

## Release Notes: Visual Advanced Production Scheduler

Product	Visual Advanced Production Scheduler
Version	1.18
Build	1.18.0.1
Date	5 July 2024

### List of fixed bugs

- An error message appeared when one tried to change the production order status via the VAPS.

Product	Visual Advanced Production Scheduler
Version	1.18
Build	1.18.0.0
Date	3 July 2024

### List of new features

- **Modification of setup times** depending on the sequence in which operations are executed (lightweight SDST = Sequence Dependent Setup Times)

The new (lightweight) SDST function works based on the item attributes. For this purpose, we enhanced the Work Center and Machine Center cards and the Item Attributes page and added the new SDST Configuration List, with the according sub-page to define exceptions
- **Move operations with custom sort order**

Up to now, the order of operations to be moved could only be determined for all operations at once according to a specific field. With the new feature, we added the options “Move up” and “Move down” to the “Move multiple operations” dialog so that also single operations can be shifted in the sequence.
- **New color scheme for more shop floor transparency** to give feedback as to what is “done”, “in progress”, “ready to get started” and “others”.
- **Update required due date on a sales order change**

The VAPS already allows for the update of sales order lines when a connected production order is moved, keeping reservations intact. The new feature aims at working in reverse by automatically updating the due date of a connected production order when sales order dates (Planned Delivery Date, Planned Shipment Date, Shipment Date) are postponed. This helps ensure production schedules reflect the changes made by the sales department. However, if sales lines are moved to an earlier date, the production orders are not rescheduled automatically, which may result in date conflicts and the removal of reservations.
- The handling of EMAD was enhanced and improved so that it is now possible to **take different pre-defined location codes into account** when determining inventory availability which will lead to more inventory accuracy.
- **Performance improvement** of “Create Simulation”.

### List of fixed bugs

- Error when manually moving the scheduling start line
- Not editable or finished operations were part of the move operations list
- “Start not earlier than” was not calculated on production orders that were generated from the planning worksheet.
- Consumed/picked items caused overreduction in the overview of the available quantity on the EMAD - demand page.

Product	Visual Advanced Production Scheduler
Version	1.17
Build	1.17.0.1
Date	3 April 2024

**List of fixed bugs**

- Too many picked items were taken into account in the EMAD calculation

Product	Visual Advanced Production Scheduler
Version	1.17
Build	1.17.0.0
Date	28 March 2024

## List of enhancements

- Improve handling of simulations with **warehouse activity lines**

When a production order contains a warehouse activity line, this order can't be changed, and the according simulation can't be published. Up to now, this was only indicated by the Business Central error message that doesn't offer much help. Therefore, the VAPS now offers support by

- showing a symbol for blocked production order routing lines
- an info window telling the users which production orders have been blocked
- a new option in the "General" group of the VAPS setup dialog allowing to disable the checking process. Please mind that in this case, the affected orders will still be blocked for modification.

- Calculation of **earliest start date**

Up to now, the fields "Earliest Start Date" on production order, production line and production order routing line level had to be filled manually by the user or via an individual dependent extension developed by the partner.

We have improved the handling on production order level, so that now the "Earliest Start Date" on this level can be calculated and filled automatically. For this, the VAPS setup dialog was enhanced by the new area "Earliest Start Date Calculation" Here you can define which mode of calculation should be used along with the associated custom values:

- **None** – same behavior as previously
- **Simple Date Formula** - the formula will be applied to the "Required Due Date" to fill the Earliest Start Date
- **Weighted Production Order Time Demand Factor** - all times (setup time, run time multiplied with quantity, wait time and move time) will be added to represent the whole pure duration of that production order. The result will then be multiplied with a user-defined factor and then subtracted from the "Required Due Date" as real time (without using work/shift calendars)

The settings in the VAPS dialog are valid by default. It is also possible to make **individual settings** on the production order itself, which will overwrite the settings from the setup dialog. This enables users to define a "one size fits all" setting and to use individual settings for single production orders.

- The **progress info window** was streamlined and enhanced to give users a better insight into the underlying processes.
- Enhanced and improved usage of the **progress bar**

Previously, the progress bar was automatically displayed, indicating the elapsed production time. Now, users can choose whether to display a progress bar at all and if so, whether the progress should be calculated based on the time consumed or the quantity produced. The calculation of the consumed quantity is derived from the input quantity, allowing consideration for scrap as well. These options can be found in the "General" section of the VAPS setup dialog.

The color of the progress bar depends 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 > 100 % : red

When trying to move operations “in progress,” a warning pops up, asking whether the scheduling should be carried out with the old quantity or with the current remaining quantity. In the second case, the input quantity gets changed, warning the user that this will lead to a misleading progress bar information.

- **Performance improvement** of “Create Simulation”.

