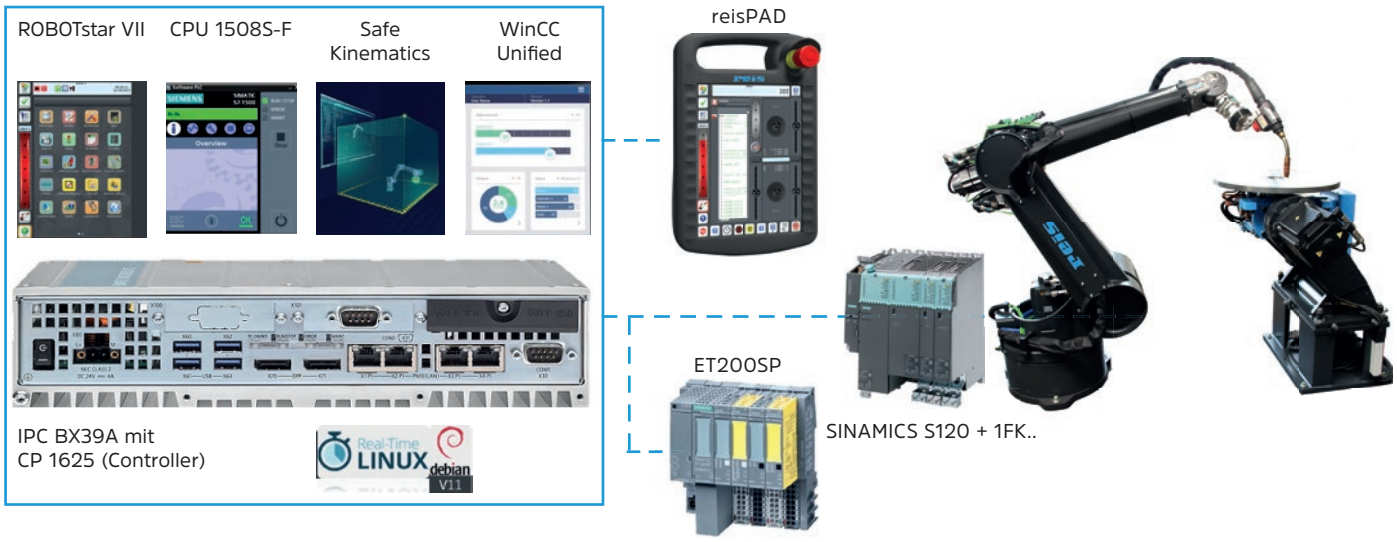
ROBOTstar VII

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.



SOFTWARE ARCHITECTURE
ROBOTstar VII

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

In the near future, our robot control solution will be available 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 master the challenges of modern and future-proof production control.

Please contact us at any time.

MAXIMUM FLEXIBILITY AND EFFICIENCY

with our innovative switch cabinet design

Our control cabinet solution is specially designed to meet the needs of modern robot systems and production lines. 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**
- **Space for applications**
- **An enclosure solution for cells and systems**
- **Flexible enclosure design**
- **Cost-effective approach**

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 24 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 STO, SS1, SS2E, SBT, SLS, SSM, SZM, SLO
PLC	Yes, S7 1500 (fail-safe) Programming according to IEC 61131-3 Integrated PLC in the RSVII
Visualization	Yes, ProVis, WinCC unified (optional)
reisPAD	Yes, ProVis, WinCC unified (optional)

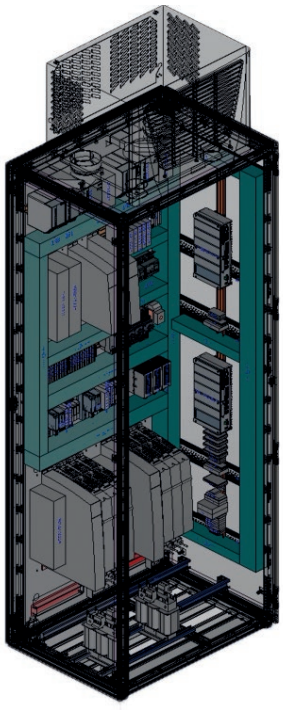
SWITCH CABINET

Structure & possibilities

Technische Daten

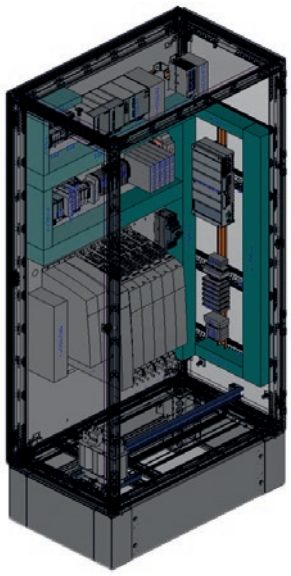
Electrical connection:
3AC 380-480V 50/60Hz, optionally with transformer
Protection class: IP54
Ambient temperature:
0 – 40 °C, optionally 0 – 50 °C
Relative humidity: max. 85 %
SIMATIC IPC BX-39A with 240 GB (SSD M.2) internal memory
Dimensions: (H x W x D)
2000 x 800 x 600 mm
(without base)
Axes: up to 24 axes or 2 robots with 6 – 9 axes each
Weight: 300 kg

