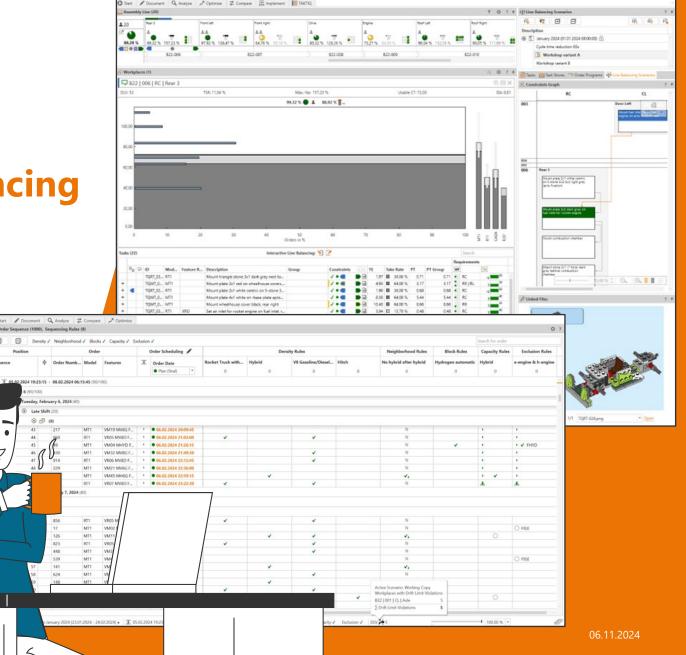
### **TAKTIQ**

# Market-Leading Line Balancing and Order Sequencing

For Smooth Production at Maximum Efficiency



### Facilitate Production Planning, Unlock Maximum Potential

Focus on variant-rich assembly lines:

- 20sek.-6std. cycle time
- 100-2.500.000 tasks
- 10-50.000 orders
- 2-10<sup>27</sup> order variants



+12%
Efficiency

-50%
Planning Effort

+100%
Planning Reliability

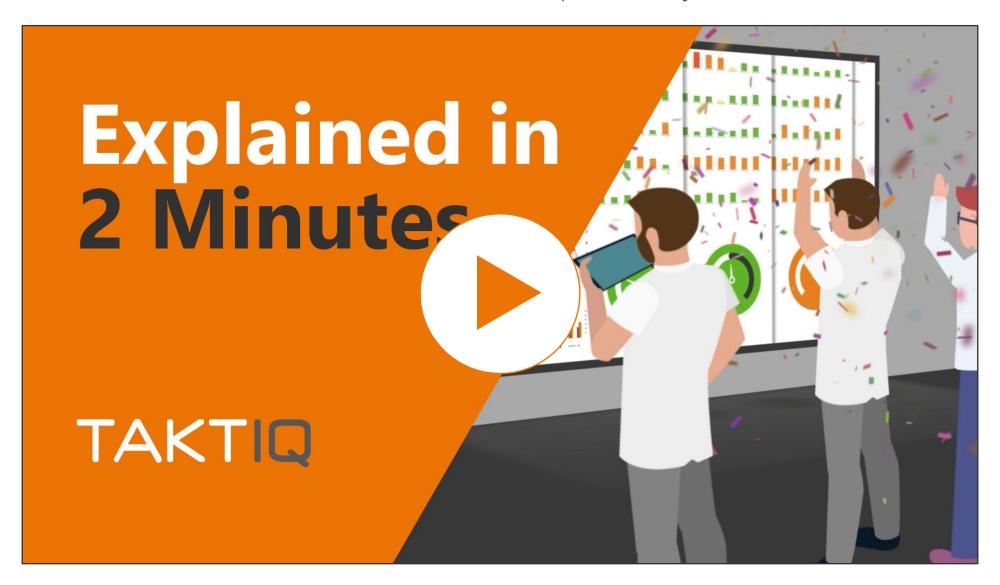
### Who Is TAKTIQ



### **User-Centered Innovation**

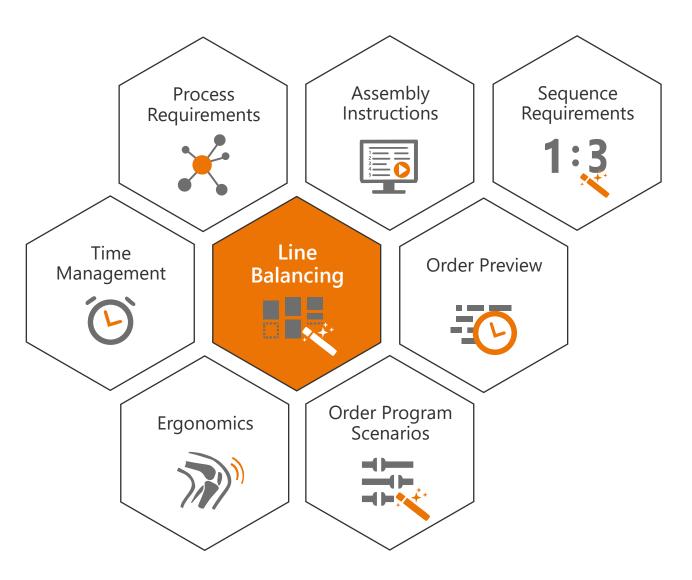
- Love Agile Development
   Through continuous innovation, we are actively shaping the future of production planning.
- Life Close Cooperation
  With fun, partnership and transparency, we make
  variant diversity manageable.
- Deliver Focused Software
   Customized functions and updates enable leading manufacturers to achieve ever new levels of quality and efficiency.

