


| BLOCKSET <sup>1</sup>  | DESCRIPTION   | TECHNICAL CAPABILITIES AND SPECIFICATIONS  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
|--|---|--|------------------|--|----------------|--------|---------------|------------------------|---------|-------------------------------|--------------------|------------------|------------|----------------|------------|--------------------------------------|-----------|----------------|
| <p><b>KUKA ROBOT</b></p>                             | <p>Using the KUKA Robot Blockset you can control any KUKA robot equipped with RSI [Robot Sensor Interface] through the interactive Simulink® environment without tedious hand coding and cumbersome hardware interfacing.</p> <p><i>This blockset is not included in the standard QUARC license and is sold separately.</i></p> <p><b>SUGGESTED RESEARCH APPLICATIONS</b></p> <ul style="list-style-type: none"> <li>• Robotic manipulation</li> <li>• Teleoperation</li> </ul>   | <table border="0"> <tr> <td>Payload</td> <td>5 kg</td> </tr> <tr> <td>Number of axes</td> <td>6</td> </tr> <tr> <td>Repeatability</td> <td>&lt;±0.02 mm</td> </tr> <tr> <td>Weight</td> <td>28 kg</td> </tr> <tr> <td>Mounting positions</td> <td>floor or ceiling</td> </tr> <tr> <td>Controller</td> <td>KR C2sr</td> </tr> <tr> <td>Max speed</td> <td>8.2 m/s</td> </tr> </table> <ul style="list-style-type: none"> <li>• Ability to command either Cartesian or joint velocity set points</li> <li>• Ability to measure the Cartesian positions, joint angles and joint torques</li> <li>• Ability to set either Cartesian or the joint minimum and maximum velocity limits</li> <li>• KUKA built-in safety checks are still enabled for safe operation</li> </ul>   | Payload          | 5 kg   | Number of axes | 6      | Repeatability | <±0.02 mm              | Weight  | 28 kg                         | Mounting positions | floor or ceiling | Controller | KR C2sr        | Max speed  | 8.2 m/s                              |           |                |
| Payload  | 5 kg  |  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
| Number of axes   | 6   |  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
| Repeatability  | <±0.02 mm   |  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
| Weight   | 28 kg   |  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
| Mounting positions   | floor or ceiling  |  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
| Controller   | KR C2sr   |  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
| Max speed  | 8.2 m/s   |  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
| <p><b>JOINT CONTROL ROBOT - 6 DOF D</b></p>        | <p>Using the Denso Robot Blockset you can control the articulated Denso robot through the interactive Simulink® environment without tedious hand coding and cumbersome hardware interfacing.</p> <p><i>This blockset is not included in the standard QUARC license and is sold separately.</i></p> <p><b>SUGGESTED RESEARCH APPLICATIONS</b></p> <ul style="list-style-type: none"> <li>• Robotic manipulation</li> <li>• Teleoperation</li> </ul>  | <table border="0"> <tr> <td>Supported models</td> <td>VP-6242G, VS-6556G[-B], VS-6577G[-B], VM-6083G, and VM-60B1G</td> </tr> <tr> <td>Number of axes</td> <td>6</td> </tr> <tr> <td>Repeatability</td> <td>+/- 0.02 to +/- 0.07mm</td> </tr> <tr> <td>Weight</td> <td>13 to 88kg</td> </tr> <tr> <td>Payload</td> <td>2.5kg to 13kg</td> </tr> <tr> <td>Reach</td> <td>430 to 1,300mm</td> </tr> <tr> <td>Controller</td> <td>Quanser Open-Architecture Controller</td> </tr> <tr> <td>Max speed</td> <td>3.9 to 8.3 m/s</td> </tr> </table> <ul style="list-style-type: none"> <li>• Ability to command joint position or velocity and controller gains to the robot</li> <li>• Ability to read robot joint positions and robot status</li> <li>• Ability to set either cartesian or the joint minimum and maximum velocity limits</li> <li>• Denso built-in safety checks are still enabled for safe operation</li> </ul>   | Supported models | VP-6242G, VS-6556G[-B], VS-6577G[-B], VM-6083G, and VM-60B1G | Number of axes | 6      | Repeatability | +/- 0.02 to +/- 0.07mm | Weight  | 13 to 88kg                    | Payload            | 2.5kg to 13kg    | Reach      | 430 to 1,300mm | Controller | Quanser Open-Architecture Controller | Max speed | 3.9 to 8.3 m/s |
| Supported models   | VP-6242G, VS-6556G[-B], VS-6577G[-B], VM-6083G, and VM-60B1G  |  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
| Number of axes   | 6   |  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
| Repeatability  | +/- 0.02 to +/- 0.07mm  |  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
