

Synchron Parts Planning Solution

Parts Planning

All you need to do parts planning. Forecasting, inventory optimization, replenishment, reporting, and a lot of configuration options.

The Parts planning base package encompasses all the essential components for parts planning, and includes the following sub-modules:

- Demand forecasting
- Inventory optimization
- Stock replenishment
- Reporting and KPIs
- Planning configuration

Demand forecasting

Demand forecasting performs automatic periodical time-series forecasting for all active location unique items. By default, it considers available historical demand data and uses different forecasting techniques to predict future period demand.

The forecasting of each item is governed by a forecasting parameter set, and different settings can be applied to different items.

Demand forecasting includes the following capabilities:

- Statistical forecasting: Statistical time series forecasting for each location unique item.
- Forecast adjustments: Users can make manual adjustments or import changes to the system-generated forecast.
- Replacements and demand inheritance: The system considers replacement relations and propagates demand from replaced items to their replacements.
- Market volume density: Create and apply market volume density profiles to adjust future period forecasts.
- Seasonality: Automatic individual and group seasonal profiles that can be used in forecasting.

Inventory optimization

Inventory optimization suggests the item replenishment policies required to achieve a given target service level. The inventory policy governs which items are to be stocked and

at which target service levels, and consequently at which stock level and in which quantity each item should be ordered. Each item is assigned to one inventory policy, based on configurable rules. The inventory policy can be optimized using target service level optimization. Given the applied constraints and optimization mode, the solution finds the best setup to achieve a given service level.

Inventory optimization includes the following capabilities:

- Inventory optimization: Inventory optimization across a defined group of items assigned to a so-called inventory policy.
- Replenishment parameter generation: Recommendation of stocking decision, target service level, order level, buffer stock, and optimal order quantity for each location unique item in alignment with the inventory policy.
- Delivery mode optimization: Optimal selection of delivery mode for a given supplier.
- Item overrides: Users can change a large set of item parameters through central and local overrides.
- Critical stock lists: Users can define an initial or critical list of items to be maintained in stock, along with minimum order levels.
- CO₂ emission simulation: The system enables the simulation of transportation CO₂ emissions within the context of inventory optimization.

Stock replenishment

With Stock replenishment orders are recommended. The order generation is governed by the replenishment policies as well as different ordering calendars. Confirmed orders are exported to customer ERP and/or order management solutions.

Stock replenishment includes the following capabilities:

- Refill order generation: The system generates refill/stock orders when the effective stock hits the order level.
- Rush order generation: The system recommends rush orders as a reaction to identified risks of runout.
- On-demand order generation: The system or a user generates on-demand orders for non-stocked items with a backorder.
- Manual order creation: Users can create manual orders.
- Replenishment history: Full history of generated orders.

Reporting and KPIs

Reporting and KPIs calculates and provides parts planning key performance indicators and reports.

Reporting and KPIs includes the following capabilities:

- Summary: Summary view of the overall parts planning situation
- Standard KPIs: Vast array of KPIs such as service level and stock value.
- Item alerts: Detailed report showing item alerts.
- Item report: Report to filter out items and perform actions such as mass updates.
- Demand transactions: Report showing all demand transactions and related details.
- Excess stock: Detailed report listing all items with excess inventory.
- Stock Health: Aggregated view of the stock health.
- Risk of Run-out: Actionable report listing all items with risk of run-out.

Planning configuration

Planning configuration provides users with access to a wide range of configuration options.

Planning configuration includes the following configuration capabilities:

- Forecasting parameters: Settings governing how an item will be forecasted.
- Replenishment parameters: Settings governing the replenishment process for an item.
- Dynamic parameter set assignment: Rule framework to dynamically assign parameter sets and inventory policies to items.
- Warehouse settings: General warehouse settings and defaults.
- Supplier configuration: Settings and defaults for suppliers.
- Inventory policy configuration: Configuration governing how inventory will be optimized.
- Demand stream configuration: Configuration of different demand streams.
- Currencies: Configuration of currencies and exchange rates.
- Schedules / Ordering calendars: Configuration of business schedules governing the stock replenishment.

Planner automation

The process of planning can be entirely automated, incorporating replenishment policy approval and order auto-confirmation to streamline decision-making. Blocking rules can be configured to direct planners' attention towards exceptional cases. Planner automation encompasses the following sub-modules:

- Order blocking and auto-confirmation
- Replenishment policy approval

Order blocking and auto-confirmation

Recommended order lines can be automatically approved. Planners have the flexibility to configure blocking rules to prevent specific order lines from being auto-confirmed.

The capabilities of order blocking and auto-confirmation include:

- Auto-confirmation: Enables the automatic confirmation of recommended order lines, with configurations set for each warehouse supplier.
- Order blocking: Involves establishing order blocking parameter sets and assigning them to various warehouses, suppliers (for each warehouse), or inventory policy picks classes.

