

DOCUMENTATION

Visual Production Scheduler (VPS)

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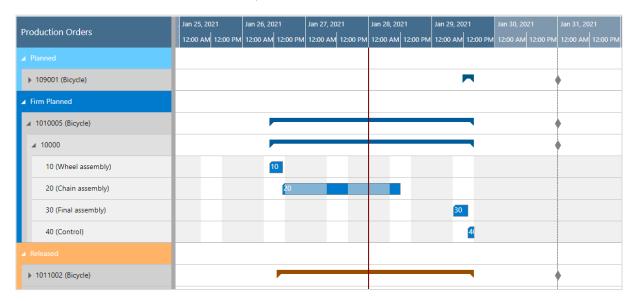


Technical requirements

Microsoft Dynamics 365 Business Central

1. Understanding the VPS

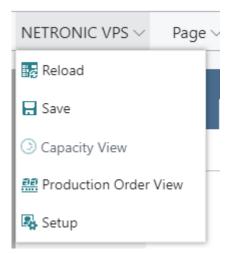
Since the VPS is a Gantt chart, it naturally has all its characteristics:



- A **timescale** at the top.
- A **table** at the left, production orders (in the Production Order View) or work and machine centers in the Resource View
- On the right below the time scale, a **chart** displaying the production schedule with a **calendar** in the background indicating work free periods in grey while working times appear in white.
- A menu ribbon allowing to make basic settings that will be explained in detail in the following.

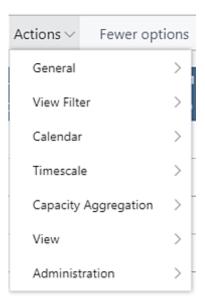


The item "NETRONIC VPS" summarizes the options that we think are the most frequently used ones:



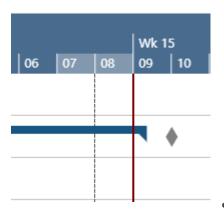


All options of the VPS can be found under "Actions":



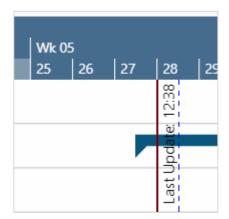
In case the "Actions" item is not visible in the menu ribbon, click "More options". To hide it again, click "Fewer options".

• A vertical line in the chart indicates the **work date** as having been set in Dynamics 365 Business Central.



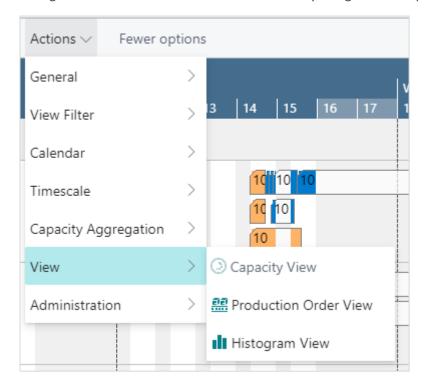
was last updated.



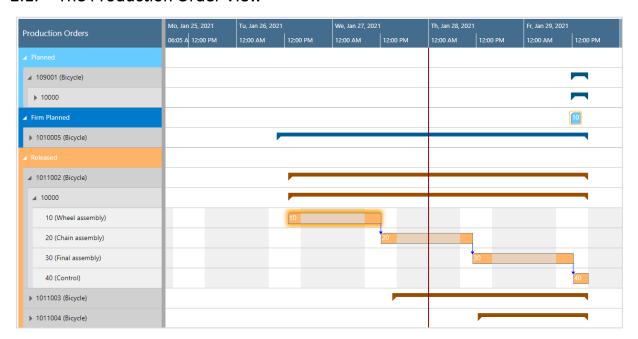


2. Three different views

There are three different views in the VPS: The Production Order View, the Capacity View, and the Histogram View. You can switch between them by using the corresponding menu items:



2.1. The Production Order View





The Production Order View shows production orders categorized by status; the categories being indicated by different colors:

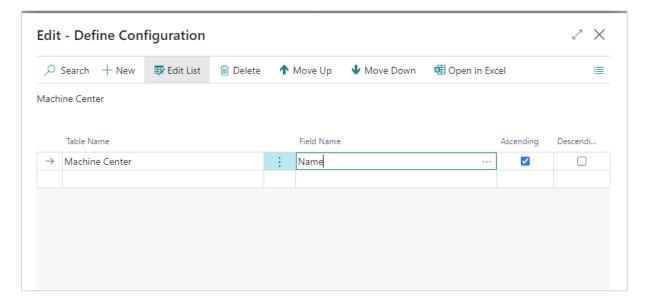


2.1.1. Sorting

Production orders, their production order lines, and production order routing lines are sorted in ascending numerical order.

Within each production order, the relating production order lines with their production order routing lines are listed.

This sorting order can be changed in the according dialog which can be opened either by context menu or in the "Configuration"s tab of the user setup.



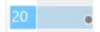
2.1.2. Information shown on bars

The following information can be gathered from optical indicators:

• Currently marked operation:



Operation changed but not saved yet



Violated due date

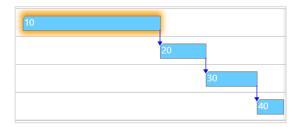




2.1.3. Links

Links are shown after having clicked the desired production order or production order line as described below:

• between operations of one production order line



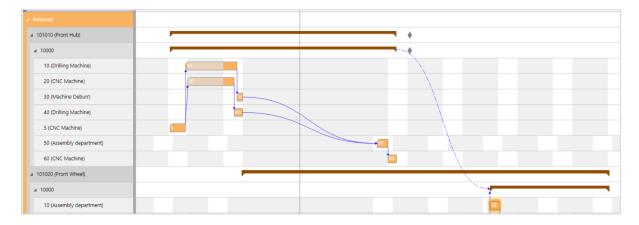
• between production order lines (make-to order)



You can decide whether to show these links or not by ticking/unticking the according option in the "General" section of the "Setup" dialog.



