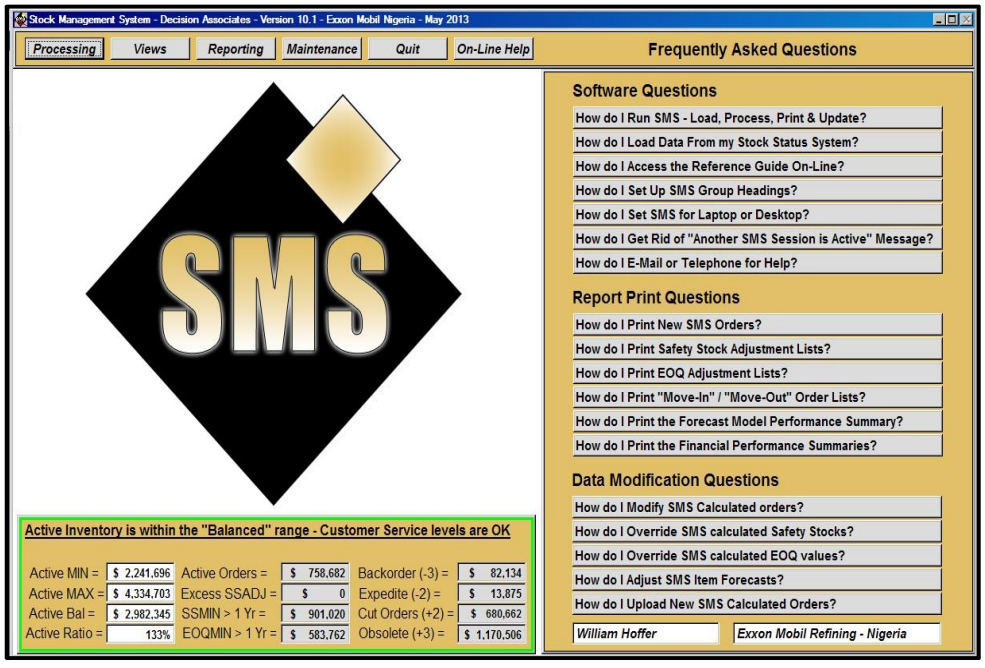
Functional Overview

The Views menu contains various selections to edit SMS information. Some of this information is simply data provided from the host (i.e., item number, cost, demand history, etc.). Other information represents calculations of SMS (i.e., forecasts, safety stock, EOQ, etc.). Both Master Views and Order Code Views represent detailed item views. The former is shown in item/location sequence, while the latter is shown in order code sequence. The *Bill-of-Material* view represents a view of that file as loaded from the host and is a view-only screen. The *Supersessions* view represents a view of superseding items as loaded from the host, if data is available. This view screen is editable. The *Summaries* view represents summary information by each of the key fields (i.e., Location, Level 3, and Level 2), and is useful to show sales or usage projections for strategic groups of data. Examples of such groups could be by vendor, product line, location or any appropriate grouping as long as these groups have been placed in the key fields on the download file.

SMS Desktop

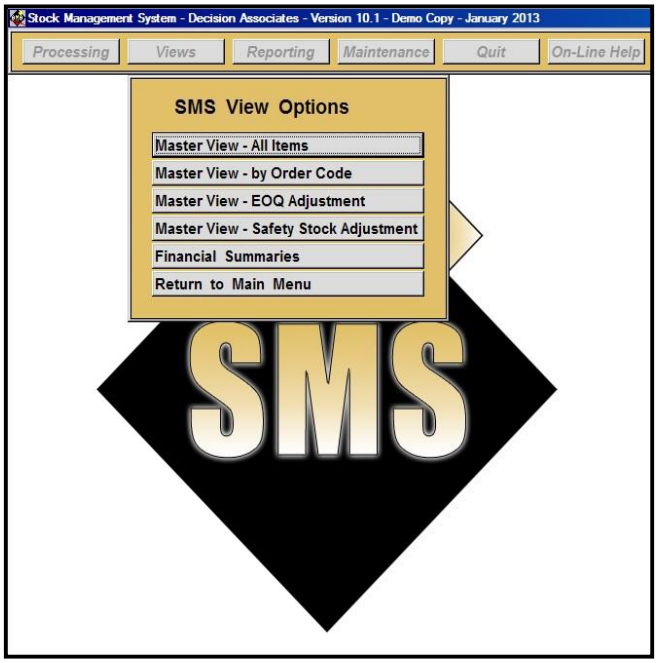
SMS operates from a ñDesktopò screen as shown below. There are four main functions available to the SMS user ï *Processing*, *Views*, *Reporting* and *Maintenance*. Additionally, a menu of *Frequently Asked Questions* is always present on this screen to provide quick reference without the need to look things up in the Reference Guide. Any of the *Frequently Asked Questions* can be clicked and brought up ñon screenò while performing any of the other processes that may be needed. Each of these questions can be printed, if needed.



A ñStatus Indicatorò banner is always displayed on the bottom of this screen. This indicator reflects the status of this inventory managed by SMS. A green border indicates a balanced inventory. A red border indicates either a chronic shortage of inventory or a chronic excess of inventory. ***Details are discussed on pages 19 and 20.***

SMS View Options

SMS View Options include four versions of the Master View. The first (***Master View – All Items***) is a view which includes all items. This is the most commonly used view and will be shown in this section.



The ***Master View - by Order Code*** invokes a view menu by each order code and ï once selected ï the view only includes items for that Order Code. For example, selecting *(-2) Expedites* brings up a view with only Order Code (-2) items.

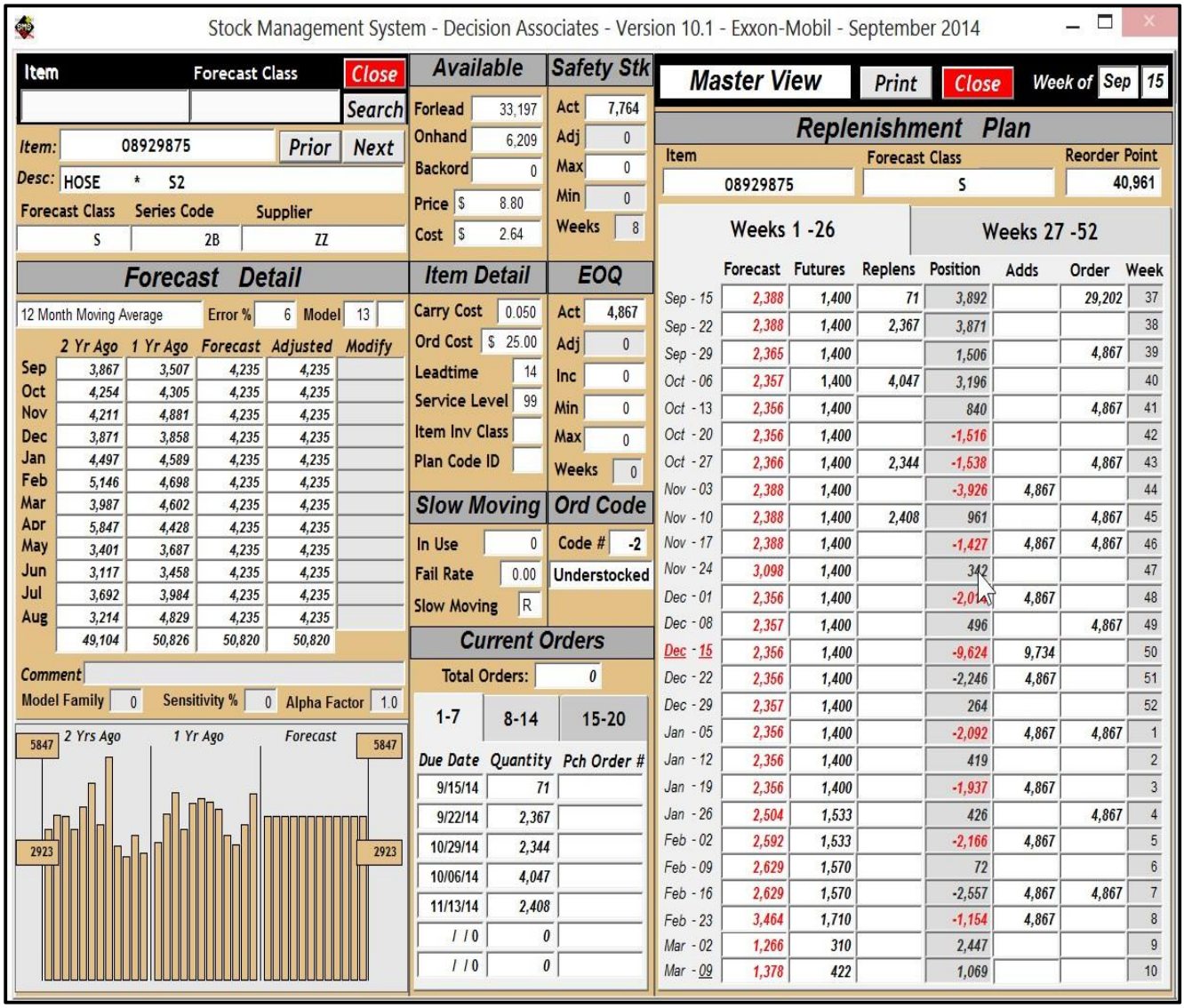
The ***Master View – EOQ Adjustment*** invokes a Master View which only includes items with an adjusted EOQ value. Users may override the SMS calculated EOQ ï or there may be a ñMinimum EOQòprovided from the host and passed to SMS on the download file.

