Advanced Manufacturing Planning and Scheduling

SeikiSOFTWARE

MDM

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Advanced Planning and Scheduling

The difference between Planning and Scheduling

Planning is about breaking down a works order into individual operations that will deliver a completed product, defining what to make, when to make it, how many and on what resource(s). Scheduling is the sequencing, factoring in constraints and priorities to apply a chronological order to the plan. It also synchronises with upstream and downstream processes to include changes or updates so you can monitor and control the impact.

Some systems specialise in planning and others in scheduling. The Seiki Scheduler integrates both functions to make your job easier.

A Dynamic Solution

Striking a balance between the demands of meeting delivery dates and managing workflow efficiently and economically can be difficult when trying to plan and schedule your production manually. Especially when time is a critical factor. For example, managing complex planning and interwoven scheduling procedures in multiple, uncontrolled spreadsheets typically results in errors that can have a huge impact on the accuracy of your plan. This can be down to errors in formulas or simply because your information is out of date as the spreadsheets don't dynamically update. By the time you've realised and investigated the source of the error your plan is obsolete. Seiki addresses this with a real-time, finite capacity solution that provides a high level of visibility and control so you can confidently and quickly make key planning decisions.

Advanced planning and scheduling can help you to:

- Understand the sequence of operations in the manufacturing process
- Take into account complex interdependencies
- Know when the machines or resources are required for each works order and when they will be available
- Control and modify the timings and delays between operations for more realistic production lead times
- Monitor the live progress of each works order on the shop floor
- Measure performance against plan
- Use people's time more effectively

Seiki Scheduler can deliver benefits such as:

- Faster and more accurate scheduling
- Reduced outsourcing
- Reduced inventory and WIP
- Identification of untapped production capacity
- More realistic delivery promise dates
- Improved on time delivery performance
- Increased responsiveness to unplanned downtime events
- Avoidance of production bottlenecks
- Greater visibility and improved communication
- Responsiveness to new or rush orders
- Increased customer service levels

Finite Capacity

Finite capacity planning ensures that your capacity is taken into account from the moment you start to plan. With the Seiki Scheduler you can create a realistic model of your capacity by defining key factors such as resources, individual workplace efficiency, shift times and company calendars. It helps you to work leaner. For example, stock levels are reduced as materials are only ordered when required, improving cash flow. Operations are only scheduled when resources are available, reducing work in progress and avoiding bottlenecks in production. The resulting efficiency and productivity improvements also mean you can avoid unnecessary subcontracting.

Finite doesn't mean you're restricted to a short term view. The advantage of having a dynamic system combined with a comprehensive capacity model provides a more reliable view of future availability. This has company wide benefits as it supports strategic business planning and forecasting.

PRODUCTION CONTROL AND VISIBILITY

Watch this video:
An Introduction to Planning and Scheduling

As a decision support tool Seiki Scheduler can help you maintain the balance between demand and capacity.

It can help to identify and justify opportunities for increasing capacity by:

- Offering overtime
- Subcontracting work
- Splitting batches
- Avoiding bottlenecks

It can help to visualise and account for events that can cause reductions in capacity such as:

- Machine breakdowns
- Operator absence
- Scrap or re-work
- Excessive changeover times

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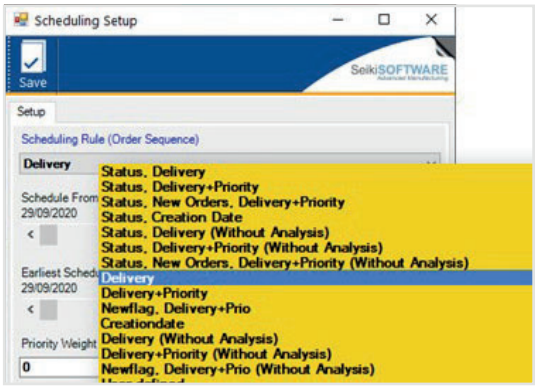
Key Features