• between production orders





2.1.4. Due date

The **due date** of a production order is represented by a diamond-shaped symbol, turning red in case of an exceeded due date.



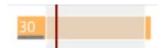
2.1.5. Progress

Based on the settings you have specified in the "Setup" dialog, you can display a progress bar for production order routing lines of **released** production orders, the color of the progress bar depending on the **routing status** and the **percentage of completion**:

• Status "finished": black



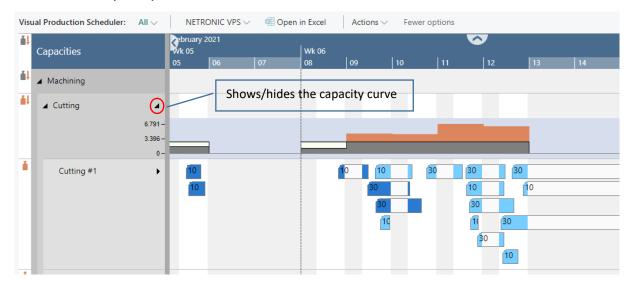
- Status "none", "planned", "in progress":
 - Progress by quantity / by time < 100%: grey



Progress by quantity / by time (i.e., you have posted more than initially planned) > 100%: red



2.2. The Capacity View



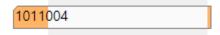
- Shows capacity loads of work centers and machine centers, grouped by work center groups.
- Capacity bottlenecks and conflicts concerning delivery dates can be visualized by a red box in the capacity curve and by according symbols in the table part.

The meaning of the symbols in detail:

- No overload at the parent resource (group) but at one or more subordinate resource(s)
- Overload at the resource (group) itself and at one or more subordinate resources
- Overload only at the resource (group) itself

Please note that if there isn't any overload in the complete plan the symbol column will not be shown.

 The bars of the operations are colored during working times and white during non-working times.



 The bars get different colors according to the different categories of the Production Order View.



2.2.1. Information shown on bars

The following information can be gathered from optical indicators:



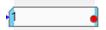
• Currently marked operation:



• Operation changed but not saved yet

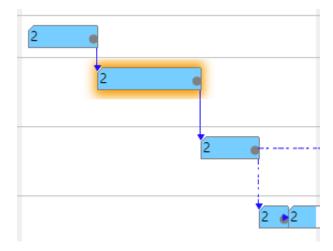


• Violated due date



2.2.2. Links

Links between operations are shown after having clicked one operation of the according production order.



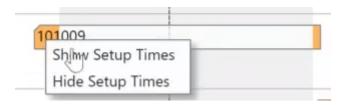
2.2.3. Due date

If you click an operation, a vertical line in the color of the operation's status appears, indicating the due date.



2.2.4. Setup times

A context menu enables to show or hide the setup times



If "Show Setup Times" is selected, they are visualized as grey section at the beginning of the bar



2.3. The Histogram View

A histogram offers visual decision support by showing impending capacity problems. In the Histogram View, the histograms of the work centers and their respective machine centers are displayed.

Overloads at a resource are indicated by a red box in the chart and according symbols in the table part.



The meaning of the symbols in detail:

- No overload at the parent resource (group) but at one or more subordinate resource(s)
- Overload at the resource (group) itself and at one or more subordinate resources
- Overload only at the resource (group) itself

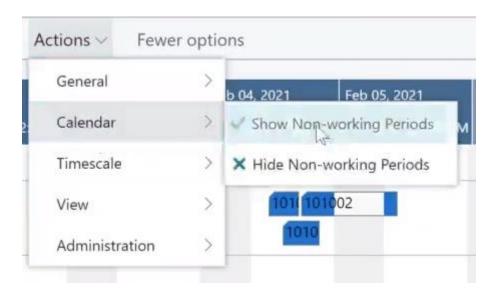
Please note that if there isn't any overload in the complete plan the symbol column will not be shown.



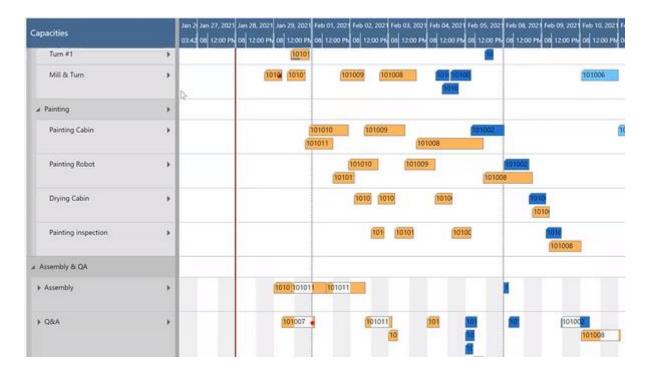
3. Show/hide non-working periods

Some planning situations require to focus on the working periods of a work or machine center only.

To show or hide non-working periods, click the "Calendar" item in the "Actions" menu and select the desired option.



After having selected "Hide non-working periods", you'll only see the non-working periods that are unique to some work and machine centers.