### Explanatory Video TAKTIQ Software



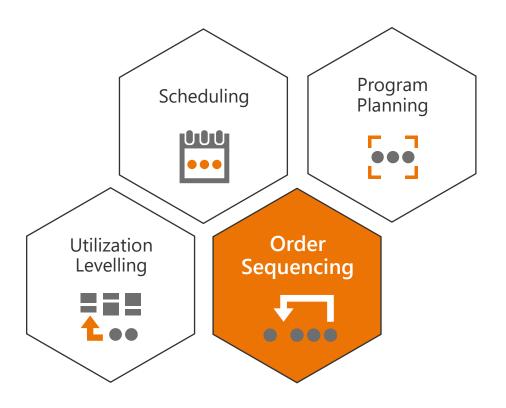
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### TAKTIQ Line Balancing



+,

### TAKTIQ Order Sequencing



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### Next Steps



### **Download Free Demo Here**

Independent test application of TAKTIQ with your own or sample data



### **Request Free Live Demonstration Here**

Presentation of TAKTIQ and discussion of your requirements, production features and usage scenarios





### Risk-Free Pilot Project (<u>Learn More</u>)

Using TAKTIQ in parallel to your current system, tailored key user training, guidance by personal consultant



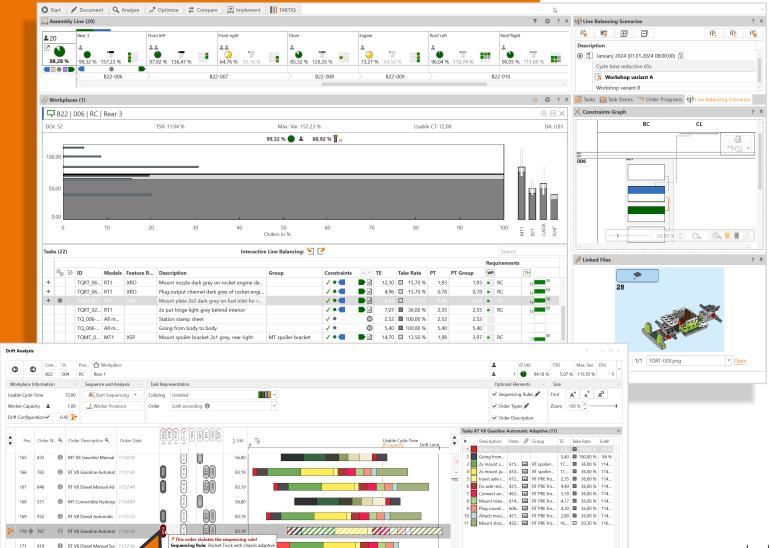


### **Revolutionizing Rollout (<u>Learn More</u>)**

Full integration into your IT, tailored training, frequent exchange of experience

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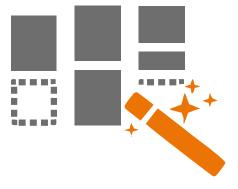
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Number of Tasks: 11

Feature Rule: RT1 & CADA

HVB HVS



### **Line Balancing**

Optimally distribute workers and tasks to workplaces for efficient and smooth production

#### Your Result



### **Maximum Efficiency**



#### Smooth **Production**



Reduced **Planning Effort** 

#### **Valuable Information in Seconds**

- Interactive and automatic line balancing
- Calculate, simulate and evaluate alternative planning scenarios extremely quickly (> 1,000,000 solutions in 5 seconds)
- Compare different cycle times and line balancing solutions
- Consider multiple order programs (variants and mix) and evaluate utilization and added value
- Flexible variant linking with any feature rules (And, Or, Not, Bracketing)

### **Ensure Feasibility**

- Evaluate variants and production times in detail
- Use extensive analysis functions and visualized key figures (time spread, drift, ...)

### **Convince Yourself Today**

Try your free demo now or book your free live-demonstration at taktiq.de/experience

### Benefits – Line Balancing

#### **Learn Quickly, Plan Intuitively**

- Clear and easy to understand visual representations
- Modern user-friendly interfaces
- Automatic workshop protocols and reports
- Smooth multi-user planning with time versioned plan states (when using a server)

### One Tool for Everything

- Documentation, simulation and optimization in one
- Integrated planning with additional modules: Time Management, Ergonomics, Order Preview, Order Sequencing and more

#### **Permanent Technical Pioneer**

- You always remain highly innovative through our agile development process
- Regular updates with new features are inspired by impulses from our customers

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### Business Case with 25 Workers – Line Balancing

Production per year:	Before	V	Vith TAKTIQ
Utilization	77%	<b>▲</b> 15%	92%
Cycle time	21 min	▼ 10%	19 min
Necessary workers	25	▼ 8%	23
Necessary line stops and support operations	2.520	▼ 71%	720
× Ø Costs for line stops and support operations		300 €	
× Cost per worker		60.000 €	
Production costs per year	2.256.000 €		1.596.000 €