### List of fixed bugs

- The histogram collapse/expand state was not restored on machine center level
- The standby indicator in the “Move Operation(s)” selector dialog was missing
- The field “Alternate Routing Set” on the “Prod Order Routing Line” page was changed to a drill-down field.
- The required due date line was not updated after interactions
- “Move Operation(s)” did not move operations based on the current order
- EMAD
  - The calculation was unable to handle scenarios where some components were fully picked while others were not picked at all.
  - “Clear Flags” cleared too many production order routing lines and did not clear the “FullyPromised” flag on production order routing lines

Product	Visual Advanced Production Scheduler
Version	1.16
Build	1.16.0.0
Date	31 January 2024

### List of enhancements

- **Move operations via dialog:** new context menu on work centers, machine centers, and operations to select the operations to be moved.
- **New Role Center Page** , currently showing four activities with related cues, thus providing information of interest to the production department:
  - Information from Business Central with numbers of production orders and resources
  - EMAD information
  - General information about the VAPS simulations
  - Data validation data for Business Central: the cues appear in red when data is not valid, otherwise they are displayed in green like the other cues.
- Performance improvement when loading and scheduling

### List of List of fixed bugs

- Histogram load curves were not updated after the production order status was changed to “finished”
- Histogram load curves were not updated on “Pinned without Capacity” operations

Product	Visual Advanced Production Scheduler
Version	1.15
Build	1.15.2.0
Date	19 December 2023

### List of fixed bugs

- Translation correction in the German version
- Production Line Assignment Color Scheme was not applied correctly
- Work center/machine center component bin did not get updated on publish

Product	Visual Advanced Production Scheduler
Version	1.15
Build	1.15.1.1
Date	26 October 2023

### List of enhancements

- The new VAPS version primarily enables the new AppSourceTransact capability, allowing users to directly purchase VAPS licenses through AppSource. This enhanced connectivity provides a seamless experience for users to access and acquire the licenses they need. This also applies to existing customers that need to migrate to the new licensing system  
For detailed information, please see the article in our knowledge base [How to deploy the VAPS into a cloud infrastructure?](#)



Product	Visual Advanced Production Scheduler
Version	1.15
Build	1.15.0.0
Date	13 October 2023

## List of enhancements

- (Basic) scheduling by production lines possible now:
- A new option on the work center card allows to define work centers as production lines.
- Two new color modes “Production Line Assignment View” and “Production Line Sequence View” indicate deviations from the scheduling rules.
- Prerequisites for this way of scheduling:
  - Machine center capacities in a “production line” must have a value of 1 or 0. This means no station can handle more than one operation at a time.
  - If a station is to be skipped in the “production line” the routing still needs to have an operation for that step (this can have setup time + runtime of 0)
  - Every station in a “production line” must be defined through an alternate routing set (for each “production line”).
- Extended “Add all” functionality:  
The already known “Add all” functionality was enhanced so that planners can now regulate the behavior of preceding and succeeding linked production orders via two new options when you add from selected production orders or sales orders:
  - add unplanned preceding production orders first
  - do not add unplanned succeeding production orders
- A new option in the VAPS setup allows to include or exclude operations on standby for the load curve. By default, these operations are now excluded.
- EMAD
  - Completely picked (i.e., taken from inventory) items are treated with a higher priority than unpicked ones.
  - New option to move operations with missed EMAD date back to standby.
- Option to show/hide an info bar below the Gantt chart, with information about an active/inactive view filter and whether the focus mode is active, the selected color mode, the last time the EMAD was calculated, and date and time of the last shopfloor update.
- Improved search and navigation  
We enhanced the options in the role center so that users can now directly open the following pages:
  - Simulations
  - Sales Line Changes
  - Alternate Routings
  - Color Setup
  - VAPS Setup
  - EMAD Demand Priority
  - Tooltip, label, and table texts of production order lines can now also be equipped with information (document number and sales line) about connected sales lines.
  - Use of flow fields within table extensions to simulation tables for tooltips, bar, and table labels:  
Until now, flow fields could be created in the original tables of Microsoft Dynamics 365 Business Central or its extensions and calculated as required via the OnBeforeTransfer events.

Now, under certain conditions, flow fields can also be created directly in NETRONIC's own simulation tables and used for tooltips, bar, and table labels.

**Important:** Only persistent records can serve as the basis for calculating the values in the formulas for the flow fields, i.e., values that come about as a result of interactive rescheduling in the planning board are not included in the calculation. In addition, there is no event that is triggered before the value of the flow field is calculated. Therefore, it is not possible, for example, to use a date filter to restrict the calculation to dynamic values. Therefore, the feature should only be used in combination with values from standard Dynamics 365 Business Central tables.

- Feature ColorPicker available for external use, meaning that the related procedures have been set to public.
- Improved performance of the “Focus Mode”.

#### List of fixed bugs

- Fields could not be moved up in the tooltip definition.
- “Fill Idle Times” didn’t work correctly.
- The application area on the “Sales Line Changes” page was wrong.
- Demands of requisition line reservations were automatically excluded from the EMAD calculation.
- Component bins were not updated when the work center/machine center got changed
- Items with quantity 0 now get automatically set to “excluded”.
- The KPI measure table was empty in certain cases and had no reset function.
- EMAD dates on routing lines were not reset before a new calculation.
- Operations with a warning symbol from the scheduler got the flag "record updated" and hence were saved and published.
- Publishing a simulation after moving an operation from one “Standby” resource to another one didn’t work properly.
- Operations in progress seemed to be flagged as “changed” and got published.
- Behavior issues with zero capacity resources.
- Issues with refreshing KPI values.

