

EPSON INDUSTRY SOLUTIONS CENTER – WE'LL FIND YOUR SOLUTION!



Experience all our Epson robots in action. In a workshop cell you can build,, simulate and improve your automation application with help from our experts. The cell can be controlled and networked using all conventional field bus systems. In addition we can supply you with modern peripherals such as a vision and conveyor tracking system.

WOULD YOU LIKE TO ARRANGE AN APPOINTMENT?

CALL US ON
+49 2159 538 1800

OR SEND AN EMAIL TO
robot.infos@epson.de

EPSON DEUTSCHLAND GMBH

Factory Automation Division
Otto-Hahn-Strasse 4
40670 Meerbusch

Phone: +49 2159 5381800
Fax: +49 2159 5383170
Email: robot.infos@epson.de
www.epson.de/robots

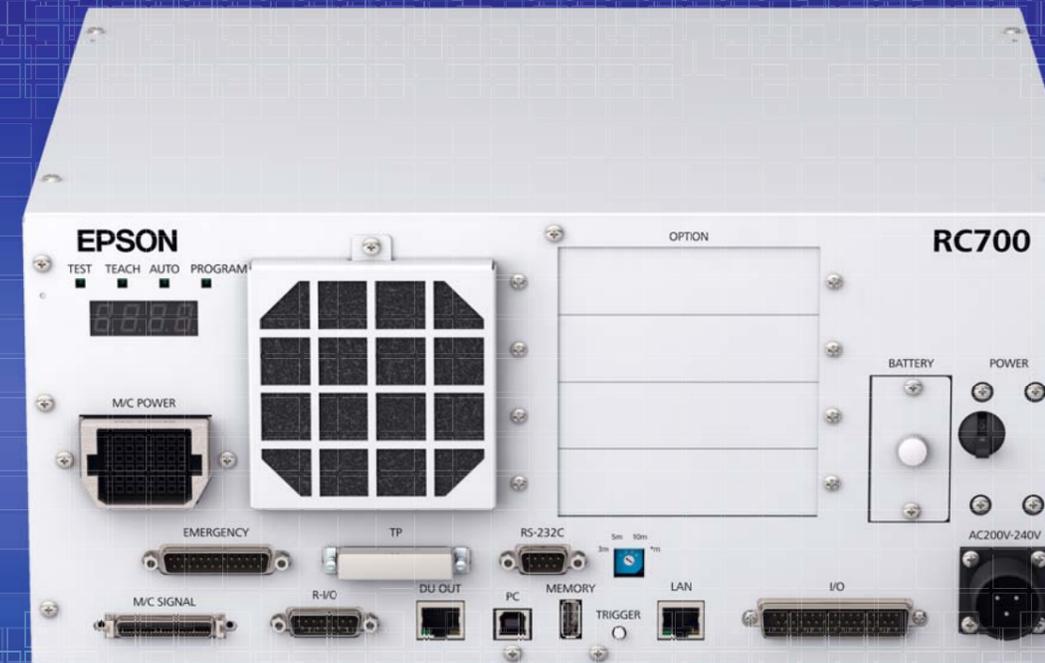
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www.epson.jp/e/products/fa/

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ONE FOR ALL.

Open control concept for a wide range of applications.



ENGINEERED FOR BUSINESS

EPSON[®]
EXCEED YOUR VISION

EPSON[®]
EXCEED YOUR VISION

ONE OF THE MAIN CRITERIA OF INTELLIGENCE IS THE ABILITY TO ADAPT

Compact. Powerful. And as flexible as you need to meet your demands. The new Epson RC700 controller is a universal genius and can demonstrate its ability as a stand-alone or integrated system. If it is extended to create a multi-manipulator controller, the Epson RC700 can control several robots and various peripherals in a complex system. **The automation of the future starts with Epson.**



The Epson RS700 is also designed for the new generation of robots featuring Epson QMEMS® sensor technology. Thanks to QMEMS vibrations by the kinematic system are considerably reduced even at high starting speeds or when decelerating. This improves production throughput and ensures stable quality for assembly work even at high speeds.

