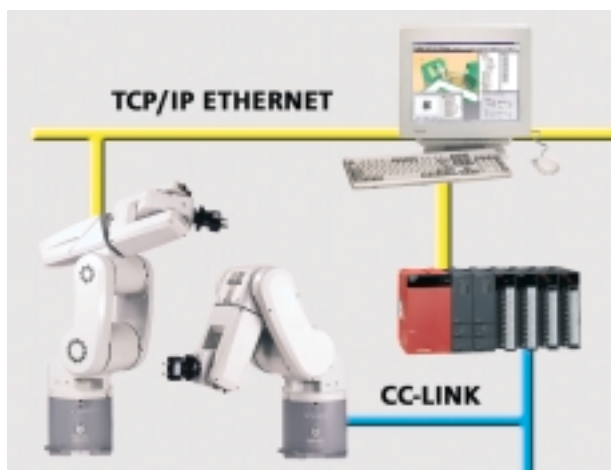


**MELFA-
Robots:
RV-A
RH-AH
RP-AH**

**Unfailing Quality
and Precision Handling**

MELFA Industrial Robot Systems – High-precision Automation Solutions



***One possible network
connection
configuration for
MELFA robots***

Modern automation technology from Mitsubishi Electric is one of the driving forces behind technical progress and commercial success all over the world. Since 1978 small-scale Mitsubishi robots have been installed in over 30,000 industrial applications in many different fields.

Mitsubishi is now one of the leading manufacturers of small robots. In Europe the company markets SCARA robots with handling payloads of up to 10kg, and articulated-arm robots with 5 and 6 degrees of freedom (DOF) and handling payloads of up to 5kg.

***Example of a SCARA
robot application for
placing, soldering and
assembly in a
manufacturing plant for
mobile phones***

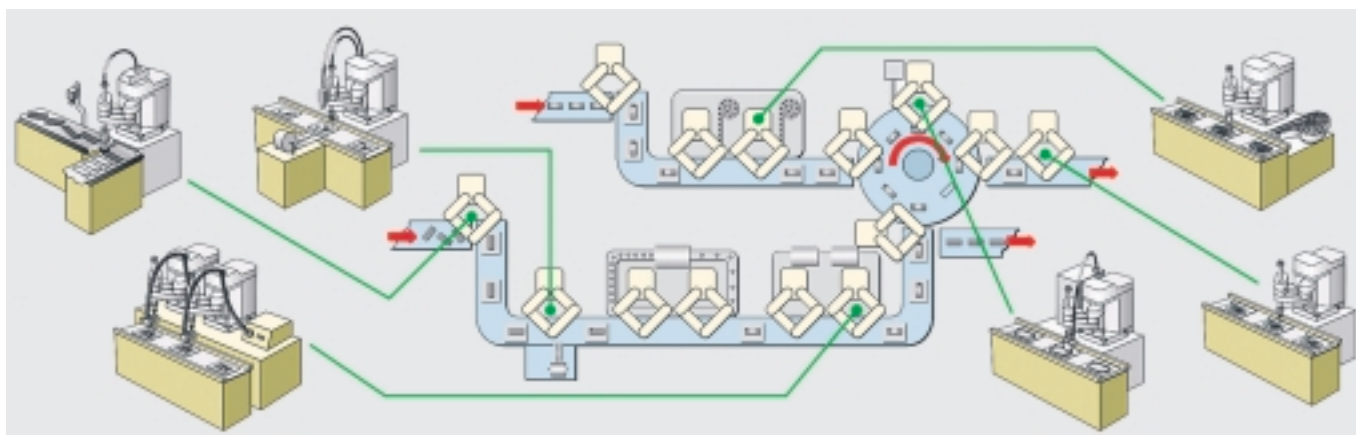
Our customers include top companies in all branches of industry. Maximum reliability is always the top priority for our robots, no matter whether they are used in simple handling operations or the highly-complex applications of car manufacturers and their high-tech suppliers. Whatever the job, you can always depend on the reliability of Mitsubishi robots.

Other typical applications for these robots include manipulation of components and tools, quality control, placement and installation of small and miniature parts and handling tasks in medical and laboratory environments.

The robot programming language MELFA BASIC IV is powerful yet easy to learn, ensuring that users can start producing their own powerful and efficient robot programs in a very short time. Those who prefer systems that are ready to run can have a turnkey solution made for them by one of our automation partners, who have many years of experience

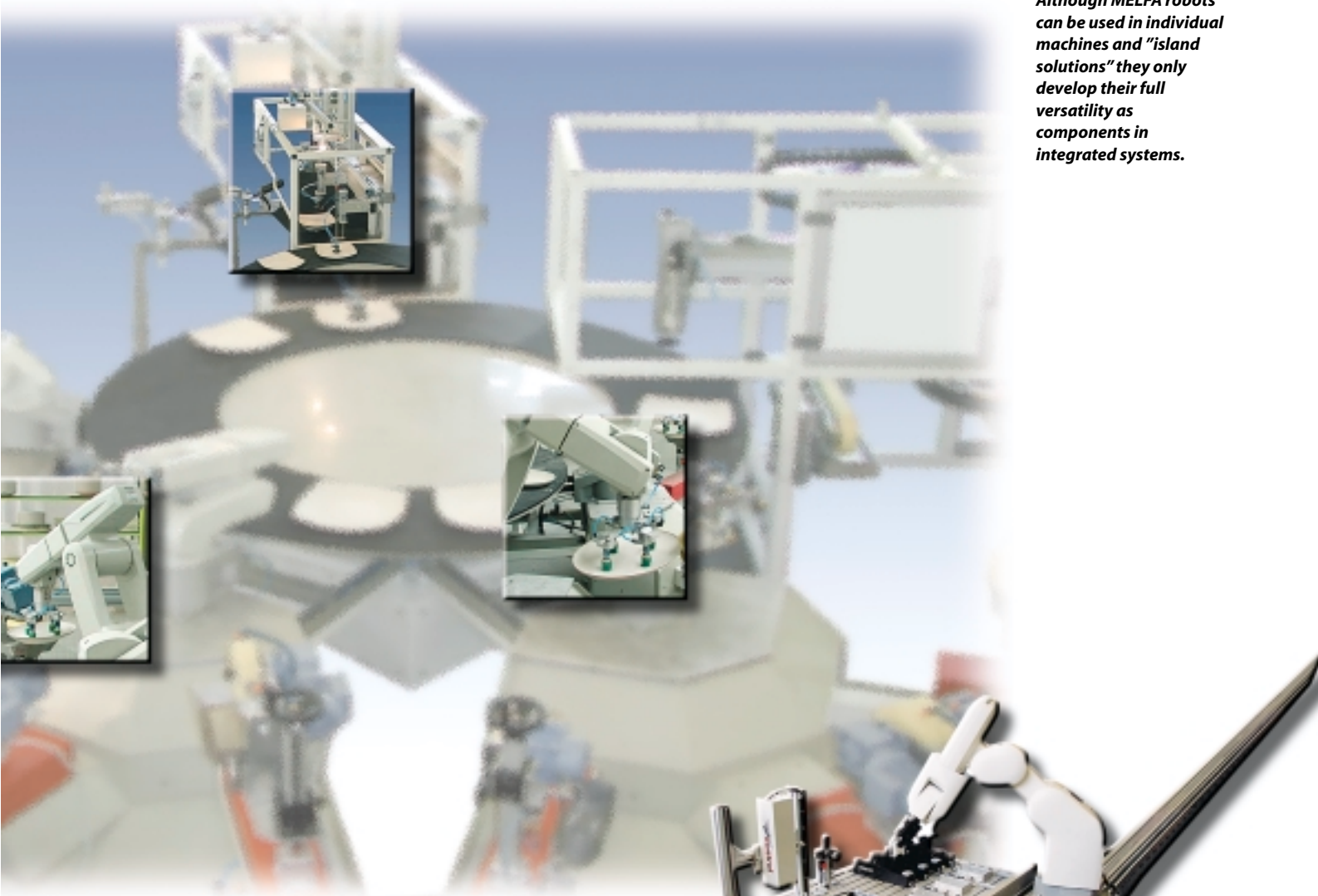
in the development of tailor-made production systems geared to clients' precise needs and wishes.