Product	Visual Advanced Production Scheduler
Version	1.14
Build	1.14.0.1
Date	13 July 2023

### List of fixed bugs

- Unexpected behavior of “Add Up-Downtime by Shift”
- Some capacity management menu entries did not work
- Internal issue: duplicate code lines in combination with curve handling
- If the VAPS Setup page was not editable, the values Zoom factor, StandbyColor, and WeekendColor were still editable
- When customizing tooltips, labels, or tables, the EMAD captions in the “Simulation Prod. Order Routing Line” table were duplicated

Product	Visual Advanced Production Scheduler
Version	1.14
Build	1.14.0.0
Date	30 June 2023

### List of enhancements

- EMAD calculation:
  - Consideration of the **supplier's promised delivery date** in EMAD calculation and automatic functions
  - Include fully consumed items into EMAD calculation
- Increased efficiency by new option to include selected sales orders or production orders in "Add-all"
- Option to **pin whole production orders or production order lines** instead of single production order routing lines
- Option to move unhandled production order routing lines of **whole production order or production order line** to Standby
- Option to move unhandled production order routing lines to Standby **per work or machine Center**
- Enhanced dialog "Add down/uptime": the field Capacity No. now allows **entering individual texts and filters**
- Option to update several simulations in one go
- Improved performance of copying simulations
- We added the page "Visual Advanced Production Scheduler Guide" in the Extension Management of Business Central which allows to directly go to the product page and upcoming webinars.
- **API:** new event by which the user **can create own links between production order lines** that are processed by the scheduler like normal reservations. The event is structured as follows:

procedure OnProvideCustomReservationsForProdOrderLine(pSourceProdOrderLinePosition: Text; var pDestinationProdOrderLinesPositions: List of [Text]; var pHandled: Boolean)

### List of fixed bugs

- Certain routing constellations led to erroneous execution of "Add-all" and "Apply routing".
- Overflow on move time as integer
- The EMAD dates on production order component lines differed from the EMAD allocation table
- Strange texts in tooltip page for Sales order and sales line
- When creating tooltip, label and table definitions, a search is now made for double entries
- Records were inserted without checking whether they already existed.
- The "Search" dialog produced an error regarding navigation when a view filter was active

Product	Visual Advanced Production Scheduler
Version	1.13
Build	1.13.0.2
Date	12 May 2023

### List of fixed bugs

- Circular routings were not handled correctly
- Scrollbars were not working correctly in Firefox Browser
- Changing the routing status outdates simulation
- Operations were not always correctly colored after an interactive movement
- "Recalculate Current Schedule" did not treat infinite resources correctly
- Error message "not all entries were processed" would pop up under certain circumstances
- Excluded items were included in EMAD Calculation

**Please note:** All methods with an "obsolete" flag were set to "internal."

Product	Visual Advanced Production Scheduler
Version	1.13
Build	1.13.0.1
Date	14 April 2023

**List of fixed bugs**

- “Apply Shop Floor Changes” unintentionally moved finished operations
- Description for downtimes were not shown correctly in the tooltip
- EMAD calculation resulted in wrong values and duration of calculation was too long.
- Some missing German translations were supplied

Product	Visual Advanced Production Scheduler
Version	1.13
Build	1.13.0.0
Date	31 March 2023

### List of enhancements

- **Integration with capacity ledger entries** so that customers can easily **update their schedule based on the actual shop floor data.**
  - Work date line changed to work date/timeline.
  - Load recent shop floor data into the simulation.
  - New color scheme to highlight deviations between plan and actual. Differentiation of deviations in resource, duration, time, quantity, none.
  - Capability to update schedule with actual data: capacity ledger entries get written into production order routing lines so that customers always run a current schedule.
- Enhanced **integration of sales orders and production orders.**
  - **Reservation entries between production orders and sales order are always kept** – even if the production order due date gets moved after the sales order requested shipment date when planning with finite capacity.
  - Provision of **report** so that both planners and salespeople easily can see **which sales orders have a new shipment date** following the production order changes.
  - Capability to show **sales order number on production order line.**
- New scheduling function “Recalculate Current Schedule” to check the plan for **violations of the VAPS scheduler rules** (overloads and sequence violations) and to correct them if possible. In doing so, operations can be shifted from their previous position into the future if necessary.
- Enhanced “Capacity Management” menu to define **variations in capacity** (uptime and downtime).
- Option to remove blocked lots from EMAD calculation.
- New context menu items to **navigate within one routing.**
- Interactively change **duration of all** operations (not only started ones). For this, the context menu “Change Started Operation” was renamed to “Change Duration”.
- New context menu item to **move pinned/started operations**, replacing the former “Change Pinned Operation” item.
- Three new options **for bar coloring** in the “Appearance” settings of the setup dialog:
  - Graded: nonworking times are displayed in a lighter shade of the main color
  - Solid: draws a continuous block in the main color
  - Only allocated times: nonworking times appear with white background

The new options ensure that the label texts are always readable.

### List of fixed bugs

- The Production Order View stayed empty after switching views and using view filters in a certain order.
- Division by 0 exception when calendar entries are empty..
- Alternate routing set not configured completely
- Publish original run time if changed.
- Update simulation did not update the histogram curve.

- Long waiting time when “Add All” was run in certain data structures.
- Save simulation took a long time.
- Calculate Allocated Time in Capacity Need Entries with respect to already posted times
- Expected Capacity Need was not handled in simulation.
- Limited unnecessary calendar entries were loaded.
- Prevent demand with no item number.