* Main switch can be customized adapted to the application



Technical data

Electrical connection:
3AC 380-480V 50/60Hz, optionally with transformer
Protection class: IP54
Ambient temperature:
0 – 40 °C, optionally 0 – 50 °C
Relative humidity: max. 85 %
SIMATIC IPC BX-39A with 240 GB (SSD M.2) internal memory
Dimensions: (H x W x D)
1400 x 800 x 500 mm
(without base)
Axes: up to 12 axes
Weight: 210 kg



Optional

Roof cooling unit

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.

- C-frame with omnipresent system functions: always available in the same place
- App(lication) area: Content changes depending on context
- Option to also use softkeys in the app area **blindly via**:

1. Corners
2. Finger recesses
3. Knobs
4. Edge

- 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

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.

Learn more about
our ROBOTstar VII control system

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 has a symmetrical design and features haptic markers in the display frame that enable blind operation of the touchscreen (Fig. 1). On the back, symmetrically positioned grip strips with integrated enabling switches ensure that the device can be operated comfortably and without hand fatigue with one or both hands.

1. symmetrical housing design at the front

2. blindToUse
The most important operating elements on the touch display are positioned so that they can be operated blind.

3. touch-controlled HMI
The number of hardware components has been reduced to a minimum.

4. reliableTouch
A touch function is only triggered after a specific “small gesture” to avoid accidental touches.

5. smartTouch
Operating elements in the corners of the housing edge use a special gesture control that enables an L-shaped movement along the edges of the housing.

6. TouchMotion
By dragging the finger on the touch display, an analog movement specification can be generated for the robot in 6 degrees of freedom (X, Y, Z and A, B, C) (Fig. 2).

2. 6D robotic process using haptically tactile operating elements

7. FrameCalibration

3. Compass for quick recalibration by gesture

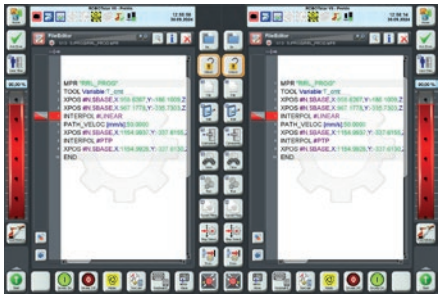
8. SoftOverride
The tried and tested override function is now controlled via a slider (Fig. 4) on the edge of the housing on the touchscreen.

4. 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 has been replaced by a secure software function (Fig. 5).

5. Selecting an operating mode

10. LeftRightMode



6. Right-handed operation / left-handed operation

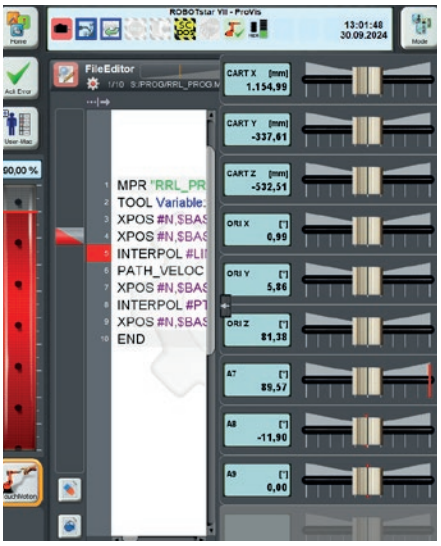
PROVIS
Programming and visualization

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

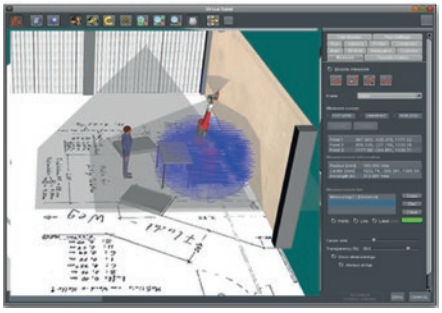
- is an integrated component of the ROBOTstar VII system software
- reisPAD HMI (Apps)
- CAD data import / export (VRML, DXF, STL)
- Collision and availability check
- 3D online / offline programming
- Online teach-in
- Automatic path generation
- SCADA configurator
- Diagnostic function / Oscilloscope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