The ***Master View – Safety Stock Adjustment*** invokes a Master View which only includes items with an adjusted Safety Stock value. Users may override the SMS calculated Safety Stock and ï over time ï forget that they made the adjustment. These adjustments can continue to cause excess stock to be built up if they are not reviewed and corrected from time to time.

Financial Summaries will be reviewed later in this section. Those summaries are useful to review individual groupings of items (i.e., by Supplier, Product Group, etc.). Additionally, users can make group adjustments to the SMS forecast using these views.

Master Views

The most commonly used view would be the Master Views selection. This choice invokes a screen with different sections in a tiled fashion. These include the ***Forecast Analysis*** screen, ***Replenishment Plan*** screen, and the ***Item Detail*** screen. When selected these screens are displayed on one large tiled page. This screen is optimized to the most popular monitor sizes. If the user has a larger screen, these screens can be moved anywhere on the monitor. Resizing is optional as the screen was designed to be viewed all on one page, with no need for rearranging.



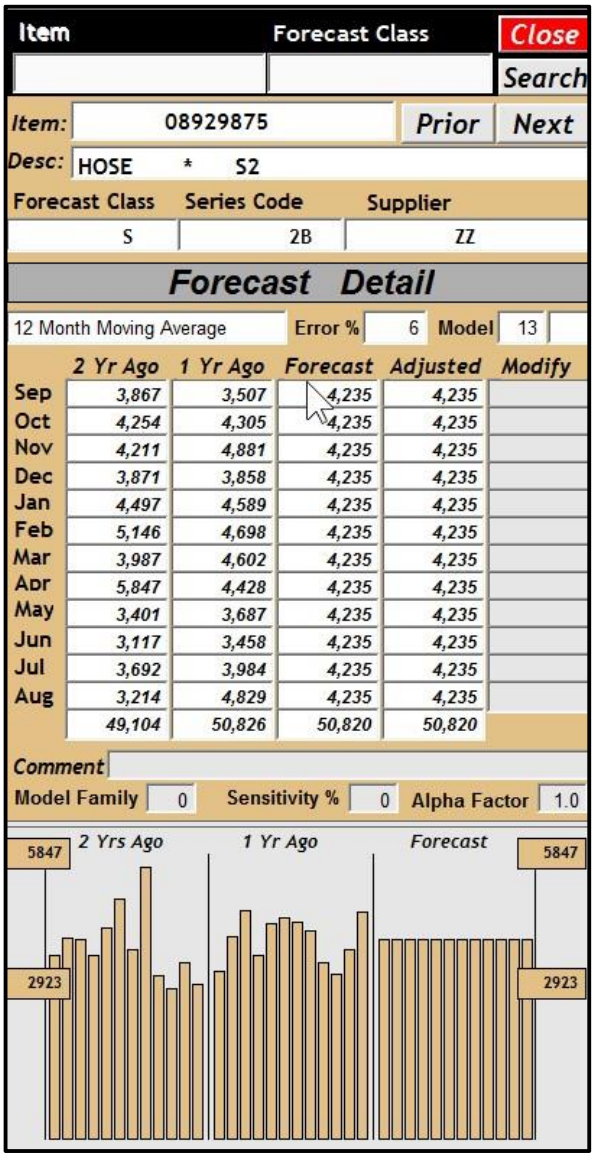
This Master View screen is often used only for detail review. Exception reports (most commonly the Ordering Reports) are used for fast exception review. Ordering Reports enable the user to quickly scan SMS calculated orders before approving them and automatically sending them back to the Stock Status system for processing. The user would typically use this view to look up a specific item if some question arises about the ordering plan.

Forecast Detail

The ***Master Views*** selection invokes a large page tiled with the screens. The first screen is the ***Forecast Detail*** section. In time, the user will become comfortable with the statistical forecasts that Stock Management calculates. Other than major promotions, Stock Management always provides the best statistical fit.

This ***Forecast Detail*** view will enable access to all variables, controls, overrides and adjustments that can be made by the user. This is also the view selection that enables the user to modify the results (i.e., ñ***Modify***ò column to adjust SMS Forecasts) before such information is used to calculate orders which are, in turn, sent back to the host via the ***Data Upload*** processing choice.

These views are the same in all SMS copies. As stated previously, data will be split among various users over a network environment to enable them all to work concurrently on SMS review - but only with each userôs individual items. No single user works on the all SMS items ï unless there is only one copy for the operation. Each SMS copy creates itôs own Upload file (containing new orders).



This ***Forecast Detail*** screen shows demand history, forecasts, forecast adjustments and forecast statistics. A detailed screen description is contained on subsequent pages that explain individual fields.

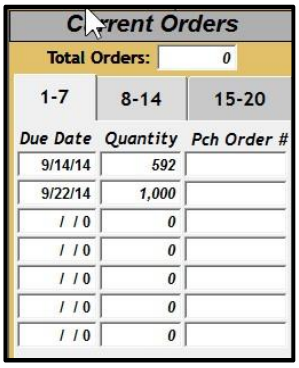
The buttons along the top of the screen enable the user to move back (***Previous***), forward (***Next***) or to a selected item (***Search***). The ***Close*** button is the only way to exit this view, as the menu choices are not available at the top of the screen during entry into this view.

There is an ***Update*** button which refreshes the screen and is only needed for older computers have older versions of 32 bit operating systems.

At the bottom on this screen section is a graph of the items history and SMS forecast. This graph is broken into three sections with ñ2 Yrs Agoò being history for a period of 24 months ago through 13 months ago. The next section shown as ñ1 Yr agoò would be history for a period of 12 months ago through the past month (just completed).

The ñForecastòrepresents the SMS forecast for the coming 12 month period. His monthly forecast is further broken down into daily forecasts ï and subsequently ñrolled upòinto weekly forecasts when calculating weekly ordering patterns.

Current Orders



The Stock Management System considers current replenishment orders that the user may have already placed. Once the Stock Management System has been run for a few weeks, these current orders would be the original orders that SMS calculated and automatically placed in earlier weeks.

The *Current Orders* section simply shows the detail of outstanding orders (i.e., orders already placed and scheduled to come into inventory on the dates shown). These orders also indicate order number (if provided on the download) for easy cross reference to the host system. SMS allows for up to 20 current orders to be shown. They are displayed in three tabs.