Product	Visual Advanced Production Scheduler
Version	1.12
Build	1.12.0.0
Date	23 December 2022

### List of enhancements

- An **info window** now also shows the detailed progress when simulations are created, deleted copied, published, and closed (with saving).
- Like tooltips and bar labels, the **texts in tables** can now also be defined as having more than one line.
- **EMAD:** The item type “non-Inventory” can be excluded from EMAD calculation by ticking the according option in the VAPS setup.
- Set **color of date line grids and weekends** in the “Appearance” section of the VAPS setup

### List of fixed bugs

- “Update simulation” moved a production order routing line back to Standby.
- Error message “Key not found”.
- View Color Mode with family orders.
- Change up- downtime.
- The planning domain was not saved correctly in the simulation.
- “Update simulation” with active data filter restored all data.
- “Show/Hide non-working periods” didn’t work initially.
- Error “ODT is not valid” if interactions happened at the end of the simulation.
- Error “ODT is not valid” when using “Add all”.
- Overload was allowed on pinned operations.
- “Change started order” didn’t not work with resize
- “Key not found” error in “Last known error” even though no error message was shown.
- Adding downtimes raised error “Operation already on curve.”
- Production Order View was empty.
- EMAD calculation:
  - An error in the calculation formula could lead to negative values for reserved quantities, which in turn led to incorrect values for the inventory.
  - Inventory Supply calculation precedence on calculation incorrect, producing invalid inventory.

Product	Visual Advanced Production Scheduler
Version	1.11
Build	1.11.0.0
Date	28 October 2022

### List of enhancements

- **The VAPS now supports scheduling with finite capacity >1.** So far, the VAPS worked with the assumption that each work and each machine center had a capacity of 1. This assumption was removed with the new release. As a result, the settings on the following standard Business Central fields are taken into account by the VAPS:
  - Work center: *capacity*
  - Work center: *efficiency*
  - Machine center: *capacity*
  - Machine center: *efficiency*
  - Production order routing line: *concurrent capacity*
- **EMAD on production order routing line level.** So far, the VAPS calculated the EMAD (earliest material availability date) on production order line level. With the new release, we also support the *routing link*. Thus, the EMAD now is calculated by the production order routing line.
- **Enhanced data filter options:** when creating a simulation, **capacities can now also be filtered**, resulting in loading only production order routing lines that are assigned to these capacities via routing. Production order lines that, due to filtering, have no child elements are not loaded. If lines that are not complete because, for example, an operation is missing because its capacity is filtered out, the remaining operations are displayed paler and can no longer be moved, i.e., they are treated as "pinned with blocked capacity". The same applies to production orders.
- Further EMAD enhancements:
  - The "Availability" menu on the Item card was enhanced by an option to **directly navigate to the EMAD demand entries**.
  - Refined EMAD calculations in case of the demand date coming from reservation entries.
  - Performance improvements.
- **Extended info symbol functionality:** showing info symbols is now available not only for comments, but also for tool information, personnel information, and quality measure information. The feature can be activated in the "General" area of the VAPS Setup that was enhanced by the new entry "Show info symbol on additional information". According new items in the context menu allow to **directly open the dialog** where the information can be created and edited.
- New feature "**Copy simulation**", available in the simulation overview.
- The **texts in tables** can be **designed individually** in analogy to tooltips and bar labels.
- **Finished operations** appear grayed out.

### List of fixed bugs

- After updating a simulation, operations were moved to another work center although they had not been changed in Business Central.
- The production order view was empty after updating a simulation.
- Unnecessary reservation entries are now removed in case of filter reservation entries by "reservation".
- In some cases, operations that were already added to the plan were moved by „Add All“.

- The VAPS is now able to handle errors upon creating a simulation if the name of a standby center exceeds 20 characters.
- Message when double-clicking an item that no longer exists in Business Central.

Product	Visual Advanced Production Scheduler
Version	1.10
Build	1.10.1.2
Date	9 September 2022

#### **List of fixed bugs**

- When using a view filter or the focus mode, some resources vanished or were not shown in the correct order after disabling the filter.
- After applying the view filter, some links were not shown anymore.

Product	Visual Advanced Production Scheduler
Version	1.10
Build	1.10.1.1
Date	8 August 2022

### List of enhancements

- Comprehensive performance improvements: increasing performance gains with increasing number of data (production order routing lines).
- Load performance: 10% performance increase (sample data with 1000 production order routing lines).
- Usage performance: 80% performance increase when changing the view color mode (sample data with 1000 production order routing lines).
- An info window indicates the progress during loading/reloading of a simulation.

Product	Visual Advanced Production Scheduler
Version	1.10
Build	1.10.0.0
Date	30 June 2022

### List of enhancements

- Run EMAD allocations from job queue
- Define an EMAD tolerance value on the item card
- Show info symbol on production order routing lines to highlight that there are comments in the respective Business Central table
- Show or hide a world view to allow faster navigation through the visual schedule
- Show or hide non-working times
- Refactor handling of alternate routing sets
- Load performance Improvements

### List of fixed bugs

- The grey curtain on the left which shows the EMAD date will not be shown, if “Considering EMAD” is disabled in the VAPS setup.
- Sometimes the error message „Capacity Need Entry already exists” was shown when saving a simulation.
- On Platform v20 a warning about “Released functionality” was shown. This is an update for the provisional fix in release 1.9.0.1
- The warning “Not all operations could be scheduled” was not generated in all cases.
- Due Date Violation is now calculated by comparing the line ending date with the required due date from the order. This fix affects only the Wait Time Color Scheme.
- The functions “Fill Idle Times” and “Tighten Queue” will also handle operations on Infinite and Standby resources if they can be moved horizontally.
- In some cases, a duration with fractions of milliseconds was calculated resulting in a rounding error.
- An integer variable containing milliseconds could result in an arithmetic overflow if the interval was more than some days. Now always the datatype BigInteger is used.
- A performance issue by using an unfavorable index was fixed.
- An incorrect schedule warning could be generated in function “Apply Routing”.
- EMAD Allocation Type "NETVAPS EMAD Allocation Type" CalcFormula was not including the Production Order status which in turn could lead to an incorrect value being reported from the EMAD Demand record for production order components where document numbers are the same and only the status differs. Such as planned or released. Status is now considered in the CalcFormula for the FlowField.