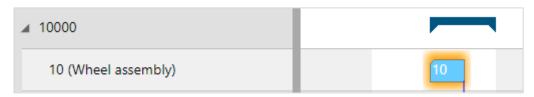




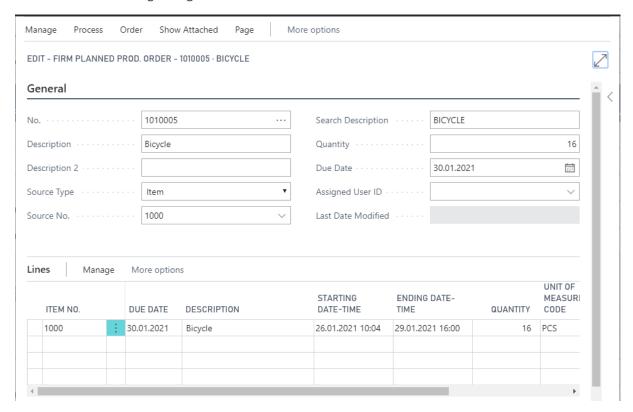
4. Open Microsoft Dynamics 365 Business Central dialogs

The VPS fully integrates with Microsoft Dynamics 365 Business Central. This means that by double-clicking the according element (production order, production order line, production order routing line, work center etc.) either in the table area or in the Gantt area, you'll directly switch to the according Dynamics 365 Business Central dialogs where you can navigate and make changes as usual:

Double-clicking a production order routing line...



...will call the according dialog:



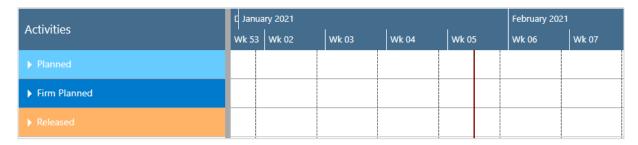


5. Collapsing and expanding

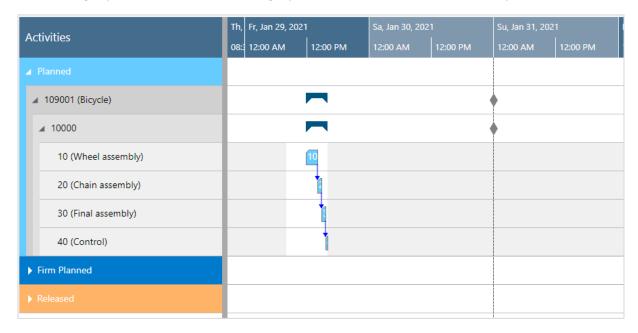
The VPS allows to view your data from different angles easily and quickly. The symbols in the table allow to collapse and expand production orders, work center groups, work and machine centers, thus hiding details or rendering them visible.

Please note that the VPS autmatically saves the collapsed/expanded state of a view so that you can start exactly with the status you saw when you left the view.

All order categories collapsed:



After having expanded the "Planned" category with order 109001 and all its sub-operations:





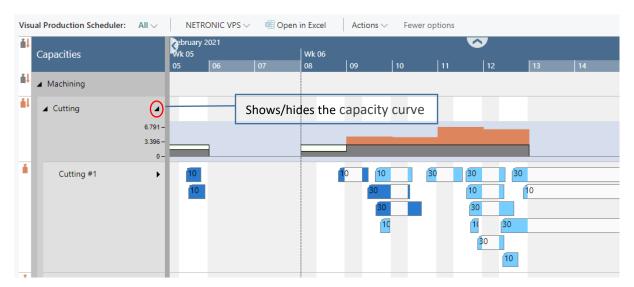
6. Capacity information

In the VPS, you can show a capacity curve in the Capacity View, to see free and exceeded capacities, a red box in the capacity curve and by according symbols in the table part indicating an overload.

The meaning of the symbols in detail:

- No overload at the parent resource (group) but at one or more subordinate resource(s)
- Overload at the resource (group) itself and at one or more subordinate resources
- Overload only at the resource (group) itself

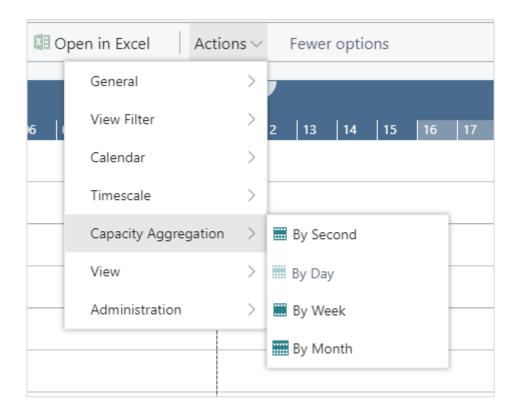
Please note that if there isn't any overload in the complete plan the symbol column will not be shown.



The capacity curve combines information on a resource's allocation and its availability. If, for instance, a task's duration is 10 hours, the capacity curve of a resource with an availability of 8 hours/day shows an overload - if it is calculated per day.

In many cases, the planner regards a resource's availability by week or even by month. That is why the VPS lets you select whether you do the capacity calculation either by second, day, week, or month. The curve will aggregate the occupancy on the selected period.