Replenishment Plan

The *Replenishment Plan* Section is located on the far right. This section contains a 52 week planning horizon. The Dual Tab Replenishment Section is shown below.

This *Replenishment Plan* section shows weekly replenishment detail calculations including order receipts, forecasted demand, dates when orders are needed and when orders should be placed. SMS calculates a 52 week *Replenishment Plan*. All 52 weeks can be viewed. The coming 26 weeks are on the first tab, while the second half of the year is on the second tab.

Master View | Print | Close | Week of Sep 15

Replenishment Plan

Item	Forecast Class	Reorder Point
08929875	S	40,961

Weeks 1 -26 | Weeks 27 -52

	Forecast	Futures	Replens	Position	Adds	Order	Week
Sep - 15	2,388	1,400	71	3,892		29,202	37
Sep - 22	2,388	1,400	2,367	3,871			38
Sep - 29	2,365	1,400		1,506		4,867	39
Oct - 06	2,357	1,400	4,047	3,196			40
Oct - 13	2,356	1,400		840		4,867	41
Oct - 20	2,356	1,400		-1,516			42
Oct - 27	2,366	1,400	2,344	-1,538		4,867	43
Nov - 03	2,388	1,400		-3,926	4,867		44
Nov - 10	2,388	1,400	2,408	961		4,867	45
Nov - 17	2,388	1,400		-1,427	4,867	4,867	46
Nov - 24	3,098	1,400		342			47
Dec - 01	2,356	1,400		-2,014	4,867		48
Dec - 08	2,357	1,400		496		4,867	49
Dec - 15	2,356	1,400		-9,624	9,734		50
Dec - 22	2,356	1,400		-2,246	4,867		51
Dec - 29	2,357	1,400		264			52
Jan - 05	2,356	1,400		-2,092	4,867	4,867	1
Jan - 12	2,356	1,400		419			2
Jan - 19	2,356	1,400		-1,937	4,867		3
Jan - 26	2,504	1,533		426		4,867	4
Feb - 02	2,592	1,533		-2,166	4,867		5
Feb - 09	2,629	1,570		72			6
Feb - 16	2,629	1,570		-2,557	4,867	4,867	7
Feb - 23	3,464	1,710		-1,154	4,867		8
Mar - 02	1,266	310		2,447			9
Mar - 09	1,378	422		1,069			10

The column on the left side of this section indicates weekly dates for the upcoming 52 weeks, beginning with the current run date.

Columns (left to right) include:

Forecast ï weekly *SMS* forecast as a calculated and adjusted by the user

Futures ï Known future demand already sold (or earmarked) for a customer

Replens ï scheduled (incoming) orders if the user has already placed any such orders

Position ï simply the net stocking position which is On Hand ï Forecast ï Futures + Replens (incoming replenishments)

Adds ï the time slot that *SMS* requires for delivery of an order

Order ï the time slot that *SMS* needs to place an order for delivery within one lead-time (may be shorter if expedite is required)

Week ï the specific week number in a 52 week year (for reference) and is used on the ñMove in ï Move Outòreport

Forecast Data Elements (User Specified)

Many of the variables contained in the *Forecast Analysis* screen can be modified. These variables are user specified and have a wide variety of impacts on calculations performed by SMS analysis. These are, in effect, the control variables of forecasting. Some are contained on other screen functions since they may affect calculations relative to *Economic Order Quantity* and *Safety Stock* which are calculated later during the replenishment process. Only the variables which are user specified (or modifiable) are listed here. If not listed here, variables can be assumed to be calculated only. The following variables are specified by the user:

Forecast Variables

Variable	Variable Description	Valid Range	Default	Calculations Affected
Model Family	Forecast Model Family	00 = All Families 10 = Moving Average 20 = Trend Average 30 = Seasonal 40 = Single Exp. Smooth 50 = Linear Regression 60 = Custom Exp Smooth	00 (All Families) ***Example:*** **10:** (Models 11,12,13) **11:** (Model 11) **19:** (No Model 11,12,13)	Provides user selection to designate a specific family of forecast models for use in the analysis and selection of a forecast ï may select a single family or default to all families. NOTE: Selection of any one family will ensure similar forecasts, but may result in higher forecast error, higher Safety Stock and/or Bias/Volatile forecasts.
Sensitivity	History is more/less a factor in forecasting	10-90%	0 = off	Specifies the ñweightòof more recent forecast errors when selecting the forecast model with the least error
Alpha Factor	Smoothing factor for Model 61 only	.08 - .88	.88	Userôs smoothing factor for Model 61 (single exponential smoothing with user factor)

The variables below are downloaded from the userôs Stock Status System. As such, they are not subject to user change in the Stock Management System. The ñAdjustedòcolumn may have been adjusted through the userôs ñFuture Demandòtable or a userôs manual forecast adjustment elsewhere.

History & Forecast Variables

Variable	Variable Description	Valid Range	Default	Calculations Affected
2 Yr Ago	Column of 12 months of demand usage with annual total at bottom	0 ï 99999999 units	0 units	12 months of demand usage beginning two years ago with an ñautoò total at the bottom ï from userôs Stock Status
1 Yr Ago	Column of 12 months of demand usage with annual total at bottom	0 ï 99999999 units	0 units	12 months of demand usage beginning two years ago with an ñautoò total at the bottom ï from userôs Stock Status
Adjusted	Columns of 12 months of *Adj Forecast* with annual total at bottom	0 ï 99999999 units	0 units	12 months of adjusted forecasts for the coming year with an ñautoòtotal at the bottom ï alculated in the forecast process and can be modified

Forecast Data Elements (Calculated)

Some of the variables contained in the *Forecast Analysis* screen cannot be modified. These variables are calculated by the analysis modules and are shown for reference and/or exception reporting by the user. These are, in effect, the qualifying variables of forecasting. Some of these variables are contained on other screen functions, but cannot be modified anywhere by the user.

There are instances where some of these variables are set at processing time as discussed in Section I (PROCESSING). These are available to the user only during that process. These instances are structured this way to ensure uniformity for common control variables such as *Carrying Cost* and *Ordering Cost*. The following variables are calculated by the analysis modules:

Calculated Forecast Variables

Variable	Variable Description	Valid Range	Default	Calculation Affected
Error %	Forecast Error as a % of simulated lead time forecast	0% - 99%	0%	Indicator of the relative magnitude of forecasting inaccuracy ï this is the percent error compared to the simulated forecast for Lead Time ï can be used as an exception reporting criteria to focus on higher error forecasts
Model Chosen	Forecast Model # Identifier	11 - 61		Model number indicator showing which model was selected by the forecast analysis module. Stock Management reporting also displays a description of the model on the report ï these model descriptions and formulas are reviewed in Appendix A (Forecast Model Descriptions
Forecast Code	Condition (i.e., Bias, Volatile, Spike, etc.)	(B), (V), (S)		Indicator of forecast condition (if any) for the model chosen by SMS ï SMS will exclude a model from further consideration if one of these conditions exist ï otherwise will select the least error if all choices have a condition
Forecast	Column of 12 months of ñrawò statistical forecast with annual total at bottom	0 ï 99999999 units	0 units	Column of 12 months of calculated forecast for the coming year with ñautoòtotal at the bottom ï calculated in the forecast process as explained in Appendix C. May be modified using ñModifyò fields

Forecast Adjustment

Since there can be many external factors which affect the forecasted usage of a stock item, the statistical forecast alone will not comprise the most usable basis for stock planning. Although the wide selection of forecast *Families* will provide an objective and accurate forecast trend, each and every individual month will most likely be close but not exact. Statistical forecasting identifies a trend or pattern and then uses that trend to predict future usage. If an external factor, particularly a new factor, is introduced, the past trend may become invalid. External factors can exist in the form of promotions, engineering changes, large fixed orders or even discontinuance of stock items. The forecast adjustment process will likely be necessary for at least some portion of items in inventory.

