

QuARC[®]

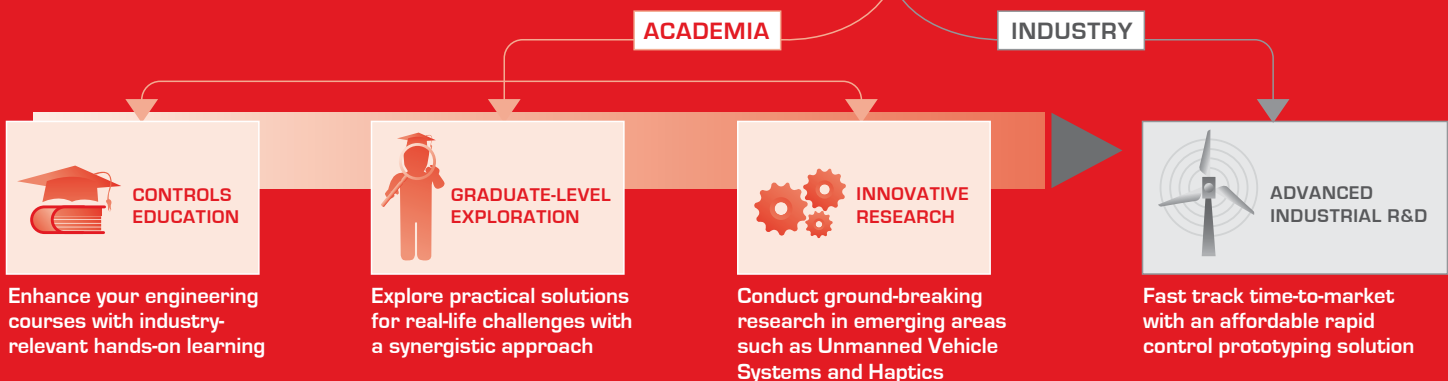
accelerate design

HOW MUCH TIME CAN YOU SPARE?

Choosing software for control system design and implementation is critical for timely, successful research and development. Quanser knows this because we've pioneered control engineering for over 20 years. That's why we created QUARC – a powerful rapid control prototyping tool that significantly accelerates control design and implementation. Initially designed for industrial demands, QUARC is nonetheless ideal for

advanced research, Masters-level, and even undergraduate, teaching. QUARC is an integral part of all Quanser control lab workstations and is used all over the world by thousands of educational institutions and organizations, including the Canadian Space Agency and Defense Research and Development Canada. Discover what QUARC can help you achieve in less time and effort than you might be spending now.

FOUR USES OF QUARC



A SINGLE PC SOLUTION FOR RAPID CONTROL PROTOTYPING IN WINDOWS[®].

QUARC generates real-time code directly from Simulink[®]-designed controllers and runs the generated code in real-time on the Windows[®] target - all on the same PC. The Data Acquisition Card seamlessly interfaces with Simulink[®] using Hardware-in-the-loop blocks provided in the QUARC Targets Library.

SPLIT SECOND CONTROL DESIGN – A DECADE IN THE MAKING

QUARC was built on the legacy of WinCon, the first real-time software to run Simulink[®]-generated code in Windows[®]. QUARC seamlessly integrates with Simulink[®] and redefines the traditional design-to-implementation interface toolset. Just click a button to enjoy more functionality and development flexibility, all geared towards improved real-time performance. Academics have successfully deployed many advanced control and mechatronic systems, ranging from intelligent unmanned systems to force-feedback-enabled virtual reality.



QUANSER
INNOVATE. EDUCATE.



CONTROLS EDUCATION

ACCELERATE CONTROLS EDUCATION

QUARC is an ideal tool to teach control concepts. It allows students to draw a controller, generate code and run it - all without Digital Signal Processing or without writing a single line of code. The capabilities of this powerful yet adaptable software are emphasized by the comprehensive curriculum that accompanies Quanser's control lab equipment. The supplied Instructor and Student Workbooks feature lab exercises and projects based on Simulink®. They help focus students' efforts on key control concepts rather than tedious code writing. The curriculum is developed by engineers for engineers to effectively demonstrate and teach the mechatronic design approach practised in industry. This includes modeling, controller design, simulation and implementation. An excellent low-cost rapid control prototyping system, QUARC is being used by thousands of institutions worldwide. It is an effective and efficient teaching tool for undergraduate and graduate-level courses in classical and modern control theory.

