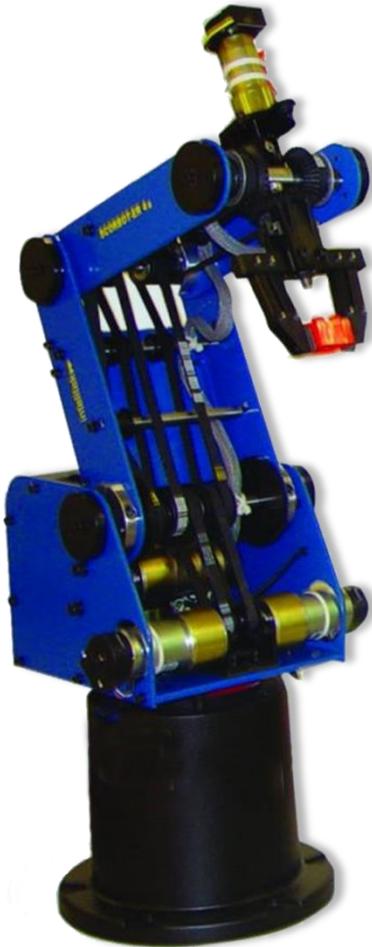


SCORBOT-ER 4u

THE ROBOTIC SYSTEM VERSATILITY FOR EDUCATIONAL USE



The **SCORBOT-ER 4u** robot is a versatile and reliable system for educational use. The robot arm can be mounted on a tabletop, pedestal or linear slidebase.

The robot's speed and repeatability make it highly suited for both stand-alone operations and integrated use in automated workcell applications such as robotic welding, machine vision, CNC machine tending and other FMS operations.

The robot is supported by **RoboCell** 3D graphic software that lets students design, create and control simulated industrial workcells. RoboCell is fully integrated with **SCORBASE** robotics programming and control software and provides dynamic simulation of the robot and workcell devices during visual program execution.

The **SCORBOT-ER 4u** is a powerful tool for teaching science and technology in the classroom or lab. Many teachers have already discovered its potential in subjects such as:

- **Mathematics:** Use the robot to demonstrate 3-dimensional space and coordinate systems.
- **Physics:** Combine the robot with motion sensors and tracking software to measure and test physical properties such as speed, velocity and acceleration. Take advantage of the robot's open structure to observe and study the principles of power transmission.
- **Computer Science:** Program complex conditional statements to solve logic problems such as the Hanoi Tower and have the robot execute the manipulation task.
- **Technology:** Use the robot controller's digital and analog input/output capabilities to create and monitor systems controlled by physical properties such as light, temperature or sound.



LEARNMATE® E-LEARNING CURRICULUM

With LearnMate extensive curriculum and a wide range of accessories, the SCORBOT-ER 4u is the ultimate resource tool for robotics and technology training.

Courses include:

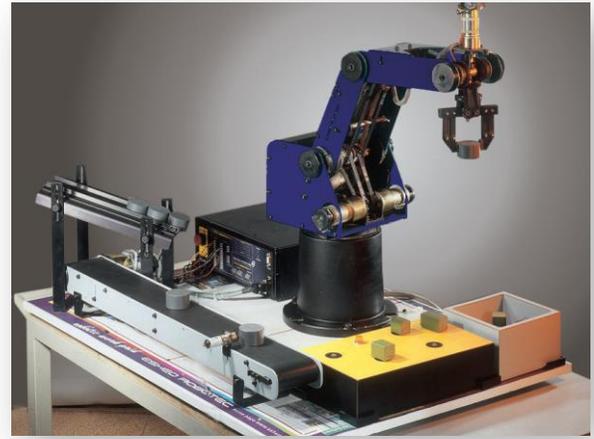
- Fundamentals of Robotics for SCORBOT-ER4u
- Robotics and Materials Handling 1 with SCORBOT-ER4u (laboratory)
- Robotics and Materials Handling 2 with SCORBOT-ER4u
- Automated Welding with SCORBOT-ER4u
- Advanced Robotic Programming with the SCORBOT-ER4u



