the distribution is unlikely to be normal for a sample size less than 10.
- If the r value is greater than 9 and the sample size greater than 10, we use the 95% CI.
- If the *r* value is greater than 9 and the sample size greater than 5, we use the descriptive statistic of the average.

Lag Time

What Is the Difference between the Lag Time and Lead Time?

The *lead time* is the agreed delivery period according to the tender document, and the *lag time* is the actual performance of the supplier. It is best to use the lag time and, if the sample is sufficiently strong, the CI. Failing this, the default that is used is the lead time.

Where Do the Data Come From?

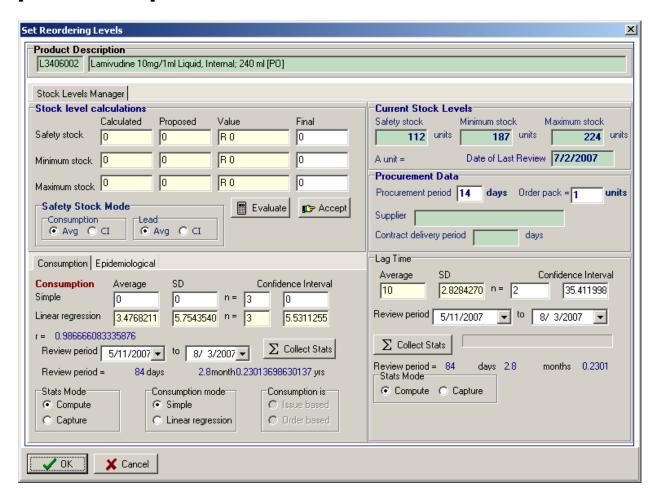
- The lag time is calculated as the difference between the date of the purchase order and the date when the product was actually received.
- The database history is sampled at today's date minus 10 times the PP.

Which Value Is used in the Calculation?

- If the 95 percent CI is greater than 3 times the average lag time and greater than 4 times the default lead time, and the number of receipts during the review period is greater than 10, then we use the 95 percent CI.
- Failing this, if the average lag time is greater than 4 times the default lead time and the number of receipts during the review period is greater than 5, then we use the average lag time.
- Failing both of the above, RxSolution will use the default lead time.

Results

The reorder calculation results are shown (and can be adjusted) in the following screen. You access this screen by clicking the **Calc** button at the bottom of the **Product Catalog:** [Institutional EDL] screen.



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ANNEX 6. CUSTOMIZING PURCHASE ORDER AND INVOICE REPORTS

To be able to run and customize purchase orders and invoices/requisitions, the "tmp" folder with all the required files must be located in the RxSolution program files folder. This is done during implementation of the software.

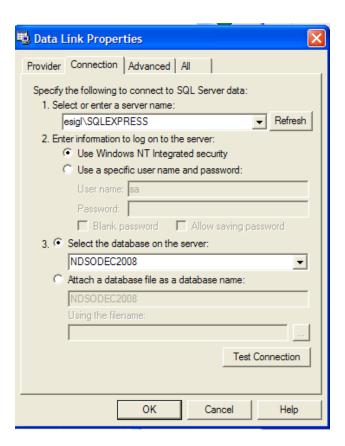
If you later need to edit the customized reports, follow the steps below.

1. Connect the reports to the RxSolution database by double clicking on the



ConnectToDb.udl file, found in the RxSolution/tmp folder.

2. This opens the **Data Link Properties** window. Set up the connection to the data by entering the server name, information, and database. Click the **Test Connection** button to ensure your connection is established.



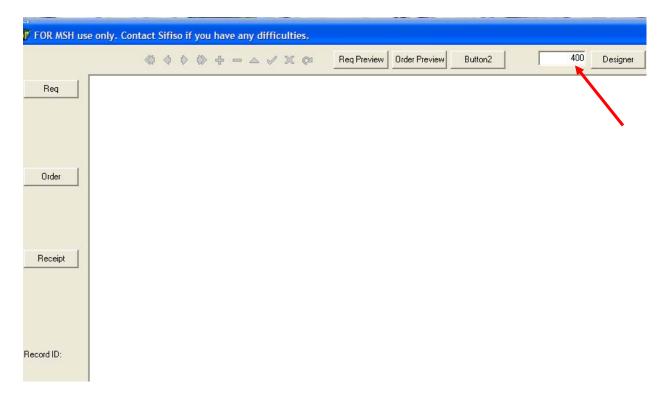
3. Click on **OK** when the connection has succeeded.

