

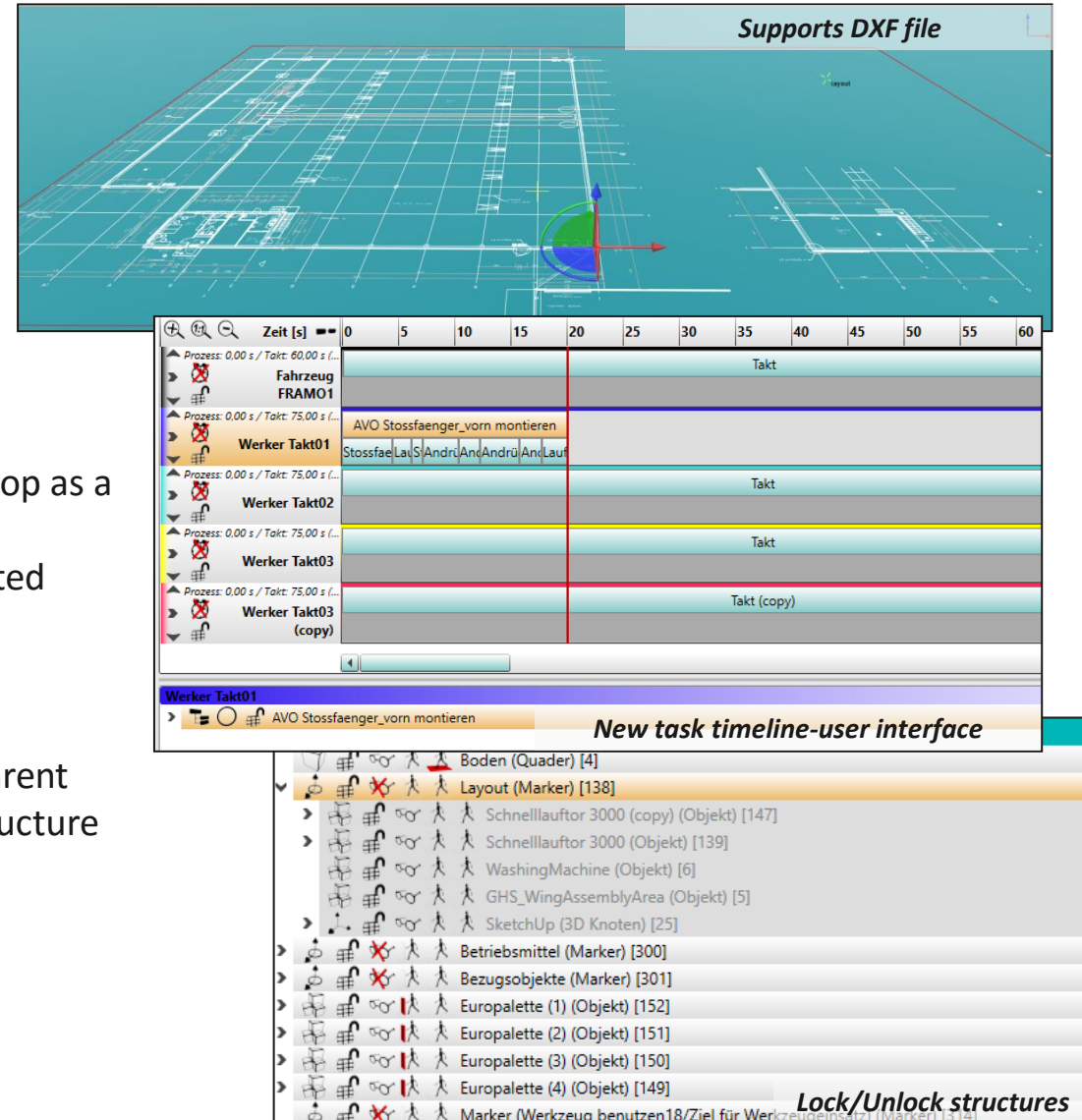
- **DXF-file is supported**
 - ✓ Suitable for 2D-Layouts

- **New task timeline-user interface**
 - ✓ Representation of any number of task levels
 - ✓ Name of the actor is shown on the left side of the task bar
 - ✓ Ignored tasks are no longer visible in the time line view

- **Optimizations in user interface**
 - ✓ Enhanced playback control (play & pause combined, Play in loop as a separate button)
 - ✓ Layout-commands and documentation commands are separated
 - ✓ Both are placed in side by side tabs

- **Function to lock structure in object tree**
 - ✓ Child nodes cannot be selected and manipulated when the parent node is locked. (A click in the greyed out region in the tree structure selects only the parent node.)