The first step in adjusting the forecast would be the review of forecast calculations through the *Forecast Analysis* screen. There are six basic criteria which should be considered in examining forecasts which are:

- **Forecast Error %**
- **Forecast Code ("Bias" or "Volatile")**
- **Inventory Class**
- **Adjusted Forecast Items**
- **Monthly Forecast Patterns**
- **Annual Forecast Trends**

The ***Forecast Error %*** lends itself to automated exception reporting. Exception reporting is the process of reporting only those stock items which are determined to have potentially unacceptable forecasts. Custom reports can be created identifying high error items. Processing of all items is done in order to ensure forecasts for all items and to determine errors, codes and raw forecasts for review.

The ***Forecast Code*** also lends itself to automated exception reporting. Any stock item with a *BIAS* or *VOLATILE* code should be reviewed. This usually means that the choice of forecast models was limited to one *Family* and as a result a pattern was forced to be chosen which was not necessarily the best statistically. If no specific *Family* was specified, then this may, indeed, be a problem item with no discernible trend. If a *Forecast Code* exists, the item should be reviewed.

Although the ***Inventory Class*** designator does not affect the calculations in any way, this is often an excellent way to classify stock items according to importance. Specific criterion may vary but usually includes relative cost of the item, how critical it may be as a component or even how competitive sales may be for it. This is also an excellent means to review through ñexception reportingò in order to focus on important items first. Extraction on this field is also done through use of data base query language.

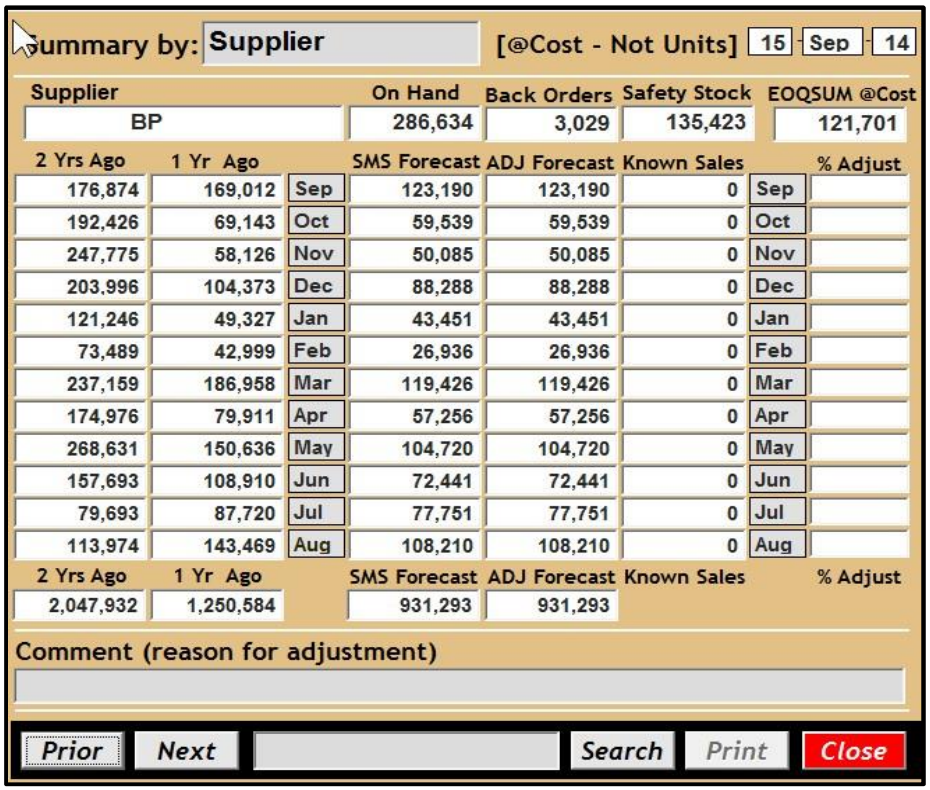
Adjusted forecasts are also an excellent method for exception reporting. A simple comparison of all items where *SMS Fcst* does not equal *Adj Fcst* totals will reveal some adjustment in the statistical forecast. Since prior adjustments may be less pertinent over time, continuous review is suggested.

The final criteria for monthly forecast patterns and annual forecast total comparisons is much more subjective. It does not lend itself to exception reporting. These will typically be methods of secondary review after one (or more) of the first four criteria have been employed.

The process for adjusting the forecast amounts consists of two procedures. The first procedure is through the use of *Forecast Adjustments*. You enter a desired value directly onto the screen under the *Modify* column. The second step is to actually choose the *Confirm Adjustments* choice under the Maintenance menu. This second step can be done after several adjustments have been tried and the *Process User Updates* has been run. As long as *Confirm Adjustments* is completed before your weekly process is redone each week, these adjustments will be made permanent.

Financial Summaries

There is actually a method available to make forecast adjustments at the group level. A *Summary Screen* exists by each of the three keys (Location, Level 3, and Level 2). These screens provide total information about the key groups as created by the user in the download structure. Adjustments can be made to any key group and will affect items within that group. Be careful!! An adjustment to a Location can impact an item. Also an adjustment to a Product Line, for example, can affect an item again if it falls within that Product Line ***and*** within that Location!! ***Extreme care is advised!***



Adjustments are made in the column labeled *% Adjust* and are entered as a percentage. These will be applied according to a base of 100% (i.e., cutting the forecast in half would mean an adjustment of 50%). These adjustments trickle down to each item within the grouping that the adjustment has been applied. In this example, every item within Level 4 (Location) would have an adjustment applied to the month entered. ***These can be dangerous and should not be taken without serious thought.*** An adjustment comment can also be placed for future reference.

Replenishment Plan Data Elements (User Specified)

Many of the variables contained in the *Replenishment Plan* screen can be modified. These variables are user specified and have a wide variety of impacts on calculations performed by SMS are, in effect, the control variables of forecasting. Some of these variables are shown on other screen functions since they may affect calculations relative to *Economic Order Quantity* and *Safety Stock* (calculated during the replenishment process). Only the variables which are user specified (ñmodifiableò) are listed here. If not listed here, it is calculated only. The following are specified by the user:

Key Database Fields ("Keyfields")

Variable	Variable Name	Valid Range	Default	Calculations Affected
Location	Location	Alpha		Summarized by Level 4
Level 3	Product Group (usually)	Alpha		Summarized by Level 3
Level 2	Supplier (usually)	Alpha		Summarized by Level 2
Item	Item SKU number	Alpha		Unique stock identifier
Descr	Description	Alpha		No affect

Order Status Variables

Variable	Variable Name	Valid Range	Default	Calculations Affected
Forlead	Forecast for lead time horizon	0 ï 99999999 units	0 units	Forecast (in units) for the number of weeks specified as the lead time horizon ï used to plan stocking levels and used for error comparison of Forecast Error %
Onhand	Stock on the shelf and available for use	0 ï 99999999 units	0 units	Quantity of stock available for forecasted future demand
Backord	Stock needed for outstanding demand but not available on the shelf	0 ï 99999999 units	0 units	Quantity of stock needed for unfilled orders ï this can exist even if ON HAND is a positive value (due to partial ships)
Price	Current unit price (each)	0.01 ï 9999999.99		The current sales price of the item ï can be standard price or avg price (used for margin analysis)
Cost	Current unit cost (each)	0.01 ï 9999999.99		The current cost of the item ï can be standard cost or avg cost (used for margin analysis)
Carry Cost	Administrative cost and storage overhead	.05 - .30	.20	This is set at run time to ensure a uniform value across all ITEMS ï this represents the cost of having stock investment - some components to derive this value are the cost of warehousing, staff, utilities, etc.
Ord Cost	Administrative cost for placing the order ï could be the set-up cost for manufacturing	$1.00 - $999.99	$5.00	This is set at run time to ensure a uniform value across all ITEMS - this represents the cost of placing orders, including cost of staff, set-up, order filling, etc. - some components to derive this value may vary for each company.
Lead-time	Delivery time from supplier ï or manufacturing and delivery time in manufacturing	1 ï 52 weeks	1 week	Specifies the lead time (weeks) needed to replenish stock either by manufacture or purchase ï the same in the replenish schedule analysis - calculates new orders for the coming year (52 weeks). NOTE: This is a critical variable since analysis of stocking position is done through lead time ï too short means not enough delivery time -- too long means a false shortage & unnecessary buying
Service Level	Item criticality (%)	88 ï 99%	95%	Desired service level of stocking availability ï indicates a ñfill rateò requirement for an itemôs stocking strategy ï more critical = higher %
Inv Class	Inventory Class	Alpha		Specifies the relative importance of the item as determined by cost, price, or corporate strategy (i.e. promotions, etc.)
Plan Code ID	Planner Code	Alpha		Planner ID - 2 alpha characters