| Weight   | 13 to 88kg  |  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
| Payload  | 2.5kg to 13kg   |  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
| Reach  | 430 to 1,300mm  |  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
| Controller   | Quanser Open-Architecture Controller  |  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
| Max speed  | 3.9 to 8.3 m/s  |  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
| <p><b>JOINT CONTROL ROBOTS</b></p>                 | <p>Using the MICO Blockset you can control the Joint Control Robot - 4 DOF and Joint Control Robot - 6 DOF, equipped with a two-finger gripper through the interactive Simulink environment without tedious hand coding and cumbersome hardware interfacing.</p> <p><i>This blockset is not included in the standard QUARC license and is sold separately.</i></p> <p><b>SUGGESTED RESEARCH APPLICATIONS</b></p> <ul style="list-style-type: none"> <li>• Robotic manipulation</li> <li>• Teleoperation</li> </ul>  | <table border="0"> <tr> <td>Supported models</td> <td>Joint Control Robot - 4 DOF, Joint Control Robot - 6 DOF</td> </tr> <tr> <td>Number of axis</td> <td>4 or 6</td> </tr> <tr> <td>Weight</td> <td>5 kg or 5.2 kg</td> </tr> <tr> <td>Payload</td> <td>1.25 kg or 1.3 kg (mid-range)</td> </tr> <tr> <td>Max linear speed</td> <td>20 cm/s</td> </tr> <tr> <td>Reach</td> <td>60 or 70 cm</td> </tr> </table> <ul style="list-style-type: none"> <li>• Ability to command the robots joint position and torque</li> <li>• Ability to tune the robot position and torque controller gains</li> <li>• Ability to read robot joint position, joint torque, joint current, joint temperature and robot status</li> <li>• Ability to set either Cartesian or the joint minimum and maximum velocity limits</li> </ul>  | Supported models | Joint Control Robot - 4 DOF, Joint Control Robot - 6 DOF     | Number of axis | 4 or 6 | Weight        | 5 kg or 5.2 kg         | Payload | 1.25 kg or 1.3 kg (mid-range) | Max linear speed   | 20 cm/s          | Reach      | 60 or 70 cm    |            |                                      |           |                |
| Supported models   | Joint Control Robot - 4 DOF, Joint Control Robot - 6 DOF  |  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
| Number of axis   | 4 or 6  |  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
| Weight   | 5 kg or 5.2 kg  |  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
| Payload  | 1.25 kg or 1.3 kg (mid-range)   |  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
| Max linear speed   | 20 cm/s   |  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
| Reach  | 60 or 70 cm   |  |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |
| <p><b>GEOMAGIC<sup>2</sup> HAPTIC DEVICES</b></p>  | <p>The PHANTOM® Blockset lets you control the series of Geomagic<sup>2</sup> haptic devices via Simulink®. For added flexibility researchers can combine the PHANTOM Blockset and Visualization Blockset to enjoy seamless haptics rendering of virtual environments.</p> <p><i>This blockset is not included in the standard QUARC license and is sold separately.</i></p> <p><b>SUGGESTED RESEARCH APPLICATIONS</b></p> <ul style="list-style-type: none"> <li>• Force feedback virtual reality</li> <li>• Haptically enabled medical simulations</li> <li>• Teleoperation</li> <li>• Precise robotic manipulation</li> </ul> | <p>Supported devices:</p> <ul style="list-style-type: none"> <li>• Geomagic® Touch™ [formerly Sensable Phantom Omni]</li> <li>• Geomagic® Touch™ X [formerly Sensable Phantom Desktop]</li> <li>• Geomagic® Phantom® Premium [formerly Sensable Phantom Premium]</li> <li>• Geomagic® Phantom® Premium 6DOF [formerly Sensable Phantom Premium 6DOF]</li> </ul> <ul style="list-style-type: none"> <li>• Send forces and torques in Cartesian or joint space</li> <li>• Read encoder values, position, and joint angles</li> <li>• Send commands in two different work spaces to the PHANTOM device</li> <li>• The block outputs the gimbal angles of the device plus the values associated with the buttons and the 7 DOF available on the device (thumb-pad or scissors)</li> </ul> <div style="border: 2px solid red; padding: 10px; text-align: center;"> <p><b>REQUEST A FREE 30 DAY TRIAL OF QUARC TODAY. VISIT</b></p> <p><a href="http://WWW.QUANSER.COM/PRODUCTS/QUARC">WWW.QUANSER.COM/PRODUCTS/QUARC</a></p> </div> |                  |  |                |        |               |                        |         |                               |                    |                  |            |                |            |                                      |           |                |

