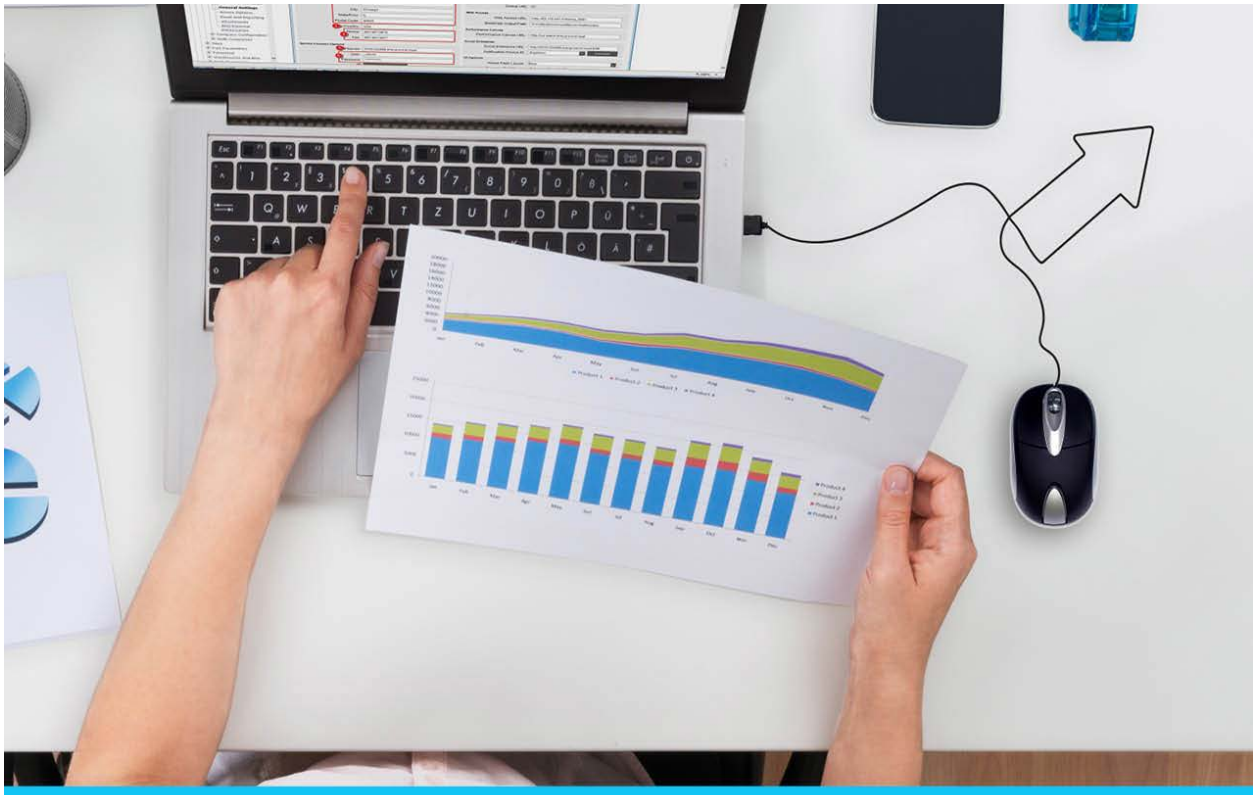

Solar Eclipse Forecasting

Release 9.0.5

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Forecasting Overview

The system uses the process of forecasting to predict how much of a product customers will purchase *in the future* based on *past* sales. Forecasting requires you to define parameters for a product or a period of time which the system uses to make these forecasting predictions. The system also must filter demand to create an accurate forecast picture. This filtering requires considering exceptional sales, lost sales, and trend, such as water heaters that are seasonal products and normally sold in the winter months.

Forecasting must also take into account the hits of a product, safety days, order points, line points defined and the economic order quantity (EOQ). The Update Demand Forecast program provides information necessary about how often a product sells per day or the average number of units sold per day. The system uses these demand calculations for the Suggested Purchase Order Queue, Suggested Auto Transfer, and Product Ranking programs.

These values determine the amount of inventory to stock in your warehouse. In a multiple-branch warehouse company, these values also determine the amount of inventory to transfer to branches.

Forecast Parameters and Periods

Before the system calculates order points, line points, and EOQ, it needs a "clean" demand sample. That is, as accurate an estimation of demand as possible, despite the unpredictability of the future. To help clarify demand, the system gives you the ability to:

- Use variable forecasting periods.
- Eliminate exceptional sales.
- Compensate for lost sales and exceptional sales.
- Consider trends in demand.
- Handle seasonal and non-seasonal products.

Forecast parameters exist at the branch, buy line, and product levels, providing broad to detailed control over your inventory.

Setup Requirements for Forecasting

Following are the control maintenance records used for forecasting. Set the following control maintenance records:

- Assign Demand Forecast To Price/Ship Branch Or By Zip Code
- Control Forecast Parameters Maintenance
- Branch Fields Required To Add Product Demand
- Default Lead Time Days If Product And Buy Line Have None
- Default Lead Time Factor If Product And Buy Line Have None
- Demand Hit Definition
- Do Not List Item More Than Once On Add Demand Screen
- Exclude Exceptional Sales From Customer Demand Index
- Exclude MiscChrg Products From Customer Demand Index
- Forecast Parameters For Demand Calculation
- Global Hits Definition
- Minimum Hits
- Minimum Lead Samples
- Number Of Years To Be Included In Customer Demand Index
- Respect Item Min/Max For Suggested Transfers

Setup Requirements for Exceptional Sales

Following are the control maintenance records and authorization key used for exceptional sales.

Control Maintenance Records

The following control maintenance records affect exceptional sales:

- Demand Hit Definition
- Exclude Exceptional Sales From The Customer Demand Index

Authorization Key

The following authorization key affects exceptional sales:

- OE.PRODUCT.TYPE.EDIT

Setup Requirements for Lead Time Parameters

Following are the control maintenance records used for lead time parameters.

Control Maintenance Records

Set the following control maintenance records:

- Default Lead Time Days If Product And Buy Line Have None
- Default Lead Time Factor If Product And Buy Line Have None
- Minimum Lead Samples

Authorization Keys

- PRODUCT.MAINT.LEVEL

Setup Requirements for Order Points and Line Points

Following are the control maintenance records and authorization key used for order points and line points.

Control Maintenance Records

Set the following control maintenance records:

- Default For Excess Grace In Buy Line Maint
- Default Lead Time Days For Branch Procurement
- Default Lead Time Days If Product And Buy Line Have None
- Default Lead Time Factor If Product And Buy Line Have None
- Minimum Lead Samples
- Minimum Order Cycle Days For Suggested P/O
- Percentage Of Mother Branch's OP Protected In Suggested Transfer
- Warn About Additional Lead Time During OE

Authorization Key

Set the following authorization keys:

- PRODUCT.MAINT

Entering Forecast Parameters for Products

Forecast parameters filter transactions to determine product demand so that the demand forecast is accurate. Forecast parameters define boundaries for how the system suggests when to replenish products in your warehouse. For example, based on the product history, the system uses the settings you define to determine how much you need to keep on hand to fulfill expected sales.

Forecast parameters are set at the product, branch, or buy line level. Set forecast parameters at the product level to override settings at the branch or buy line level. Assign forecast parameters at the product level to filter demand, set the forecast method and forecast period, and to calculate a product's economic order quantity (EOQ).

Note: The following procedure is a manual process for a single product. Use the Mass Load program to enter inventory parameters to groups of products.

To enter forecast parameters for a product:

1. From the **Maintenance** menu, select **Product** to display the Product Maintenance window.
2. Display a product record.
3. From the **Inventory** menu, select **Primary Inventory Maintenance** to display the Primary Inventory Maintenance dialog box.
4. From the **Edit** menu, select **Forecast Parameters** to display the Product Forecast Parameters dialog box.
5. From the **File** menu, select **Hierarchy** to display the Product Forecast Parameters dialog box.
6. In the **Enter hierarchy branch** field, enter the branch or territory ID.
7. Click **OK** to display forecast parameters for the selected branch in the Product Forecast Parameters dialog box.
8. Complete the following fields:

To...	Use this field...
Whether the system uses the standard or median forecasting method for this product. If left blank, the default is standard.	**Forecast Method**
Whether the product sells more at certain times of the year than at other times. Select **Demand Parameters** from the **File** menu to define the forecast period parameters.	**Seasonal**
The maximum number of days in the forecast period that the system uses to increase an item's raw demand to compensate for lost sales of a product.	**Lost Sales**
The exceptional sales percentage for the product. The system eliminates from demand forecasting any sale exceeding the percentage difference between the two largest sales in the forecast period.	**Exceptional Sales %**
The positive or negative percent to change the calculated demand forecast in anticipation of a trend increasing or decreasing the demand. **Note:** You can enter negative numbers, if needed, such as to account for declining sales on a buy line.	**Trend %**
Enter the backorder tolerance quantity above which a hit is not included in the demand forecast calculation.	**BTQ**

To...	Use this field...
Enter the minimum number of most-recent purchase orders the system samples to calculates the lead time for the product.	**Minimum Lead Factor**
Define how the system calculates lead time for the product: • If greater than 0 (zero), this is the maximum number of most-recent purchase orders the system samples to estimate the lead time for the product. • If 0 (zero), the automatic calculation of lead time for the product is turned off and the system uses the value of **Lead Days** for the lead time. • If null (blank), the system uses the lead factor set for the product's buy line. **Note:** Seasonal products use a lead time calculated for the season.	**Lead Factor**
The lead time for the product. This field updates when **Lead Fctr** is greater than 0 (zero).	**Lead Days**
The theoretical cost of reordering and restocking a single item, used in calculating the EOQ.	**EOQ $**
The carry cost percentage used in calculating the EOQ of this item.	**EOQ %**

9. Save the information and exit the dialog box.

   Changes take effect when you exit Product Maintenance.

More Options for the Product Forecast Parameters Dialog Box

The Product Forecast Parameters dialog box also offers these options:

To...	Select this menu option...
Enter forecast period parameters	**File > Demand Parameters** The Product Demand Parameters dialog box displays.
Define minimum and maximum stocking levels and add service stock	**Edit > User Control Parameters** The Product User Control Parameters dialog box displays.
View the default cost for a product	**Edit > Default Cost** The Product Default Cost dialog box displays.
Adjust the product's lead time	**Edit > Override Lead Time** The Override Lead Time Maintenance dialog box displays.
View product availability and inventory information	**Inquiry > Inventory Inquiry** The Inventory Inquiry window displays.
Audit the demand calculation	**Inquiry > Audit** The Demand Calculation Audit dialog box displays.

Entering Forecast Period Parameters

Demand patterns for products selling an average of 10 times a month are different from those for products selling an average of 10 times a year. Therefore, the system forecasts product demand based on variable forecast periods.

On average, the following is true:

- Fast-moving items use shorter forecast periods because most recent sales are the best for predicting future demand.
- Slow-moving items use a longer forecast period, because you need more time and purchase for accurate predictions.
- Seasonal products, which are in greater demand at certain times of the year than for non-seasonal products, use the demand history from the prior year's season.

In addition to setting forecast period parameters at the product level, you can also set these parameters at the branch or buy line level. Parameters set at the product level override those set at the buy line and branch level.

Note: The following procedure is a manual process for a single product. Use the Mass Load program to enter inventory parameters for groups of products.

To enter product demand parameters:

1. Enter forecast parameters.
2. In the Product Forecast Parameters dialog box, from the **File** menu, select **Demand Parameters** to display the Product Demand Parameters dialog box.
3. From the **File** menu, select **Insert Branch** to display the Product Demand Parameters dialog box.
4. In the **Enter new branch or territory** field, enter the branch or territory ID.
5. Click **OK** to return the ID to the **Branch** field in the Product Demand Parameters dialog box.
6. To enter non-seasonal demand parameters for a branch, under the **Regular** column, complete the following information:

Column	Description
Hits	The number of hits the system looks for within the regular **Minimum Days** and **Maximum Days** range to calculate the number of days of sales history used to calculate a non-seasonal product's demand.
Minimum Days	Minimum days used with regular **Hits** to determine the number of days of sales history used to calculate a non-seasonal product's demand.
Maximum Days	Maximum days used with regular **Hits** to determine the number of days of sales history used to calculate a non-seasonal product's demand.

Note: If the date of the first transaction for a product is less than the maximum days, the demand history calculation program populates the **Maximum Days** field with that date. If the date of the first transaction for a product is also less than the minimum days, the program also populates the **Minimum Days** field with that date.

7. To enter seasonal forecast parameters for a branch, under the **Seasonal** column, complete the following information:

Column	Description
Hits	The number of hits the system looks for within the regular **Minimum Days** and **Maximum Days** range to calculate the number of days of sales history used to calculate a seasonal product's demand.
Minimum Days	Minimum days used with regular **Hits** to determine the number of days of sales history used to calculate a seasonal product's demand.
Maximum Days	Maximum days used with regular **Hits** to determine the number of days of sales history used to calculate a seasonal product's demand.

Note: If the date of the first transaction for a product is less than the maximum days, the demand history calculation program populates the Max Days field with that date. If the date of the first transaction for a product is also less than the minimum days, the program also populates the Min Days field with that date.

8. Enable the automatic trend calculation, if needed.
9. Include direct shipments in the demand calculation, if needed.
10. Save the information and exit the window.

    Changes take effect when you exit Product Maintenance.

More Options in the Product Demand Parameters Dialog Box

The Product Demand Parameters dialog box also offers these options:

To...	Select this menu option...
remove a branch from the Product Demand Parameters dialog box, select the branch and	**File > Clear Branch**
find a branch that is not currently visible in the dialog box	**File > Find Branch** The Product Demand Parameters dialog box displays. In the **Enter branch or territory to find** field, enter the branch or territory ID and click **OK** to return to the Product Demand Parameters dialog box. The cursor moves to the requested branch.
toggle between prompting for a branch to display branch-specific parameters and displaying all branches	**File > Toggle Hierarchy** The Product Demand Parameters dialog box displays. In the **Enter hierarchy branch** field, enter the branch or territory ID to which you want to toggle and click **OK** to return to the Product Demand Parameters dialog box.
Enable the automatic trend calculation	**Edit > Auto Trend** The Product Auto Trend Maintenance dialog box displays.

Entering Control Forecast Parameters

Forecast parameters filter transactions to determine product demand so the system can make a more accurate demand forecast. The **Forecast Parameters For Demand Calculation** control maintenance record defines the system-wide forecast parameters.

You can assign forecast parameters at the branch level that apply to all products in that branch, unless overridden at the buy line or the product level. These include parameters to filter demand, set the forecast method and forecast period, and to calculate a product's economic order quantity (EOQ).

To enter system default forecast period parameters:

1. From the **System > System Files** menu, select **Control Maintenance** to display the Control Maintenance window.
2. In the **Keyword** field, enter **forecast parameters for demand** to display the Control Forecast Parameters Maintenance dialog box.
3. Double click the INVM control maintenance record that displays.
4. In the **Branch** field, select the branch, branches, or territories for which you want to apply control forecast parameters.
5. Complete the main fields to apply to the branch.

Field	Value
Forecast Method	Whether the system uses the standard or median forecasting method for this product.
Lost Sale	The maximum number of days in the forecast period that the system uses to increase an item's raw demand to compensate for lost sales of a product.
Exceptional %	The exceptional sales percentage for the product. The system eliminates from demand forecasting any sale exceeding the percentage difference between the two largest sales in the forecast period.
Trend %	The positive or negative percent to change the calculated demand forecast in anticipation of a trend increasing or decreasing the demand. **Note:** You can enter negative numbers, if needed.
EOQ $	The theoretical cost of reordering and restocking a single item, used in calculating the EOQ of the product. We recommend using 1.00 for $1.00.
EOQ %	The carry cost percentage used in calculating the EOQ of the product. We recommend using 28 for 28%.

6. In the **Auto-Trend** area, select to apply an automatic trend for seasonal products. The system calculates and applies a trend based on recent demand compared to the previous year's demand.
   - **Max Decrease%** - The maximum negative trend to apply to the demand forecast for the product. This parameter only applies to seasonal products when the Auto-Trend check box is selected.
   - **Max Increase%** - The maximum positive trend to apply to the demand forecast for the product. This parameter only applies to seasonal products when the Auto-Trend check box is selected.

7. Select **Include Directs** to include direct shipments in the demand calculation for the branch demand calculations.
8. Select **Seasonal** if you have products in the branch that sell more at certain times of the year than at other times. For example, you may count furnaces as a seasonal product because you sell more during winter months.
9. In the **Regular** section, enter non-seasonal product forecast parameters.

Field	Description
Hits	The number of times an item sold within the regular **Min Days** and **Max Days** range. The system uses hits to calculate the forecast period for calculating demand for a non-seasonal product. The **Demand Hit Definition** control maintenance record determines how the system calculates hits based on sales orders.
Min Days	Minimum days used with regular **Hits** to determine the forecast period for calculating demand for a non-seasonal product.
Max Days	Maximum days used with regular **Hits** to determine the forecast period for calculating demand for a non-seasonal product.

Note: If the date of the first transaction for a product is less than the defined **Max Days**, the system uses the date of the first transaction as **Max Days**. If the date of the first transaction for a product is also less than the defined **Min Days**, the program uses the date of the first transaction as **Min Days**.

10. In the **Seasonal** section, enter seasonal product forecast parameters.

Field	Description
Hits	The number of times an item sold within the seasonal **Min Days** and **Max Days** range. The system uses hits to calculate the forecast period for calculating demand for a seasonal product. The **Demand Hit Definition** control maintenance record determines how the system calculates hits based on sales orders.
Min Days	Minimum days used with seasonal **Hits** to determine the forecast period for calculating demand for a seasonal product.
Max Days	Maximum days used with seasonal **Hits** to determine the forecast period for calculating demand for a seasonal product.

Note: If the date of the first transaction for a product is less than the defined **Max Days**, the system uses the date of the first transaction as **Max Days**. If the date of the first transaction for a product is also less than the defined **Min Days**, the program uses the date of the first transaction as **Min Days**.

11. In the **Days Out Calculation Parameters** area, select **Exclude Ship From Different Branch** to eliminate including the days out calculation from another branch.

    For example, a customer orders 20 garbage disposals. You have none in your warehouse, but have them in branch 2. You have them directly shipped to the customer, but do not want to consider that you have them on-hand in your days out calculation although you can get them to the customer. Select this option to exclude shipping from them from a different branch in the calculation of on-hand.

12. Click **OK** to save changes and exit the window.

Forecast Parameters for Buy Lines

The system forecasts product demand (trend) for both seasonal and non-seasonal products. You have the flexibility of setting your own forecast parameters. For complete information about setting these forecast parameters, see *Setting Forecast Parameters for Buy Lines* in the Purchasing online documentation.

Setting Product User Control Parameters

Use the Product User Control Parameters dialog box to enter specialized product-level inventory parameters, to:

- Estimate product demand for a new branch

  When you have a new branch that has no product history, use the **Min**, **Max**, **Exp Date**, and **Calc Dmnd** fields to define minimum and maximum stocking levels for the products until there is sufficient product history for the demand calculation to take over.

  You can estimate the minimum and maximum stocking levels for a new product until the product accrues enough demand history for the system to begin forecasting. As the system monitors a product's demand, you can set an expiration date after which the system will stop using estimated minimum and maximum levels for suggested purchasing, and begin forecasting demand for regular product order points and line points.

- Add service stock to the demand

  Use the **Service Stock** and **Serv Stock Exp Date** fields to add service stock, to the product's order point and line point calculations. This adjustment, also known as manual safety stock, is a quantity of stock above your normal stocking level that you have committed to keep on the shelf at a branch for a set period.

  For example, assume the following it true:

  - You run a promotion on an item, guaranteeing that you will have it in stock.
  - A contractor requests that you keep an item in stock in case he or she needs one in an emergency.
  - Your branch utilizes items for its own maintenance and you do not want your use of the items to count towards the item's demand.

  When you assign service stock, the system assigns the additional quantities to the order point and line point calculations. When you reach the expiration date of the service stock the system removes the additional quantities from the order point and line point calculations.

  You can set service stock for a branch or for a customer at a branch using the Product User Control Parameters dialog box.

  Use the **Customer Service Stock** menu option to add customer service stock to the product's normal demand. Customer service stock is a quantity of stock above your normal stocking level that you have committed to keep on the shelf for a set period, as a courtesy to a customer. After entering customer service stock information for a product, the total requirements display in the **CusServ Stock** field. The system adds the additional stock requirements to the product's order point and line point calculations.

The following procedure is a manual process for a single product. Use the Mass Load program to enter inventory parameters to groups of products.

To set User Control Parameters for a product:

1. From the **Maintenance** menu, select **Product** to display the Product Maintenance window.

2. Display a product record.
3. From the **Inventory** menu, select **Primary Inventory Maintenance** to display the Primary Inventory Maintenance dialog box.
4. From the **Edit** menu, select **User Controls** to display the Product User Control Parameters window.
5. Do one of the following:
   - From the **File** menu, select **Hierarchy** to display the Product User Control Parameters dialog box. In the **Enter hierarchy branch** field, enter the branch or territory ID.
   - From the **File** menu, select **Add Branch**. In the **Enter Branch** field, enter the branch or territory ID you want to view.

   Important: Only stocking branches are allowed.
6. Click **OK** to display user control parameters for the selected branch in the Product User Control Parameters dialog box.
7. For each branch or territory, complete the User Control Parameter columns, as needed.

Field	View	Description
Min (ea)	**All**	The estimated minimum quantity to stock: • Purchasing branches use this quantity in place of a calculated order point until the expiration date. • When the **Respect Item Min/Max For Suggested Transfers** control maintenance record is set to **Y**, child branches use this quantity in place of a calculated transfer point until the expiration date. • Enter **0** (zero) if the branch does not stock the item, or enter the actual quantity that should ever be stored at the child branch when using this field with the **Calculate Demand** field.
		If a product has a min setting but no max setting, the order point and the line point quantity are equal to the value in the **Min** field unless the system calculated line point quantity is greater than the minimum. In this case, the system uses the calculated line point quantity. Any child branches inherit the minimum only setting.
		Note: If you use vendor managed inventory and generate EDI 852s, the MIN only should only report if it is greater than the OP. If it is greater than the order point, it should net to the Available and report the difference between the MIN and the available as the quantity reserved (QD). If the order point is 10 and MIN only is 15 and available is 5, then report 10 as quantity reserved (QD). If the order point is 10 and MIN only is 15 and available is 20, then report nothing, as the product has enough available to cover the MIN only.

Field	View	Description
Max (ea)	**All**	The estimated maximum quantity to stock: • Purchasing branches use this quantity in place of a calculated order point until the expiration date. • When the **Respect Item Min/Max For Suggested Transfers** control maintenance record is set to **Y**, child branches use this quantity in place of a calculated transfer point until the expiration date. • Enter **0** (zero) if the branch does not stock the item, or enter the actual quantity that should be stored at the child branch when using this field with the **Calculate Demand** field.
		If a product has a min setting but no max setting, the order point and the line point quantity are equal to the value in the **Min** field unless the system calculated line point quantity is greater than the min. In this case, the system uses the calculated line point quantity. Any child branches inherit the minimum only setting.
Expiration Date	**All**	The date after which the values in the **Min** and **Max** fields are no longer valid. We recommend that you use an expiration date six months from the current date.
Calculate Demand	**All**	To calculate demand from dependent selling branches for use at purchasing branches, select the check box in the selling branch rows; otherwise, leave it empty. If you use a minimum-only order point for your newer products, ensure that the **Calculate Demand** field is deselected. For more information, see Setting Minimum and Maximum Stocking Levels for New Products.
Service Stock	**Service Stock**	The quantity of the product to reserve as service stock.
Service Stock Expiration Date	**Service Stock**	The date the system stops adding the service stock quantity to the product's order point and line points.
Customer Service Stock	**Service Stock**	The system populates this field with the total quantity of service stock reserved for selected customers. The total quantity only includes those quantities within their respective effective date and expiration date. The effective and expiration dates are for reporting purposes only and do not affect automated purchasing or automated transfers. For more information, see Customer Service Stock Report. When a branch or territory appears on the User Inventory Control window without a value in the **CusServ Stock** field, this indicates that a customer contract stock quantity is set. For more information, see Viewing Customer/Vendor Specific Part Number Details. This field is view-only.
Product Lifecycle	**Service Stock**	Select the product lifecycle to classify the product you are adding. For information about product lifecycles, see Creating Product Lifecycles in Product Maintenance.

Field	View	Description
Vendor Return Allowed	**Product Returns**	Select one of the following: • **Always** - Allow returns regardless of return type. • **RGA** - Allow returns only if customer has Return Goods Authorization number provided by the vendor. Users must be assigned the SOE.RGA.REQUIRED authorization key to return any products without an RGA number, but flagged with this setting. • **Never** - Disallows all returns from this vendor. This setting can be used for items like remnants that you cannot take back into inventory. Products flagged as non-returnable are not included in the Suggested PO Return Queue. Users must be assigned the SOE.NONRETURN.PROCESS authorization key to return any products with this setting.
Customer Return Allowed	**Product Returns**	Select one of the following: • **Always** - Allow returns regardless of return type. • **Defective** - Allow returns only if product is broken or otherwise defective. • **Never** - Disallows all returns from this customer. Users must be assigned the SOE.ALLOW.NONRETURN authorization key to return any products with this setting.
Economic Amount	**Product Returns**	Enter the amount below which the system recommends not returning items to inventory. If the value of the item being returned falls short or below this amount, the system recommends the item not be returned to inventory because the processing costs outweigh the actual value of the item. For more information, see Determining the Economic Return Amount in the Purchasing documentation.
Auto Generate Return?	**Product Returns**	Indicate if you want to allow the system to automatically generate a return.
Auto Return Ship Via	**Product Returns**	Select the ship via that the system should use when automatically creating a return for products.
Auto Return Status	**Product Returns**	Select the order status that the system should use when automatically creating a return for products.
Auto Return Days for Ship Date	**Product Returns**	Select the number of days allowed for the customer to return the selected product.

