reis

ROBOTstar VII

INTUITIVE – UNIVERSAL – FLEXIBLE

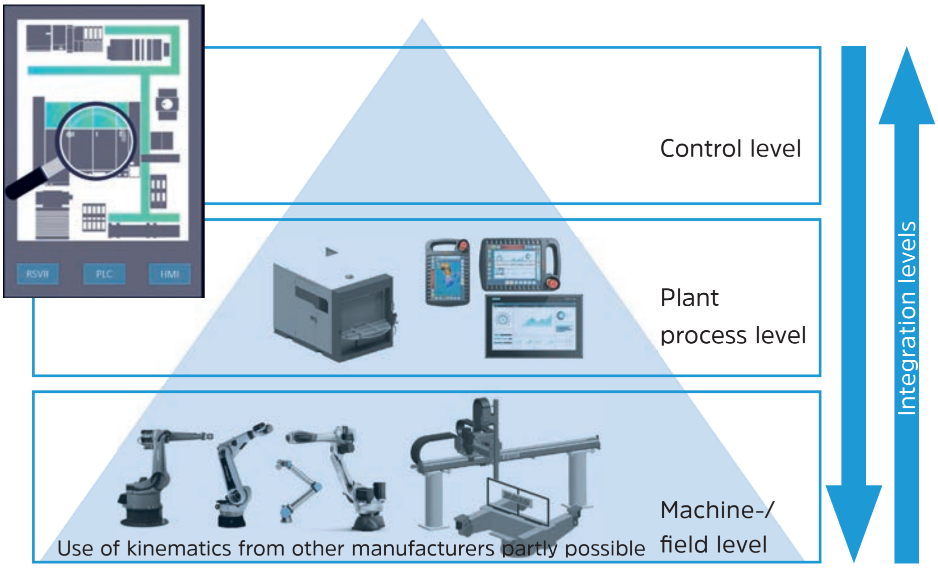
www.reisrobotics.com

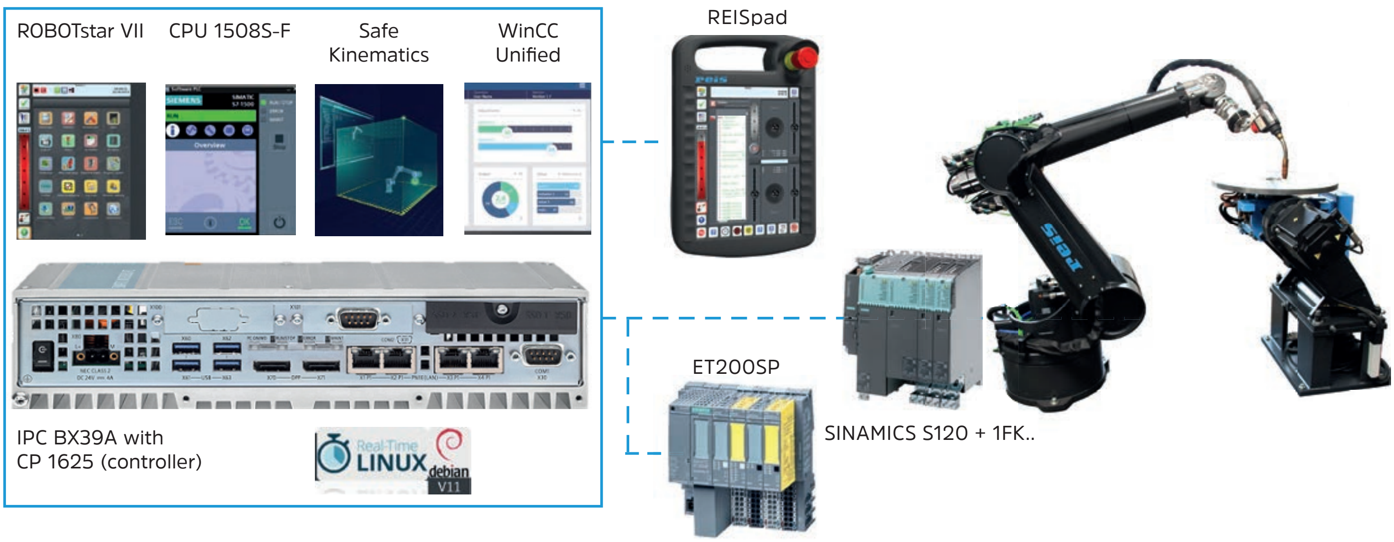
ARCHITECTURE
ROBOTstar VII

With the new independence, Reis Robotics decided in October 2023 to port the world-famous Reis ROBOTstar VI control system, which was developed in-house 10 years ago, to LINUX. The new ROBOTstar VII is thus available as a LINUX app for integration into a completely new, innovative and future-proof control platform. The development was driven forward in record time together with Siemens.

Advantages:

- an integrated control concept
- state-of-the-art technology
- less installation effort
- integrated PLC (Siemens)
- integrated HMI (Siemens) possible
- regenerative/ direct current capable
- Development and service in our hands





THE ADVANTAGES

- Robot control with integrated Siemens SIMATIC controller
- latest and future-proof technology
- possibility to also control robots and automation technologies from third-party and connect them via Profinet IRT

SOFTWARE ARCHITECTURE

ROBOTstar VII

Experience the robot control revolution with our open and flexible software architecture.

Our solution offers a unique combination of flexibility, efficiency and innovation that addresses the needs of developers and regular users alike. Benefit from an open, scalable platform that enables quick and easy integration based on a future-proof, innovative approach.

Your benefits at a glance:

- **Flexible, efficient operation:** adapt the control of your robots precisely to your specific requirements and optimize your operations
- **Open, scalable solution:** Expand and scale your applications without restrictions to keep pace with growing requirements
- **Fast, easy integration:** Integrate our software seamlessly into existing systems and reduce implementation effort
- **Innovative, future-proof approach:** Use the latest technologies to prepare for the future and stay one step ahead

Exemplary solutions:

- **IT-OT integration:** connect your IT and OT systems for seamless data transfer and improved decision making
- **Production analytics:** Use detailed analytics to monitor and continuously optimize your production processes
- **Efficient maintenance:** Implement preventive maintenance strategies to minimize downtime and extend the life of your machines