- **No additional license costs when purchasing a robot with ROBOTstar VII**



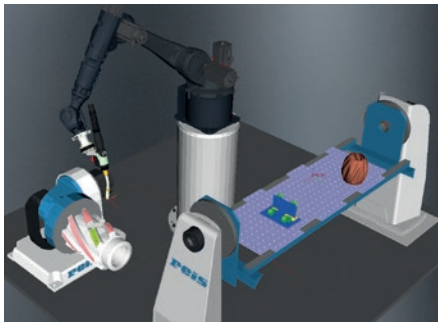
reisPAD HMI

Integrated SCADA functionality

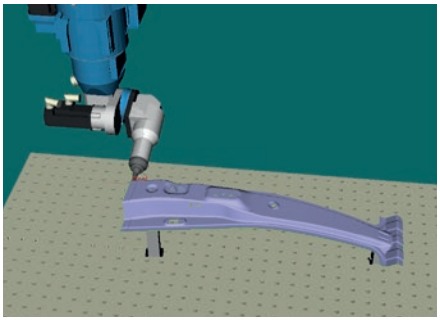


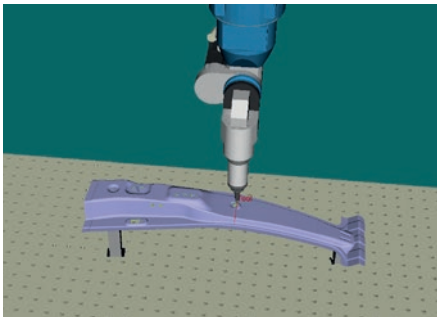
3D configurator for safety areas

Diagnostic software

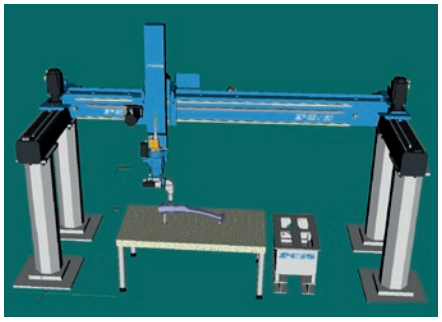


Virtual Reality
3D visualization of the robot cell





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



SIMATIC SAFE KINEMATICS

An alternative to safety fences

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

Safe zone monitoring

Safe orientation monitoring

SAFE SPEED MONITORING (SLS)

various points of the kinematics

SLS-TCP
Tool Center Point

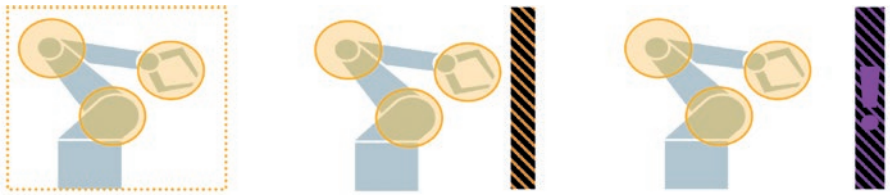
SLS-JOINT
Joint positions

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)

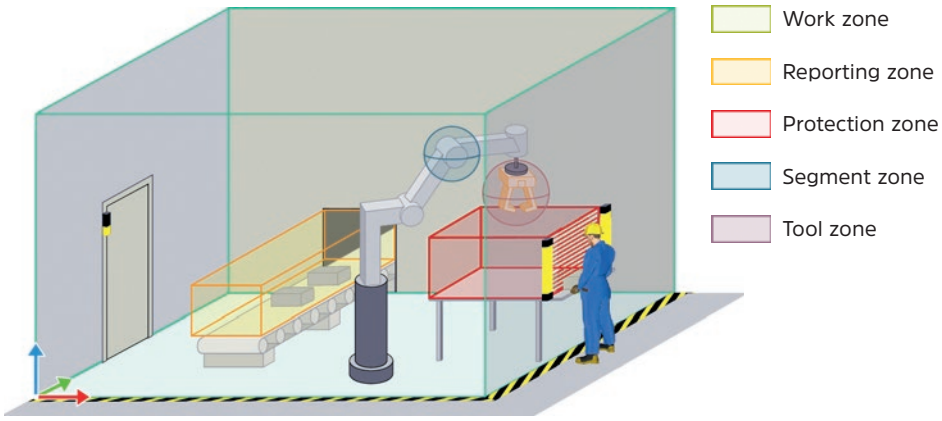
SAFE ORIENTATION MONITORING (SLO)

of the flange for user-defined serial kinematics

Kinematics within the tapered tolerance range

The following zones can be defined

- **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

Learn more about
our company

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