7. Save the information and exit the dialog box.

   Changes take effect when you exit Product Maintenance.

More Options for the Product User Control Parameters Dialog Box

The Product User Control Parameters dialog box also offers these options:

To...	Select this menu option...
view inventory details about the product in all branches	**Inquiry > Inventory Inquiry** The Inventory Inquiry window displays.

To...	Select this menu option...
view information pertaining to the calculation of the product's demand	**Inquiry > Audit** The Demand Calculation Audit dialog box displays.
add the demand history of discontinued products to their replacements	**Additional Controls > Add Demand** The Add Demand dialog box displays.
define hits-related inventory parameters for each branch	**Additional Controls > Hits Maintenance / Max Days Supply** The Hits Control Maintenance dialog box displays.

How Standard and Median Forecasting Works

The system offers two different methods for forecasting product demand. The default is Standard. Use:

- **Standard** for products with larger demand histories.
- **Median** for products with smaller demand histories.

Use the **Forecast Parameters For Demand Calculation** control maintenance record to define how you want the standard forecasting to calculate. For more information about these settings, see *Entering Control Forecast Parameters* in this documentation.

> **Note:** For options in advanced forecasting, see How Advanced Demand Forecasting Works which works independently as a complement to this process.

Standard Forecasting Method

- The system identifies and eliminates from demand forecasting any sales exceeding the back order tolerance quantity (BTQ) during the forecast period.
- After eliminating sales exceeding the BTQ, the system eliminates from demand forecast in any sale exceeding the exceptional sale percent during the forecast period.
- The system adds the remaining sales quantities together and divides the sum by the number of days in the forecast period.
- This demand per day is then multiplied by 30 to produce a monthly demand. The system rounds up to the nearest unit.

For example, Product A does not have a BTQ set. The exceptional sales percent equals 50%. Product A sells ten times in a forecast period of 365 days in the following quantities: 200, 100, 9, 8, 7, 6, 5, 4, 3, and 2. The sale of 200, being 50% more than the second largest sale of 100, is considered exceptional and eliminated from demand forecasting. The system adds the remaining quantities together (100+9+8+7+6+5+4+3+2=144) and divides the sum by the days in the demand period (144/365=0.394). The system then multiplies the daily demand by one month to produce a monthly demand of 12 units (0.394*30=11.82).

Consider that if Product A had a BTQ set to 100, the sale of 200 would be eliminated and the sale of 100, being 50% more than the second largest sale of 9, would be considered an exception and eliminated from demand forecasting. Adding the remaining quantities together (9+8+7+6+5+4+3+2=44), dividing by the days in the demand period (44/365=0.12), and multiplying by 30 days would produce a monthly demand of only 4 units (0.12*30=3.61).

Median Forecasting Method

- The system identifies and eliminates from demand forecasting, any sales exceeding the BTQ and the exceptional sale percent during the forecast period.
- The system identifies the median quantity of the remaining sales and multiplies this quantity by the number of hits counted in the forecast period.
- This daily demand is multiplied by 30 days to produce a monthly demand. The system rounds up to the nearest unit.

For example, Product A does not have a BTQ set. The exceptional sales percent equals 50%. Product A sells ten times in a forecast period of 365 days in the following quantities: 200, 100, 9, 8, 7, 6, 5, 4, 3, and

2. The sale of 200 is proven to be exceptional and eliminated from demand forecasting. The median of the remaining quantities (100, 9, 8, 7, 6, 5, 4, 3, 2) is 6. The system multiplies the median quantity by the number of hits counted (6*9=54) and divided by the days in the forecast period (54/365=.148). The system then multiplies the daily demand by 30 days to produce a monthly demand of 5 units (.148 x 30=4.4).

Including Direct Shipments in the Demand Calculation

Include direct shipments from the vendor in the demand calculation for the product when the majority of your direct shipments are the result of not having enough of the item on the shelf.

Forecast parameters set at the product level override those set at the branch or buy line level.

> **Note:** The following procedure is a manual process for a single product. Use the Mass Load program to enter inventory parameters to groups of products.

To include direct shipments from the vendor in demand calculations:

1. Enter forecast parameters.
2. In the Product Forecast Parameters dialog box, from the **File** menu, select **Demand Parameters** to display the Product Demand Parameters dialog box.
3. From the **File** menu, select **Insert Branch** to display the Product Demand Parameters dialog box.
4. In the **Enter new branch or territory** field, enter the branch or territory ID.
5. Click **OK** to return the ID to the **Branch** field in the Product Demand Parameters dialog box.
6. In the **Include Directs** column, enter **Yes** next to the branch or territory for which to include direct shipments in the demand calculation for the product.
7. Save the information and exit the dialog box.

   Changes take effect when you exit Product Maintenance.

Viewing the Default Cost for Products

If you have authorization, you can view the default cost used in the economic order quantity (EOQ) calculation for the product at the sales branch. This cost comes from Global Basis name matching the **Dflt Cost Prompt**, set in the **Global Buy/Sell Basis Names** control maintenance record. Assign costs to products through Product Price Sheet Maintenance or Price Line Maintenance.

Users must the COST.VIEW and COGS.VIEW authorization key to view the default cost. Otherwise, the column displays asterisks (*****).

To view the default cost for a product:

1. From the **Maintenance** menu, select **Product** to display the Product Maintenance window.
2. From the **Inventory** menu, select **Primary Inventory Maintenance** to display the Primary Inventory Maintenance dialog box.
3. From the **Edit** menu, select **Forecast Parameters** to display the Product Forecast Parameters dialog box.
4. From the **File** menu, select **Hierarchy** to display the Product Forecast Parameters dialog box.
5. In the **Enter hierarchy branch** field, enter the branch or territory ID.

   Note: Use the **Find** option as necessary to locate a branch that is in the list, but not in the viewable area. Use **Alt-Insert** to add a branch or territory to the list. The new branch or territory inherits the settings of the previous entry. Use **Alt-Delete** to remove a branch or territory from the list.

6. Click **OK** to display forecast parameters for the selected branch in the Product Forecast Parameters dialog box.
7. From the **Edit** menu, select **Default Cost** to display the Product Default Cost dialog box.
8. Review the default cost for each branch.
9. Click **OK** to exit the dialog box.

Advanced Demand Forecasting Overview

By default, Eclipse uses standard and median forecasting when calculating demand to help you determine what products you need to purchase and how often you need to purchase them. Starting in Release 8.7.8, Eclipse provides additional, or advanced, forecasting methods to help you best determine how to categorize your products and thereby maximizing your purchasing power.

> **Note:** These forecasting methods are used *in addition to* the standard forecasting methods. This process is to complement the original process and help you determine the best forecast to use.

Eclipse analyzes the product history to determine the demand by looking at minimum hits and history, smoothing factors, and automatic trends. Use the *Advanced Demand Forecast Parameters* control maintenance record to define these forecasting factors for the system to estimate future needs to create purchasing suggestions. Meaning, the current demand levels can be used to determine future demand.

This means, Eclipse uses your selected group and goes back the number of weeks indicated in the *Advanced Demand Forecast Parameters* control maintenance record to gather the most recent sales history on your buy line or product set. The system stores the most recent 52 weeks' worth of data. Then, using that information applies your selected advanced forecast method.

Smoothing Factors

In forecasting inventory, *smoothing* refers to finding the demand by removing the random variations that may occur in the purchasing history. This helps determine demand patterns more accurately, so that you do not purchase for those exceptional sales or exceptional periods in the life of the warehouse. For standard forecasting calculations, this means taking an average of your sales. With Advanced Demand Forecasting, Eclipse applies base level, trend level, and seasonal level. In formalized forecasting manuals, this refers to Alpha, Beta, and Gamma factors. For ease of explanation we refer to them as Base, Trend, and Seasonal.

- **Base** - Known as the *Alpha* factor. The recent demand period versus the prior demand period. This field must be set between 0.05 and 0.25. If left blank, the system uses 0.15.
- **Trend** - Known as the *Beta* factor. Must be set between 0.05 and 0.25. If left blank, the system uses 0.15.
- **Seasonal** - Knows as the *Gamma* factor. Must be set between zero (0) and 0.5. If left blank, the system uses 0.5. For example, if the seasonal score for this week is 100% of normal, but actual sales were 200% of normal, the forecast adjusts the score *up* for next year. A higher gamma means a higher adjustment. A gamma of .25 would in that instance have the score as 125% for the following year.

Once calculated, Eclipse automatically calculates smoothing factors for each item. If the calculation is above the maximum value set in the *Advanced Demand Forecast Parameters* control maintenance record, then the system uses the control maintenance record values.

> **Note:** Eclipse uses weekly forecasts, meaning 52 weeks' worth of data. Due to this type of calculation, Eclipse limits your maximum smoothing factor values to prevent these factors from including outlying values. This keeps your smoothing factors addressing the most useful data and giving you the best values for managing trends.

The system uses the smoothing factor, the most recent period's calculated demand, and the most recent period's forecast to create and *exponential smoothing* calculation. This calculation takes into account the previous period and goes back in the demand periods for you and the output represents all the previous period demand. In Eclipse, the default is 24 months of product history, but it can use whatever history your company stores in the Eclipse files.

Using the *Advanced Demand Forecast Parameters* control maintenance record enables you to customize the calculations for your business.

In addition, the system can use those exceptional sales and help determine if they truly are exceptional or are actually seasonal product sales. For more information see *How Eclipse Test for Seasonality* below.

How Eclipse Tests for Seasonality

In order for Eclipse to know which advanced forecast method to apply, the system must first test your branches and products in combination for seasonality. This means, the system considers specific parameters or factors to determine if a product should be considered seasonal. By marking a product seasonal limits when you purchase the products.

Eclipse uses the most recent years of history as defined in the *Advanced Demand Forecast Parameters* control maintenance record for every product and branch combination.

The demand information is gathered four-week groupings culminating in thirteen groups per calendar year. Using this method avoids the influence variations in month length or weekday periods throughout the year. For example February, in comparison to other months, is 7-8% shorter. In addition, months of equal length, such as 30 days, can have an unequal number of weekdays depending on how the months fall in a calendar year. Eclipse then passes the calculated demand value through a Autocorrelation Function (ACF) to determine if the correlation over a one-year period and the 50% confidence level. The system then uses a moving average method for this time series and calculations. If the determined correlation is greater than 0.3 and outside the 50% confidence interval, the item is treated as seasonal.

> **Note:** The seasonal tests do not prove if an item is seasonal, but to show that is more likely seasonal than non-seasonal to have seasonal forecasting methods applied.

Setting Up Advanced Demand Forecasting

Use the **Advanced Demand Forecast Parameters** control maintenance record to define these forecasting factors for the system to estimate future needs to create purchasing suggestions. Meaning, the current demand levels can be used to determine future demand.

Enter the forecasting and seasonality levels you want to apply for advanced forecasting.

Field	Description / Options
Forecasting	• **Min Hits** - Minimum hits needed for an item to qualify for advanced demand forecasting. The system compares this to the current forecast period hits by branch to determine if this has been met. • **Max Years History** - This field must be set between 3 and 10 years. The more years you select the longer the forecast program may run, but the more years you use the more accurate your forecasting values. **Note:** You are restricted to the number of years' activity based on the **Number Of Years Sales In PSUB File** control maintenance record.
Smoothing Factors	• **Max Level (Alpha)** - This field must be set between 0.05 and 0.25. • **Max Trend (Beta)** - This field must be set between 0.05 and 0.25. • **Max Seasonal (Gamma)** - This field must be set between zero (0) and 0.50. For more information about how smoothing factors work, see Advanced Demand Forecasting Overview.
Seasonality	• **Min Hits** - Enter the number of hits an item should have to be included in the seasonality pattern test. This number must be greater or equal to the Minimum Hits for Advanced Forecasting (above). • **Min Months History** - This field must be set between 13 and 36 months. • **Exclude Seasonal Forecasts For Non-Seasonal Items** - Select the items that are not flagged as seasonal and do not have seasonal trending that you want to exclude from the seasonal forecasting calculations. • **Include Seasonal Forecasts For Non-Seasonal Items** - Select to *include* all items in the seasonal forecasting calculations regardless of their classification. ***Important:*** Using this setting may increase the amount of time the system requires to run the Update Demand Forecast.
Outcome of setting this control record	Eclipse uses these settings to calculate demand forecast and seasonality testing.
Default Value(s)	**Advanced Forecasting Defaults:** • Min Hits: 10 • Max History in years: 5 • Max Alpha: 0.15 • Max Beta: 0.15 • Max Gamma: 0.5 **Advanced Forecasting Defaults for Seasonality:** • Min Hits: 10 • Min History in months: 24
Dependencies	Update Demand Forecast program should be addressed.

Field	Description / Options
	Using the Exclude Negative Quantities From Item Demand Calculations control maintenance record will eliminate any negative quantities, but does not eliminate the system actually calculating a negative demand. This means if you use Holt or Holt-Winters and your sales have actually gone down over the specified period, the system will show a negative demand.
Action if set to Null	**None.**
Additional Information	Complete the Update Demand Forecast program.

About Advanced Forecasting Calculations

Advanced forecasting calculations complement the current forecasting to help you delve more deeply into how your products should be managed for replenishment. The system looks through the sales history going back a specified amount of time. Eclipse uses your selected group and goes back 52 weeks to gather the most recent sales history on your buy line or product set. Then, using that information applies your selected advanced forecast method. The system records the values by product for each of these methods with the product's file. Demand Calculation Audit updates with the current method.

> **Note:** You can add advanced forecasting method results to a user-defined queue using the BR_BEST_FIT and BR_ADV_FRCST dictionaries. For more information about user-defined views and user-defined queues, see Creating User-Defined Views and Creating User-Defined Queues.

See Assigning Advanced Demand Forecast Methods to indicate which method you want to use.

Single Exponential Smoothing Method

In forecasting inventory, *smoothing* refers to finding the demand by removing the random variations that may occur in the purchasing history. This helps determine demand patterns more accurately, so that you do not purchase for those exceptional sales or exceptional periods in the life of the warehouse. For more information about smoothing factors, see *How Advanced Demand Forecasting Works* in this documentation.

The simplest form of exponential smoothing is given by the following formula:

$$F_{t+1} = \alpha Y_t + (1 - \alpha) F_t$$

Where α is the smoothing factor and $0 < \alpha < 1$. This means that the smoothing is a weighted average of the previous data and the previous smoothed statistic. For Eclipse, this means the system uses the previously calculated smoothing factor and the previously calculated demand within the specified time frame and uses the average to determine the demand. Exponential refers to the fact that you use the smoothing factor back into itself on each subsequent demand calculation. Therefore, it changes exponentially.

Holt Method

The Holt method calculates the same way as the single exponential smoothing, but calculates using the trending factor in addition to the smoothing factor. The formula calculations are as follows:

$$L_t = \alpha Y_t + (1 - \alpha)(L_{t-1} + b_{t-1})$$

$$b_t = \beta(L_t - L_{t-1}) + (1 - \beta) b_{t-1}$$

$$F_{t+m} = L_t + b_t m$$

Holt-Winters Method

The Holt-Winters method calculates the same way as the standard Holt method, but uses seasonality in addition to the since exponential smoothing and trending factors. To initialize the Holt-Winters calculations, the system uses back-casting. This allows the system to handle a wider variety of sales patterns without producing inaccurate forecasts.

The year is broken into 52 buckets, or 52 weeks' worth of data. For Holt-Winters, each bucket is adjusted according to its seasonal score. This means the system provides a "at this time of year, the sales are x% of normal." The seasons score for *that bucket* is updated according to the gamma value.

For items that pass the seasonality test, the system runs the Holt-Winters method.

$$L_t = \alpha \frac{Y_t}{S_{t-s}} + (1-\alpha)(L_{t-1} + b_{t-1})$$

$$b_t = \beta (L_t - L_{t-1}) + (1 - \beta) b_{t-1}$$

$$S_t = \gamma \frac{Y_t}{L_t} + (1-\gamma) S_{t-s}$$

$$F_{t-m} = (L_t - b_t m) S_{t-s+m}$$

Note: Holt-Winters calculations are not made with less than three years demand history.

Monthly Demand Calculations

For both Single Exponential Smoothing and Holt methods, the system uses a weekly demand divided by seven multiplied by 30 to get the monthly demand value:

monthly demand = (weekly demand / 7) x 30

For Holt Winters method, because the forecast is more than a single week, Eclipse uses four 2/7ths of a week and make that the monthly demand. Eclipse divides that value by 30 to find the daily demand.

Best Fit Calculations

Runs as if the product is set to standard method for each method (above) individually and without relying on information from the other calculations. For more about how the system creates and manages best fit calculations, see How Eclipse Calculates Best Fit.

Using Advanced Update Demand Forecasting

Advanced Update Demand Forecasting does not replace the current, standard and median Eclipse forecasting methods or the standard Update Demand program. These calculations complement the current forecasting to help you delve more deeply into how your products should be managed for replenishment. The system looks through the sales history going back a specified amount of time.

Eclipse calculates demand, finds the current forecast, and then applies the new forecasting. By default, the system uses a 5-year period to calculate demand unless a value is set in the **Advanced Demand Forecast Parameters** control maintenance record. Eliminates slow moving items that would not generate accurate demand. Smoothing factors for calculating the forecast behind-the-scenes then populate the factors after running the program. With the new methods the system tests seasonality on all products that meet the minimum hits and minimum history for the calculations. By default, the system uses 24 months. Then, Eclipse uses your selected group and goes back the number of weeks indicated in the *Advanced Demand Forecast Parameters* control maintenance record to gather the most recent sales history on your buy line or product set.

Important: If running the advanced forecasting for all products or all branches, we recommend running the calculations off-hours so as not to impact system performance. If running the forecast for a single product or branch, system performance should not be affected.

Set these parameters using the **Advanced Demand Forecast Parameters** control maintenance record.

For more information about advanced forecasting methods, see *About Advanced Forecasting Methods* in this documentation.

To run the advanced update demand program:

1. From the **Purchase > Forecasting** menu, select **Update Advanced Demand Forecast** to display a selection list.
2. In the **Select Group** field, select one of the following:

Option	Selects...
All*	All products in inventory.
Changed*	Only those products that have sold since the last time you ran the Update Forecast Demand program. The system also tests products that, in a given period of time, have decreased in sales activity as compared to the average period between past sales. The system does this to include products in the "changed" group that might be experiencing a decrease in demand.
Buy Line	Only those products within a buy line. This option activates the **Line** or **Product** field, where you define the buy line. Use this option when you know that significant changes have been made to the products in a given buy line.
Product	Only a specified product. This option activates the **Line** or **Product** field, where you define the product. For example, if you correct an error on a transaction that affects a product's sales history, use this option to recalculate the product's demand.

*** If you select Changed or All, the Line / Product field does not display.**

3. In the **Branch** field, enter a branch to define the branches for which to run the update. To run the report for all branches, enter **All**.
4. In the **Line / Product** field, enter the specific buy line or product for which you want to run the forecasting.

   Note: The field name changes based on your selection in the **Select Group** field.
5. In the **As of Date** field, enter the actual or system variable date on which the forecast is based.

   Note: When using the Phantom Scheduler to run a program at regular intervals, enter a variable date in this field; otherwise, each time the program runs, it will use the same as of date you enter now.
6. Select the forecast method or methods you want to use for advanced update demand:

   Note: Current forecasting methods *cannot* be deselected.

   - **Single Exponential Smoothing** - Standard smoothing factors for forecasting.
   - **Holt** - The standard smoothing and includes trending calculations.
   - **Holt-Winters** - The standard smoothing and trending calculations, and adds seasonality calculations. Holt-Winters calculations are not made with less than three years demand history.

   Note: For more information about these methods and their calculations, see *About Advanced Forecasting Methods* in this documentation.
6. Set the **Auto Set Best Fit** field to **Yes** to automatically use the best fit method for advanced demand forecasting. The report indicates this setting in the header of the report.
7. Do one of the following:
   - From the **File** menu, select **Begin** to run the program immediately. You can also use the **Run** button to run the calculations immediately.
   - From the **Options** menu, select **Schedule** to display the Phantom Scheduler, where you can schedule the program to run at a defined date and time.

Analyzing Advanced Demand Forecast Methods

After running the Advanced Demand Forecast Program, you can retrieve visual results using the Advanced Demand Forecast Analysis. The analysis provides the results for each selected for product or line and the selected methods.

You can use this information to study the difference between the demand calculated by the current method compared to the demand that would be used with other forecast methods and if the advanced demand forecast is a more viable or reliable solution. you can use the table display that Eclipse provides, or graph the forecast or sales options, to review the information more closely.

You can run the forecast programs and display this information based on the last forecast that was run. After running your demand program, the system alerts you that the program is complete. You can then review the latest information through the Advanced Demand Forecast Analysis window.

Note: Eclipse uses the closest Saturday before the day when the report runs. The system considers the As of Date (that Saturday) to be the Date Last Calculated from the audit window. Therefore the **Date Analyzed** field matches the date the report runs.

Important: If the seasonality test of a product fails without returning an ACF score or if a product has less hits than the minimum hits to test seasonality as defined in the **Advanced Demand Forecast Parameters** control maintenance record, then the system calculates a standard demand forecast. Meaning, no advanced demand forecast calculations are made on the product. You can check this information by using the audit screen in Primary Inventory Maintenance.

To analyze your demand forecast methods:

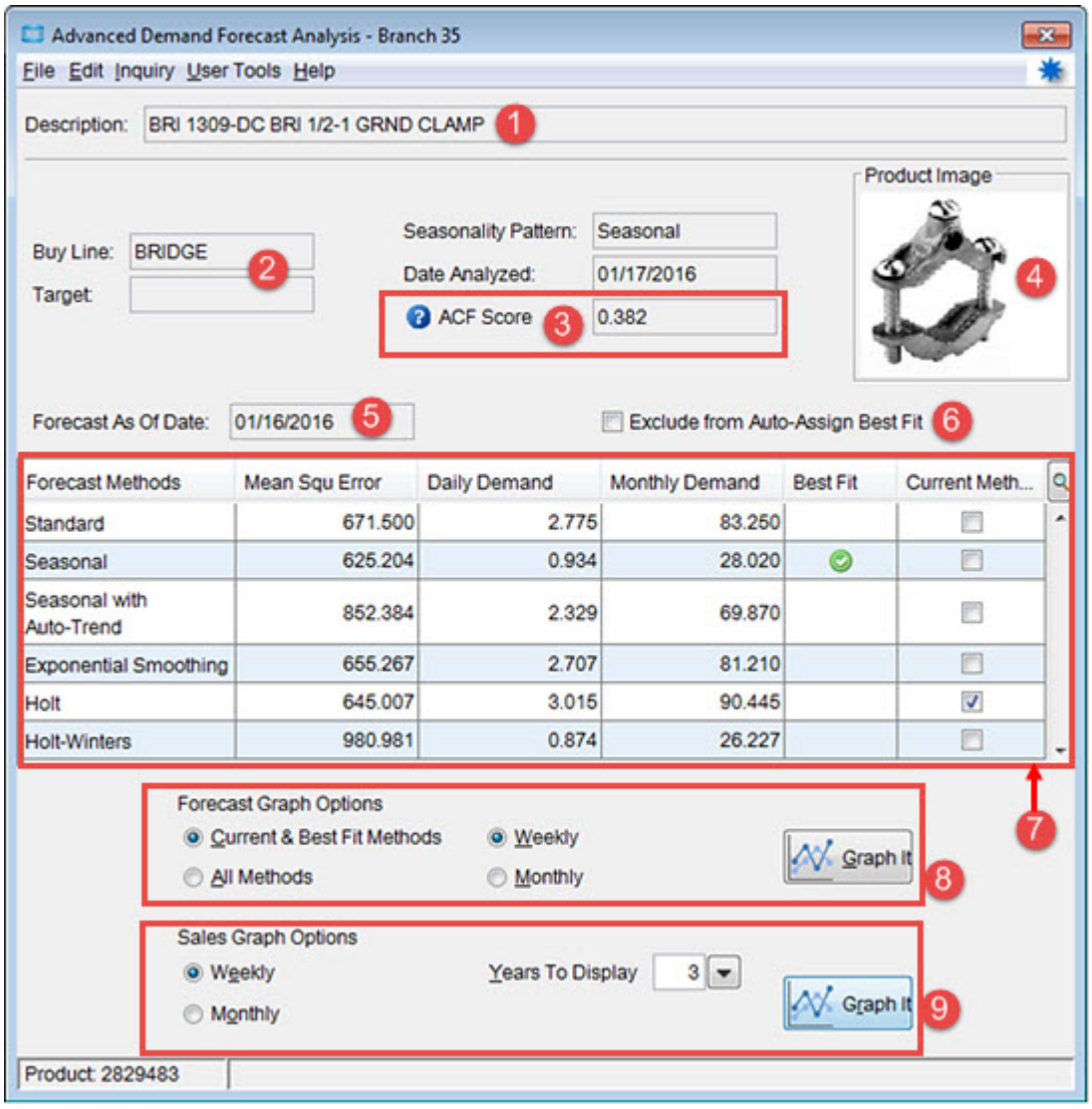
1. From the **Maintenance** menu, select **Product** to display Product Maintenance.
2. In the **Product** field, enter the product or line you want to review.
3. From the **Inventory** menu, select **Primary Inventory Maintenance**.
4. From the **Edit** menu, select **Advanced Demand Forecast Analysis**.
5. Use the **Inquiry** menu to do one of the following:
   - Display weekly and monthly calculated values for the selected product in the selected branch.
   - Display the Product Sales History.

   These options display in new windows.

About the Analysis Window

The Analysis window is broken into sections so you can see at-a-glance what your current forecast method looks like compared to what is determined a best fit, or other forecasting methods.

Important: Using the Exclude Negative Quantities From Item Demand Calculations control maintenance record will eliminate any negative quantities, but does not eliminate the system actually calculating a negative demand. This means if you use Holt or Holt-Winters and your sales have actually gone down over the specified period, the system will show a negative demand.