Replenishment policy approval

Replenishment Policy Approval (RPA) serves as a framework for reviewing and approving replenishment policies. These policies, defining parameters such as stocking decisions, order levels, and optimal order quantities, dictate the replenishment process for each item. The policy changes regularly due to forecast and configuration changes, and with the replenishment policy approval process planners can review changes before they are put into effect.

Flexible rules can be configured to determine which changes require review and which changes can be auto-approved. In instances where RPA is not utilized, all changes are automatically approved without review.

Typically, when RPA is implemented, a significant portion of order suggestions are auto-confirmed, thereby saving time for planners. Moreover, through policy reviews, planners gain confidence in their replenishment policies, leading to reduced review time for order recommendations.

RPA also facilitates the gradual introduction of major changes, preventing planners and suppliers from being overloaded on the day of implementation.

RPA includes the following capabilities:

- Replenishment policy smoothing: Enables the control of replenishment policy changes that immediately generate order recommendations, ensuring a smoother implementation of configuration adjustments. This aims to reduce the peak load on planners and logistics operations that can follow after major changes.
- Replenishment policy approval: Involves manually reviewing changes to each item's replenishment policy, encompassing changes to order levels, optimal order quantities, and stocking parameters.
- Replenishment policy auto-approval rules: Allows for the configuration of simple or advanced rules to automatically approve or manually review replenishment policy changes.

Supplier Collaboration

Supplier collaboration offers a set of capabilities to facilitate collaboration with your suppliers. This helps increase both your and your suppliers' parts planning. Work together on open orders, share



your purchase order forecast, generate return suggestions, and level the load for suppliers and production entities. It includes the following sub-modules:

- Purchase order management
- Supply planning / purchase order forecasting
- Return order management
- Supplier load leveling

Purchase order management

Purchase order management (delivery monitoring) streamlines the collaboration with suppliers regarding open orders. This tool aids in the identification of order lines requiring expedited deliveries and allows for the updating of Estimated Time of Arrivals (ETAs).

Purchase order management includes the following capabilities:

- Delivery monitoring: Planners can view open purchase orders and identify possible risks of run-out. Planners can then collaborate with suppliers to get updated ETAs, and expedite order lines if needed.
- Supplier log-in: Suppliers can log in to the application to review and respond to expediting requests directly in the application.

Supply planning / purchase order forecasting

With Supply planning / purchase order forecasting, the system forecasts upcoming purchase orders and makes the forecasts available for various applications. The prediction can be shared with suppliers for improved delivery accuracy, serve as input to budget and S&OP discussions and be used directly in the application for intelligently filling up orders to meet certain constraints, such as supplier order value constraints, supplier bonus targets or container sizes.

Supply planning / purchase order forecasting includes the following capabilities:

- Item order schedule: Generates future replenishment order predictions for a particular item.
- Order fill-up: Utilizes item order schedules to fulfill existing orders efficiently to meet specified targets or constraints.
- Order prediction: Enables users to consolidate item order schedules, such as those for a specific supplier. The compiled list can be exported to Excel or viewed within the application, aiding the supplier in preparing for future order volumes and enhancing delivery accuracy.
- Supplier log-in: Suppliers can log in to the application and access order predictions.

Return order management

With return order management, the system automatically creates return order lines for excess and obsolete inventory according to a pre-set schedule or on demand. The returns can be either guaranteed or non-guaranteed based on agreements with the suppliers. The rules governing returns are managed through a wide array of configuration choices.

Supplier load leveling

The load for a configured [master] supplier can be constrained (leveled) for each day of the week. Constraints are managed in terms of the number of order lines. Order suggestions for all customer warehouses facing a given supplier location are prioritized based on service contribution. Supplier load leveling assists in mitigating fluctuations in order volumes, ensuring a consistent workload on a daily basis for supplying locations.

Global Parts Planning

Global parts planning offers a large set of capabilities to optimize inventory across multiple locations. It includes the following sub-modules:

- Demand and forecast propagation
- Multi-echelon inventory optimization
- Internal stock redistribution
- Item locator
- Virtual planning
- Warehouse clustering
- Planned events management

Demand and forecast propagation

Demand and forecast propagation unifies all demand and forecasting aggregation techniques, whether through the supply chain or a BOM structure, ensuring compatibility. This process allows a supplying warehouse to aggregate forecasts from certain customer warehouses and demands from others, while effectively planning and propagating demand and forecast from assemblies to sub-assemblies and components. To achieve accurate probabilistic forecasting, it is essential to account for forecast uncertainty. When utilizing demand or forecast data from downstream locations, the patterns often appear smoother than they truly are due to Minimum Order Quantities (MOQs) and Optimum Order Quantities. Therefore demand and forecast propagation considers the expected order sizes in the probabilistic forecasting.

