

INTELLIGENT ROBOT SOLUTIONS



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FANUC Robotics' Customer Resource Center is committed to the success of our customers. To compete in today's global economy and maximize profits, companies require smooth running manufacturing systems without downtime. Our vast offering of support services in North and South America are designed to ensure our customers' peace of mind when it comes to the operations of their FANUC robots and systems.

fanucrobotics.com/crc

Web Solutions
Technical Phone Support
Training Services
Technical Services
Parts Services



YELLOW SUN....

INTELLIGENT ROBOT SOLUTIONS
FOR THE ALTERNATIVE ENERGY INDUSTRY



YELLOW ROBOTS....



FANUC Robotics is a world leader with over 200,000 robots installed. **FANUC Robotics has 200 + robot models and 700 engineers ready to support its customer base. FANUC Robotics operates in over 80 countries.**

Industry leading motion control

We have the largest robot development organization in North America. This means that when you work with FANUC Robotics you get the most advanced motion control capability including our patented Singularity Avoidance Software.

Blazing speed without compromising precision

No need to compromise precision with a spider-like robot configuration just to get high speed. FANUC Robotics LR Mate® series of robots provides sub 1/2 second pick and place cycles with .0008" repeatability. We also offer our patented iRCalibration™ suite to assure high accuracy over your entire workspace.

Total cell control capability

Eliminate the need for costly PLCs and touch screens. FANUC Robotics' PMC provides PLC like capabilities through the robot controller while our iPendant™ provides the tools so that you can use the teach pendant as your workcell's graphical user interface.

iRVision® – Vision ready robots

FANUC Robotics' iRVision is built into every robot. No third party hardware, PC interfaces or other complications to deal with. Instead you get unmatched integrated vision performance for all of your guidance and error proofing requirements.

Dual Check Safety Software (DCS)

The DCS software option provides the capability to restrict the robot work space to its operating space (Position Check function) and the robot speed to its set speed limit (Speed Check function).

FANUC ROBOTICS WORLD LOCATIONS



LR Mate and iRvision are registered trademarks of FANUC LTD.



YOUR ADVANTAGES



FANUC Robotics' intelligent robots offer alternative energy manufacturers and suppliers a competitive advantage compared to manual processes, hard automation and offshore manufacturing. A combination of the worlds most reliable robots, deepest portfolio of software and controls tools, and the strongest support and integration network helps manufacturers maximize profitability.

Total solutions –
From brick, wafer and module lines for the solar industry to carbon fiber lay-up and trimming for wind energy, FANUC Robotics and our integration partners look at every step in the manufacturing process to optimize your options.

Flexibility –
Our robots are iRvision ready and can be customized easily without extensive development work to meet the wide range of wafer and solar cell handling.

Delicate handling –
Our robots have exceptional positioning accuracy (0.02-0.08mm) for handling delicate products, such as glass covered or laminated modules.



Manufacturing advantages –
FANUC Robotics provides the following key advantages to green technology manufacturers:

- Reduced costs by eliminating costly and inflexible fixed automation
- Quick production startup with proven robotic technologies to bring products to market faster
- The broadest robot product line available
- Optimized overall system throughput with best-in-class speed and performance
- Increased system uptime with unmatched reliability and support
- Complete off-line simulation capabilities with CAD to PATH feature
- Standard iRvision built in to every FANUC R-30iA™ Controller to speed start-up and reduce costs
- DCS software option provides the capability to restrict the robot work space to its operating space, saving valuable floor space



FANUC Robotics offers manufacturers across the entire spectrum of green technologies solutions to their production needs. FANUC Robotics and our integration partners take a comprehensive approach to understanding our customers needs for flexible solutions that meet their current and future requirements.

High speed solar cell and wafer handling
There is no need to sacrifice positioning accuracy or work envelopes with delta-style or SCARA robots. FANUC Robotics' family of high-speed LR Mate 200iC robots offer the work envelope, speed and precision required for solar wafer and cell transfer applications. Combine our reliable robots with FANUC's integrated iRvision and the result is unmatched performance with the most cost-effective package available in the market.