Following are the sections and options available in the Advanced Demand Forecast Analysis window:

Number / Section	Description
1	Description of the product for which you have run the Advance Demand Forecast.

Number / Section	Description
2	If running for a product, the Buy Line the product is contained in, indication if you have the product marked as seasonal, the current Vendor Target, and the date the product was analyzed.
3	ACF Scores. Auto-correlation Function. Displays visually how the seasonal and non-seasonal scores were determined. For more information, see About ACF Scores below.
4	Product image, if available, as entered in the product maintenance file.
5	The Saturday date for the last full week of sales.
6	Option to exclude the product when the update forecast method selected calculates demand based on when Eclipse forces the Advanced Demand Forecast best-fit analysis.
7	For each forecast method, both current and advanced, the system displays the following values: • **Mean Squared Error (Annual)** - The metric that compares actual sales to past forecasted demand. For more information, see How Eclipse Calculates Best Fit in this documentation. • **Daily Demand** - The current daily demand the system determined when running demand forecasting.. • **Monthly Demand** - The current monthly demand the system determined when running the demand forecast. • **Best Fit -** The system selects the forecast method that best fits the product sales using the Mean Squared Error. The lowest mean squared error considering the most recent year, makes it the best fit. For more information, see How Eclipse Calculates Best Fit in this documentation. • **Current Method** - Indicates the current forecast method you are using for the selected product.
	If a row displays as blank, that forecast method was not selected to calculate demand in the Advanced Demand Forecast setup parameters.
8	Graphing options for the selected forecast methods. Select from the following: • **Current & Best Fit Methods** - Graphs only your current forecast method and the best fit analysis. • **All Methods** - Graphs all values as displays regardless of selected methods. • **Weekly / Monthly** - Indicate which values you want to display the last week or the last month's forecasting. • **Graph It** - Click to display the graph.
9	Graphing options for the selected sales. Select from the following: • **Weekly / Monthly** - Indicate which values you want to display the last week or the last month's sales. • **Years to Display** - Indicate the number of previous years for which you want to display information. • **Graph It** - Click to display the graph.

About ACF Scores

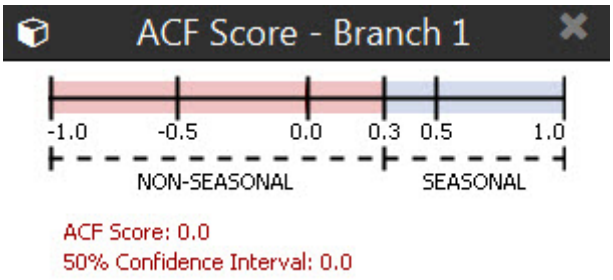
The auto-correlation function (ACF) displays visually how the seasonal and non-seasonal scores were determined. Calculating your seasonal items is vital to maintaining your warehouse stock. While forecasting is never perfect, the ACF scores helps you see how Eclipse has calculated your seasonal products to you can better plan and prepare.

The ACF chart represents time spans depending on how you have the **Advanced Demand Forecast Parameters** control maintenance record parameters set.

The graph provides a visual to see where in the seasonality spectrum your products are falling. You can then address the Advanced Demand Forecast Parameters, if you feel that the results are not accurate.

To view the ACF score:

1. From the **Maintenance** menu, select **Product** to display Product Maintenance.
2. In the **Product** field, enter the product or line you want to review.
3. From the **Inventory** menu, select **Primary Inventory Maintenance**.
4. From the **Edit** menu, select **Advanced Demand Forecast Analysis**.
5. Next to the **ACF Score** field, click the question mark icon to display the graph.



How Eclipse Calculates Best Fit

Eclipse calculates demand forecasting on a regular basis. With the advanced forecast methods, you may not know which of the advanced methods historically is closest to the actual sales. The traditional Eclipse forecasting is a flat demand-per-day calculation. The Advanced Demand Forecasting Analysis window displays these best fit selections.

To know whether or not you are using the best forecast method for your products, Eclipse runs on stock products you select, such as specific buy line, and allows you to compare your previous demand forecast to what the system calculates as the best fit. The system runs as if the product is set to standard method for each method individually and without relying on information from the other calculations.

Eclipse uses a Mean Squared Error (MSE) calculation to determine the best fit demand forecast for your product(s).

$$\textbf{(Sales - Forecast)}^2$$

This MSE compares the past 52 weeks of demand forecast to actual sales. If the system does not find 52 weeks worth of data, the system uses as many weeks as are available. For each available week, the lowest calculated MSE is the best fit.

Automatically Assigning Best Fit Calculations

Use the **Auto Set Best Fit** option on the Advanced Demand Forecasting window to automatically use the best fit calculation for the selected products. This means if Eclipse finds that a different forecast method is a better fit for a specific product or product line, then the system overrides that forecast method over the one that has been selected. These settings are at the branch level. Review your product settings carefully before using this option.

Run the demand for each week back for 52 weeks for each demand forecast method to get a full year's worth of information for comparing the values. The system then performs the same check for the three advanced methods. The system can then display which of the six methods is a best fit for your demand forecasting.

> **Note:** Eclipse considers a standard week for calculations is Sunday to Saturday.

How the System Filters Demand for Forecasting

Demand is a filtered forecast of products being sold to the customers. The calculation of demand answers this question: "How much of the product is being *demanded* by customers?" eliminate exceptional sales.

> **Note:** If the **Enable Exclusion Of Matrix Cells From Demand Calculations** control maintenance record is set, the system excludes products priced using sell matrix cells flagged for exclusion in the demand calculation.

To produce a clean data sample for the demand forecast calculation, the system does the following in the order listed:

- Examines all sales occurrences within a data sample to use for a forecast period, based on the **Demand Hit Definition** control maintenance record, and determines the largest sale of an item.
- Examines the remaining sales occurrences in the data sample and determines whether the largest sale exceeds the **Excpt %** (Exceptional Sales Percent) value. If so, the system does not use the largest sale in the data sample.
- Examines all sales occurrences for the item and eliminates those sales exceeding the Back Order Tolerance Quantity (BTQ) value.

  For example, use a BTQ for promotional sales when you require customers to purchase the item in large quantities. The BTQ prevents these large purchase quantities from being considered in the demand forecast calculation.
- Compensates for lost sales and applies any identified trend.
- Uses the remaining sales occurrences with the chosen Forecast Method as the data sample to calculate item demand.

Customer Demand

Demand is a filtered forecast of products being sold to the customers. The calculation of demand answers this question: "How much of the product is being *demanded* by customers?"

The system uses demand calculation to set order points, line points, and transfer points. In addition, demand determines surplus for the Suggested Purchase Order Queue and the Suggested Auto Transfer program.

For more information on order and line points, see the following topics:

- Order Points and Line Points Overview
- How the System Calculates Order Points
- How the System Calculates Line Points

Demand is calculated when the Update Demand program runs. You can audit the Update Demand program by accessing an individual product in the Product Maintenance window.

This topic provides information about the following:

- Demand History Period
- Using the Add Demand Window
- Using Demand Override

Demand History Period

To determine the amount of sales history to use to calculate demand, the Update Demand program first determines the number of hits for each product in each branch.

Then, the following rules apply to establish the amount of sales history appropriate to a product's rate of sale.

If a product has...	then...
25 or more hits in the past 91 days	the system uses the sales of the last 91 days to determine usage.
less than 25 hits in 91 days but more than 25 hits in the past year	the system totals the sales back to the occurrence on the day of the 25th hit. If more than one hit occurred on the day of the 25th hit, all sales on that day are included.
less than 25 hits in the past year	the sales for the past year are totaled together.

Items that sell frequently are more predictable over short periods of time. By setting the **Seasonal** field to using Mass Load, you can identify items that have a seasonal sales character. The same rules apply to seasonal items, except that the system starts from a date beginning one year *previous* and moving forward to the present date.

Using the Add Demand Window

Use the Add Demand window to add the demand history of one or more discontinued products to its replacement product or add a product's demand history in one branch to another branch. For example, you

receive notice from your vendor that the furnace Model 721A is being replaced with Model 721B. You do not want to lose the sale history for the furnace. Transfer the demand history from the discontinued model to the new model.

Note: The Days Out calculation remains the same even if the customer is a Subtract Demand Customer as set up in the Add Demand program.

To display the Add Demand window:

1. From the **File** menu, select **Product**.
2. Enter the number of the product for which you want to view the Add Demand window.
3. From the **Inventory** menu, select **Inventory Maintenance** to display the Product Maintenance window.
4. From the **Edit** menu, select **User Controls** to display the Primary Inventory Maintenance window.
5. From the **Additional Controls** menu, select **Add Demand** to display the Add Demand window.
   - Use the **Branch Fields Required To Add Product Demand** control maintenance record to limit the branch fields you want the Add Demand program to use.
   - Use the **Do Not List Item More Than Once On Add Demand Screen** to indicate if you want to list products more than once on the Add Demand window.
6. Update the demand information as needed and exit the window to save your changes.
7. Exit the Product User Control Parameters window.
8. Exit the Primary Inventory Maintenance window.
9. Save your changes and exit the window.

   For more information, see Adding Demand History to Products and Adding the Demand from a Dependent Selling Branch to a Purchasing Branch.

Using Branch Demand Override

The **Assign Demand Forecast To Price/Ship Branch Or By Zip Code** control maintenance record defines where the demand should flow. For example, if you have an order that is a pricing branch 1 and a shipping branch 2, you need to decided if the replenishment of that product goes to branch 1 or 2.

You can override this setting at the customer level. Use Miscellaneous Customer Information to change the **Branch Demand Override** field to the selected branch. If this field is not set, the system uses the setting at the control maintenance level.

To change the Branch Demand Override:

1. From the **Maintenance** menu, select **Customer** to display the Customer Maintenance window.
2. In the **Customer/New** field, enter the customer name for which you want to override the branch demand and press **Enter** to display the customer record .
3. From the **Additional** menu, select **Additional Customer Information**.
4. In the **Branch Demand Override/UET Parameters** area, enter the branch number you want to use in the **Branch Demand Override** field.

5. Save your changes and exit the window.
6. Exit the Customer Maintenance window.

Managing How the System Applies Demand

One of the biggest assets to how the purchasing process works is the way the system calculates demand based on products purchased and sold. The demand is a filtered forecast of products being sold to the customers. The calculation of demand answers this question: "How much of the product is being *demanded* by customers?" The system uses this calculation to help you project what to buy and how to replenish your warehouses.

For information about additional forecasting methods, see How Standard and Median Forecasting Works and Advanced Demand Forecasting Methods.

However, you must decide who gets the credit for the demand that the system calculates. Should the demand be credited to the branch who prices the product, ships the product, or the region from which the product sells?

Use the **Assign Demand Forecast To Price/Ship Branch Or By Zip Code** control maintenance record to indicate how you want to apply the demand credit.

If you use the pricing branch or the shipping branch, the system applies the demand calculated to the branch indicated. If you select Zip Code, then the system uses Branch Zip Code Maintenance to determine how to apply the calculated demand. You can group zip codes into regions and apply the demand results to areas rather than narrowing it down to a particular branch. For example, you can group all your branches in Florida in one group and apply the demand to them all by associating them with a single branch.

To set up the zip code branch maintenance table:

1. From the **Maintenance** > **Zip Code** menu, select **Branch Zip Code Maintenance** to display the Branch Zip Code Maintenance window.

   Note: If prompted, log on to the character-based system.

2. In the **Starting Zip Code** column, enter the zip code with which you want to start the range, such as 32000.
3. In the **Ending Zip Code** column, enter the zip code with which you want to end the range, such as 32999.
4. In the **Br** column, assign a branch to which you want to associate the zip codes indicated, such as 2.
5. Press **Esc** to apply the codes you have indicated.

Adding Demand History to Products

Use the Product User Control Parameters to add demand from one product to another. You can copy existing demand history from one or more products to a new product with the Add Demand window. Demand history can be in units, weight, or load factor depending on the item and need. This choice enables you to create demand history for new product when:

- A new product replaces a discontinued product. You can assume that the demand for the new item is similar to that of the old item. For example, you Product A Model 100 is being replaced by Product A Model 200. Use the demand for the old product to predict the demand of the new product.

  Note: Change the discontinued item's product status to something other than **Stock**. Otherwise, the system continues suggesting that you purchase both items.

- A new product is sold that combines several items. The demand of the multiple products is totaled and added to the new product. For example, you sell individual tools. You now provide three tools in a one set. Use the demand for the individual tools to calculate the history for the set.
- You must know how much material one product uses from its component parts. Copy the demand history based on the relationship between the components over to the finished product. For example, you must know how much sheet metal to order to manufacture duct work. By combining the monthly demand in weight of your duct-work components, you can estimate how much sheet metal you need each month.

Use the Add Demand dialog box to:

- Add the demand history of one or more discontinued products to their replacement.
- Add a product's demand history in one branch to another branch.
- Add or subtract a customer's demand history from one product to another.

To add demand history to a product:

1. From the **Maintenance** menu, select **Product** to display the Product Maintenance window.
2. Display a product record.
3. From the **Inventory** menu, select **Primary Inventory Maintenance** to display the Primary Inventory Maintenance dialog box
4. From the **Edit** menu, select **User Controls** to display the Product User Control Parameters dialog box.
5. From the **File** menu, select **Hierarchy** to display the Product User Control Parameters dialog box.
6. In the **Enter hierarchy branch** field, enter the branch or territory ID.
7. Click **OK** to display user control parameters for the selected branch in the Product User Control Parameters dialog box.
8. From the **Additional Controls** menu, select **Add Demand** to display the Add Demand dialog box.

   Note: Use the **Branch Fields Required To Add Product Demand** control maintenance record to limit the branch fields you want the Add Demand program to use.

9. In the **Include the following products' demand with the product above based on** field, enter one of the following measurement types:
   - **Units** - Includes demand based on the number of items.
   - **Weight** - Includes demand based on the weight, in pounds, of the item.
   - **Load** - Includes demand based on the load factor for the item.
10. Complete the following fields for each product from which to add demand:

Field	Description
Products	The product from which to copy demand history to the new product Use the **Do Not List Item More Than Once On Add Demand Screen** to indicate if you want to list products more than once on the Add Demand window.
Expire Date	The date after which to stop adding the demand of the product to the demand of the new product.
To Branch	The branch that will use the demand history.
From Branch	The branch from which to obtain the demand history.
Add PIL	Select if you want the projected inventory level (PIL) of the old product to flow through to the replacement product. When you add the demand of another product to a new or replacement product that has no inventory, the system purchases the replacement product before you have sold off what is left of the old product. Using the **Add PIL** option stops the replacement product from being suggested to purchase. As the PIL of the old product is reduced then the replacement product comes up to purchase once it is below the order point. **Note:** The PIL of the replacement product displays in bold after selecting this option.

11. Add or change a customer's demand for a product, as needed.
12. Save the information and exit the dialog box.

Filtering Demand for Exceptional Sales

Use the exceptional sales percent inventory parameter in Product Maintenance to identify an exceptional sale. The system eliminates from demand forecasting any sale exceeding the percentage amount between the largest sale and the next largest sale in the forecast period.

For example, an exceptional sales percent of 50 would flag any sale with a quantity that is 50% more than the quantity of the second largest sale. If the largest sale was 13 and the second largest sales was 8, any quantity greater than 12 becomes an exceptional sale. Therefore, 13 would be considered exceptional and not be included in the demand calculation.

> **Note:** The following procedure is a manual process for a single product. Use the Mass Load program to enter inventory parameters to groups of products.

To set inventory parameters for identifying exceptional sales:

1. From the **Maintenance** menu, select **Product** to display the Product Maintenance window.
2. Display a product record.
3. From the **Inventory** menu, select **Primary Inventory Maintenance** to display the Primary Inventory Maintenance dialog box.
4. From the **Edit** menu, select **Forecast Parameters** to display the Product Forecast Parameters dialog box.
5. From the **File** menu, select **Hierarchy** to display the Product Forecast Parameters dialog box.
6. In the **Enter hierarchy branch** field, enter the branch or territory ID.
7. Click **OK** to display forecast parameters for the selected branch in the Product Forecast Parameters dialog box.
8. In the **Exceptional Sales %** column, enter a percentage for the branch or a territory.

For items that sell...	To eliminate exceptional sales, use a...
Frequently	Higher percentage
Infrequently	Lower percentage

9. Enter other forecast parameters, if needed.
10. Save the information and exit the dialog box.

    Changes take effect when you exit Product Maintenance.

Setting the Backorder Tolerance Quantity

Use the backorder tolerance quantity (BTQ) to exclude orders with unusually large quantities of the product -- even larger than exceptional sales -- from the demand calculation. This value is the maximum order quantity for the product on one order. Any order with a quantity greater than this amount is excluded from the demand calculation.

When filtering orders for the demand calculation, the system first eliminates from the demand calculation those orders with products above the BTQ, before determining whether an order qualifies as an exceptional sale. Unlike the exceptional sales inventory parameter, which changes depending on the second largest sale made in the forecast period, the BTQ is a fixed amount.

For example, Product A normally sells 1 or 2 each per month. The exceptional sales inventory parameter is set to 200% and the backorder tolerance quantity is set to 6. A contractor orders a quantity of 24 of Product A for a large job, and schedules shipments in groups of 8 every month for the next 3 months. Whether you define hits by the order (one order of 24) or the generation (3 generations of 8), the system does not consider this order when calculating demand. Furthermore, consider that to be an exceptional sale, the highest order quantity must be 200% of the second highest order quantity, AFTER eliminating orders greater than the BTQ. Therefore, any sale of Product A in a quantity over (6 / 200% = 3) 3 is considered exceptional.

> **Note:** The following procedure is a manual process for a single product. Use the Mass Load program to enter inventory parameters to groups of products.

To set the backorder tolerance quantity for identifying exceptional quantities:

1. From the **Maintenance** menu, select **Product** to display the Product Maintenance window.
2. Display a product record.
3. From the **Inventory** menu, select **Primary Inventory Maintenance** to display the Primary Inventory Maintenance dialog box.
4. From the **Edit** menu, select **Forecast Parameters** to display the Product Forecast Parameters dialog box.
5. From the **File** menu, select **Hierarchy** to display the Product Forecast Parameters dialog box.
6. In the **Enter hierarchy branch** field, enter the branch or territory ID.
7. Click **OK** to display forecast parameters for the selected branch in the Product Forecast Parameters dialog box.
8. In the **BTQ** column for each branch, type in the maximum order quantity considered normal for this product.
9. Enter other forecast parameters, if needed.

Marking Processed Orders as Exceptional

Mark orders that have shipped or invoiced as exceptional so that the system does not include them in the demand calculation. Not marking orders as exceptional can distort your demand calculations. Use the Inventory History Ledger window to flag order generations as exceptional sales that might have been missed during order creation.

> **Note:** You must have the OE.PRODUCT.TYPE.EDIT authorization key assigned to change stock transactions to exceptional in the Inventory History Ledger window.

Direct shipments do not affect the demand forecast calculation. You cannot flag direct shipment order generation as being an exceptional sale generation because the inventory does not come into your warehouse.

To mark an entire order as exceptional from the order, see Entering Additional Sales Order Header Information in the Sales Management online documentation.

To indicate a processed order as being exceptional:

1. From the **Orders > Inquiries** menu, select **Inventory History Ledger** to display the Inventory History Ledger window.
2. In the **Product** field, enter the product for which to view transaction history.
3. For each exceptional sale, in the **Type** column, select the transaction to flag as exceptional and enter **Except**.
4. Exit the window to save the changes.

Marking Sales Orders as Exceptional

On new or existing sales orders, you can flag either entire order generations or individual line items as being exceptional sales.

Direct shipments do not affect the demand forecast calculation. You cannot flag a direct shipment order generation as being an exceptional sale generation because the inventory does not come into your warehouse.

To indicate that an entire order generation is an exceptional sale:

1. From the **Orders** menu, select **Sales Order Entry** to display the Initial Order Entry dialog box.
2. Display the sales order for which to mark generations or line items as exceptional.
3. Click the **Header** tab to display the header view.
4. From the **Edit** menu, select **Additional Information** to display the Additional Header Information dialog box.
5. Select the **Exceptional Sale** check box.
6. Save the information and exit the dialog box.

   The system now considers all items related to this order generation to be exceptional sales. When the order is processed, the stock location code for the exceptional sale items change from **S** (Stock) to **E** (Exceptional).

To indicate that an individual line item is an exceptional sale:

1. From the **Orders** menu, select **Sales Order Entry** to display the Initial Order Entry dialog box.
2. Display the sales order for which to mark generations or line items as exceptional.
3. Click the **Detail Scheduling** tab to display the scheduling view.

   You cannot flag tagged quantities as exceptional sales.
4. From the **Options > Line Options** menu, select Schedule to display the Line Item Scheduling dialog box.
5. In the **Qty Type** column for a ship date that corresponds with a ship quantity, enter **E** (Exceptional).

   The system now considers this line item to be an exceptional sale.
6. Save the information and exit the dialog box.

Marking Purchase Orders as Exceptional

On new or existing purchase orders, you can flag either entire order generations or individual line items as being exceptional. The system omits the exceptional purchase order from the lead factor median calculation. This omission is useful when procuring stock from a source with a shorter lead time that might distort the calculated lead time of your regular vendor.

Direct shipments do not affect the demand forecast calculation. You cannot flag direct shipment order generation as being an exceptional generation because the inventory does not come into your warehouse. For more complete information, see Including Direct Shipments in the Demand Calculation.

To indicate that an entire order generation is an exceptional sale:

1. From the **Purchase** menu, select **Purchase Order Entry** to display the Initial Order Entry window.
2. Display the purchase order for which to mark generations or line items as exceptional.
3. Click the **Header** tab to display the Purchase Order Entry Header dialog box.
4. From the **Additional** menu, select **Additional Header Info** to display the POE Additional Data dialog box.
5. In the **Exceptional Order** field, enter **Yes**.
6. Click **OK** to exit the dialog box.

   The system now considers all items related to this order generation to be exceptional purchases. When the order is processed, the stock location code for the exceptional sale items change from **S** (Stock) to **E** (Exceptional).

To indicate that an individual line item is an exceptional sale:

1. From the **Purchase** menu, select **Purchase Order Entry** to display the Initial Order Entry window.
2. Display the purchase order for which to mark generations or line items as exceptional.
3. Click the **Detail Scheduling** tab to display the Purchase Order Entry Scheduling view.

   You cannot flag tagged quantities as being exceptional purchases.
4. From the **Options > Line Options** menu, select **Schedule** to display the Line Item Scheduling dialog box.
5. In the **Type** column for a received date that corresponds with a order quantity, enter **E** (exceptional).

   The system now considers this line item to be an exceptional purchase.
6. Save the information and exit the dialog box.

Lost Sales Overview

A lost sale occurs when a customer wants to purchase an item, but there is insufficient stock to fulfill the request and the customer does not want to place a backorder or calls to cancel an order that has been placed. The system can calculate out-of-stock periods, estimate the lost sales during these periods, and increase demand to prevent future lost sales.

For example, an item is out of stock for one month out of the last six months. During the last six months, the product sold an average of 100 units per month when the item was in stock. The system estimates that 100 more could have been sold in the month that the item was out of stock.

The system also provides a lost sales parameter which helps prevent accumulating surplus inventory. For example, a run on inventory causes 30 days supply of an item to sell out in one day. You do not want the system to estimate that 30 days supply could be sold in the 29 days the item was out of stock.

Therefore, the system selects the lesser of two values when calculating lost sales and increasing an item's demand:

- The number of days the item was out of stock during the forecast period.
- The lost sale parameter multiplied by the number of days in the forecast period. That is, use a percentage of the forecast period as the maximum number of days to count as lost sales days.

For example, in the last 180 days, an item was out of stock for 30 days. The lost sales parameter is 50%. 50% of 180 days is 90. Because 30 is less than 90, the system uses the 30 out-of-stock days to calculate lost sales.

On the other hand, suppose there was a run on inventory: in the last 180 days, the item was out of stock for 150 days. A lost sales parameter of 50% limits the system to using 90 days of the forecast period to calculate lost sales.

When setting the lost sales parameter, consider whether the item sells often and you do not want to be out of stock. For fast-moving items, the system uses shorter forecast periods, so use a higher lost sales parameter. The system is more likely to select the actual out of stock days and increase demand.

On the other hand, for slow-moving items, the system uses longer forecast periods, so use a lower lost sales parameter. If it is acceptable for the item to be out of stock, the system is more likely to select a percentage of the forecast period and decrease demand.

Preventative measures to *eliminate* lost sales through inventory parameters differ from *tracking* lost sales through the unquality event tracking (UET) system. Eliminating lost sales affects the forecast demand calculation, automated purchasing, and transfers. Tracking lost sales is a sales analysis tool.

Increasing Demand to Compensate for Lost Sales

Enable the lost sales calculation by using the **Lost Sale** field on the Forecast Parameters window. We recommend setting the parameter according to item demand, using one of the following:

- A higher percentage (80) to increase item demand and compensate for lost sales during out-of-stock periods. This increase guards against future lost sales on fast-moving items.
- A lower percentage (20) to limit the increase in item demand of slow-moving items during out-of-stock periods. This limitation prevents over-purchasing and stock surplus.
- Zero (0) where you cannot guarantee inventory accuracy for the product or you have less than six months of product history.

Note: The following procedure is a manual process for a single product. Use the Mass Load program to enter inventory parameters to groups of products.

To assign a lost sales percentage to a product:

1. From the **Maintenance** menu, select **Product** to display the Product Maintenance window.
2. Display a product record.
3. From the **Inventory** menu, select **Primary Inventory Maintenance** to display the Primary Inventory Maintenance dialog box.
4. From the **Edit** menu, select **Forecast Parameters** to display the Product Forecast Parameters dialog box.
5. From the **File** menu, select **Hierarchy** to display the Product Forecast Parameters dialog box.
6. In the **Enter hierarchy branch** field, enter the branch or territory ID.
7. Click **OK** to display forecast parameters for the selected branch in the Product Forecast Parameters dialog box.
8. In the **Lost Sales** column, enter a lost sale percentage for the branch or territories.
9. Enter other forecast parameters, as needed.
10. Save the information and exit the dialog box.