The capabilities of demand and forecast propagation encompass:

- Point of sales demand aggregation: Aggregating demand transactions from customer warehouses to supplying warehouses.
- Forecast aggregation: Aggregating forecasts from customer warehouses to supplying warehouses.
- BOM demand/forecast propagation: Aggregating demand and forecast data from assemblies all the way down to individual components.

Multi-echelon inventory optimization

Multi-echelon inventory optimization (MEIO) is a method that optimizes inventory across multiple tiers (echelons) in the supply chain in a coordinated manner. The optimization of supplying and customer locations simultaneously results in substantial advantages, often leading to a reduction in inventory of up to 30% while enhancing service levels by more than 5 percentage points. Typically, this is accomplished by redistributing stock downstream in the supply chain. While traditional multi-tier planning just propagates demand or forecasts upstream, MEIO co-optimizes all locations with a focus on achieving a desired end-customer service level. In essence, a decrease in service level upstream impacts the average lead times downstream, consequently influencing the amount of inventory needed to meet a specific service level. MEIO takes into account this interdependence and determines the optimal service levels across all locations.

Internal stock redistribution

Inventory can be redistributed from a location with excess stock to a location in need of inventory. The system generates redistribution recommendations automatically, proposing alternative order lines to suggested orders, such as refill or rush orders. The business logic governing redistribution is managed through redistribution regions, pairs, and a range of redistribution settings.

Item locator

The Item locator, commonly known as the parts locator, enables planners from one location to locate inventory at another dealer location. By default, the item locator utilizes straight-line distances to identify the nearest locations with available inventory. Contact information is supplied to facilitate communication between planners.

Virtual planning

Virtual Planning is an advanced planning concept where a virtual (non-physical) location is configured to hold stock for a set of physical locations (referred to as the virtual region of physical warehouses). Demand and stock are aggregated from all physical locations to the virtual location before standard inventory optimization and replenishment processes are

performed. Ultimately orders are recommended for a predetermined or dynamically selected physical location.

This method is commonly employed for slow-moving items that would not typically be stored in any physical location based on the local item's individual demand pattern, but where it makes sense to maintain inventory within the region to facilitate swift backorder fulfillment for any of the physical locations.

It is essential to highlight that "Internal stock redistribution" is a prerequisite for implementing Virtual Planning, as the framework operates on the premise of stock sharing between locations.

Warehouse clustering

Warehouse clustering involves the process of grouping similar warehouses into clusters. Subsequently, the total demand is calculated for each [master] item within the cluster, and the items in the cluster are categorized into configurable cluster movement types, such as Fast, Medium, and Slow. These movement types can be utilized to assign distinct parameter sets, including inventory policies. A typical scenario is to adopt a more aggressive inventory policy for items with high sales within the cluster in contrast to those with limited cluster sales. This scenario is based on the premise that comparable warehouses exhibit similar demand trends and that local sales are more likely to be coincidental for a cluster slow-mover than for a cluster fast-mover.

Planned events management

Planned events management enables users to create upcoming events and link them to specific items, known as planned event lines. These items are suggested for timely ordering before the event, utilizing either the As Late As Possible (ALAP) or the As Soon As Possible (ASAP) mode. Additionally, events can be imported through the file interface. Planned events management can help reduce just-in-case inventory and improve service execution.

Multi-echelon inventory optimization

Multi-echelon inventory optimization (MEIO) is a method that optimizes inventory across multiple tiers (echelons) in the supply chain in a coordinated manner. The optimization of supplying and customer locations simultaneously results in substantial advantages, often leading to a reduction in inventory of up to 30% while enhancing service levels by more than 5 percentage points. Typically, this is accomplished by redistributing stock downstream in the supply chain. While traditional multi-tier planning just propagates demand or forecasts upstream, MEIO co-optimizes all locations with a focus on achieving a desired end-customer service level. In essence, a decrease

in service level upstream impacts the average lead times downstream, consequently influencing the amount of inventory needed to meet a specific service level. MEIO takes this interdependence into account and determines the optimal service levels across all locations.

Virtual planning

Virtual planning is an advanced planning concept where a virtual (non-physical) location is configured to hold stock for a set of physical locations (referred to as the virtual region of physical warehouses). Demand and stock are aggregated from all physical locations to the virtual location before standard inventory optimization and replenishment processes are performed. Ultimately orders are recommended for a predetermined or dynamically selected physical location.

This method is commonly employed for slow-moving items that would not typically be stored in any physical location based on the local item's individual demand pattern, but where it makes sense to maintain inventory within the region to facilitate swift backorder fulfillment for any of the physical locations.