Clean room and harsh environments
Our robots can handle virtually any challenging environment; from clean room robots for thin film applications, to robots that can handle the harsh environments required to clean crucibles. We offer a family of clean room robots that are available for even the most demanding Class 10 applications. Our line of wash-proof robots are specifically designed to handle sand or other airborne particles as well as high pressure backsplash.

Dispensing, laminating, trimming and soldering expertise
No other robotics organization incorporates its process expertise into its robots better than FANUC Robotics. Our DispenseTool software package allows you to dispense single component or 2K beads with precise path control while our Data Monitoring software package assures that the proper amount of material has been dispensed.

Precision panel assembly
Assembling solar panels is a very demanding application. Tolerances as tight as .05mm can be required to assure proper alignment of lenses and to avoid short circuits. Our robots offer best-in-class repeatability, while our iRCalibration software suite assures high accuracy. These technologies combined with the expertise of our staff, and our assembly integrators assure precise and reliable assembly operations.

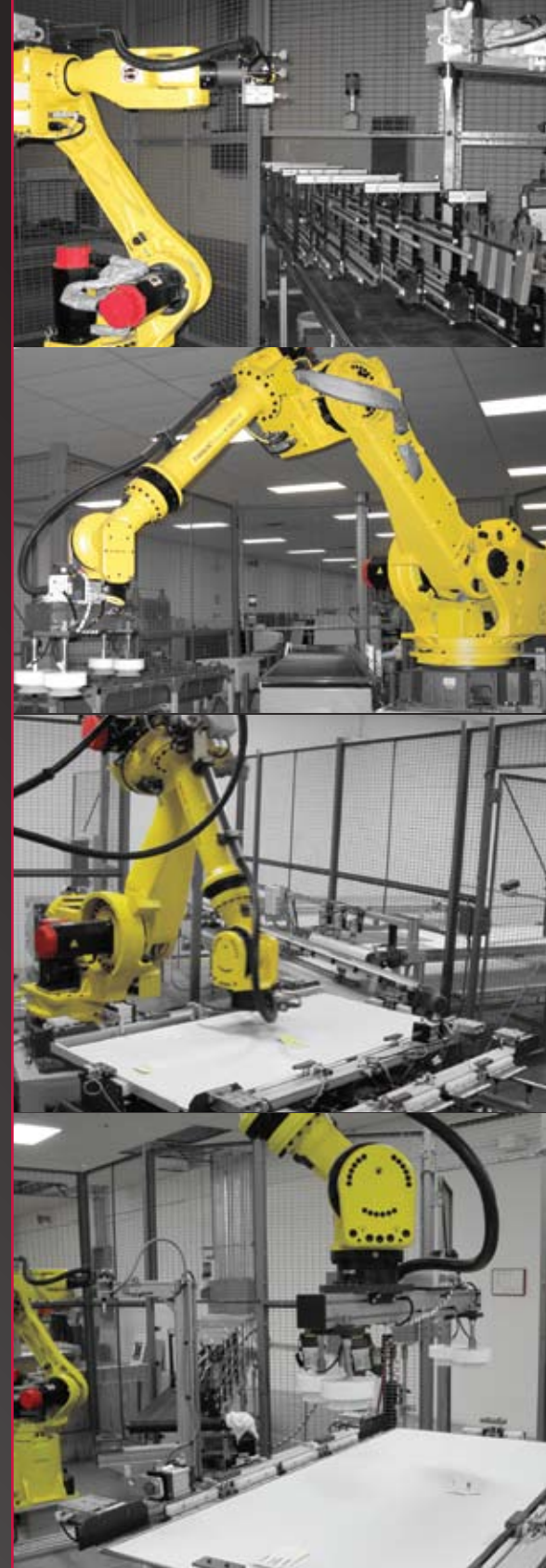
Silicon brick and ingot machine tending
Our worldwide leadership in machine controls and robotic machine tending offers silicon wafer manufacturers a key advantage. No need to block access to your machinery or force your plant layout to accommodate what the robot can reach. Our unique line of top loader robots and Dual Check Safety (DCS) software gives you the advantage of a gantry robot to keep your valuable floor space clear while offering the full flexibility of an articulated robot.