<sup>1</sup> Please note that prices for blocksets may vary. For more information or to request a quote please contact sales@quanser.com

<sup>2</sup> Formerly Sensable

**BLOCKSET****DESCRIPTION****TECHNICAL CAPABILITIES AND SPECIFICATIONS****VISUALIZATION**

The Visualization Blockset creates 3D visualizations of simulations or actual hardware in real-time. By combining meshes and textures, you can create objects to seamlessly integrate high-performance graphics with real-time controllers. Comprehensive documentation and examples along with additional content are provided to help new users get started and master this blockset quickly. QUARC Visualization Blockset is used in the Virtual Plant Simulation of selected Quanser plants such as SRVO2 and Active Suspension.  
*This blockset is included in the standard QUARC license.*

**SUGGESTED RESEARCH APPLICATIONS**

- Virtual reality rendering
- Game and medical simulation
- Simulation of mechanical components
- Data fusion
- Real-time status displays of physical hardware
- Virtual cockpit for aerial vehicles

- Remotely connect to a visualization server with multiple clients
- No interference with the operation of your real-time controller
- Plug-ins provided for Blender and Autodesk's 3ds Max
- Set different material properties such as diffuse color, opacity, specular color, shininess, and emissivity.
- Texture map support for png, jpg, tiff, and bmp
- X3D support
- Configurable mouse and keyboard interface for manually navigating around the environment
- Performance far exceeds TMW's Simulink 3D Animation toolbox

**NATURAL POINT OPTITRACK**

The OptiTrack Blockset allows motion capture and tracking by using 3 or more synchronized infrared (IR) cameras that capture images containing reflective markers within a workspace. The blockset can be used to track either individual markers or rigid bodies. This blockset makes it easy to conduct vision-based control experiments in real-time, especially for objects that were previously difficult to track, such as indoor autonomous vehicles.  
*This blockset is not included in the standard QUARC license and is sold separately.*

**SUGGESTED RESEARCH APPLICATIONS**

- Image-based control and localization
- Autonomous navigation and control
- Fault detection

- Up to 24 cameras can be connected and configured for single or multiple capture volumes
- Capture areas up to 400 square feet
- Single point tracking for up to 80 markers, or 10 rigid-body objects
- Typical calibration time is under 5 minutes
- Position accuracy on the order of mm under typical conditions
- USB 2.0 connectivity to ground station PC
- Up to 100 fps tracking

**PGR CAMERAS**

The Point Grey Research (PGR) Blockset is used to acquire images from some of the Point Grey Research cameras. QUARC also provides image processing blocksets that can be used to find objects of a given color within a source image or convert images from one format to another.  
*This blockset is included in the standard QUARC license.*

**SUGGESTED RESEARCH APPLICATIONS**

- Image-based control and localization
- Autonomous navigation and control
- Image recognition
- Mapping
- Obstacle detection and avoidance
- Visual servoing and tracking
- Vision feedback

- Support for Draganflyer 2 HI-COL FireflyMV, FireflyMV Mono, and Flea 3
- Frame rate selection from 7.5 fps to 60 fps
- Resolutions from 640 x 480 to 1024 x 768,
- Color or grayscale and custom image (subimage) sizes supported for faster framerates

**GPS**

The GPS Blockset allows GPS receivers to be easily accessed, thereby adding GPS localization to an experimental platform. This blockset integrates with Ublox GPS devices as well as NMEA compliant GPS devices.  
*This blockset is not included in the standard QUARC license and is sold separately.*

**SUGGESTED RESEARCH APPLICATIONS**

- Localization
- Autonomous navigation and control

- Data provided as output:
- GPS position (latitude, longitude, altitude)
  - Number of visible satellites (dilution of precision data)
  - Accuracy information (dilution of precision – DOP)
  - Typical accuracy 1-3m (WAAS)

**DYNAMIC RECONFIGURATION**

The Dynamic Reconfiguration Blockset lets you dynamically switch models on the target machine within a sampling interval. A running model may be replaced with another model while ensuring continuity of states between both with no interruptions (i.e. no skipped sample). For a demo and tutorial on the Dynamic Reconfiguration Blockset request a free trial of QUARC at [www.quanser.com/QUARC](http://www.quanser.com/QUARC).  
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**SUGGESTED RESEARCH APPLICATIONS**

- Mission reconfiguration (e.g., for Unmanned Vehicle Systems)
- Fault recovery
- Safety watchdog

- Continuity of states between the model being switched-out and the model being switched-in, as a necessary condition to the system stability
- Switching within one sampling interval, as a necessary condition to the system stability
- Dynamic reconfiguration can be triggered either automatically (e.g., from a supervisory model) or manually
- Dynamic Reconfiguration can be triggered either locally or remotely (i.e., on a remote target)

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