Scheduling Rules



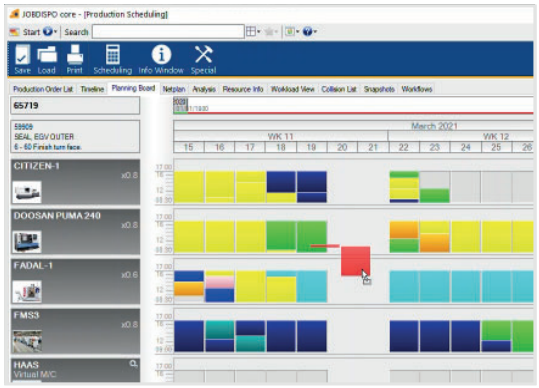
The system helps take the time, complexity and errors out of planning with built-in rules that apply a sequencing logic when scheduling works orders onto the planning board.

Each scheduling rule may contain more than one factor, in which case the sequencing logic is applied in order of display on the rule name.

The scheduling rules can be further constrained at the operation level, which means that it is possible to set rules for overlapping, workspeed factor and earliest start dates against individual operations, as opposed to being limited to a single global rule. This enhanced level of configurability means that all critical factors are accounted for and it helps to produce the most effective baseline schedule.

The Scheduler can be run stand alone, allowing you to manually enter routings, or interfaced to your existing business management system for a completely integrated end to end manufacturing solution. Using our proprietary EAI (Enterprise Application Integration) software we offer an intelligent interfacing solution between your existing ERP or MRP systems or other industry standard databases to the Seiki Scheduler database. EAI can support bi-directional upstream and downstream data transfer, automatically exchanging works order information for a dynamic, real-time connection between the shopfloor and production operations.

Interactive Graphical Planning



One of the main features of the software that makes it easy to use and simple to learn is the interactive graphical planning views. They provide a fast visual summary of the loading of all active orders along with the essential production information associated to their individual operations, such as works order number, drawing number, quantity and due date. The routing information required for scheduling, e.g. operation numbers, resource(s) to be used, setting and cycle time, are also available.

It's at this stage that you're ready to harness the experience and insight of your planning team to refine and make adjustments to the plan.

- Drag and drop operations around the planning board, either forwards or backwards along the timeline, or to different resources. All preceding and subsequent operations will automatically update to retain the sequence.
- If any gaps are created after moving jobs around, you can use the Fill Holes feature to automatically maximise capacity utilisation by filling them with smaller operations
- React to unexpected events such as machine breakdowns or staff absence by changing the number of available hours on each resource directly on the planning board to immediately see the impact across your entire workload.
- Adjust the efficiency factor of individual resources to generate more realistic operation completion times.

PRODUCTION CONTROL AND VISIBILITY

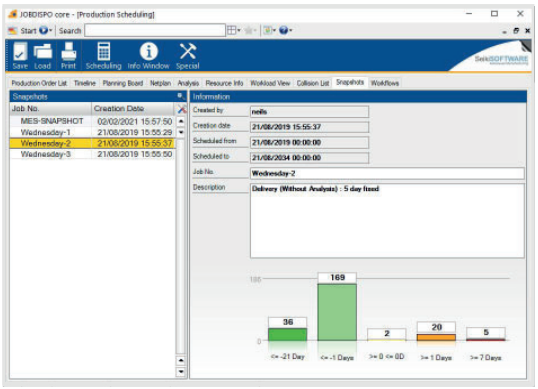
View the Consequences of Changes

57:30	-2			Tech Right Limited	0	Standard
54:07	-2	➡	+4	Power Racing	0	Standard
08:19	4			Aalco	0	Standard
14:47	-2			Rotork plc	0	Standard
35:06	-3	⬅	-1	Ellis Industries Limited	0	Standard
20:08	0	➡	+1	Spartan Aerospace	0	Standard
21:39	-1	➡	+1	Stevens Aerospace	0	Standard
18:26	-3			Dave Brook Limited	0	Standard
48:20	2	➡	+5	Seiki Systems Ltd	0	Standard
41:24	-6			Ellis Industries Limited	0	Standard
39:05	-6	➡	+1	Vickery Fabrication UK	0	Standard
48:21	2	➡	+1	Trill Cables Limited	0	Standard
11:47	-1			Dave Brook Limited	0	Standard
20:09	-4			Spartan Aerospace	0	Standard
23:03	3			Ellis Industries Limited	0	Standard
13:08	-1			Rotork plc	0	Standard
35:08	-1			Dave Brook Limited	0	Standard
48:22	3	➡	+1	Harvey Aircraft Limited	0	Standard
50:00	-5	⬅	-5	Seiki Systems Ltd	0	Critical
12:33	-13	➡	+7	Tech Right Limited	0	Standard

