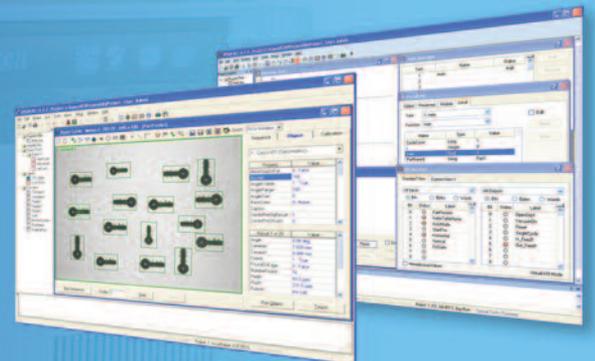




EPSON RC620+ Controller

Industry Leading PC Based Controller

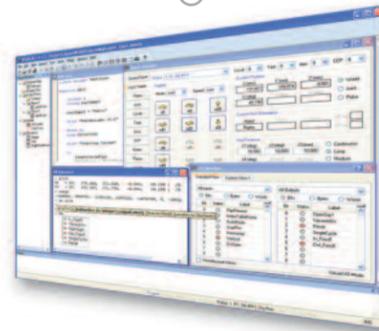
The Power of Choice



The Best Just Got Better

RC620+ PC Based Controller

- **POWERFUL** - Controls up to 2 SCARA and 2 6-axis robots (20 axes of motion)
- **FLEXIBLE** - Industry Leading PC based Open Architecture Design
- **EASY TO USE** - Industry Leading Ease of use with EPSON RC+ Software
- **EXPANDABLE** - Tons of EPSON Integrated Options save time and money
- **HIGH PERFORMANCE** - 48 tasks with real time deterministic execution



Open Architecture Design

EPSON is the PC based controls industry leader for Industrial Robots and Workcell Control. The new RC620+ PC Based Robot Controller is EPSON's 4th generation in a long line of open architecture, PC based controls. With over 10 years of PC based controller experience, EPSON has combined industry leading PC based controls with superior real time motion and I/O control to provide advanced motion control and open architecture expandability. The RC620+ is capable of controlling up to 4 SCARA robots, 3 Six Axis robots or 2 SCARA and 2 Six Axis Robots...Up to 20 axes total..ALL FROM ONE CONTROLLER.

The high performance RC620+ controller has 3 PCI slots available for options such as Vision Systems, Fieldbus masters or third party plug-in cards to expand the RC620+ controller as needed for particular applications. The powerful RC620+ runs a separate CPU dedicated to motion control and real time options including additional I/O, conveyor tracking, expansion I/O and Fieldbus options such as DeviceNet, Profibus, EtherNet/IP and CC-Link. This gives users the best of both worlds with the open architecture, ease of use and expandability of Microsoft Windows while also providing real time performance for time critical components such as motion and I/O control.

System Configuration

The EPSON RC620+ adds to EPSON's initiative of providing our customers with more Power of Choice than ever before. It is the controller of choice for those applications that require a powerful open architecture solution (for system expansion), and advanced motion and I/O control (for demanding application performance).



OPTIONS

- Vision Guide 6.0
- Smart Cameras
- Code Reading
- VB Guide 6.0 (.Net support)
- Conveyor Tracking
- GUI Builder Software
- Additional Axis Control (Pulse Generating Board)
- Teach Pendant
- Fieldbus I/O (Slave & Master) (Ethernet I/P, DeviceNet, Profibus, CC-Link)
- Expansion Discrete I/O
- RS-232C Ports
- Security / Audit Log Option
- External Control Point Motion
- Solid State Drive
- RAID Hard Drive Redundancy
- DVD RW Drive

Supported Robot Models:

- G & RS Series SCARAs
- C3 and Pro Six 6-Axis
- EZ Modules

The RC620+ Controller has custom Real-Time option slots as well as open architecture PCI bus option slots.