Product	Visual Advanced Production Scheduler
Version	1.9
Build	1.9.0.1
Date	20 April 2022

#### List of fixed bugs

- “Tighten queue” did not work correctly on single resources.
- Incorrect calculation of “Send ahead”.
- Fix for “Reduced functionality” warning in BC 20.

Product	Visual Advanced Production Scheduler
Version	1.9
Build	1.9.0.0
Date	1 April 2022

### List of enhancements

- EMAD
  - Performance improvements.
  - A new **info window** has been added, showing **processing information** while the EMAD values are being calculated.
  - New **EMAD supply information** on the demand overview page.
  - The **different switches** in the VAPS setup for considering EMAD dates when scheduling where **combined into one switch for** all affected scheduler operations (Add All, Fill Idle Times, Apply Routing, Tighten Operations).
- The new function “**Tighten queues**” allows to **minimize gaps between operations on a resource** by shifting all operations to the scheduling start as far as possible, without changing the operations’ order. It can be performed on a single resource by the according context menu or for all resources by the according menu item.
- The option “**Show operations overlapped**” is now also **available for standby resources**, the default being “Show operations stacked”.
- Work centers can now also be used in alternate routings.
- The **color schemes have** been reworked to improve performance and remove some inconsistent behavior which did not fit the specification.

### List of fixed bugs

- The error message being shown when some operations could not be scheduled because the simulation interval was too small has been improved.
- When trying to insert an already existing entry in the database, the “Last Known Error” was set although the problem was handled by the application correctly.



Product	Visual Advanced Production Scheduler
Version	1.8
Build	1.8.1.0
Date	14 March, 2022

### List of new features

- EMAD
  - The EMAD date may now also be considered when performing the “Apply Routing” function. All affected operations are placed at the maximum of work date, EMAD date and predecessor links. For this, the “Consider EMAD for Add All” option was added to the VAPS Setup
  - The EMAD calculation’s performance was improved.
- “**Fill Idle Times**” was redesigned to enhance performance and achieve better results.

### List of fixed bugs

- The “Send-Ahead” calculation did not work correctly when the run time was rounded to 0 seconds. Internally, the resolution was changed to milliseconds to solve the rounding problem. A runtime of exactly 0 will now also be handled correctly.
- Setting a calendar entry to exactly 24 hours per day could lead to unexpected results because start and ending time were set to 00:00. This is an internal problem of BC and usually gets solved by setting an ending time of 23:59:59 instead of 24:00 h (losing 1 second per day). The VAPS is now able to handle also calendar entries with both start and ending time set to 0:00 and internally corrects the duration to 24h.
- During scheduling it could happen that indirectly affected operations were moved although they were pinned with blocked capacity.
- The function “Fill Idle Times” moved some operations from standby instead of ignoring them.
- During the installation of the VAPS, sometimes the error “Inconsistent Read” was generated if the user changed a routing line in the standard BC dialog.
- The Request Page for “Create Simulation” did not handle start/end values being relative to the work date correctly. Now relative dates are recalculated when reopening the “Create Simulation” dialog instead of using outdated values from earlier work. Switching from absolute to relative dates will now force a correct recalculation of the dates in relation to work date.
- If the “Add All” or “Add All with Alternates” functions found more operations than could fit in the scheduling window, the surplus operations were not handled correctly which led to unexpected results. Now the surplus operations are moved correctly to the end of the schedule window at standby, indicated by a warning symbol.
- When an operation gets overlapped by another, the trailing operation should be pushed forward. This could lead to strange results if the operation was pushed out of the scheduling window. Now such operations will be moved to standby showing a warning symbol.
- Using alternate routings having a factor with fractions like 1.33 could result in an “numerical overflow” exception if the effective runtime was not calculated as an integer – for example 22.67. Now the effective values are rounded correctly to seconds.
- Sometimes an unnecessary entry to the error log “index out of range” was generated.
- When performing “Add All” and having not enough space on the destination resource, the scheduler did not handle as much operations as possible, leaving some gaps at the

end of the scheduling window. Now the scheduling window will be filled as far as possible leaving only the remaining operations on standby.

Product	Visual Advanced Production Scheduler
Version	1.8
Build	1.8.0.0
Date	16 December, 2021