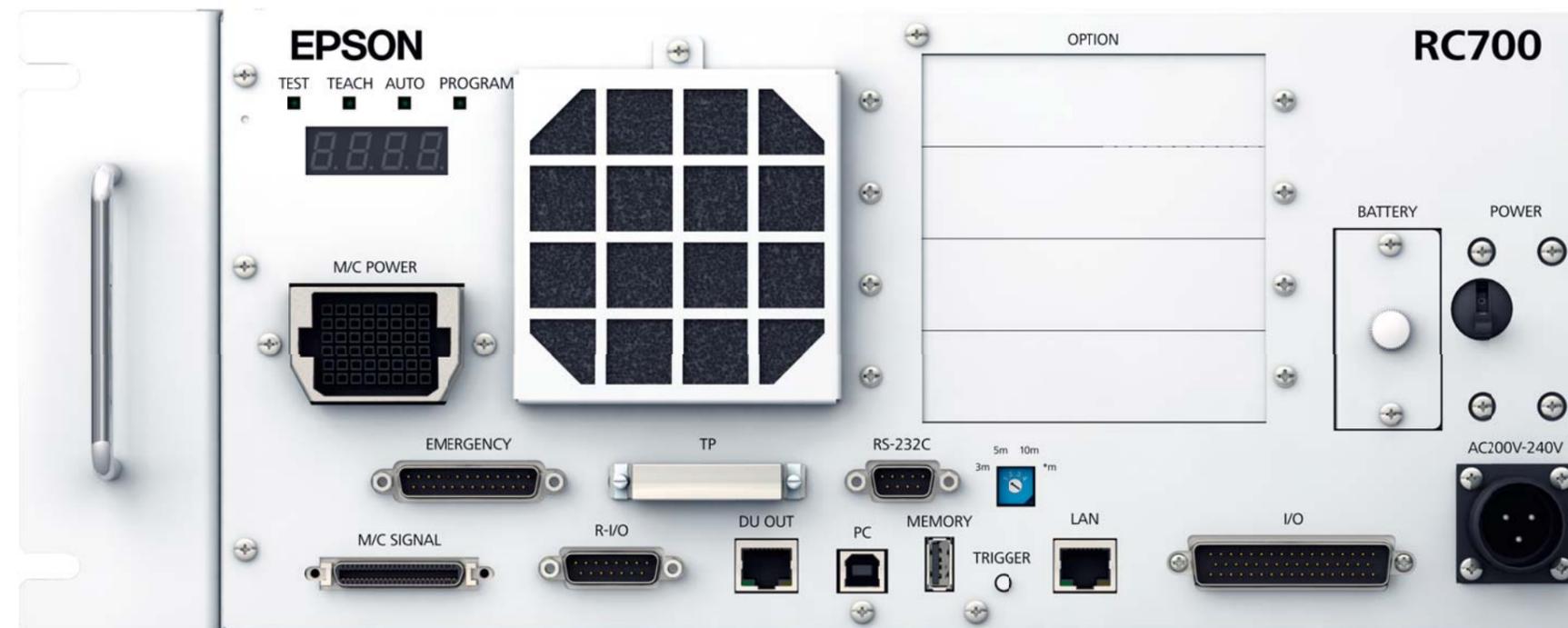
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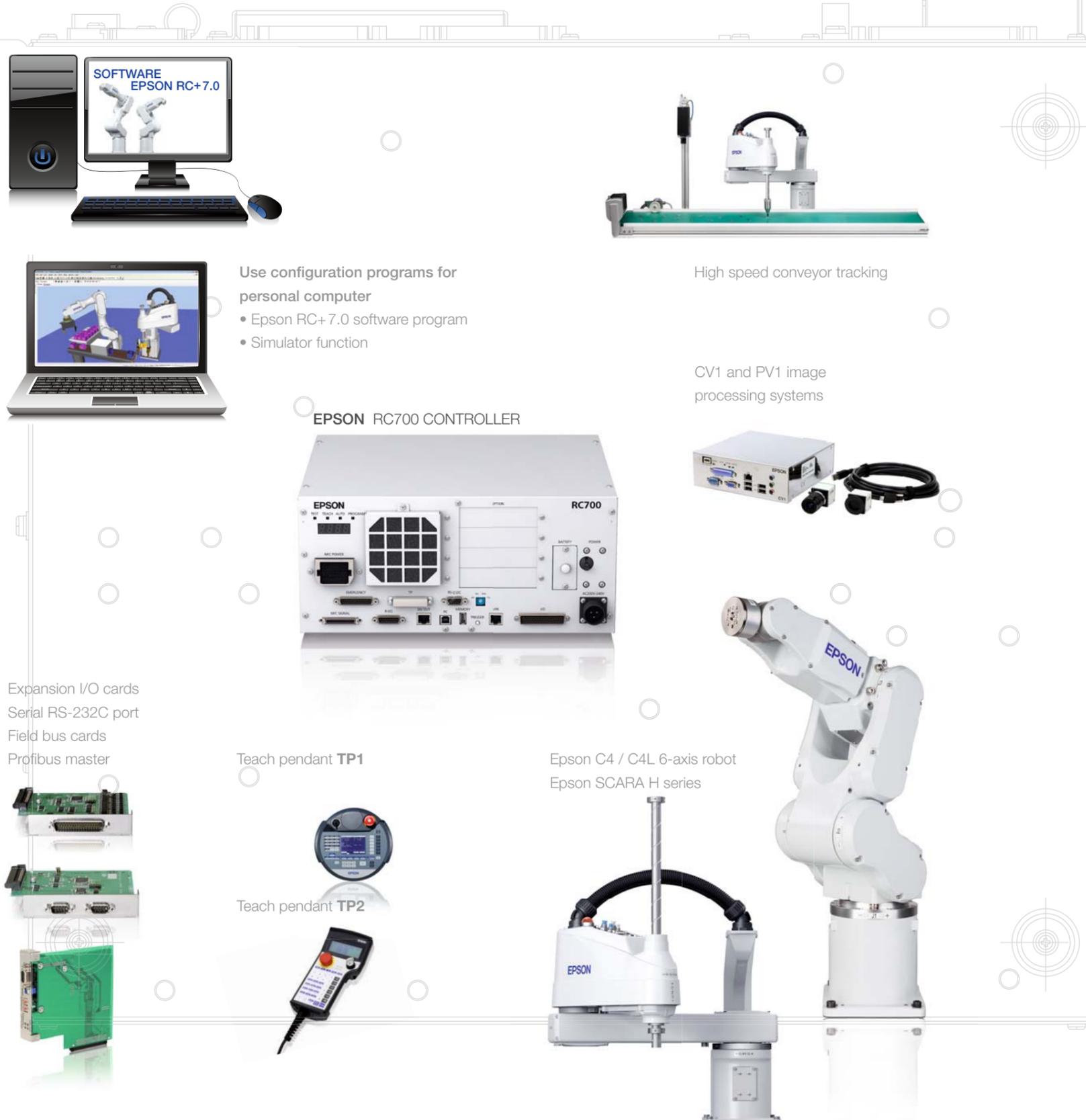
FEATURES & ADVANTAGES

- Powerful universal controller, can be expanded into a multi-manipulator controller
- Multi-tasking
- Compact design
- Low power consumption
- Low power loss
- Graded safety systems (Safety door circuits/ Emergency Stop circuits)
- Remote control and maintenance possible using additional PC
- Standard industrial inputs/outputs
- One/Two-phase connectability
- TCP-IP connection
- RS 232 connection
- Real-time inputs/outputs
- Integrated motor circuit-breaker
- Status indicator

The Epson RC700 can be used equally for both the forthcoming SCARA robots and also for 6-axis robots (Epson C4, C4L).



4 / INTEGRATED CONCEPT, SIMPLE NETWORKING



Use configuration programs for personal computer

- Epson RC+ 7.0 software program
- Simulator function

High speed conveyor tracking

CV1 and PV1 image processing systems

EPSON RC700 CONTROLLER

Teach pendant **TP1**

Epson C4 / C4L 6-axis robot
Epson SCARA H series

Teach pendant **TP2**

Expansion I/O cards
Serial RS-232C port
Field bus cards
Profibus master

5 / OPEN SYSTEM ARCHITECTURE

The Epson RC700 can communicate with all conventional field bus systems and is open for the connection of lower and higher level controllers, sensors, actors, conveyor belts and other peripherals. This means that the RC700 can take over all robot control, motion control and process control functions - without the need for a PLC.

MULTI-TASKING SPECIALIST

If several robots and peripherals are connected to the controller, the RC700's multi-tasking ability enables you to use your system more effectively and with less susceptibility to problems. Synchronisation takes place using markers and without additional wiring being required.

The RC700 can process 48 multi-tasks. Of these 16 tasks can be used as background tasks - even if the robot program is interrupted. This multi-tasking ability means that even complex processes can be controlled easily within the work cell.