When you choose a robot from Mitsubishi you get a tried and tested product that



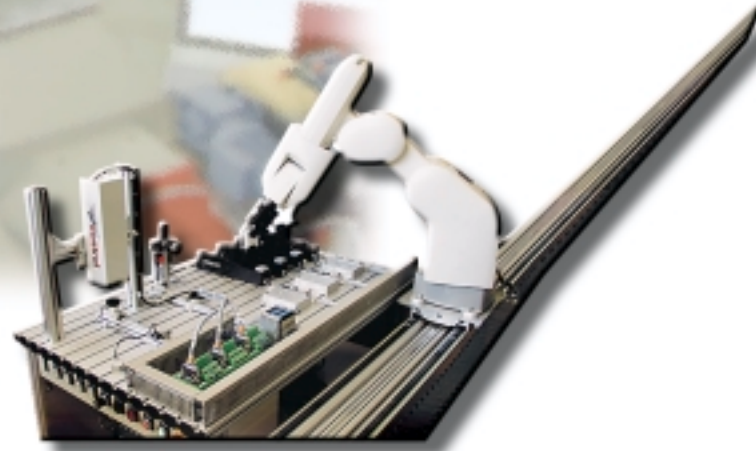
Industrial Robot Systems

Although MELFA robots can be used in individual machines and "island solutions" they only develop their full versatility as components in integrated systems.



has proved itself over and over again in demanding industrial environments. A product that you can depend

on to deliver outstanding performance in your application.



The robot's work space can be expanded by installing it on a linear travel axes. This adds a linear degree of freedom, radically enlarging the robot's reach and the scale of the system it can serve.



The MELFA Concept– Innovation in Movement



The compressed air and signal inputs are conveniently located near to the ISO 9409-1 gripper mounting flange.

For years, Mitsubishi robots have been demonstrating the power and productivity of their innovative technology in thousands of demanding applications.

These robots are now in service in virtually all branches of the motor industry and its suppliers, and also in medical, education and training applications. With their powerful controllers they provide cost-effective, reliable and easily-installable

Signal, power and compressed air connection of the SCARA robots



► *Compressed air and signal inputs of the RV-1A/2AJ*

►► *Gripper mounting flange (ISO 9409-1-31.5 standard)*

►►► *Gripper mounting flange of the SCARA robots*

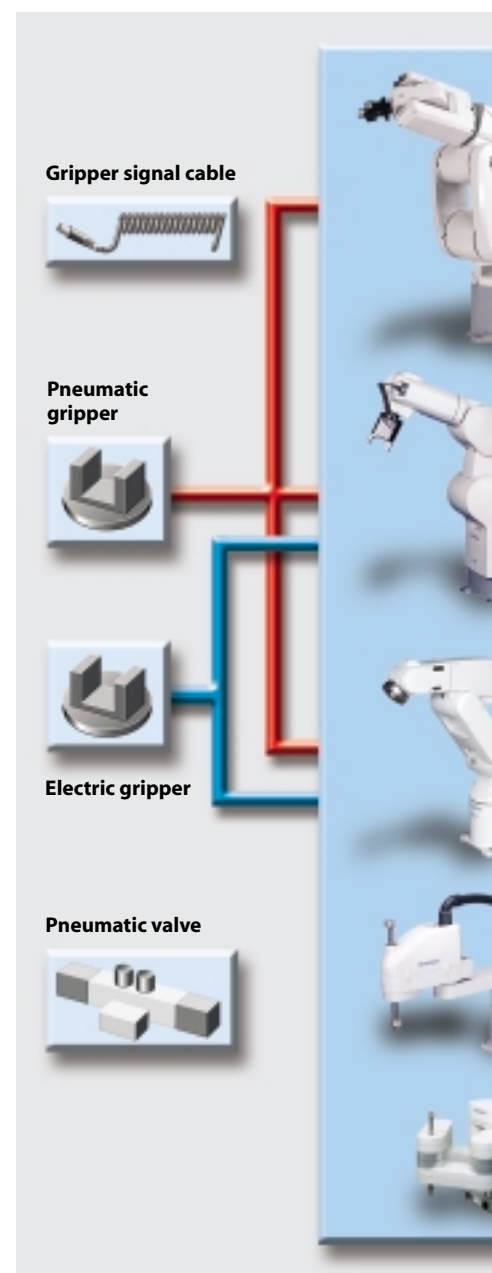


solutions for everything from simple tool and component handling tasks to complex applications in which the entire system is controlled by the robot.

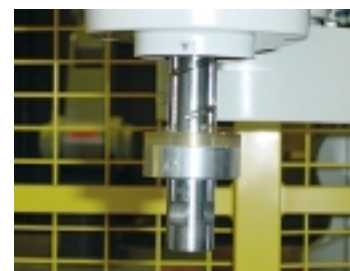
Mitsubishi's compact, 5-Joint closed link robot is the only one of its kind in the world, and it shines with an installation footprint no larger than an A5 sheet of paper and repeatability of $\pm 0.005\text{mm}$. This accuracy, combined with a cycle period of just 0.28s, predestines it for use in precise component placement applications.