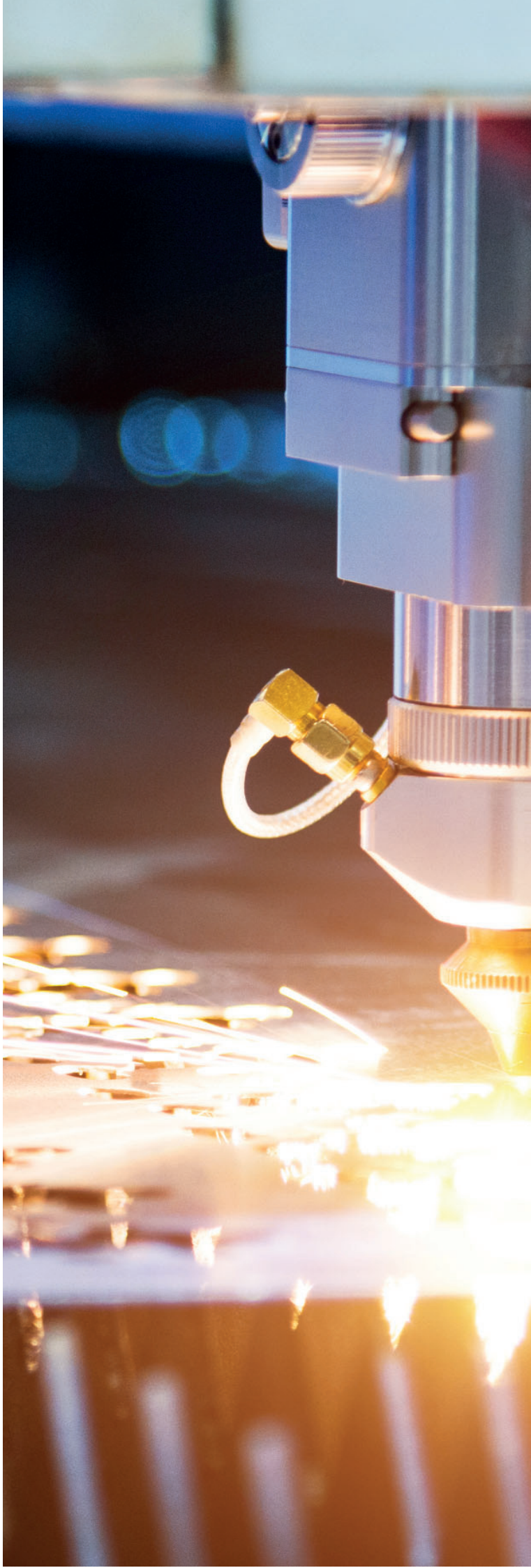
After making any changes on the planning board, the Production Order List view gives you a quantifiable assessment of the impact of those changes to your overall performance and allows you to take corrective measures to minimise the effects.

Together the Deviations and Impact columns show the number of days that the works order will be late by and how much that has increased or decreased as a consequence of the changes you made – instant feedback on whether you've made an improvement or not. This process can be repeated without affecting the live schedule until you achieve an optimal plan that keeps customers happy.

Create Snapshots



Snapshots are saved instances of the production schedule and all its data, displayed in a summarised view of works orders grouped by their deviation in days from the required delivery date. You can compare multiple Snapshots side-by-side to evaluate the results of different scheduling scenarios, before loading the one that meets your priorities at that moment.