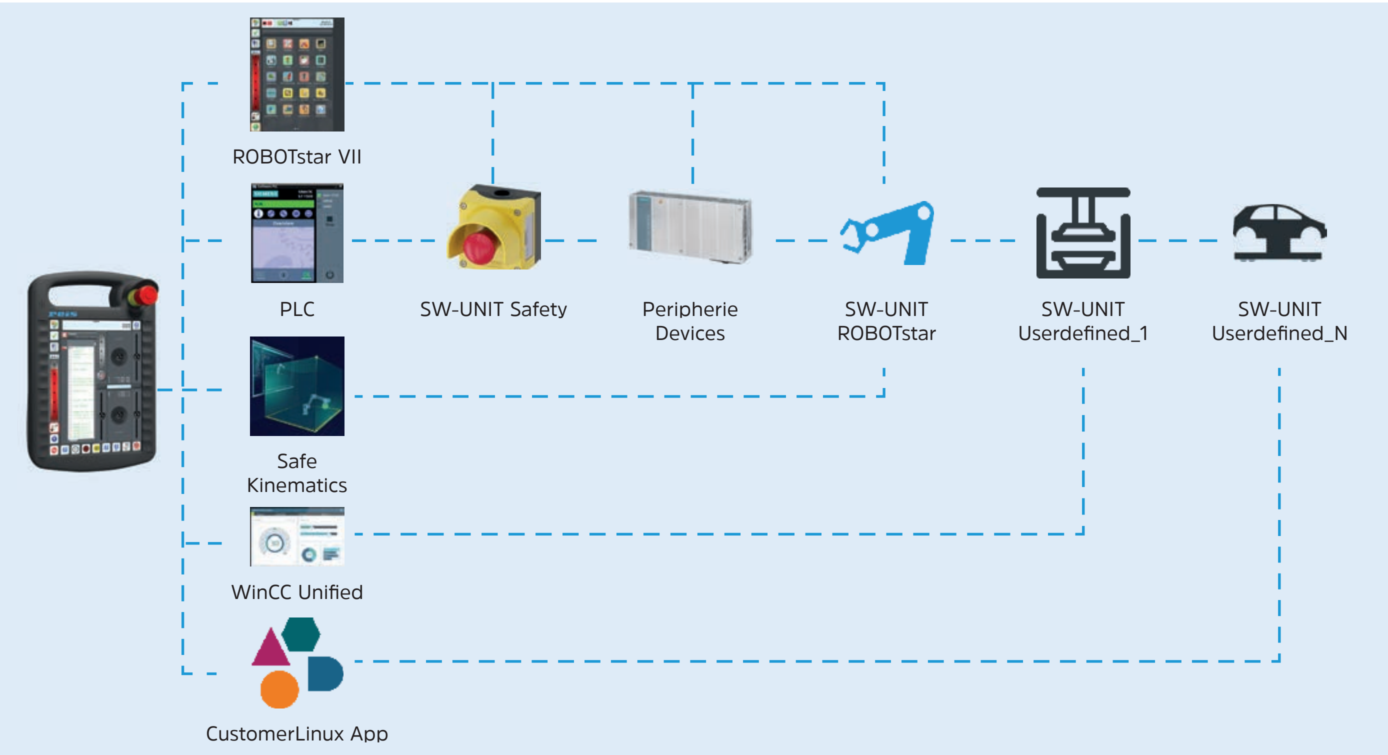
Flexible application options

Our robot control solution can be implemented either as a customized LINUX application or in the integrated Siemens Edge environment. This gives you the freedom to choose the most suitable implementation for your specific requirements.

Shaping the future now Discover how our open software architecture can help you meet the challenges of modern robot control.

Contact us today to find out more about our future-oriented solutions.

Conceptual structure RSVII



MAXIMUM FLEXIBILITY AND EFFICIENCY

with our innovative switch cabinet design

Our control cabinet solution is specially designed to meet the needs of modern robot cells and systems. With a generous and flexible design, it offers sufficient space for your applications and at the same time ensures cost-effective and efficient implementation.

Your advantages at a glance:

- **GI Spacious enclosure design:** Use the generous interior space to integrate your applications and additional components without running out of space
- **Space for applications:** Our control cabinet offers sufficient space for all applications and allows all components to be arranged clearly and neatly
- **An enclosure solution for cells and systems:** Whether for individual robot cells or complete systems – our enclosure solution adapts perfectly to your requirements
- **Flexible enclosure design:** Experience maximum flexibility in configuring and expanding the enclosure to meet your specific needs
- **Cost-effective approach:** Benefit from an economical design that not only reduces your investment costs, but also minimizes operating costs

Technical data	
Interfaces	RJ 45 Protocols: Profinet/Profisafe IO controller Profinet/Profisafe IO-Device IP protocols OPC UA (in the RSVII and in the Siemens PLC)
Number of axes	24 robot axes Transformation for additional axes (e.g. interpolation of 11 axes simultaneously and synchronized) 128 servo axes in total Controllable via the hardware and software architecture 100 servo axes Controllable if 24 robot axes
Robot safety functions	Yes, 12 interpolating axes SLS, SZM, SLO, STO
PLC	Yes S7 1500 Programming languages: AWL, KOP, FUP, SCL, CFC, Graph Integrated PLC in the RSVII
Visualization	Yes ProVis WinCC unified (optional)
ReisPAD	Yes ProVis WinCC unified (optional)

Efficiency and flexibility combined in one solution

Our control cabinet solution perfectly complements our open and flexible robot control software architecture. Together, they form an unbeatable team that helps you to optimize your production processes and make them future-proof.

Discover now and benefit

Find out more about our innovative control cabinet solution and how it can take your robot cells and systems to the next level.

Contact us today and let our experts advise you.

