SCORBOT-ER 9Pro Educational Robot

The SCORBOT-ER 9Pro offers advanced robotic path control, speed and accuracy in an affordable, industrial grade robot. With the new state of the art USB-PRO controller, the SCORBOT-ER9 Pro is provided with multi-tasking, real-time control and synchronization of up to 8 axes, 16 digital inputs, 16 digital outputs, 4 analog inputs and 2 analog outputs. The SCORBOT-ER 9Pro supports both stand-alone applications as well as sophisticated automated workcells.

The SCORBOT-ER 9Pro supports both stand-alone applications as well as sophisticated automated workcells. 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.

Specifications

**Mechanical structure**
Vertically articulated
Enclosed casting

**Number of Axes**
5 rotational axes and gripper

<table>
<thead>
<tr>
<th>Axis Movement</th>
<th>Range</th>
<th>Effective Speed</th>
<th>Maximum Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axis 1: Base rotation</td>
<td>276°</td>
<td>80°/sec</td>
<td>140°/sec</td>
</tr>
<tr>
<td>Axis 2: Shoulder rotation</td>
<td>153°</td>
<td>69°/sec</td>
<td>123°/sec</td>
</tr>
<tr>
<td>Axis 3: Elbow rotation</td>
<td>214°</td>
<td>78°/sec</td>
<td>140°/sec</td>
</tr>
<tr>
<td>Axis 4: Wrist pitch</td>
<td>202°</td>
<td>103°/sec</td>
<td>166°/sec</td>
</tr>
<tr>
<td>Axis 5: Wrist roll</td>
<td>737°</td>
<td>185°/sec</td>
<td>300°/sec</td>
</tr>
</tbody>
</table>

**Speed**
1.9 m/sec (74.8”/sec)

**Operating radius**
691 mm (27.2") without gripper

**Homing**
Optical switch and encoder index pulse on each axis

**Position Feedback**
Incremental optical encoders with index pulse on each axis

**Actuators**
24VDC servo motor on each axis

**Transmission**
Harmonic drives and timing belts

**Maximum Payload**
2kg (4.4 lbs) [Full speed]
4kg (8lbs) [with reduced acceleration]

**Repeatability**
± 0.05 mm (0.002”)

**Weight**
51 kg (112.5 lbs)
SCORBOT-ER 9Pro Educational Robot

USB-PRO Controller Specifications

Dimensions
- 460×245×140mm (LxWxH) (18.1''x9.6''x5.5'')

Weight
- 7.5 kg (16.5 lbs)

Ambient Operating Temperature
- 2° - 40°C (36° - 104°F)

Type of Control
- Real-time; PID; PWM

Communications
- USB type A cable connection to PC
- Plug and play without rebooting
- Integrated RS232 for teach pendant

Microcontroller
- Microcontroller ARM7TDMI Processor;
- 32-bit RISC Architecture with 256 Kbytes of Internal High-speed Flash

Inputs
- 16 digital inputs: 24V max., sink/source configurable
- 4 analog inputs[8-bit resolution]: input voltage 0-10V

Outputs
- 16 digital outputs: 24V max.; 4 relays; 12 open collector, sink/source configurable; 2 analog outputs: output voltage 0-10V

LED Indicators
- Main power, power on , communicating with PC; Motor on; Digital Inputs / Digital Outputs; Emergency

Control Parameters
- 160 parameters, many are user-accessible;
- Servo control PID; speed; velocity profile;
- axis position error; gripper operation;
- impact; limit protection; homing; Cartesian calculations.

User Power Supply
- 12 VDC (1A) and 24 VDC (2A) terminals, for connection of remote switches, sensors, etc.

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

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

Ordering Information

Hardware
- SCORBOT-ER 9Pro Robotic Arm 00-0430-0000

Software
- RoboCell/SCORBASE USB Pro 63-7000-1800

Curriculum & Courseware Bundles
- SCORBOT-ER 9Pro Fundamentals 77-3047-0000
- SCORBOT-ER 9Pro Advanced 77-3049-0000
- SCORBOT-ER 9Pro Materials Handling I 77-8094-0000
- SCORBOT-ER 9Pro Materials Handling II 77-8095-0000
- Robotics & Material Handling I, w/ER9 Pro, LAB ROB-ER9-MAT

Robots & Material Handling II 77-8095-0000

Robotics Accessories
- End Effector Attachment for DC Servo Gripper 00-0616-0000
- DC Servo Gripper (ER 9Pro & ER 14Pro) 00-0613-0000
- Pneumatic Gripper for ER9-Pro 00-0633-0000
- Teach Pendant 00-1710-0000
- Conveyor 00-1010-0000
- Palletizing Rack 00-1110-0000
- Gravity Feeder w/ Part Present Switch 10-1007-4000
- Rotary Table 00-1009-0000
- Linear Positioning Table 00-1013-0000
- XY Positioning Table Dual axis, 24V 00-1014-0000
- Linear Slide Base 1.0M 00-1016-0000
- Linear Slide Base 1.8M 00-1017-0000
- Linear Slide Base 2.5M 00-1023-0000
- Linear Slide Base 3.0M 00-1024-0000
- Linear Slide Base Workbench 00-1293-0000
- Automatic Tool Changer (ATC) ACC-ER9P-ATC

Hardware Bundles

SCORBOT-ER 9Pro, Introductory Package ROB-ER9-INTRO
- SCORBOT-ER 9Pro (incl. USB-Pro Controller)
- Pneumatic Gripper for ER 9Pro
- Teach Pendant for USB/USB Pro Controllers
- Palletizing Rack incl. Pins for creating Jigs
- Gravity Feeder w/ Part Present Switch
- Robotic Software for Controller USB Pro
- License Key for RoboCell/SCORBASE USB Pro

SCORBOT-ER 9Pro, Standard Package ROB-ER9-STND
- ROB-ER9-PACK Introductory package
- Conveyor Belt [24V]
- Photoelectric Sensor for Belt Conveyor
- Workbench 1500x800mm [slotted aluminum top]
- Adapter Mounting Plate for ER9/14Pro & HP3

SCORBOT-ER 9Pro, Advanced Package ROB-ER9-ADV
- ROB-ER9-STND Standard package
- Rotary Index Table [24V]
- Photoelectric Sensor for Rotary Index Table
- Viewflex - Machine Vision (Stand 1000mm)
- Parts Bin
- Marked Aluminum Cylinder

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