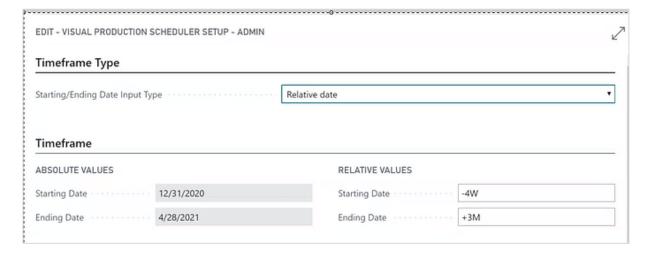


7. Navigation in the VPS

Navigating in the VRV largely comprises setting the time range for which parts of your plan are shown, modifying the timescale solution and quickly scrolling to certain parts of your plan.

7.1. Setting the timeframe

The timeframe specifies the time range covered by the timescale, either fixed by absolute values or relative to the workday. This is done in the "Setup" dialog, to be reached by clicking the "General" item in the "Actions" ribbon.

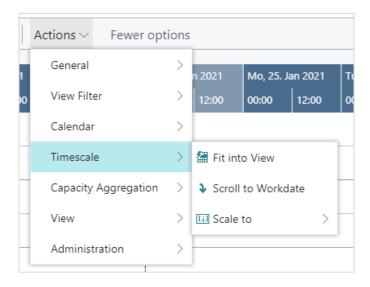




7.2. Change the timescale resolution

For zooming in a certain area of your plan or to zoom out for a better overview, you can change the timescale resolution either by

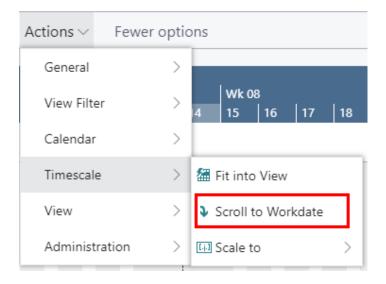
- scrolling the mouse wheel in the timescale area
- or, more specifically, by the corresponding items of the "Actions" menu, based on the work date as having been specified in the settings of Dynamics 365 Business Central.



7.3. Scrolling

The VPS offers the following options for quickly navigating to certain positions in the diagram:

- the common scrolling options by vertical and/or horizontal scrollbar
- dragging the timescale either right or left
- scroll directly to the Dynamics 365 Business Central work date by selecting the corresponding item from the "Actions" menu.



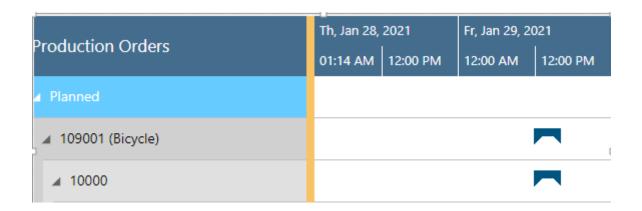


7.4. Fit into view

Select this item from the "Timescale" item in the "Actions" menu to switch directly to the timescale as defined in the "Setup" dialog.

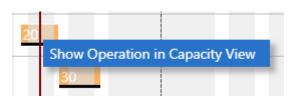
7.5. Adjust the width ratio between table and diagram

For adjusting the width ration between table and diagram, put the mouse cursor on the sash between the two parts and drag the double arrow appearing then.



7.6. Show operation in other view

Show the currently marked operation in the respective other view while it gets highlighted by a blinking frame.



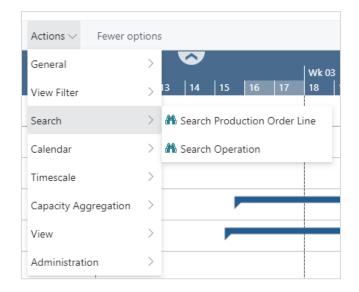
7.7. Search function

In both views, you can search for production order lines and operations.

The respective view automatically scrolls to the first search result - the operation (for production order routing line) or the first operation of the production order line. The first found operation is highlighted by a blinking frame and gets selected, so that the links are shown. If a view filter is active the search dialog will only show the visible elements in the VPS.



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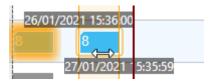


8. Move operations

You can move operations by mouse either horizontally or vertically, each way having a different impact.

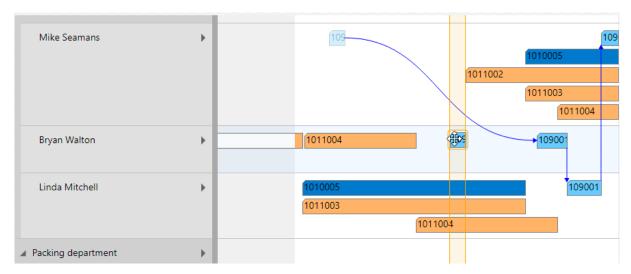
8.1. Move operations horizontally by drag & drop

To schedule an operation, you can move it horizontally along the time scale in the Production Order View as in the Resource View: As a consequence, the operation will be worked off at a different time.



8.2. Assign an operation to another resource

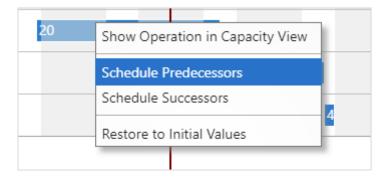
In the Capacities View, an operation can also be moved vertically when scheduled – to a different work or machine center. As a consequence, the operation will be worked off by the work or machine center it was moved to. While moving the operation, a "phantom" bar will remain at the original place until the mouse will be released.





8.3. Schedule predecessors/successors

If moving an operation shall also affect its linked preceding and/or succeeding operations to the effect that they are moved accordingly you can make the according setting in the context menu.