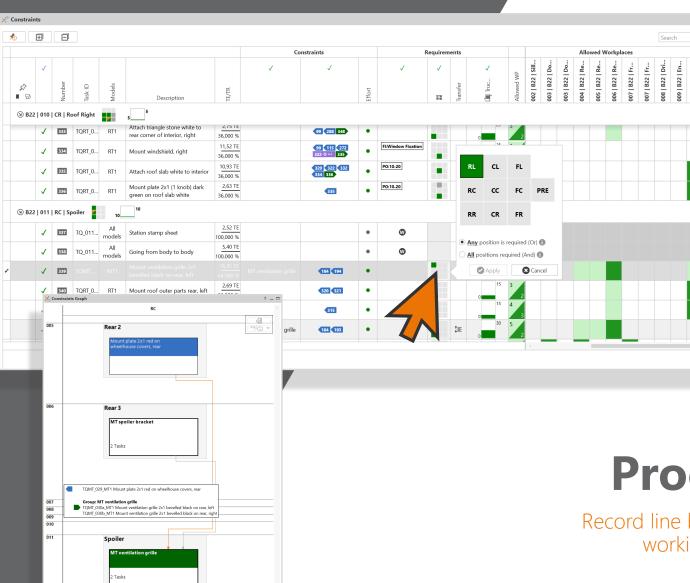
Planning per year:	Before	Wit	h TAKTIQ
Performed line balancing	12		12
Team effort per line balancing	160 h	▼ 50%	80 h
Line balancing constraints	0 h	<b>▲</b> 100%	32 h
Training time for new planners	210 h	▼ 50%	105 h
Effort for every line balancing	2.130 h	▼ 48%	1.097 h
× Hourly rate planner		40 €	
Administration costs per year	85.200 €		43.880 €

Data based on empirical values of previous use cases. Savings vary depending on size and characteristics of production.

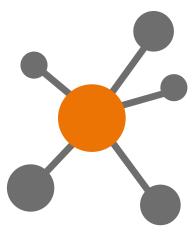
Saved costs: -701.320 €



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85,18 % 🗘 🔍 📗 🚻



### **Process Requirements**

Record line balancing requirements (predecessors, heights, working positions, tools) to ensure feasible solutions

395 shown, 395 tasks total

### Benefits – Process Requirements

#### Your Result



### Identify More Potential



### **Ensure** Feasibility



**Enable Interactive and Automatic Line Balancing** 

#### **Optimize Production Even Further**

- Identify optimization potentials more easily (reduce walking distances, avoid height changes, identify redundant tools)
- Speed up workshops and avoid overlooked requirements
- Use suggestion mechanisms and automatic line balancing
- Identify and resolve limiting constraints

#### **Simple Maintenance, Great Benefits**

- Easily maintain detailed requirements (height, working position, tools, ...)
- Manual and automatic task shifts meet all requirements
- Pre-evaluate investments in additional tools, shopping cart concepts and rebuilds

### **Convince Yourself Today**

Try your free demo now or book your free live-demonstration at taktiq.de/experience

### **Objective Feasibility Check**

- Clearly define requirements and always comply
- Live feedback on compliance and violation of maintained constraints
- Avoid discussions

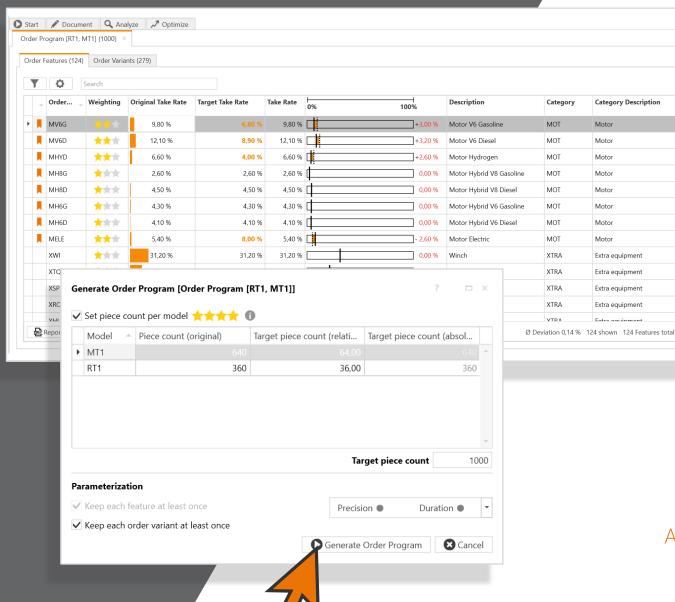
### **Everything in Sight**

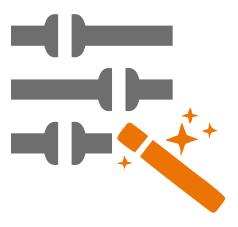
- Height profile in assembly line clearly visualized
- Directly detect conflicts in assembly areas
- Interactive constraints graph visualizes relationships between tasks
- Recognize and resolve large task groups and limiting constraints

### **Collect and Secure Knowledge Centrally**

- Document production knowledge directly and pass it on easily
- Train new colleagues more quickly







# Order Program Scenarios

Analyze order programs in detail as well as generate and simulate them based on sales forecasts

### Benefits – Order Program Scenarios

#### Your Result



### **Generate Order Programs Close to Reality**



**Increase the Quality** of Analyses



**Extreme** Responsiveness

#### **Interactive and Live**

- Adjust feature frequencies without having to edit individual order variants
- Automatic check of buildability rules when manually changing variants
- Simultaneous adjustment of several take rates and total number of orders
- Split order programs easily according to rules

### **Many Options, Easy Navigation**

- Create features and use them for optimization or analysis as desired
- Sort order features into categories and easily find them again

### **Convince Yourself Today**

Try your free demo now or book your free live-demonstration at <a href="taktiq.de/experience">taktiq.de/experience</a>

#### **Plan Realistically**

- Simulation based on different forecasts
- Detailed analysis of order variants incl. frequencies and correlation of features
- Buildability always guaranteed, as only existing order variants are used