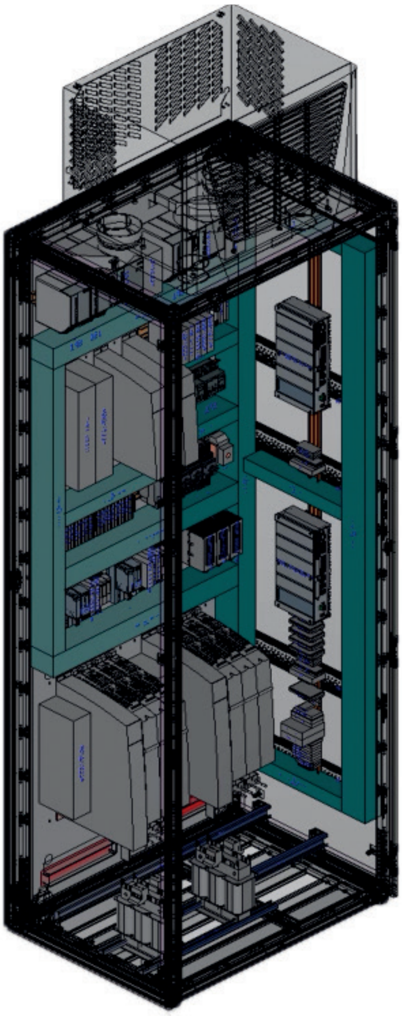
Soft- & Hardware

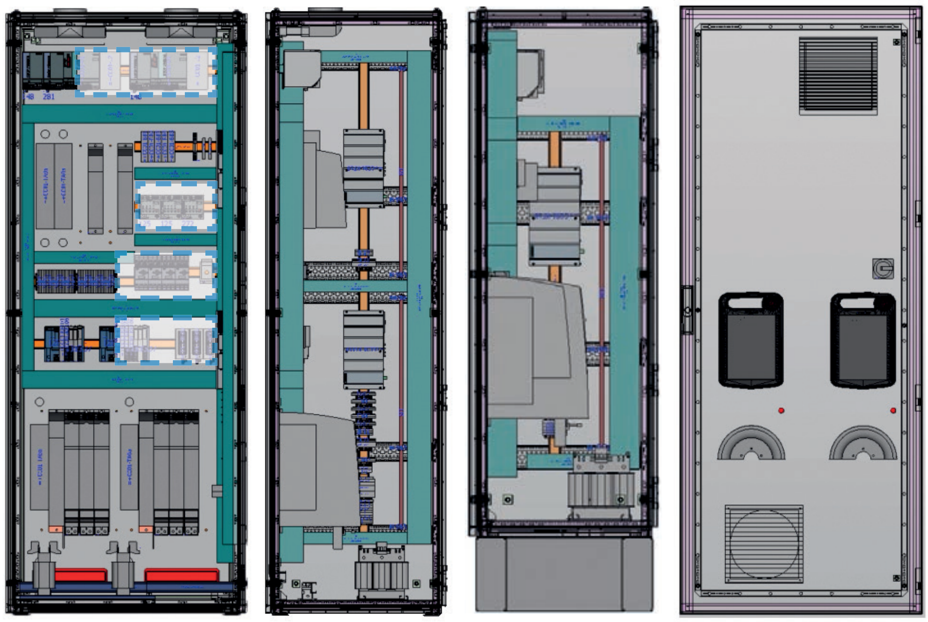
- SiemensIPC
- RSVII
- Siemens SPS

Siemens control cabinet equipment

- Controllers
- I/O´s
- Switchgear
- Switches

SWITCH CABINET
Structure & possibilities



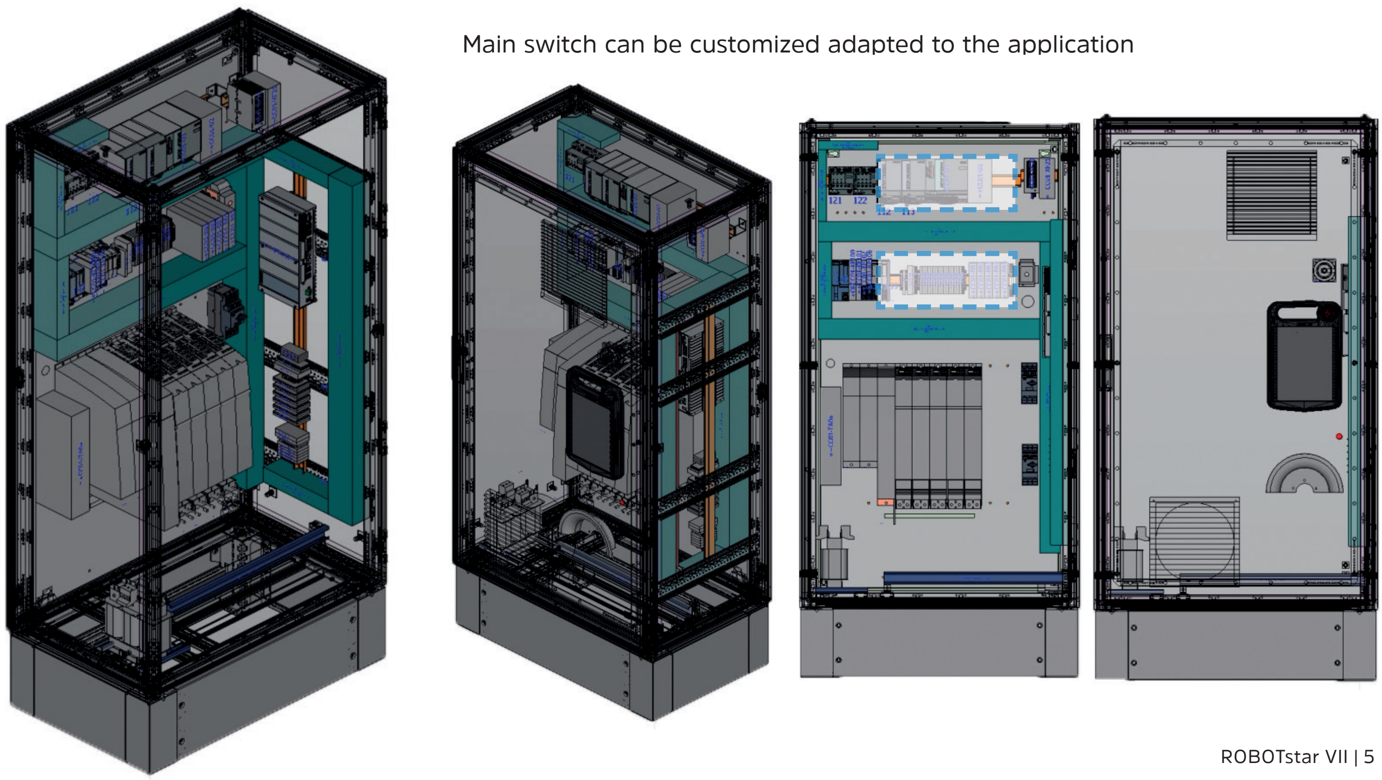


Application area

▲ Standard cabinet large
Dimensions: 2000*800*500 mm
(without base)
Axes: up to 24 axes or
2 robots with 6 – 9 axes
each

▼ Standard cabinet small
Dimensions: 1400*800*500 mm
(without base)
Axes: up to 12 axes

Main switch can be customized adapted to the application



ROBOTstar VII
ergonomic, light and clear

The new ROBOTstar VII is based on the tried-and-tested and successful control software and hardware of the ROBOTstar V with its enormous range of functions. This means that almost all control functions are also available on the new control system. The application programs of the ROBOTstar V and ROBOTstar VI are upwardly compatible and can largely continue to be used on the ROBOTstar VII.

The most striking new feature is the new **reisPAD** programming pendant with a graphical user interface that is operated via a touchscreen.

Intuitive operating concept with visualization modules

The reisPAD communicates with the robot controller via Ethernet and is therefore network-compatible. Different robot controllers in a network can be selected and operated with one operating device.

The reisPAD is also available in a wireless version as an option. Communication with the robot controller then takes place via WLAN. If there is insufficient wireless coverage, a communication cable can be plugged in at any time, which can also be used to charge the reisPAD's battery.

The tried-and-tested Reis 6D mouse can be used for intuitive manual operation of the robot. The 6D mouse is attached to the robot using a magnetic holder and connected to the reisPAD via a cable. The robot can thus be moved in all 6 degrees of freedom.There is a USB port to which a PC keyboard, a PC mouse or a removable storage device for data archiving can be connected.

The new operating concept makes consistent use of the capacitive touchscreen for all operating and input functions. The robust glass surface is also suitable for harsh operating environments, e.g. in foundries.

The number of hardware components has been reduced to an absolute minimum. All operating elements have been consistently implemented in software, with the exception of the safety-relevant enabling switches and emergency stop. The key switch for the safety-relevant operating mode selection is also implemented in software. This is possible because the safety controller integrated into the robot controller ensures that the software functions properly.

Advantage of the software solution compared to a membrane keypad:

- new interfaces can be created by updating the software
- This makes the system future-proof

THE ADVANTAGES

- reisPAD has a LINUX operating system
- ProVis (programming / visualization), graphical user interface
- ProVis – Java application – reisPAD HMI independent of operating system
- No pre-installation of system software When establishing a connection reisPAD / ROBOTstar VII the ProVis download is initiated from the control unit
- Keyless design makes it easy to expand the user interface via software updates

C-frame with omnipresent system functions: always available in the same place

Option to also use softkeys in the app area **blindly via**:

1 Corners
2 Finger recesses
3 Knobs
4 Edge

App(lication) area:
Content changes depending on context

Learn more about
our ROBOTstar VII control system

OPERATING PHILOSOPHY
and visualization solution

reisPAD is equipped with the LINUX operating system ProVis (programming / visualization). The graphical user interface ProVis is a Java application. The reisPAD-HMI is independent of the operating system. No pre-installation of the system's software When the connection between reisPAD and ROBOTstar VII is established, the ProVis download starts from the control element. The keyless design makes it easy to apply software updates to extend the surface.

The look and feel and operation are based on smartphones and can therefore be assumed to be generally familiar.

The space gained by eliminating the membrane keypad is used for a large 10.4" color display, on which there is now plenty of room for displaying information and operating elements. The operating elements are provided as large, accurate softkeys on the touch surface. The arrangement of the controls can be switched for right-hand and left-hand operation.

The controls are positioned on the display in such a way that the most important functions can be felt via haptic marks on the edge of the housing (corners, edges, finger recesses, nubs). This compensates for the basic lack of haptics of a touchscreen.

These haptic markers even enable blind operation of the most important functions, which has been proven in tests: complete motion sequences can be created blindly without looking at the reisPAD and inserted into a program.