NETWORKING AT NO EXTRA COST

Using the integral Ethernet port the RC700 can be connected to other Epson robot systems or company networks at no extra cost, enabling you to access the controller from your desk.

RC700 DRIVE UNITS – THE PLUS FOR MANIPULATORS

Would you like to increase the number of manipulators in your system which are controlled with a single controller? The RC700 drive units can be used to control up to 4 manipulators with ease. This enables you to synchronise robots which work together in a working environment easily using tasks and markers

The RC700 drive units are available in two versions:

- RC700 DU4 for additional 4-axis robots
- RC700 DU6 for additional 6-axis robots

VARIOUS ASSEMBLY SCENARIOS

Its compact dimensions enable the Epson RC700 to be fitted in a control cabinet. It can also be installed in various positions - horizontal or vertical, on the floor, on the ceiling or on the wall.

FAST INSTALLATION

All the ports are located on one side to make it easier for you to connect the controller quickly whilst also ensuring easy access for maintenance and repair work. The number of assemblies has been minimised which increases reliability. All components can be replaced without the need for special tools.

TRIGGER KEY FOR BACKUP

The trigger key enables you to save a complete backup including system status to a USB stick at any time whilst the system is running. This allows simple offline error analysis.

6 / FLEXIBLE EXPANSION TO MEET YOUR REQUIREMENTS

The expansion cards for communicating with external devices and for integration in field bus networks enable you to expand your system to exactly the configuration you need for your application - from a simple handling task to complete machine and robot control.



- Max. two expansion cards
- Two channels per card



- Galvanic separation of the inputs and output
- an additional 24 inputs and 16 outputs per expansion card
- Optical decoupling of the I/O cards
- Protection against external influences such as excess voltage and electrostatic discharge

RS-232C SERIAL PORT CARD

The Epson RC700 has a serial port for communicating with external accessories as standard. The serial expansion card enables you to use two additional channels (max. two expansion cards) so that a total of five channels are available.



- Profibus protocol stacks without loading the PC
- Direct access to the process data in the dual port memory
- Simple function control using LED status indicators
- Save the configuration files to the internal flash
- Provides 256 inputs and 256 outputs
- controls up to 1,024 inputs and 1,024 outputs (freely configurable) as Profibus master

EXPANSION I/O CARD

If the standard 24 inputs and 16 outputs are not enough, but you do not want to create a field bus network, your system can be expanded by a further 24 inputs and 16 outputs per card. In total you can fit up to four expansion cards.

FIELD BUS CARDS

Would you like to use a field bus system in your system or minimise wiring work? In that case you can use the following slave cards with the RC700: Profibus, DeviceNet, CC-Link, ProfiNet and Ethernet IP.

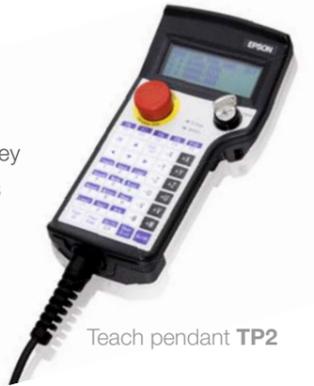
In addition you can fit **master cards**, such as a **Profibus master** in your PC which records all the stations of the Profibus DP network and completed the configuration, maintenance and diagnostic work for the network.



Teach pendant **TP1**

ERGONOMIC, CONVENIENT AND INTUITIVE – TEACH PENDANTS TP1 AND TP2

The portable control and display devices can complete all observation, control and parametrisation functions for SCARA and 6-axis robots. They can be used equally by right-handed and left-handed staff and are thus ideal for fatigue-free use.



Teach pendant **TP2**

HIGH-SPEED CONVEYOR TRACKING

Enables high precision synchronisation with moving objects.

An image processing system allows objects to be detected on the conveyor belt both in the linear direction or in a circular direction on a turntable. The robot picks them up without stopping the belt. An encoder measures the conveyor belt movement permanently. Even if the speed changed between detecting and handling an object, the robot can pick up and put it down precisely.



MULTI-CONVEYOR AND MULTI-ROBOT

The RC700 supports up to 16 conveyor belts which can be combined with all the robots connected to the controller in the conveyor tracking system. The objects found on the conveyor belts are placed in intelligent queues and processed in parallel by several robots without the operator having to intervene.

SENSOR TRACKING

Instead of detecting the position of the object with a camera, the conveyor tracking system is triggered by a sensor such as a light barrier. If the object enters the pick up range of the robot, it can pick it up precisely.

PG MOTION BOARD

The board is primarily used to read the speed of the conveyor belt using an encoder. Software options mean that it can also be used to control kinematic systems which do not consist of Epson components. Both step motors and servo motors are supported.



- 4 channels per card
- Max. 4 cards possible

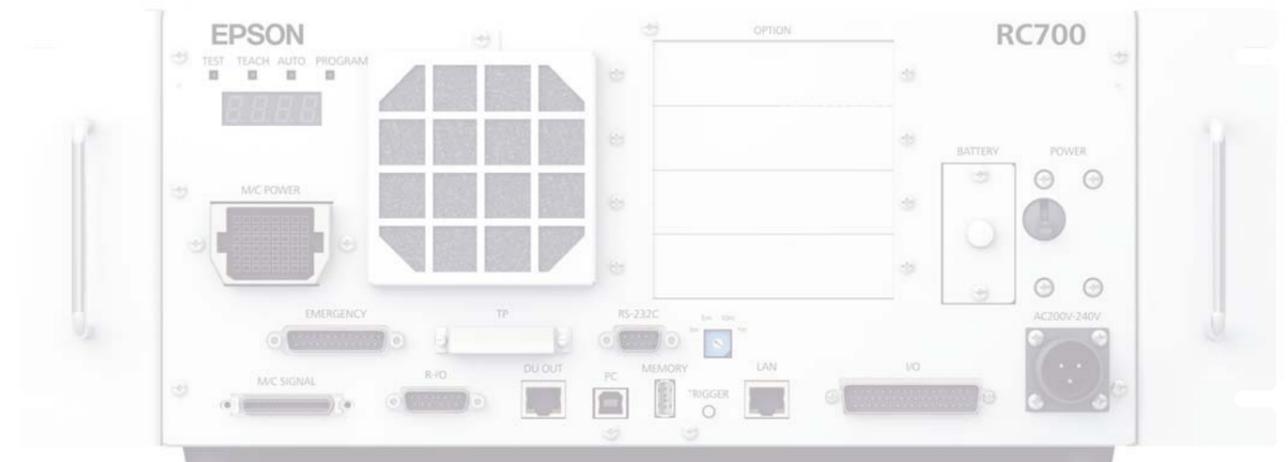
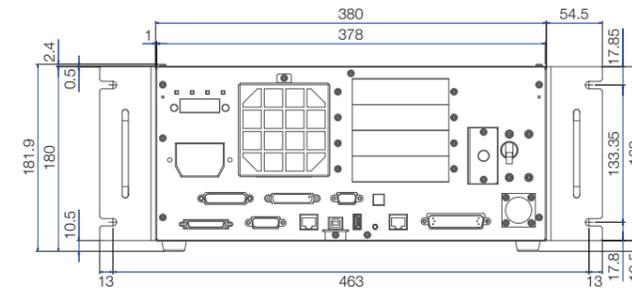
TECHNICAL DATA