#### **Record-Breaking Processing Power**

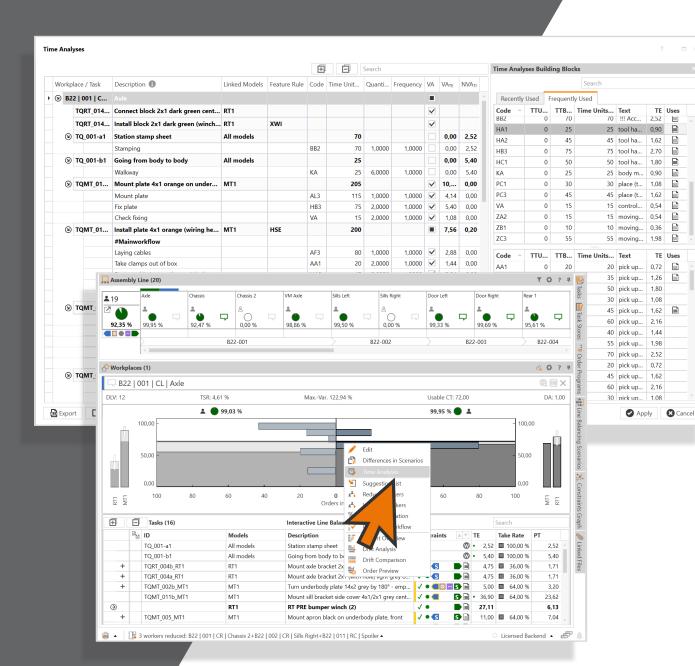
Mathematical optimization technology generates order program according to targets with minimum deviation

#### **Perfect Addition**

Evaluate the effect of alternative order programs in combination with the modules line balancing and optimal sequencing rules

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### **Time Management**

Define time requirements for tasks easily with time modules and recognize added value

### Benefits – Time Management

### Your Result



### Time Management and Line Balancing in One



Time Modules Defined Centrally



Clear and Understandable

#### **Uniform Time Measurement**

- Define modules and analyses centrally and use them on tasks
- Centrally define performance level as well as surcharges and discounts
- Define and analyze value added and non value added

### Faster to the Goal

- Combined use of estimation times and time analyses
- Fast identification of missing time analyses and active estimation times
- Transparent and comprehensible presentation

### **Convince Yourself Today**

Try your free demo now or book your free live-demonstration at taktiq.de/experience

#### **Work Simpler**

- Easy maintenance both at the task and across a workplace or the entire line
- Fast reuse of blocks that were used last or frequently
- Drag & drop of blocks to new time analyses lines
- Format comments and headings within time analyses

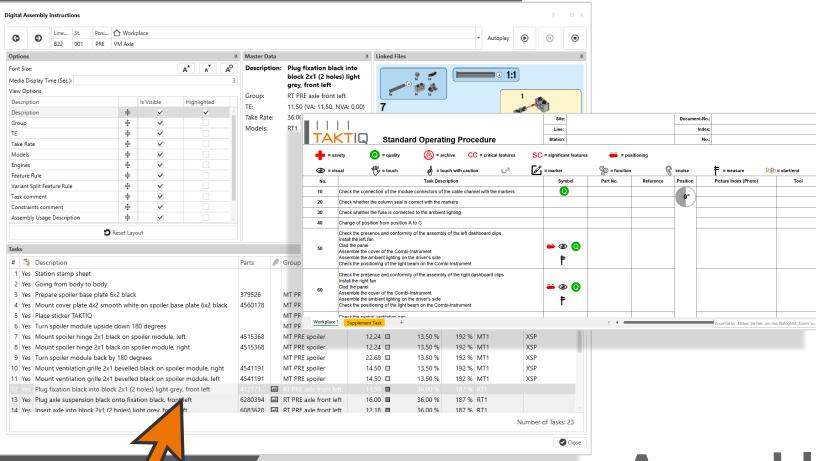
#### **Define Own Standards**

Working with any (also individual) modular systems (e.g. UAS)

### **Live Adjustment**

Live update of all time analyses in case of adjustments of time analyses building blocks

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### **Assembly Instructions**

Communicate planning results to production via Excel or PDF and train workers with digital assembly instructions in TAKTIQ

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### Benefits – Assembly Instructions

### Your Result



### Save Time in the Long Run



### **Secure and Pass On Knowledge**



**Generate Work Instructions Automatically** 

#### **Easily Train Production**

- Autoplay for qualification with images and videos
- Flexible customization of the interface and displayed attributes as needed (shown content, font sizes, image representations)

#### **Customize to Own Needs**

- Individual format template with e.g. company- and country-specific language, design, logos
- Completely individual specifications of attributes (torques, tools, icons for sensitive or dangerous activities, etc.) as well as information on the document (inspector, version, releaser, etc.)
- Placement of images on extra pages according to specifications

### **Convince Yourself Today**

Try your free demo now or book your free live-demonstration at taktiq.de/experience

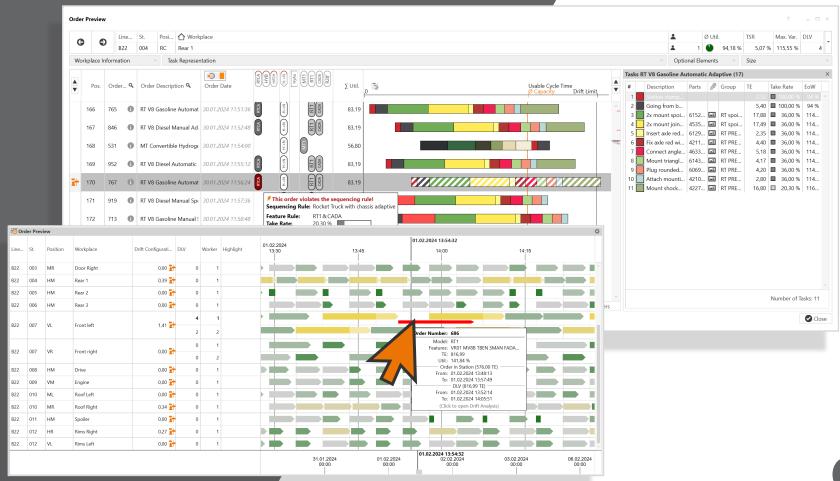
### **Generate Work Instructions Automatically**