The audio output via the built-in loudspeaker provides further support for touchscreen input. This can be used to provide acoustic feedback, e.g. button clicks, warnings or error messages.

The user interface can be internationalized and is available in various national languages. The programming language is displayed in the form of comprehensible plain text commands in the national language, e.g. „open_gripper".

User guidance is supported by the use of icons, each of which is accompanied by a short descriptive text. This makes it easier to learn. A beginner will initially use the texts as a guide until they have memorized the color and shape of the icons. Experienced users will then be guided only by the visual shape and color of the icons. This technique was used for APPs, softkeys, lists, etc.

The interface design uses photorealistic control elements, which increases the recognition value and is also timeless..

The surface structure has a structured design:

A fixed frame (C-frame) contains all the operating elements that need to be constantly available. The space within the frame and one side of the display are reserved for the various applications. This makes the interface very easy and intuitive to learn.

The operating hierarchy is kept as flat as possible: maximum level depth of 1 – 2, so that the user always retains the context.

All menus have been eliminated and replaced by lists with quick access options.

All operating elements primarily required for a work process are directly available on the user interface. Only a few less frequently required functions can be selected from lists.

Example: Editing the robot program and manual robot movement and control of peripherals (e.g. gripper) is possible at the same time.

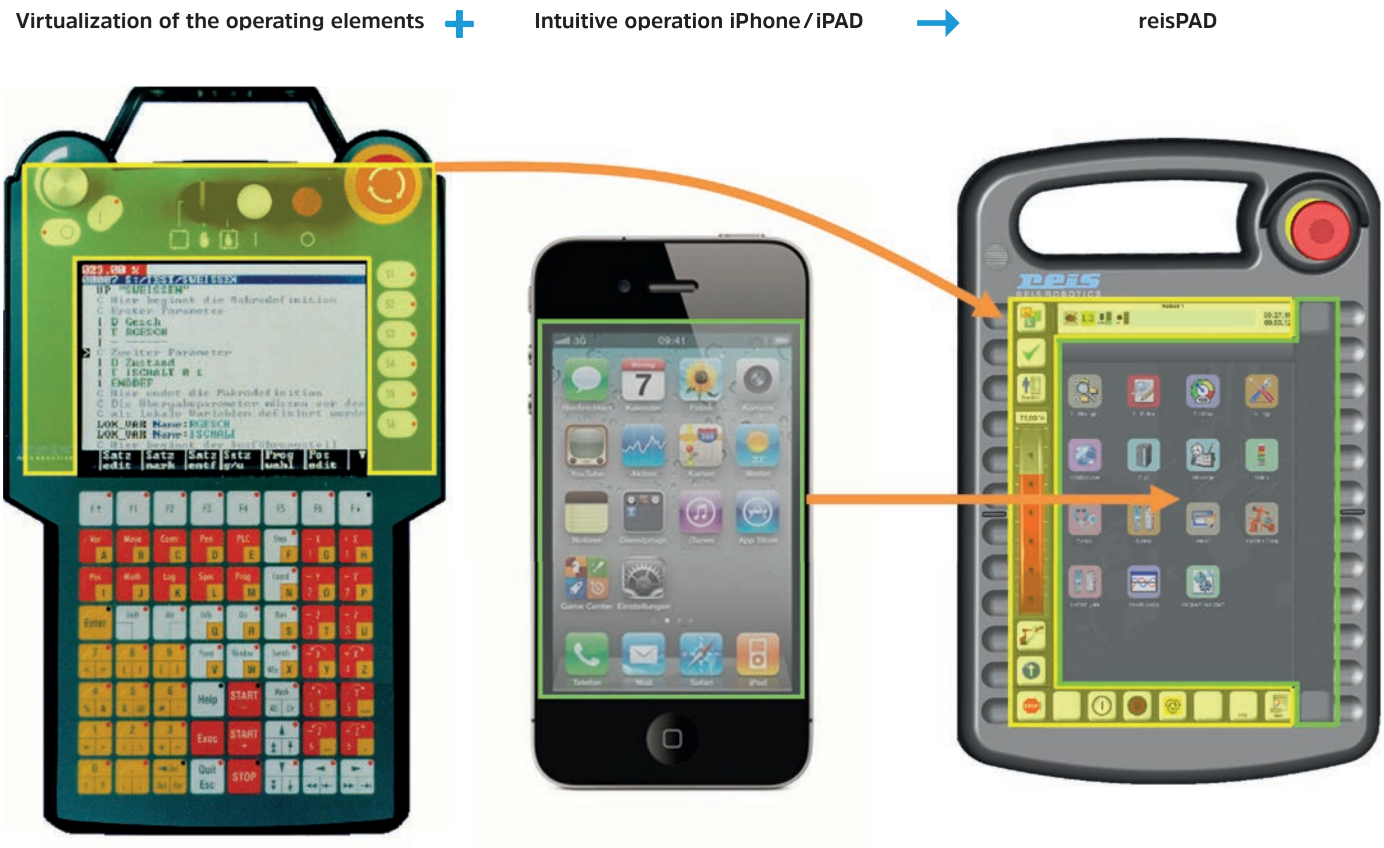
The user interface is optimized for two-handed operation. The operating elements are arranged in such a way that they can be optimally reached and operated with both thumbs. This makes it possible to work twice as fast. The touchscreen is multi-touch capable so that it can be operated with several fingers at the same time where this is essential.

Gesture control, as known from Smart Phones, allows navigation in the program, scrolling in lists / tables and moving the robot.

The available display space is optimally utilized, there are no unused areas. The operating concept is designed to minimize the number of operating actions required, enabling programs to be created in the shortest possible time.

This makes it possible to work very efficiently, including blind operation of the most important functions.

One example of this is the omnipresent availability of all functions re-



quired for creating programs without having to leave the program context. functions required for creating programs without having to leave the program context:

- Editor for editing and navigating in the program text
- Control elements for moving the robot in all 6 degrees of freedom
- Elements for teaching in positions
- Online control of the periphery
- Start / stop for testing the programs created created programs
- Override controller for specifying the robot travel speed

When entering program commands, the programmer is guided by a context-sensitive syntax completion function.

If the user still needs help, he can call up online documentation on the reisPAD, which is stored in each control unit. In the event of error messages, a help function can be called up to provide information on the cause of the error and possible remedial measures. The help information can be changed and expanded by the user, so that an individual expert system can be set up.

The program view displayed in the editor can be zoomed in or out using gesture control. A function that is also common on SmartPhones.

The user can create their own macros and store them in a list in the form of APPs. These APPs can be called up at any time.

RobOffice, the control system for the office:

The control software is available as a virtual robot controller RobOffice, which runs under Windows. The touch-based user interface of the reisPAD is embedded as a sub-function in the ProVis graphical user interface and is therefore also available in RobOffice.

HIGHLIGHTS
the touch-based user interface

The development of the touch-based user interface has resulted in a number of innovations that are unique in the field of industrial robotics and are described below:

1. balancedUse

The housing is symmetrical, with the exception of the emergency stop button. It contains a display frame on the front left and right of the display with haptic markers that can be used to feel selected positions on the touchscreen. This enables blind operation of the touchscreen *(Fig. 1a)*.

1a. Symmetrical housing structure at the front

1b. Symmetrical housing structure at the rear

There are two symmetrically positioned grip rails on the back, on which the device can be held securely with one or both hands *(Fig. 1b)*. An enabling switch is integrated into each holding bar, one of which must be actuated to enable the robot to move.