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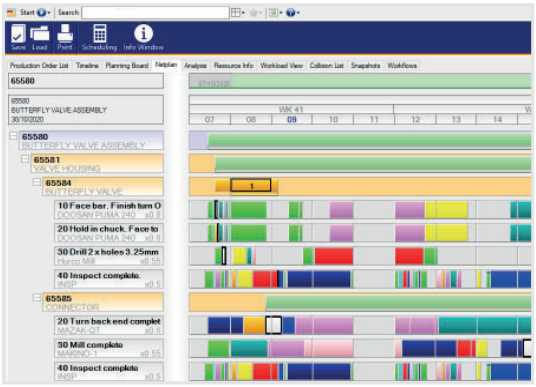
Key Features

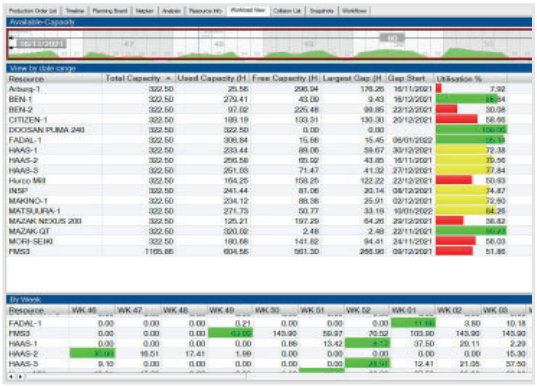
Manage Assemblies



The Scheduler gives you greater control, flexibility and visibility when scheduling kits of parts or assemblies.

- A tree structure reflects the order of manufacture.
- Scheduling rules can be applied to each specific assembly to ensure workflow is maintained and optimised and will automatically take into account the assembly order of manufacture hierarchy.
- See the deviation and impact of changes at every level, which allows for finer adjustments to be made to help you meet delivery promise dates.
- Visualise dependencies on the Netplan assembly planning board.

Workload View



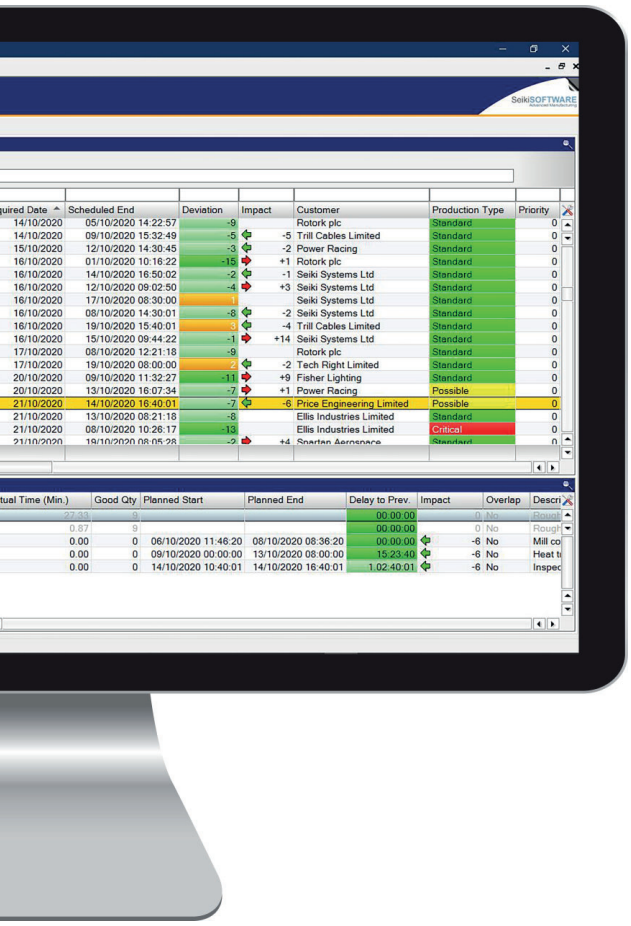
Monitor your capacity over the short, medium and longer term to support both tactical and strategic business planning and forecasting. As well as identifying resource availability that you can promote or use to respond quickly to opportunities, the Workload View also provides you with an early indicator of potential problems or shortfalls, so you can take proactive, preventative measures.

- View the total, used and free capacity of each resource.
- The largest gap of free capacity between operations is highlighted so you can easily see where jobs that are not currently scheduled could be fit in or to help your sales team target the right mix and type of work to fill it.