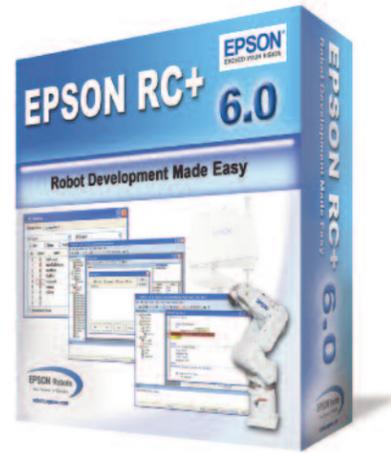
- A maximum of 4 boards can be installed into the real time option slots including: Fieldbus I/O (slave), Expansion I/O, RS-232C, Pulse Generating and Conveyor Tracking.
- A maximum of 3 boards can be installed into the PCI slots including: Fieldbus I/O Master, Vision and other 3rd party boards.



300+ robot models

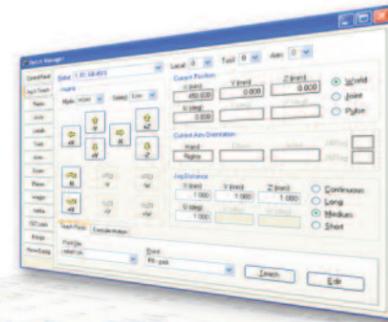
EPSON RC+ 6.0

- 32 Tasks and 16 background tasks
- Powerful Editor with color coded syntax checking
- Syntax Assist with drop downs
- Integrated Debugger with breakpoints, watch variables, and more
- Wizards, point and click setup
- Robot manager for setting up robot parameters
- Project Explorer for easy access to all robot project files
- Powerful SPEL+ language (450+ commands/statements)
- Point Editor, point labels, I/O Monitor, I/O Labels and Error Labels



Industry Leading Ease of Use

EPSON RC+ leads the industry in ease of use. Customers tell us how they love features such as our Jog and Teach dialog to jog 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 color based editor with features like syntax assist and keyword autoformat. Our integrated debugging tools allow multiple breakpoints and watch variables to be set, you can see the value of a variable by simply placing the mouse over the variable when program execution is paused, and much much more. Add to that a full set of configuration dialogs, integrated wizards and our integrated help system that is loaded with useful tips, explanations and examples and we still have only just scratched the surface of some of the features available with EPSON RC+.



Powerful Development Environment

The EPSON RC+ 6.0 development environment provides powerful tools that are easy to use. Features such as the integrated debugger, task manager, macros, smart builds, integrated wizards, syntax assist, dry run and a whole host of setup and configuration dialogs are all included to save Robot workcell developers time by simplifying many aspects of their development activities.

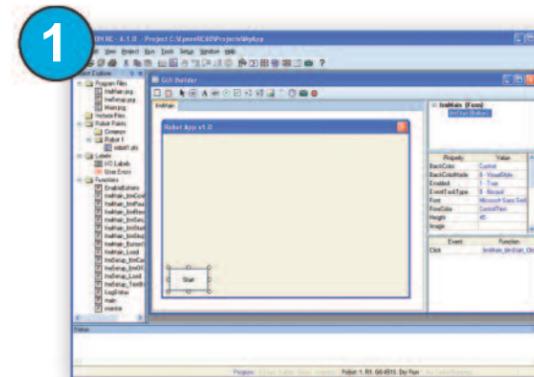
Standard features such as 32 task multi-tasking, integrated source level multi-task debugger, color syntax checking editor, control of multiple robots from one controller, variable data types and language expandability through user DLL's help make EPSON RC+ the control system software of choice for even the most advanced users. Easy development combined with the ability to program and control multiple robots and additional axes makes the RC620+ an ideal robot workcell controller. The power and flexibility of an open architecture PC and Microsoft Windows combined with the ease of use and expandability of EPSON RC+ makes the EPSON RC620+ controller a high performance and value oriented factory floor motion control solution.

EPSON GUI Builder

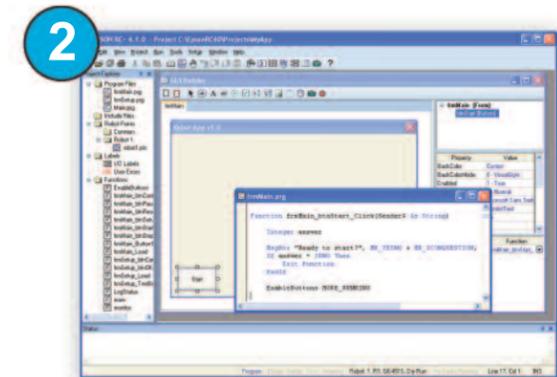
GUI Builder allows the easy creation of graphical user interfaces from within the popular EPSON RC+ Development Environment. It is ideal for users that need a simple GUI and do not want to use a third party product such as Visual Studio. Even users that have never created a GUI before can easily make one with GUI Builder. Shown below are some of the features supported in the GUI Builder 6.0 package:

- Complete integration within the EPSON RC+ environment for easy design, debugging and display at runtime. No third party tools are required.
- Create and debug GUI forms from within your EPSON RC+ project
- Form and control events are executed as SPEL+ tasks. You can specify whether these tasks run in Normal, NoPause, or NoEmgAbort modes.
- Several standard controls are provided including: Button, Label, TextBox, Radio Button, CheckBox, ListBox, ComboBox, Timer, LED (for I/O status), VideoBox (for vision image display), and more.

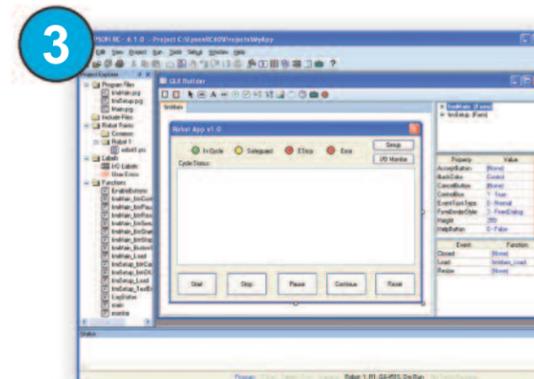
Creating a GUI using GUI Builder is very simple. Here are some dialogs showing the simple steps to creating a GUI with GUI Builder.



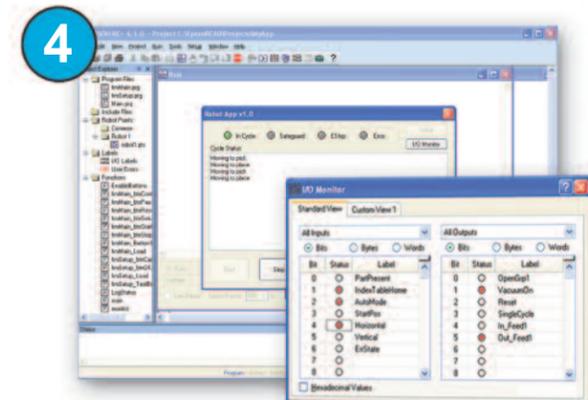
1 Create a new form and put a Button control on the form.



2 Double click the button and the code editor will appear. Add the SPEL+ code you want to execute when the button is clicked from your application.



3 Add more graphical components on your form and associated SPEL+ code as well as additional forms as required for your application.



4 Run the application from the EPSON RC+ Run Window or set to have GUI come up automatically. You can also bring up RC+ dialogs like the I/O monitor shown here.

Multi-Robot Control

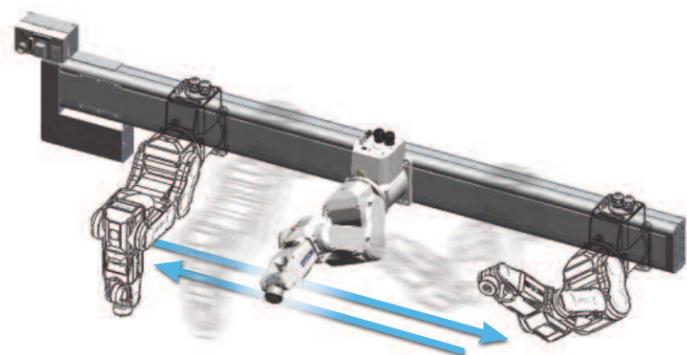
Unlike other robot controllers, the powerful EPSON RC620+ can control multiple robots from one workcell controller thus reducing costs and development time for advanced projects. By housing up to 8 amplifiers inside one box, the RC620+ control unit (CU) can control up to 8 independent single axis robots from a single chassis. It can also control a 6 axis robot with additional slides, (2) 4-axis G-Series SCARA robots, and many other robot combinations from a single RC620+ controller box. The power of the EPSON RC620+ controller doesn't stop there. Even more power and flexibility is provided through the addition of external drive units.