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Specifications

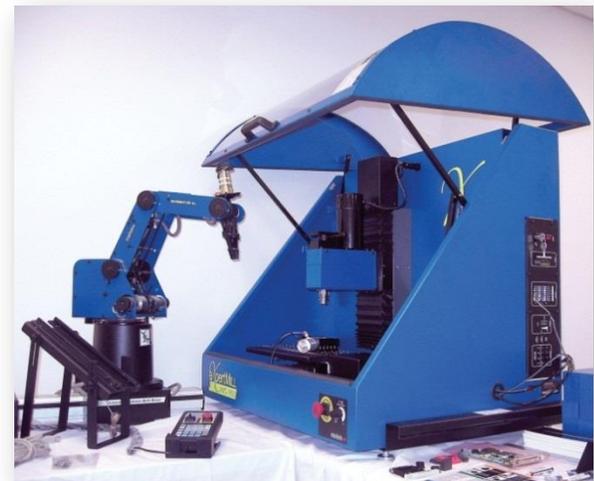
Mechanical Arm	
Mechanical Structure	Vertically articulated; open frame
Degrees of Freedom	5 rotational axes and gripper
Payload Capacity	2.1 kg (4.6 lbs.)
Axis Range	
◆ Axis 1: Base rotation	310
◆ Axis 2: Shoulder rotation	+130/-35
◆ Axis 3: Elbow rotation	+130
◆ Axis 4: Wrist pitch	+130
◆ Axis 5: Wrist roll	±570
Reach	610 mm (24") with gripper
Speed	700 mm/sec (27.6"/sec)
Repeatability	± 0.18 mm (0.007")
Position Feedback	Incremental optical encoders
Homing	Microswitch on each axis
Actuators	12 V dc servo motor on each axis
Gripper	DC servo motor, 2-finger parallel
Gripper Jaw Opening	0-65/75 mm (2.6"/3") with/without pads
Transmission	Gears, timing belts, lead screw
Weight	10.8 kg (23.8 lbs.)
Controller	
Communication	USB type A cable connection to PC; Plug and play without rebooting
Inputs/Outputs	8 digital inputs; 4 analog inputs; 8 digital outputs (4 relay, 4 open collector); 2 analog outputs
Microcontroller	Full featured, NEC V853 RISC 32-bit microcontroller
Axis Servo Control	Real-time; PID; PWM
Servo Axes	8 (robot arm, gripper and 2 peripheral devices)
User Memory	Unlimited programs, program lines and variables, positions
Position Definition	Absolute, Relative, Cartesian, Joints, Encoders
Trajectory Control	Joint, Linear, Circular
Speed Definition (software)	100 speed settings (percentages); travel time definition; millimeter per second (mm/sec) for robot linear movement.
Control Parameters	160 user-accessible parameters
Safety Features	Emergency switch; short-circuit protection; automatic shut-down upon detection of impact, overheating, PC failure or communication error
Power Requirements	110/220 VAC, 50/60Hz, 180W max.
Internal Power Supply	Servo: 24V (depending on input voltage and load) Digital: 5V, +15V, -12V
User Power Supply	Two +12VDC terminals, for connection of remote switches, sensors, etc.
Software	
SCORBASE robotic programming and operation software.	
RoboCell 3D graphic simulation software (optional) enables offline design and simulation of virtual robotic cell and online graphic tracking of actual cell	
Accessories (optional)	
Teach pendant, linear belt conveyor, rotary index table, linear slidebases, XY positioning table, parts feeders, sensors, I/O experiment table, pneumatic grippers, end effectors, machine vision system, workbenches, coordinate grid	
Programming	
Windows based user-friendly interface for Scorbase robotic programming language with multitasking facility (up to 100 concurrent programs). Scorbase integrated with Visual Basic Script language adds new facilities as serial communication and calling on an external program. Advanced students can write on C++ language their executable programs to control SCORBOT-ER 4u robot.	



Students learn to program and operate the SCORBOT-ER 4u and auxiliary servo and I/O devices using both actual and simulated robotics and materials handling workcells.



Students utilize the offline capabilities of RoboCell 3D graphic simulation software to design, program and execute an unlimited number of simulated industrial applications and gain maximum hands-on training experience.



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