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EPSON®

EPSON RC+ Controller Specifications

Industrial PC Hardware	PC Chassis	19 Inch Rack mount industrial chassis with passive backplane, shock mount drive bay and 300 Watt power supply
	PCI/ISA Slots	9 ISA & 4 PCI slots (other configurations available as an option) Single Board Computer with Intel Pentium III CPU
Software	Graphic Display	Built-in video display
	Memory	128MB PC100 SDRAM (additional RAM available)
	Hard Drive	20GB Ultra DMA 7200 RPM
	Floppy Drive	3.5" 1.44MB
	RS-232 Ports	2 standard (up to 16 channels optional)
	Parallel Ports	1 standard
	Ethernet Port	Built-in 10/100 base-T Ethernet Port
	Mouse/Keyboard	Microsoft PS/2 Intellimouse, PS/2 Keyboard, Mouse pad
	Power Requirements	110 or 220VAC, 50/60 Hz, 10-20 Amp
	Weight	18kg Note: Standard and Flat Panel Monitors sold as options
I/O	Operating System	Microsoft Windows NT 4.0 with current service pack
	Control Software	EPSON RC+ System Software
Bar Code	Programming Language	SPEL+ high performance language with 350+ commands
	Multitasking	Up to 32 simultaneous tasks
Drive Unit	Debugger	Source Level debugger with single step, breakpoints, multiple task handling
	Editor	Color based editor with syntax assist/checking feature
Options	Communications	Ethernet TCP/IP multiple communication channels available from SPEL+
	Standard I/O	32 I/O on RC520DU Drive Unit (standard configuration is PNP)
Security	Emergency Stop Circuit	• SafeGuard Input
	Low Power Mode	• Dynamic Brake
Drive Unit	Motor speed	• Motor speed error detection
	Positioning servo error detection	• Drive Module Overheat detection
Options	Irregular Motor torque detection	• CPU Irregularity detection
	Encoder cable disconnect detection	• Fully CE compliant
Drive Unit	Speed Overflow servo error detection	
	Axes per Drive Unit	1-4 AC Servo Axes in 1 RC520DU Drive Unit
Options	Brake	Regenerative Brake Unit included when used with XM3000 Cartesian Robots
	Power Requirements	200-220V AC Single Phase, +/-10%, 50/60 Hz, 20-30 Amp
Options	Environmental Requirements	5-40 deg. C, 10-90% humidity
	Weight	14kg
Options	Integrated Vision	Vision Guide for integrated vision guidance or stand alone vision applications (OCR and Bar Code Reading are also available for use with Vision Guide)
	Discrete I/O	Up to 512 discrete I/O configured as PNP (NPN available as option)
Options	Ethernet I/O	Virtually unlimited I/O using integrated Ethernet I/O option
	Analog I/O	Analog I/O available as an option module with Ethernet I/O
Options	Force Sensing	Integrated Force Sensing option with ATI high performance force sensors
	V/B Guide	Active X controls that allow EPSON Robots to be programmed from common PC languages such as Visual Basic or Visual C++
Options	Security/Audit Log	Provides password protection for user defined security levels as well as activity audit log which monitors who made changes and when
	Notes	Options are being added to EPSON RC+ on a regular basis. Check with EPSON for the latest additions to our options list.

Security Audit Viewer

Tracks changes to source code, system parameters, point files, etc. by user, and computer for all projects.

User Error Editor

Easily add user defined error codes and messages for each project.

I/O Monitor

Real time I/O monitoring for all types of Inputs and Outputs such as Ethernet, digital and memory I/O.

Run Window

Easily run and debug functions from within the development environment with scalable video.