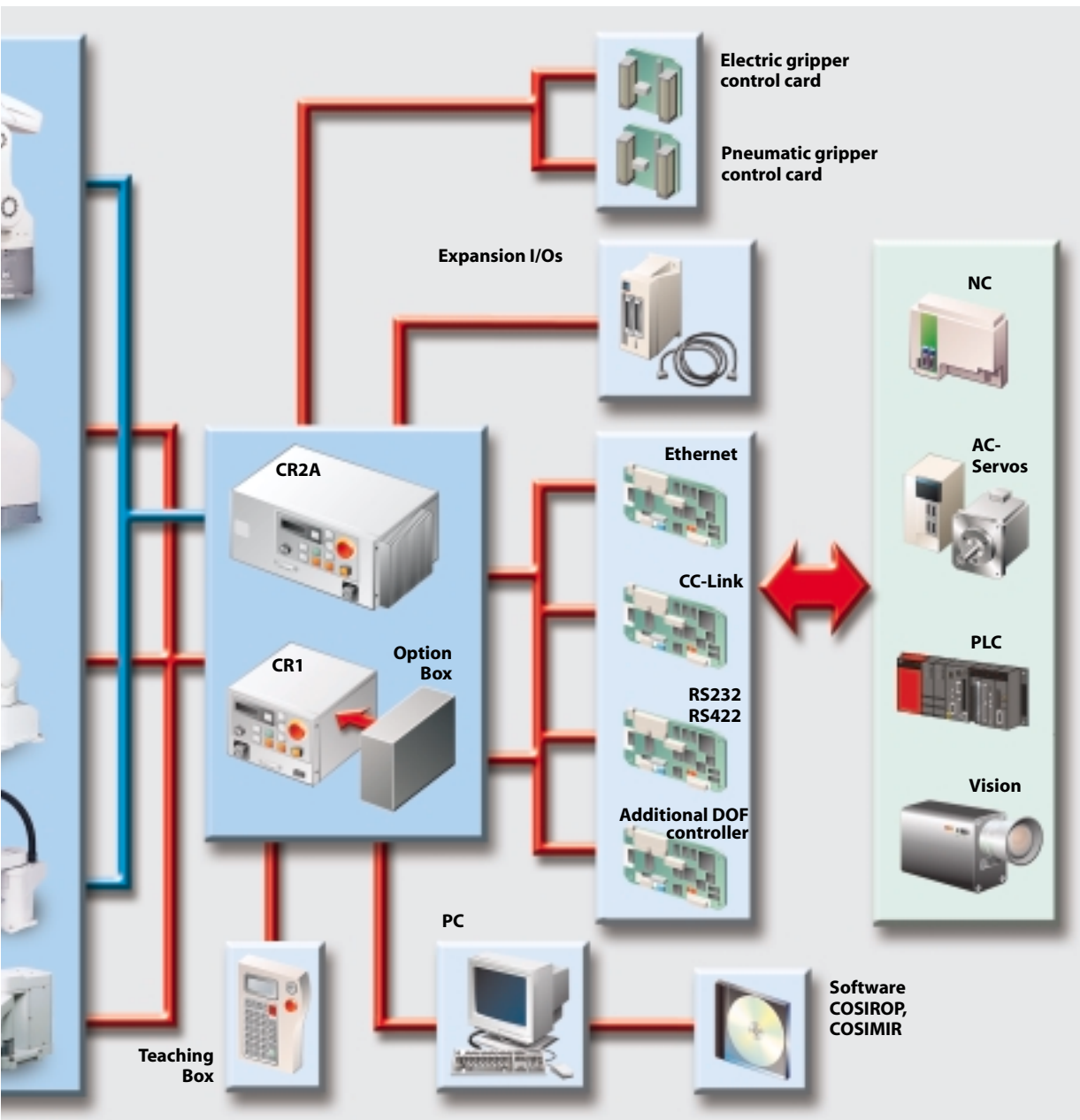
The individual joints and axes of the robots are powered by high-precision AC servo motors coupled with play-free Harmonic Drive gears. Absolute position encoders are fitted to every motor, saving time by enabling the robot to start work as soon as it is powered up.

The robot controllers are equally small and compact. With dimensions close to those of a standard PC they can be installed in the most cramped environments without taking up valuable production space. Their multitasking operating system and the powerful MELFA BASIC programming language make it easy to use



them to control other system components. For example, the language instruction set also includes simple commands for the integration of cameras for object identification.





Quality requirements are becoming more exacting every day, and as a result Mitsubishi robots in quality control applications are often in operation round the clock, seven days a week – yet another demonstration of the quality and reliability of Mitsubishi robots under the most demanding conditions. Festo Didactic, one of the world's leading suppliers of training applications, has

already been using Mitsubishi robots in its training systems for years. Thousands of students and trainees have already learned to appreciate the capabilities of Mitsubishi robots on these systems. Mitsubishi is committed to the ongoing development and improvement of its robots, to ensure that they continue to earn the confidence of our customers in the future.

Signal, power and compressed air connection of the articulated-arm robots



MELFA Industrial Robot Systems – A Model Range for All Needs



reconfiguration of production systems.

Do you need the speed and high precision of the robots of the RP series? The assembly and product placement capabilities of the RH series of SCARA robots? Or the great versatility of the 5 and 6 DOF robots of the RV series? Whichever product you choose, you always get a system designed from the ground up for continuous operation, that will perform its work reliably 24 hours a day, 7 days a week.

Or does your application impose extreme precision, speed and reach requirements? Robots from Mitsubishi Electric are the solution to all these problems, and more.

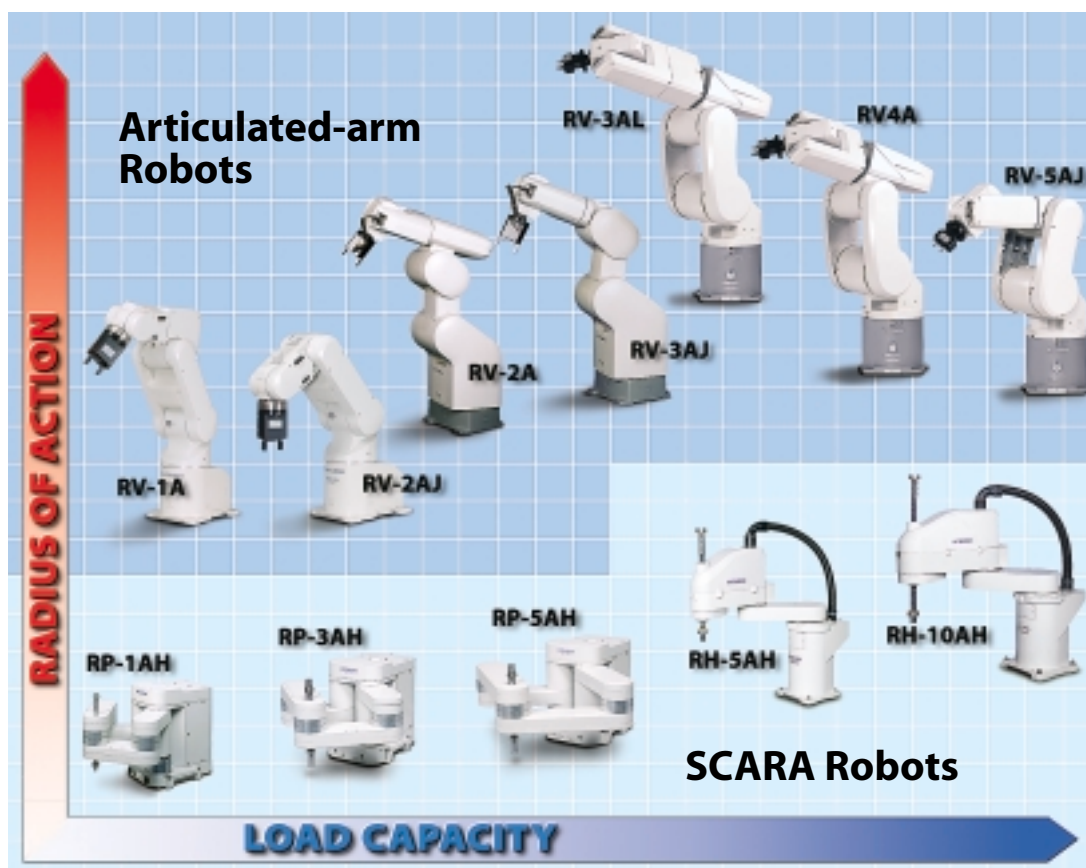
A comprehensive range of products

The MELFA line includes a broad selection of robot models and versions. This

family of products is designed to meet all the needs of most industrial applications, and they also provide the extreme flexibility required for quick

The MELFA range of robots has everything you need. They are available in a wide variety of configurations and performance classes:

- From SCARA to articulated-arm robots
- From 4 to 6 degrees of freedom
- From 1kg to 10kg handling payloads
- From 150mm to 843mm action radius



RV-2AJ/RV-1A Articulated-arm Robots – The Powerful Compact Class



The combination of small dimensions and a reach of around 400 mm make these two 5 and 6 DOF robots very popular in applications calling for compact robots that can be installed right next to or even in the system they are serving. They are predestined for handling tasks involving the removal and/or placement of small components. Other applications include quality control and sample handling in laboratories and medical facilities.