- Automatic adjustment of assembly instructions after moving tasks or adjusting avos and workplaces
- Constantly updated illustration of the sequence at the workplace by linking tasks with images
- Summary and highlighting of attributes and cells automatically in the document
- Export to Excel or PDF according to individual specifications

#### **One Time Effort, Every Time Benefit**

- Information on tasks automatically moves with them when they are moved
- Linked files are available during scheduling, training and export instructions







### **Order Preview**

Secure quantities and ensure smooth production through early detection of bottlenecks and better control of short-term capacity measures

### Your Result



Avoid Bottlenecks



Make Detailed **Predictions** 



Increase Product Quality

### Benefits – Order Preview

#### **React Early**

- Live calculation of expected order dates based on real dates
- Feedback from external system or manual specification
- Alert support personnel in a targeted and timely manner

#### **Work and Navigate Intuitively**

- Update view live based on current time
- Automatically enter at the beginning of the shift with the appropriate data
- Flexible zoom of the view
- Display detailed contents and drift behavior of an order on demand
- Overview through individually marked order types

### **Convince Yourself Today**

Try your free demo now or book your free live-demonstration at taktiq.de/experience

### **Accurately Predict the Timing and Content of Bottlenecks**

- Pre-calculate job deadlines at each station, taking into account plant structure, shift schedules, break times and disruptions
- Calculate expected drift limit violations based on individual drift configuration per workplace
- Display compliance with or violation of sequence rules

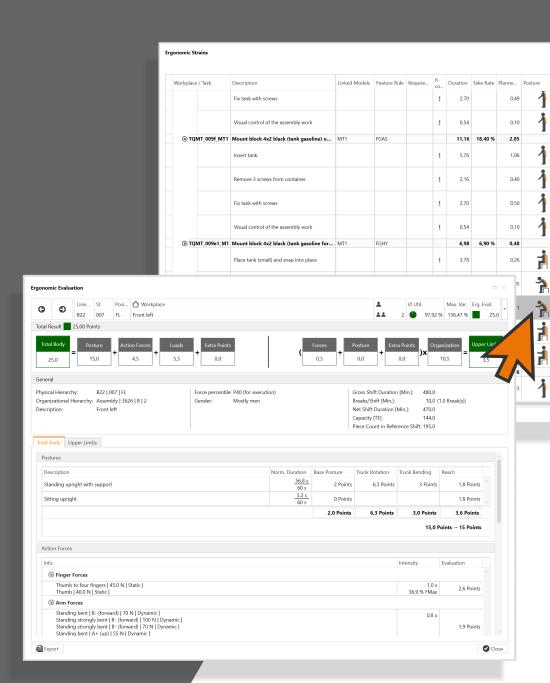
#### **Integrate Data Easily**

Integration into MES systems for the transfer of real dates

#### **Beautiful To Look At**

Visualization of the detailed drift behavior per workplace







### **Ergonomics**

Determine and optimize ergonomic load per worker and perform live ergonomics assessment during line balancing

Search

9

(E) 3.8 TE

(E) 0.7 TE

(E) 1,6 TE

Apply Cancel

Trunk Rotation Trunk tilt

Easy (<10°) <10° Medium (~15°)

Extreme (>30°)

#### Your Result



**Certified Ergonomics** 



Maximum Efficiency & Ergonomics



Rapid Revaluation

**Established Standards** 

- Assessment of ergonomic loads of workers by EAWS® or individual assessment methods of our customers.
- First company to be officially certified as EAWS® compliant by the German MTM Society



### **Automatic Line Balancing**

Automatic line balancing procedures take ergonomic limit values into account (point or traffic light system)

### **Convince Yourself Today**

Try your free demo now or book your free live-demonstration at taktiq.de/experience

### Benefits – Ergonomics

#### **Realizable Workshop Results**

- Integrated evaluation of ergonomics when developing new line balancing solutions.
- Better solutions and shorter planning time through direct live assessment of the ergonomic impact of each change (shift of tasks, order program, cycle time or shift schedule change)

### **Interactive Line Balancing**

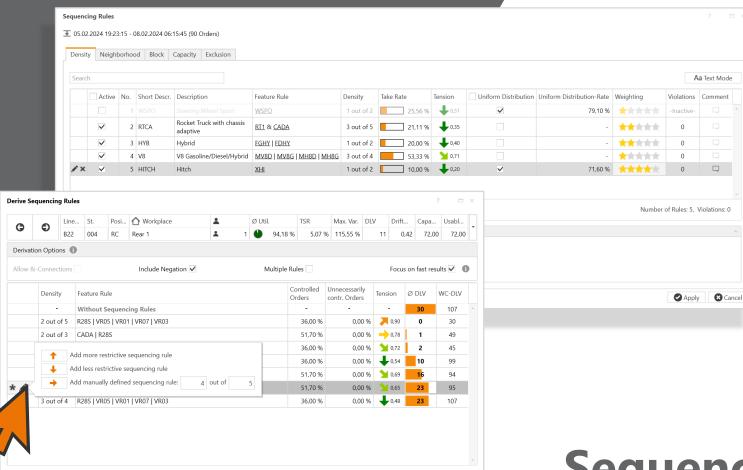
- Suggestions for shifting tasks with live calculation of resulting ergonomic effects.
- Achieve highest efficiency & ergonomic goals!

