ema Software Suite 2.5.1.0
Capabilities Chart

	Commercial Editions									Education			
							emaPD + emaWD						
	emaPD - Professional	emaLayout (ema4all)	emaWD - Base	emaWD - Base MRK	emaWD - Performance	emaWD - Professional	emaSWS - Base	emaSWS - Performance	emaSWS - Professional	emaPD - Education	emaWD - Education	emaSWS Education	emaSWS Demo Version
Human Models													
Human models male/female 50. body height percentile German population	●	●	●	●	●	●	●	●	●	●	●	●	●
Standard models male/female; 5./50./95. body height percentile; population Germany, North America, Japan, China, Mexico					●	●		●	●		●	●	●
Age groups (20/40/60 years); ranges of motion (age appropriate average and reduced)					●	●		●	●		●	●	●
Support for individual human model measurements					●	●		●	●		●	●	●
Simulation													
Integrated check of reachability in human movement generator			●	●	●	●	●	●	●		●	●	●
Live preview for task parameter changes			●	●	●	●	●	●	●		●	●	●
automatic carrying position when handling objects			●	●	●	●	●	●	●		●	●	●
Collision avoidance during walking activities			●	●	●	●	●	●	●		●	●	●
Advanced collision avoidance for activities using the upper body parts					●	●		●	●		●	●	●
Reachability studies (3D and 2D reach spaces based on DIN EN ISO 14738)					●	●		●	●		●	●	●
Working on moving objects					●	●		●	●		●	●	●
Working with moving objects			●	●	●	●	●	●	●		●	●	●
Creation of user defined tasks and object libraries	●			●	●	●		●	●	●	●	●	●
Drag-and-drop for interactive sequence changes and task distribution			●	●	●	●	●	●	●		●	●	●
Checks of consistency and plausibility (missing objects, missing task, right order of tasks etc.)			●	●	●	●	●	●	●		●	●	●
ema Wizard Import			●	●	●	●	●	●	●		●	●	●
Reports / Process Analysis													
3D representation of the walk-paths with worker assignment and direction			●	●	●	●	●	●	●		●	●	●
Results Cockpit, Work process description, spaghetti chart, cycle time chart (incl. task dependencies), Ergo-Check			●	●	●	●	●	●	●		●	●	●
Export in csv, xlsx; objects, time analysis, spaghetti chart, cycle time chart, EAWS; NIOSH, workplace profiles if available				●	●	●		●	●		●	●	●
Simulation time calculation or manual predefined target times for tasks/processes			●	●	●	●	●	●	●		●	●	●
Automatic MTM-UAS time evaluation "approved by MTM" - incl. consideration of the official rules and instructions					●	●		●	●		●	●	●
Screenshot/video export, comments, advices and speech bubbles		●	●	●	●	●	●	●	●		●	●	●
Options for custom watermarks in videos/screenshots	●	●	●	●	●	●	●	●	●	●	●	●	●
Task potentials (visualization of ergonomic potential on task groups)					●	●		●	●		●	●	●
Display field of view for human models (First Person View for visual analysis)		●	●	●	●	●	●	●	●		●	●	●
3D reach object for human models (Hettinger & Wobbe, 1993)			●	●	●	●	●	●	●		●	●	●
Interactive and easy to use camera paths in combination with the integrated video export		●	●	●	●	●	●	●	●		●	●	●
Ergonomic Reports and Features													
EAWS ergonomic assessment method (Postures, Forces, Loads), Point Booster Analysis					●	●		●	●		●	●	●
NIOSH ergonomic assessment method + load handling assessment					●	●		●	●		●	●	●
Work Place Requirements method					●	●		●	●		●	●	●
Ergonomic analysis of MoCap Data (Postures, Body Part Heights, Joint degrees - e.g. trunk, head)						●			●		●	●	●
Dynamic body part coloring					●	●		●	●		●	●	●
Interface													
Simplified/reduced user interface		●	●				●						
VR functionality (in 3 modes) with basic review and handling functionality	○	○	○	○	○	●	○	○	●	●	●	●	●
Touch interface support	●	●	●	●	●	●	●	●	●		●	●	●
Space mouse support	●	●	●	●	●	●	●	●	●		●	●	●
Language support for German, English, simplified Chinese, Italian, Spanish, French	●	●	●	●	●	●	●	●	●	●	●	●	●
Support for multilingual activity names in one project			●	●	●	●	●	●	●		●	●	●
Layout													
Intuitive/intelligent EASY layout mode with automatic collision-free and gravity-correct placement of objects	●	●	●	●	●	●	●	●	●	●	●	●	●
advanced Layout functions	●	●	●	●	●	●	●	●	●	●	●	●	●
Automatic layout optimization (Schmigalla - material flow)	●							●	●			●	●
Path network with routing functions (path widths according to legal workplace guidelines)	●				●	●		●	●	●	●	●	●
Object library (approx. 500 elements, standard equipment, parametric geometry, tools, robots, PPE etc.)	●	●	●	●	●	●	●	●	●	●	●	●	●
Professional Line Balancing													
Drag and drop sequence change for line balancing			●	●	●	●	●	●	●		●	●	●
Drag and drop sequence change with automatic layout adjustment for line balancing						●			●		●	●	●
Human Robot Collaboration HRC / Robotics													
Import and display of quick check results with HRC-potential on tasks				●		●			●		●	●	●
HRC: special robot tasks, visualization of movement and safety zones				●		●			●		●	●	●
Event-based simulation with action reaction logic for safety devices, converting tasks (human ↔ robot)				●		●			●		●	●	●
HRC report with collision detection and evaluation based on ISO/TS 15066				●		●			●		●	●	●
MoCap (Motion Capturing)													
Universal task to map captured body movement data on human models						●			●		●	●	●
Parameters to split recorded data and define task type; ergonomic parameters for assessment						●			●		●	●	●
Example MoCap body part assignment table (ART, AXS, XSENS, Captury)						●			●		●	●	●