Ordering Variables

Variable	Variable Name	Valid Range	Default	Calculations Affected
EOQ - Adj	User Adjusted Order Quantity	0 ï 99999999 units		Represents the order quantity (lot size) as changed by the user.
EOQ - Inc	Incremental Order Quantity	0 ï 99999999 units		Increments to be added to an ORDER QUANTITY to arrive at the actual order amount scheduled to arrive into inventory as an ADD
EOQ - Min	Minimum Order Quantity	0 ï 99999999 units		Minimum quantity to be calculated for ORDER QUANTITY such as a production minimum or a vendor minimum order ï the EOQï Act is calculated and then checked to see that it conforms to this minimum (or greater) ï same impact on reorder analysis as EOQ-Inc
EOQ - Max	Maximum Order Quantity	0 ï 99999999 units		Maximum quantity to be calculated for ORDER QUANTITY such as a production maximum or a vendor maximum order ï the EOQï Act is calculated and then checked to see that it conforms to this maximum (or less) ï same impact on reorder analysis
EOQ - Wks	Equivalent weeks supply of Order Quantity	0 ï 52 weeks		Equivalent weeksôworth of *ORDER QUANTITY* which should be calculated for reordering based on the coming year forecast - the EOQ-Act is calculated then adjusted to equal the number of units which will last for the number of weeks specified - same impact on reorder analysis as EOQ-Adj

Safety Stock Variables

Variable	Variable Description	Valid Range	Default	Calculations Affected
SS ï Adj	User adjusted Safety Stock	0 ï 99999999 units		User adjustment to the SMS calculated safety stock ï will affect Reorder Analysis and the modified safety stock value will change the stocking level at the end of lead time. Extreme caution should be used with this adjustment since userós tend to force higher safety stock values as protection against future shortages.
SS ï Min	Minimum Safety Stock	0 ï 99999999 units		Minimum quantity to be calculated for SAFETY STOCK to provide enough stock for projected service levels ï the SS-Act is calculated, then checked to see that it conforms to this minimum (or greater) ï same impact on reorder analysis as SS-Adj
SS ï Max	Maximum Safety Stock	0 ï 99999999 units		Maximum quantity to be calculated for SAFETY STOCK to provide enough stock for projected service levels ï the SS-Act is calculated, then checked to see that it conforms to this maximum (or less) ï same impact on reorder analysis as SS-Adj
SS ï Wks	Weeks supply of Safety Stock	0 ï 52 weeks		Equivalent weeks of safety stock calculated by adding up the coming ñweekly forecastsòï SAFETY STOCK is then adjusted to cover the # of weeks specified
Order Date	Column of dates associated with respective ñopenòorders	MM/DD/YY		Column of 20 date slots specifying the dates that the corresponding order quantities are expected for delivery ï factored into the Reorder Analysis calculations for the coming 52 weeks
Quantity	Column of quantities ï these are the open orders	0 ï 99999999 units		Column of 20 slots allowing for (up to) 20 outstanding or ñopenò orders scheduled for delivery in the coming 52 weeks ï also factored into the Reorder Analysis calculations
Order ##	Column of order ñnumbersòor reference numbers for respective orders placed	Alpha		Order number used for internal reference ï no effect on SMS calculations

Replenishment Data Elements (Calculated)

Some of the variables contained in the *Replenishment Plan* screen cannot be modified. These variables are calculated by the analysis modules and are shown for reference and/or exception reporting by the user. These are, in effect, the qualifying variables of forecasting. Some of these variables are contained on other screen functions but cannot be modified anywhere by the user.

Actually there are instances where some of these variables are set at processing time as discussed in Section I (PROCESSING), and are available to the user only during that process. These instances are structured this way to ensure uniformity for common control variables such as *Carrying Cost* and *Ordering Cost*. The following variables are calculated by the analysis modules:

Order Status Variables

Variable	Variable Name	Valid range	Default	Calculations Affected
Order Code	Ordering Code	-3 = Backorders -2 = Expedites -1 = Normal reorder 0 = Balanced (no action) +1 = Excess OnHand +2 = Excess Orders +3 = Obsolete Excess		Determines the specific ordering action to be taken to balance inventory stock at the end of the Lead Time period

Ordering Variables

Variable	Variable Name	Valid Range	Default	Calculations Affected
EOQ ï Act	SMS Order Quantity	0 ï 99999999 units	1 unit	Represents the Order Quantity (lot size) calculated by SMS

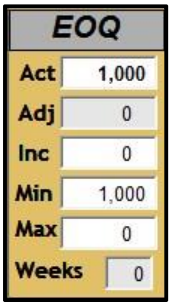
Safety Stock Variables

Variable	Variable Name	Valid Range	Default	Calculations Affected
SS ï Act	SMS Safety Stock	0 ï 99999999 units		Represents the Safety Stock calculated by SMS

These variables will show actual (calculated) values. If the EOQ or Safety Stock value is adjusted or overridden, these variables will still show the calculated value. SMS may still use the adjusted or overridden value, but retains the calculated values for reference.

Order Quantity Control

SMS will determine the *Economic Order Quantity* as explained in *Appendix C (Calculations)*. This calculation will minimize the cost of restocking throughout the coming year and is based primarily on the calculated forecast. If no overrides, limits or ranges are specified, this value will be calculated to a specific unit value. *Order Quantity* controls are available to make this calculation conform to existing parameters the user has specified. In many cases, constraints exist in terms of production lot sizes, vendor packaging and even storage limits.



The *Economic Order Quantity* (*Act*) cannot be accessed by the user. The five additional fields that follow provide control of the EOQ calculation. Only the ñAdjòand the ñWeeksòfields can be accessed by the user. These are:

- ***EOQ - Adj*** ***Adjusted ORDER QUANTITY (User Field)***
- ***EOQ - Inc*** ***Incremental ORDER QUANTITY (Download Only)***
- ***EOQ - Min*** ***Minimum ORDER QUANTITY (Download Only)***
- ***EOQ - Max*** ***Maximum ORDER QUANTITY (Download Only)***
- ***EOQ - Weeks*** ***ORDER QUANTITY to last "xx" weeks* (User Field)**

The adjusted *Order Quantity* (*EOQ - Adj*) is an override and, as such, will replace the value calculated by the Stock Management System. This value will supersede any of the other controls in this function. In all data base screens and reports the *EOQ - Act* is always shown for reference and cannot be changed. The *EOQ - Adj* value will also be shown and used for subsequent calculations, if a value is entered. If no value is entered, this field will contain a value of zero which disables this override. On data base screens and/or reports, a value of zero indicates that no override has been entered. Note that an override of zero is not allowed since a minimum order must be at least one (1) unit.