Up to 2 external drive units (DU) can be connected to 1 controller, giving the RC620+ control system the capacity to control up to 20 Axes of motion (2 SCARA, 2 6-Axis Robots). There are 2 configurations of drive units: RC620DU and RC620DU6. Attaching an RC620DU to the RC620+ allows the system to control an additional 4 axes (a single SCARA robot or combinations of EZ Modules). Combining an RC620DU6 to the RC620+ enables the system to control an additional 6 axis robot. Below are illustrations of a few possible RC620+ robot combinations:



Additional Axis with Coordinated Motion

EPSON EZ Modules, SCARA and 6-Axis models all run on EPSON RC620+ controllers and can be easily integrated together. With the ability to control up to 8 axis of coordinated motion, The RC620+ can easily control a 6 Axis robot mounted on top of a single axis EZ Module to expand the work envelope.



Options

Vision Guide 6.0

Vision Guide leads the industry in ease of use for integrated Robot/Vision systems. Vision Guide supports both Multiple Frame Grabber Boards and EPSON Smart Cameras for easy integration. Vision Guide features powerful tools such as Geometric Search, Normalized Correlation, Image Analysis, Polar Search, Bar code reading, Blob tools and much more.



Visual Basic (VB) Guide 6.0

EPSON VB Guide 6.0 provides the power to create sophisticated user interfaces or to connect to 3rd party software/hardware products to make the most out of your EPSON Robot system. EPSON VB Guide provides .NET based tools allowing EPSON Robots to be programmed or controlled through Visual Basic, C++/C# or other .NET based solutions such as LabView for example.



Conveyor Tracking

EPSON Conveyor Tracking supports conveyer belt tracking using a vision system or sensors. Several conveyers can be controlled simultaneously. Built-in configuration wizards help make setup and use a breeze. EPSON's Conveyor Tracking system can be used with any suitable conveyers.



Teach Pendant (TP1)

The EPSON TP1 allows for easy jogging of the robot and teaching of points. It has features to allow the editing and saving of point data, I/O and task monitoring, easy calibration guidance, system history display and much more. The TP1 is fully IP65 compliant and comes with all UL and RIA safety features such as E-Stop, 3 position deadman switch, single point of control, and slow speed control in Teach Mode to name a few.



GUI Builder

GUI Builder is a tightly integrated and easy to use software package which allows the user to create a graphical user interface (GUI) entirely from the EPSON RC+ development environment. Created to build simple GUI's, GUI Builder greatly reduces the effort normally required in building GUI's for robot and automation systems by providing a GUI creation environment entirely from within the EPSON RC+ development environment. See page 5 for more details.



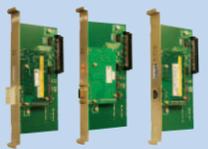
Expansion I/O

Up to 4 expansion I/O boards can be added to an RC620+ controller. Each expansion I/O board provides 32 inputs and 32 outputs for a maximum of an additional 128 inputs and 128 outputs.



Fieldbus I/O (EtherNet/IP, DeviceNet, Profibus and CC- Link)

The 2 types of Fieldbus I/O available with the RC620+ controller are master and slave. Fieldbus I/O enables high speed communication between peripheral devices. EtherNet/IP, DeviceNet, Profibus and CC-Link are networks that provide easy interconnection between control devices and are all supported with single card solutions.



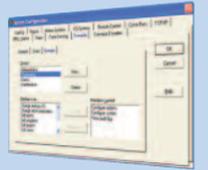
RS-232C – Communication

Additional RS-232C ports can be added to the RC620+ controller to communicate with external RS-232 devices such as scales, bar code readers, or many other devices. A maximum of 2 boards can be installed in an RC620+ controller. With 4 ports per expansion board, a maximum of 8 RS-232C ports are available.



EPSON Security/Audit Log Option

The EPSON Security/Audit Log Option implements a password based access system for EPSON RC+. This allows an administrator to give rights to users at various levels preventing unauthorized users from making alterations to the system. The Audit Log allows you to track how many hours are spent using the system and logs when changes are made.



Additional Axis Control

The EPSON PG motion system is an integrated motion system used to control additional axes. It supports both servo and stepper motors, single or multiple axes. Up to 4 boards with 4 axes each are supported.