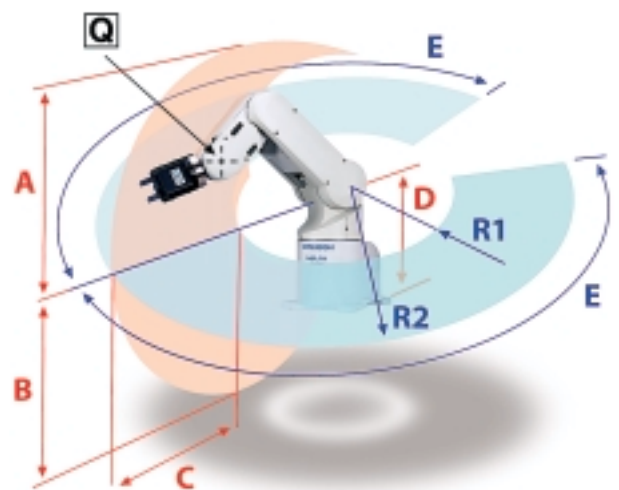


*The degrees of freedom
of the RV-2AJ and RV-1A
robots*



Component handling can be performed with a single electric gripper or up to two pneumatic grippers. Pre-installed pneumatic hoses in the robot arm make connection of the compressed air for the grippers quick and easy.

Model	RV-2AJ	RV-1A
Degrees of freedom	5	6
Maximum payload	2 kg	1 kg
Gripper flange reach	410 mm	418 mm
Repeatability	±0.02 mm	±0.02 mm
Max. speed	2,100 mm/s	2,200 mm/s
Controller type	CR1	CR1
Pick and place (cycle period in mm)	1.1 s	1.2 s
Reach (from Q/mm)	A 410, B 285	A 418, B 308
Reach (from Q/mm)	C 190, D 300	C 211, D 300
Reach (from Q/deg.)	E 150	E 150
Reach (from Q/mm)	R1 220, R2 410	R1 207, R2 418
Robot weight	17 kg	19 kg



RV-3AJ/RV-2A Articulated-arm Robots – The Reliable Mid-range Solution



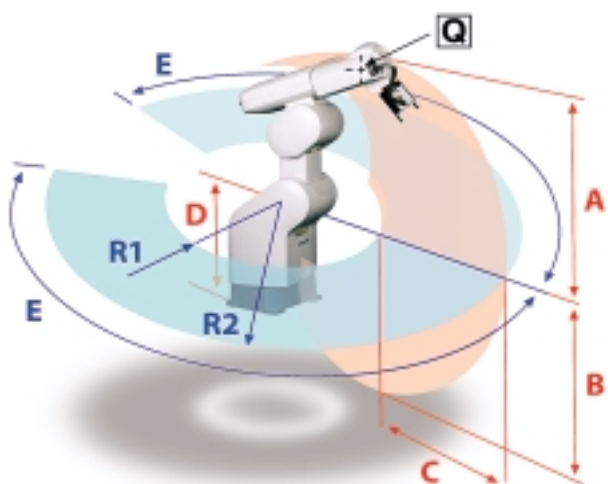
*The degrees of freedom
of the RV-3AJ and RV-2A
robots*

Typical applications for these two robots include handling samples for analysis instruments and similar manipulations in other quality control applications. Their slim design and exceptional mobility make it easy to integrate them in test setups and other systems.

Free choice of grippers

The robot can be fitted with one electric gripper or up to two pneumatic grippers, depending on the task at hand. Gripper force is continuously adjustable, making it possible to handle even fragile items safely and securely.

Pneumatic hoses and signal cables are pre-installed in the robot, making gripper connection quick and simple.



Model	RV-3AJ	RV-2A
Degrees of freedom	5	6
Maximum payload	3 kg	2 kg
Gripper flange reach	630 mm	621 mm
Repeatability	±0.04 mm	±0.04 mm
Max. speed	3,500 mm/s	3,500 mm/s
Controller type	CR1	CR1
Pick and place (cycle period in mm)	1.25 s	1.3 s
Reach (from Q) in mm	A 530, B 457	A 521, B 459
Reach (from Q) in mm	C 308, D 350	C 348, D 350
Reach (from Q) in deg.	E 160	E 160
Reach (from Q) in mm	R1 322, R2 630	R1 273, R2 621
Robot weight	33 kg	37 kg

RV-5AJ/RV-4A/RV-3AL Articulated-arm Robots – The Universal High-performance Class



Thanks to their spherical work space and up to 6 degrees of freedom these robots can place,

check or process components in virtually any required orientation. A few simple operations

is all it takes to get a new robot system installed and ready to go. Calibrating the robot takes a matter of minutes, without any of the time-consuming mechanical calibration operations that used to be necessary before first operation; you just have to enter the reference point data recorded for the robot at the factory. The versatile installation options – the robot can be mounted on a floor, ceiling or wall as required (wall mounting limits the J1 axis range) – enables optimum configuration of your system. You can place the robot wherever you want inside, next to or above the system it is serving, without wasting valuable space.



The degrees of freedom of the RV-5AJ and RV-4A robots



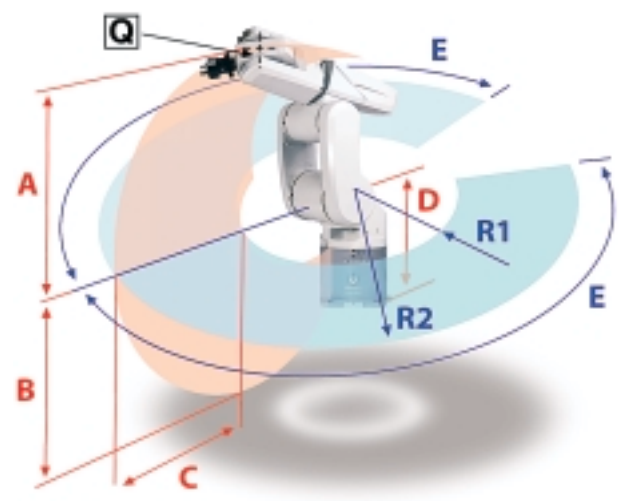
Optimum gripper connections

The pneumatic hoses and sensor signal lines are routed through the robot, with the ends directly next to the gripper mounting flange for easy connection. These lines can supply up to three pneumatic grippers with compressed air.

Special versions

Special clean room class 100 and 10 and long-arm versions of these robots are also available.