#### **Faster (Re)Evaluation**

- Documentation of ergonomic loads at the tasks level and simultaneous assessment of ergonomics at the workplace level
- Reuse of all determined ergonomic loads at tasks



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Generate

Close



### **Sequence Requirements**

Create sequencing rules analytically, verify and optimize effectiveness

### Benefits – Sequence Requirements

#### Your Result



### Optimal Production Sequences



### **Smooth Order Scheduling Process**



Increased Responsiveness

#### **Valuable Information in Seconds**

- Simulate 1000 order schedules in a few seconds
- Evaluate expected impact of rule sets on sequencing and on bottlenecks in production
- Obtain well-founded predictive ability for "what-if" scenarios

#### **Interactive Rule Derivation**

- Recognize control-relevant order features and feature combinations for program planning and sequencing
- Derive distance rules automatically
- Recognize control-relevant orders and automatically describe them with rules
- Recognize maximum take rate for critical features

### **Convince Yourself Today**

Try your free demo now or book your free live-demonstration at <a href="taktiq.de/experience">taktiq.de/experience</a>

#### Get an Overview and Use It

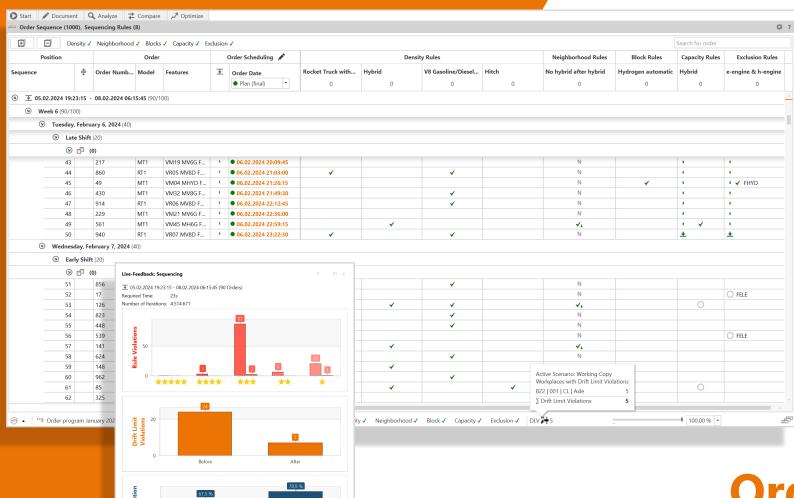
- Transparency about limit values of your own production
- Recognize and react to bottlenecks and potentials at an early stage

#### **Reduce Rules, Increase Quality**

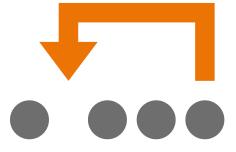
- Avoid unnecessary rules with overlap and impact analyses
- Rule sets can always be sequenced

### **Making Versatile Use of Findings**

Receive recommendations for adjustments to line balancing and sequencing parameters



Apply and Close Sincard and Close



### **Order Sequencing**

Optimal production sequence of orders for efficient and smooth production

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### Benefits – Order Sequencing

#### Your Result



### Master Complexity



### Smooth Production



Reduced Planning Effort

#### **Optimal Order Sequence**

- Reduce manual effort to a few minutes
- Sequence automatically in seconds
- Adhere to even complex order sequence requirements and ensure smooth production

### **Flexible Control Through Rule Types**

- Density Distribute demanding orders evenly to relieve stress on workers and enable stable production
- Neighborhood Define sequences of different order types to enable stable production
- Position Schedule special orders easily and precisely or place them in position windows
- Block Bundle similar orders for scheduling to minimize setup times

#### **Permanent Technical Pioneer**

- You always remain highly innovative through our agile development process
- Regular updates with new features are inspired by impulses from our customers

#### **Learn Quickly, Plan Intuitively**

- Clear and easy to understand visual representations
- Modern user-friendly interfaces
- Quickly create significant reports
- Flexible interfaces to existing systems (order management, ERP, ...)

### **Individually Expandable**

- Production Leveling Consider the utilization on individual workplaces during sequencing and enable more stable production
- Scheduling Control and meet deadlines using extensive rule types and a plant calendar
- Order Planning Determine the feasibility and bottlenecks of the order program at an early stage and plan ahead efficiently
- Multi-Line Planning Plan individual line structures easily

### **Convince Yourself Today**

Try your free demo now or book your free live-demonstration at taktiq.de/experience

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### Business Case With 25 Workplaces – Order Sequencing

Production per year:	Before		With TAKTIQ
Workplaces	25		25
Production days	220		220
Bottleneck situation per day	50	▼ 76%	12
Ø Effort <b>per day</b> for rework, support and line stops	48 h	▼ 50%	24 h
Ø Effort for rework, support and line stops	10.560 h	▼ 50 %	5.280 h
× Hourly rate supporter		35€	
Production costs per year	369.600 €		184.800 €

Planning per year:	Before	With TAKTIQ		
Evaluated sequences per day	1.000	▲ 9.999.900%	100.000.000	
Sequencing rules considered	10	▲ 900%	100	
Effort per order sequence	6 h	▼ 92%	0,5 h	
Necessary final sequences	220		220	
Necessary hours for sequencing	1.320 h	▼ 92%	110 h	
× Hourly rate planner		40 €		
Management costs per year	52.800 €		4.400 €	