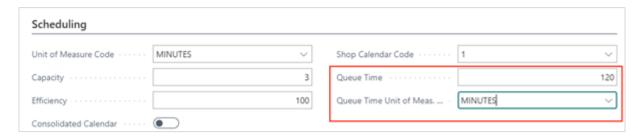


Please note that if you want these links to be taken into account for scheduling, you have to tick the "Schedule across Production Order Lines" option in the "Scheduling" section of the "Setup" dialog.



9. Consider the queue time in the scheduling algorithm

The VPS allows to consider the queue time that is set on the machine/work center card in 365 BC.

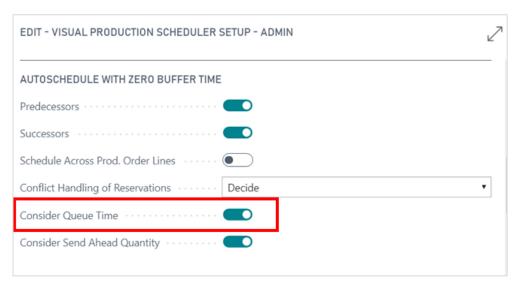


Setting a queue time has no impact on the load of a work/machine center but causes the starting time of the operation to be moved forward. It can be seen as a buffer time between an operation and its successor so that you create a gap between the end time and the start time of two consecutive operations:





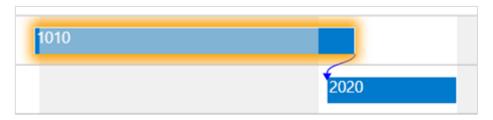
The option can be activated in the VPS setup dialog:



10. Consider the send-ahead quantity

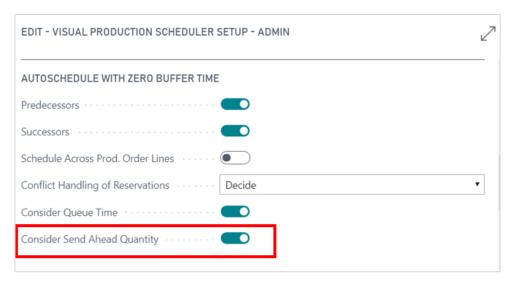
In Business Central, the user can specify a send-ahead quantity for an operation when defining a routing. The send-ahead quantity can be used to start a dependent operation before the current operation is fully completed,

The VPS algorithm tries to avoid any gaps of nonproductive periods on the successor of an operation. By that, the following operation may start later than expected, but therefore has a continuous workload. This reduces the overall runtime of the production order line because the operations then start to overlap. The successor does not have to wait until the predecessor finishes and hence has no idle time.



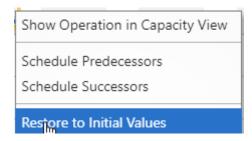


The option can be activated in the VPS setup dialog:



11. Restore to initial values

In case you have made changes to an operation, not yet saved your plan, and want to restore the original values again, click the according context menu item.





12. The "Setup" dialog

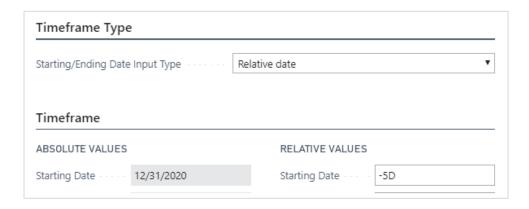


The "Setup" dialog allows to customize basic settings of the Visual Production Scheduler. You reach it via "Actions" -> "Administration".

Here you can make or see the basic settings for:

12.1. Timeframe:

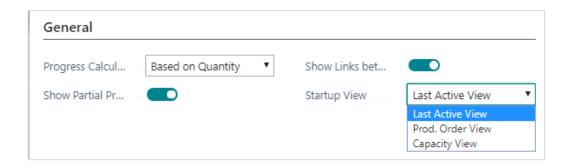
- Specify the timeframe that sets the time range covered by the timescale, either fixed by absolute values or relative to the workday (see also .6.1, "Setting the timeframe).



12.2. General

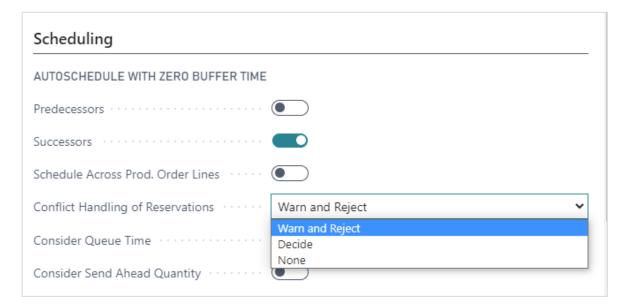
- Choose whether to display a **progress bar** for production order routing lines of **released** production orders, based on quantity or time.
- **Show links between production order lines**: You can decide whether you want dependencies to be illustrated by links in production orders with more than one production order lines or not. Tick or untick the according option.
- When, by setting filters, a single operation of a PO line gets filtered out, the standard procedure in the VPS is to only visualize the complete PO line. By unticking the option, you can switch to visualizing also a partial PO line.
- Decide which **view** is shown upon starting the VPS. No matter which view you select, the following settings get saved upon closing the VPS and are active the next time it gets started:
 - Show/hide setup times
 - Show/hide work free periods
 - Histogram aggregation





12.3. Scheduling

- Determine whether or not **predecessor operations should automatically be re-scheduled** when an operation is modified.
- Determine whether or not successor operations should automatically be re-scheduled when an operation is modified.
- Determine whether dependencies between several production order lines of a manufacturing order are to be taken into account for the automatic planning.
- Users can decide how they want to handle **conflicts between existing reservation entries** and drag and drop actions they make in the planning board.
 - Warn and Reject: The message informs about the conflict, and then the drag & drop action is rejected. That way, the users cannot violate any existing reservation with the VPS.
 - Decide: The user receives a message about the conflict and can decide whether to cancel or confirm the interaction. If the action gets confirmed, the conflicting reservation will be removed.
 - None: No warning is giving about possible conflicting interactions and the conflicting reservation will be removed.
 - Consider queue time: Decide whether the queue time specified in Business Central on the work/machine center card is to be considered for the scheduling process.
 - Consider send-ahead time: Decide whether the send-ahead time specified in Business Central on the work/machine center card is to be considered for the scheduling process.