The incremental *Order Quantity (EOQ – Inc)* can be used to specify multiples of an *Order Quantity* to be used for procurement or production. If a stock item is manufactured, this field could be used for specifying production run sizes. If a stock item is procured from outside sources, this field may represent the vendor pack sizes such as dozens, cases, carton counts, etc. When an *Order Quantity* is calculated this variable is taken into account in determining the *EOQ – Act*. This *EOQ - Act* will be calculated in multiples of the *EOQ – Inc.*

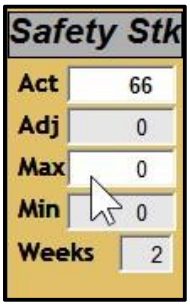
The minimum *Order Quantity* (*EOQ-Min*) is used to specify the lowest lot size to be produced or procured. In manufacturing, this field is used to ensure that no lower quantity is asked for than can be produced in a single production run. With set-up costs, processing costs and scheduling constraints, the proper quantity should be determined to make production profitable. This will vary among various types of users. In distribution environments, this may represent the lowest *Order Quantity* a vendor will ship. The lowest *EOQ-Min* which can be specified is, or course, one (1) unit. As with all controls in this function, a value of zero disables the *EOQ-Min*. Also, this value is taken into account when the *EOQ-Act* is calculated. This means that the *EOQ-Act* will be at least as large as the *EOQ-Min*, and this calculated value will be used throughout the Stock Management System. The data base and reports display the *EOQ-Min* for reference (if zero is displayed then *EOQ-Min* is disabled).

The maximum *Order Quantity* (*EOQ-Max*) is used to specify the largest lot size to be produced or procured. In manufacturing environments, this is used to ensure that no higher quantity is asked for than can be produced in a scheduled production run. With set-up costs, processing costs and scheduling constraints, the quantity can often be determined that makes production profitable. This determination will vary among various types of users. In distribution environments, this may represent the largest *Order Quantity* a vendor can ship. The highest *EOQ-Max* which can be specified is 99999999 units. As with all controls in this function, a value of zero disables the *EOQ-Max*. Also, this value is taken into account when the *EOQ-Act* is calculated. This means that the *EOQ-Act* will be no higher than the *EOQ-Max* and this calculated value will be used throughout the Stock Management System. The data base and reports display the *EOQ-Max* for reference (if zero is displayed then *EOQ-Max* is disabled). Users with storage concerns or concerns about obsolescence of stock items with relatively short product life cycles will tend to use this control somewhat more often.

The week supply control (*EOQ - Weeks*) allows the user to specify the *Order Quantity* in terms of how many weeksôworth of supply this order will provide. This value has a range of one (1) to fifty two (52) weeks. If used, this procedure takes the coming year forecast (in units) and divides by 52 weeks to determine the quantity which will be used for an "average" week. Even though forecasts may be volatile and may trend up or down, this method to determine "average" week quantities is used to stabilize the value over time. The *EOQ - Weeks* value specified in the data base is then multiplied by this "average" week value as the *Order Quantity* is calculated. This becomes the value of the *Order Quantity*. This control is used in conjunction with production schedules to help match the amount available with the changing demand over time. It may have an effect on production from the standpoint of varying the production quantities each month. This *EOQ - Weeks* will be further overridden by the *EOQ - Adj* value if one has been specified. It will also be subject to the *EOQ - Min* and *EOQ - Max* limits if specified.

Safety Stock Control

SMS will determine the *Safety Stock* quantity for the *Lead Time* horizon as explained in Appendix C (*Safety Stock*). Since this value is calculated based primarily on forecast *Error* it is recalculated as part of the forecasting analysis process. Other variables can have an effect such as *Service Level* and *Lead Time*. For this reason, the *Safety Stock* calculation is done in the replenishment analysis process as well. It will reflect a change in any of these three variables every time SMS is run.



In addition to the *Safety Stock* field (*SS-Act*) which cannot be entered by the user (field is calculated by analysis modules), there are four fields available to control the *Safety Stock* used in the Stock Management System:

- ***SS-Adj*** ***Adjusted SAFETY STOCK (User Field)***
- ***SS-Min*** ***Minimum SAFETY STOCK (Download Only)***
- ***SS-Max*** ***Maximum SAFETY STOCK (Download Only)***
- ***SS-Weeks*** ***SAFETY STOCK which should be last "xx" weeks (User Field)***

The adjusted *Safety Stock* (*SS - Adj*) is an override and, as such, will replace the value calculated by the Stock Management System. This value will supersede any of the other controls in this function. In all data base screens and reports the *SS-Act* is always shown for reference and cannot be changed. The *SS - Adj* value will also be shown and used for subsequent calculations, if a value is entered. If no value is entered, this field will show a value of zero which disables this override control. On data base screens and/or reports, a zero value indicates that no override has been entered. Note that an override of zero is not allowed since the minimum *Safety Stock* override must be at least one (1) unit.

The minimum *Safety Stock* (*SS - Min*) is used to specify the lowest quantity to be stored. In manufacturing environments, this is used to ensure that enough is available to cover production through *Lead Time*. With set-up costs, processing costs and scheduling constraints, a quantity can be determined that makes production levels safe. In distribution environments, this represents the lowest buffer stock to protect against disruption of vendor ship schedules. The lowest *SS - Min* specified is, of course, one (1) unit. As with all controls in this function, a value of zero disables the *SS - Min*. Also, this value is taken into account when the *SS - Act* is calculated. This means that the *SS - Act* will be at least as much as the *SS - Min* and this calculated value will be used throughout the Stock Management System. The data base and reports display the *SS - Min* for reference (if zero is displayed *SS - Min* is disabled).

The maximum *Safety Stock* (*SS - Max*) is used to specify the highest quantity to be stored. In manufacturing environments, this is used to limit stock on the shelf. With set-up costs, processing costs and scheduling constraints, a quantity can often be determined that is consistent with limitations on storage space. This determination will vary among users. In distribution environments, this represents the highest buffer stock management allows to protect against disruption of vendor ship schedules. The highest *SS - Max* which can be specified is 99999999 units. As with all controls in this function, a value of zero disables the *SS- Max*. Also, this value is taken into account when calculating *SS - Act*. This means that the *SS - Act* will be no more than the value for *SS - Min* and will then be used throughout the Stock Management System. The data base and reports display the *SS - Max* for reference (zero disables *SS- Max*).

The week supply control (*SS- Weeks*) allows the user to specify the *Safety Stock* in terms of how many weeks supply this quantity will provide. This value has a range of one (1) to fifty two (52) weeks.

If used, this procedure takes the coming year forecast (in units) and divides by 52 weeks to determine the quantity which will be used for an "average" week. Even though forecasts may be volatile and may trend up or down, this method to determine "average" week quantities is used to stabilize this value over time. The *SS - Weeks* value specified is then multiplied by this "average" week value as the *Safety Stock* is calculated. This becomes the value of the *Safety Stock*. This *SS - Weeks* will be further overridden by the *SS - Adj* value if one has been specified. It will also be subjected to the *SS - Min* and *SS - Max* limits if specified.

Bill – of – Material

The *Bill-of-Material* data base enables the user to maintain a list of component parts and their relation to a "parent" item. This function is similar to a "bill-of-material" function, in that it will derive dependent demand for any specified item and add this to the independent demand (which has been forecasted). The component part may be only another component - or a component and a finished good.

The user may access this menu as a "sub-option" within the *Maintenance* menu. Select *Browse Components* or *Browse Parents* to view the relationship by components (Parents that use them) or by Parents (components used by them). This data base can be updated in the Maintenance section.

