



# Production Management and Scheduling

## Meet Your Due Dates

Your production process can be simple or complex, time consuming or quick, but one thing remains constant – the drive to meet your customer’s delivery date. Even the simplest production plan is at the mercy of proper planning and scheduling. In order to meet the promised deadline, your production team needs access to material, labor, and work center information to understand what resources need to be available. Likewise, your Scheduling department also needs the tools to balance your material, labor, and equipment investment. With this information, your production staff can be confident that the customer’s delivery schedule can be met.



The INDUSTRIOS Production Management and Scheduling suite represents a group of modules completely dedicated to managing the production process from process planning and scheduling to production order control. This comprehensive collection of tightly integrated modules ensures a seamless flow of information between departments. The features will enable your production and scheduling teams to collect and report information in a simple and meaningful way that is critical to the efficient execution of your production plans. As many others have discovered, INDUSTRIOS provides you with the solutions you can depend on.

“Often times manufacturing developers have never worked in a manufacturing environment and don’t think of the things we need. INDUSTRIOS has thought of everything we ever needed and even some things we hadn’t.”

— Roxanne Morrisey, Controller,  
American Metal Products

# Bills of Materials and Routings

Clearly defining how you manufacture or assemble the products that you sell helps to ensure that you are covering costs when defining pricing structures, minimize quality and rework issues due to misunderstandings of the requirements and planning for the appropriate materials and resources. The INDUSTRIOS Process Plan integrates the bills of materials, drawings, secondary constraints and instructions with the manufacturing router to provide a comprehensive database to manage the goods you manufacture.

## Define

- Establish cost centers and define how applied costs are grouped for absorption analysis on the financial statements.
- Identify work centers used in manufacturing or assembly. Define unique efficiency factors for each work center including: run time, change over, setup and clean up.
- Secondary constraints, such as labor and tooling, can be defined and include defaults for efficiencies and costing rates.
- Create a library of standard instructions and text that can appear at various sequences on the manufacturing router.
- Use Phantoms to simplify the management of non-stocking kits.
- Control drawings and other electronic files used to communicate manufacturing or assembly instructions.
- Define identifiers for materials and outside services not managed through perpetual inventory.
- Identify raw materials, purchase components and subassemblies required at each routing sequence. Associating materials with the sequence ensures planners do not plan deliveries too early or too late.
- Associate multi-media files to easily confirm which item the process plan produces.
- Assign user-defined fields to collect data specific to the production environment. User defined field formats can include alpha, numeric, date, time, logical, and file links, and can be supported by tables and default values.

## Classify

- Each sequence identifies a unique routing step in the manufacturing or assembly process. Routings can be as simple or as complex as necessary. Within each sequence on the router, associate the primary and alternate work centers, secondary constraints, resource levels, setup group, setup and runtime hours.
- Identify data collection requirements for work center, secondary resources and materials.
- Identify multiple versions of manufacturing routers and bills of materials for a specific assembly or subassembly. The routing status includes: Preferred, Alternate, New or Obsolete.
- Integrated with each sequence on the router are the Bills of Materials, Direct Purchases, Subcontract Services, Drawings, Secondary Constraints, Phantoms and Sequence Text.

## Manage

- Maintain and integrate multi-level bills of materials into the routing structure.
- Identify where more than one finished item is produced using an individual router.
- Define cost allocations for each co-product with user defined formulas.
- Plan for expected yield losses and lot size restrictions for items on the bills of materials and the manufactured or assembled item.
- Identify scheduling flow assumptions for each sequence. Options include: overlap, lag, parallel and queue.
- Easily import/export bills of material and routing steps from/to external systems.
- Verify expected costs based on routing and bills of material assumptions for single or multi-level BOM structures.
- Produce BOM Tree and Process Plan reports to quickly verify routers and bills of material before release to production.



# Shop Floor Data Collection

Having a clear picture of the activities that are happening on the shop floor is fundamental to making the best decisions for scheduling, resource allocations, and expediting customer orders. Making the collection of that information simple and meaningful to the organization is important.

Having the flexibility to collect data at the level and frequency you need to manage your business performance is imperative. The INDUSTRIOS Data Collection features offer your business the capability to record, track, and adjust time and material transactions quickly and easily so that you can spend more time managing the shop!