### List of enhancements

- **Schedule on work centers only:** The VAPS now handles work centers in the same way as machine centers and users can dispense any machine centers if they want.
  - All work centers are visible in the simulation even if they don't contain a machine center.
  - Every work center now provides a standby center where all new operations are initially placed.
  - Only exception: subcontractor work centers which are already handled as having infinite capacity so that an additional standby center for them is not needed.
- **Define infinite capacity for work centers/machine centers:** The respective cards were enhanced to activate the "Schedule with infinite capacity" option. Work centers/machine centers with infinite capacity are indicated by the ∞ symbol. Operations on such an "infinite" center may overlap without driving out each other. The behavior is the same as on standby resources. Switching on or off this option will affect the respective center in all existing simulations, but already scheduled operations will not automatically be rescheduled.
- **Move all operations from Standby:** The "add-all" feature was enhanced in such a way that it now also affects operations that are before the scheduling start line. All operations will be moved behind the scheduling start line.
- **Apply routing:** Operations affected by this function are now always positioned at least at the current work date, or later, if requested by a linked predecessor.
- **Move operations to Standby:** The "Schedule" menu was enhanced by two new items that allow to move certain operations back to standby in one go.
  - **future operations:** operations that start after the scheduling start
  - **past operations:** operations earlier than the current work date where the routing status is not "in progress" or "finished".
- **The collapsed/expanded** states of table elements and their curves get saved automatically now.
- Two new resource context menu items allow to specify whether overlapping operations are to be shown **overlapped in one row or stacked**.
- The item card was enhanced by the new feature "**Exclude items from EMAD calculation**".
- In the Production Order View, and the Sales Order View you can now also **sort by status**.

### List of fixed bugs

- Subcontractor color:
  - The background color for subcontractor work centers will only be shown in the left-hand table.
  - The calendar line will be shown like any standard work center with calendar visible.
- Decimal to integer conversion: in some rare cases the scheduler calculated a runtime with a fraction of seconds. This was not rounded correctly and caused a program exception.

Product	Visual Advanced Production Scheduler
Version	1.7
Build	1.7.0.0
Date	19 October, 2021

### List of enhancements

- New **view filter**, to be reached via the “Actions” menu.
- **Base-view filter**: In addition to the view filter, which can only be managed, switched on and off in the according view, the new base view filter is managed outside the view and is assigned to a simulation. So, when loading, another view filter comes into play in addition to the data filter, which cannot be changed during the runtime of the view.
- **Lot size** is supported now so that the duration gets calculated by the formula “duration = setup time + runtime \* input quantity/lot size”.
- **Change sorting**: A new dialog, which is opened via a corresponding entry in the context menus of almost all elements, can be used to configure the sorting of the respective element. The configuration is also possible via user setup, like the configuration of tooltip, label, and table texts.
- **Tooltip delay**: You can now define a delay time after which the tooltip appears. This is done in the “Appearance” area of the user setup.
- **Editorial edit of tooltips** for data fields and action buttons
- **API**: A new event was added by which a production order line can be set to “not editable”. The event is called upon starting the simulation (view simulation) and updating the simulation (update simulation). The event is structured as follows:

procedure OnProvideProdOrderRoutingLineEditability(pClientGuid: Guid; pProdOrderRoutingLinePosition: Text; var pEditable: Boolean; var pHandled: Boolean

### List of fixed bugs

- Send-Ahead (and other) values were changed/set to zero when a simulation was published.
- Incorrect behavior of username query.
- When calculating the start date of a successor with “send-ahead”, the runtime factor for alternate routings was not observed.
- When moving a started operation via "change started operation" and selecting to reduce the input quantity to the remaining amount, this value was not used when the simulation got published but was reset to the original value.
- When an operation (without wait and move time) got scheduled so that its end time neared the end of the day (e.g., 23:00), the calculated end date/time got shifted to next day’s start of working time (e.g., 8:00).

Product	Visual Advanced Production Scheduler
Version	1.6
Build	1.6.0.1
Date	6 August, 2021

**List of enhancements**

- No enhancements in this release.

**List of fixed bugs**

- The items of the context menu concerning MRP caused an error message.

Product	Visual Advanced Production Scheduler
Version	1.6
Build	1.6.0.0
Date	June 30, 2021

### List of enhancements

- Show/hide **links between production order lines** via the VAPS setup dialog.
- **Consider queue time:** the VAPS now enables considering the queue time in the scheduling algorithm in the same way as is done in Business central. The queue time is stored in the machine/work center and operates on the calendar of the relevant machine/work center. The feature can be enabled in the VAPS setup.
- **Consider send ahead quantity:** in Business Central, the user can specify a send ahead quantity for an operation when defining a routing. This send ahead quantity that can be considered to start a dependent operation before the current operation is fully completed, can now also be used in the VAPS. The algorithm used is slightly different from that of Business Central. The VAPS algorithm tries to keep the working times on the following operation together without any gaps of nonproductive periods. By that the following operation may start later than expected, but therefore has a continuous workload.
- Enhancements of **search dialogs:** The search dialogs can be personalized the same way as is known from Business Central by adding columns in the fields list. This makes it easier to search for special attributes of orders, order lines or routing lines.
- Automatically generated translations were removed and exchanged by **manually created proper translations in English and German**. For partners wanting to create an own translation in their language, we provide the English xlf files as basis.
- API
  - A new set of **OnBeforeTransfer** events was added. These events can be used to modify Business Central data before transferring them into our simulation data. This way, the customer can use flow fields, for example.

The values of a field class Flowfield of standard BC are dynamically calculated and can be used in fields added by partners, but currently they are not triggered to get calculated during data transmission from Business Central to the SIM tables. By using the new events, these fields can nevertheless be processed in a meaningful way and can be provided for tooltip, bar, and label texts. The partner enhances the BC as well as the SIM tables by new fields accordingly. The events occur on loading and are structured as follows:

```
OnBeforeTransferBCTableName(pClientGuid: Guid; var pBCTableNameRecord: Record
"BCTableName" var pHandled: Boolean)
```

**BCTableName** has to be replaced with the concrete table name. The following tables can be used:

- Production Order
- Production Order Line
- Production Order Routing Line
- Work Center Group
- Work Center
- Machine Center
- Sales Header
- Sales Line

The event delivers the BC record to be transferred. Then an own or an already existing FlowFilter can be set and FlowField values can be calculated – the new value will be stored in the record. After this,

the VAPS will process the record and transfer it to the SIM tables. The calculated value is then used as well but it is also possible to describe “nonFlowFields” so that the BC data for the simulation can be modified. These data can be displayed in tooltip, bar, or table.