It is essential to highlight that "Internal stock redistribution" (Global parts planning) is a prerequisite for implementing Virtual planning, as the framework operates on the premise of stock sharing between locations.

Planned events management

Planned events management enables users to create upcoming events and link them to specific items through so-called planned event lines. The items are suggested for timely ordering before the event, utilizing either the As Late As Possible (ALAP) or the As Soon As Possible (ASAP) mode. Additionally, events can be imported through the file interface. Planned events management can help reduce just-in-case inventory and improve service execution.

Advanced Prediction

If historical demand data alone proves insufficient for predicting future demand, advanced forecasting methods may offer a solution. By incorporating various causal factors like machine running hours or installed base, the accuracy of demand forecasting can be significantly improved. Establishing live connections to your products ensures that the installed base remains current, allowing for immediate responses to any changes.

Advanced prediction encompasses the following components:

- Causal forecasting
- Installed base forecasting
- Connected products

Causal forecasting

Causal forecasting complements traditional statistical forecasting by taking into account causal factors (e.g., machine running hours) and the mean time between failures when projecting future demand.

Installed base forecasting

Installed base forecasting correlates demand history and forecasts with the total number of installed units. The forecast is adjusted proportionally based on the quantity of installed units, resulting in a scaled forecast. The installed base information is propagated through Bill of Materials (BOM) structures.

Connected products

Connected products leverage real-time machine and product data to optimize inventory management processes. This involves monitoring real-time machine or product positions (GPS coordinates) and assigning them to the nearest warehouses for accurate installed base counts. The installed base information, propagated through a BOM structure, enables real-time forecasting and enhances the accuracy of data, particularly helpful in scenarios like return approval processes.

The capabilities of connected products include:

- Connected installed base forecasting: Adjusting forecasts in response to products moving to a different service area.
- Product to warehouse allocation: Determining or predicting the location that will serve a product.

Replay Simulator

The Replay simulator facilitates the testing of a new feature or configuration, aiding in comprehending its implications before deployment.

Through the simulator, an analyst can re-simulate history with a different setup. This capability provides the analyst with valuable insights into the potential outcomes of making configuration



adjustments, such as modifying forecasting parameters. Technically, the Replay simulator mirrors the production environment, executing all standard processes with automatic order confirmation.

Insights

Insights is a Business Intelligence (BI) tool designed to provide analysts with actionable intelligence derived from a vast list of data models.

Analysts utilize Insights to create interactive dashboards, set up alerts, and collaborate by sharing data with their colleagues. The tool enables them to delve deep from high-level Key Performance Indicators (KPIs) into specific data subsets, aiding in the identification of root causes of issues or opportunities for strategic action. Insights offers a variety of pre-built dashboards and supports a wide range of use cases, including:

- **Override and compliance analytics:** Understand the impact of user overrides on crucial performance metrics.
- **Supplier performance monitoring:** Monitor supplier performance such as on-time delivery and overdue order value.
- **Warehouse performance tracking:** Compare and assess the performance of various warehouses, taking necessary actions as needed.
- **Service level and backorder analysis:** Gain insights into factors hindering you from meeting service level targets.

CSX Data Central - Core

CSX Data Central is an analytics product designed for analysts and data scientists. It enables users to discover, preview, query, and export data products created by Synchron. This unlocks multiple use cases, from generating KPI reports across multiple data sources to uncovering hidden patterns in the data. Users will have access to **standard data products** from the Parts Planning subscription, such as Warehouse, Items, Demand history and others.

CSX Data Central - AI Premium

The AI Premium add-on package provides customers access to **Notebooks** for writing Python scripts to conduct advanced analytics. It also includes the **Text-to-SQL** functionality, which leverages AI to translate natural language queries into SQL scripts, enhancing accessibility and efficiency.



CSX Managed exports

The Managed Exports add-on is a service where customers can request Synchron's Expert Services to **set up and manage data exports** from CSX Data Central on their behalf. This allows customers to streamline and automate their data export processes with Synchron's support.

ML Forecasting

Machine learning forecasting leverages diverse machine learning methods and increased data volume to enhance forecast accuracy, thereby improving overall parts planning efficiency.

A standard machine learning model is trained on customer data (demand, item characteristics, etc.) to enhance point forecast accuracy metrics that are in line with overarching part planning goals.

This documentation is a confidential material of Synchron and is intended solely for use of the Customer in connection with the subscription agreement for Synchron's SaaS Solution("Agreement"). All information furnished by Synchron to the Customer in this documentation is of confidential and proprietary nature. All analysis, compilations, data, presentations, quotes, summaries, or other documents prepared or presented by Synchron or its representatives based on or in relation to this documentation shall also be considered confidential. Confidentiality section of your Agreement shall apply to the treatment of this confidential material shared by Synchron. Synchron Holding AB reserves all rights to this documentation and all information set forth therein.