## Define

- Menu Groups determine the nature of the transactions that can be performed such as time and material transactions, putting jobs on hold, viewing activities, time and attendance activities, etc.
- Break Groups eliminate the need for staff to record break times. The break group also determines if the break is to be considered paid time.
- The shop floor data collection screens allow you to display the list of work to be completed for all or specific areas of the factory. The Work Center Dispatch determines the frequency of update, information display restrictions, and the time horizon.

## Classify

- Understand how direct your direct labor is by using continuous clocking. The continuous clocking feature requires the staff to report not only time spent on production orders but also indirect time such as training, clean up, etc.
- Differentiate between machine time and labor time through transaction types.
- Automatically prorate time staff spends working on multiple production orders at the same time.

## Capture

- Materials used at each stage of the manufacturing process can be charged to the production order and automatically relieved from inventory.
- From one interface, employees can easily track clock-in and out transactions, time and quantities completed against production orders, as well as indirect activities such as training, meetings, and waiting for materials.
- Record transactions using keyboard entry or bar code scanners at shop floor workstations.
- Correct transactions, before or after posting, easily using manual data collection screens.

## Get Mobile

- Record shop floor transactions where they happen using hand held PC's. Mobile transaction capability allows you to automate material, inventory and production transactions without having to go to a shop floor station.
- Take advantage of barcode technology for recording transactions and improve the accuracy of your perpetual inventory.

## Analyze

- Identify which employees have clocked in for the shift and view the daily activities for a specific employee.
- Manage accuracy of time records by quickly reviewing which employees have not started or completed their time transactions.
- View the activity and status of each work center including; jobs in process, the status, quantity completed, planning information, job and transactions details.
- Quickly review the transactions in process at any point in time to identify the status of employees and work centers.
- Review the job cost status at any point in the production process to determine whether the job is keeping to estimates.
- Generate work in process reports to support a financial view of the dollars invested in WIP or a manufacturing view of time spent and quantities completed to date.



# Production Orders

Efficient execution of your production plan is accomplished when all involved share the same information. Access to material, labor, and work center information helps the production team know who and what needs to be available to meet the customer's delivery requirements. The online query capabilities combined with the advanced shop floor data collection capabilities truly connect the production team to the events on the shop floor.

## Classify

- Indicate the planning status of the production order. The planning status identifies the commitment the planner has made in the schedule. The planning statuses include: preliminary, planned, firm planned and released.
- Identify the work status of the production order. The status identifies the nature of the transactions and include: in process, partial complete, on hold, cancelled, and complete.
- Select the version of the bills of material and routing that will be used to identify material and resource requirements for the production order.
- Assign responsibilities for planning specific items.
- Integration with Quoting and Sales Order makes it easy to locate all production orders associated with specific quotes and customer orders.
- Define production order numbering conventions to be system assigned at creation of the order, system assigned at release, linked to sales order numbering convention or manually assigned.
- Assign user-defined fields to collect data specific to the production environment. User defined field formats can include alpha, numeric, date, time, logical, and file links, and can be supported by tables and default values.

## Manage

- Production work orders can be created directly from the results of the Material Planning Calculation, during sales order entry, or manually from the Job Entry/Browse screen.
- Changes to the manufacturing routing and bills of material can be recorded on a production order without modification to the master process plan.
- Easily identify material shortages and determine strategies before production orders are issued to the floor.
- Communicate instructions to the production team using the comprehensive shop document with flexibility to include the appropriate level of detail.
- Quickly review tracking information for the production order from the Job Entry/Browse screen, including; planned vs actual start dates, routing sequence status, material requirements and usage, and job estimate vs actual costs. The supporting transactions can be accessed directly from the job screen.

## Report

- Capture time spent on a production order at the work center and labor activity. The information includes: employee, start/end date, start/end time, work hours, break time, quantity completed and rejected, sequence status, and hold reason. Associate user defined fields with time transactions to capture data specific to the environment.
- Material used on the production order can be quickly reported at the job, sequence or individual item level. Materials not defined on the bills of material can still be reported and flagged as a variance on the production order.
- Record completed production quantities without closing the production order.
- If the item manufactured may be different from the plan, result in multiple items being manufactured or is not known until the end of the manufacturing run, the Co-Products functionality can be implemented to define the rules and costing assumptions.



# Material Planning

Having too much inventory can result in obsolescence and increased costs but not having enough can result in lost sales, delayed deliveries and overtime premiums.

The challenge is to increase sales and maintain on-time deliveries while working to lower costs, reduce inventory levels and manage supplier relationships. The INDUSTRIOS Material Planning module provides you with complete online material requirements analysis so that you can create your purchasing plans, deal more effectively with scheduling conflicts, and ensure that materials and services are delivered on time.