Ports	1x USB memory, 1x USB device 1x 10/100 base T-Ethernet 24/16 Standard I/O channels – 8/8 as remote RS-232C Standard 1x channel
CPU	32-bit microprocessor
Hardware options	Control and display devices Teach pendant 1 (TP1) Teach pendant 2 (TP2) Drive unit 1 Robot manipulator per drive unit, 2 additional drive units possible
Expansion card options	I/O expansion 24/16, 4 additional cards possible I/O slave field bus cards DeviceNet, Profibus, ProfiNet, CC-Link, Ethernet/IP, 1 additional card of each type possible RS-232C serial port 2 channels per card, 2 additional cards possible Pulse generator motion card 4 channels per card, 4 additional cards possible
Software options	RC+ API 7.0 previously VB Guide External Control Point Motion (ECP) GUI Builder 7.0 Force Sensing Security Option
Development environment	Epson RC+ 7.0
Programming language	Epson SPEL+ 7.0 multitasking-capable
Connection values	One-phase AC 200 V to 240 V Two-phase AC 110 V to 120V, 50/60 Hz
Power consumption	Up to 2,500 VA - depending on manipulator model
Ambient temperature	5–40°C
Relative humidity	20% to 80% – non-condensing
Safety equipment	Emergency Stop button, safety door entry, low power mode, generator brake Error detection Encoder cable break Detectors Motor overload, motor speed error, irregular motor torque (manipulator out of control), overheating of a motor driver module, positioning overrun - servo error, speed overrun - servo error, CPU error, memory checksum error, relay drop-out, excess voltage, mains voltage outage, temperature deviation, fan error
Certifications	CE ANSI RIA R15.06-1999 EC Machinery Directive 2006/42/EC
Dimensions	380 x 350 x 180 mm
Weight	11 kg

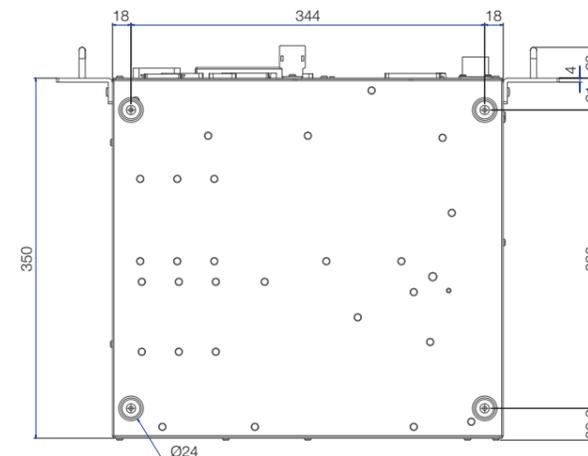
PACKAGE

- 1 Epson RC700 controller
- 1 Epson RC+ program CD including simulator
- 1 Set of mounting brackets for the robot controller
- 1 Set of 3 m motor and signal cables
- 1 Plug for Emergency Stop
- 1 Plug for standard I/O
- 1 USB programming cable
- Manuals on CD
- 1 Installation/ Safety manual

Front view

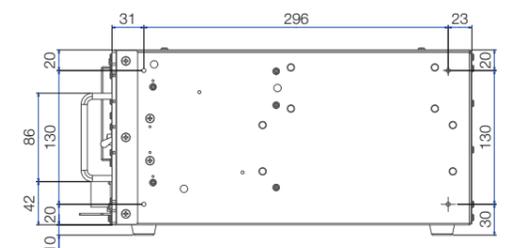


View from below



A gap of 200 mm at the front and 100 mm in all other directions should be left clear for the air flow and the outgoing cables.

Side view



Dimensions excluding cable connection

TESTING AND POSITIONING THE INTEGRAL EPSON VISION GUIDE 7.0 IMAGE PROCESSING SYSTEM

Wizards are available for many functions to make setting and up and using the image processing system easier.

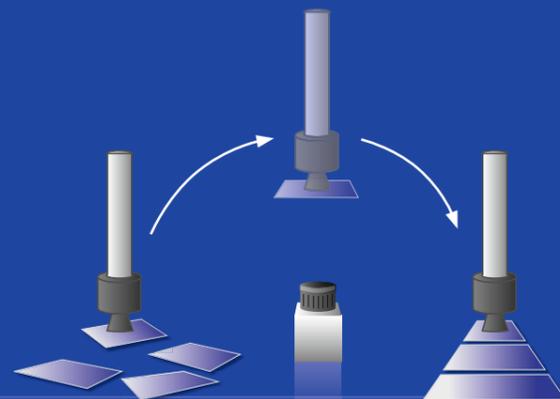
NEW FUNCTIONS

SIMULATION OF IMAGE PROCESSING

The Vision Simulation function is ideal for simulating sequences of image processing before building the robot system so that they can be tested easily. Not only does it reduce the set-up times for the entire Epson system with robot and image processing system but the simulation system can also provide valuable experience in the operating environment for first time users.

CATCH-ON-FLY RECORDING AND EVALUATION DURING THE ROBOT MOTION AT HIGH SPEEDS

The Catch-On-Fly function enables the robot controller to record and evaluate an image without having to stop the robot over the camera. This allows corrections to a workpiece relative to a grab to be found very quickly.



Would you like to carry out simple measurements or quality inspections? Do you need a positioning concept that detects parts and positions them precisely even in the event of protection deviations and varying positions?

Epson can supply kinematic systems, controllers and image processing systems from a single source. That ensures that your robot controller and inspection tasks/position detection systems will interconnect without any interface problems. In addition the integrated system satisfies the requirements for communication in milliseconds between robots and the image processing system. You can also benefit from outstanding support: You have a contact to provide you with competent, fast support.