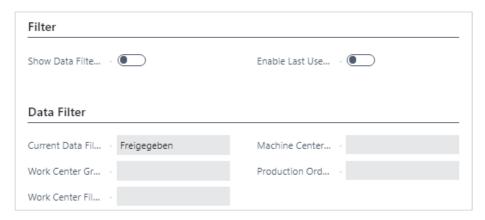


12.4. Filter

- You can determine whether the "Data filter" dialog comes up on starting the VPS or not. Please note that if you decide to not have it shown, the last selected data filter will be activated.
- The last selected view filter can be applied when the VPS is started.

12.4.1. Data Filter

- See which data filters are currently active.



12.5. Appearance

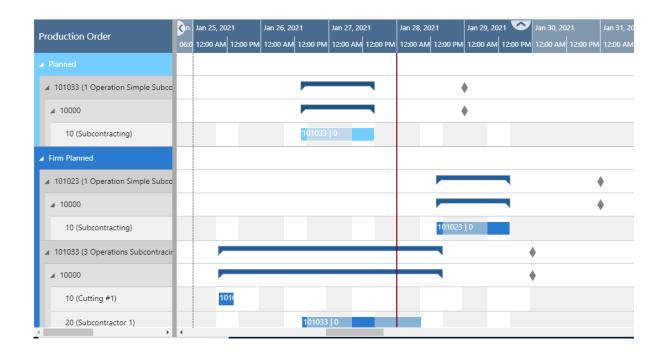
Zoom Factor(%) 100 Selection Color #ffa000 ... Layout STANDARD V Tooltip Delay (ms) 200¢

- Specify a **zoom factor** in percent.
- Choose a **layout**: In the "Compact" layout, the display is reduced as much as possible to provide a better overview, especially with large plans.

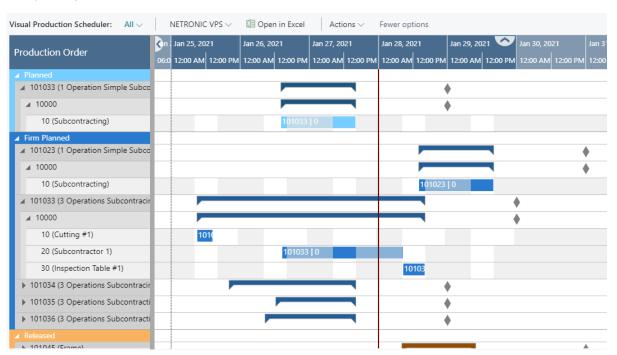
Standard layout:



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Compact layout:



- Choose a selection color
- Specify a **tooltip delay**: give a time in milliseconds after which the tooltip shall appear

13. Use filters

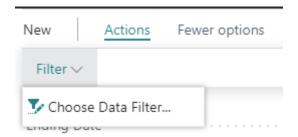
The VPS offers two kinds of filters, the difference between them lying in the time of application and the data being used.

13.1. Data filters

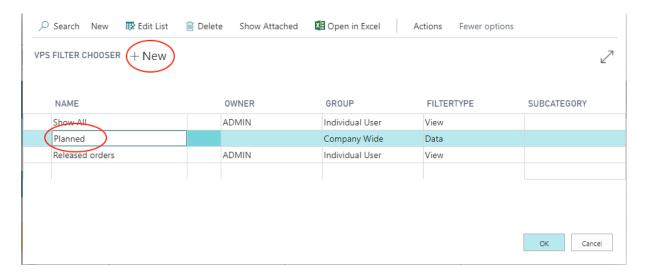
Data filters work as Dynamics 365 BC filter on reading the data (either when the VPS is started or on reloading) so that they are already effective at the data interface to make sure that only filtered data are handed over from Dynamics 365 BC to the VPS.

13.1.1. Create and edit data filters

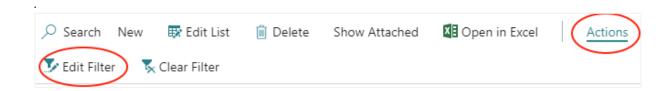
First, you have to open the according dialog by clicking "Choose Data Filter" in the "Setup" dialog:



In the dialog, you can edit, create and apply not only one but multiple data filters.

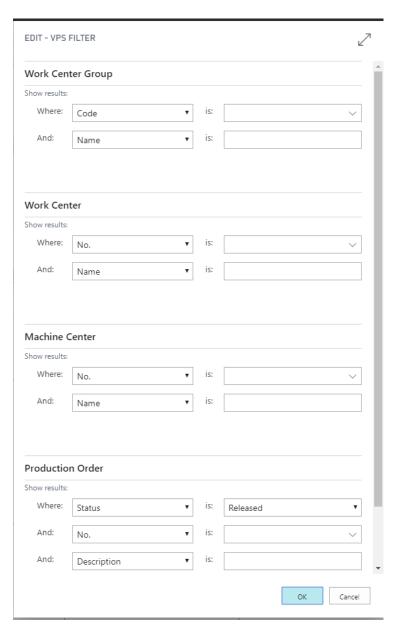


To create a data filter, click "+New" and then enter the name of the new filter. To specify the filter settings, click "Actions" "Edit Data Filter".