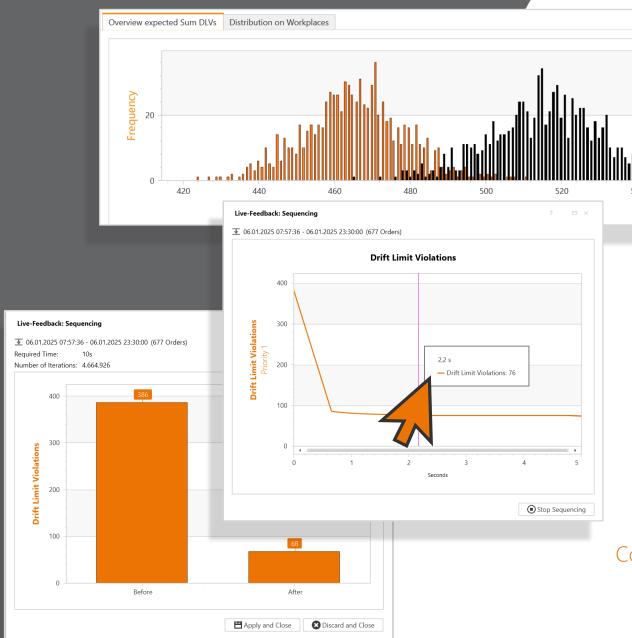
Data based on empirical values of previous use cases. Savings vary depending on size and characteristics of production.

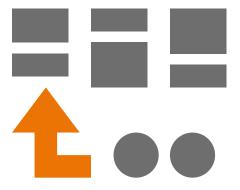
Saved costs: -233.200 €



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### **Utilization Levelling**

Consider the utilization on individual workplaces during sequencing and enable more stable production

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### Benefits - Utilization Levelling

#### Your Result



### Maximum Stability in the Assembly Line



Happy Employees



Reduced Drifting and Downtimes

#### **Utilization-Based Sequencing**

### Stable Production Despite High Variety & Changing Production Times

- For more efficiency and stability, take existing line balancing into account when sequencing
- Plan drift and quickly detect violations
- Easily ensure uniform distribution of utilization for a large number of variants

#### **Development Partner Required**

### Recognize and Control Future Production Fluctuations

- Carry out production leveling over long time horizons to uncover potential problems
- Obtain the summed production times at the shift, day, week or month level and take them into account for planning

### **Convince Yourself Today**

Try your free demo now or book your free live-demonstration at <a href="taktiq.de/experience">taktiq.de/experience</a>

#### **Sequencing Simulation**

### **Identify Critical Workplaces**

- Test and evaluate the effect of rule sets in advance
- Identify potential drift limit violations at an early stage for each workplace
- Simulate and compare several scenarios precisely

#### **Impact Analysis**

### Determine the Effectiveness of Individual Rules

- Simulate the impact of the rules to identify and resolve ineffective rules
- Reduce rules and administrative effort

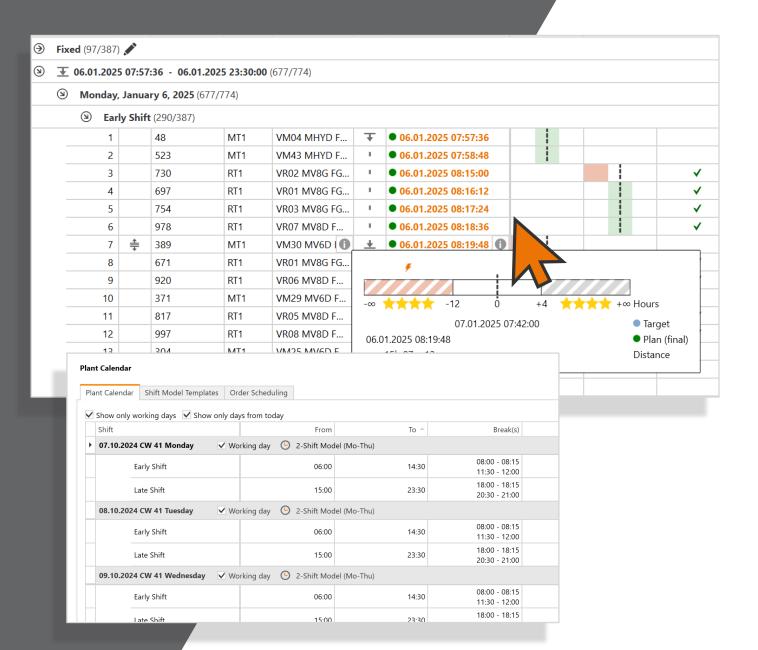
#### Sensitivity Analysis

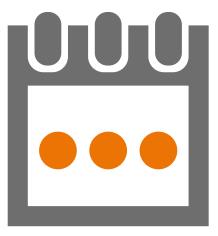
### **Simulating the Effects of Increased Production**

- View individual variants or features in detail and determine limit values for their production quantities
- Get an overview of all effects like overloaded workplaces, exceeded drift limits, time spread ratio and more

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### **Scheduling**

Control and meet deadlines using extensive rule types and a plant calendar

#### Your Result



### Meet Deadlines With Confidence



**Get an Overview** 



Plan Ahead Without Surprises

### **Produce Transparently and on Time**

- Easily view production dates and status to ensure deadlines are met
- Quickly see when which order is at which station
- Live update of deadlines through measuring points in production possible

### More Stable Production Thanks to Additional Rule Types

- Capacity Control maximum production of variants per day or week
- Exclusion Never produce certain variants in the same shift
- Order Date Meet deadlines for each order or control maximum deadline variance

### **Convince Yourself Today**

Try your free demo now or book your free live-demonstration at taktiq.de/experience

### Benefits - Scheduling

### **Depict the Plant Calendar Realistically**

- Manage working days and (rotating) shifts
- Different shifts per line section or station
- Flexibly plan any number of planning horizons