Customer challenge

A California-based major solar panel manufacturer was challenged to reduce direct labor costs, increase productivity and deliver a quality product in a shorter amount of time. "Our production line consisted of manually operated processing stations which required people to move the product from station to station," said the company's automation project manager. In particular, two processes needed immediate attention: lay-up and framing. The lay-up operation had very tight tolerances; string placements outside of +/- .030" would cause a short circuit. The framing operation required the robot to perform a variety of tasks from driving screws to specified torques, to placing four buss bar leads on the back of the module. The engineering staff decided to partner with FANUC Robotics and its regional office near Los Angeles, CA. "We selected FANUC Robotics because of its service and support capabilities, and on the strength of its product line."

Successful results

Key success criteria for both lay-up and framing were uptime and ROI. The customer reports that the lay-up production went from three laminates every 16 minutes with an eight-hour changeover to three laminates every eight minutes with less than an hour changeover. The robotic framing cell substantially reduced labor costs and at the same time could handle multiple products simultaneously while the manual operation could not. The customer also reports that uptime for both workcells went from about 80% to about 95%, with the robots up virtually 100% of the time. ROI for lay-up was achieved in under a year, while framing took about 18 months.



Robot Model	LR Mate 200iC			M-10iA		M-20iA		M-710iC				R-2000iB							M-900iA				M-430iA		M-420iA		M-410iB				F-200iB				
	LR Mate 200iC LR Mate 200iC/SWP LR Mate 200iC/5C	LR Mate 200iC/5H	LR Mate 200iC/5L LR Mate 200iC/5LC	M-10iA	M-10iA/6L	M-20iA	M-20iA/10L	M-710iC/50 M-710iC/70	M-710iC /50S	M-710iC/70W	M-710iC /20L	R-2000iB /165F	R-2000iB /210F	R-000iB/125L	R-2000iB/175L	R-000iB/165R R-000iB/200R	R-2000iB /100P	R-2000iB /150U	R-000iB /170CF	R-2000iB /100H	R-2000iB /165EW R-2000iB /200EW	M-900iA/350	M-900iA /260L	M-900iA /200P	M-900iA /600	M-900iA /400L	M-430iA /2F	M-430iA /2PH	M-420iA	M-421iA	M-410iB /160	M-410iB /300	M-410iB /450	M-410iB/700	F-200iB
Controlled Axes	6	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	6	6	6	5	6	4	2	4	4	4	4	4	4	6
Payload (kg)	5	5	5	10	6	20	10	50 70	50	70	20	165	210	125	175	165 200	100	150	170	100/120 wrist down	165 200	350	260	200	600	400	2	2	40	50	160	300	450	700	100
Reach (mm)	704	704	892	1420	1632	1811	2009	2050	1360	1214	3110	2655	2655	3005	2852	3095	3500	2655	1520	2655	2650	2650	3100	3507	2832	3625	900	900	1855	1855	3143	3143	3130	3143	500
Repeatability (mm)	±0.02	±0.02	±0.03	±0.08	±0.1	±0.08	±0.1	±0.07	±0.07	±0.07	±0.15	±0.2	±0.3	±0.2	±0.3	±0.3	±0.2	±0.2	±0.15	±0.2	±0.3	±0.3	±0.3	±0.3	±0.4	±0.5	±0.5	±0.5	±0.5	±0.5	±0.5	±0.5	±0.5	±0.5	±0.1
Interference Radius (mm)	181	181	181	262	262	317	317	368	368	368	368	582	620	582	620	727	727	582	355	582	710	746	746	746	814	814	-	-	543	-	674	674	808	800	-