You can filter by work center groups, work centers, machine centers and production orders:



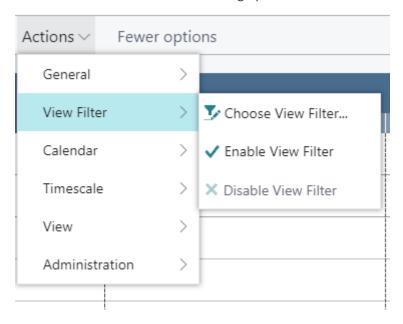
If you want to make sure that the "Edit Data Filter "dialog pops up when you start the VPS, tick the according option in the "Setup" dialog:





13.2. View filters

View filters are applied to data already having been loaded into the VPS. Accordingly, only the capacity utilization by the visible activities are shown in the histograms. To work with the filters, the "Actions" menu offers three according options:



13.2.1. Create and edit view filters

Click "Choose View Filter" to open the list of existing filters where you can create, delete and edit filters as described in the "Data filters" section.

If you want to make sure that the last used view filter will be applied when you start the VPS, tick the according option in the "Setup" dialog:



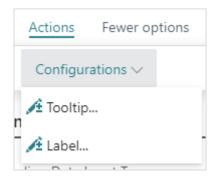


14. Configure tooltips

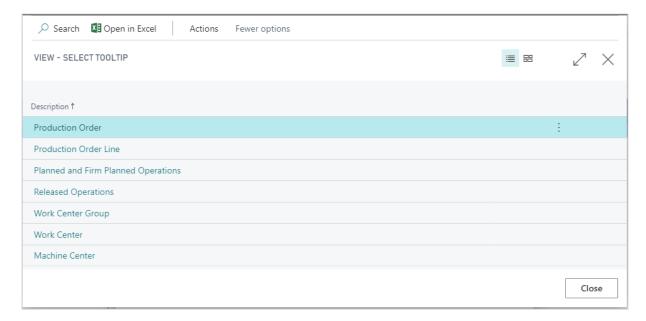
The tooltips of the VPS provide further information on the following items of your production schedule:

- production orders
- production order lines
- operations
- work center groups
- work centers
- machine centers
- planned and firm planned operations
- released operations

You can specify which information is to be shown in the tooltip of the respective item in the "Tooltip" dialog - to be reached by clicking "Configurations" in the "Actions" menu of the "Setup" dialog:

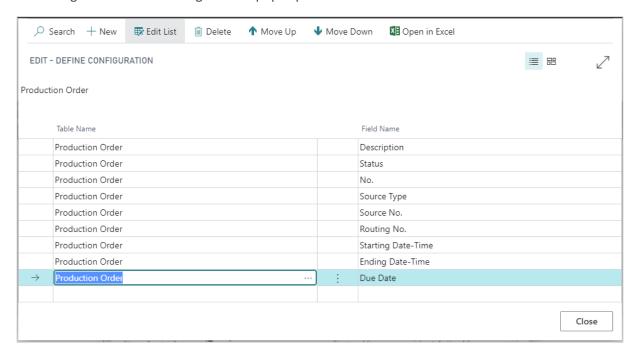


In the dialog popping up, you select the item for which you want to customize the tooltip and then either delete, edit or add fields and then click the "Edit" item from the "Actions" menu:





The dialog "Edit – Define configuration" pops up.



Here you can:

Add a new field:
 either click +NEW or just click in the last row. You can select the desired Dynamics 365 BC
 data by clicking "..." either for table and field name.



- Insert a new field:
 Select the field above which you want to insert a new one and proceed as described above.
- Delete a field:







15. Configure bar labels

You can decide which D365 BC information is to be shown as bar label.

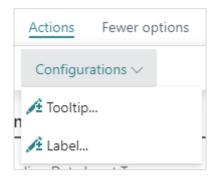
Bar labels are shown on

- operations in the Production View
- operations in the Capacity View

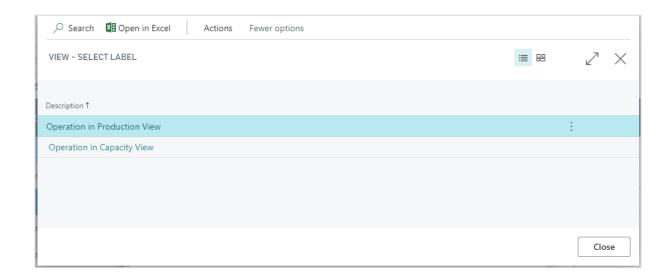
In the picture below, the bar label shows the production order number and the operation number, separated by "|".