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Tasks for Human Models													
Object Handling													
Basic: Tasks for work process simulation (walk, pick, place, actuate, push/pull)			●	●	●	●	●	●	●		●	●	●
Extended: move object(s) to target/to default position					●	●		●	●		●	●	●
Advanced: switch hand holding object, encompass, retract object(s); move object(s) on path; create/remove object link					●	●		●	●		●	●	●
Operations for handling objects with a manipulator including IK chain representation			●	●	●	●	●	●	●		●	●	●
Body movements													
Basic: walk, kneel down, squat, stoop			●	●	●	●	●	●	●		●	●	●
Basic for seated workplaces: sit down; straighten up			●	●	●	●	●	●	●		●	●	●
Basic for seated workplaces: slide to target					●	●		●	●		●	●	●
Extended: single step in direction; move foot to target					●	●		●	●		●	●	●
Advanced: single full step; turn in place; get into/off the vehicle; lie down					●	●		●	●		●	●	●
Tool Handling													
Handle tool			●	●	●	●	●	●	●		●	●	●
Move tool/on path; move hand to TCP					●	●		●	●		●	●	●
Move tool on path (extended) - manual weld gun operations						●			●		●	●	●
Manual activities													
Bolt down manually			●	●	●	●	●	●	●		●	●	●
Smear on surface					●	●		●	●		●	●	●
Hand / arm movement													
Grasp; move hand(s) to target/to default position/on path					●	●		●	●		●	●	●
Head movement													
Check/read			●	●	●	●	●	●	●		●	●	●
Watch					●	●		●	●		●	●	●
General Tasks													
Synchronization: wait (time), wait (until other tasks are finished)			●	●	●	●	●	●	●		●	●	●
Task group			●	●	●	●	●	●	●		●	●	●
Complex Tasks													
Complex tasks: screwing together; clipping					●	●		●	●		●	●	●
Motion Capture Data													
Specific tasks for motion capture data import (*.bvh)						●			●		●	●	●
Interactive Mocap cutting and merging functionalities						●			●		●	●	●
Tasks for Objects													
Objects movement													
Trigger pre-defined movements on library objects (open door) [1)]		●	●	●	●	●	●	●	●		●	●	●
Move; color change/transparency		●	●	●	●	●	●	●	●		●	●	●
move in direction; turn around; rotate; create/remove object link				●	●	●		●	●		●	●	●
Complex object forward kinematics | inverse kinematics | degrees of freedom (set a specific configuration)				●		●			●		●	●	●
Robot movement													
Move robot; pick/place object(s) (robot)				●		●			●		●	●	●
General Tasks													
Synchronization: wait (time), wait (until other tasks are finished)		●	●	●	●	●	●	●	●		●	●	●
Task group		●	●	●	●	●	●	●	●		●	●	●
Factory Design													
Capacities													
Production Program - Determination of achievable quantities	●						●	●	●	●		●	●
Working time, setup time, downtimes | Utilization and setup time ratio | required resources (incl. bottleneck)	●						●	●	●	●		●	●
Determination of the required higher input / capacities / space per workplace by scrap rate/rework rate on item/operation level	●						●	●	●	●		●	●
Calculation of employee concepts/variants for multi-machine operation	●						●	●	●	●		●	●
Time													
Lead Time and Total Time - Calculation of the process time, waiting time, setup time, transport time and lay time | critical path	●						●	●	●	●		●	●
Target/actual-comparison of lead times and potential determination	●						●	●	●	●		●	●
Determination of necessary buffer positions	●						●	●	●	●		●	●
Calculation of the production ratio | Determination of the required transport packages (number of carriers)	●						●	●	●	●		●	●
Costs													
Calculation of the production costs, material costs and manufacturing costs, work in progress	●						●	●	●	●		●	●
Areas													
Calculation of the required workplace areas | Determination of staging areas for push- or pull principle	●						●	●	●	●		●	●
Probability calculation for staging areas | Determination of the amount of the storage places in the interim storage	●						●	●	●	●		●	●
Determination of the number of required storage places and the space requirement in the incoming goods warehouse	●						●	●	●	●		●	●
Material Flow													
Representation of intensities and efforts | Layout planning based on key indicators | 3D visualization	●						●	●	●	●		●	●
Data import (wizard) - Bills of material, work plans, workplace information and basic data	●						●	●	●	●		●	●
Mat. properties: (t,q/t,S)-policy, time phased planning / (s,q/s,S)-policy, reorder point planning, maximum delay for reorder	●						●	●	●	●		●	●
Calculation of means of transport (Beta): Number, capacity utilization, waiting transport orders	●						●	●	●	●		●	●
Value Stream Map													
Automatic Value Stream Map generation with KPI calculation and possibilities for individual visual adjustments	●						●	●	●	●		●	●