EPSON RC+
PC Based Robot Workcell Controller

- Easy to learn and use
- Open architecture design allows use of 3rd party hardware/software
- Uses standard software (Windows NT) and hardware (Pentium III CPU)
- Multiple 4-Axis EPSON Robots can be controlled from one EPSON RC+ Controller
- Powerful SPEL+ language provides commands for robot workcell control
- Runs up to 32 simultaneous tasks
- User created DLL's can be added to SPEL+ language
- Project management mechanism
- Built-in source level debugger
- I/O monitor shows entire system I/O state in real time
- Supports a variety of I/O options
- Provides integrated options such as: Vision, Force Sensing, Security/Audit Log etc.
- Active X controls allow programming via Visual Basic or Visual C/C++
- Extensive integrated help system

EPSON RC+ is the next generation robot and motion control system that takes advantage of the latest advances in technology and at the same time provides a robot workcell controller that is easy to program and use. At the heart of EPSON RC+ is our powerful Industrial PC running Windows NT on a fast Intel Pentium III processor. But EPSON RC+ is much more than just a PC based controller. It is a powerful Workcell Controller designed to:

- Save Developers time and effort required to build Automation Workcells
- Reduce the costs of components for Workcells
- Give users access to 3rd party hardware and software available for the PC
- Provide top performance for fast cycle times and high part throughput
- Provide a clear and easy upgrade path for the future
- Allow for easy communications to other devices on the factory floor

Our SPEL+ programming language and EPSON RC+ Development Environment provide all the elements you would expect to find in an advanced control system. Standard features such as 32 task multitasking, integrated source level multitask debugger, color syntax checking editor, control of multiple robots from one controller, parameter passing, variable data types, and language extensibility through user DLL's (to name a few) help make EPSON RC+ the controller of choice for advanced users.

But what really makes EPSON RC+ stand out is the ease with which new developers learn to use it and the high retention level users experience even with detailed features. This is due to EPSON's years of focus on our EPSON RC+ IDE (Integrated Development Environment) to make sure that EPSON RC+ is intuitive to use and thus easy to learn for beginners while also providing powerful features for advanced users. As a result, our customers find that EPSON RC+ helps reduce their overall development time significantly as compared with other robot systems and controllers they have used in the past.

The power and flexibility of the PC and Windows NT combined with the ease of use and expandability of EPSON RC+ make EPSON RC+ hard to beat as the high performance and value oriented Factory Floor motion control solution.

The specifications herein were valid at the time of this document's publication. However, for the latest information check our website at: www.robots.epson.com

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PC Based Robot Workcell Controller to meet your needs today and tomorrow

Ease of Use that is 2nd to none

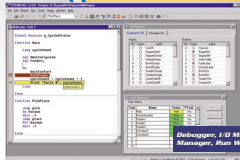
EPSON RC+ is both easy to learn and easy to use. Our customers continue to tell us how much they like features such as our Jog and Teach dialog for the robot and teach points, our I/O monitor to look at the current I/O status (and even fire I/O with the click of a mouse), and our vector based editor with features like syntax assist or keywords to format. Our task manager helps customers see what tasks are running and even pause them from one dialog. Add to that a full set of configuration dialogs and is loaded with useful tips, integrated help system that is coupled with useful tips, explanations and examples and we still have just barely scratched the surface of all the features available with EPSON RC+. Take a look and see for yourself why our customers are calling EPSON RC+ the easiest Robot Workcell Controller to learn and use.



Jog & Teach Dialog

Powerful Development Environment saves time and money

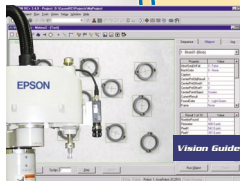
System Developers are always pushed to get things done yesterday and many times they are asked to do this with limited tools. Not with EPSON RC+. Our development environment provides powerful tools that are easy to use. Features such as our integrated debugger (which also ties into VB), task manager, macros, smart builds, quick function jumps, syntax assist, dry run and whole host of setup and configuration dialogs were all built to save Robot workcell developers time. Customers often tell us that they save lots of time using our development/debugging tools and powerful SPEL+ language.