HOW QUARC FUSES MULTIPLE ENGINEERING COURSES

The Integrated Learning Centre at Queen's University fuses all engineering disciplines into one modern lab. Quanser's workstations, featuring a wide range of modular Quanser experiments, are used here to teach introductory, intermediate and advanced controls. QUARC software is an integral part of all those workstations. An economical approach to outfitting a lab, it also keeps students motivated, providing access to even more hands-on learning.



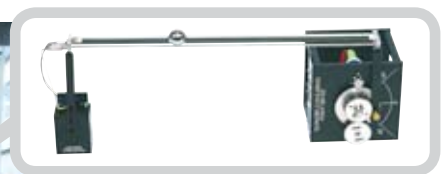
Quanser's SRV02 rotary workstation includes the SRV02 plant, amplifier, data acquisition card, control design software, comprehensive curriculum and pre-built controllers



This Flexible Link module further expands your topics of study with the SRV02 workstation.



The Integrated Learning Center, Queen's University, Canada.



The Ball and Beam module utilizes components of the basic SRV02 workstation.

"QUARC software is designed so that most fundamental work is done, allowing the students to focus more on the control design theory and less on the workings of MATLAB Simulink, thus improving the learning experience."

Dr. Wen-Hua Chen,
Loughborough University,
United Kingdom

All on a Single PC

QUARC provides a single PC solution for rapid control prototyping in Windows XP® or Vista®. It generates real-time code directly from Simulink®-designed controllers – but for the same PC. This single PC Solution for rapid control prototyping significantly accelerates control design and implementation. This helps students focus on the important aspects of the control design process and complete project-based assignments successfully.

Simple. Intuitive.

QUARC user interfaces are easy to understand without training. For example, QUARC's "external mode" communications allow the Simulink® diagram to communicate with real-time code generated from the model. Tune parameters of the running model by changing block parameters in the Simulink® diagram. Want to view the status of a signal in the model? Simply open a Simulink® Scope (or any other Sink in the diagram) while the model runs on the target. Furthermore, data can be streamed to the MATLAB® workspace or to a file on disk for off-line analysis.

Low Maintenance

QUARC streamlines the process of maintaining and servicing a laboratory without sacrificing system performance or an excessive amount of your staff's time. The extremely flexible host-target structure allows QUARC users to maximize limited resources (i.e. PC, laptop and hardware) with minimal effort or cost. Host (control design environment) and target (platform which executes the real-time code) can be on separate computers yet still communicate through a network connection. QUARC can sustain any possible multi-configuration. Ask about License Server Architecture.

REQUEST A FREE 30 DAY TRIAL OF QUARC TODAY. VISIT WWW.QUANSER.COM/QUARC



GRADUATE-LEVEL EXPLORATION

BRING THEORIES TO LIFE

Whether you're exploring emerging technologies or transforming knowledge into solutions for real-world challenges, count on Quanser to help you achieve your research goals. The power of QUARC software combined with Quanser's innovative plants can help researchers test their theories in real-time, on real hardware. QUARC seamlessly integrates with Quanser's research platforms to implement virtually any control algorithm. Combine QUARC with Quanser's multi-function Data Acquisition card and plants to create a self-contained control workstation ideal for advanced research. Use it to design, simulate, implement, and test a variety of time-varying systems: communications, controls, signal processing, video processing, and image processing.

All this is achievable quickly, easily and affordably because the workstation is a fully integrated, open-architecture solution.

The set-up pictured below shows a 3 DOF Gyroscope workstation as one example of a Quanser workstation for high level research. This typical configuration entails:

- Plant
- Amplifier
- Data Acquisition Card
- Virtual Plant Simulation
- Rapid Control Prototyping Design Software
- Pre-designed Controllers

For more information about the Quanser's research platforms please visit www.quanser.com/MCC.



"Using Quanser's software, we can easily design control systems for many plants. We can apply complex control strategies quickly and effectively - and it is very easy to verify theory on the real plant."