The integration of the Epson Vision Guide 7.0 software in the Epson RC+ development environment means that set-up times can be drastically reduced and vision sequences created with a few clicks of a mouse. Programming uses drag&drop without additional complicated editors.

DEFECT INSPECTION FOR CHECKING SPECIFICATIONS AND SAMPLES

The defect detection function can be used to identify differences in comparisons with the specification image very quickly. Thanks to a newly developed algorithm the problem that edge images are wrongly identified as defective by conventional image processing systems occurs much more rarely.

SUPPORT FOR COLOUR CAMERAS

This new function facilitates the selection of various coloured or transparent workpieces and the assessment of the front and rear.

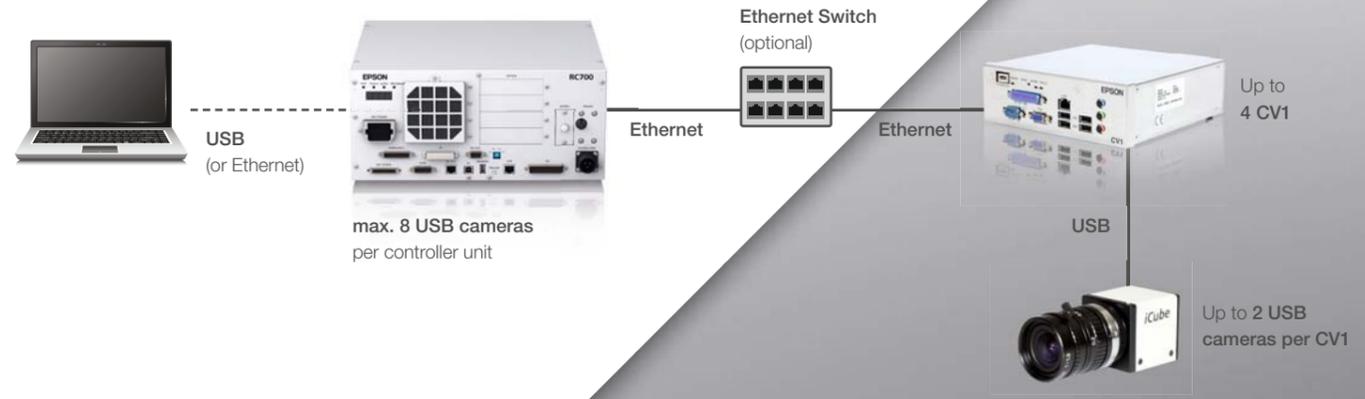
SUPPORT FOR HIGH RESOLUTION CAMERAS (2MP/5MP)

These cameras now mean a vastly increased search area with the same precision. Alternatively details can be shown in higher resolution with the same size search area.

TOOL LIBRARY

- **Integrated calibration routines** which support various camera alignments and calibrations
- **Point-and-click interface** for fast prototyping
- **Blob analysis tools** which measure the size, form and position of objects with changes
- **Search function** for geometric figures based on geometric part elements
- **Normalised correlation search** which detects objects using a sophisticated template matching technique in varying light conditions
- **Edge search function** which detects a certain edge precisely at sub-pixel level
- **Polar search**, an angle search function which measures the rotation of complex objects fast
- **Line and point tools** to draw and measure lines between points
- **Object reference mechanism** to align a vision tool at the result of another vision tool
- **Histograms** for looking more closely at pixel data and to define limit values for tools
- **Statistical calculations and evaluations** for every vision tool
- **Automatic compensation** of small defects on the camera lenses and the camera itself for object angle deviations
- **Catch-on-fly** motion control via I/O function without stopping the robot
- **Vision simulation** for simulating complete motions including image processing
- **Defect inspection** for comparison with template images
- **Code reading** for the identification of barcodes or two-dimensional data matrix codes without them having to be explicitly learned
- **Support for colour cameras** and high resolution cameras

AS INDIVIDUAL AS YOUR REQUIREMENTS



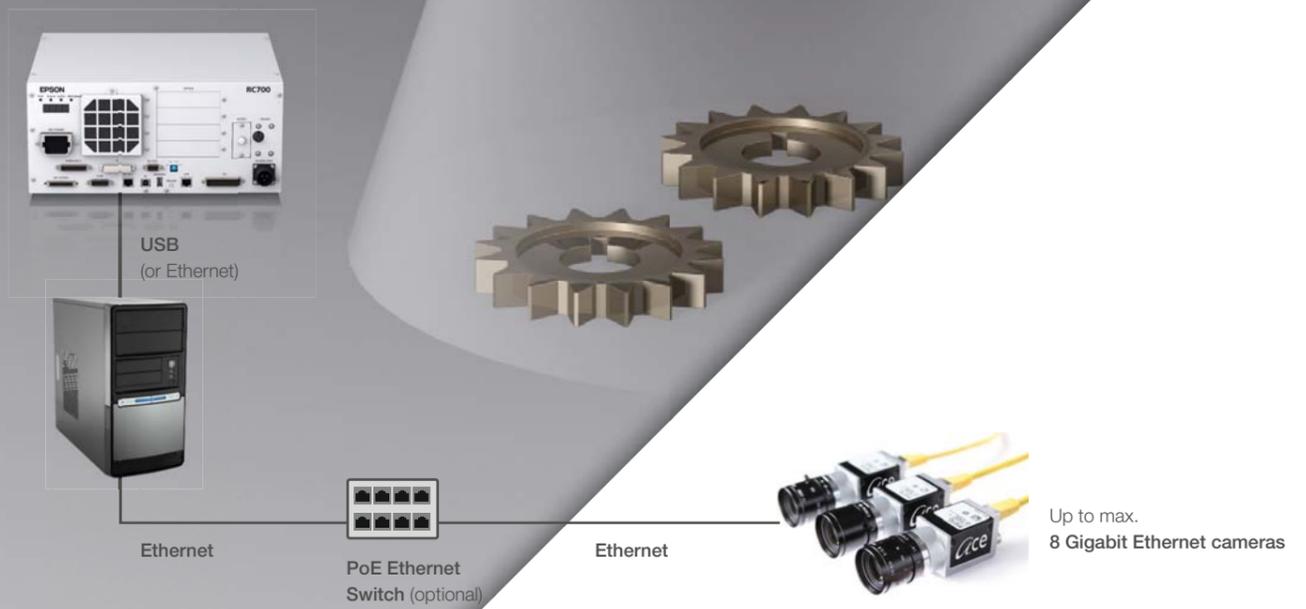
EPSON COMPACT VISION (CV1) COMPACT IMAGE PROCESSING SYSTEM

This compact system is particularly suitable for customers who do not always use a computer for image processing. The system can be combined with both standard USB cameras and with high resolution USB cameras - for either stationary or mobile use. Maximum flexibility is also guaranteed for objects in various focal lengths, integrated or with offset lens.