Debugger, I/O Monitor, Task Manager, Run Windows.....

Integrated Vision for Guidance and Inspection Tasks

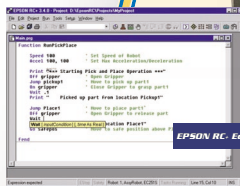
The Vision Guide integrated vision option is both easy to use and extremely powerful. Through a point and click interface, users can apply and easily configure vision tools such as: correlation, polar search, blob, image analysis, lines and points. The power of Vision Guide is the speed and manner in which the Vision Objects are created, values set, and associations made between objects. The need for language based programming is virtually eliminated. Complete point and click based Robot to Camera calibrations tools are included for Vision Guidance Applications. Also available for Vision Guide are data matrix tools which include bar code reading (1 and 2 dimensional) as well as OCR.



Vision Guide

Flexible and expandable where you need it

Today's robot workcells are more complex than ever. Flexibility and expandability are critical factors to consider when choosing a controller to run your workcell. EPSON RC+ provides access to the thousands of 3rd party hardware and software products available today for the PC and Microsoft Windows NT. While EPSON is committed to providing more and more integrated options with EPSON RC+, our customers can also add new features and integrate 3rd party products into EPSON RC+ on their own. Our unique custom DLL feature allows developers to create custom SPEL+ (Dynamic Link Libraries) to extend the SPEL+ language to fit their specific needs. The possibilities are endless and isn't that exactly what you expect from your workcell controller.



EPSON RC+ Editor

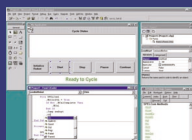
Power based on PC Technology

EPSON RC+ runs applications fast which equates to more parts processed in less time. The great part about this is that EPSON RC+ continues to get faster and faster every few months due to the power of PC based processing. Unlike other controllers, EPSON RC+ is based on PC technology and takes full advantage of all that the PC has to offer which includes processor performance improvements. EPSON RC+ also has the ability to add in PC based option boards, additional memory and hard drive upgrades at a fraction of the cost of other systems. Add to that the scores of software available to run on the standard Windows NT and you've got a standards based solution that offers true value today and into the future.



Active X Controls (simple yet powerful)

EPSON is one of the industry leaders in providing Active X Controls for the factory floor. Our Active X controls allow customers to program our robots using standard languages such as VB or Visual C/C++ . VB Guide provides hundreds of integrated methods & results and even an event mechanism that allows users to throw events from our SPEL+ language back to VB. Our SPEL.vd control also allows for drag and drop video display capability when using Visual Guide. The EPSON RC+ debugger is also integrated for use with VB so that users can stop on SPEL+ breakpoints from their VB Application.



VB Guide

I/O Expandability Options

Discrete I/O: Optional 64 pin I/O boards (NPN and PNP) are available that plug into the EPSON RC+ industrial PC to provide discrete I/O expandability.

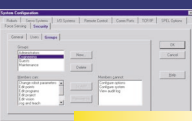
Distributed I/O: Integrated Ethernet I/O is available as an option for expansion I/O. Up to 64 points can be configured on each I/O rack with the number of total racks virtually limitless. Ease of wiring and ease of use makes this the way to go if your application requires a lot of I/O.



Ethernet I/O

Security Option gives password protection

The Security option allows users to set password based protection levels to various parts of the EPSON RC+ system. For example, security parameters can be set so that only developers can open the EPSON RC+ editor to make program changes. The security levels are fully customizable allowing users to set them any way they choose. Also included is an automated activity audit log which tracks time and changes made by individual users to EPSON RC+ projects.



Security Configuration

Integrated Force Sensing made easy

EPSON RC+ provides an Integrated Force Sensing option for those customers that need to use force sensing with their robots. With just a few lines of code you can have an integrated force sensor detect when a specified level of force is reached and stop the robot motion. This is extremely useful for delicate applications and also for checking to see if parts are placed properly.



Force Monitor