    Changes take effect when you exit Product Maintenance.

How the System Determines Lost Sales for Fast-Moving Items

Fast-moving items with high demand have shorter forecast periods. For items that sell every day, you want to include the demand of any day that the item was out of stock to prevent future lost sales. The percent that you set determines the number of days by which the system recommends to increase demand.

To ensure that you are counting the days the item is out of stock, set the **Lost Sale** parameter to a higher percentage.

The system eliminates exceptional sales from the demand calculation before including lost sales in the demand forecast.

Example

The system uses the lesser of one of the following values to increase the item's raw demand:

- The number of days that the item was out of stock during the forecast period.
- The **Lost Sale** percentage multiplied by the number of days in the forecast period.

Compare the effect of two different Lost Sale percentages for fast-moving items:

Days out of stock	Forecast period	Lost Sale percentage	Forecast period Lost Sale %	Increase item demand by...
25 days	90 days	80	72 days	25 days
25 days	90 days	20	18 days	18 days

By setting the Lost Sale percentage to a higher value for fast-moving items, the system increases demand by the days the item was out of stock, thereby avoiding future lost sales.

How the System Determines Lost Sales for Slow-Moving Items

Slow-moving items with low demand have longer forecast periods. For items that sell only a few times a year, you want to keep only the average sale quantity in stock and replenish them when needed. You replenish these items when you are ready to purchase them as part of a line buy. The percent that you set determines the number of days by which the system recommends to increase demand.

If you count all the days that a slow-moving item is out of stock as lost sale days and increase the item's raw demand, the item demand increases beyond its average sale quantity. This increase results in an unnecessary stock surplus. To prevent this, set the **Lost Sale** parameter to a lower percentage.

The system eliminates exceptional sales from the demand calculation before including lost sales in the demand forecast.

Example

The system uses the lesser of one of the following values to increase the item's raw demand:

- The number of days that the item was out of stock during the forecast period.
- The **Lost Sale** percentage multiplied by the number of days in the forecast period.

Compare the effect of two different Lost Sale percentages for slow-moving items:

Days out of stock	Forecast period	Lost Sale percentage	Forecast period Lost Sale %	Increase item demand by...
100 days	365 days	80	292 days	100 days
100 days	365 days	20	73 days	100 days

By setting the Lost Sale percentage to a lower value for slow-moving items, the system increases demand by a percentage of the forecast period, thereby avoiding a stock surplus.

Enabling Automatic Trend Calculations

For seasonal products, use an automatic trend calculation to moderate the demand forecast. The system calculates and applies a trend based on recent demand compared to the previous year's demand. Trend is represented as a percentage increase or decrease to the calculated demand.

Define the automatic trend parameters in the Product Auto Trend Percentage Maintenance dialog box.

In addition to setting automatic trend parameters at the product level, you can also set these parameters at the branch or buy line level. Parameters set at the product level override those set at the buy line and branch level.

> **Note:** The following procedure is a manual process for a single product. Use the Mass Load program to enter inventory parameters to groups of products.

To enter forecast period parameters for a product:

1. Enter forecast parameters.
2. In the Product Forecast Parameters dialog box, from the **File** menu, select **Demand Parameters** to display the Product Demand Parameters dialog box.
3. From the **File** menu, select **Insert Branch** to display the Product Demand Parameters dialog box.
4. In the **Enter new branch or territory** field, enter the branch or territory ID.
5. Click **OK** to return the ID to the **Branch** field in the Product Demand Parameters dialog box.
6. In the **Auto Trend** column, enter **Yes** next to the branch or territory for which to calculate trend for seasonal products.
7. From the **Edit** menu, select **Auto Trend** to display the Product Auto Trend Maintenance dialog box.
8. From the **File** menu, select **Insert Branch** to display the Product Auto Trend Maintenance dialog box.
9. In the **Enter new branch or territory** field, enter the branch or territory ID.
10. Click **OK** to return the ID to the **Branch/Terr** field in the Product Auto Trend Maintenance dialog box.
11. Complete the following fields:

Field	Description
Max Decrease %	The maximum negative trend to apply to the demand forecast for the product. This parameter only applies to seasonal products with the Auto Trend flag enabled.
Max Increase %	The maximum positive trend to apply to the demand forecast for the product. This parameter only applies to seasonal products with the Auto Trend flag enabled.

12. Save the information and exit the window.

    Changes take effect when you exit Product Maintenance.

Seasonal and Non-Seasonal Products

Demand patterns for products that sell an average of ten times a month are different than those for products that sell an average of ten times a year. Items that are seasonal have a greater demand at certain times of the year than others.

Non-Seasonal Products

The system calculates the demand history based on hits. The system defaults to the following conditions:

- If a product has 25 or more hits in 91 days or less, then the system uses the last 91 days of sales history to determine demand.
- If a products has less than 25 hits in 91 days, but more than 25 hits in the last 365 days, then the system uses the number of days back to the 25th hit to determine demand. For example, if the 25th hit occurred 180 days ago, the demand history uses the last 180 days.

  Note: If more than one hit occurred on the date of the 25th hit, all hits on that date are included.

- If a product has less than 25 hits in the last year, then the system uses 365 days for the demand history.

The more frequently sold items are statistically more predictable and demand calculations should, when possible, use shorter periods of time to reflect recent sales trends.

Seasonal Products

Seasonal products are those products that sell more often at certain times of the year. For example, heating products such as furnaces, sell more often during winter months. Seasonal forecasting lets you use the winter months only as the forecast period to determine appropriate demand.

- When forecasting the demand of a seasonal product in September 2000, the system checks from September 1999 forward to gauge the winter month demand.
- If there are 10 or more hits in a 45-day period, the system uses those 45 days of the product history for the calculation. For example, today is September 1, 2000. The system checks the history for Product A and finds 17 hits from September 1, 1999 to October 15, 1999. This 45-day period is used for the calculation.
- If there were less than 10 hits in a 45-day period, but more than 10 hits in a 122-day period, the system uses the date of the 10th hit as the end date of the period for the calculation. For example, today is September 1, 2001. The system checks the history for Product B and finds that 10 hits occurred between September 1, 2000 and November 1, 2000. This 60-day period is used in the calculation.
- If there are less than 10 hits in a 122-day period, the calculation is based on the full 122-day period. For example, today is September 1, 2000. The system checks the history for Product C and find that only 6 hits occurred between September 1, 1999 and January 1, 2001. The 6th hit occurred on December 15, 1999. The full 122-day period is used in the calculation.

How the System Calculates Trend for Seasonal Products

For seasonal products, use the automatic trend calculation to even out the demand forecast according to recent trends. The system calculates trend in a hierarchical order. When you enable automatic trend calculation, the system calculates a trend factor by comparing the recent demand to that of the prior year, and then multiplies the current demand forecast by the factor. Parameters set at the product level override those set at the buy line level. Parameters set at the buy line level override those set at the branch level.

For products with automatic trend calculation enabled, the system does the following:

1. Calculate the current demand forecast based on the as of date, and note the number of days of sales history it took to meet the minimum days or minimum hits forecast parameters.
2. Determine the recent demand for the product, starting from the as of date and going *back* the number of days noted in Step 1.
3. Determine the product demand for the same period in the prior year, starting from 365 days before the as of date and going *back* the number of days in Step 1.
4. Calculate the trend factor by dividing the demand of Step 2 by the demand of Step 3.

   If the system-calculated automatic trend percentage is higher or lower than the **Max Increase%** or **Max Decrease%**, respectively, then the system defaults to these values.

   If the demand for step 3 is **0** (zero), the **Auto Trend** factor is set to **1** (one) and the Demand Calculation Audit window displays **N/A** in the **Automatic Trend** field.

5. Produce a revised demand forecast by multiplying the current demand determined in Step 1 by the trend factor.

Note: If the product uses non-seasonal forecasting or **Auto Trend** is set to **N**, the Demand Calculation Audit window displays **N/A** in the **Automatic Trend** field.

For example, the current demand based on the As of Date is 49 days. The recent demand for the product is 192.5 each. The product demand for the same period the previous year is 166.1 each. The system calculates the trend factor as follows: (1 - (166.1 / 192.5)) = 13.71 or 13.71%. For information on auditing demand, see Auditing Demand Calculations.

How the System Uses Manual Trend for Products

Use the **Trend%** field on the Forecast Parameters Maintenance window to modify the demand forecast in anticipation of increases or decreases in demand. Apply a change to a product's calculated demand when you expect factors, such as economic conditions, to affect future demand for the product relative to past demand.

Trend is represented as a percentage increase or decrease to the calculated demand. For example, entering **20** causes the system to add 20% of the calculated demand to the product's demand. Entering **-20** causes the system to subtract 20% from the product's demand.

Seasonal Products

For seasonal products, use the automatic trend calculation feature in the Forecast Parameters dialog box rather than this field. For more information, see How the System Calculates Trend for Seasonal Products.

Non-Seasonal Products

In order to use this field for non-seasonal products, you must know your market well, monitor the product sales, and know when to remove the trend percentage.

Lead Time Overview

Lead time is the number of days it takes for you to prepare and process the purchase order, the vendor to ship the material, and your warehouse to receive the material. Every product requires a lead time for calculating:

- Order point / transfer points
- Line points / child branch surplus points
- Safety days

The Update Demand Forecast program calculates a product's lead time based on lead time parameters. In order for the system to calculate these items accurately, you must enter parameters for products or buy lines. If no parameter is set, the system uses a default setting through the control maintenance record program. You can also enter overrides for lead times at the product level and the buy line level.

Use the following control maintenance records to set parameters:

- **Default Lead Time Days If Product And Buy Line Have None**
- **Default Lead Time Factor If Product And Buy Line Have None**
- **Minimum Lead Samples**

How the System Calculates Lead Time

The Update Demand Forecast program updates each product's lead time, based on lead time parameters set at the system, buy line, or product level. Lead time is the number of days it takes for you to prepare and process the purchase order, the vendor to ship the material, and your warehouse to receive the material.

Lead time parameters include the following:

- **Lead Factor** - Defines the maximum number of processed purchase orders in the forecast period.
- **Minimum Lead Samples** - Identifies the minimum number of processed purchase orders in the forecast period.
- **Default Lead Time Days** - Defines the default lead time set at the buy line and system level.

  Note: The system only checks the transfer order cycle when determining lead time on child branches in a central warehouse.

The system uses a Lead Time Variable in many calculations, such as the safety stock:

1. If LT < 1, then LTSD = 0
2. If LT 1 to 15, then LTSD = (LT + 7) * HRSC
3. If LT 16 to 60, then LTSD = ((LT/2) + 15) * HRSC
4. If LT 61 or higher, then LTSD = ((LT/4) + 30) *HRSC

   Note: LT = Lead Time, LTDS = Lead Time Safety Days, HRSC = Hits Related Safety Coefficient

In addition to the lead time variable, the system uses the following steps when calculating the lead time:

1. Checks for an override and determines which lead time to use.
2. Determines the range of purchase orders to use for calculating the lead time.
3. Derives the median lead time from the purchase orders.

Determining Which Lead Time to Use

In order to calculate lead time, the system checks for overrides. Overrides can also be set at the system, buy line, or product level. For example, your vendor calls you to tell you they are snowed in and it will take an additional three days to get the items to you. You can use the override settings to change the lead time for those items.

The system makes several checks to determine the lead time:

- The system first checks for a lead time override at the buy line level or the product level.

If the product is...	Then...
in a buy line	If an override lead time is set in Buy Line Maintenance or Override Lead Time Maintenance, the system checks for an expiration date: • If no expiration date is set, then the days in the lead time equal the override lead time set at the buy line level. • If an expiration date is set and the date has not passed, then the days in the lead time equal the override lead time set at the buy line level. • If an expiration date is set, but that date has passed, the system checks for an override lead time at the product level. If an override lead time is not set at the buy line level, then the system checks for a lead time override at product level.
not in a buy line	check for an override lead time at the product level.

- You can set a manual override in the **Lead Days** field in Forecast Parameters Maintenance, or in the **Ovrd LT Days** column in Override Lead Time Maintenance. Setting a value in one field or column causes the same value to display in the other field or column.

Is an override set at the product level?	Then...
Yes	check for an expiration date: • If no expiration date is set, lead time days equals the override set in the **Lead Days** field, or in the **Override Lead Time Days** column. • If an expiration date is set and the date has not passed, lead time days equals the override set in the **Lead Days** field, or in the **Override Lead Time Days** column. • If an expiration date is set, but that date has passed, check the **Lead Factor** field in the Product Forecast Parameters window to determine how the system calculates the lead time.
No	check the **Lead Factor** field in the Product Forecast Parameters window to determine how the system calculates the lead time.

- The **Lead Fctr** field in Forecast Parameters Maintenance controls how the system calculates the lead time for the product.

If the Lead Factor field is set to...	Then...
null or blank	the system uses the **Lead Factor** in the Buy Line Maintenance window.
0	the system checks for a value in the **Lead Days** field: • If **Lead Days** > 0 (zero) then lead time equals the value entered in the **Lead Days** field. The system *does not* calculate a new lead time for the product until **Lead Factor** is set to a number other than 0. • If **Lead Factor** = 0 (zero) and **Lead Days** = 0 (zero) or null or a blank, then lead time equals the value of the **Default Lead Time Days If Product And Buy Line Have None** control maintenance record.

If the Lead Factor field is set to...	Then...
> 0	the system determines the lead time by checking a sample of most-recent purchase orders. For more information, see Determining the Range of Purchase Orders to Use below.

Determining the Range of Purchase Orders to Use

If there are no overrides at the product or buy line level, the system checks for a minimum and maximum number of purchase orders to sample for the lead time.

Because recent data is more accurate for estimating lead times, the system checks the lead time derived from recent purchase orders in the forecast period for the product. The system checks a range of purchase orders to derive an accurate median lead time value using the minimum samples up to the lead factor. If there are insufficient purchase orders within the forecast period, the program resorts to a default lead time. For more information, see How Standard and Median Forecasting Works and Entering Forecast Period Parameters to determine your forecast periods.

The system makes several checks to determine which range to use:

- Determine the minimum number of purchase orders in the forecast period to use in calculating a product's lead time. If the **Minimum Lead Factor** field in the Product Forecast Parameters window is set to null, then the system checks:

If...	Then...
product is in a buy line	use the value of **Minimum Sample** in Buy Line Maintenance to determine the minimum number of purchase orders to use for calculating lead time.
product is not in a buy line	use the value of the **Minimum Lead Samples** control maintenance record to determine the minimum number of purchase orders to use for calculating lead time.

  Otherwise, the system uses the value of **Minimum Lead Factor** as the minimum number of purchase orders to use for calculating lead time.

- Determine the maximum number of purchase orders in the forecast period to use in calculating a product's lead time. If the **Lead Factor** field in the Product Forecast Parameters window is not **0**, then the system checks:

If the Lead Factor is ...	And the product is in a buy line...	And the product is not in a buy line...
null or blank	if the **Lead Factor** in the Buy Line Maintenance window is null or 0, lead time is equal to the value of the **Default Lead Time Days If Product And Buy Line Have None** control maintenance record. otherwise, use the **Lead Factor** in the Buy Line Maintenance window to determine the number of purchase orders within the forecast period to use for calculating the product's lead time.	use the value of the **Minimum Lead Samples** control maintenance record to determine the number of purchase orders within the forecast period to use for calculating the product's lead time.

Otherwise, use the value of **Lead Factor** in the Product Forecast Parameters window as the maximum number of purchase orders to use for calculating lead time.

Deriving Median Lead Time from Purchase Orders

The system then calculates a final lead time based on the determined range of purchase orders. After determining the minimum and maximum samples of purchase orders to check, the system calculates the median lead time for the product.

- Compare the number of purchase orders in the forecast period with the minimum lead samples and lead factor parameters to be used for the product:

If the number of purchase orders in the forecast period is...	Then...
less than the minimum lead samples	if the product is in a buy line, the lead time is equal to the default lead time the system calculates and displays in the **Lead Factor** field in the Buy Line Maintenance window. if the product is *not* in a buy line, the lead time is equal to the value of the **Default Lead Time Days If Product And Buy Line Have None** control maintenance record.
equal to the minimum lead samples	calculate the lead time days using a number of purchase orders equal to the minimum lead samples.
more than the minimum lead samples but less than the lead factor	calculate the lead time days using the available purchase orders within the forecast period.
equal to or greater than the lead factor	calculate the lead time days using a number of purchase orders equal to the lead factor.

Note: The values selected for the lead factor and minimum lead samples can be determined at two different levels. For example, the lead factor can be determined at the product level and the minimum lead samples can be determined at the buy line or system level.

- Calculate and record the lead time of the selected purchase orders:

  Purchase Order Lead Time = Purchase Order Create Date - Purchase Order Receive Date

- Select the median lead time.

  This value is the calculated lead time entered in the **Lead Days** field in Product Forecast Parameters.

Entering Lead Time Parameters

Lead time is the number of days from the placement of a purchase order to date of its receipt. Lead time affects order points, line points, and safety stocks; therefore, accurate lead times are critical to accurate purchase planning.

You can override the lead time by changing the calculated lead days, or by changing the lead factor used to calculate the lead time.

Seasonal products use a lead time for the season.

Enter lead time parameters for a defined product on the Forecast Parameters Maintenance window.

In addition to setting lead time parameters at the product level, you can also set these parameters at the system or buy line level.

The following procedure is a manual process for a single product. Use the Mass Load program to enter inventory parameters to groups of products.

To enter lead time parameters for a product:

1. From the **Maintenance** menu, select **Product** to display the Product Maintenance window.
2. Display a product record.
3. From the **Inventory** menu, select **Primary Inventory Maintenance** to display the Primary Inventory Maintenance dialog box.
4. From the **Edit** menu, select **Forecast Parameters** to display the Product Forecast Parameters dialog box.
5. From the **File** menu, select **Hierarchy** to display the Product Forecast Parameters dialog box.
6. In the **Enter hierarchy branch** field, enter the branch or territory ID.
7. Click **OK** to display forecast parameters for the selected branch in the Product Forecast Parameters dialog box.
8. Complete the following fields:

Field	Description
Minimum Lead Factor	The minimum number of most-recent purchase orders the system samples to estimate the lead time for the product.
Lead Factor	This field controls the automatic calculation lead time for the product. Seasonal products use a calculated lead time for the ”r;season” of the product. • If greater than **0** (zero), this is the maximum number of most-recent purchase orders the system samples to estimate the lead time for the product. • If null, the system uses the lead factor set for the product's buy line. • Entering **0** (zero) overrides the lead time calculation and the system uses the value of **Lead Days** for the lead time.
Lead Days	The lead time for the product. This field updates when **Lead Factor** is greater than **0** (zero). You can override the calculated lead time by entering a user-defined lead time in this field.

9. Enter other forecast parameters, if needed.

10. Save the information and exit the dialog box.

    Changes take effect when you exit Product Maintenance.

Overriding the Lead Time for a Product

You can override the calculated lead time by entering a user-defined lead time in the **Lead Days** field. The system uses this override until the next time you run the Update Demand Forecast program.

Overriding the Lead Time Calculation for a Product

Entering **0** (zero) in the **Lead Factor** field overrides the lead time calculation. The Update Demand Forecast program uses the current value of the **Lead Days** field as the lead time. The program will *not* calculate a new lead time until **Lead Factor** is set to a number other than **0** (zero).

Note: If you do not enter a lead time in the **Lead Days** field, the program uses the current value of the **Default Lead Time Days If Product And Buy Line Have None** control maintenance record.

Overriding Product Lead Times

Normally, the system uses a median calculation to determine the lead time for products. However, there are circumstances in which the lead time must be manually adjusted. For example, a storm comes through the city where your manufacturing supplier has a factory. The building and several machines are damaged. The supplier tells you that the products' lead times will be pushed out three weeks until repairs can be made. Use the Override Lead Time Maintenance window to adjust and enter an expiration date. The override is in effect until the expiration date.

Overrides set at the product level take precedence over those set at the buy line level.

You must have the PRODUCT.MAINT.LEVEL authorization key set to edit the override lead time.

To override the product lead times:

1. Enter forecast parameters.
2. In the Product Forecast Parameters dialog box, from the **Edit** menu, select **Override Lead Time** to display the Override Lead Time Maintenance dialog box.
3. From the **File** menu, select **Insert Branch** to display the Product Demand Parameters dialog box.
4. In the **Enter new branch or territory** field, enter the branch or territory ID.
5. Click **OK** to return the ID to the **Branch** field in the Product Demand Parameters dialog box.
6. In the **Override Lead Time Days** column, enter the number of override lead time days to use.
7. In the **Expiration Date**, enter the date the lead override lead time expires.

   The system resumes calculating the lead time for the product on this date.
8. Save your information and exit the window.

Economic Order Quantity (EOQ) Overview

The Economic Order Quantity (EOQ) is the most cost-effective quantity of a product for you to purchase and hold in inventory.

The EOQ calculation considers the product's:

- Daily demand
- Cost
- Acquisition costs
- Carrying costs

The EOQ is based on approximations. It is an estimate only and one of many factors to consider when determining order quantities.

How the System Calculates the Economic Order Quantity

The formula for the Economic Order Quantity (EOQ) is:

Square root of (24* Monthly Demand of Product * Acquisition Cost) / (Carrying Cost * Cost of Product)

> ***Important:*** The system uses the REP-COST is recorded in Price Line Maintenance. If there is no REP-COST recorded, then the system uses the value listed in the Basis Line #6 on the Price Line Maintenance window.
>
> If both the REP-COST and the Basis Line #6 are blank, the system uses a zero (0) value. So, you must ensure that you have a value in one of the two fields in Price Line Maintenance.

Example

Product A has a demand per month of 5 and a unit cost of $12.00. The cost of processing a purchase order has been determined to be $1.75 and the cost of carrying the item in inventory is 30%.

$$EOQ = \sqrt{(24 \times \text{Avg Mthly Demand} \times EOQ\ \$) \div (EOQ\ \% \times \text{REP-COST})}$$

$$EOQ = \sqrt{(24 \times 5 \times 1.75) \div (0.3 \times 12)}$$

$$EOQ = \sqrt{(210 \div 3.6)}$$

$$EOQ = \sqrt{58.33}$$

$$EOQ = 7.64$$

In the above example, considering the cost of processing a purchase order and the cost of carrying the item in inventory, the most cost-effective quantity of Product A to order at one time is 8 units.

Economic Order Quantity Acquisition Cost

The Economic Order Quantity (EOQ) calculation considers the cost to acquire a product. For example:

- Clerical/labor cost of processing orders
- Cost of inspecting and returning products
- Transportation costs
- Handling costs

To estimate the acquisition cost of the item, total the costs to acquire an average product, divide by the number of items on a typical purchase order.

The actual acquisition cost varies per item. For the purpose of calculating and using an EOQ, apply the purchasing method used most often for most products within your company.

Set the EOQ acquisition cost using the **EOQ $** field in the Forecast Parameters Maintenance dialog box.

EOQ Carrying Cost Percentage

The Economic Order Quantity (EOQ) calculation considers the cost to hold a product in inventory, known as a *carrying cost*. For example:

- Rent on warehouse
- Depreciation and obsolescence of inventory
- Heating, lighting, security overhead
- Money tied up in inventory investment (lost opportunity cost)
- Obsolescence cost

The carrying cost ranges from 10% to 30% of the cost to replace an item per year.

The actual carrying cost varies per item. Products that are more subject to damage or that require special storage considerations would have higher carrying costs. Lower interest rates also lower carrying costs.

Set the EOQ carrying cost using the **EOQ %** field in the Forecast Parameters Maintenance window.

How the System Uses EOQ

The system uses the Economic Order Quantity (EOQ) in suggesting quantities to purchase or transfer. It also places restrictions on the use of the EOQ so it does not distort the reality of product demand:

- The EOQ appears on a suggested purchase orders, but the Suggested P/O program will only suggest ordering the EOQ if: the EOQ exceeds the calculated line point for the product, less the current projected inventory level.
- The system does permit an EOQ to exceed six times the monthly demand of a product.
- If the low sale quantity for an item is greater than the EOQ, the system uses the low sales quantity in place of the EOQ.

This adjustment ensures that products sold in logical quantities are not purchased in quantities less than what the customer is likely to request. For example, tires are sold in sets of four, although the EOQ might suggest three.

Hits Control Maintenance Overview

The system uses the frequency of sales, known as the number of hits, to determine:

- The forecast period to use for calculating demand.
- Whether an item is stock or nonstock in a multi-branch network.
- When a parent branch needs to replenish a child branch.

The **Demand Hit Definition** control maintenance record, set by your system administrator, defines a hit for your company. It can be defined as one ordered line item regardless of quantity, one order regardless of multiple line items for the same product, or one shipped/invoice generation.

Hits Control Maintenance Parameters

Use Hits Control Maintenance to define hits-related inventory parameters for each branch. You can define hit control maintenance parameters at three levels:

- **System** - Applies to all products unless overridden at the buy line or product level.
- **Buy Line** - Applies to all products assigned to the defined buy line and overrides the system default parameters.
- **Product** - Applies to the product and overrides the buy line and system default parameters.

In a multi-branch network, the Hits Control Maintenance window to define the central warehouse type you want to use for multi-branch stock/nonstock determination and branch replenishment.

Defining Hits

The **Demand Hit Definition** control maintenance record defines how the system calculate hits when running the update demand program. The system bases hits on the entries on a sales order. There are three choices:

- Order
- Generation
- Line item

The system also uses this parameter to recalculate hits when there are credits and returns.

Once set, the system does not further adjust the demand hit definition. Therefore, select the variable based on how your company runs its business.

The demand hit definition affects how the system calculates exceptional sales and usage for items split amongst multiple orders. More exceptional sales are possible when calculating hits on a per order basis, than when set to the generation or line item level.