EPSON PC VISION (PV1) POWERFUL IMAGE PROCESSING SYSTEM ON YOUR PC

This solution is suitable for customers who require very short cycle times and extremely high camera resolution (more than 1.3 MP) for their application. The PV1 also allows high speed communication via Giga Ethernet. Several high resolution mobile or stationary cameras can be connected. The system requires the provision of a computer for image processing.

THE RC700 CONTROLLER CAN BE EXPANDED WITH VARIOUS IMAGE PROCESSING SYSTEMS TO MEET YOUR REQUIREMENTS.



14 /

IMAGEPROCESSING SYSTEMS

15 /

TECHNICAL DATA AND DRAWINGS

EPSON
COMPACT VISION CV1

Ports	Ethernet, USB, monitor, mouse, keyboard
Camera connections	Maximum 2 cameras
Dimensions	190 x 63 x 197 mm
Power consumption	DC 24V ±5%
Ambient temperature	0–45°C
Weight	1.5kg

EPSON **USB CAMERAS**
FOR COMPACT VISION (CV1)

B/W IMAGE PROCESSING

B/W AND COLOUR IMAGE PROCESSING

	USB VGA Mono Kamera	USB 1.3M Mono Kamera/Farb-Kamera	USB 5.0M Mono Kamera/Farb-Kamera
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Resolution	640 x 480 pixels	1,280 x 1,024 pixels	2,560 x 1,920 pixels
Sensor types	CMOS – 1/3" Progressive Scan	CMOS – 1/1.8" Progressive Scan	CMOS – 1/1.8" Progressive Scan
Lens mounting	C/CS mount		
Camera use	Stationary camera 5m USB cable Mobile camera 5m USB high flex cable		
Accessories (optional)	1x Set of mounting brackets Lenses 8, 12, 16, 25, 50mm standard and high resolution , available singly or in a set, 1x Set of intermediate rings		
Dimensions without lens	33 x 30.5 x 30 mm		
Weight	50g		

EPSON **GigECAMERAS**
FOR PC VISION (PV1)

B/W IMAGE PROCESSING

B/W AND COLOUR IMAGE PROCESSING

	GigE VGA mono camera	GigE 2.0M mono / colour camera	GigE 5.0M mono / colour camera
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Resolution	640 x 480 pixels	1,600 x 1,200 pixels	2,560 x 1,920 pixels
Sensor types	CCD – 1/4" Progressive Scan Global shutter	CCD – 1/1.8" Progressive Scan Global shutter	CMOS – 1/2.5" Progressive Scan Rolling shutter
Lens mounting	C/CS mount		
Camera use	Stationary camera 5m Gigabit Ethernet cable Mobile camera 5m Gigabit Ethernet high flex cable		
Accessories (optional)	1x Set of mounting brackets Lenses 8, 12, 16, 25, 50mm standard and high resolution , available singly or in a set, 1x Set of intermediate rings 10m Gigabit Ethernet cable 10m Gigabit Ethernet high flex cable		
Dimensions without lens	42 x 29 x 29 mm		
Weight	90g		

Front view

View from below

Rear view

Front view

View from below

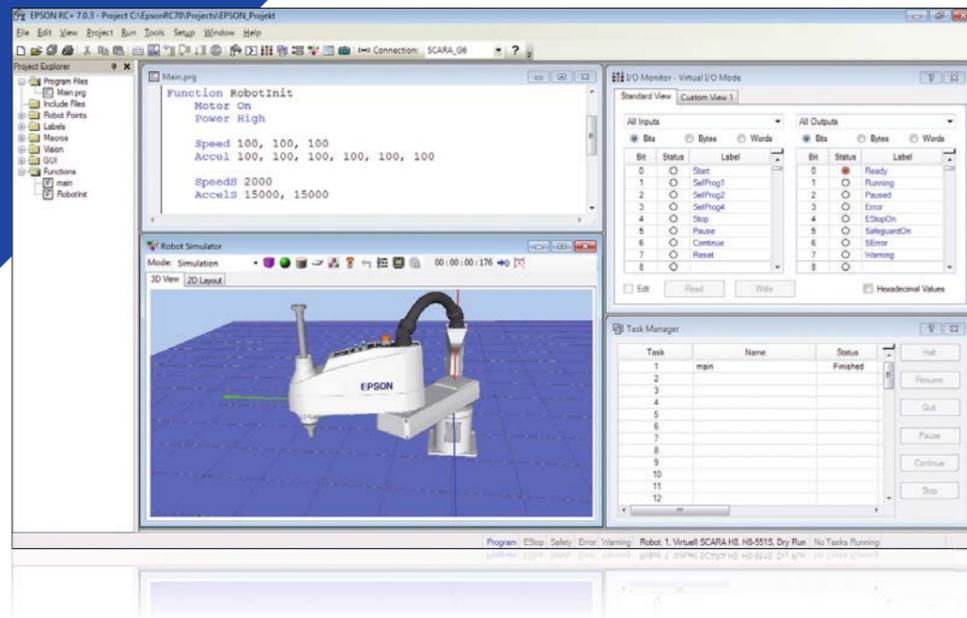
Rear view

Front view

View from below

Rear view

POWERFUL, EFFICIENT, INTUITIVE: EPSON RC+ 7.0 DEVELOPMENT ENVIRONMENT



The powerful Epson RC+ 7.0 project management and development environment is ideal for the straightforward programming of your applications with its intuitive Windows interface, open structure and integrated image processing.

The software is capable of controlled all types of robots and functions. It also supports a graphic 3D environment which enables you to simulate the robot program almost completely and visualise robot motions.

We make it easy for you!

As soon as you enter movement and I/O instructions, for example, the system displays well-known designators on pull-down menus to make the programming process easier. You can access an extensive help system using the F1 help key familiar from Windows. Every command is described along with its parameters. In addition there are links to related commands and examples which can be copied into your project using copy and paste.