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Interfaces													
Common H2 Database	●						●	●	●	●		●	●
Import wizard for PD data in *.xlsx / Export in the same format / structure	●						●	●	●	●		●	●
Creating databases with access rights (project-specific user rights for viewing, reading and writing)	●						●	●	●	●		●	●
NVIDIA Omniverse Connector (ema-->nucleus USD, interactive live session)	○	○	○	○	○	●	○	○	●		●	●	●
Direct reading and writing of *.usd	○	○	○	○	○	○	○	○	○	○	○	○	○
Basic CAD/File Interfaces Import: *.dae; *.dxf; *.jpg; *.jt; *.obj; *.png; *.stl; *.stp; *.step; *.tga; *.wrl; *.las	●	●	●	●	●	●	●	●	●	●	●	●	●
Basic CAD/File Interfaces Export: *.dae; *.jpg; *.obj; *.png; *.stl; *.tga; *.pdf; *.mp4; *.dxf	●	●	●	●	●	●	●	●	●	●	●	●	●
Invenio CAD Processor Add-Ins													
ema CAD Reduction - powerful and efficient *.jt geometry reduction (geometrical and structural)		○	○	⊙	○	○	○	○	○		○	○	○
ema CAD Comparison - powerful and efficient *.jt geometry comparison (on geometrical level)		○	○	⊙	○	○	○	○	○		○	○	○
Import for fastener data, welding spots					●	●		●	●		●	●	●
Import *.bvh (Motion data from Motion Capturing Systems - many systems supported)						●			●		●	●	●
Import for halocline-Data			●	●	●	●	●	●	●		●	●	●
CSV / XLSX exports for calculated results	●	●	●	●	●	●	●	●	●	●	●	●	●
Universal movement data export | human | objects (customizable *.csv, *.bvh)				○	●	●		●	●		●	●	●
axilaris Collaboration Hub (virtual desktop infrastructure for worldwide remote access to high performance workstations)	○	⊙	⊙	⊙	⊙	○	○	⊙	○	○	○	○	○
Interface for TAKTIQ (balancing) [2]		○	○	○	○	○	○	○	○		○	○	○
Interface for MTM TiCon [2]		○	○	○	○	○	○	○	○		○	○	○

1) When available
2) Functionalities/interfaces are licensed via a separate module

● Included ○ Available (additional purchase) ⊙ Customer specific solution