Order Level

The system calculates hits on a "per sales order" basis, regardless of how or when you ship the items, or how the material is separated on the order.

For example, a customer purchases 45 lengths of 1-1/2" x 10' PVC pipe and schedules delivery on three different dates (or the system schedules three different dates due to back ordering). In this example, 15 lengths are sold on three generations of sales order S1267176 (S1267176.001, S1267176.002, and S1267176.003).

Because the Demand Hit Definition is set to "order," the system counts 1 hit of 45 items. If the customer returns 10 of the 15 items ordered on S127176.003, the system still counts 1 hit, but now of (45-10=35) 35 items.

More exceptional sales are possible when calculating hits on a per sales order basis than when using the "generation" or "line item" level.

Now, consider the effect of the Demand Hit Definition of "order" on exceptional sales. If the **Excpt%** field for the 1-1/2" x 10' PVC pipe product was 50%, and the second largest sale to date happened to be 20, then the sale of 45 would be considered exceptional.

Generation Level

The system calculates hits on a "per sales order generation" basis. Each scheduled shipment or generation produces a separate hit occurrence. Credits and returns apply to the sales order generation.

Using the previous example of Sales Order S1267176, the system would now count 3 hits of 15 items each.

Now, consider the effect of the Demand Hit Definition of "generation" on exceptional sales. With the **Excpt%** field for the product at 50%, the largest sale is 20 and the second largest sale happened to be 15. Twenty is not 50% or more than 15, so there is no exceptional sale excluded.

Line Item Level

The system calculates hits on a "per line item" basis. Each line item produces a separate hit occurrence.

For example, a customer requests a blanket order, separated by room or tool crib, and shipped on different dates. Product A appears 10 times on Sales Order S0001234.001, 3 items per occurrence. The system counts 10 hits of 3 items each. If the customer returns one room's worth of Product A, the system would count 9 hits of 3 items per occurrence.

Entering Hits Control Maintenance Parameters

Use the Hits Control Maintenance dialog box to define hits-related inventory parameters for each branch in a multi-branch network. The Update Demand Forecast and branch replenishment programs use this information in their calculations.

You can set these parameters at the product and buy line levels. Use the **Global Hits Definition** control maintenance record to set system defaults.

The following procedure is a manual process for a single product. Use the Mass Load program to enter inventory parameters to groups of products.

To enter Hits Control Maintenance parameters at the product level:

1. From the **Maintenance** menu, select **Product** to display the Product Maintenance window.
2. Display a product record.
3. From the **Inventory** menu, select **Primary Inventory Maintenance** to display the Primary Inventory Maintenance dialog box.
4. From the **Edit** menu, select **User Controls** to display the Product User Control Parameters dialog box.
5. From the **Additional Controls** menu, select **Hits Maintenance/Max Days Supply** to display the Hits Control Maintenance dialog box.
6. If you use a multi-branch network, in the **Central Warehouse Type** field, enter one of the following central warehouse types:
   - **Top-down** - The central warehouse dictates branch replenishment and automatic stock/nonstock determination.
   - **Bottom-up** - The selling branches dictate branch replenishment and automatic stock/nonstock determination. The is the default.

     In a bottom-up central warehouse scheme, the system analyzes and reports the needs of the child branches back to the parent branch (central warehouse) so that stock can be purchased to bring the child branch back to the greater of its transfer point or its economic order quantity (EOQ).
7. From the **File** menu, select **Insert Branch** to display the Hits Control Maintenance dialog box.
8. In the **Enter new branch or territory** field, enter the branch or territory ID.
9. Click **OK** to return the ID to the **Branch** field in the Hits Control Maintenance dialog box.
10. Complete the following fields:

Field	Description
Branch Hits	Minimum hits a product needs at a branch to be considered a stock item.
Network Hits	Minimum hits a product needs throughout the branch network to be considered a stock item. This field does not apply to single-branch warehouses.

Field	Description
Max Days Supply	The maximum number of days' supply of this product that your company permits to be maintained in inventory. The maximum number of days' supply equals the projected inventory level (PIL) of the item divided by its demand per day. If no maximum days' supply is set at the product level, the system uses the value set at the branch and buy line level. If no value is set at the branch and buy line level, the system uses the value set under the **Maximum Days Supply** control maintenance record. The maximum days' supply check does not apply to "Misc Charge" products. When an item is added to an adjustment, purchase order, sales order, or transfer order, the system checks the PIL at that moment and stores the value. When appropriate, the system displays a warning message if adding the item to the transaction causes the maximum days supply to be exceeded. If an item is removed, or if an order deleted, the system compares the PIL at the time of the removal or deletion to the stored PIL. If the removal or deletion does not make the PIL higher then it was at the time of the addition, no warning displays.

11. Save the information and exit the dialog box.

    Changes take effect when you exit Product Maintenance.

More Options in the Hits Control Maintenance Dialog Box

The Hits Control Maintenance dialog box also offers these options:

To...	Select this menu option...
remove a branch from the Hits Control Maintenance dialog box, select the branch and	**File > Clear Branch**
find a branch that is not currently visible in the dialog box	**File > Find Branch** The Hits Control Maintenance dialog box displays. In the **Enter branch or territory to find** field, enter the branch or territory ID and click **OK** to return to the Hits Control Maintenance dialog box. The cursor moves to the requested branch.
toggle between prompting for a branch to display branch-specific parameters and displaying all branches	**File > Toggle Hierarchy** The Hits Control Maintenance dialog box displays. In the **Enter hierarchy branch** field, enter the branch or territory ID to which you want to toggle and click **OK** to return to the Hits Control Maintenance dialog box.

Order Points and Line Points Overview

Order points and line points determine the amount of inventory to stock in your warehouse. In a multiple branch warehouse company, transfer points and transfer surplus points determine the quantities for replenishing branches.

Order Point

This is the minimum amount of stock you want to have on the shelf for a given item so a warehouse can meet demand while waiting vendor replenishment.

The order point considers the vendor lead time and safety days for the product. When a product's projected inventory level (PIL) falls below its order point, the system suggests purchasing back to the line point.

When calculating the order point for a baby branch in a parent/baby relationship, the lead time for the baby branch is the greater of the lead time of the parent branch or the transfer cycle from the parent branch to the baby branch. This method protects the baby branch from running out of material during the transfer cycle.

> **Note:** You can set a minimum-only order point for a product to make sure the system uses the largest line point available.

Line Point

This is the upper limit to the amount of stock you want to have on the shelf for a given item so a warehouse can meet demand during the order cycle of the product.

The line point considers the vendor lead time, safety days, and order cycle for the product. The line point can vary as the order cycle changes. For more information, see How the System Calculates Line Points and How the System Calculates Line Point Safety Days.

When calculating the line point for a baby branch in a parent/baby relationship, the lead time for the baby branch is the greater of the lead time of the parent branch or the transfer cycle from the parent branch to the baby branch. This method ensures that the baby branch's order point is not higher than its line point.

Order Cycle

The time it takes to sell enough of a product to contribute to meeting the vendor target for the product's buy line. The order cycle can vary when some products in a buy line sell faster than others.

Demand Samples

Before the system calculates order points, line points, transfer points, and transfer surplus points, it needs to start with a "clean" demand sample. To create a clean demand sample, the system use inventory parameters to do the following:

- Use the correct forecast period
- Compensate for lost sales
- Consider trends in demand

Reviewing Product Order Points and Line Points

Use the Product Order Points/Line Points dialog box to view or adjust information related to the product's order point and line point. You can view this window for nonstock products, but the system does not calculate the order point and line point.

To review a product's order point and line point:

1. From the **Maintenance** menu, select **Product** to display the Product Maintenance window.
2. Display a product record.
3. From the **Inventory** menu, select **Primary Inventory Maintenance** to display the Primary Inventory Maintenance dialog box.
4. Select a branch and, from the **Edit** menu, select **Order Points** to display the Product Order Points/Line Points dialog box.
5. If you selected an individual branch, change either of the following fields, as needed, to adjust the order point and line point:

   Note: If you selected a summary branch, all fields are view-only.

Field	Description
Safety Factor	A value that adjusts the hits related safety coefficient (HRSC) applied to a product at an individual branch. For example, if the value in the **Hits Adjusted Safety Factor** field is **0.85**, entering **0.8** in the **Safety Factor** field reduces the HRSC by 80 percent, or a value of **0.68**. The default value is **1**. **Note:** The **Safety Factor** and **Projected Service Level** fields are mutually dependent. Changing one field changes the other's value, too. If safety factors are uploaded using Mass Load, then the system updates the projected service level regardless if they were previously overridden.
Projected Gross Margin	Used to adjust the adjusted gross margin for a product at an individual branch. **Note:** Changing the projected gross margin updates the adjusted gross margin.
Projected Service Level	The service level determines the amount of stock you want to guarantee to be in your warehouse. For example, as a hardware store you want AA batteries to be available 99.9% of the time. You make the AA batteries an A Ranked product with a service level of 99.9% and therefore a safety factor of 3.72. The system uses the calculated safety factor to determine demand and how often to replenish your warehouse. **Note:** If a service level has never been set for a product, the system uses one (1.00). **Note:** The **Safety Factor** and **Projected Service Level** fields are mutually dependent. Changing one field changes the other's value, too. If projected service levels are uploaded using Mass Load, then the system adjusts the safety factors to match.

6. Review the adjusted amounts and other information in the following fields, as needed:

Field	Description
Hits Adjusted Safety Factor	The hits related safety coefficient (HRSC) for the product at the branch multiplied by the value in the **Safety Factor (SF)** field. The hits adjusted safety factor affects the adjusted gross margin, projected service level, projected turns, order point safety days and line point safety days.
Adjusted Gross Margin	The estimated gross margin, using the value in the **Projected Gross Margin** field, and the estimated turns calculated in this field, and the carrying cost percentage on file. The system calculates it as follows: **ADJ. GM = GROSS MARGIN - (CARRY COST% / TURNS)**
Projected Turns	The estimated number of turns, based on the current demand per day annualized. It is calculated as: **TURNS = (365 x annualized demand / day) / average onhand**

7. Review the components used in the calculation of order points and line points for parent branches, and for transfer points and transfer surplus points in child branches:

   For the order point or transfer point:

In a Parent Branch:	In a Child Branch:
Lead time days	Transfer cycle days
Order point safety days	Transfer cycle days safety
Order point days	Transfer point days
Average daily demand	Average daily demand
Service stock or manual safety stock	Service stock or manual safety stock
Order point	Transfer point

   For the line point or transfer surplus point:

In a Parent Branch:	In a Child Branch:
Lead time days	Transfer point days
Order cycle	Transfer grace days
Line point safety days	Transfer surplus days
Line point days	Average daily demand
Average daily demand	EOQ
Service stock or manual safety stock	Service stock or manual safety stock
Line point	Transfer surplus point

   Note: If a minimum or maximum amount of quantity to stock is set on the User Inventory Controls window and the setting has not expired, then the minimum amount setting overrides the order point calculation and the maximum amount setting overrides the line point calculation.

8. Click **OK** to exit the window.

Adding Customer Service Stock

Customer service stock, also called manual safety stock, is a quantity added to the normal stocking level of a product for a period of time, based on:

- Running a promotion on items, guaranteeing that you will have them in stock.
- Contractors requesting that you keep an item in stock in case then need one in an emergency.
- Branches using items, but not wanting this use to count towards the demand calculation.

When you assign service stock for a customer, the system adds additional quantities to the order point and line point calculations. You can also set service stock at the branch level using the Product User Control Parameters dialog box.

Note: The system does not convert nonstock items with customer service stock set to stock items.

To add service stock for a customer:

1. Set user control parameters for a product.
2. In the Product User Control Parameters dialog box, select a branch, and, from the **Additional Controls** menu, select **Customer Service Stock** to display the Product Inventory Customer Service Stock dialog box.
3. In the **Service** columns, complete the following for each customer, as needed:

Field	Description
Customer	The name of the customer requiring the service stock.
Quantity	The amount of service stock the customer required.
Effective Date	The date to begin adding the service stock to the order point and line point calculations.
Expire Date	The date to stop adding the service stock to the order point and line point calculations.

Note: The effective and expiration date are for reporting purposes only. They do not affect the order point and line point calculations. For more information, see Running the Customer Service Stock Report in the Reporting in Eclipse documentation.

4. View service stock for contracts, as needed.
5. Click **OK** to save the information exit the dialog box.

   The system populates the **Customer Service Stock** field with the total quantity required by customers.

Setting the Percentage of Parent Order Point to Protect

When calculating the order or line point for a baby branch in a parent/baby relationship, the lead time for the baby branch is the greater of the lead time of the parent branch or the transfer cycle from the parent branch to the baby branch. This method protects the baby branch from running out of material during the transfer cycle and ensures that the baby branch's order point is not higher than its line point.

When the system determines the quantity of products to transfer from the parent branch to the child branch, it does not transfer a quantity that takes the parent branch below its order point, unless there is an immediate need in the child branch. For non-immediate need suggested transfers, the parent branch will, by default, not transfer a quantity that takes the parent branch below its order point.

In regards to non-immediate need suggested transfers to child branches, you can modify how much of the parent branch's order point the system protects. You can set this parameter at the system, buy line, and product level.

The following procedure is a manual process for a single product. Use Mass Load to enter inventory parameters to groups of products.

To set the percentage of a parent branch order point to protect for suggested transfers:

1. From the **Maintenance** menu, select **Product** to display the Product Maintenance window.
2. Display a product record.
3. From the **Inventory** menu, select **Primary Inventory Maintenance** to display the Primary Inventory Maintenance dialog box.
4. From the **Edit** menu, select **Additional Parameters** to display the Additional Inventory Parameters dialog box.
5. From the **File** menu, select **Insert Branch** to display the Additional Inventory Parameters dialog box.
6. In the **Enter new branch or territory** field, enter the branch or territory ID.
7. Click **OK** to return the ID to the **Branch/Terr** field in the Additional Inventory Parameters dialog box.
8. Enable stock/nonstock determination for the product, if needed.
9. Set the product buy package quantity and divisibility, if needed.
10. In the **%OP** field, enter a percentage of the parent branch's order point to be protected in suggested transfers for non-immediate needs. For example, if the calculated order point is 12 and the **%OP** is 50, the system reads the parent branch order point as 6 for calculating suggested order quantities.

    - A value set at the product level overrides that set at the buy line level. If no percentage is set at the product level, but one is set at the buy line level, the value at the buy line is used.
    - A value set at the buy line level overrides that set at the system level. If no percentage is set at the buy line level, but one is set at the system level, the value at the system level is used.
    - If no percentage is set for the parent branch-that is, the field is left blank-the system uses the default of 100%.

    Note: The calculated order point at the parent branch includes manual service stock.

11. Save the information and exit the dialog box.

    Changes take effect when you exit Product Maintenance.

More Options in the Additional Inventory Parameters Dialog Box

The Additional Inventory Parameters dialog box also offers these options:

To...	Select this menu option...
remove a branch from the Additional Inventory Parameters dialog box, select the branch and	**File > Clear Branch**
find a branch that is not currently visible in the dialog box	**File > Find Branch** The Additional Inventory Parameters dialog box displays. In the **Enter branch or territory to find** field, enter the branch or territory ID and click **OK** to return to the Additional Inventory Parameters dialog box. The cursor moves to the requested branch.
toggle between prompting for a branch to display branch-specific parameters and displaying all branches	**File > Toggle Hierarchy** The Additional Inventory Parameters dialog box displays. In the **Enter hierarchy branch** field, enter the branch or territory ID to which you want to toggle and click **OK** to return to the Additional Inventory Parameters dialog box.

Using Minimum-Only Order Points

You can set up an order point or transfer point for a product using a *minimum-only order point*. The system uses the value entered for the minimum as both the order point and the line point until the demand of the product exceeds the minimum value. When the value exceeds the minimum value, the system uses the calculated line point. The system still pulls and displays products on the Suggested Purchase Order Queue regardless if the product uses minimum-only or minimum-maximum order points.

For example, you want to have at least three of a product in a branch, but if the true demand would result in a line point of more than three, you want the system to use the greater line point.

> **Note:** Order points and transfer points are the same. The system considers order points in a child branch to be transfer points.

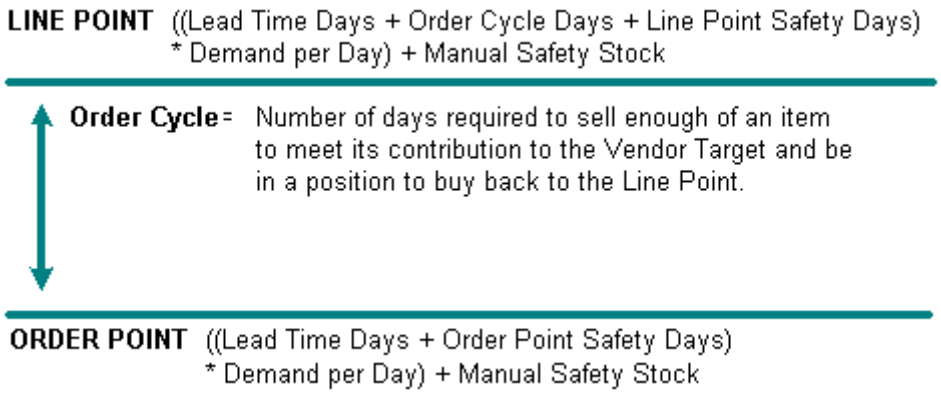
Use the User Inventory Controls screen to set up an order point with only a minimum value. The following are true for this screen for this scenario:

- The **Exp Date** field and **Calc Dmnd** field functions do not change.
- The value in the **Min** field displays as the value for the order point and transfer point (**OP/XP** field) on the Primary Inventory Maintenance and Product Order Points/Line Points screens.
- A lowercase m, such as 15m, next to the **EOQ** (Economic Order Quantity) field's value indicates that it is a minimum-only order point. An uppercase M, such as 15M, indicates that the system must consider both minimum and maximum values from the User Inventory Controls screen.
- A minimum-only value acts as an order point for a purchasing branch and a transfer point for the child branch.
- After you have loaded a minimum value for a branch, the system stops checking hits at this location because the item is considered *stock*. However, if a product is a nonstock, the system does not use a min/max or min only setting.
- The system uses the value entered for the minimum as both the order point and the line point until the demand of the product exceeds the minimum value. When the value exceeds the minimum value, then the system uses the calculated line point. The system uses the greater value.
- If a product has a minimum setting but no maximum setting, the order point and the line point quantity are equal to the value in the **Min** field unless the system calculated line point quantity is greater than the minimum. In this case, the system uses the calculated line point quantity.

How the System Calculates Line Points

A product's line point is the upper limit to the amount of stock you want to have on the shelf for a given item. It includes enough stock to carry you through the order cycle, plus an amount of safety stock. When an item's projected inventory level (PIL) falls below its order point, the Suggested P/O program suggests that you purchase enough stock to bring all items in the buy line up to their adjusted line points. The line point adjusts up or down to meet the vendor target, depending on where you are in the order cycle when the Suggested P/O program runs.

A product's line point is the sum of the lead time days plus order cycle days, plus line point safety days, multiplied by the average demand for the item per day. If you define manual safety stock, the system adds this stock as a last step in determining the item's line point.



Note: If a maximum amount of quantity to stock is set on the User Inventory Controls window and the setting has not expired, then that amount overrides the line point calculation.

Components of the Line Point

- **Lead Time Days -** The time it takes to replenish a product. You do not want your stock levels to fall below the amount that you can sell during the time it takes the vendor to ship the material to you.
- **Order Cycle Days -** The time it takes to sell enough of an item to meet its contribution to the vendor target. The normal order cycle for a buy line is the vendor target for the buy line, divided by the cumulative demand of all the products in that buy line.
- **Line Point Safety Days -** To ensure against possible out of stock periods, you also want to consider safety days in the line point calculation. Safety days translate into safety stock, which provides a cushion when daily sales exceed the average daily sale quantity.
- **Demand per Day -** Product demand drives the automated purchasing and transfer system. Formulas built into the safety day calculation compensate for the differences between fast-moving, high demand items, and slow-moving, low demand items.
- **Manual Safety Stock -** Also known as service stock, this is a quantity added to the order point to honor a commitment to keep a quantity of stock on the shelf.

Parent/Baby Branches

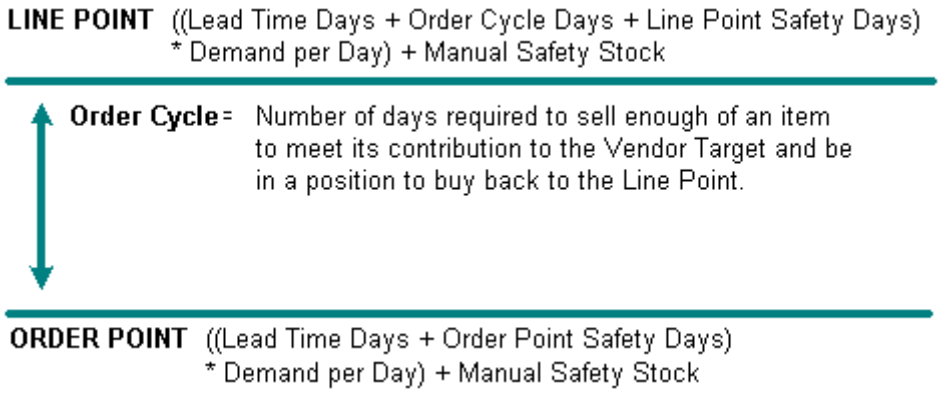
When calculating the line point for a baby branch in a parent/baby relationship, the lead time for the baby branch is the greater of the lead time of the parent branch or the transfer cycle from the parent branch to the baby branch. This method ensures that the baby branch's order point is not higher than its line point.

How the System Calculates Order Points

A product's order point indicates the minimum amount of stock you want to have on the shelf for a given item. When an item's projected inventory level (PIL) falls below its order point, the Suggested P/O program suggests that you purchase enough stock to bring all items in the buy line to their adjusted line points. That is, the line point adjusted up or down to meet the vendor target.

The Suggested P/O report can include products that were not below their order points.

A product's order point is the sum of the lead time days plus order point safety days, multiplied by the average demand for the item per day. If you define manual safety stock, the system adds this stock as a last step in determining the item's order point.



Note: If a minimum amount of quantity to stock is set on the User Inventory Controls window and the setting has not expired, then that amount overrides the line point calculation. You can set a minimum-only order point for a product to make sure the system uses the largest line point available.

Components of the Order Point

- **Lead Time Days -** The time it takes to replenish a product. You do not want your stock levels to fall below the amount that you can sell during the time it takes the vendor to ship the material to you.
- **Order Point Safety Days -** To ensure against possible out of stock periods, you also want to consider safety days in the order point calculation. Safety days translate into safety stock, which provides a cushion when daily sales exceed the average daily sale quantity.
- **Demand per Day -** Product demand drives the automated purchasing and transfer system. Formulas built into the safety day calculation compensate for the differences between fast-moving, high demand items, and slow-moving, low demand items.
- **Manual Safety Stock -** Also known as service stock, this is a quantity added to the order point to honor a commitment to keep a quantity of stock on the shelf.

Parent/Baby Branches

When calculating the order point for a baby branch in a parent/baby relationship, the lead time for the baby branch is the greater of the lead time of the parent branch or the transfer cycle from the parent

branch to the baby branch. This method protects the baby branch from running out of material during the transfer cycle.

Adjusting Additional Inventory Parameters

The Additional Inventory Parameters window lets you adjust the percentage or quantity below which you do *not* want to include the remnant in the projected inventory level or the percentage of the parent branch's order point to be protected in suggested transfers for non-immediate needs. You can also indicate buy package quantities to purchase or transfer in and whether or not you allow package divisibility.

To adjust the parameters:

1. From the **Maintenance** menu, select **Product** to display the Product Maintenance window.
2. Enter the product for which you want to adjust parameters.
3. From the **Inventory** menu, select **Primary Inventory Maintenance** to display the Primary Inventory Maintenance window.
4. From the **Edit** menu, select **Additional Parameters** to display the Additional Inventory Parameters window.
5. In the **Exclude Remnant PIL %** and **Quantity** fields, indicate the percentage and quantity below which you do not want the system to include the values in the project inventory level calculations. For example:

Item	Value
Available Qty	50 ft
Remnant On Hand	10 ft (including in process)
Exclude Remnant PIL%	30
Exclude Remnant Qty	2

6. First, the system calculates the following:

Item	Value
Exclude Percent Qty	Integer (Remnant On hand X (Exclude Remnant PIL% / 100))
Exclude Percent Qty	10 X .3
Exclude Percent Qty	3

7. Then, the system subtracts from the **Available Qty** whichever of the following is larger: **Exclude Percent Qty** or **Exclude Remnant Qty**
8. In this example, since **Exclude Percent Qty** = 3 and is larger, then the system subtracts as follows: Available Qty = 50 - 3
9. **Result =** The system uses 47 as the Available Qty.
10. In the **OP%** field, indicate how much of the parent branch's order point to protect when suggesting transfers.
11. Set buy package quantities and package divisibility, if needed.
12. Save your changes and exit the window.

How the System Calculates Line Point Safety Days

The system calculates safety days for each product's line point, based on lead time and the following equations:

- Using the sum of lead time days plus order cycle days to determine base line point safety days.
- Modifying base line point safety days using the hits related safety coefficient (HRSC) factor.

How the System Calculates Base Line Point Safety Days

The system first applies an inverse relationship to the sum of the lead time and the order cycle and the number of safety days. That is, for shorter the lead time and order cycle, the more safety stock the system recommends. For longer lead times and order cycles, the system recommends less safety stock to protect against the carrying costs of the extra inventory.

For base Line Point Safety Days, three equations apply.