This symmetrical arrangement prevents hand fatigue, as the enabling switches can be operated alternately with the left or right hand. In the event of hand fatigue, the other hand can take over the enabling function without interrupting the robot movement.

2. blindToUse

The most important virtual controls have been positioned on the touch display so that they can be operated blind. The offset and particularly pronounced housing frame provides tactile orientation on the touchscreen *(Fig. 2)*.

2. Housing frame with haptic marks on the edge of the housing: edges, corners, finger recesses and nubs

Edges, corners, finger recesses and protruding nubs that are shaped in such a way that they can be reliably felt with the fingers serve as haptic markers on the edge of the housing. On the one hand, this compensates for the basic lack of haptics of a touchscreen, and on the other hand, the operator can focus visually on the robot and the process without having to look at the operating device, which increases operating safety.

There are 4 different haptic marker types, which are arranged symmetrically on the left and right display frame:

a) Edges: along these edges, the finger can perform a sliding movement via which a virtual slider element placed at the edge of the display is adjusted.

b) Corners: The four corners of the display frame define a clear, exact position on the touch display. Important softkeys that can be operated blind can be placed on these selected positions.

c) Nubs: The nubs protruding from the edge of the housing are used for rough orientation on the edge of the display. They are positioned at the top and bottom of the display frame and thus mark the upper and lower display borders. Another nub is placed in the middle between the upper and lower borders to mark the center of the display. This allows the upper and lower halves of the display to be felt.

d) Finger recesses: The finger recesses recessed from the edge of the housing are used for a finer haptic orientation on the display edge, e.g. for feeling softkey positions if these are arranged directly next to the finger recess. Each finger recess can be clearly assigned to a softkey. The finger recesses are half-open and open towards the display so that a finger can slide onto the display as if guided in a groove and trigger a softkey function there.

3. TouchControlled-HMI

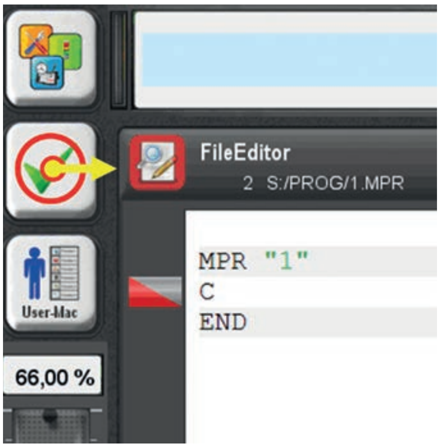
The number of hardware components has been reduced to an absolute minimum. All operating functions have been consistently implemented in touch software, with the exception of the energy-interrupting, safety-relevant „emergency stop“ and „consent“ switches. No further electrical components such as membrane buttons, switches or signal lamps are required. This makes the system low-maintenance.

The space gained is used for a large, convenient touch display. The virtual operating elements and displays shown on the touch display are designed for industrial applications and are high-contrast and large, so that reliable operation is possible *(Fig. 3)*.

3. touch-based user interface with large control elements

4. reliableTouch

Triggering a touch function requires a manual action by the operator on the touchscreen. To prevent operating elements from being accidentally triggered by unintentional touching, a function is only triggered if a special „small gesture“ is performed after touching the touch display, e.g. moving the finger in a defined direction *(Fig. 4)*.



4. a function is triggered after touching and dragging the finger across a radius limit

The intensity of the required gesture can be infinitely adjusted: It ranges from a simple finger touch (common operation of touchscreens) to a special small gesture. Thanks to the special shape of the finger recesses in the edge of the housing, the finger (in continuation of the finger recesses) can slide onto the touch display and trigger a function.

If the user realizes that he has triggered a function unintentionally, he can suppress the function triggering by pulling his finger back to its original position.

5. smartTouch

Control elements placed in the **corners of the edge of the housing** are linked with a **special gesture control**. They can be moved along the edges of the housing in an L-shape in two directions *(Fig. 5)*.

`5. function selection by means of L-shaped gesture along two housing edges

A selectable function can be assigned to each direction of movement. For example, it is possible to activate a function A when moving on one leg and a function B when moving on the other leg. The degree of deflection is evaluated, whereby there are two evaluation options:

a) The degree of deflection is immediately transferred to the function as an analog parameter (e.g. speed specification). If the finger is released in the deflected position, the analog value immediately jumps to zero. If the finger is moved smoothly back to the starting position, the parameter is reset to zero in the same way as the deflection. This function can be used, for example, to start a movement program in a positive or negative direction and vary the speed analogously in each case.

b) If a definable threshold value is exceeded, a switching function is triggered. However, the function is only activated when the finger leaves the

HIGHLIGHTS
the touch-based user interface

touchscreen in the deflected position. However, if the finger is returned to the zero position on the leg without being released, the function is not triggered.

6. TouchMotion

The ability to „pull" the finger more or less after touching the touch display is used to generate an analog movement specification for the robot. This allows the robot to be controlled sensitively in 6 degrees of freedom (e.g. X, Y, Z, and tool orientation A, B, C).

With the deflection of the finger it is possible to give a position specification to the robot, similar to the cursor control via touchpad on a notebook. The robot can be moved simultaneously in two coordinate directions, e.g. X and Y.

In a further mode, a speed specification for the robot is generated by the finger deflection: the more the finger is deflected, the faster the robot moves.

After touching the selected travel surface, the finger can then be dragged across the entire display via the field boundary to generate travel specifications. After releasing the finger, the robot stops immediately. The desired field must then be touched again for a new movement specification. The sensitivity of the reaction to a finger movement can be infinitely adjusted via a controller, e.g. the override, for both position and speed settings. The sensitive area for the 2D method is positioned near the edge of the display so that it can still be easily reached with the finger (e.g. with the thumb) at a clear distance from the edge of the display *(Fig. 6)*.

6. robotic process using haptically tactile operating elements

In order to be able to move in a third coordinate direction, a finger-wide field is placed directly on the side of the display edge so that this field can be felt with the finger. This field generates a one-dimensional movement specification, e.g. in the Z direction.

Thanks to the special arrangement, the operator can clearly distinguish between the two travel fields and reach them blindly: The field directly at the edge of the display (finger has perceptible contact with the edge of the housing) activates the movement specification for the third dimension. The field approx. one finger's width from the edge of the display activates the simultaneous movement specification in two dimensions.

An industrial robot has 6 degrees of freedom. The same procedure as described above is used to set the tool orientation with the three angles (A, B, C). For this purpose, the display is divided into two zones. One (e.g. the upper) zone contains the fields for the dimensions 1 - 3 (e.g. X, Y, Z). The other zone (e.g. the lower zone) contains the movement fields for dimensions 4 - 6 (e.g. A, B, C). The two zones can be blindly distinguished using haptic markers.

With a multi-touch display, the robot can be moved simultaneously in all 6 degrees of freedom. With a single-touch display, the movement functions can only be used sequentially.

7. FrameCalibration

Ideally, when the robot is moved using the TouchMotion function, it is aligned collinearly with the robot's coordinate system. In this case, the robot movement matches the finger movement perfectly.

However, if the operator turns to the side with the control unit, this alignment is no longer given. The direction of robot movement then no longer matches the direction of finger movement.