Model	RV-5AJ	RV-4A	RV-3AL
Degrees of freedom	5	6	6
Maximum payload	5 kg	4 kg	3 kg
Gripper flange reach	630 mm	634 mm	843 mm
Repeatability	±0.03 mm	±0.03 mm	±0.04 mm
Max. speed	5,700 mm/s	5,800 mm/s	6,000 mm/s
Controller type	CR2A	CR2A	CR2A
Pick and place (cycle period in mm)	0.6 s	0.65 s	0.72 s
Reach (from Q/mm)	A 530, B 472	A 534, B 476	A 743, B 662
Reach (from Q/mm)	C 334, D 321	C 351, D 350	C 540, D 350
Reach (from Q/deg.)	E 160	E 160	E 160
Reach (from Q/mm)	R1300, R2 634	R1283, R2 634	R1303, R2 843
Robot weight	46 kg	50 kg	58 kg



RP-AH SCARA Robots – Outstanding Speed Plus High Precision



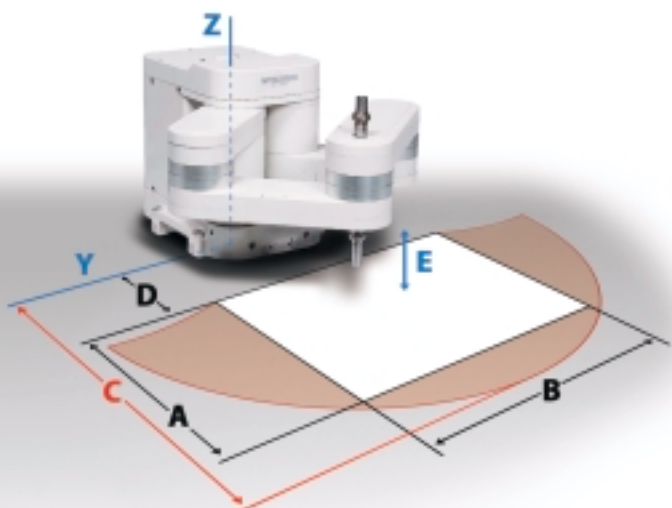
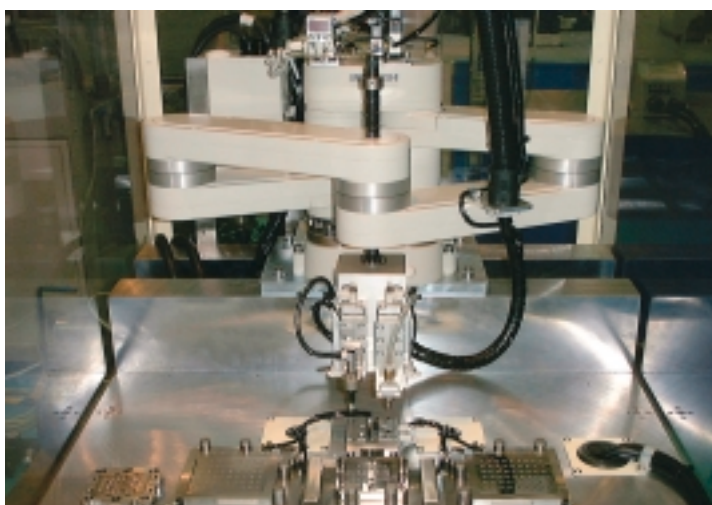
The degrees of freedom of the RP-1AH, RP-3AH and RP-5AH robots

The RP-1AH is in its element in all applications where parts have to be processed quickly and precisely in cramped quarters. It has an installation footprint of just 200 x 160mm and a reach of 236mm, and it can place components with a precision of $\pm 0.005\text{mm}$. This combination of compact dimensions and great precision predestine the RP robots for micro-handling tasks like micro-assembly and the population and soldering of SMD circuit boards for mobile phones. The robots of this series are incomparably more flexible than traditional automated machines, and this pays off in greatly enhanced efficiency and higher productivity.



The RP-3AH and RP-5AH models have handling payloads of 3kg and 5kg and a reach of 335mm and 453mm,

making them ideal for applications requiring more lifting capacity and longer reaches.



Model	RP-1AH	RP-3AH	RP-5AH
Degrees of freedom	4	4	4
Maximum payload	1 kg	3 kg	5 kg
Controller type	CR1	CR1	CR1
Repeatability x/y	$\pm 0.005\text{ mm}$	$\pm 0.008\text{ mm}$	$\pm 0.01\text{ mm}$
Pick and place (cycle period in mm)	0.28 s	0.33 s	0.38 s
A x B (in mm)	105 x 150 (DIN A6)	150 x 210 (DIN A5)	210 x 300 (DIN A4)
C (in mm)	234	332	451
D (in mm)	95	130	170
E-axes travel (in mm)	30	50	50
Robot weight	12 kg	24 kg	25 kg

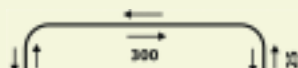
RH-AH SCARA Robots – Specialists for Palletising



SCARA robots are ideal for sorting, palletising and component installation. They have a short cycle period of less than 0.5 seconds for a

movement sequence of 25 mm vertical lift, 300 mm horizontal traverse and 25 mm vertical lower and return (the 12" test).



Model	RH-5AH55	RH-10AH85
Degrees of freedom	4	4
Maximum payload	5 kg	10 kg
Controller type	CR2A	CR2A
Gripper flange reach	von 198 bis 550 mm	von 278 bis 850 mm
Axis range in degrees	J1 ±127, J2 ±137	J1 ±140, J2 ±145
Repeatability	±0.02 mm	±0.025 mm
Z-axes travel in mm	200	350
Pick and place (cycle period in mm)	0.48 s	0.52 s
		
Max. speed	5,360 mm/s	5,650 mm/s
Robot weight	19 kg	40 kg

No reference point travel

Travel and position are measured with absolute encoders, so that the robot can start work as soon as it is powered up without wasting time with reference point traverses. In fact, the robot can even resume at the point where it left off after power failures and emergency shutdowns in the middle of a movement sequence. In most cases, this eliminates the need to reset the entire system.



The degrees of freedom of the RH-5AH and RH-10AH robots

Optimum gripper connections

Pneumatic hoses and signal connection lines are routed inside the robot, making it easy to connect grippers and sensors.

Unpack, calibrate, start work

You can start work almost as soon as you have unpacked the robot and installed the arm assembly. You only have to enter the reference point data recorded at the factory, then the robot is ready to execute the first movements.



The Robot Controller – A Compact Switching & Control Package



The convenient Teaching Box is used for manual entry of the working positions of the MELFA robot. It also has functions for testing the entire programmed movement sequence after it has been entered.

The compact, modular robot controller is an integral part of the robot system. It contains the CPU and the power electronics for powering and controlling the robot.

At Mitsubishi Electric "switchgear cabinets" are relics of the past – everything is now packed into a single compact controller. Depending on the robot model either the CR1 controller with a footprint no larger than an A4 sheet of paper or the CR2A controller is used. The powerful control performance is the same in both the smaller and larger versions; the only difference between the two is in the power output stages. No matter which controller you use you always work with the same programming

language – MELFA BASIC IV – and have the same options at your disposal. This transparent compatibility pays off when you need to use different robot types or models when the needs of your application change. The impressive performance specifications of these controllers speak for themselves.

Number-crunching power

A 64-bit RISC processor with DSP provides ample power for 3-D circular and linear interpolation, and for multitasking with up to 32 programs running in parallel.

Gentle joining

The standard "compliance control" function guarantees gentle positioning. This function can be activated and deactivated as required, making it possible to optimise demanding joining and assembly processes, saving wear and tear on both components and robots.

Torque limitation

The torque limitation function for the individual robot axes prevents damage to your delicate products.

Work space limitation

You can define multiple "no-go" areas within the robot's work space that the robot is not permitted to enter, even in teaching mode. This makes it possible to protect the product being manipulated and the robot from dangerous collisions.