4. Double click ReportToolUserDefined.exe file in the RxSolution/tmp folder

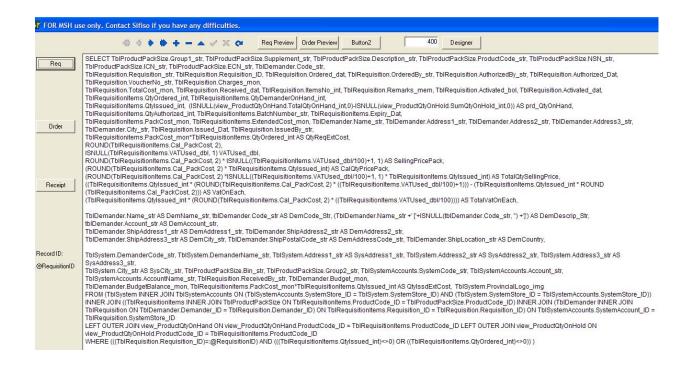


to run the program to edit the reports.

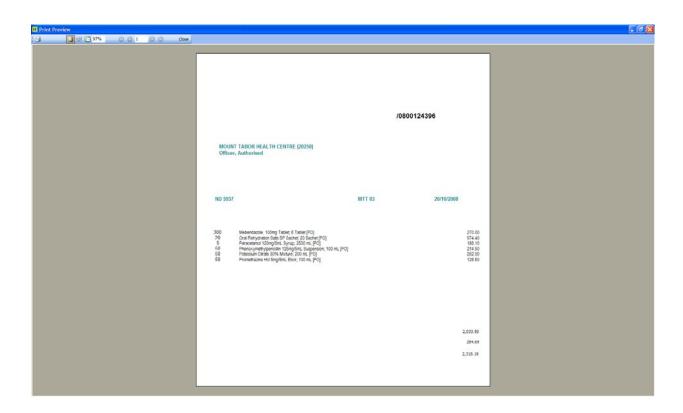
5. Enter an order or requisition (invoice) number (if known) as a sample or a random ID number.



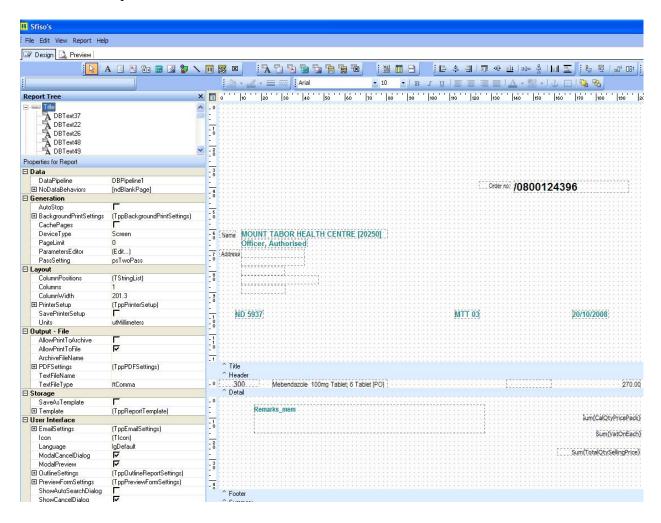
6. Click on the **Req** or **Order** button to load the SQL script for that report. It is possible to alter the SQL script here, but this is not advised without a thorough knowledge of SQL.



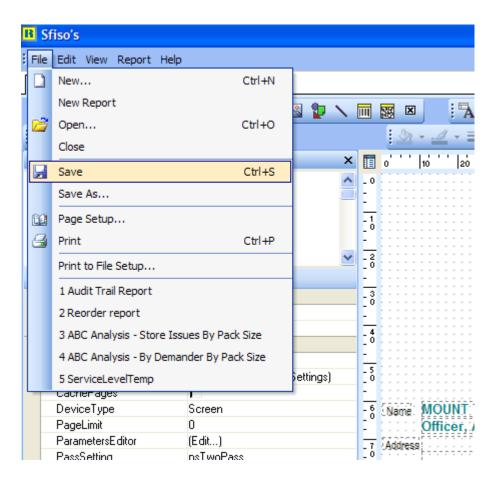
7. Click on the **Req Preview** or **Order Preview** button depending which had been selected in loading the SQL script and which report is expected to print. This displays a preview of the report.



- 8. If the report template needs to be changed, click **Close** to exit the preview, then click on the **Designer** button on the screen where the script is displayed.
- 9. In the design mode, the report can be edited the same way that you would edit any report in the report builder.



10. When the desired changes have been made, save the report by clicking on **File** and **Save**.



- 11. To exit the template program, click on File and Close.
- 12. To exit the "ReportToolUserDefined" screen, click the "X" in the top right corner of the screen.
- 13. The next time you start RxSolution, your newly revised purchase order or receipt will be used.

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