In this case, the coordinate system of the display must be recalibrated to the robot coordinate system. For this purpose, there is a special virtual control element with a pointer on the touch display *(Fig. 7)*

7. Compass for quick recalibration by gesture

This control element must first be tapped with a finger and then the finger must be dragged in the selected direction of the robot coordinate system, e.g. X direction. After lifting the finger, the vector direction between the first direction between the first point of contact and the release point is calculated. This vector and the selected robot coordinate axis are used to calculate a rotation matrix, which is then used to transform all finger movements before they are given to the robot as movement specifications. Recalibration is therefore carried out as quickly as possible with a single gesture. After recalibration, both coordinate systems are set collinear to each other again, virtually aligned. For better verifiability, the direction of the calibrated touch coordinate system is shown graphically on the touch display.

This calibration method can also be used be used for any other coordinate system (e.g. user frames).

8. SoftOverride

The tried and tested override function (previously implemented as a handwheel) is now carried out via a slider on the touchscreen.

This slider is positioned on the display at the edge of the housing *(Fig. 8)*. This allows its position to be felt and adjusted by sliding your finger along the edge of the display. The blind adjustment can be additionally supported by haptic marks on the edge of the display. The override can be adjusted by a fixed amount (e.g. 20 %) when moving between two haptic marks. This function can also be used to set other analog variables, e.g. process parameters in blind operation.

8. SoftOverride with tactile detent marks (finger recesses) on the edge of the housing

9. soft-ModeSelector

The conventional key switch for selecting the robot operating modes „Setup", „Automatic" and „Automatic test" has been replaced by a software function. The special feature lies in the data processing in safe technology. A touchscreen is basically a single-channel and therefore insecure device. With the aid of a safety controller integrated into the robot controller, however, safe functionality of the software is guaranteed.

Functional description:
On the display, the user interface offers various operating mode options in the form of softkeys for selection *(Fig. 9a)*.

9a. Selecting an operating mode

The operator selects a new operating mode „X" by touching one of these softkeys. The user interface software sends the newly selected operating mode to the Safety Controller as a „Request new operating mode X" command. The Safety Controller takes an icon corresponding to this operating mode from its memory and places it at a random position in a larger screen. The position of the icon in the image is only known to the Safety-Controller.

This image is now sent to the user interface as a bitmap and displayed there *(Fig. 9b)*.

HIGHLIGHTS

the touch-based user interface

9b. Confirmation of the operating mode

The operator must confirm the operating mode recognized by the SafetyController by tapping on the icon displayed. The touch position on the touchscreen is sent back to the SafetyController in the form of touch coordinates. This compares the touch position with the icon position on the screen. If both are the same (within a defined tolerance), the initiated operating mode change is executed. Otherwise, the operating mode change is discarded and the previous operating mode is retained.

This procedure creates a **safe operating circuit between the operator and the safety controller:**

- Operator selects an operating mode,
- SafetyController displays the recognized operating mode
- Operator confirms the correctness of the displayed operating mode to the SafetyController
- SafetyController sets the new operating operating mode

Notes:

- All icons are stored in the SafetyController in safe technology
- Optionally, a request to change the operating mode can also be made via a hardware key switch
- the insertion / removal of the key in the operating mode selector switch is simulated by a login / logout procedure using a PIN

10. LeftRightMode

Thanks to the consistent keyless design of the user interface and the symmetrical structure of the housing with its symmetrically arranged haptic markers, the user can switch the user interface from right-handed operation to left-handed operation via a simple setup function. left-handed operation.

All positions of the softkeys are mirrored on the vertical axis of the operating device *(Fig. 10a and 10b)*. This variability is not available on conventional devices with mechanical buttons.

10a. Right-handed operation

10b. Left-handed operation


REIS ROBOTICS
Robot 1
10:10:10
07.03.12
FileEditor
1 S:/$CONFIG/$DATA/MDPROG.MPR
MPR "MDPROG"
C Version : 30.0 Datum:14.11.11
C Kommission : RV10-6
C Kunde : RV10-6 Standardmaschine
C Aktive Achsen: Bit 0..23 => Achsen 1..
D IACT_AXES 0000003Fh
C Verfahrrichtung festlegen:
C Bitkodiert kann für jede Achse die
C Verfahrrichtung gedreht werden
D IAXES_DIR 00000005h
C Anzahl der Geberimpulse pro Motorumdre
D IENC_RESOL 4096
C Tabelle der Referenzpunkt-Winkel in
C [Grad] bzw. [mm]. Wertebereich:
C [-1000000.0...1000000.0]
D RHOME_POS[1] 0.0
D RHOME_POS[2] -90.0
85,00 %
STOP
FileEditor
2 S:/PROG/1.MPR
MPR "1"
C
END
85,00 %
Cart

PROVIS

Programming and visualization

ProVis is part of the ROBOTstar system software and can be run on various devices, including the controller, reisPAD, tablet and PC. It can also be used worldwide via the internet.

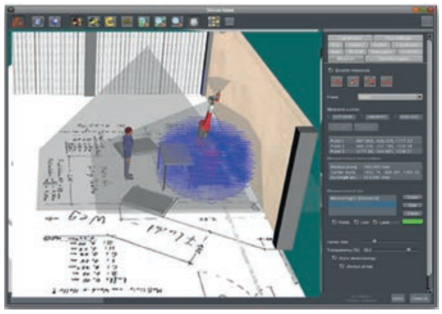
ProVis combines a complete collection of tools

- is an integrated component of the ROBOTstar VII system software
- reisPAD HMI (Apps)
- CAD data import / export (VRML, DXF, STL)
- Collision and reachability check check
- 3D online / offline programming
- Online teach-in
- Automatic path generation
- SCADA configurator
- Diagnostic function / Oscilloscope ...
- WebBrowser
- Automatic data backup function
- Virtual Reality / Augmented Reality