External Control Point (ECP) Motion

ECP is a powerful motion profile function that allows datums external to the robot's coordinate system to influence robot motion paths. For example... externally mounting a fixed process dispense unit and allowing the robot to hold a part and maintain path and velocity for the part relative to the fixed dispensing point.



EPSON RC620+ Controller Specifications



PC Based Controller Specifications	RC620+ Controller		
Mounting Options	Desktop, Rack, Floor		
CPU	High Speed 2 Ghz Intel® Core™ Duo		
Memory	1GB Standard, 2GB Max.		
Hard Drive Capacity	120GB		
Controllable Axes	Up to 8 from Control Unit; Up to 6 with each Drive Unit (20 axes maximum)		
Robot Manipulator Control	Robot Control Software and Programming Language	EPSON RC+ 6.0 / SPEL+ (a multi-tasking robot language)	
	Joint Control	Up to 8 joints simultaneous control Software AC servo control	
	Speed Control	PTP (Point to Point) motion: Programmable in the range of 1 to 100% CP (Continuous Path) motion: Programmable	
	Accel/Decel Control	PTP (Point to Point) motion: Programmable in the range of 1 to 100%; Automatic CP (Continuous Path) motion: Programmable	
Position Control	PTP (Point-To-Point control) CP (Continuous Path control)		
Memory Capacity	Maximum Object Size:	8MB	
	Point Data Area:	1000 points (per file)	
	Backup Variable Area:	Max. 400KB (Includes the memory area for the management table.) Approx. 4000 variables (Depending on the size of array variables.)	
Teaching Method	Remote Direct MDI (Manual Data Input)		
External input/output signals (Standard)	Standard I/O	Input: 24 Output: 16	Including 8 inputs, 8 outputs with remote function assigned. Assignment change allowed
Communication Interface (Standard)	EtherNet	1 Channel	
	RS-232C	2 Channels	
Option Slots (Real Time) (Max. 4 slots)	I/O	Input: 32 per board Output: 32 per board	Addition of 4 boards allowed
	RS-232C	4ch per board	Addition of 2 boards allowed
	Fieldbus I/O Slave	PROFIBUS-DP DeviceNet EtherNet/IP CC-Link	Addition of 1 board allowed (1ch per board)
	Pulse Generator	Number of Controlling axes	Addition of 4 boards allowed (4ch per board)
Option Slots (PCI bus)	Frame Grabber	Standard Frame Grabber Advanced Frame Grabber	Addition of 2 boards allowed
	Fieldbus I/O Master	PROFIBUS-DP DeviceNet EtherNet/IP	Addition of 1 board allowed (1ch per board)
Safety Standards	CE Compliance, ANSI/RIA 15.06-1999, UL 1740		
Safety Features	Emergency stop switch, Safety door input, Low power mode, Dynamic break, Encoder cable disconnection error detection, Motor overload detection, Irregular motor torque (out-of-control manipulator) detection, Motor speed error detection, Positioning overflow-servo error-detection, Speed overflow-servo error-detection, CPU irregularity detection, Memory check-sum error detection, Overheat detection at the Motor Driver Module, Relay Detection, Over-voltage detection, AC power supply voltage detection, Temperature error detection, Fan error detection		
Power Source	AC 200 V to AC 240 V Single phase 50/60 Hz		
Maximum Power Consumption	2.5 kVA (Depending on the robot model)		
Environment	Temperature	5-40 deg C	
	Humidity	20-80% (no condensation)	
	Standards for Environment	RoHS	
Weight	4 axes spec	22.5 kg	
	6 axes spec	24.5 kg	
	8 axes spec	25.5 kg	
Dimensions (mm)	489(w) x 420(d) x 212(h)		
Options	Vision Guide, VB Guide, Conveyor Tracking, Teach Pendant, GUI Builder, Drive Units, Expansion I/O, Fieldbus I/O (EtherNet/IP, PROFIBUS-DP, DeviceNet & CC-Link), RS-232C, Security, PG Motion System, ECP Motion		
Available Robots	SCARA: G-Series, RS-Series Six Axis: Pro Six Series, C-Series & S-Series Linear Axes: EZ Modules		

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