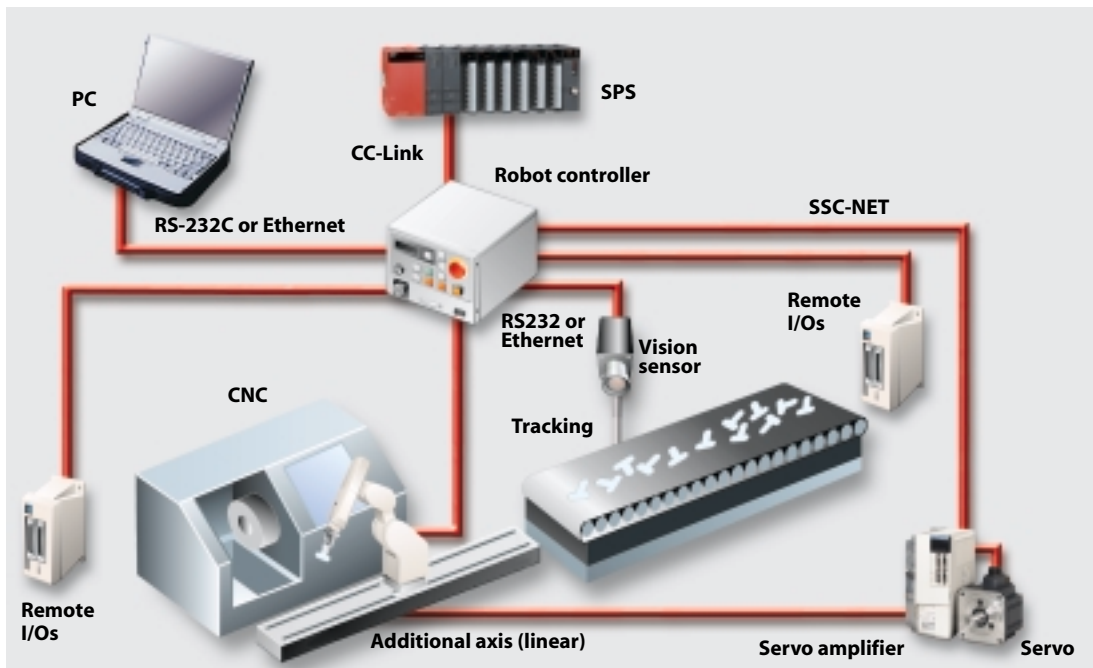
Digital inputs and outputs

In their standard configurations the CR1 has 16 digital inputs and 16 digital outputs, the CR2A 32 digital inputs and 32 digital outputs. Optional remote I/O boxes make it possible to increase this to up to 256 inputs and 256 outputs for complex applications.

Large program memory

The controller can store up to 88 independent programs, all of which can call each other, for example when different program sequences are needed for different products.

Controller type	CR1, CR2A
Control mode	PTP and CP
Processor	64-bit RISC + DSP
Control functions	Axial, linear and 3-D circular interpolation; palletising functions, interrupt control and multitasking
Max. position points	88
Max. Anzahl der Positionspunkte	2,500 per program
Max. program lines	5,000 per program
Internal I/Os	CR1: 16 I/16 O, max. 240 I/240 O CR2A: 32 I/32 O, max. 256 I/256 O
Safety functions	EMERGENCY OFF and door contact switch
Power supply	207-253V AC, single-phase
Max./normal power consumption	3.5kVA/0.9kVA
Outside dimensions (W/H/D in mm)	CR1: 212/166/290, CR2A: 430/200/400

*Example of a robot
system configuration*


Enhanced path precision

Applications like laser cutting and welding require extreme path precision. An enhanced path precision function for applications like this can be switched on and off as required.

Expansion options for your applications

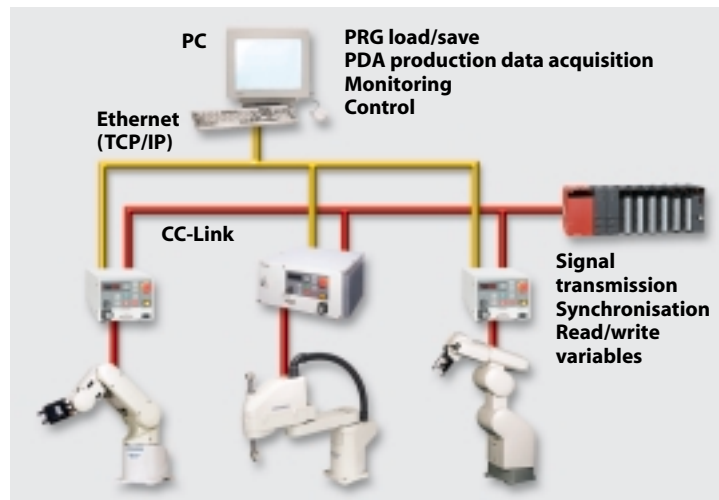
You can expand the robot and add features required by your applications with expansion cards that plug into slots in the controller, similar to the expansion cards in a personal computer.

Control for additional axes

The controller can handle up to 8 additional axes, in addition to the robot's own axes, and up to 2 of the additional axes can be interpolated with the robot.

Ethernet link

The Ethernet link with the standard TCP/IP protocol provides for fast communication between the robot controller and a PC or sensors. You can also connect a camera with an Ethernet


*Example of a network
connection
configuration*

Master function directly to the robot controller for the realisation of guided actions. One of the highlights of this communication facility is the ability to implement real-time robot control with immediate robot movements in response to the data from the sensors.

RS232, RS422/485, tracking

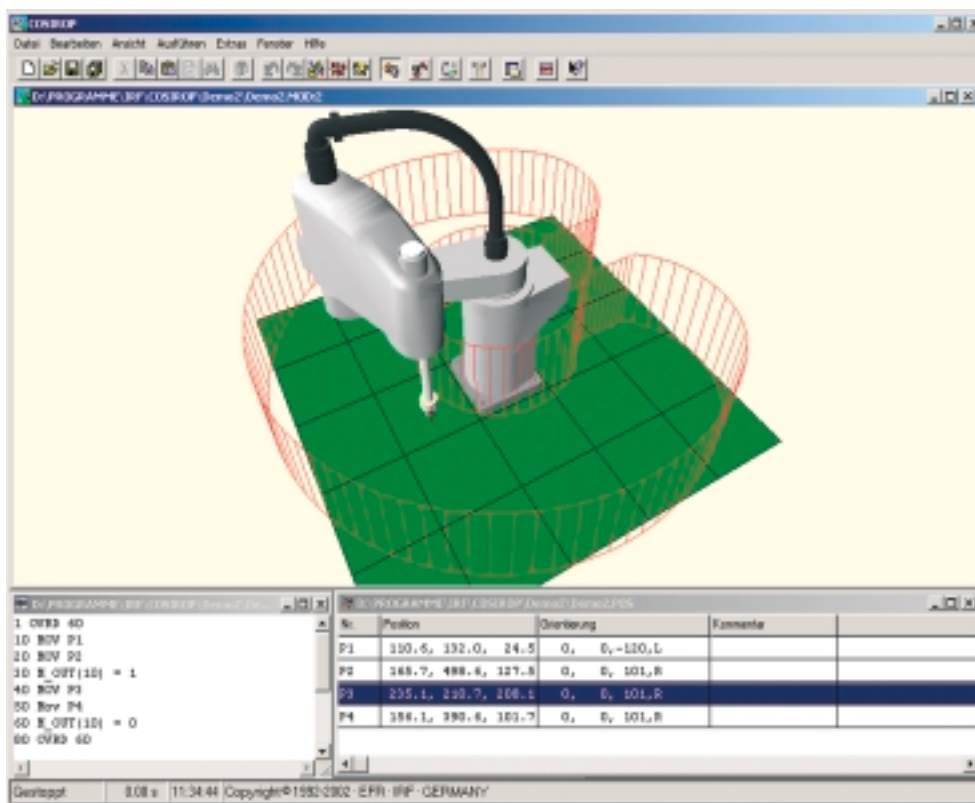
This expansion card provides several serial communications options for the connection of peripherals and two encoder inputs for the registration of conveyor belt speeds. In combination with the corresponding integrated

system functions these encoder inputs allow the implementation of a "tracking" function, with which the robot can synchronise with the conveyor belt and process products while they are in motion.