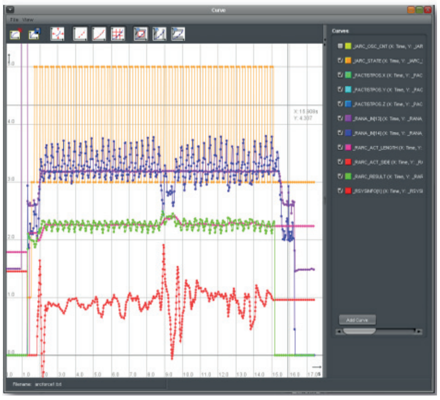
- **No license required**

reisPAD HMI

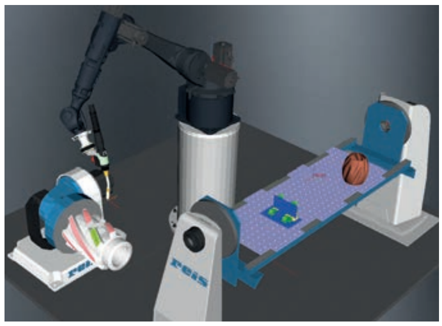
Integrated SCADA functionality



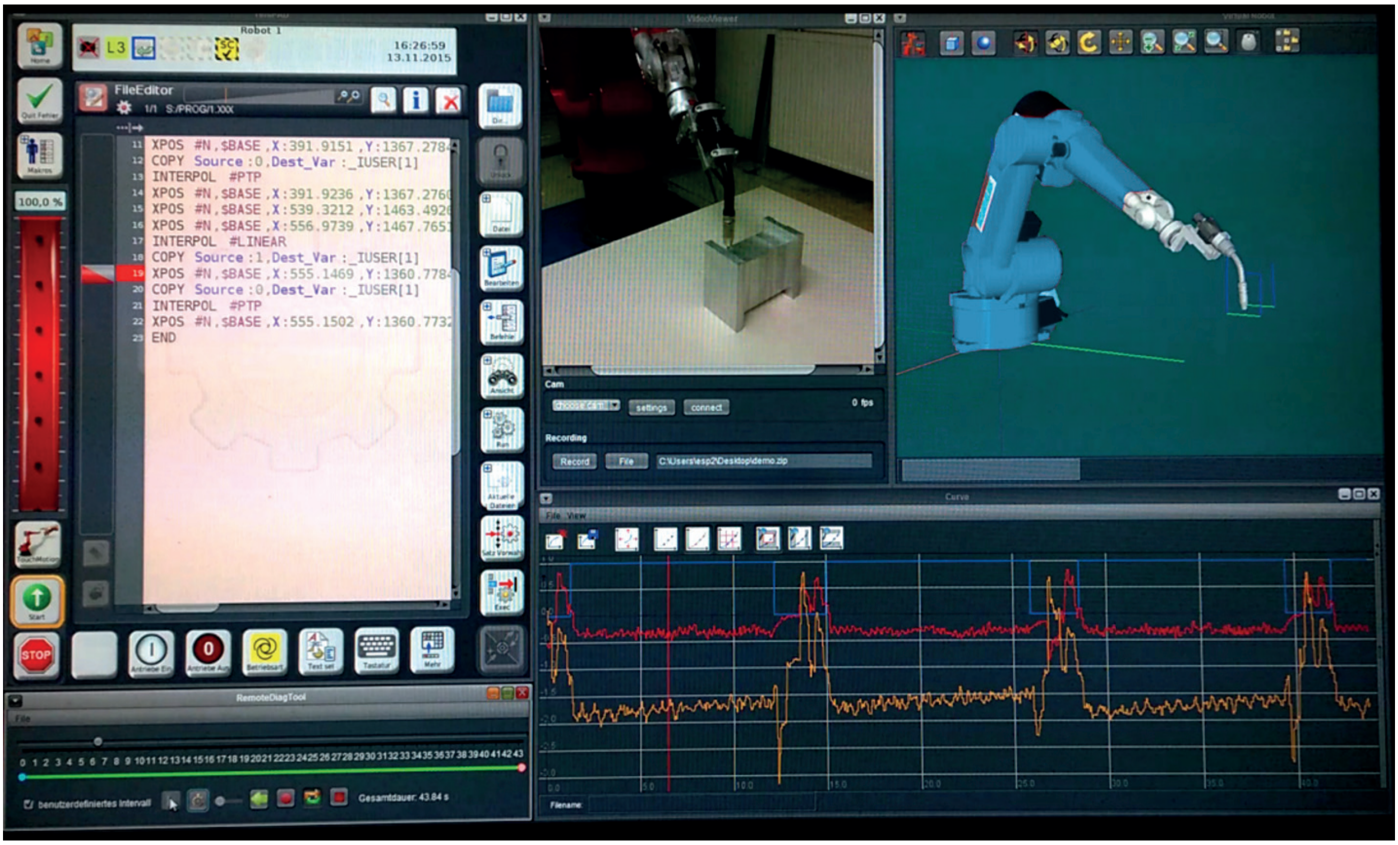
3D configurator for safety areas

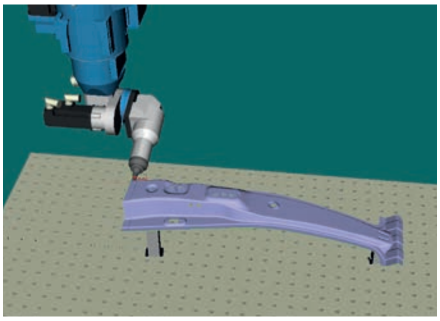


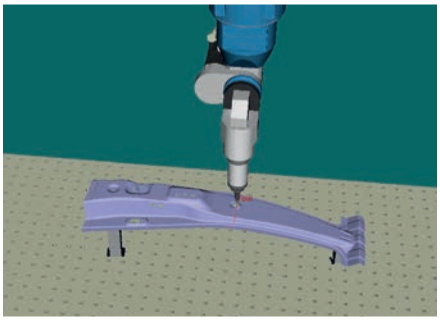
Diagnostic software

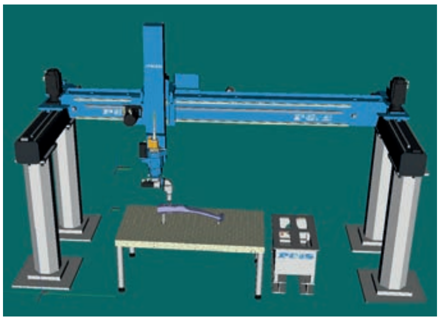


Virtual Reality
3D visualization of the robot cell









Graphics-supported programming with automatic path creation online on the robot and offline on the PC

SIMATIC SAFE KINEMATICS

An alternative to safety fences

Industrial robots are taking on more and more handling tasks. They are often only protected by a safety fence, but better protection costs valuable space or is expensive. The principles of SIMATIC Safe Kinematics are based on the groundbreaking inventions of Reis Robotics, the pioneers of modern robot safety technology. This software-based solution can monitor the movement in multi-dimensional space of predefined kinematics with up to 12 interpolating axes in a fail-safe manner - and thus offers a safe and space-saving alternative for industry.

Fully integrated and certified software-based solution

To ensure safety and increase the efficiency of machines, safe interaction between the machine operator and the machine is essential.

- SIL3 (IEC 61508),
- SILCL 3 (IEC 62061) and
- PL e/Category 4 (ISO 13849-1)

Safe speed monitoring

With safe speed monitoring, you can monitor the Cartesian speeds of individual points of the kinematics, e.g. at the tool center point or at joints.

Safe zone monitoring

With safe zone monitoring, you can monitor the position of the kinematics in Cartesian space, e.g. to restrict the travel range of the kinematics or to monitor areas that can be accessed by operating personnel.

Safe orientation monitoring

With the safe orientation monitoring function, you can monitor an an With safe orientation monitoring, you can monitor the orientation of the flange on a user-defined serial kinematic system, e.g. a workpiece may only be machined if the tool is perpendicular to the floor.

SAFE SPEED MONITORING (SLS)
various points of the kinematics

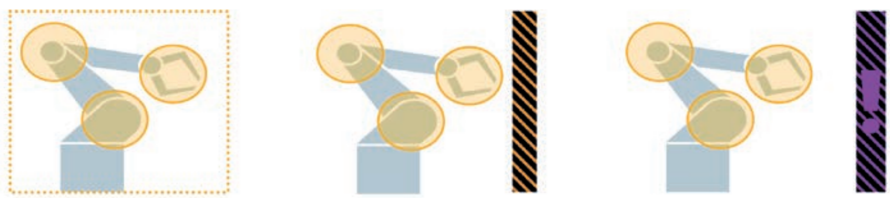
SLS-TCP Tool Center Point

SLS-JOINT Joint positions

SLS-TOOL Tool points

SLS-POINT Any points on the kinematics

SAFE ZONE MONITORING (SZM)
Safe collision check between kinematic and workspace zones



Kinematics within the the work zone (2D/3D)

Kinematics outside the the warning zone (2D/3D)