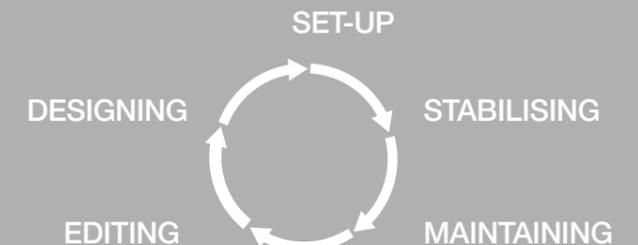
FEATURES & ADVANTAGES

- Can run in Microsoft Windows XP, Windows Vista and Windows 7
- Integrated project management system for fast project development
- Communicates with the controller via USB or Ethernet
- Enables you to connect one computer to multiple controllers
- Parallel operation of multiple RC+ 7.0 applications possible (one computer accesses multiple control units in parallel)
- SPEL+ programming language: powerful, easy to learn and use
- Intuitive control
- Image processing integrated in the interface

- Wide-ranging port connection: Ethernet I/O, Profibus, DeviceNet, ProfiNet, serial port, TCP/IP, I/O Handshake direct or available as an option
- Programming environment available in German, English, French, Japanese and Chinese
- Background tasks for complete system control
- Extensive multi-manipulator commands
- Integration of DLL functions
- Simulator
- File management



The Epson RC+ 7.0 is suitable for the complete software life cycle in automation:



NEW FUNCTIONS

The Epson RC+ 7.0 is the successor to the Epson RC 5.0 and RC 6.0 featuring lots of new functions such as

- **Vision simulation**, to simulate and test image processing sequences
- **Catch-on-fly** for recording and evaluating images without stopping the robot over the camera
- **Defect inspection** image processing function to identify defective parts
- **Support** for colour cameras and high resolution cameras
- **CAD-to-Point** to convert CAD data to robot points
- **Test mode** such as running the program with the safety door open using the enable key
- **Support** for Epson QMEMS® sensor technology

SIMULATION OF ROBOT CELLS

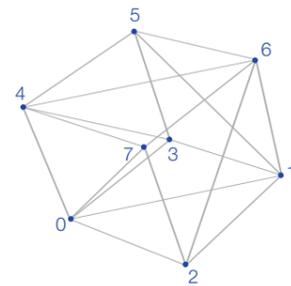
Good preparation is everything. Plan and visualise all procedures in your production, validate your program offline initially and carry out troubleshooting and editing work easily from your desk. The Epson RC simulator which is included in the software package enables you to save time and money throughout every phase.

PHASE 1 DESIGN

You can plan your robot cell in full size in advance and assess the expected cycle time for your application. This verifies feasibility before a single part for the system has been made. Later system expansions can be prepared in the simulation system so as to reduce down times to the bare minimum.

EVEN SIMPLER DESIGN USING THE CAD-TO-POINT FUNCTION!

The CAD-to-Point function allows CAD data to be converted into CAD data.

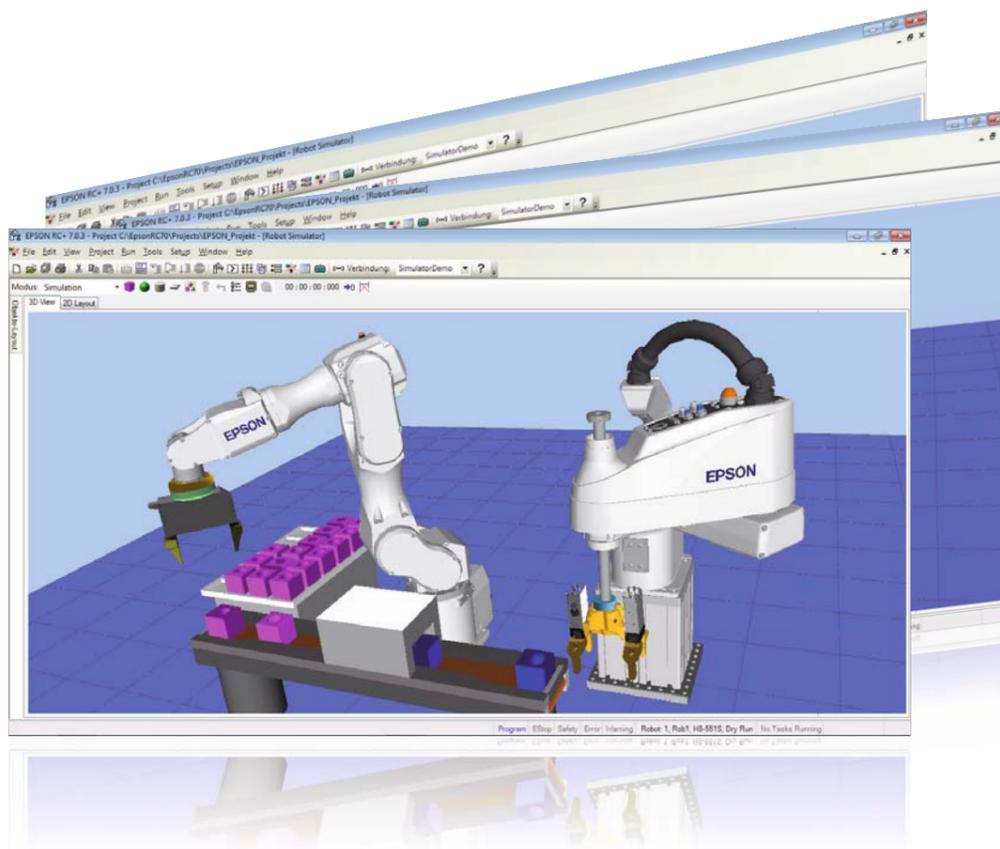


PHASE 2 INTEGRATION

The program validation process is completed offline before the robots are delivered. This enables you to create programs at the same time with the system capable of displaying and evaluating even complex motions. Collision risks are identified and equipment damage prevented.

PHASE 3 OPERATING AND MAINTENANCE

Troubleshooting or program modifications can be carried out conveniently from your desk. Collision detection, reachability checks and robot motions can be visualised in a 3D layout.



WE SPEAK SPEL!

```

Main.prog
Function main
Integer Nest
Pallet 0, P1, P2, P3, 7, 4
Speed 100
Accel 100, 100
Weight 2
For Nest = 1 To 28
  Jump Pallet(0, Nest)
  On Gripper
  Jump P4
  Off Gripper
Next
Fend

'Application Start
'Definition counter variable
'Definition pallet
'Definition PTP-speed
'Definition PTP-accel-/deceleration
'Definition payload (2kg)
'Start counter loop (x28)
'Robot motion to the pallet
'Gripper close
'Robot motion to the place position
'Gripper open
'End counter loop
'Application End
  
```

The line-based SPEL+ script language specially developed by Epson is not only powerful but also easy to learn. Its range of commands enables you to program a very wide range of robot motions – from a simple pick & place application to complex multi-manipulator line control.