FAST DECISION MAKING

SUPPORT TOOL

Responding to Daily Challenges



The Scheduler can help you improve your responsiveness to both every day challenges and sudden changes in resource, demand and capacity. Just some examples:

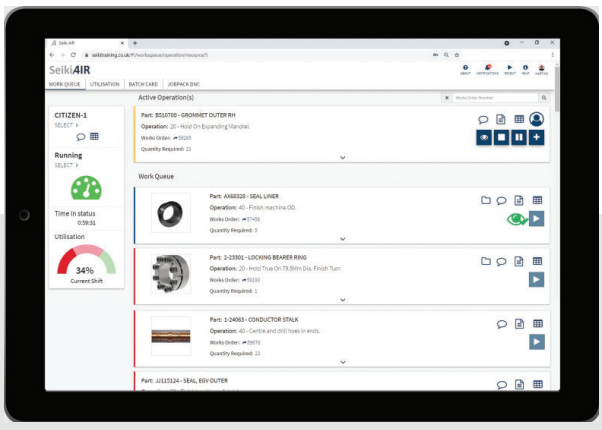
- Dynamically increase or decrease capacity on a resource by adjusting the available hours on a specific day or days when you have a machine breakdown, staff absence or want to see the effect of adding overtime.
- Adjust the workspeed (efficiency) factor of your resources if you expect this to change due to the introduction of different products, or as staff are moved to equipment they may be less familiar with. You can also define whether this factor will be applied to all steps of the production process, or just the operation Setup Time or Cycle Time.
- Split operations if there isn't enough capacity to finish the full quantity in time and a partial shipment can be made to the customer.
- Run scenarios to see the effect of subcontracting operations.
- Prioritisation can be applied to Works Orders and used in scheduling to help avoid a critical job from running late.
- Allow overlapping of operations to maximise utilisation and minimise bottlenecks.
- Schedule by works order status to focus efforts on completing the workload that is already in production to help reduce the amount of work in progress.

Work In Progress Tracking

Driven by the works orders released from the Scheduler, our WIP Booking module delivers a dynamically updated, prioritised work queue for each resource to the Operator on the shopfloor. They can then confirm the start, pause and completion of operations to help you track live progress and adherence to plan.

The Batch Card details the full works order routing information, so your team can see every stage of its manufacturing process, identify any bottlenecks and contribute to its production history by enriching the record with comments and file attachments.

Having captured actual operation times you'll be able to track live progress and analyse planned versus actual performance across previous works orders, drilling down to individual operations to understand causes of productivity loss.



NOTE: The Scheduler can also be interfaced to your existing Shop Floor Data Collection system

Visit the Seiki AIR WIP Booking Module product page on our website

Additional Features

The Scheduler includes a host of additional features designed to simplify, speed up and deliver a powerful advanced planning and scheduling solution.

- Define your capacity model with company calendars and weekplans.
- Manage all your Works Order records, whether the data has been imported from your ERP system or you are manually creating orders in the Scheduler.
- Create template part records that contain master operation scheduling details and routing information.
- Classify Works Orders with a Production Type so that you can easily filter and highlight them on the planning board.
- Automatically distribute operations across resources within a group.
- Multi-language support.
- Supports planning of manufacturing and production operations across all industry sectors.

Advantages

- Gain valuable insight to reduce decision and action time
- Visual format for easier interpretation and understanding of information
- Create more time for problem solving and strategic planning activities
- Stay agile and flexible with a robust, scalable solution
- Calibrate your business goals by balancing revenues, customer satisfaction and operational performance
- Understand your performance against KPIs
- Identify critical factors, understand interdependencies and contextualise performance data
- Revitalise and enrich your ERP system with detailed manufacturing process information, from start to delivery

About Seiki Systems

Seiki has been specialising in digital manufacturing solutions since 1992. Today our portfolio comprises of a suite of integrated software modules that deliver a live, visual and dynamic picture of the production process. Our production control and manufacturing execution solutions maximise the productivity of production equipment and plant resources by monitoring and managing the complete works order lifecycle.

We provide a complete service that includes planning, installation, implementation, customisation, training and after sales support. Our aim is to work with you as your strategic Industry 4.0 (4IR) operational manufacturing management solution partner to secure your return on investment and support your business as it grows.

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