CC-Link and high-speed I/O network

This option provides a large number of virtual I/Os, for example for communication between several robots or connection of a PLC via a simple twisted-pair line.

COSIROP – Programming Software for the Real World



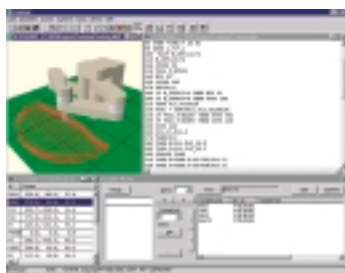
While the programs are being executed you can monitor and visualise the robot with the help of COSIROP's comprehensive control and diagnostics functions. The real-time axis speeds and motor currents are displayed clearly, together with the statuses of all the robot's inputs and outputs. Live monitoring facilities for all the programs executed by the controller enable you to track down program errors quickly and reliably.

COSIROP also provides tools for program archival and for backing up the robot's parameters and settings.

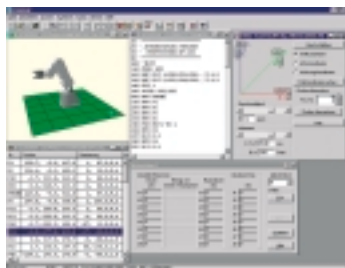
Other useful functions include:

- Online "teach-in" function for robot positions
- Position display on a 3-D representation of the robot
- Syntax checking
- I/O monitor
- Variable monitor
- Online command execution
- Error diagnostics
- Position editor
- Project management

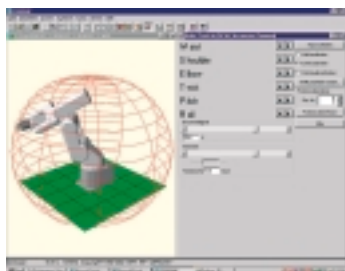
Variable monitor for program checking



Online position definition and motor current monitoring



Online-Teach-In function with single-axis mode



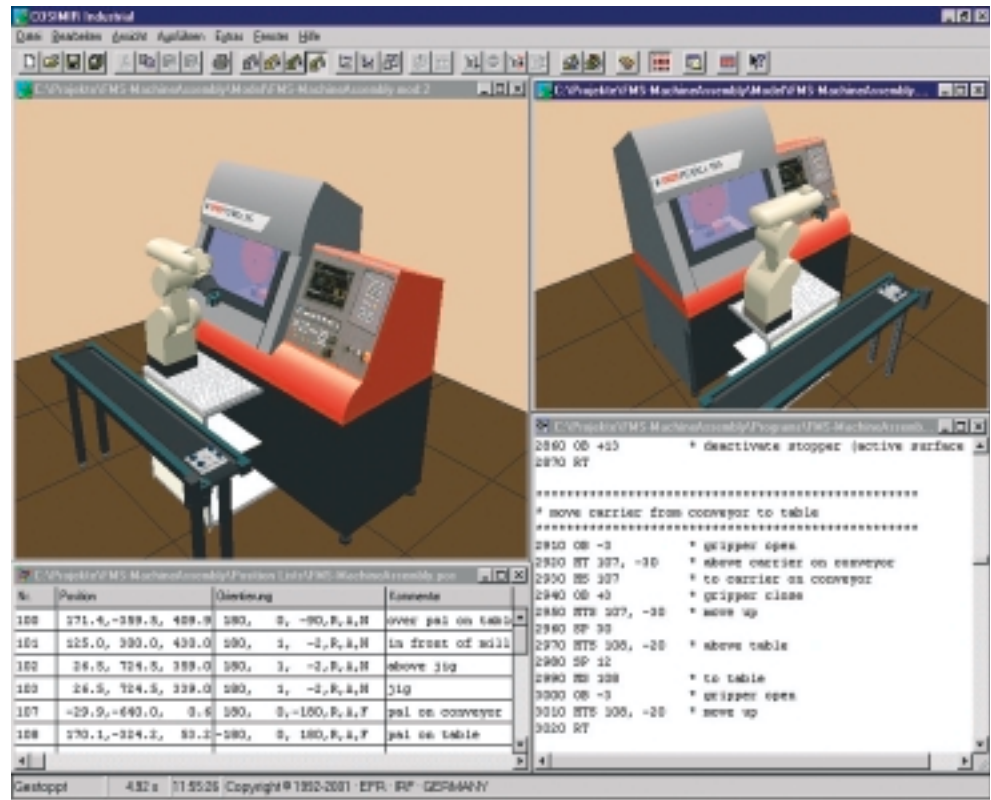
A powerful robot programming language needs an equally powerful programming environment. COSIROP is the programming environment for all Mitsubishi robots. It allows you to create robot programs in minutes using the MELFA BASIC IV or MOVEMASTER COMMAND robot programming languages. After testing and optimising your program you can then transfer the program to the actual robot with a couple of mouse clicks, via an efficient direct network or serial link between the PC and the robot.

COSIMIR® Industrial – Integrated Simulation and Programming Software

The COSIMIR® 3-D robot simulation system can simulate entire work cells, i.e. systems including both the robot itself and its interaction with its environment. In addition to the entire program of Mitsubishi robots COSIMIR® also supports a broad spectrum of automation equipment including material flow control systems, a variety of sensors and actuators and so on – the automation components you use to create production systems to meet the needs of your application.

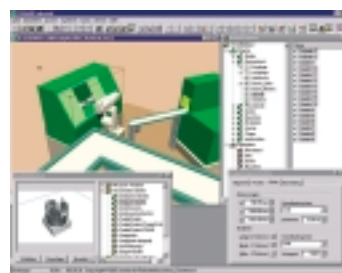
The powerful tools of the COSIMIR® package help you throughout the planning, programming and test phases. Reachability checks in the early planning stages help you to select the most suitable robot systems for the task. You can move the robots and other work cell components around in the simulation at will, making it easy to optimise the layout of your system.

COSIMIR® uses the native robot languages (MELFA-BASIC or Movemaster Command) to program the robots within the simulation environment. This means that no additional conversion or processing steps are required when you transfer the resulting programs to real robots. In addition, this enables you to use the familiar robot languages and all your existing know-how and skills when you are working with the simulation. The comprehensive online



help system is always available when you need support with the formulation of the necessary syntax. After creating your robot programs you can test them directly in the simulation environment, eliminating the need to remove the actual work cell from the production process for testing.

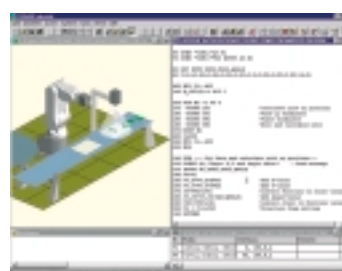
The COSIMIR® and COSIROP packages are powerful tools for achieving maximum efficiency and cost-effectiveness in the configuration and operation of robot-supported automation solutions, and they allow you to plan and operate your systems with a very high degree of confidence.