If the sum of Lead Time plus Order Cycle is...	the base Line Point Safety Days is...	The formula is...
less than or equal to 15	the sum of lead time plus order cycle plus seven days.	If (LT + OC) < 15, Then LPSD = (LT + OC) + 7.
greater than 15 but less than 60 days	one half the sum of lead time plus order cycle plus 15 days.	If (LT + OC) > 15 and < 60, Then LPSD = ((LT + OC)/2) + 15.
greater than 60	the sum of lead time plus order cycle divided by 4 plus 30 days.	If (LT + OC) > 60, Then LPSD = ((LT + OC)/4) + 30.

How the System Adjusts Line Point Safety Days by the HRSC Factor

The system next adjusts the base line point safety days to consider whether the item is a fast-moving, high demand item, or a slow-moving, low demand item using the Hits Related Safety Coefficient (HRSC) factor. The system uses this to compensate for the relative unreliability of demand forecasting for slow-moving items compared to fast-moving items.

For example, an item that sells an average of once a day for a month is a fast-moving item. An item that sells an average of once a month for a year is a slow-moving item.

The HRSC is 4 divided by the total number of hits in the last 365 days, plus 0.6. Products with less than 4 hits in the past year use 4 as the number of hits in the calculation. The highest HRSC is 1.6 while the lowest HRSC approaches 0.6. The HRSC value displays in the **Hits Adjusted SF** field on the Product Order Points/Line Points window.

You can change the HRSC by changing the value of the **Safety Factor (SF)** field on the Product Order Points/Line Points window.

How the System Calculates Order Point Safety Days

The system calculates safety days for each product's order point, based on lead time and the following equations:

- Using lead time days to determine base lead time safety days.
- Applying the hits related safety coefficient (HRSC) factor to base lead time safety days to calculate order point safety days.

How the System Calculates Base Order Point Safety Days

The system first applies an inverse relationship to the length of the lead time and the number of safety days. That is, for shorter lead times, the system recommends more safety stock to protect customer service levels. For longer lead times, the system recommends less safety stock to protect against carrying costs on the extra inventory.

For base Order Point Safety Days, three equations apply:

If the Lead Time is...	The base Order Point Safety Days is...	The formula is...
less than 15	0	If LT < 1, then LTSD = 0
greater than 1 up to 15	the lead time plus seven days multiplied by the hits related safety coefficient with the result added to the lead time.	If LT 1 to 15, then LTSD = ((LT + 7) * HRSC)
greater than 15 but less than 60 days	one half the lead time plus 15 days multiplied by the hits related safety coefficient with the result added to the lead time.	If LT 16 to 60, then LTSD = ((LT/2) + 15) *HRSC
greater than 60	the lead time divided by 4 plus 30 days multiplied by the hits related safety coefficient with the result added to the lead time.	If LT 61 or higher, then LTSD = ((LT/4) + 30) *HRSC

How the System Adjusts Base Lead Time Safety Days by the HRSC Factor

The system next adjusts the base lead time safety days to consider whether the item is a fast-moving, high demand item or a slow-moving, low demand item using the Hits Related Safety Coefficient (HRSC) factor. This adjustment enables the system to compensate for the relative unreliability of demand forecasting for slow-moving items compared to fast-moving items.

The system uses the following equation:

((4 / Total Hits on Product in Last 365 Days) + 0.6) * Safety Factor

The result of this equation displays in the **Hits Adjusted SF** field on the Product Order Points/Line Points window. You can change the HRSC by changing the **Safety Factor (SF)** field on the Product Order Points/Line Points window. The default value is 1.0. If you update your service levels on the Product Order Point/Line Point window, then the HRSC factor also changes.

About Service Level Numbers and Standard Deviation

The system calculates the service level number based on the standard deviation of the safety factor. The service level determines the amount of stock you want to guarantee to be in your warehouse. For example, you have a hardware store and you want AA batteries to be available 99.9% of the time. You make the AA batteries an A Ranked product with a service level of 99.9% and therefore a safety factor of 3.72. The system uses the calculated safety factor to determine the amount of safety days needed to provide the desired service level.

The most popular distribution level for determining probability is referred to as *normal distribution*. This term used in statistical analysis describes a distribution of numbers in which the probability of an occurrence, if graphed, follows the form of a bell-shaped curve.

Standard deviation refers to the spread of the distribution number. The system calculates this as follows:

1. Determine the mean of a set of numbers.
2. Determine the difference of each number and the mean.
3. Square each difference.
4. Calculate the average of the squares.
5. Calculate the square root of the average.

   Note: In safety stock calculations, the forecast quantity is often used instead of the mean in determining the standard deviation.

Service Levels and Related Safety Factors

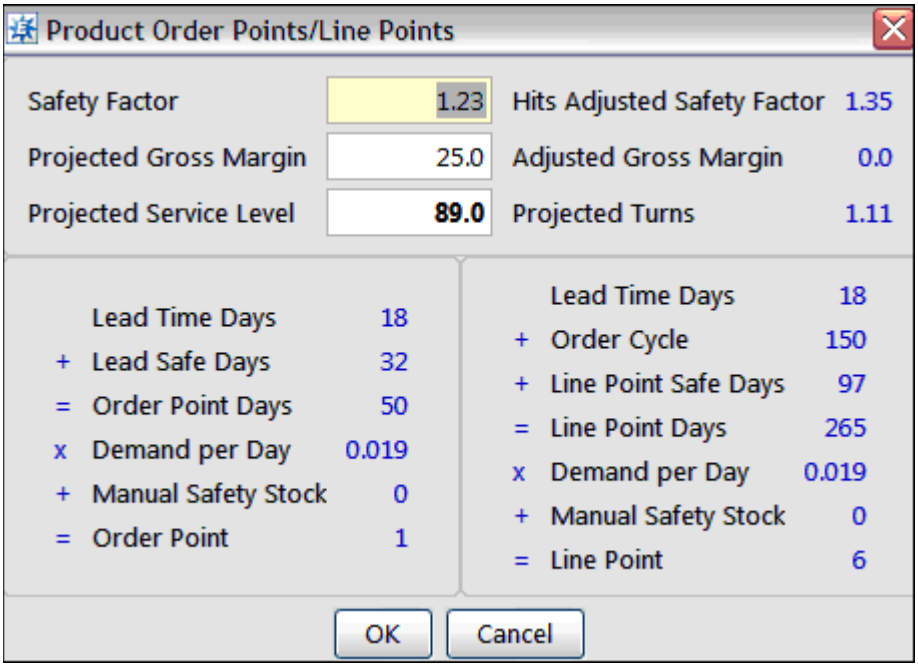
The following table shows the service level and its corresponding safety factor using the above calculation process:

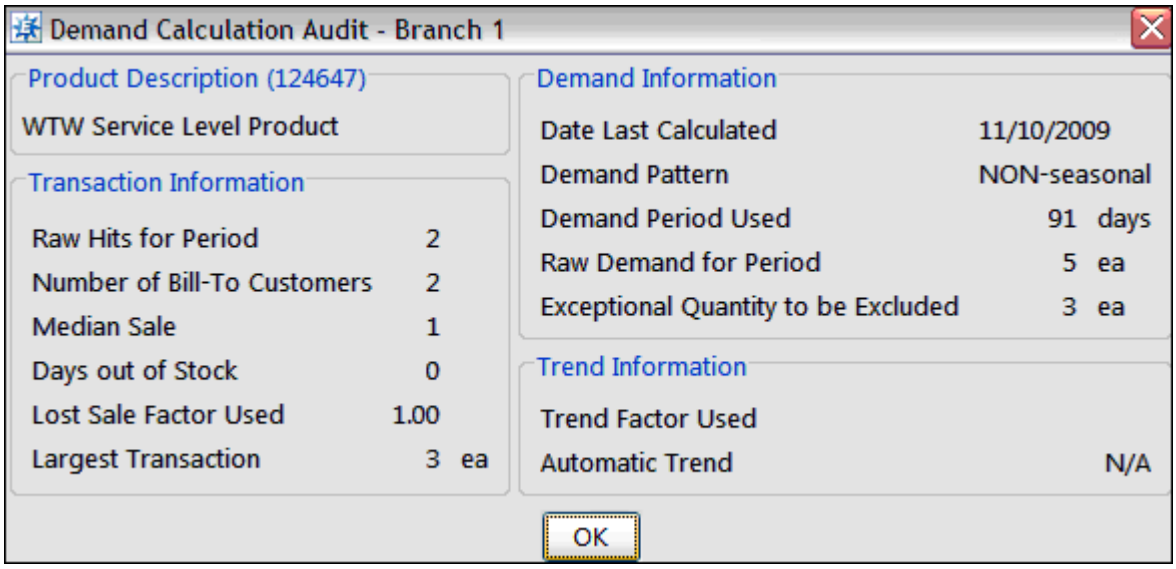
Service Level	Safety Factor
50.00 %	0
55.00 %	0.13
60.00 %	0.25
65.00 %	0.39
70.00 %	0.52
75.00 %	0.67
80.00 %	0.84
81.00 %	0.88
82.00 %	0.92
83.00 %	0.95
84.00 %	0.99
85.00 %	1.04
86.00 %	1.08
87.00 %	1.13
88.00 %	1.17

Service Level	Safety Factor
89.00 %	1.23
90.00 %	1.28
91.00 %	1.34
92.00 %	1.41
93.00 %	1.48
94.00 %	1.55
95.00 %	1.64
96.00 %	1.75
97.00 %	1.88
98.00 %	2.05
99.00 %	2.33
99.50 %	2.58
99.60 %	2.65
99.70 %	2.75
99.80 %	2.88
99.90 %	3.09
99.99 %	3.72

Example: How Safety Factor Impacts the Lead Safe Days

Following is an example of how the system handles a change to the Projected Service Level which updates the Safety Factor which then updates the Lead Safe Days calculated for the product.





- The lead time for this product is 18 and calculated from received purchase orders.
- The Hits Adjusted Safety Factor is using this calculation:

  safety factor X (4 / annualized hits) + .6 = 1.35

  If there are no hits, the system uses 4 in the calculation. Annualized hits are calculated as follows: raw hits X 365 / Forecast Period
- Since the Lead Time Days equal 15, then the normal safety days rules apply.
- If the lead time days are less than or equal to 18, the safety days are equal to the lead time plus 7.
- If the lead time days are greater than 15, but less than 61, then the safety days are equal to one-half of the lead time, plus 15.
- If the lead time days are greater than 60, then the safety days are equal to one quarter of the lead time, plus 30.

  Therefore: (18 / 2 + 15) X 1.35 (HRSC) = 35.2 and Lead Time Safety Days = 32

Updating Product Demand Overview

Use the Update Demand Forecast program to forecast the demand of products in your inventory. The system consults the branch zip code table when calculating demand. If demand does not display as anticipated, ensure the zip code table is accurate and no changes have been made. Changes to Branch Zip Code table should be made with the assistance of Eclipse Support personnel. For more information, see Zip Codes Overview.

This program serves four primary functions. By product by branch, it updates the following:

- Demand per day
- Economic order quantity (EOQ)
- Lead time
- Buy line's average lead time

Several programs use the demand forecast data:

- The plenty date calculation uses the lead time and buy line average lead time data.
- The order point and line point calculations use the demand per day and lead time data.
- The Maximum Days' Supply for a product is based on the demand per day.
- The Product Ranking program uses the demand per day data for ranking products.
- The Suggested P/O and Suggested Transfer programs rely on order point, line point, and product ranking calculations for suggesting purchases and transfers.

Viewing Product Demand Information

Use the Primary Inventory Maintenance dialog box to view product information related to inventory management.

- The system continually updates the product's projected inventory level (**PIL**) and order/transfer point (**OP/XP**) in real time.
- The system updates the remaining fields in the window each time you run the Update Product Demand Forecast program for the product.

When you assign a product the product status of **Stock**, the Primary Inventory Maintenance window displays a summary of the product's current demand information.

When you assign a product the status of **NonStock**, the system does *not* calculate the order point, line point, Economic Order Quantity (EOQ), and monthly demand.

To view product demand information:

1. From the **Maintenance** menu, select **Product** to display the Product Maintenance window.
2. Display a product record.
3. From the **Inventory** menu, select **Primary Inventory Maintenance** to display the Primary Inventory Maintenance dialog box.
4. In the **Br** column, review the branch numbers and types.

   Branch or warehouse identifiers with letter suffixes indicate the warehousing scheme used for replenishing that product. These lines display calculated information for all branches combined under the defined warehouse scheme.

Suffix	Defines a...	Which...
P	Central purchasing branch	Purchases for other branches.
W	Central distribution branch	Warehouses for other branches.
C	Central warehousing branch	Purchases and warehouses for other branches.

5. In the **Stock** column, review whether the item is a known stock (**Yes**) or nonstock (**No**) item, or whether the system calculates (**Auto**) the stock or nonstock status based on the number of hits the product receives in a branch warehouse network.

   The product's stock or nonstock status can be set in the Additional Inventory Parameters dialog box.
6. In the **Buy Pkg <unit of measure>** column, review the quantity multiple in which stock is purchased or transferred. For example, if set to 6, stock is purchased or transferred in quantities of 6, 12, 18, 24, and so forth.
7. In the **Div** column, review whether the buy package can be divided either by the vendor when purchasing or by the warehousing branch before transfers occur.

   Note: Both the **Buy Pkg** and **Div** columns remains blank if no territory is selected.
8. Review the fields, as needed, for each parent branch and child branch:

Field	For a parent branch, shows the...	For a child branch, shows the...
PIL	projected inventory level.	projected inventory level.
OP/XP	order point. If a minimum-only is set for the product, the system uses that minimum as the order point until the calculated order point exceeds the minimum-only setting. The system then uses the calculated order point. Minimum-only is in effect when a lower case "m" displays after the EOQ value. If there is a min/max order point set for the product, the min is always the order point and an upper case "M" displays after the EOQ value. **Note:** The order point displays as a whole number.	system-calculated transfer point if there is no min/max order point set for the product. If the **Respect Item Min/Max For Suggested Transfers** control maintenance record is set to **No**, the system checks the Max setting for the product. • If there is a min/max set for the product, the transfer point is the max and an uppercase "M" displays next to the EOQ value. • If there is ***no*** min/max set for the product, the system uses the system-calculated transfer point. • If there is a minimum-only set for the product the system uses the minimum-only is in effect when a lowercase "m" displays after the EOQ calculation.
		If the **Respect Item Min/Max For Suggested Transfers** control maintenance record is set to **Yes**, the system checks the min setting for the product. • If there is a min/max set for the product, the transfer point is the min and an uppercase "M" displays next to the EOQ value. • If there is ***no*** min/max set for the product, the system uses the system-calculated transfer point. • If there is a minimum-only set for the product, the system uses the minimum-only as the transfer point until the calculated transfer point exceeds the minimum-only setting, the system uses the system-calculated demand. A minimum-only is in effect when a lower case "m" displays after the EOQ value. **Note:** The transfer point displays as a whole number.
Low Sale <unit of measure>	lowest sale in the branch within the forecast period.	lowest sale in the branch within the forecast period.

Field	For a parent branch, shows the...	For a child branch, shows the...
EOQ	Economic Order Quantity, based on the combined demand of the multi-branch network. When the low sale quantity exceeds the calculated EOQ, the system uses the low sale quantity in place of the EOQ in associated calculations. In this case, the field displays with an asterisk to indicate the exception. • An uppercase "M" in this field indicates that the system is using the min/max setting as the transfer point. • A lowercase "m" in this field indicates that the system is using the minimum-only setting as the transfer point. An EOQ with no letter indicates that the system is using the system-calculated transfer point. • An uppercase "M" in this field indicates that the system is using the min/max setting as the transfer point. • A lowercase "m" in this field indicates that the system is using the minimum-only setting as the transfer point. • An EOQ with no letter indicates that the system is using the system-calculated transfer point.	Economic Order Quantity for the item in the branch. • An uppercase "M" in this field indicates that the system is using the min/max setting as the transfer point. • A lowercase "m" in this field indicates that the system is using the minimum-only setting as the transfer point. • An EOQ with no letter indicates that the system is using the system-calculated transfer point.
Monthly Demand	monthly demand for the item in the branch.	monthly demand for the item in the branch.
Monthly Hits	monthly hits for the item in the branch.	monthly hits for the item in the branch.
Leadtime XF Cycle	product's lead time for a purchasing branch.	transfer cycle days for selling (child) branches.
Safety LT Day	number of lead time safety days for the item in the branch.	number of lead time safety days for the item in the branch.

9. When you have finished reviewing the information, exit the dialog box.

More Options in the Primary Inventory Maintenance Dialog Box

The Primary Inventory Maintenance dialog box also offers these options:

To...	Select this menu option...
view product demand calculation information	**Edit > Audit** The Demand Calculation Audit dialog box displays.
view product order point and line point calculation information	**Edit > Order Points** The Product Order Points/Line Points dialog box displays.
change the safety factor and projected gross margin for an individual branch	**Edit > Order Points** The Product Order Points/Line Points dialog box displays.
set the parameters used to forecast product demand	**Edit > Forecast Parameters** The Product Forecast Parameters dialog box displays.
enter specialized product-level user inventory control parameters	**Edit > User Controls** The Product User Controls Parameters dialog box displays.
view inventory details for the product in all branches	**Edit > Inventory Inquiry** The Inventory Inquiry dialog box displays.
define whether the item is stock and nonstock determination, by branch, and determine the buy package and divisibility overrides for branches and territories or to indicate how to calculate PIL when handling remnants	**Edit > Additional Parameters** The Additional Inventory Parameters dialog box displays.
flag the product as vendor-managed inventory for EDI	**Edit > EDI/VMI Maintenance** The Product EDI/VMI Maintenance dialog box displays.

Running the Update Demand Forecast Program

Use the Update Demand Forecast program to forecast the demand of one, some, or all products in your inventory.

You can run the program for a single product or buy line during the day, when necessary. When using the "All" or "Changes" option, schedule the program to run overnight because it can take a long time to complete.

To run the Update Demand Forecast program:

1. From the **Purchase > Forecasting** menu, select **Update Demand Forecast** to display a selection list.
2. In the **Select Group** field, select one of the following options to indicate the products for which to run the program:

Option	Selects...
All	All products in inventory.
Changed	Only those products that have sold since the last time you ran the Update Forecast Demand program. The system also tests products that, in a given period of time, have decreased in sales activity as compared to the average period between past sales. The system does this to include products in the "changed" group that might be experiencing a decrease in demand.
Buy Line	Only those products within a buy line. This option activates the **Line/Product** field, where you define the buy line. Use this option when you know that significant changes have been made to the products in a given buy line.
Product	Only a specified product. This option activates the **Line** or **Product** field, where you define the product. For example, if you correct an error on a transaction that affects a product's sales history, use this option to recalculate the product's demand.

3. In the **Branch** field, enter a branch to define the branches for which to run the update. To run the report for all branches, enter **All**.
4. If you selected either **Buy Line** or **Product** in the **Select Group** field, in the **Line** or **Product** field, enter the corresponding buy line or product.
5. In the **As of Date** field, enter the actual or system variable date on which the forecast is based.

   Note: When using the Phantom Scheduler to run a program at regular intervals, enter a variable date in this field; otherwise, each time the program runs, it will use the same as of date.

6. Do one of the following:
   - From the **File** menu, select **Begin** to run the program immediately.
   - From the **Options** menu, select **Schedule** to display the Phantom Scheduler, where you can schedule the program to run at a defined date and time.

Using Advanced Update Demand Forecasting

Advanced Update Demand Forecasting does not replace the current, standard and median Eclipse forecasting methods or the standard Update Demand program. These calculations complement the current forecasting to help you delve more deeply into how your products should be managed for replenishment. The system looks through the sales history going back a specified amount of time.

Eclipse calculates demand, finds the current forecast, and then applies the new forecasting. By default, the system uses a 5-year period to calculate demand unless a value is set in the **Advanced Demand Forecast Parameters** control maintenance record. Eliminates slow moving items that would not generate accurate demand. Smoothing factors for calculating the forecast behind-the-scenes then populate the factors after running the program. With the new methods the system tests seasonality on all products that meet the minimum hits and minimum history for the calculations. By default, the system uses 24 months. Then, Eclipse uses your selected group and goes back the number of weeks indicated in the *Advanced Demand Forecast Parameters* control maintenance record to gather the most recent sales history on your buy line or product set.

Important: If running the advanced forecasting for all products or all branches, we recommend running the calculations off-hours so as not to impact system performance. If running the forecast for a single product or branch, system performance should not be affected.

Set these parameters using the **Advanced Demand Forecast Parameters** control maintenance record.

For more information about advanced forecasting methods, see *About Advanced Forecasting Methods* in this documentation.

To run the advanced update demand program:

1. From the **Purchase > Forecasting** menu, select **Update Advanced Demand Forecast** to display a selection list.
2. In the **Select Group** field, select one of the following:

Option	Selects...
All*	All products in inventory.
Changed*	Only those products that have sold since the last time you ran the Update Forecast Demand program. The system also tests products that, in a given period of time, have decreased in sales activity as compared to the average period between past sales. The system does this to include products in the "changed" group that might be experiencing a decrease in demand.
Buy Line	Only those products within a buy line. This option activates the **Line** or **Product** field, where you define the buy line. Use this option when you know that significant changes have been made to the products in a given buy line.
Product	Only a specified product. This option activates the **Line** or **Product** field, where you define the product. For example, if you correct an error on a transaction that affects a product's sales history, use this option to recalculate the product's demand.

*** If you select Changed or All, the Line / Product field does not display.**

3. In the **Branch** field, enter a branch to define the branches for which to run the update. To run the report for all branches, enter **All**.
4. In the **Line / Product** field, enter the specific buy line or product for which you want to run the forecasting.

   Note: The field name changes based on your selection in the **Select Group** field.
5. In the **As of Date** field, enter the actual or system variable date on which the forecast is based.

   Note: When using the Phantom Scheduler to run a program at regular intervals, enter a variable date in this field; otherwise, each time the program runs, it will use the same as of date you enter now.
6. Select the forecast method or methods you want to use for advanced update demand:

   Note: Current forecasting methods *cannot* be deselected.

   - **Single Exponential Smoothing** - Standard smoothing factors for forecasting.
   - **Holt** - The standard smoothing and includes trending calculations.
   - **Holt-Winters** - The standard smoothing and trending calculations, and adds seasonality calculations. Holt-Winters calculations are not made with less than three years demand history.

   Note: For more information about these methods and their calculations, see *About Advanced Forecasting Methods* in this documentation.
6. Set the **Auto Set Best Fit** field to **Yes** to automatically use the best fit method for advanced demand forecasting. The report indicates this setting in the header of the report.
7. Do one of the following:

   - From the **File** menu, select **Begin** to run the program immediately. You can also use the **Run** button to run the calculations immediately.
   - From the **Options** menu, select **Schedule** to display the Phantom Scheduler, where you can schedule the program to run at a defined date and time.

Auditing Demand Calculations

View the components of the demand forecast calculation for an individual product on the Demand Calculation Audit dialog box.

These values update each time you run the Update Demand Forecast program for the product.

To audit the demand calculation:

1. From the **Maintenance** menu, select **Product** to display the Product Maintenance window.
2. Display a product record.
3. From the **Inventory** menu, select **Primary Inventory Maintenance** to display the Primary Inventory Maintenance dialog box.
4. Select a branch and, from the **Edit** menu, select **Audit** to display the Demand Calculation Audit dialog box for that branch.

   The Product ID displays in the **Product Description** area. All fields on this window are *view-only*.
5. In the **Transaction Information** area, review the following fields, as needed:

Field	Description
Raw Hits for Period	Number of hits recorded during the forecast period. The system uses the number of sales occurrences to determine the amount of sales history to review.
Number of Bill-To Customers	Number of individual customers billed for the raw hits during the forecast period. This value demonstrates whether the market or individual customers drive a product's demand.
Median Sale	Quantity sold on the median sale from the forecast period.
Days Out of Stock	Number of days the product's on-hand quantity was zero or less during the forecast period. By default, if you ship items directly from another branch to the customer to meet an order, fulfilling demand, the system does not count the product in your branch as out of stock. To change this setting, use the **Control Forecast Parameters Maintenance** control maintenance record and select the **Exclude Ship From Different Branch** check box. **Note:** This calculation uses transactions only as far back as when the item was created.
Lost Sale Factor Used	Lost sale factor used by the demand calculation.
Largest Transaction	Largest quantity sold on a single transaction during the forecast period.

6. In the **Demand Information** area, review the following fields:

Field	Description
Date Last Calculated	Date the Update Demand Forecast program was last run.
Demand Pattern	Whether the product is seasonal or non-seasonal.
Demand Period Used	Number of days in the forecast period.

Field	Description
Raw Demand for Period	Total quantity sold during the forecast period.
Exceptional Quantity to be Excluded	Quantity excluded from the demand calculation due to being an exceptional sale.
Customer Demand Excluded	Number of products excluded from the demand calculation.

7. In the **Trend Information** area, review the following fields:

Field	Description
Trend Factor Used	Trend factor, if any, used by the demand calculation.
Automatic Trend	Whether the automatic trend calculation is enabled for this product's demand calculation. **Note:** Use this figure to compare to the **DEMAND (PER DAY)** field on the Product Order Points/Line Points window to ensure that the audit demand is calculating correctly.

8. Click **OK** to exit the dialog box.

How the System Calculates Demand per Day

Demand is how often a customer requests a product, whether that product is on the shelf ready to be sold, or whether it must be ordered and direct shipped from a vendor, or transferred in from another branch. To provide for the needs of your customers, you want to have enough product on the shelf. How much you purchase, and how often, often depends on how often a sold in the recent past.

The basic formula for calculating a product's demand per day is:

Total Demand in Forecast Period / Days in the Demand Period = Demand per Day

However, past performance is not always an accurate predictor of future sales. For this reason, the system uses different inventory control parameters as part of the demand calculation.

To calculate daily demand for each product, the system does the following:

1. Determine whether to do the demand calculation.
   - If the product status is **Stock** or **NonStock**, calculate demand.
   - Otherwise, do not calculate demand.
2. Determine whether product is seasonal or non-seasonal and whether to use product, buy line or system forecast parameters, and then determine the product's forecast period.
3. Within the product's forecast period, scan the sales and work order transactions, but not returns or transfers, for **Stock** and **Tagged,** *not* Direct, Overship, Exceptional or Review quantity types.