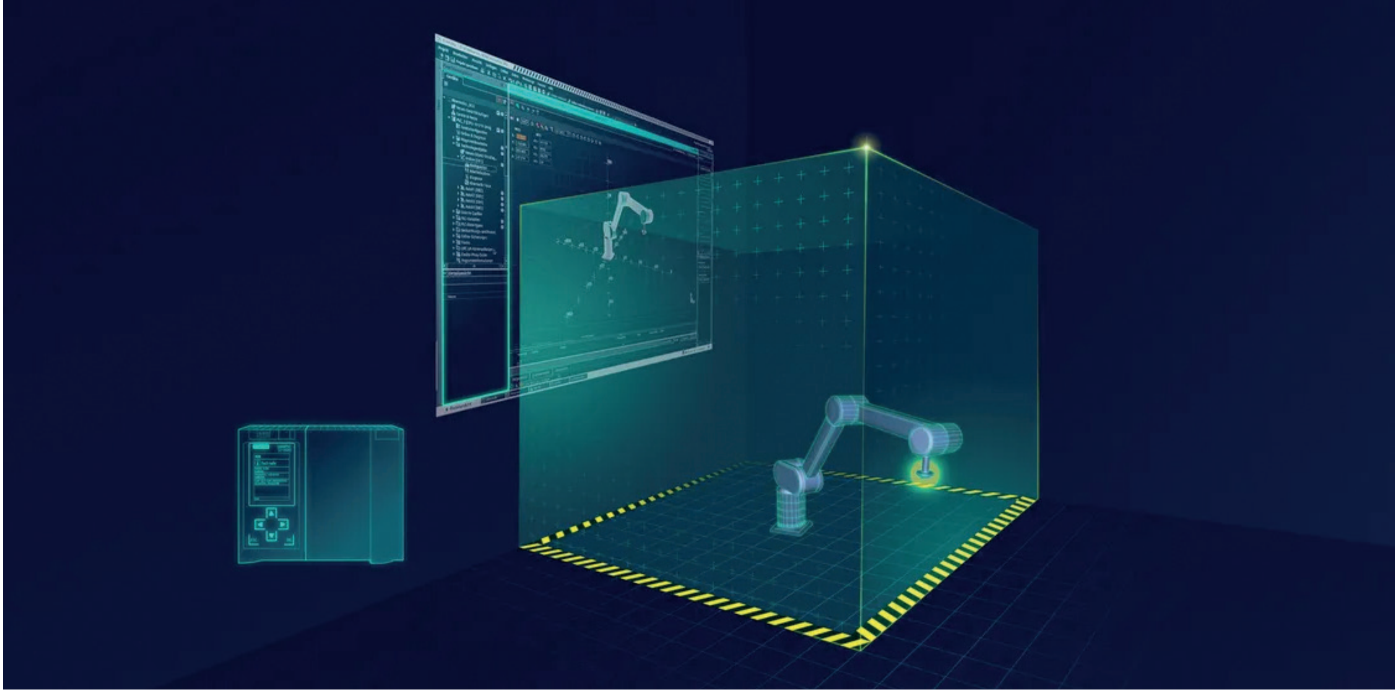
Kinematics outside the the protection zone (2D/3D)

SAFE ORIENTATION MONITORING (SLO)
of the flange for user-defined serial kinematics

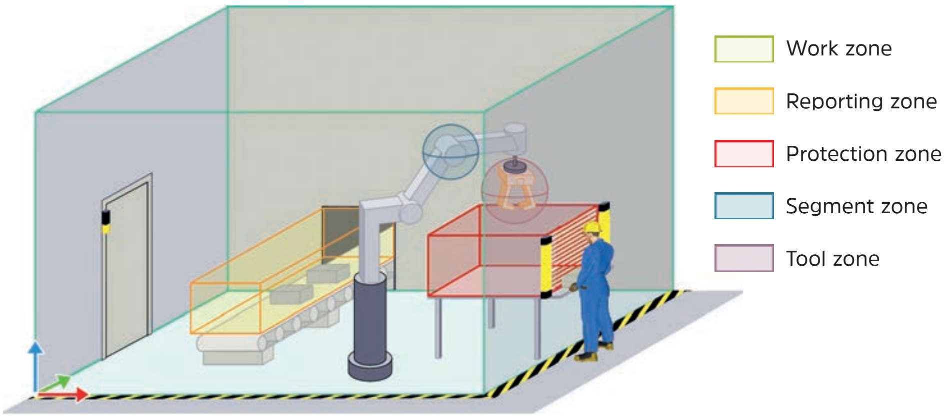
Kinematics within the tapered tolerance range

THE ADVANTAGES

- compact and flexible machine design
- Compliance with safety requirements in accordance with EN ISO 10218
- increased availability and productivity
- consistent engineering
- short commissioning times



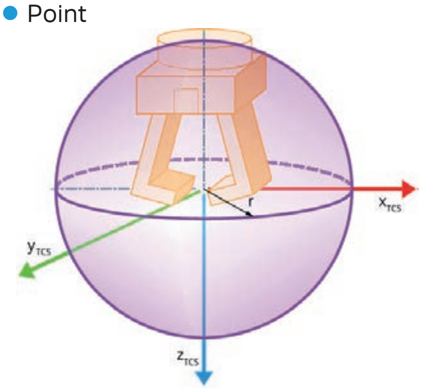
- **Work zones** define areas in which the kinematics can move. You can define up to ten work zones
- **Protective zones** are areas within the travel space of the kinematics in which the kinematics may not enter (e.g. switch cabinet, protective wall or areas in which a system operator moves). If a kinematics zone violates a protection zone, the kinematics are required to stop
- **Monitoring zones** are areas within the travel range of the kinematics. You can define up to ten protection or signaling zones. Monitoring zones indicate a zone violation by a kinematic system. This does not require the kinematics to stop
- You define **segment zones** in the respective segment coordinate system (SCS) or in the flange coordinate system (FCS). The following graphic shows a spherical segment zone using the example of the „articulated arm“ kinematics
- You define **tool zones** in the tool coordinate system (TCS)

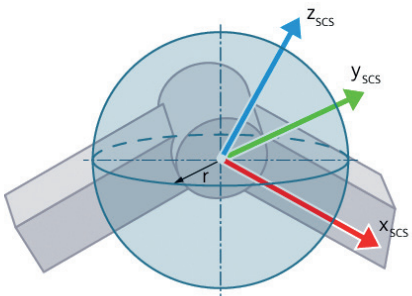


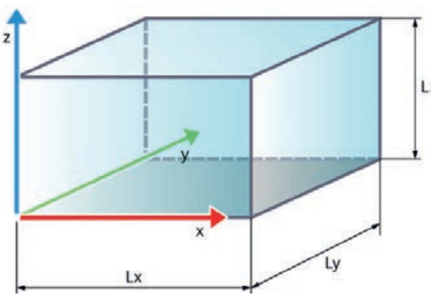
Zone geometry

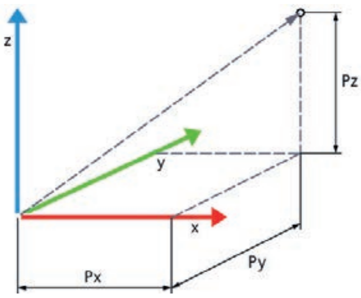
Depending on the zone type, you can configure zones with the following geometric bodies:

- Sphere
- Cuboid
- Point









For further information please contact us at sales@reisrobotics.com

Specifications regarding the characteristics and usability of the products do not constitute a warranty of properties. They are intended to serve informative purposes only. Solely the respective contract of sale shall be binding in respect of the extent of our services and supplies. Some items of equipment depicted in the illustrations are optional and are not included in the standard scope of supply. Technical Data and illustrations are not binding for the delivery. Subject to change without prior notice.

Learn more about
our company

Follow us on:

Reis Robotics GmbH & Co. KG
Walter-Reis-Straße 1
63785 Obernburg / Germany
Telefon +49 6022 503-0
sales@reisrobotics.com

www.reisrobotics.com

A company of ARETÈ COCCHI TECHNOLOGY

ROBOTstar VII | EN | 08-2024 | A