The user simply specifies how many of each component parts are included for each "parent" item. The user can also specify how many component units are included in a "parent" item made of several units, such as may be found in chemical items. For example, a user may specify 237 units (ounces) of a component for a parent item which has 10 units (ounces) - and thus accommodate fractional component parts. The Bill-of-Material screen is shown below:

Bill-of-Material

Data Extraction Date: *04-Jul-07* **Print Date:** *11-Aug-08* *Page 1 of 1*

Component	Parent Item	Ratio
86570021	61160557	1.00
86570021	61370043	1.00
86570021	61370088	11.00
86570021	61370099	6.00
86570021	61370099	1.00
86570021	61370353	4.00
86570021	61370641	1.00
86570021	61370645	6.00

Superseding Parts

The Stock Management System has the capability to store a data base of superseding part numbers for use in specifying a replacement item designation for an obsolete part. This can be useful for engineering changes, discontinued parts or newer equivalent parts. The user can navigate through this file, but the file must be loaded from the host. This ensures synchronization with the host. An optional date field is shown indicating when the new part should be used (and when the old part is discontinued). The screen is shown as follows:

Superceding Parts - by Old Item

Data Extraction Date: *04-Jul-07*

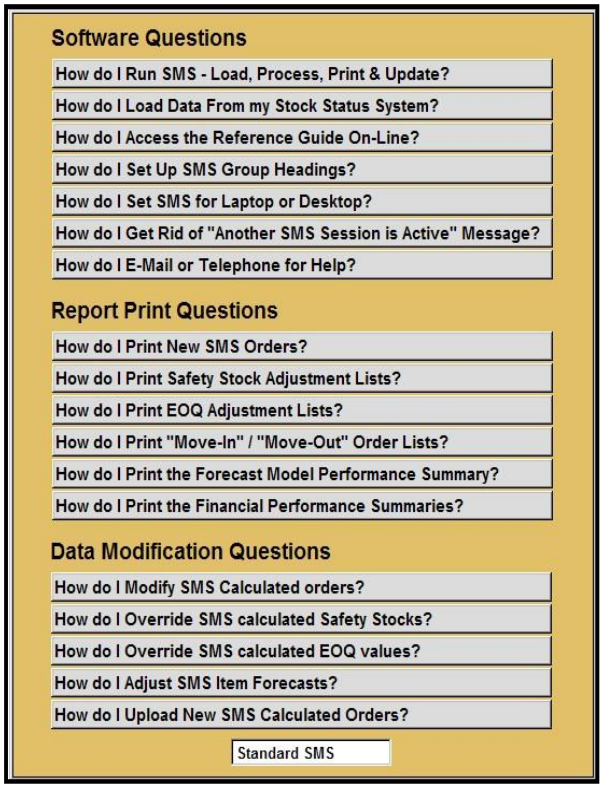
Effective Date	Old Location New Location	Old Product Group New Product Group	Old Supplier New Supplier	Old Item New Item	Conversion Factor
08/08/08	THERE	OLDGROUP	45	OLD ITEM	
	HERE	NEWGROUP	67	NEW ITEM	1.00

The history from the old part is used (added to) the new part. This new part is then forecasted, given a safety stock, EOQ, replenishment plan. The new part can be used and ordered. The old part will still calculate a forecast and replenishment projection. It will not, however, generate any new replenishment orders (even if the calculation indicates a shortage). This allows the user to consume the old part without ordering any more of it.

Frequently Asked Questions

As SMS becomes an often used weekly procedure, the user will become familiar with menus, views, reports and processes well enough to operate without documentation. However, initial use of SMS will require reference from time to time. The SMS Reference Guide can be accessed on the Decision Associates Inc. website ï and printed if desired. This would be a complete approach to having reference material ready.

In SMS, there are quick and easy references available on the SMS desktop. These are the *Frequently Asked Questions* which are always shown on the right side of the desktop screen. Simply click on any specific question on the list and a full page explanation appears until the user clicks ñReturn to Questionsò These pages list instructions regarding a specific operation, view, report or process. These are a ñquickòreference alternative.



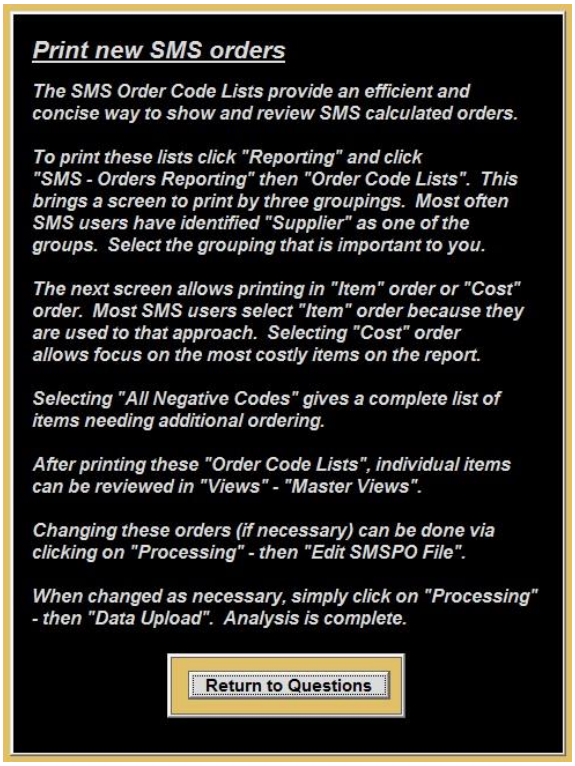
The first set of questions would be the *Software Questions* which focus on use of SMS and how to process.

The second set of questions would be the *Report Print Questions* which focus on printing reports. These would be the typical working reports used each week to review and approve new orders.

The third set of questions would be the *Data Modification Questions* which focus on overrides, adjustments and uploading modified data. Forecasts can be adjusted, EOQ and Safety Stocks can be overridden, and the file of new orders can be modified before automatic upload, if appropriate.

For a new SMS user, these ñon screenòquestions are usually sufficient to operate and navigate SMS effectively. For inventory operations that may want to provide additional SMS copies throughout their operation, these *Frequently Asked Questions* should facilitate that expansion. New user training should be much easier to implement.

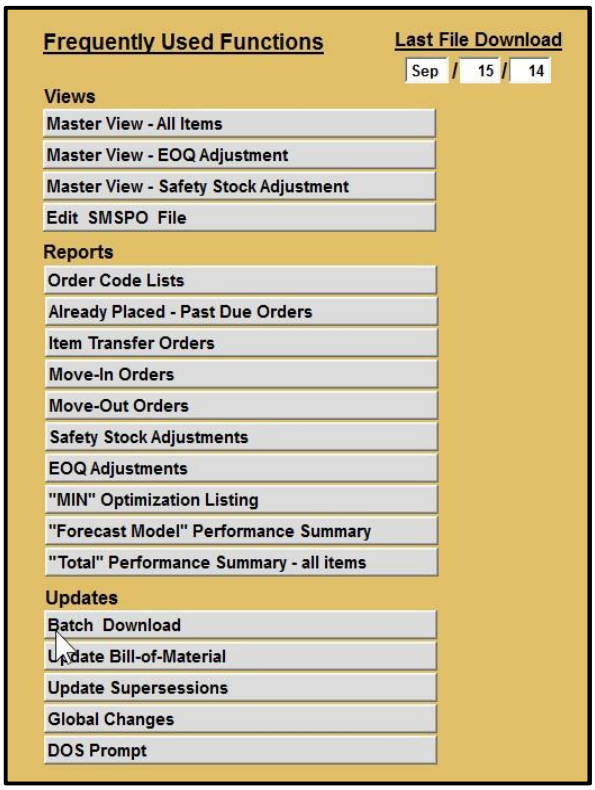
An example is shown below. This example shows the question ñ*How do I PrInt new SMS orders?*.



This screen would be shown on the right side of the SMS Desktop while all processing would be done and shown on the left side of the SMS Desktop. The SMS user could follow these ñstep by stepò instructions to process, print, review and upload orders each week.

Once the process is complete, the user simply clicks on the ñ*Return to Questions*òbutton at the bottom of the screen. This screen disappears and leaves only the SMS Desktop in place.

The only View that covers these questions would be the *Master View*. This *Master View* takes the entire SMS Desktop due to the extensive number of fields contained there.