**The Model Explorer
simplifies object
management**



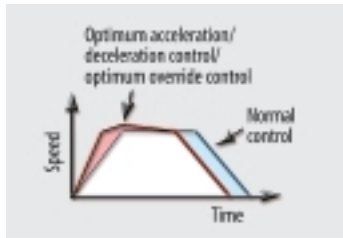
**You can open any
number of view
windows**



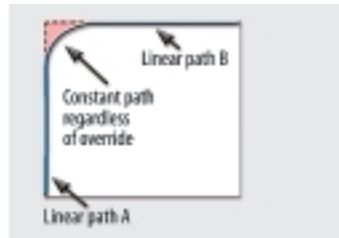
**Program execution
monitoring in the
simulation**

MELFA Robot Systems – Practical Functions for all Applications

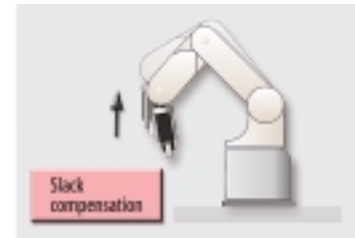
All MELFA robots feature a large number of advanced integrated system functions that enable you to adapt and optimise their performance for the specific needs of your applications.



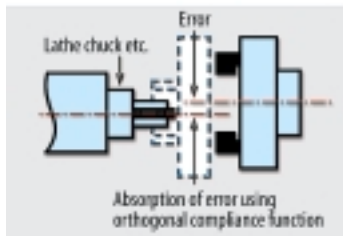
Automatic acceleration and braking ramp optimisation for faster cycle times



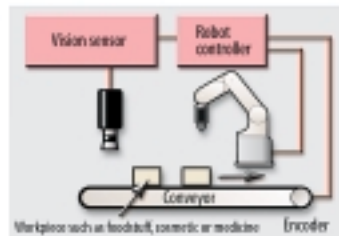
Continuous Path function for faster cycle times



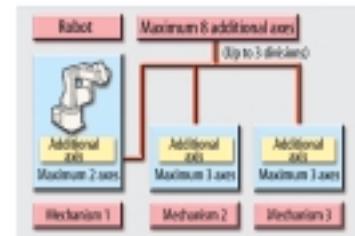
Gravity compensation for greater positioning and palletising precision



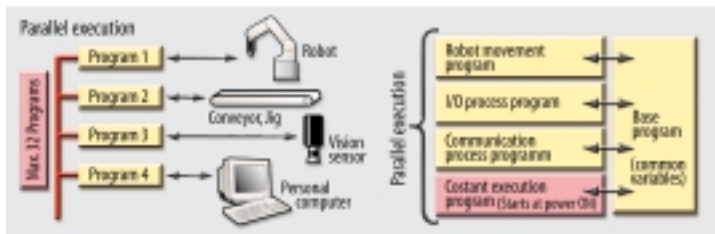
Orthogonal "compliance control" function for interactive response to opposing forces



Object tracking function for faster cycle times



Control functions for up to 8 additional axes



Multitasking function for parallel execution of multiple tasks

EUROPEAN HEADQUARTERS

MITSUBISHI ELECTRIC EUROPE B.V.
Gothaer Straße 8
D-40880 Ratingen
Phone +49 (0) 21 02/4 86-0

MITSUBISHI ELECTRIC EUROPE B.V.
Via Paracelso 12
I-20041 Agrate Brianza (MI)
Phone +39 (0)39 6053 1

MITSUBISHI ELECTRIC EUROPE B.V.
Carretera de Rubí, 76-80
E-08190 Sant Cugat del Vallés
Phone +34 (93)565 31 31

MITSUBISHI ELECTRIC EUROPE B.V.
25, Boulevard des Bouvets
F-92741 Nanterre Cedex
Phone +33 (0) 1 55 / 68 55 68

EUROPEAN REPRESENTATIVES

GEVA GmbH
Wiener Straße 89
A-2500 Baden
Phone +43 (0) 2252 / 85 55 20

GETRONICS NV/SA
Pontbeeklaan 43
B-1731 Asse-Zellik
Phone +32 (0) 2 / 4 67 17 51

INEA CR d.o.o.
Drvinje 63
HR-10000 Zagreb
Phone +385 (0) 1 / 3 66 71 40

AutoCont Control s.r.o.
Nemocnicni 12
CZ-70200 Ostrava 2
Phone +420 (0) 69 / 6 15 21 11

Louis poulsen
Geminievej 32
DK-2670 Greve
Phone +45 (0) 43 / 95 95 95

Beijer Electronics OY
Ansatie 6a
FIN-01740 Vantaa
Phone +358 (0) 9 / 88 67 75 00

Meltrade Automatika Kft.
55, Harmat St.
HU-1105 Budapest
Phone +36 (0) 1 / 2 60 56 02

MITSUBISHI ELECTRIC
Westgate Business Park, Ballymount
IRL-Dublin 24
Phone +353 (0) 1 / 419 88 00

ILAN & GAVISH Autom. Service
24 Shenkar St., Qiryat-Arie 49513
IL-49001 Petach-Tikva
Phone +972 (0) 3 / 922 18 24

DENMARK

Getronics B.V.
Donauweg 28
NL-1043 AJ-Amsterdam
Phone +31 (0) 20 / 5 87 67 00

Beijer Electronics AS
Teglverksveien 1
N-3002 Drammen
Phone +47 (0) 32 / 24 30 00

MPL Technology Sp.z.o.o.
ul. Sliczna 36
PL-31444ul. Sliczna 36 Kraków
Phone +48 (0) 12 / 632 28 85

ACP AUTOCOMP a.s.
Chalupkova 7
SK-81109 Bratislava
Phone +4 21 (0) 2 52 / 92 22 54,55

INEA d.o.o.
Stegne 11
SI-61230 Ljubljana
Phone +386 (0) 1 / 5 13 81 00

NETHERLANDS

Beijer Electronics AS
Teglverksveien 1
N-3002 Drammen
Phone +47 (0) 32 / 24 30 00

MPL Technology Sp.z.o.o.
ul. Sliczna 36
PL-31444ul. Sliczna 36 Kraków
Phone +48 (0) 12 / 632 28 85

ACP AUTOCOMP a.s.
Chalupkova 7
SK-81109 Bratislava
Phone +4 21 (0) 2 52 / 92 22 54,55

INEA d.o.o.
Stegne 11
SI-61230 Ljubljana
Phone +386 (0) 1 / 5 13 81 00

Beijer Electronics AB
Box 426
S-20124 Malmö
Phone +46 (0) 40 / 35 86 00

ECONOTEC AG
Postfach 282
CH-8309 Nürensdorf
Phone +41 (0) 1 / 8 38 48 11

CBI Ltd
Private Bag 2016
ZA-1600 Isando
Phone +27 (0) 11 / 9 28 20 00

GTS
Darülaceze Cad.No.43A KAT:2
TR-80270 Okmeydanı-Istanbul
Phone +90 (0) 212 / 3 20 16 40

MITSUBISHI ELECTRIC EUROPE B.V.
Travellers Lane
GB-Hatfield Herts. AL10 8 XB
Phone +44 (0) 1707 / 27 61 00

SWEDEN

ECONOTEC AG
Postfach 282
CH-8309 Nürensdorf
Phone +41 (0) 1 / 8 38 48 11

CBI Ltd
Private Bag 2016
ZA-1600 Isando
Phone +27 (0) 11 / 9 28 20 00

GTS
Darülaceze Cad.No.43A KAT:2
TR-80270 Okmeydanı-Istanbul
Phone +90 (0) 212 / 3 20 16 40

MITSUBISHI ELECTRIC EUROPE B.V.
Travellers Lane
GB-Hatfield Herts. AL10 8 XB
Phone +44 (0) 1707 / 27 61 00

TURKEY

MITSUBISHI ELECTRIC EUROPE B.V.
Travellers Lane
GB-Hatfield Herts. AL10 8 XB
Phone +44 (0) 1707 / 27 61 00