You can specify which information is to be shown on the bar label of the respective item in the according dialog to be reached by clicking "Configurations" in the "Actions" menu of the "Setup" dialog:

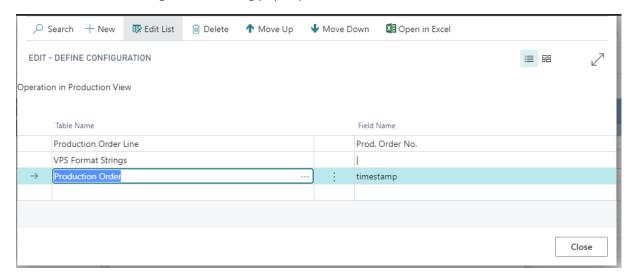


In the "View - Select Label" dialog, select the item and/or view for which you want to customize the bar label:





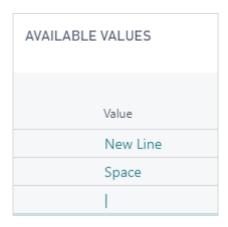
The "Edit – Define Configuration" dialog pops up:



Here you can add, insert, edit, and delete fields as well as change their order. You can select the desired table name and field name from your Dynamics 365 BC data by clicking "..."

15.1. Formatting the labels

Separate the field contents by a line break, a blank or a "|" by selecting the according separator from the "VPS Format Strings" table.



The separators can get enhanced by the function "Extendible bar text separator" that has to be implemented by the partner. Please contact us for further information.

16. Configure table labels

You can decide which D365 BC information is to be shown as labels in the table for:

- Production orders
- Production order lines
- Production order routing lines
- Machine centers



- Work centers
- Work center groups

The picture below shows the table label for a production order routing line, containing:

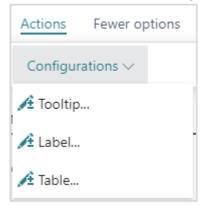
- the operation number
- a blank
- the description in brackets



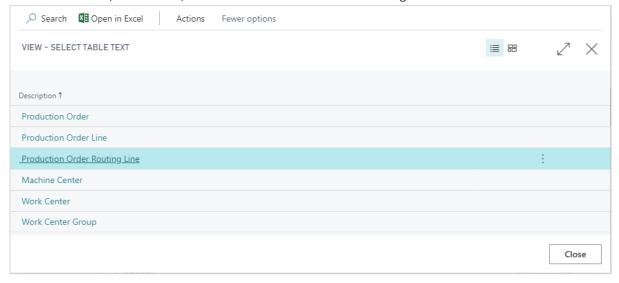
16.1. How to proceed

For customizing the table label, proceed as follows:

• In both extensions click "Configurations" in the "Actions" menu of the "User Setup" dialog:

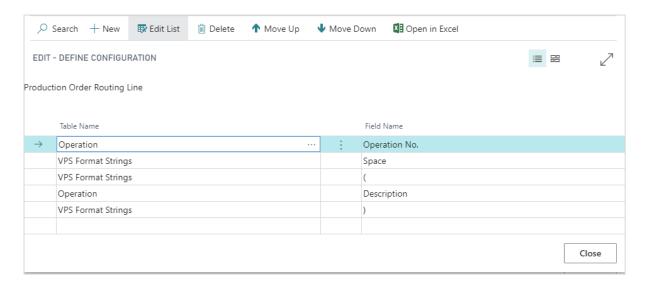


• In the "View - select table text" dialog, select the item for which you want to customize the table label which, in our case, would be "Production Order Routing Line":





• The "Edit – Define Configuration" dialog pops up:



Here you can add, insert, edit, and delete fields as well as change their order. You can select the desired table name and field name from your Dynamics 365 BC data by clicking "...".

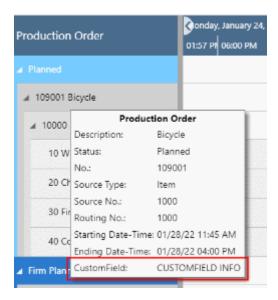
16.2. Formatting the labels

Separate the field contents by a blank, or by the separators shown below by selecting the according character from the "VPS Format Strings" table.



17. Custom fields

In addition to the default fields available in tooltip, label and table text it is possible now to equip custom fields with data to use them in tooltip, bar label and table text.



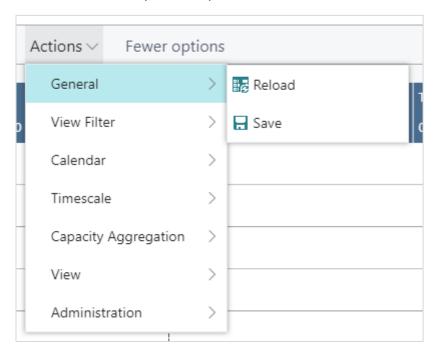
Please find a detailed description in the related Knowledge Base articles:

How to add custom fields to the VPS

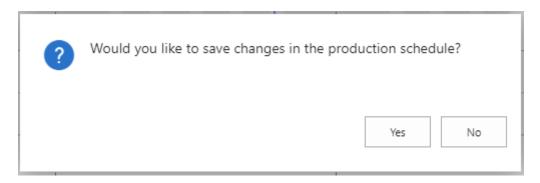


18. Reload and save data

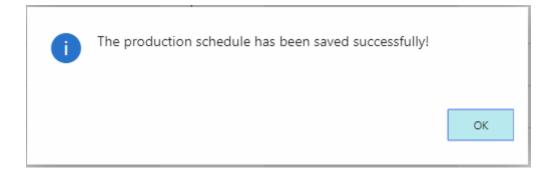
In case you wish to discard your changes after modifying the diagram (provided you didn't save them) you can simply reload the data of the diagram. The "General" items allow to reload the former values or, alternatively, to store your modifications.



If there are unsaved changes in your plan when you click "Reload", a dialog pops up where you can decide whether to save these changes or discard them.



After having saved your changes, a confirmation message pops up:





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The successful reload will be stated by another message box:



