DopX for robots and applications

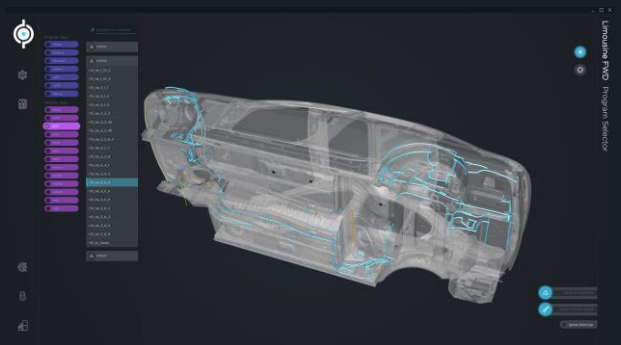
Safe and intuitive

DopX connects your virtual representation of the factory to the real production environment. To achieve this, DopX works directly with the existing Process Simulate data. In general, the system consist of two different views on the data: Provide easy access to the current state of production for the planning department (*currently under development*) and serve as a tool for shop floor needs.

The goal of DopX is to let the shop floor user solely focus on the robot modification itself and let the software be smart enough to automate all the administrative work that is needed to provide the environment to do so. To do so it is irrelevant if the target discipline is body & white, paint or assembly. Furthermore, the robot vendor is insignificant because the system is based on Process Simulate and therefore a generic simulate software.

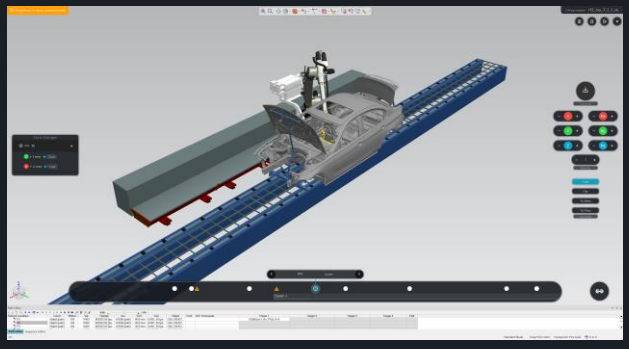
The shop floor system consists of four steps to support the user to adapt either the robot program or parameter in the application system (i. e. brush parameter): Identify the point of interest, change the current state of production, commit and log the changes.

To identify the correct point of interest, the user selects the product and gets visualized the product in 3D with all application points and seams that are available for changes. The list and 3D view can be filtered by tags, robot or program names.



After selecting the product, the actual program will be transferred from the real robot and Process Simulate gets prepared for the modification step.

After the loading has been completed, Process Simulate shows up with the visible robot, car body and relevant surroundings. Kinematics are set to a predefined pose, the program has been uploaded and the shop floor controls are visible.



There is no need for the user to open a project, load a study, display or hide objects or to do anything else in the base software itself. No knowledge for Process Simulate is required.

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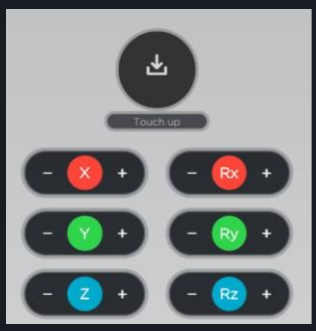
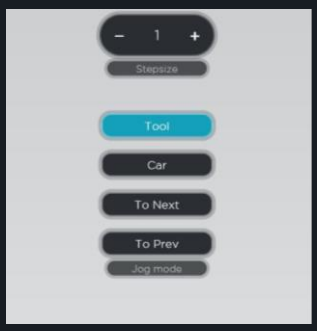
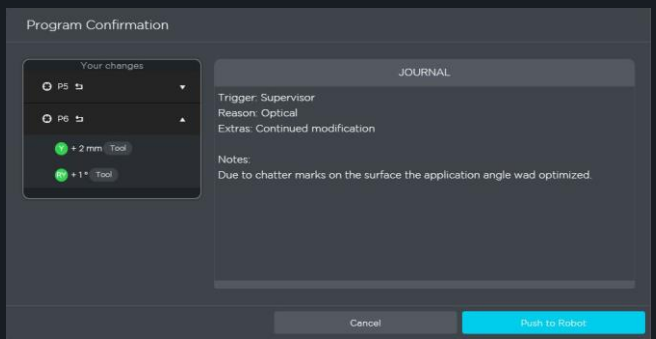
Robot locations can easily be modified by the given set of controls. Each modification (in the shop floor environment) needs to be confirmed with the Touch Up button in order to avoid accidental changes.





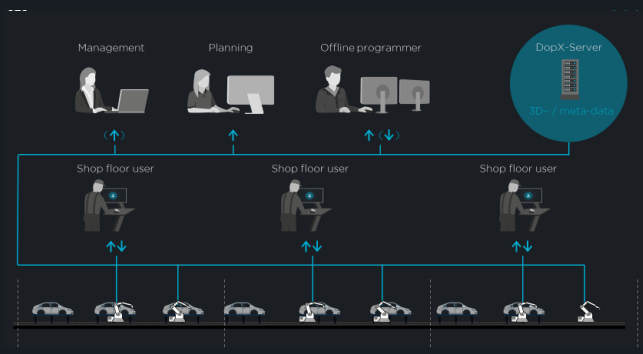
Modifications in general are restricted to a predefined, context-based limit (paint environment do have other limitations than spot welding). In addition, all other functionalities in Process Simulate are disabled and only the DopX controls are usable to prevent unsupervised actions. Only with a higher user level the regular Process Simulate can be unlocked for maintenance or bigger changes.

All modifications that were done during the change process are registered automatically. Predefined text phrases/modification types are given to the user to describe the changes that were done. The given information by the user and the robot program will be stored into a digital logbook in order to restore the program afterwards if necessary. After this step, the robot program will be transferred back to the production and becomes active after the next cycle.



Again, the transfer is fully automated. There is no need to know or select the target robot and no need to set the production into a transfer mode.

In a large-scale network environment there is one DopX server which manages the access of the users, stores the 3D data for the program selection and backups of the robot programs.



The system uses the regular Windows user to authenticate the user in the company's environment. This includes that any interaction with the system is linked to a specific user. It is impossible to access the software without a proper identification.

On one hand the DopX server is connected to the Process Simulate infrastructure be use the latest facility data and recognize changes of it. It supports Process Simulate on eMServer in connected mode and Standalone. On the other hand it is the single adapter which connects to the production infrastructure to load the robot programs.

The shop floor machines have Process Simulate installed and are connected to the eMServer environment (if connected mode is preferred). Siemens provides the license Process Simulate Shopfloor for this scenario, but still a regular Process Simulate license can be used.

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