## Classify

- Establish the planning horizon to be used when calculating the material requirements plan. The planning horizon includes: the planning bucket length, the start date for the plan, and the demand horizon.
- Schedule the materials planning calculation to automatically generate on a user-defined schedule.
- Considers the low level code for multi-level bills of materials to ensure the proper sequencing of material requirements.
- Identify one or more forecasts to include in the materials requirement plan.
- Define the expedite horizon to minimize the number of suggested requisitions or production orders.

## Analyze

- Dynamic ranging filters allow planners to quickly focus on shortages that will affect firm demand in the short-term planning horizon.
- Time phased view of material requirements plan allows planners to easily review trends in demand and supply.
- Material planning results provide visibility to the opening available inventory, source of demand and supply and shortages for each planning bucket.
- Easy drill down access to details supporting the material planning recommendations for all or ranges of planning buckets.
- Quickly identify and address situations where it is necessary to pull in, push out or cancel supply due to changes in demand.

## Anticipate

- Analysis of time phases allows you to quickly predict when there will be a shortage in inventory based on firm bookings, forecasts, planned production and purchase commitments.
- Define stocking constraints such as minimum stock levels help to reduce the risk of shortages due to unexpected increases in demand.
- Easily integrate forecasts to manage and commit purchasing plans for long lead-time items or create master production schedules.
- Standard templates developed in MS Excel make it simple to create new or adapt existing forecasts to be included in the Material Planning Calculation.
- Multiple forecasts can be created and included in the planning calculation.

## Execute

- Suggestions to purchase inventory can be easily and quickly converted to a purchase order directly from the material planning results.
- Requirements to manufacture inventory are automatically translated from the materials plan into preliminary production orders for consideration in the production schedule.



## Scheduling

Planning production can be as much art as science. Wouldn't it be nice to reduce the amount of art and have tools to allow you to manage multiple constraints, change-overs and update other functional areas within your organization? The INDUSTRIOS Advanced Scheduling module provides those involved with scheduling activities the tools to be able to do just that!

Easily review your plan using the drag and drop Gantt view of the schedule. You can also generate multiple versions of the schedule using different assumptions and identify the plan that results in the least number of late orders.

## Navigate

- Easily review scheduling results using the Gantt view on the Scheduling Workbench.
- Move scheduled operations both forward or backwards with the click of a mouse.
- Quickly update the schedule using the "Drag and Drop" interface.
- Extensive online filtering options provide the planner with the capability to quickly review schedule results by work order and highlight changes or exceptions.
- Review supporting details relating to the operations such as: work order status, estimated completion dates, material availability, customer order details, etc.
- Customize the schedule presentation including patterns, colors, time intervals, etc.

## Define

- Specify constraints that will impact the scheduling of a specific work center such as tooling, labor, materials, etc.
- Define each work center as either infinite, finite or excluded for scheduling purposes.
- Efficiency rates and run time definitions can be unique by work center.
- Specify change over matrix to minimize setup as part of scheduling calculation.
- Job priority sequencing and job selection is defined by the planner.
- Establish work calendar for all scheduled resources.
- Ability to define preferred and alternate manufacturing routers.
- Capacity can be defined based on multiple shift assumption and 7 day operations.
- Ability to define resource levels to represent the number of work centers in a group and number of production orders that can be loaded at any one time for the group.
- Define finish to start relationships between sequences such as queue, parallel, lag, and overlap.
- Sequences in the routing can be flagged to not be scheduled or to be scheduled as a group.
- Complex assemblies are scheduled using low level code.

## Plan

- Allows for the following planning rules: started operations, locked operations, actual before planned, critical ratio, priority code, required date, due date and entry date.
- Both primary and secondary constraints are considered in the planning of production.
- Scheduling calculation parameters allows for finite or infinite planning by resources or for the entire plan, forward or backward planning and allows for jobs to be anchored in the schedule.
- Automated Multi-Pass Scheduling allows the planner to establish user defined selection criteria for orders to be scheduled.
- Ability to generate multiple schedules to support "What if Multi-Scenario Comparisons".
- Analyze scheduling information such as work center utilization, labor and resource requirements, production order schedules, etc.

## Update

- Changes to work centers and labor, schedule start and end dates and schedule status are automatically updated on production orders.
- Changes to schedule start and end dates will update the materials plan, without regenerating the plan, and identify requirements to expedite purchase orders or highlight purchase orders that can be pushed out.



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