COMPETE HIGH LANGUAGE SPEL+

- **Fast and secure**

SPEL+ is translated into a robot code by a compiler. This is carried out faster than using an interpreter and the syntax can also be checked before the program is run.

- **More flexibility**

The extensive range of comments for various applications means short programming time with many fewer errors. You can add your own commands using the SPEL+ syntax.

- **Clearly structured**

In addition to program structure commands you can also use sub-program techniques, multi-tasking and interrupt commands to write programs which are easy to read and easy to enhance and expand.

- **Communicative**

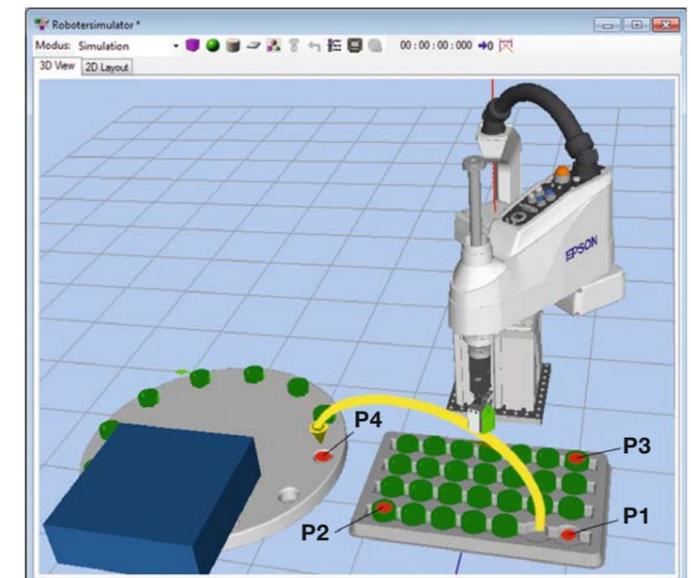
Whether it is for easy handling of inputs and outputs, communication via the serial TCP/IP port or exchange data in a field bus system – SPEL+ minimises the programming work.

- **Intuitive to learn**

SPEL+ has no cryptic codes and uses real values.

- **Simple to transfer**

SPEL+ syntax can be transferred to various .Net products. It also has an interface to Labview.



Even complex pallet layers can be set up and processed easily with the pallet command. You save time and gain more reliability because you do not need to teach every single network.

In addition to **PTP** (point-to-point), **LINEAR MOTIONS**, **CP** (continuous path) and more, SPEL+ also covers a series of other commands such as **JUMP** or **PALLET**.

SOFTWARE TOOLS FOR THE EPSON RC+ 7.0 DEVELOPMENT ENVIRONMENT

Isn't it great when even complex projects are simple. The tools for the Epson RC+ 7.0 development environment provide everything you need to program your application efficiently.



COMMAND

One-line command editor

COMPILER

Check the programs (syntax, definition, value range, etc.)

DEBUGGER

Program with stop points / step mode

DLL FUNCTIONS

Access to external DLL functions

EDITOR

Create SPEL+ programs: Online help, syntax check, label lists, detection and colour display of keywords, parameters and comments, parameter list, definition jump

ERROR TEXT EDITOR

Creation of your own error messages for the specific application

FILE MANAGEMENT

Create and access files and databases (Excel, Access, SQL)

IO LABEL EDITOR

Edit names for I/O / markers / field bus I/O for the data sizes bits byte and word

IO MONITOR

Display the status of I/O / markers / field bus I/O for the data sizes bits byte and word. Special application displays can be created.

MACRO EDITOR

Create a SPEL+ program as a programming aid

ROBOT MANAGER

Contains all information and control elements relevant to robots – inserted in clear windows: Set-up, edit points, loop parameters, tool and robot coordinate systems, load capacity and moment of inertia. The robot trip points can be used to switch motors on and off, complete a reset or complete a home run.

STACK EDITOR

Display the program branches

SYSTEM HISTORY

Recording of errors, events and warnings (diagnostics)

TASK MANAGER

Display of the opens multi-tasks, traps and their status, display the current program line

VARIABLE EDITOR

Display / Edit the current variable values

MAINTENANCE MANAGER

Create / Load / Display backups, controller reset

SIMULATOR

Planning and visualisation of processes, program validation

SOFTWARE OPTIONS

CONVEYOR TRACKING

Position synchronisation whilst the conveyor is running.

EXTERNAL CONTROL POINT (ECP)

You decide the coordinates: With ECP you can guide the workpiece contour easily and precisely along an external point.

FORCE SENSING

Allows the force of the robot to be measured in real-time.

GUI BUILDER

For the fast, easy creation of your own user interface based on Epson programming language SPEL+.



OPTICAL CHARACTER RECOGNITION (OCR)

OCR allows fonts and symbols to be detected reliably and the print checked - even in difficult conditions.

PG MOTION SYSTEM

Read conveyor speeds via encoders.

RC+ API

RC+ API enables you to integrate your application in external software, develop user interfaces and use databases.

SECURITY OPTION

Greater security by user management and usage control.

VISION GUIDE 7.0

Efficient Epson image processing system (see pages 10/11).



Epson Factory Automation is only of the leading suppliers of high tech robot systems which are renowned all over the world as a result of their reliability.



In addition to 6-axis robots, the Epson product range also includes Epson SCARA robots, Epson spiders with overhead assembly, controllers and software.



TECHNOLOGICAL PIONEER

Epson Factory Automation has its own Research and Development Department for robotics and offers its customers the widest ranges of robot models in the world.

2013

saw the first use of the revolutionary Epson QMEMS® sensor technology in robotics - to control kinematic system vibrations at high starting speeds or decelerating.

Other milestones

- **1982**
Market launch of the SCARA robot by Epson
- **1986**
First class 1 clean room robot in the world
- **1997**
First Pc-based robot controller
- **2008**
Inventor of the right or left arm-enhanced SCARA robot
- **2009**
Inventor of the spider - a unique SCARA robot with a working range of 450° – with no dead zones

PRE AND AFTER-SALES SUPPORT

- Feasibility studies for planning and project security
- Support for planning and implementation
- Introductory seminars, programming/maintenance courses, operator training
- Inspection and individual maintenance concepts
- Hotline service, on site repair service
- Central spare part stocking
- Global support