### List of fixed bugs

- Warning symbols showing a link constraint violation are refreshed correctly after complex operations.
- Scheduling family orders could generate an internal error because the parent production order line was not found.
- Pinned state of operations was not saved correctly when updating a simulation.
- No “focus view” functionality if there are no links connected to the current production order routing line.  
If there was a routing with just one element and no reservations and this production order routing line was selected with the focus mode enabled, the focus on the capacities was not evaluated (no links). The capacities for the focus are in this case now evaluated via the selected production order routing line itself, not by linked production order routing lines.
- Braces disappeared after the tooltip setup was reopened: some formatting elements were removed accidentally by the validation check for non-existing fields.
- Progress calculation by quantity was not based on the “Quantity (Base)” field of the production order line.

Product	Visual Advanced Production Scheduler
Version	1.5
Build	1.5.0.0
Date	March 31, 2021

### List of enhancements

- Production Order View available.
- Allow moving of pinned operations by context menu.
- The “Fill Gaps” function can now be triggered on a single machine center using the context menu.
- Move and wait times are now considered when calculating the ending date-time of operations and production orders.
- API with which the customer can change the behavior of the app via extensions, for the time being consisting of one event: *OnPostPublishSimulation()*, which is triggered on publishing a simulation.

### List of fixed bugs

- The VAPS crashed when IDs like order number, operation number or routing number contained an underline character.
- The “pinned” state of an operation was not set correctly after updating an outdated simulation.
- The warning sign showing a link violation between successor/predecessor was not restored after closing/reopening a simulation.
- In some cases, the VAPS could not handle family orders correctly (fixed in 1.4.1.0 for an on prem version, now available for all).
-



Product	Visual Advanced Production Scheduler
Version	1.4
Build	1.4.0.0
Date	December 17, 2020

### List of enhancements

- **Change operations that have already been started:** Up to now, operations that had already been started, i.e., operations with postings, could not get changed in the visual planning board. Now, the **new context menu item** “Change Started Operation” allows for the following changes:
  - Moving the operation to another point in time or assigning it to another machine center including the decision how to scheduler the remaining quantity.
  - Changing the operation’s duration
- **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.
- The **notifications window** can now be **switched off** by a new option in the VAPS Setup dialog.
- New section “Appearance” in the “Settings” dialog where you can specify
  - the zoom factor in %
  - the **layout:** In the "Compact" layout, the display is reduced as much as possible to provide a better overview, especially with large plans.
- Enhancements of the **Search functionality:** You can now also search for **production order lines** in the Capacity View and for **sales item lines** in the Sales Order View.
- Due to a smarter calculation of the capacity curve, we gained considerable loading and interaction **performance improvements**.
- Support of alternative connection to Microsoft’s Base App. Requires Microsoft Dynamics 365 BC v16.4 and higher.

### List of fixed bugs

- Operations were shown in the wrong work center when setup time + run time was zero.
- Error when creating a production order with a multi-level structure through the planning worksheet.
- The run time of a production order routing line was set to 0 during "Update Simulation".
- Setting the production order status to "finished" from the planning board did not remove the order.
- “Fill Idle Times” in combination with alternate routing sets resulted in overlapping operations.
- "Apply Standard Routing" with parallel routings could result in backward links depending on the processing order of the parallel operations.

Product	Visual Advanced Production Scheduler
Version	1.3
Build	1.3.0.0
Date	October 2, 2020

### Changed technical detail

- Requires Microsoft Dynamics 365 Business Central version 14.4.

### List of enhancements

- **Better integration with MRP/planning worksheet:**

The VAPS is responsible for the shorter-term finite capacity scheduling, whereas MRP and the planning worksheet are responsible for the mid-term demand planning. The VAPS/MRP integration establishes clear rules as to which production orders belong into the VAPS area of responsibility and hence must be untouched by the planning worksheet.

- Functional details:

- Define a **frozen period** (as that period in which the planning flexibility of firm planned production orders is set to “none” if they are scheduled by the VAPS).
- Enhancement of context menu to **allow deviations from standard rules** concerning the VAPS/MRP integration.
- **Enhancement to the planning worksheet** to show which production orders are scheduled by VAPS.
- When action messages are carried out, a **warning message** is given that this might change production orders that are scheduled by VAPS.
- **New color scheme** to quickly differentiate production orders that belong to the VAPS area of responsibility from those that belong to the MRP area of responsibility.

- **New read-only Sales Order View**

Users can see those sales orders that have production orders against it and when those production orders are scheduled. A visual alert is given if the production order finish date is past the sales order’s requested delivery date.

- **KPIs**

Users can compare different simulations by opening a new page that shows the following KPIs per simulation:

- Number of production orders
- Number of operations on standby
- Number of late production orders
- Total delay (hours)
- Total setup time
- Total buffer time (time between end of production order and required due date)
- Number of production orders without required due date

- Change production order status via context menu.