- **Customizable background** for the 3D-window
 - ✓ Adjustable color gradients in ema options

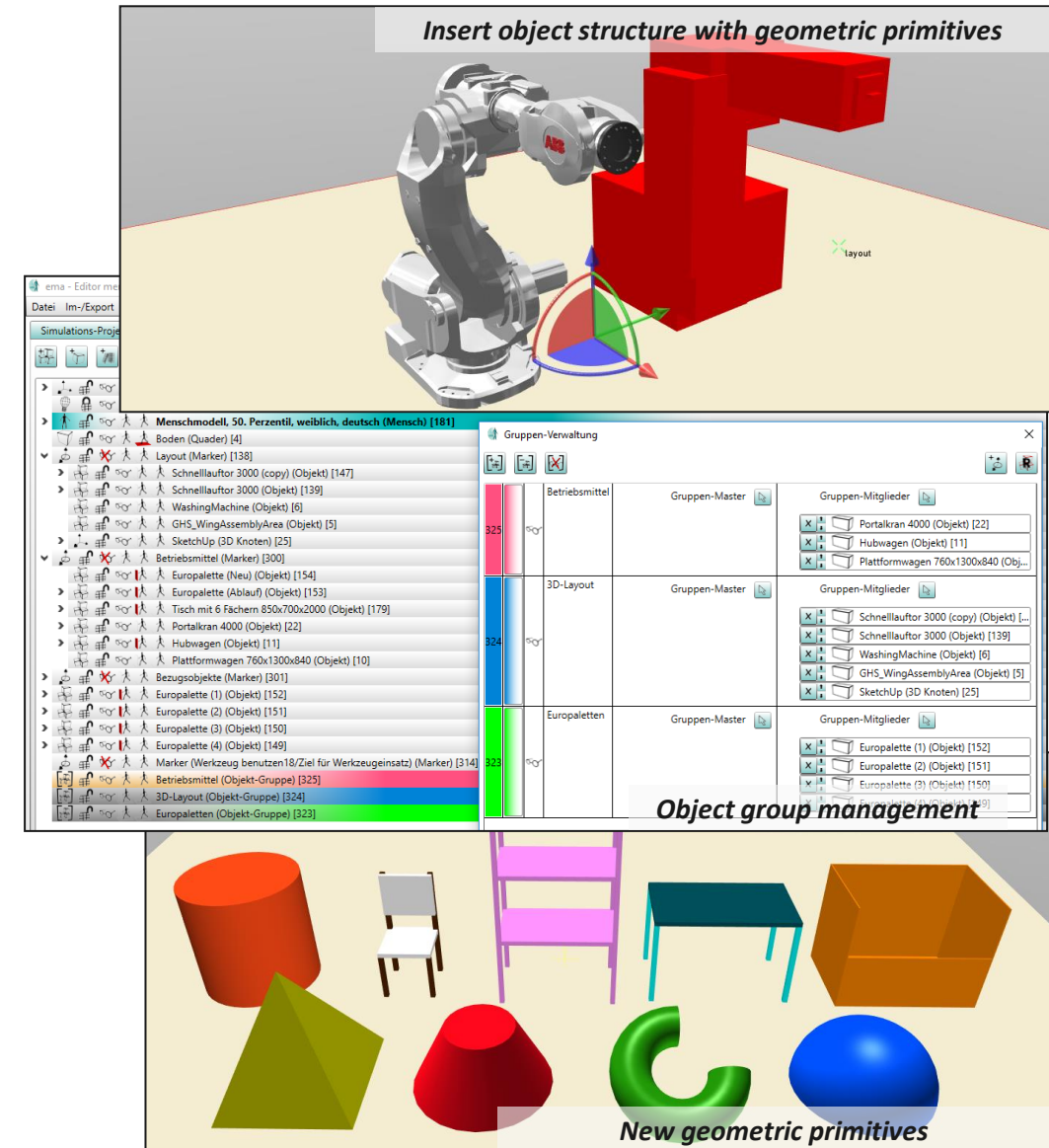


- New function to **insert** the copied object structure **with primitive geometry**
 - ✓ Simplification of real geometry
 - ✓ Performance optimization

- Robot's task "**Complexobject IK**" is enhanced
 - ✓ Option for "linear end effector motion"
 - ✓ possibility to provide multiple reference objects as target (motion path)

- Introduction of **Object groups**
 - ✓ Virtual hierarchy creation
 - ✓ Object group level control of selection, manipulation, visibility (show/hide)
 - ✓ Usable in tasks as object parameters

- New **geometric primitives**
 - ✓ Option "hemisphere" for sphere object
 - ✓ Option "radius at top" for cone object
 - ✓ Option "segment end" for torus object



User interface:

- "license request dialog" updated
- Raster settings are always saved
- Default colors updated
- Parameter ID is now additionally printed out in parameter management dialog (for own parameters)
- New user defined task parameter "time scaling [%]"
- Ignored tasks are now no longer visible in time line view
- "replace object in task parameters" via new object selection dialog
- During "delete object" a hint on existing references will be shown
- New visibility commands for behavior & task context menu
- Option "use ref object as new parent object" is set to "True" by default
- New option: activate "lock leg movement" on new tasks by default (settings -> GUI)

3D-View & Geometry data:

- Smoothed path visualization
- Switch between Layout & Picking mode via left double click in 3d view
- Object context menu via right double click in 3d view
- Library objects have been slightly modified(Coordinate frame origin, Grasp points, etc.)

