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SCORBOT-ER 4u Educational Robot

The SCORBOT-ER 4u robot is a versatile and reliable system for educational use. The SCORBOT-ER4u 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 and FMS applications such as robotic welding, machine vision and CNC machine tending. The optional RoboCell 3D simulation software lets students design and control industrial workcells.

Standard Features

- Mechanical arm
- Controller-USB
- USB communication cable
- Software CD
- Plastic dust covers
- Documentation for all software and hardware components
- This system is certified for CE safety compliance.

Optional Accessories

- DC servo motor kit
- Gravity parts feeder
- Linear conveyor
- Linear slidebase for small robots
- MicroASRS
- Multi-purpose gripper adapters
- Rotary index table
- Teach Pendant for USB Controller
- Linear Table
- XY-Table
- Motor Kit

Applications (samples)

- ER4 u with Machine Tending (Milling/Turning/Laser Engraver)
- ER4 u with Assembly and/or Quality control

Specifications

Mechanical structure

Vertically articulated

Number of Axes

5 axes plus servo gripper

Axis Movement	Range	Effective Speed
Axis 1: Base rotation	310°	20°/sec
Axis 2: Shoulder rotation	158°	26.3°/sec
Axis 3: Elbow rotation	260°	26.3°/sec
Axis 4: Wrist pitch	260°	83°/sec
Axis 5: Wrist roll	Unlimited (mechanically); ±570° (electrically)	106°/sec

Maximum Operating Radius

610 mm (24")

End Effectors

DC servo gripper, with optical encoder, parallel finger motion; Measurement of object's size by means of Gripper sensor and software.

Maximum Gripper Opening

75 mm (3") without rubber pads

65 mm (2.6") with rubber pads

Homing

Fixed position on each axis found by means of micro switches

Feedback

Optical encoder on each axis

Actuators

12 VDC servo motors

Transmission

Gears, timing belts, lead screw

Maximum Payload

Default parameters 1Kg (2.2 lbs)

Reduce velocity increase

weight up to 2.5Kg (5.5 lbs)

Position Repeatability

±0.18 mm (0.007") at TCP (tip of gripper)

Weight

10.8 kg (23.8 lb)

Maximum Path Velocity

700 mm/sec (27.6"/sec)

Ambient Operating Temperature

2°-40°C (36°–104°F)

SCORBOT-ER 4u Educational Robot

USB Controller

Dimensions

- 315(L)x223(W)x117(H) mm (12.4"x8.8"x4.6")

Weight

- 7 kg (15.4 lb)

Ambient Operating Temperature

- 0°C-55°C (32°F-131°F)

Type of Control

- Real-time
- PID (Proportional, Integral, Differential)
- PWM (Pulse-Width Modulation)

Communications

- USB connection to PC, Plug-and-Play without rebooting
- Integrated RS232 port for Teach Pendant connection

Microcontroller

- Full featured, NEC V853 RISC 32-bit microcontroller

Inputs

- 8 digital inputs PNP/NPN (High/Low) configurable, 0-24VDC max.
- 4 analog inputs (8-bit resolution): input voltage 0–10VDC

Outputs

8 digital outputs:

- 1 – 4: relays, 1.0A max.
- 5 – 8: sink/source configurable open collectors

Sink: 15VDC, 0.5A max. for each output

Source: 15VDC, 50mA max. for all outputs combined

2 analog outputs (8-bit resolution): output voltage 0–10VDC, 20mA max

LED Indicators

- Main power, bicolor: green: power on communication with PC red: power on; no communication with PCflashing: power on; PC USB communications timeout Motors Power ON (green), Emergency (red) 8 digital inputs (green), 8 digital outputs (orange)

User Power Supply

- 12VDC 0.1A max.

Power Requirements

- 110/220VAC (+15%, -10%), 2A max, 50/60Hz

Internal Power Suplies

- Servo: 24V (depending on input voltage & load
- Digital: 5V, +15V, -12V

Ordering Information

Hardware

Scorbot-ER 4u Robotic Arm	00-0413-0000

Software

RoboCell virtual simulation control	63-7000-0100

Curriculum & Courseware Bundles

(See E-learning data sheet for details)

Scorbot-ER 4u Fundamentals	77-3046-0000
Scorbot-ER 4u Advanced	77-3048-0000
Scorbot-ER 4u Materials Handling I	77-8082-0000
Scorbot-ER 4u Materials Handling II	77-8083-0000
Scorbot-ER 4u Automated Welding	77-3001-0000
Robotics & Material Handling I w/ER4U	ROB-ER4U-MAT
Robotics Automation Technology Skills Project	RAT-ER4U-1000
Robotics Automation Project Parts	RAT-ER4U-ACC1
Scorbot ER4u Welding LAB ER4U	ROB-WELD-

Robotics Accessories

End Effector Attachment for ER4U Gripper	00-0609-0000
End Effector Attachment for DC Servo Gripper	00-0616-0000
Teach Pendant	00-1710-0000
Conveyor	10-5803-000
Rotary Table	00-1009-0000
Linear Slide base	00-1020-0000
Linear Slide base	00-1021-0000
Linear Positioning Table 300mm	00-1013-0000
XY PositioningTable24V	00-1014-0000
MOBILE Workbench 1500x1140MM	00-1293-0000

Hardware Bundles

SCORBOT-ER4u, Introductory Package	**ROB-ER4U-INTRO**

Includes

- SCORBOT-ER 4u
- Gripper attachment for round and square parts
- Teach Pendant
- Conveyor Belt tabletop
- Photoelectric Sensor for Belt Conveyor
- Gravity Feeder w/ Part Present Switch
- Robocell Software

SCORBOT-ER4u, Standard Package	**ROB-ER4U-STND**

Includes

- ROB-ER4U-PACK Introductory package
- I/O Experiment Table
- Rotary Index Table (24V)
- Photoelectric Sensor for Rotary Index Table
- Workbench 1800x800mm (Formica Top)
- Intro package plus

SCORBOT-ER4u, Advanced Package	**ROB-ER4U-ADV**

Includes

- ROB-ER4U-PACK Introductory package
- I/O Experiment Table
- Rotary Index Table (24V)
- Photoelectric Sensor for Rotary Index Table
- Workbench 1500x800mm (slotted aluminum top)
- Adapter Mounting Plate for ER4u
- Viewflex - Machine Vision (Stand 1000mm)
- Marked Aluminum Cylinder
- Parts Bin

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