- **Search functionality**

In both views, a search functionality can be used now. In the Capacity View, users can search for production orders using data from the production order routing line table. In the Sales Order View, users can search for sales orders using data from the sales order header table. The respective view then automatically scrolls to the first search result which gets highlighted as well.

- **Automatic initial population of required due date field**  
The VAPS custom field “required due date” (on production order header level) is automatically populated with the production order’s initial due date.
- **Enhancements of the alternate routing set page**  
The alternate routing set page got enhanced by the “where used” functionality so that users can see in which routing the respective alternate routing set is used. We have added a new page to list all existing alternate routing sets.
- **Customizable tooltip and bar label**  
For both items there are now identical dialogs where you can adjust the contents to your individual needs. The new "format strings" allow, among other things, the multi-line display of the bar label or the separation of the individual fields by special characters.
- **Changes and improvements made to the Earliest Material Availability Date (EMAD) calculations**
  - The item record has been extended to show reservations regardless of the date (this is a new FlowField). This field is used in the EMAD Demand table.
  - Demand allocations have been adjusted to always consider what is in demand regardless of reservation.
  - Demand priority is considered correctly when inserting EMAD Demand records.
  - Track Source Type and Source Sub Type on Demand entries.
  - Improved methods of data aggregation with queries with significant improvement in terms of performance of these calculations
  - Reorganize allocations page removing the word 'Allocation' since the user is already in that area, making navigation more concise.
  - Assembly order quantities correctly considered, previously missing (Qty. on Assembly Order).
  - Item allocation creation process adjusted to consider production order component due date when fully reserved.
  - Removed unnecessary calls to CalcFields (where not being used)
  - Create Item Allocation now considers correct reservation qty.

#### **List of fixed bugs**

- In certain configurations the extensions could not get published into the system when a previous version was already installed.
- Issue with a work or machine center no. which comes close to its maximum character length.
- Wrong calculation of curve values if the unit of measure code of the involved operations is varying.

Product	Visual Advanced Production Scheduler
Version	1.2
Build	1.2.0.1
Date	June 26, 2020

**List of enhancements**

- No enhancements in this release.

**List of fixed bugs**

- Issue when processing Prod. Order Numbers which differ significantly in length.

Product	Visual Advanced Production Scheduler
Version	1.2
Build	1.2.0.0
Date	June 24, 2020

### List of enhancements

- Show/hide setup time by new menu item.
- Improved handling of reservation entries & linked production orders (incl. safety lead time).
- “Add all” function to bulk schedule production orders with a clear prioritization rule from standby resource to respective machine centers with options to
  - define the schedule start date
  - decide whether you want to take into account alternate machine centers or not
  - decide whether you want to take into account the EMAD (earliest material availability date) or not.
- “Fill idle time” function to bulk reschedule already planned operations with a clear prioritization rule to reduce idle times on machine centers with options to
  - define the schedule start date
  - decide whether you want to take into account alternate machine centers or not
  - decide whether you want to take into account the EMAD or not
  - set number of iterations.
- Capability to update simulation from planning board directly (incl. notification that the simulation got outdated).
- Various enhancements of the filter options when creating a new simulation.
- Provision of more information related with a simulation on the simulation overview page (incl. capability to add notes to a simulation).

### List of fixed bugs

- Adapted JSON handling to reduce misleading last known error message
- It was ensured that UTF8 text coding is used internally.
- The color picker for “Subcontractor Color” did not show up.
- Issue with work centers containing underscores.
- Issue with machine center names longer than 18 characters.
- Issue when using the progress view and no required due date was set.
- Too many calendar entries were loaded due to a wrong filter setting.
- Update Simulation could falsely overwrite certain changes in a simulation.

Product	Visual Advanced Production Scheduler
Version	1.1
Build	1.1.0.1
Date	11 May 2020

### List of enhancements

- Support of subcontracting work centers

Scheduling the work given to subcontractors is improved by the following enhancements:

- Subcontracting work centers are visualized differently than the other work centers.
  - They are treated as work centers with infinite capacities
  - They can be made part of alternate routing sets.
- Improved production order status change
    - Changing the status of a production order no longer makes a simulation outdated. Instead, the bar's color immediately reacts to the status change of the production order if the Production Order Status View is applied.
    - Changing the production order status no longer leads to moving the production order to the standby resource.

### List of fixed bugs

- Issues in case of work and machine centers with identical numbers.
- Incorrect tooltip in languages other than English.
- Setup/runtime handling in combination with alternate routing sets.
- Type conversion error in EMAD calculation in case of quantities with decimals.

Product	Visual Advanced Production Scheduler
Version	1.0
Build	1.0.0.0
Date	17 January 2020

### Key features

- Visual production scheduling with (semi-)automatic scheduling tools.
- Finite capacity scheduling.
- Calculation and visibility of material availability when scheduling.
- Alternative machine centers with production coefficients for setup time and production time.
- Build and manage multiple production schedule simulations.
- Different color schemes to highlight
  - Material availability.
  - Late production orders.
  - Bottlenecks.
  - Production order status.
  - Important production orders.
  - Production orders for certain items.
- Pin production orders.

### Technical Details

- Available for Microsoft Dynamics 365 Business Central.
- Requires Microsoft Dynamics 365 Business Central version 14.
- Optimized for the Web Client.
- Fully designed and implemented as future proven AL Extension.
- Full integration into Microsoft Dynamics 365 Business Central.
- Currently available as on-prem version.