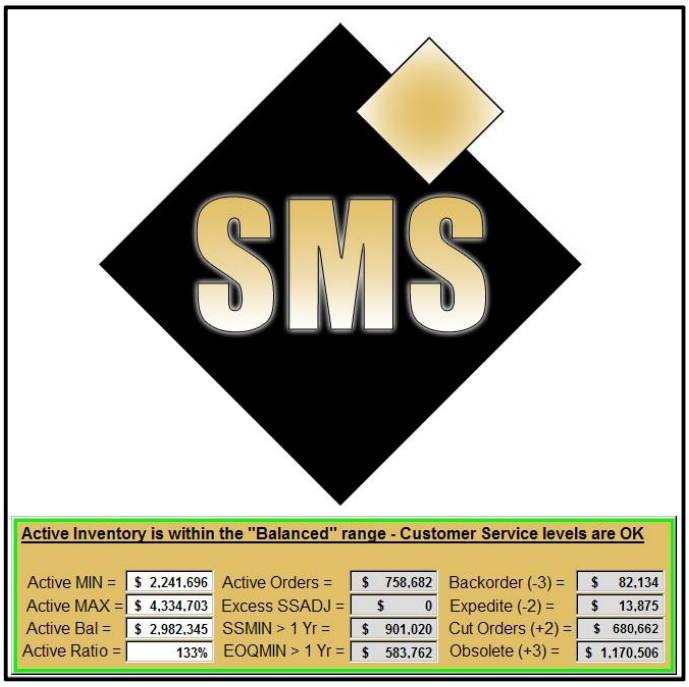
Frequently Used Functions

This menu screen is available and makes SMS processing easier for the advance user. The most commonly used functions are placed on a single screen. This menu screen enables the advanced user to operate SMS without drilling down to individual menus.

Three sections include Views, Reports and Updates. A toggle switch appears in the upper right corner of the main SMS screen and allows the user to switch back to Frequently Asked Questions at any time.

Performance Banner

SMS assesses inventory status and provides a ***Performance Banner*** at the bottom of the SMS Desktop. This ***Performance Banner*** indicates how effective the user has been at managing the inventory processed by SMS. If SMS is processed without overrides, limits or adjustments it will optimize the inventory by itself. However, every user may introduce the "human element" into weekly processing. These overrides, limits and adjustments – although often well intended – may actually be harmful. SMS will indicate how beneficial these may be.



If "active" inventory is optimized within acceptable limits, SMS will display a green border as shown at left. This should be the goal of every SMS user. These numbers are the "white" fields at the left.

Acceptable limits range from an ***Active MIN*** level which is ½ the SMS calculated EOQ plus SMS calculated Safety Stock at cost. This calculation formula would be represented as **(1/2 EOQ@cost) + (Safety Stock@cost) for active items where either last year was > 0 – or – the coming year forecast is > 0**.

SMS recognizes that there are always inactive items in every inventory that cannot be used. This banner shows active inventory.

The upper value for inventory is represented by the ***Active MAX*** level which is the full SMS calculated EOQ plus SMS calculated Safety Stock at cost. This calculation formula would be **(Full EOQ@cost) + (Safety Stock@cost) for active items where either last year was > 0 – or – the coming year forecast is > 0.**

The ***Active Bal*** level indicates the current level of "active" inventory being processed. On this example, the ***Active Bal*** is between the SMS ***Active MIN*** and ***Active MAX*** indicating that – overall – this inventory is in the balanced range. The ***Active Ratio*** is 133% for this inventory.

The fields in the center and right of the banner are displayed in gray and can be "clicked" to bring up lists of individual items that comprise the total shown. The middle column of fields starts with ***Active Orders*** that shows the total cost of orders currently outstanding. Frequently, these orders still have items where the order has been received into inventory, but (for some reason) not taken off the Stock Status system. Clicking this field opens the "All Open Orders menu" shown on page 19 (Reporting).

The ***Excess SSADJ*** field indicates how many Safety Stock adjustments have been entered by the user that may be excessive. "Clicking" and reviewing these items will help the user revise and clean up these adjustments.

The ***SSMIN > 1 Yr*** field indicates how much excess investment is the result of unnecessary minimums for Safety Stock as sent by the user's data interface. These may be the result of the user supplying the Stock Status MIN value which can be corrected through use of SMS. "Click" this field to review these items.

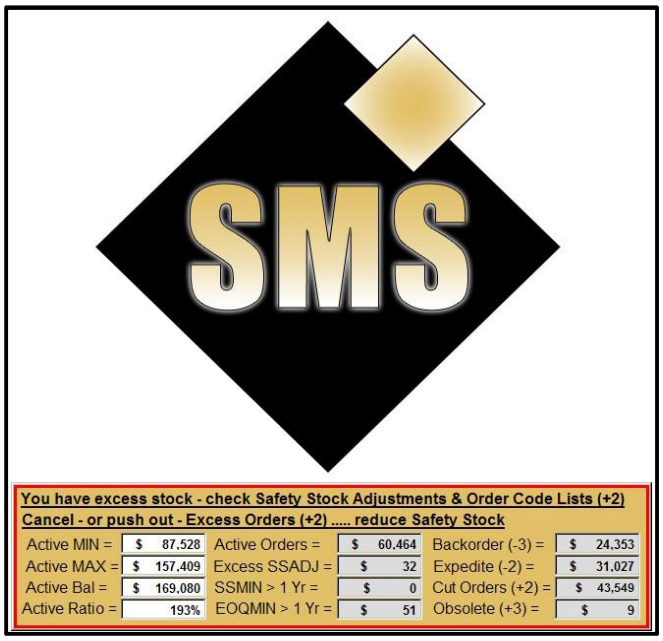
The ***EOQMIN > 1 YR*** field indicates how much excess investment is due to unnecessary minimums for EOQ as sent by the user's data interface. These may be dictated by the supplier and cannot be changed. "Clicking" and reviewing these may identify items that can be changed and, thus, prevent a huge order in future that may be unnecessary and costly.

The column of fields to the right indicate how much investment may be lacking or in excess. These are the critical Order Codes of SMS and should be thoroughly reviewed each week. Each field summarizes the total for that Order Code category and can be "clicked" to display a listing of the individual items that comprise that total. These listings are the Order Code Listings discussed on pages 13 and 14 (Reporting Section). These lists are for analysis and are displayed in cost order with the biggest cost at the top of each list. They are grouped by the Level 4 field (usually "Location").

From the top, these are ***Backorder (-3)*** which shows the shortage needed to be filled. "Clicking" here lists current backordered items some of which may have an order placed, but not due to arrive in time. Next would be the ***Expedite (-2)*** which shows the cost of additional orders needed to be procured or existing orders moved up. "Clicking" here lists items that are not yet backordered, but will be short before lead time. Hence, the need to expedite orders.

Next would be ***Cut Orders (+2)*** which shows the cost of excess orders placed, but not needed. "Clicking" this field lists items with excess orders which should be cancelled or moved back. At the bottom would be the ***Obsolete (+3)*** field which shows the cost of excess inventory > 1 year supply. "Clicking" here lists items that comprise this excess. Try to transfer these to bring this level down.

If the inventory is not optimized within acceptable limits, SMS will display a banner with red border. This can be caused by excess stock (shown below). It can also be caused by chronic shortages of stock (much less frequent). The banner fields are the same for all banners shown. ***Red borders require immediate action!!!***



SMS users frequently get red banners during the first few weeks. After a few months, SMS should begin to show the green banner. The banner will focus on "active" inventory. This is inventory that the user can control and manage.

Reviewing and cleaning data should be the first step when using the SMS tool. SMS highlights the data problems in any Stock Status System. For example, deleting orders that have been received but not cleared from the Stock Status Order file is extremely important. Revising existing MIN/MAX values is another effective task. Setting proper customer service levels for key items is also effective. Reviewing lead times can also have an impact on bringing inventory levels into acceptable ranges. Maintaining and loading Bill-of-Material files is critical. For DRP processing, setting the proper "supplier to warehouse" hierarchy is also critical.

This main menu "Banner" is an executive tool to focus user attention on the critical items which keep inventory levels optimal. Too much inappropriate user intervention can be harmful. Not reviewing user updates or adjustments on a regular basis can also be harmful. These problems show prominently in SMS.