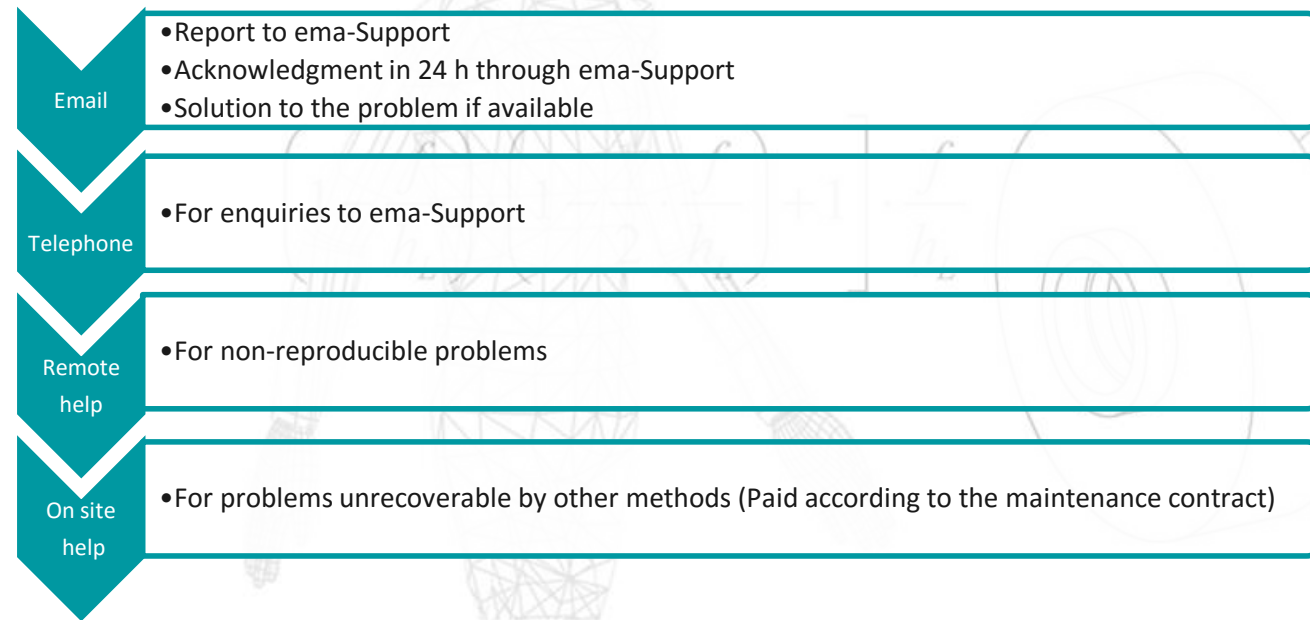
Tasks & Simulation logic:

- Task "push / pull" enhanced with grasping
- Task "place object(s)" enhanced with parameter "new parent object (secondary)"
- New process description parameter for "MoCap"-task
- Task "move tool on path" enhanced with optional parameter "use orientation"
- New parameter "reverse path" in task "actuate /press" (for object with path)
- Task "handle tool" enhanced with arm movement parameters in order to keep hand at tool in case of "second hand support"
- Interpretation of "port of entry" path in task "get into vehicle / get off vehicle" relaxed

Evaluation & Reporting:

- Optimized body posture detection for MoCap data
- MoCap tasks is now linked to spaghetti chart and this implies motion path is displayed in spaghetti chart
- Cycle time chart: non time relevant tasks are hidden in chart
- Cycle time chart: cycle time can be adjusted within UI
- Cycle time chart: visualization of various cycle time lines (per actor)
- Results overview: export enhanced by column "object handling"

- Issue with posture cross highlighting fixed
- Optimized the multi-selection of objects and task tab
- Invalid values within MoCap file frames are ignored in simulation and cause warning dialog
- Issue with deleted origin objects of references solved
- Issue with the visibility of reference objects fixed
- Body force direction detection enhanced
- Issue in complex tasks "clipping" / "screwing together" regarding squatting in case of low targets fixed
- Issue regarding automatic walking in complex tasks "clipping / screwing together" fixed
- Issue with leg movement in tasks containing automatic pick of objects (e.g. "place object(s)", "handle tool", ...) fixed
- Issue regarding "reverse path" fixed
- Issue regarding "get into vehicle" fixed
- Issue in time computation of "push / pull" task is fixed
- Upper body movement in task "push / pull" in case of "none (keep current posture)"
- Issues with scaling of the geometric objects are fixed



Contact address for errors, questions & tips:

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Necessary information for error reporting:

- Customer number
- ema-Release number
- Contact person/ Telephone number
- Detailed Error description
- if possible sample data