### **Generate and Communicate Order Dates**

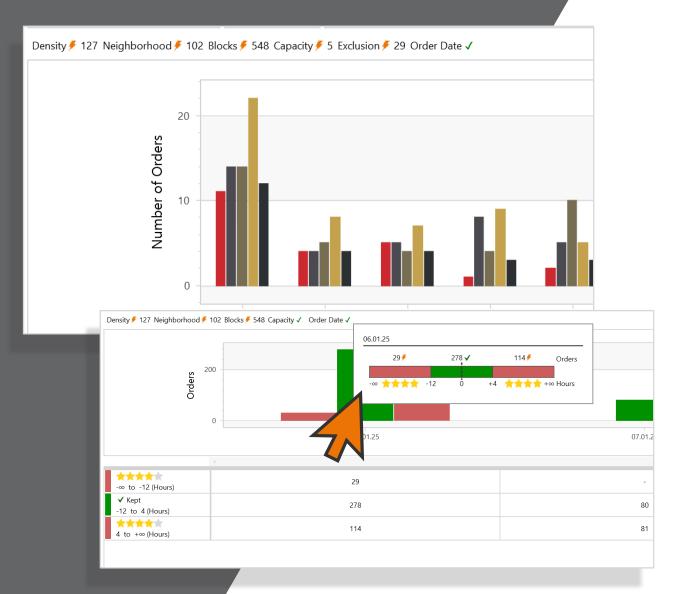
- Automatically generate planned dates by linking order sequence and plant calendar
- Live order date updates when changes are made to the sequence or quantity
- Use an interface or Excel export to conveniently share order dates
- Clearly compare planned, target & actual order dates

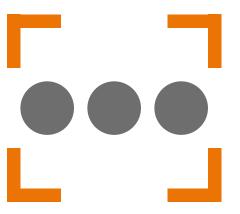
#### **Work More Easily as a Team**

- Multi-User Support
- Display the current planning status at any time and change it if necessary
- Complete order scheduling without the need for an additional third-party system

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### **Program Planning**

Determine the feasibility and bottlenecks of the order program at an early stage and plan ahead efficiently

### Benefits - Program Planning

#### Your Result



#### Meet Deadlines



### Recognize Bottlenecks at an Early Stage



**Ensure Feasibility of Production Quantities** 

### Obtain a Useful Overview in Early Planning Stages

- Analyze adherence to order dates to clients and suppliers at an early stage and take countermeasures if necessary
- Display the distribution of models and equipment features quickly and clearly
- Identify critical production days or shifts using convenient filter and analysis functions

#### Reduce Planning Effort

### **Plan Ahead Efficiently**

- Better control of large production volumes and assignment of variants to days or weeks at an early stage
- Better adherence to deadlines and production restrictions through advance planning
- Perfect preparation of the daily order scheduling through forward-looking planning when creating the order programs

### Recognize and Communicate Problems Quickly

- Receive important key figures long before detailed planning begins
- Easy communication with other departments through greater transparency

### **Convince Yourself Today**

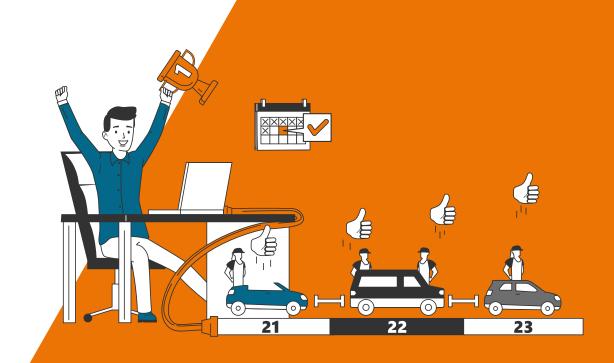
Try your free demo now or book your free live-demonstration at <a href="mailto:taktiq.de/experience">taktiq.de/experience</a>

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# Your Experience

### **Your Advantages With TAKTIQ Software**

- Use and exploit production capacities safely
- Precisely simulate and compare planning scenarios
- Smoothly map and plan interrelationships
- Create significant reports easily
- Modern and user-friendly interfaces
- Clear and comprehensible visual representations
- Easy and intuitive to use
- Language selection enables native use (German, English, French, Chinese, Hungarian and Italian)



### Your Experience

### **Your Advantages With TAKTIQ**



Used by Renowned Customers Worldwide



Certified Company



Regular Exchange of Best Practices



Individual Solutions for Your Production



Permanent Updates and Improvements



Solving Problems Within a Day



Comprehensive User Manual



Direct Support by E-Mail and Telephone

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### Further Information Material

## 3 Ways To Integrate TAKTIQ Into Your IT Landscape



#### **Excel Im-/Export**

Do you want to **test everything first** before investing in a long-term interface?

Simply export our Excel template directly from TAKTIQ, enter your data in the selected columns and import it again. We will be happy to help you!

Schedule Appointment



#### **Standard Interfaces**

Connect your IT landscape **yourself, quickly and easily** with TAKTIQ thanks to our standard interfaces.

With our sample interfaces, your IT team can get an idea of the scope and structure.

**Open Sample Interfaces** 



#### **Other Interfaces**

We have already implemented interfaces to systems such as **Ticon, SAP, Windchill** and over 10 other customer-internal systems.

We are also happy to program an interface to **ema, halocline, Siemens Teamcenter** and other systems on request.

Schedule Appointment

### Further Information Material

### **Open Questions?**

### **These Documents Will Help You!**

#### **Service Specifications**

What product combinations and services does TAKTIQ offer?

How is the price calculated?

Open PDF

#### **System Requirements**

How does the installation work?
What requirements does my IT have to meet?

Open PDF

### **Product Development Agreement**

What is the development process for a TAKTIQ extension?

What is the pricing for such a development?

Open PDF

#### **More Questions**

Which address should I contact if I have further questions?

Write E-Mail



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### **TAKTIQ**

Bring your Produktion in Einklang!

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