   For each qualifying transaction, collect the:
   - Transaction date
   - Number of hits
   - Bill-To ID
   - Order quantity

   Continue collecting data until the number of transactions reaches the minimum number of hits required for forecasting-as defined on the Forecast Parameters window at the product, buy line or system level-or the end of the forecast period.
   - If the total number of hits collected is less than the minimum number of hits required for forecasting, check to see whether the product is set up to add the demand of other products to its demand. If so, repeat step 3 to gather the same information for the additional items.
   - If, after all sales transaction information has been gathered, the total hits is still less than the minimum hits requirement as defined in the **Minimum Hits** control maintenance record, then discontinue the demand calculation for this product.
4. Remove the exceptional sales, if they exist.
5. Sort the new transaction list by quantity and identify the order quantity of the median sale. That is, the quantity of the middle transaction in the data sample.
6. For a seasonal product with automatic trend enabled, adjust the demand according to the system-calculated trend percent.
7. If a lost sale percentage exists for the product, increase the demand to account for lost sales.

8. If it exists for a non-seasonal product, adjust the demand by the manual trend percent.

Setting Product User Control Parameters

Use the Product User Control Parameters dialog box to enter specialized product-level inventory parameters, to:

- Estimate product demand for a new branch

  When you have a new branch that has no product history, use the **Min**, **Max**, **Exp Date**, and **Calc Dmnd** fields to define minimum and maximum stocking levels for the products until there is sufficient product history for the demand calculation to take over.

  You can estimate the minimum and maximum stocking levels for a new product until the product accrues enough demand history for the system to begin forecasting. As the system monitors a product's demand, you can set an expiration date after which the system will stop using estimated minimum and maximum levels for suggested purchasing, and begin forecasting demand for regular product order points and line points.

- Add service stock to the demand

  Use the **Service Stock** and **Serv Stock Exp Date** fields to add service stock, to the product's order point and line point calculations. This adjustment, also known as manual safety stock, is a quantity of stock above your normal stocking level that you have committed to keep on the shelf at a branch for a set period.

  For example, assume the following it true:

- You run a promotion on an item, guaranteeing that you will have it in stock.
- A contractor requests that you keep an item in stock in case he or she needs one in an emergency.
- Your branch utilizes items for its own maintenance and you do not want your use of the items to count towards the item's demand.

  When you assign service stock, the system assigns the additional quantities to the order point and line point calculations. When you reach the expiration date of the service stock the system removes the additional quantities from the order point and line point calculations.

  You can set service stock for a branch or for a customer at a branch using the Product User Control Parameters dialog box.

  Use the **Customer Service Stock** menu option to add customer service stock to the product's normal demand. Customer service stock is a quantity of stock above your normal stocking level that you have committed to keep on the shelf for a set period, as a courtesy to a customer. After entering customer service stock information for a product, the total requirements display in the **CusServ Stock** field. The system adds the additional stock requirements to the product's order point and line point calculations.

The following procedure is a manual process for a single product. Use the Mass Load program to enter inventory parameters to groups of products.

To set User Control Parameters for a product:

1. From the **Maintenance** menu, select **Product** to display the Product Maintenance window.
2. Display a product record.
3. From the **Inventory** menu, select **Primary Inventory Maintenance** to display the Primary Inventory Maintenance dialog box.

4. From the **Edit** menu, select **User Controls** to display the Product User Control Parameters window.
5. Do one of the following:
   - From the **File** menu, select **Hierarchy** to display the Product User Control Parameters dialog box. In the **Enter hierarchy branch** field, enter the branch or territory ID.
   - From the **File** menu, select **Add Branch**. In the **Enter Branch** field, enter the branch or territory ID you want to view.

   Important: Only stocking branches are allowed.
6. Click **OK** to display user control parameters for the selected branch in the Product User Control Parameters dialog box.
7. For each branch or territory, complete the User Control Parameter columns, as needed.

Field	View	Description
Min (ea)	**All**	The estimated minimum quantity to stock: • Purchasing branches use this quantity in place of a calculated order point until the expiration date. • When the **Respect Item Min/Max For Suggested Transfers** control maintenance record is set to **Y**, child branches use this quantity in place of a calculated transfer point until the expiration date. • Enter **0** (zero) if the branch does not stock the item, or enter the actual quantity that should ever be stored at the child branch when using this field with the **Calculate Demand** field.
		If a product has a min setting but no max setting, the order point and the line point quantity are equal to the value in the **Min** field unless the system calculated line point quantity is greater than the minimum. In this case, the system uses the calculated line point quantity. Any child branches inherit the minimum only setting.
		Note: If you use vendor managed inventory and generate EDI 852s, the MIN only should only report if it is greater than the OP. If it is greater than the order point, it should net to the Available and report the difference between the MIN and the available as the quantity reserved (QD). If the order point is 10 and MIN only is 15 and available is 5, then report 10 as quantity reserved (QD). If the order point is 10 and MIN only is 15 and available is 20, then report nothing, as the product has enough available to cover the MIN only.

Field	View	Description
Max (ea)	**All**	The estimated maximum quantity to stock: • Purchasing branches use this quantity in place of a calculated order point until the expiration date. • When the **Respect Item Min/Max For Suggested Transfers** control maintenance record is set to **Y**, child branches use this quantity in place of a calculated transfer point until the expiration date. • Enter **0** (zero) if the branch does not stock the item, or enter the actual quantity that should be stored at the child branch when using this field with the **Calculate Demand** field.
		If a product has a min setting but no max setting, the order point and the line point quantity are equal to the value in the **Min** field unless the system calculated line point quantity is greater than the min. In this case, the system uses the calculated line point quantity. Any child branches inherit the minimum only setting.
Expiration Date	**All**	The date after which the values in the **Min** and **Max** fields are no longer valid. We recommend that you use an expiration date six months from the current date.
Calculate Demand	**All**	To calculate demand from dependent selling branches for use at purchasing branches, select the check box in the selling branch rows; otherwise, leave it empty. If you use a minimum-only order point for your newer products, ensure that the **Calculate Demand** field is deselected. For more information, see Setting Minimum and Maximum Stocking Levels for New Products.
Service Stock	**Service Stock**	The quantity of the product to reserve as service stock.
Service Stock Expiration Date	**Service Stock**	The date the system stops adding the service stock quantity to the product's order point and line points.
Customer Service Stock	**Service Stock**	The system populates this field with the total quantity of service stock reserved for selected customers. The total quantity only includes those quantities within their respective effective date and expiration date. The effective and expiration dates are for reporting purposes only and do not affect automated purchasing or automated transfers. For more information, see Customer Service Stock Report. When a branch or territory appears on the User Inventory Control window without a value in the **CusServ Stock** field, this indicates that a customer contract stock quantity is set. For more information, see Viewing Customer/Vendor Specific Part Number Details. This field is view-only.
Product Lifecycle	**Service Stock**	Select the product lifecycle to classify the product you are adding. For information about product lifecycles, see Creating Product Lifecycles in Product Maintenance.

Field	View	Description
Vendor Return Allowed	**Product Returns**	Select one of the following: • **Always** - Allow returns regardless of return type. • **RGA** - Allow returns only if customer has Return Goods Authorization number provided by the vendor. Users must be assigned the SOE.RGA.REQUIRED authorization key to return any products without an RGA number, but flagged with this setting. • **Never** - Disallows all returns from this vendor. This setting can be used for items like remnants that you cannot take back into inventory. Products flagged as non-returnable are not included in the Suggested PO Return Queue. Users must be assigned the SOE.NONRETURN.PROCESS authorization key to return any products with this setting.
Customer Return Allowed	**Product Returns**	Select one of the following: • **Always** - Allow returns regardless of return type. • **Defective** - Allow returns only if product is broken or otherwise defective. • **Never** - Disallows all returns from this customer. Users must be assigned the SOE.ALLOW.NONRETURN authorization key to return any products with this setting.
Economic Amount	**Product Returns**	Enter the amount below which the system recommends not returning items to inventory. If the value of the item being returned falls short or below this amount, the system recommends the item not be returned to inventory because the processing costs outweigh the actual value of the item. For more information, see Determining the Economic Return Amount in the Purchasing documentation.
Auto Generate Return?	**Product Returns**	Indicate if you want to allow the system to automatically generate a return.
Auto Return Ship Via	**Product Returns**	Select the ship via that the system should use when automatically creating a return for products.
Auto Return Status	**Product Returns**	Select the order status that the system should use when automatically creating a return for products.
Auto Return Days for Ship Date	**Product Returns**	Select the number of days allowed for the customer to return the selected product.

7. Save the information and exit the dialog box.

   Changes take effect when you exit Product Maintenance.

More Options for the Product User Control Parameters Dialog Box

The Product User Control Parameters dialog box also offers these options:

To...	Select this menu option...
view inventory details about the product in all branches	**Inquiry > Inventory Inquiry** The Inventory Inquiry window displays.

To...	Select this menu option...
view information pertaining to the calculation of the product's demand	**Inquiry > Audit** The Demand Calculation Audit dialog box displays.
add the demand history of discontinued products to their replacements	**Additional Controls > Add Demand** The Add Demand dialog box displays.
define hits-related inventory parameters for each branch	**Additional Controls > Hits Maintenance / Max Days Supply** The Hits Control Maintenance dialog box displays.

Adding Demand History to Products

Use the Product User Control Parameters to add demand from one product to another. You can copy existing demand history from one or more products to a new product with the Add Demand window. Demand history can be in units, weight, or load factor depending on the item and need. This choice enables you to create demand history for new product when:

- A new product replaces a discontinued product. You can assume that the demand for the new item is similar to that of the old item. For example, you Product A Model 100 is being replaced by Product A Model 200. Use the demand for the old product to predict the demand of the new product.

  Note: Change the discontinued item's product status to something other than **Stock**. Otherwise, the system continues suggesting that you purchase both items.

- A new product is sold that combines several items. The demand of the multiple products is totaled and added to the new product. For example, you sell individual tools. You now provide three tools in a one set. Use the demand for the individual tools to calculate the history for the set.
- You must know how much material one product uses from its component parts. Copy the demand history based on the relationship between the components over to the finished product. For example, you must know how much sheet metal to order to manufacture duct work. By combining the monthly demand in weight of your duct-work components, you can estimate how much sheet metal you need each month.

Use the Add Demand dialog box to:

- Add the demand history of one or more discontinued products to their replacement.
- Add a product's demand history in one branch to another branch.
- Add or subtract a customer's demand history from one product to another.

To add demand history to a product:

1. From the **Maintenance** menu, select **Product** to display the Product Maintenance window.
2. Display a product record.
3. From the **Inventory** menu, select **Primary Inventory Maintenance** to display the Primary Inventory Maintenance dialog box
4. From the **Edit** menu, select **User Controls** to display the Product User Control Parameters dialog box.
5. From the **File** menu, select **Hierarchy** to display the Product User Control Parameters dialog box.
6. In the **Enter hierarchy branch** field, enter the branch or territory ID.
7. Click **OK** to display user control parameters for the selected branch in the Product User Control Parameters dialog box.
8. From the **Additional Controls** menu, select **Add Demand** to display the Add Demand dialog box.

   Note: Use the **Branch Fields Required To Add Product Demand** control maintenance record to limit the branch fields you want the Add Demand program to use.

9. In the **Include the following products' demand with the product above based on** field, enter one of the following measurement types:
   - **Units** - Includes demand based on the number of items.
   - **Weight** - Includes demand based on the weight, in pounds, of the item.
   - **Load** - Includes demand based on the load factor for the item.
10. Complete the following fields for each product from which to add demand:

Field	Description
Products	The product from which to copy demand history to the new product Use the **Do Not List Item More Than Once On Add Demand Screen** to indicate if you want to list products more than once on the Add Demand window.
Expire Date	The date after which to stop adding the demand of the product to the demand of the new product.
To Branch	The branch that will use the demand history.
From Branch	The branch from which to obtain the demand history.
Add PIL	Select if you want the projected inventory level (PIL) of the old product to flow through to the replacement product. When you add the demand of another product to a new or replacement product that has no inventory, the system purchases the replacement product before you have sold off what is left of the old product. Using the **Add PIL** option stops the replacement product from being suggested to purchase. As the PIL of the old product is reduced then the replacement product comes up to purchase once it is below the order point. **Note:** The PIL of the replacement product displays in bold after selecting this option.

11. Add or change a customer's demand for a product, as needed.
12. Save the information and exit the dialog box.

Changing Customers' Demand for Products

When customers change their buying habits, the change can affect product demand. If a customer must change to a new model of product either by choice or by necessity, the customer can lose that buying history and thus effect demand. Update the customer's demand for the products using the Add Demand feature in Product Maintenance.

For example, if a customer decides to start purchasing Brand A rather than Brand B products, you want to add the demand of Product B to Product A to assist the demand calculation. Or if a customer decides to purchase products from a different branch, you want to add the demand of those products from the old branch to the new branch.

To change a customer's demand for a product:

1. Add demand history to the product.
2. From the **File** menu, select **Customer Demand** to display the Add Demand Customer Information dialog box.
3. Complete the following fields for each customer:

Field	Description
Customer	The customer whose demand you are adding to or subtracting from the product.
Option	Enter one of the following: • **Add** - Adds the customer's demand for the selected product to the new product's demand. • **Sub** - Does not add the customer's demand for the selected product to the new product's demand.

4. Click **OK** to save the information and exit the dialog box.

Viewing Contract Stock Quantities

You can view customer or vendor contract quantities and their effective dates on the Product Inventory Customer Service Stock window.

A customer or vendor can have contract quantities independent of service stock quantities. The system does not add contract quantities to the demand calculation; they are used for reporting purposes only.

Assign contract stock quantities using the Customer/Vendor Part Number Detail window.

Use the Customer Service Stock report to track demand for contract quantity items that have not expired.

To view contract quantity information for a product:

1. Set user control parameters for a product.
2. In the Product User Control Parameters dialog box, select a branch, and, from the **Additional Controls** menu, select **Customer Service Stock** to display the Product Inventory Customer Service Stock dialog box.

   The system populates the **Customer Service Stock** field with the total quantity required by customers.
3. Under the **Contract** heading, review the following:

Column	Description
Customer	The customer assigned the contract stock quantities.
Quantity	The contract quantity. This field is for reporting purposes only.
Effective Date	The date the contract goes into effect. This field is for reporting purposes only. It does not affect automatic purchasing or automatic transfers.
Expire Date	The date the contract expires. This field is for reporting purposes only. It does not affect automatic purchasing or automatic transfers.

   As contract quantities are for reporting purposes only, the system does not include them in the customer service stock totals in the **Customer Service Stock** field of the Product User Inventory Controls window.
4. Click **OK** to save the information and return to the previous dialog box.

Adding Demand from Dependent Selling Branches to Purchasing Branches

A dependent selling branch is a branch that does not warehouse the stock that it sells. Instead, it relies on a separate purchasing or warehousing branch to ship items that the selling branch has sold to customers. For example, your selling branch is a showroom branch without a warehouse. When you sell items, your purchasing branch or warehousing branch is responsible for shipping or transferring those items "as needed."

- If a selling branch does not stock an item, but transfers it in "as needed" to fulfill a customer request, you will want to add the demand to the purchasing branch. If the Min/Max settings are less than the actual demand in the selling branch, the purchasing branch buys and keeps in reserve sufficient inventory based on demand and transfers it to the selling branch.
- If the selling branch is closing out of the item at their location, you would not want to add the demand to the purchasing branch. If the Min/Max settings are more than the actual demand in the selling branch, the purchasing branch buys and keeps in reserve the specified amounts.

To add demand from a selling branch to a purchasing branch:

1. From the **Maintenance** menu, select **Product** to display the Product Maintenance window.
2. Display a product record.
3. From the **Inventory** menu, select **Primary Inventory Maintenance** to display the Primary Inventory Maintenance dialog box
4. From the **Edit** menu, select **User Controls** to display the Product User Control Parameters dialog box.
5. From the **File** menu, select **Hierarchy** to display the Product User Control Parameters dialog box.
6. In the **Enter hierarchy branch** field, enter the branch or territory ID.
7. Click **OK** to display user control parameters for the selected branch in the Product User Control Parameters dialog box.
8. Complete the following fields:

Field	Setting
Min	Enter the actual quantity that should ever be stored at the child branch when using this field with the **Calc Dmnd** field. In this case, the minimum value must equal the maximum value.
Max	Enter the actual quantity that should ever be stored at the child branch when using this field with the **Calc Dmnd** field. In this case, the maximum value must equal the minimum value.
Expiration Date	Leave blank.
Calculate Demand	To include sales of the item at the selling branch in the calculation of demand at the purchasing branch, select the check box; otherwise, leave it blank. Use this option for situations wherein a selling branch does not normally stock an item, but transfers the item in as-needed from another location.

Field	Setting
	For example, if the Min/Max settings are less than the actual demand in the baby branch, select the check box so the purchasing / parent branch buys and keeps in reserve sufficient inventory based on demand and transfers it to the child branch according to Min/Max.
	If you use a minimum-only order point for your newer products, ensure that the **Calculate Demand** field is deselected. For more information, see Setting Minimum and Maximum Stocking Levels for New Products.

9. Save the information and exit the dialog box.

   Changes take effect when you exit Product Maintenance.

Estimating Demand for New Branches

When you add a new branch to your company, you must estimate demand for the products sold at the branch. There are two ways to add demand for a new branch:

- If you expect the new branch to be similar to an existing branch, you can add the product demand history of another branch to the new branch.
- If you do not have suitable product demand to use for the new branch, you can set minimum and maximum stocking levels for products at the branch.

Setting Minimum and Maximum Stocking Levels for New Products

Until a new product accrues enough demand history for the system to begin forecasting demand, you can enter estimated minimum and maximum stocking levels for the product. You can also set an expiration date, after which the system stops using estimated stocking levels for suggested purchasing. On this date, the system begins forecasting demand using the accumulated demand history and established order points and line points.

> **Note:** You can set a minimum-only order point for a product to make sure the system uses the largest line point available. If you use a minimum-only order point, ensure that the **Calculate Demand** field is deselected.

The following procedure is a manual process for a single product. Use the Mass Load program to enter minimum and maximum levels for all the products in a buy line.

To set minimum and maximum levels for suggested purchasing of a new product:

1. From the **Maintenance** menu, select **Product** to display the Product Maintenance window.
2. Display a product record needing minimum and maximum stocking levels.
3. From the **Inventory** menu, select **Primary Inventory Maintenance** to display the Primary Inventory Maintenance dialog box.
4. From the **Edit** menu, select **User Controls** to display the Product User Control Parameters dialog box.
5. From the **File** menu, select **Hierarchy** to display the Product User Control Parameters dialog box.
6. In the **Enter hierarchy branch** field, enter the branch or territory ID.
7. Click **OK** to display user control parameters for the selected branch in the Product User Control Parameters dialog box.
8. Complete the following fields:

Field	Description
Min	Enter the estimated minimum quantity to stock. • Enter **0** (zero) if the branch does not stock the item. • Purchasing branches use this quantity in place of a calculated order point until the expiration date. • When the **Respect Item Min/Max For Suggested Transfers** control maintenance record is set to "Y" child branches use this quantity in place of a calculated transfer point until the expiration date. • Enter the actual quantity that should ever be stored at the child branch when using this field with the **Calc Dmnd** field.
	If a product has a minimum setting but no max setting, the order point and the line point quantity are equal to the value in the **Min** field unless the system calculated line point quantity is greater than the min. In this case, the system uses the calculated line point quantity. Any child branches inherit the minimum only setting.

Field	Description
Max	Enter the estimated maximum quantity to stock. • Enter **0** (zero) if the branch does not stock the item. • Purchasing branches use this quantity in place of a calculated line point until the expiration date. • When the **Respect Item Min/Max For Suggested Transfers** control maintenance record is set to "Y" child branches use this quantity in place of a calculated surplus point until the expiration date. • Enter the actual quantity that should ever be stored at the child branch when using this field with the **Calc Dmnd** field.
	If a product has a minimum setting but no max setting, the order point and the line point quantity are equal to the value in the **Min** field unless the system calculated line point quantity is greater than the min. In this case, the system uses the calculated line point quantity. Any child branches inherit the minimum only setting.
Expiration Date	The date after which the system no longer uses the values in the **Min** and **Max** fields. We recommend using six months.
Calculate Demand	Indicates whether to calculate demand for dependent selling branches. If you use a minimum-only order point, ensure that the **Calculate Demand** field is deselected.

9. Enter service stock parameters, if needed.
10. Save the information and exit the dialog box.

    Changes take effect when you exit Product Maintenance.

Defining the Maximum Day's Supply for Products

Define a maximum number of days' supply of a product that your company permits to be maintained in inventory. Defining a maximum number of days' supply keeps your inventory at an efficient level so that you do not keep unnecessary stock in your warehouse.

The system checks whether a product's current maximum days' supply is greater than a limit set for the individual product, buy line, or all products. This check also prevents you from bringing unnecessary stock into your warehouse and moving inventory in quantities greater than what you sell. The system makes this check whenever a product is placed on an sales order, purchase order, transfer order, or inventory adjustment.

The system uses the following calculation to determine the product's projected maximum days' supply:

> Product Projected Maximum Days' Supply = Product's projected inventory level (PIL) / Demand per day

You can define maximum days' supply at three levels:

- **Branch** - Applies to all products, unless overridden at the buy line or product level. The **Maximum Days Supply** control maintenance record defines the maximum days' supply default for each branch. The branch default is used when products do not have maximum days' supply set at the product or buy line level.
- **Buy Line** - Applies to all products assigned to the defined buy line, unless overridden at the product level. The buy line level overrides the branch default parameters.
- **Product** - Applies to the defined product and overrides the buy line and branch default parameters. The maximum days' supply checking logic does not apply to products with a status of MiscCharge.

When an item is added to a transaction, the system checks the PIL. If an item fails the check, the system warns that you are about to affect inventory levels set to the maximum days' supply limit. The warning displays the item's part number, description, PIL, daily demand, and its projected maximum days' supply.

If you have the corresponding PIL override authorization key (AOE.PIL.DAYS.OVRD, POE.PIL.DAYS.OVRD, SOE.PIL.DAYS.OVRD or TOE.PIL.DAYS.OVRD) assigned, the message has a **Continue (Y/N)** prompt. Otherwise, the message prompts you to enter the password of another user who is authorized to override the maximum days' supply limit.

For example, you set the system default for maximum days' supply to be 456. Product A has a daily demand of 0.03 and a PIL of 12. The system calculates that the maximum days' supply is 400. This product is not in violation of the maximum days' supply limit. A purchasing agent attempts to meet a vendor target by manually adding 3 more of Product A to a purchase order. Product A's PIL increases to 15 and its maximum days' supply to 500. The system warns the purchasing agent that including this product on the purchase order in this quantity violates the maximum days' supply limit.

If an item is removed from a transaction, or the transaction is deleted, the system compares the PIL at the time of the removal or deletion to a stored PIL. If the removal or deletion does not make the PIL higher than it was at the time of the addition, no maximum days' supply warning displays.

To define the system default maximum days' supply:

1. From the **System > System Files** menu, select **Control Maintenance** to display the Control Maintenance window.

2. In the **Keyword** field, enter **max day supply** to display the Maximum Days Supply control maintenance record window.
3. Double-click the description to display the Maximum Days Supply window.
4. In the **Branch/Territory** field, enter the branch or territory you want to select. Enter **All** to select all branches and territories. The default is All.
5. For each branch, enter the maximum days' supply that your company permits to be stocked for all products in the warehouse.

   Note: We recommend setting the system default to 99999. This causes the system to warn users when they attempt to purchase or transfer nonstock items that have a daily demand of 0.

6. Click **Save** to save changes and exit the screen.

To define the maximum days supply for a product:

1. From the **Files** menu, select **Product** to display the Product Maintenance window.
2. Select a product.
3. From the **Inventory** menu, select **Primary Inventory Maintenance** to display the Primary Inventory Maintenance window.
4. From the **Edit** menu, select **User Controls** to display the Product User Controls Parameter window.
5. From the **Additional Controls** menu, select **Hits Maintenance / Max Days' Supply** to display the Hits Control Maintenance window.
6. In the **Central Warehouse Type** field, enter **Top-Down** or **Bottom-U**p to define which type of warehouse you are working with.
7. Use the **Find** menu as necessary to locate a branch that is in the list, but not in the viewable area, add a branch or territory to the list, or remove a branch or territory from the list. Select the branch to which you need to make changes.

   Note: The new branch or territory inherits the settings of the previous entry.

8. In the **Max Days Supply** field for a branch or territory, enter the maximum days' supply of the product that your company permits to be stocked in the warehouse.
9. Set hits control parameters, as needed
10. Press **Esc** to save changes and exit the screen.

Product Ranking Overview

Use the Product Ranking program to analyze the activity of a product, including dynamic kits, in each branch of your company. Product Ranking is used to compare the activity of a product against all other products within the same price line, a group of price lines, or all price lines. Product ranking is a way to label all your products as to their relative impact to sales, inventory, and purchasing activities. Product ranking is calculated by the system based on the parameters set. For more a breakdown of the parameters in the system, see Product Ranking Method and Breakpoint Rules .

When you run the ranking program, the system sorts the products according to the ranking method and then ranks the products according to the percentages defined as the ranking breakpoints. The system makes a pass through each branch for each ranking method and populates the Rank Maintenance information for each product based on the parameters you define. Adjust product ranks in Rank Maintenance in Product Maintenance, if needed. You can also relabel rank IDs, if needed depending on your business needs.

Note: The product ranking program updates records for only active branches. If the system finds a record for an inactive branch, then the system deletes that record.

A product has an X ranking in the following circumstances:

- The product is a kit (not a dynamic kit). The true rank value is at the products that make up the kit.
- The product has been set for deletion.
- The product has a product status of MiscChrg.
- The product has been set for purging.
- The product is a non-stock and the Product Ranking program excluded non-stocks from the ranking process.

The Product Ranking program, in conjunction with the Update Demand program, provides tools to help you decide how best to price your products. Using a matrix cell, you can detail product pricing based on product velocity.

Important: Due to lengthy run times, we recommend updating demand and updating product ranking on different days.

This section discusses the following topics:

- Product Ranking Method and Breakpoint Rules
- Viewing Product Ranks
- Running the Product Ranking Report
- Product Ranking Information Uses
- Using the Product Ranking Program

Product Ranking Method and Breakpoint Rules

Use the Product Ranking program to compare the activity of a product against all other products within the same price line, a group of price lines, or all price lines. Ranking methods for your product files depend on your company's needs. After you have determined the ranking methods and breakpoints, you can generate the Product Ranking Report.

You can use different ranking methods at different branches. You can use all of these methods or just the ones that meet your company's needs.

Ranking Method	Description
Monthly Demand	Average monthly usage in units.
$ Demand (Dflt COGS)	Dollar demand with respect to cost (unit demand times the cost of goods sold cost) over the course of 365 days.
Gross Sales $ (12 Mths)	Gross sales dollars in the past 365 days.
Hits	Number of times the product was sold over the course of 365 days.
Gross Profit $ (12 Mths)	Gross profit dollars in the past 365 days.

Entering ranking methods in a descending order of importance is most effective, because the Inventory Inquiry window only displays the rank corresponding to the first three ranking methods. Descending order displays the highest percentage of products first.

In addition, the Suggested P/O report only displays the rank corresponding to the first two ranking methods for a product that is listed on the report. If the items are listed in descending order, then the most needed items display as purchasing suggestions.

Note: The system allows user-defined product ranks, if you need to map a specific character or number to a product rank.

Incorporating Breakpoints

After you decide what kind of methods to rank products with, then determine the percentage you attach to a Rank ID. After identifying what you want to track for each ranking, you need to decide how to break your products into groups for each rank you identified.

For example, consider that you rank 100 percent of your products. You can set Rank IDs to track product issues, or methods, as follows:

Rank ID	Rank Method
Rank # 1	Hits
Rank # 2	Demand
Rank # 3	Demand $ (Dflt-COGS)
Rank # 4	Gross Sales $ (12 Mths)
Rank # 5	Gross Profit $ (12 Mths)

Ranking methods are typically specified in a descending order, however this is not required.

Important: You can create user-defined ranks, if you want to label your ranks differently.

The following percentages reflect the normal industry convention for ranking breakpoints called the 80/20 rule. This rule says that 20 percent of your products accounts for 80 percent of your sales:

Rank ID	% of Total Products
A	80%
B	15%
C	4%
D	1%
E	0%

When the ranking program runs, the system selects those products that meet the selection criteria specified for price lines and stock/nonstock items. After items are selected then the products are ranked for each specified ranking method according to the ranking breakpoints defined. For example, using the methods defined above, a product could have an A rank due to Hits, but a C rank due to Dollar Demand. View the ranking by individual product on the Product Ranking Maintenance window from Product Maintenance.

Note: Normally, the system compares product activity within a price line. If the ranking is done globally, the system compares each product's activity against the activity of all other products, regardless of price line.

Individual versus Collective Ranking

Indicate whether to rank the products Individually or Collectively.

If you rank *individually*, product amounts within each branch are considered separately from every other branch when calculating product ranks.

If you rank *collectively*, product amounts for all branches are combined before calculating product ranks. If ranked collectively, products then would be assigned the same rank in each of the branches selected.

Global versus Non-Global Ranking

When creating a new Ranking ID, you have the option of selecting how you want the program to rank the products: globally or non-globally. The default entry is **No**.

If set to **No**, items are ranked with respect to the products in the same price line. Select No if you want items to be compared within the same price line for specific purposes, such as markup on slow moving items.

If set to **Yes**, products are ranked with respect to all other selected products, regardless of price line. For example, if you selected Moen and Delta price lines, products within the Moen price line are ranked against the products in the Delta price line. Use **Price Lines** function to update this list. Select Yes if you are looking at overall inventory analysis. In addition, when the ranking method displays for the indicated branch on the Ranking window from Price Line Maintenance *Global* displays with the indicated rank.

Changing Product Ranking

You can manually change product ranking for any of your branches when necessary. For example, a customer purchased a large volume of a D-ranked product in one day, turning the product into an A-ranked product. You can manually change the rank back to D to reflect the product's true sales volume. Use the Product Rank Maintenance window to make manual changes. For more information about changing ranks on products, see Changing Product Ranking.

Using a Template

We recommend using the 80, 15, 4, and 1 template, which is the normal industry convention for ranking breakpoints. This convention reflects the 80/20 rule, that says 20 percent of your items account for 80 percent of your sales.

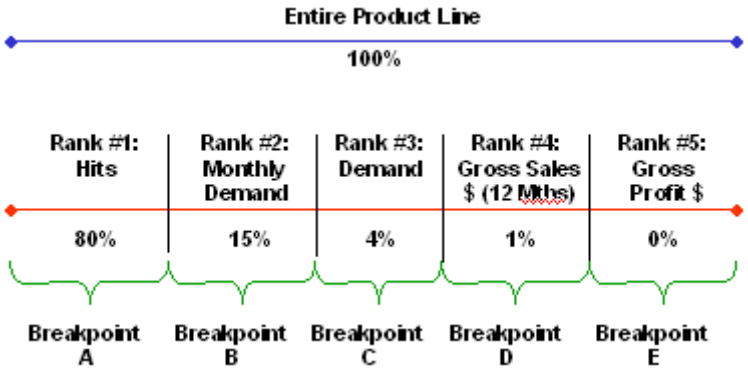
With these breakpoints, the items that contribute to the top 80 percent of the value, or the top 20 percent of your items, of the ranking category are A items. The items that comprise the next 15 percent are B items. The items that make up the next 4 percent are C items and the items that contribute to the last 1 percent are D items. You cannot go over 100% because anything greater than 100 percent has no rank. See the example below.

After specifying a new template name, the default numbers are cleared. Enter the same or other numbers that reflect your ideas about ranking breakpoints. You can assign up to seven ranks. The total of the percentages should not exceed 100. Anything greater than 100% has no rank.

We recommend that you use all the product ranking methods in the order that best suits your company's needs. However, when using multiple Ranking IDs, be consistent with the order of the ranking methods.

An Example

Five ranking methods and ranking breakpoints have been selected in the example below.



Product Ranking Information Uses

You can use product ranking information in several areas of your business:

- Warehousing
- Purchasing
- Pricing
- Inventory Management

Warehousing

The more times you pick a product, the more accessible it has to be. Therefore, high selling items have a higher ranking. You can set up your inventory location by Rank ID. higher selling items would need a more convenient and accessible storage location.

Purchasing

The more you sell a product, the more important it is that you never run out of it.

The product ranking information on the Suggested P/O Report and the Suggested P/O Detail Queue helps you decide which products to order, transfer, or procure.

The report and the queue display:

- The most recent ranks calculated for the first two ranking methods for a product in the buying branch on the report.
- The most recent ranks calculated for all five ranking methods for a needed product when it is in surplus at another branch.

If two branches have a surplus of this product, transfer the product from the branch for which this product has the lowest rank. Use the Transfer Surplus Queue to convert the suggestion to transfer purchase orders.

Pricing

Use product ranking information with the product velocity pricing function in Assigning Rank in Product Velocity Pricing. This function lets you fine tune the pricing of the products in a matrix cell with respect to the ranking of those products.

Use the product velocity function to be competitive when needed and to try to make more money on the items that do not have to be competitive. Assign an additional price break to faster moving items and progressively raise the price for slower moving items, according to their rank.

For RF Receiving and PutAway, you can display product ranks on the RF window to provide guidance when changing locations for items being put away. Move products with a high ranking closer to the shipping area. For more information, see RF Warehouse Management Overview.

Inventory Management

Manage your inventory in conjunction with Purchasing.

Inventory GMROI Report

The Inventory GMROI Report displays the first three product rankings, based on the selected product ranking categories, for the product for each branch. For more information, see GMROI Overview.

Cycle Counting

When doing a cycle count, you can limit the count to items with certain product ranks. For more information, see Counting Inventory Overview.

Viewing Product Ranks

You can view the program results for a product's latest product ranking from several windows.

- Product Maintenance
- Inventory Inquiry
- Price Line Ranking
- Product Ranking Report

To view a ranking in Product Maintenance:

1. From the **Maintenance** menu, select **Product** to display the Product Maintenance window.
2. From the **Pricing** menu, select **Product Price Maintenance**, enter the product ID for which you want to view the rank.
3. From the **Pricing** menu, select **Ranks** to display the Rank Maintenance window.
4. In the **Branch/Territory/All** filed, enter the branch or territory for which you want to display the rank information.

   The results of the last ranking that affected the specified product display. The rankings are dependent upon the criteria assigned to the Ranking ID that was used to run the ranking.
5. Save your changes and exit the window.

To view a ranking on the Inventory Inquiry window:

1. From the **Orders > Inquiries** menu, select **Inventory Inquiry** to display the Inventory Inquiry window.
2. In the **Product** field, enter the product for which you want to display the rank information.

   For each warehouse branch the Rank column displays the product's most recent ranks for the first three ranking methods.
3. Exit the window.

To review a product ranking on a price line:

1. From the **Maintenance > Price Maintenance** menu, select **Price Line** to display the Price Line Maintenance window.
2. In the **Price Line ID** field, enter the price line for which you want to display the rank information.
3. From the **Edit** menu, select **Ranking** to display the Price Line Ranking dialog box.

   For each branch, the ranking method used for each Rank # and the date and time the last ranking was done and the user who ran it displays.
4. Click **OK** to exit.
5. Exit the window.

Using the Product Ranking Program

Normally, the system compares product activity within a price line. If the ranking is done globally, then the system compares each product's activity against the activity of all other products, regardless of price line. By default, the program runs for all price lines. Before running the Product Ranking program you need to determine how to rank the products and save the parameters.

If you manually change a product rank through Product Maintenance, you have the option of maintaining or overwriting that rank when you run the Product Ranking program. The system prompts you with the following: Overwrite Manually Set Product Ranks (Y/N). Enter **Yes** to complete the override.

> **Note:** If a product has been ranked Collectively, the system does not delete the ranking even if the product is inactive for that branch.

For more information about how the system uses methods and breakpoints in the system, see *Product Ranking Method and Breakpoint Rules*.

The Product Ranking program provides the following information:

Column	Description
Rank	The sequential position of the item within the selected items.
Rank%	The rank divided by the number of items being ranked times 100. Formula: (rank / #of items) x 100 = Rank%
Cum-Value%	The percentage of the cumulative value divided by the total value. Formula: cum-value / total value = Cum-Value%
Cum-Value	Running total of the actual value.
Product Description	The product being ranked.

Miscellaneous charges and purge items are excluded from the rank calculation and items with a negative GP$ are considered zero.

Generating the Product Ranking Report

Use the Product Ranking program to run the Product Ranking Report. This report is more like an audit and lists what the percentage of items is in each rank and the value of each breakpoint. Use this information to determine how and why your products are currently ranked the way they are, answering the question: *Where did this product rank come from?*

To create a report from the Product Ranking Program follow the procedure below and change the **Generate Report** selection to **Yes**. The system saves this setting. The next time you run the program, you must change it back to **No** to rank your products without running the report.

For more information, see What the Report Shows below.

To run the Product Ranking Report:

1. From the **Purchase > Forecasting** menu, select **Product Ranking** to display the Product Ranking Report window.
2. In the **Ranking ID** field, select the ranking ID to include in the report. The system populates the current methods and breakpoints saved for that ranking ID.

3. Update the remaining fields, as needed:

Field	Description
Branch/Territory	Lets you rank products in a particular branch, branches, or territories. The results of the ranking process are always displayed on a branch-by-branch basis.
Ranked	Indicate whether to rank the products **Individually** or **Collectively**. • **Individually** - Product amounts within each branch are considered separately from every other branch when calculating product ranks. This is the default. • **Collectively** - Product amounts for all branches are combined before calculating product ranks. If ranked collectively, products would consequently be assigned the same rank in each of the branches selected.
Nonstocks	Specify whether to **Include** or **Exclude** product ranking for nonstock products. • **Include** - If a nonstock is selling often enough to earn a high ranking, you can consider changing it to a stock item so you do not run out of it. This is the default. • **Exclude** - The product is not included in the ranking process. For companies that do not rank nonstocks, this guarantees that ranked stock items that are changed to nonstock items do not retain their rank after the ranking program runs. • **Only** - Apply parameters or run for *only* nonstock items.
Generate Report	Select one of the following • **Yes** - The system applies rankings and methods and creates a report to send to your hold file. You may need to set options for the report before running it. If the Ranking Method uses multiple branches and is ranked individually, a separate report for each branch prints. If the method used to rank products is set to Collectively, a single report prints for all branches because the products received the same rank at all branches. Item rank displays on the report next to rank number. • No - The system applies rankings and methods without creating a report. This is the default. Generally, users only want to apply ranking changes and not run a new report.

4. Use the **Ranking Method** and **Ranking Breakpoints** areas to limit the report:

Area	Description
Ranking Method	Select the ranking method used to rank the products, such as by demand or by total raw hits. You can also apply any user-defined ranking methods created. **Note:** In the **Global** field, for each ranking number, indicate whether to use global ranking. If set to **No**, items are ranked with respect to the products in the same price line. If set to **Yes**, products are ranked with respect to all other selected products, regardless of price line.
Ranking Breakpoints	Enter the percentages assigned to each product rank in the **Rank As** column. The total percentage must add up to 100. You can also apply any user-defined breakpoints created. **Note:** If you change or add user-defined product ranks or methods, you must reschedule the report so the system applies the changes.

5. Do one of the following:
   - From the **File** menu, select **Save** to save your rankings and methods.
   - From the **File** menu, select **Begin** to rank you products or run the report immediately.
   - From the **Options** menu, select **Schedule** to set the program to run at a later date or at regular intervals.

To delete a product ranking ID:

1. From the **Purchase > Forecasting** menu, select **Product Ranking** to display the Product Ranking window.
2. In the **Ranking ID** field, select the product ranking template you want to delete and press **Enter**.
3. From the **File** menu, select **Delete** and answer **Yes** at the prompt.

What the Report Shows

The Product Ranking Report lists the following fields and information. The report is used like an audit to figure out why your products are ranked the way they are.

Normal Report View

The following columns display regardless if you have advanced ranks or breakpoints. These column names display at the top of the report in the header. They line up with the values when normal report values display for a ranking method.

Column	Description
Cum-Value%	The percentage of the cumulative value divided by the total value. Formula: cum-value / total value = Cum-Value%
Value	Individual value of the item.
Cum-Value	Running total of the actual value.
Rank	The sequential position of the item within the selected items.
Rank%	The rank divided by the number of items being ranked times 100. Formula: (rank / #of items) x 100 = Rank%
Product Description	The product being ranked.

Advanced Report View

The advanced report view is written as an audit and describes *why* a ranking displays as it does. The system lists each ranking method, such as *#1 Ranking Method: Annualized Hits for the Year* and its ranking information separately.

For example:

```
Advanced Ranking - Value Match : B PRODUCT 5/6 WGHT SPECIAL 120082
Product Ranking = 'C' because an Annualized Hits for the Year of 80 is
greater than or equal to 50 AND is less than 100
```

The product ID number listed with each product is a link that you can select to display information about, such as inventory history or product ledgers. For more about how report interfaces work, see Drilling Into Report Data.

Creating User-Defined Product Ranks

Product Ranking is used to compare the activity of a product to all other products within the same price line, a group of price lines, or all price lines. By default, the system sets product ranks and uses the default methods: demand, hits, gross sales, etc. However, you can map conversions to each rank and create user-defined labels for the product ranks based on the breakpoints you have defined.

For example, you have Rank #2 set up to read the Demand. You have the breakpoints set to list all items in the top 20% as A items. However, you want the system to list those items as a 1 (one) on reports instead of an A. Set up your conversion table with the Rank Item and UD Rank appropriately:

Note: You can map any alphabetical character or single-digit number to your rank levels.

Use user-defined product ranks in conjunction with user-defined product breakpoints to tailor your ranking and best suit your warehouse set up.

To create a user-defined product rank:

1. From the **Purchase > Forecasting** menu, select **Product Ranking**.
2. In the **Ranking ID** field, enter the rank to which you want to add user-defined ranks and press **Enter**.
3. In the **Ranking Method** area, right-click on the method you want to update and select **Edit User-Defined Mapping**.
4. Use the **Item Rank** and **UD Rank** columns to map the rank and character.
5. Save your changes and exit the window.

   The system automatically displays an indicator when a user-defined rank exists: .

   Note: After making changes you must reschedule the Product Ranking Program for the system to apply the changes.

Creating User-Defined Breakpoints

Product Ranking is used to compare the activity of a product to all other products within the same price line, a group of price lines, or all price lines. By default, the system sets product ranking breakpoints by percentage only. These breakpoints are displayed in the **Ranking Breakpoints** area of the Product Ranking Report. These percentages apply to all product ranking methods. You can adjust the percentages, as needed. However, if the percentages alone do not assist your forecasting, you can add breakpoint rules to include ranges and percentages of totals to further define each rank.

For example, Rank#1 is set to Hits. However, the standard breakpoints based on the cumulative % might not be what you consider an ”r;A” ranked item. The low moving line could have an ”r;A” ranked item with just six (6) hits for example, based on the cumulative %.

With the *Advanced Ranking* you can set a different rule for each rank. If a rule is not set, the system uses the standard break points. In the example of Hits, a user can specify the absolute value for the number of hits required for a product to be classified as an ”r;A” ranked product. For example, a rule for Hits could be that ”r;A” ranked products must have 50 or more hits ***or*** 20% of the cumulative and still have at least 30 hits. The additional ”r;or” statement adds additional flexibility to this and does not have to be used.

The system uses standard product ranks or any user-defined ranks you have defined. Any user-defined breakpoints override the **Ranking Breakpoints**. Use user-defined product ranks in conjunction with user-defined product breakpoints to tailor your ranking and best suit your warehouse set up.

To create a user-defined breakpoint:

1. From the **Purchase > Forecasting** menu, select **Product Ranking**.
2. In the **Ranking ID** field, enter the rank to which you want to add user-defined ranks and press **Enter**.
3. In the **Ranking Method** area, select the method you want to edit and from the **Edit** menu, select **Edit Advance Ranking Breakpoints** to display the Advanced Ranking for <method> window.

   You can also right-click the method you want to update and select **Edit Advance Ranking Breakpoints**.
4. Use the columns to add or adjust the column values to refine your selected rank.

   Note: Alt-Delete clears the values in the table for the line the cursor is on.
5. Save your changes and exit the window.

   The system automatically displays an indicator when a user-defined breakpoint exists:.

   Note: After making changes you must reschedule the Product Ranking Program for the system to apply the changes.

How Projected Services Levels Work

A *service level* refers to the amount of stock you want to guarantee to be in your warehouse at a given time. The *safety factor* is a quantity added to the normal stocking level of a product for a period of time. These are both used to determine a projected service level, meaning how much you need to purchase to purchase to ensure you are replenishing your warehouse regularly enough to keep merchandise on the shelves for purchase.

For example, you have a hardware store and want AA batteries to be available 99.9% of the time. You make the AA batteries an A Ranked product with a service level of 99.9% and therefore a safety factor of 3.72. The system uses the calculated safety factor to determine the amount of safety days needed to provide the desired service level.

The *service level* and *safety factor* are mutually dependent. Changing one field changes the other field's value also. If projected services levels are uploaded using mass Load, then the system adjusts the safety factors to match.

To see how service levels are calculated and examples of corresponding safety factors, see *Service Levels and Related Safety Factors* section in the *About Service Level Numbers and Standard Deviation* topic in this documentation.

As of Release 8.0, you can edit the **Project Service Level** field. The enables purchasing agents to rank products, as needed, and mass load projected service levels by product rank. As of Release 8.6.7, these uploads can be automated: service levels adjust based on product rank changes.

For example, you can define a table of all your ranking combinations considering 1 to 2 different ranks and load the corresponding service level:

Example 1:

If Rank #1 = A, then SL is 90.0 %

If Rank #1 = B, then SL is 85.0 %

Example 2:

If Rank #1 = A and Rank #2 = 1, then SL is 93.5 %

If Rank #1 = B and Rank # 2 = 1, then SL is 87.5 %

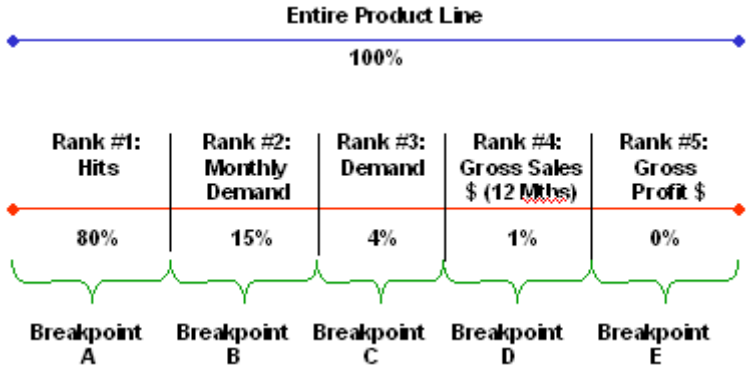
The Rank #2 of 1 is a user-defined rank.

Once defined, you can update projected service levels by ranks, as needed. For more information and examples, see *Updating Projected Service Levels by Ranks* in this documentation.

Product Ranking Examples

Following are examples for how you can setup your product rankings. After determining your ranking methods and breakpoints, you can decide how you want to rank your products and how many ranks you want to use.

In this example, five ranking methods and ranking breakpoints have been selected in the example below.



Example 1 - A and B Level Rankings Only:

You run your Product Ranking program and are ready to update product service levels. You set your ranks as follows:

Service Level by Rank

Rank#1	Rank#2	Rank#3	Rank#4	Rank#5	Service Level
A					90.0
A	1				93.5
B					85.5
B	1				87.5

This means, if a product has an A ranking, then the service level is set to 90%. However, if the product is A-ranked, but has a user-defined level of 1 for Hits, then the service level is set to 93.5.

Additionally, if a product has an B ranking, then the service level is set to 85.5%. However, if the product is B-ranked, but has a user-defined level of 1 for Hits, then the service level is set to 87.5.

Example 2 - A, B, and C Rankings:

Service levels and ranking tools can be used in combinations.

If Rank #1 is...	and Rank #2 is...	then apply the following service level:
A		90.0%
A	**A**	85.5%
A	**B**	80.0%
B		70.0%
B	**A**	75.5%
C		60.0%

If Rank #1 is...	and Rank #2 is...	then apply the following service level:
Null		

In this example, the product's service level is determined as follows:

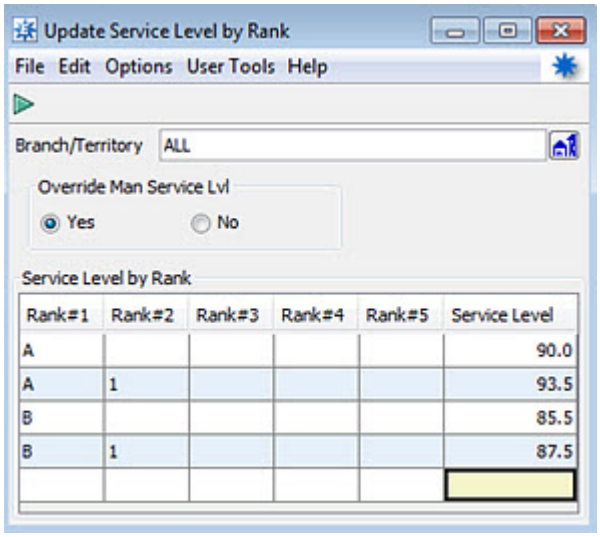
- If Rank#1 = A and Rank #2 = anything other than A or B, then the service level is 90%.
- If Rank#1 = A and Rank#2 = A, then the service level is 85.5%.
- If Rank#1 = A and Rank#2 = B, then the service level is 80%.
- If Rank#1 = B and Rank#2 = anything other than A or B, then the service level is 70%.
- If Rank#1 = B and Rank#2 = A, then the service level is 75.5%.
- If Rank#1 = C and Rank#2 = anything else, then the service level is 60%.

With this setup, you can see that if you do not have Eclipse checking second-level rankings, then your service levels can be very different. We recommend running this utility after your product ranks are updated.

Updating Projected Service Levels by Product Ranks

In addition to assigning product ranks or user-defined ranks to help track product activity, you can load projected service levels by product rank automatically so the service level adjusts as product ranks change. You can define a table of all ranking combinations, looking at 1 to 2 different ranks and load in a corresponding service level. If a product falls into more than one rank breakpoint, the system uses the highest level of detail to determine the projected service level.

For example, you set up the service level by rank as follows:



The ranking is staggered using the first two rank positions. The first rank in the product ranking program is set to analyze hits and the second is set to Demand$. With this service level program, the system takes the top items based on hits and applies a service level. Then, the system looks at items that have the top hits plus higher dollar value and applies a different percentage. Applying service levels this way, you avoid overstocking your high dollar items based on hits alone.

Important: Do not leave blank cells between ranks. In the example above, you cannot enter a rank in the first row, column Rank #3 without an entry in Rank #2. Leaving a rank blank in this way, may result in false matches.

To update projected service levels by rank:

1. From the **Purchase > Forecasting** menu, select **Update Service Level by Rank** to display the Update Service Level by Rank.
2. In the **Branch/Territory** field, enter the branch or territory for which you want to update service levels based on product ranks.
3. Use the **Overwrite Manual Service Levels** area to indicate if you want to ignore any service level that users have manually overwritten. The default is **No**.
4. Use the **Rank** columns to enter which ranks and combination you want to use to update service levels.
5. In the **Service Level** column, enter the service level you want to use, if the rank matches for the product.

6. From the **File** menu, select **Begin** or schedule the program to run at a later time.

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