Kenichi Yano,
Associate Professor, Gifu University, Japan

- 3 DOF GYROSCOPE**
Featuring three Degrees Of Freedom (DOF), this dynamically diverse experimental platform is ideal for teaching rotational dynamic challenges.
- AMPLIFIER AMPAQ**
Quanser's multi-channel linear current amplifier is ideal for precision controls. The AMPAQ connects to the DAQ terminal board and is connected to the 3-DOF Gyroscope with its easy-connect cables.
- DATA ACQUISITION CARD**
Measure and command real-time signals with high I/O sampling period. QUARC supports a wide range of Quanser and National Instruments data acquisition cards. For a complete list please visit www.quanser.com/QUARC.
- SOFTWARE TO ACCELERATE DESIGN**
3-DOF Gyroscope models are designed to run in real-time with QUARC® software, which integrates seamlessly with MATLAB®/Simulink®.



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INNOVATIVE RESEARCH

EFFORTLESS INTEGRATION FOR MECHATRONIC RESEARCH

QUARC is a powerful, flexible mechatronic integration tool, providing time-saving and simple solutions to those unique challenges encountered when you're developing mechatronic systems. Whether you have custom-made research platforms or use manufactured equipment, QUARC is the only software that makes it easy to interface with all of them. QUARC offers a suite of third-party device blocks which help researchers seamlessly interface and control KUKA robots, PGR cameras and SensAble® PHANTOM devices, to name a few. These blocks not only allow a Simulink® model to communicate with external devices but also implement the mathematical framework for controlling them. All this is possible without the need to learn new tools or hand coding since the controller design and integration is performed in an environment most researchers are familiar with, such as Windows®, MATLAB®, Simulink®.

"QUARC's support of TCP/IP has been a tremendous help for our research. It allowed us to develop a distributed sensing system that isn't dependent on expensive I/O hardware or DAQ boards. Further, this allows for safety-critical redundancy when we are doing vehicle control tests."

Sean Brennan,

Department of Mechanical and Nuclear Engineering,
Pennsylvania State University, USA

QUARC OFFERS OVER 10 BLOCKSETS

The table provides an overview. At a glance, you can see specific research applications, unique attributes and technical specifications.

Now you can enjoy greater flexibility when implementing control schemes. QUARC expands the possibilities for complex control design by:

Multiple Operating Systems Support.

QUARC is designed so that code could be generated for multiple operating systems and hardware platforms while maintaining a common, seamless and easy-to-use interface. Simulink® models can run in real-time on a variety of targets - a target being a combination of operating system and processor for which QUARC generates code from a Simulink® diagram. Targets include Windows® and QNX®. The number of targets QUARC supports is continually increasing.

Support for Communications.

The QUARC Stream API offers a flexible and protocol-independent communications framework. Conduct standard communication between QUARC models and more: between a QUARC model and an external third-party application [e.g., graphical user interface] or even between two external third-party applications. The Stream API is independent of the development environment and can be used in C/C++, .NET, MATLAB®, LabVIEW™, etc. The Stream API enables the communication between multiple real-time model over the internet. This could be used for distributed control, teleoperation, device interfacing, etc. The stream API natively supports the following protocols: TCP/IP, UDP, serial, shared memory, named pipes, ARCNET, and more. For demos and tutorials on QUARC's communication capabilities



request a free trial of QUARC at www.quanser.com/QUARC.






Increasing Number of Blocksets.

The number of interfaces QUARC supports is continually increasing over time to ensure easy integration with recent and popular third-party devices. Here are a few more examples:

- Nintendo Wiimote
- Qbot- An Unmanned Ground Vehicle based on iRobot Create®
- Schunk Grippers
- SparkFun Electronics SerAccel



Get an updated list of interfaces supported by QUARC at www.quanser.com/QUARC/blocksets

BLOCKSET *	SUGGESTED RESEARCH APPLICATIONS	DESCRIPTION	TECHNICAL CAPABILITIES AND SPECIFICATIONS	
KUKA ROBOT 	<ul style="list-style-type: none"> • Robotic manipulation • Teleoperation 	<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>This blockset is not included in the standard QUARC license and is sold separately.</p>	<ul style="list-style-type: none"> • Payload 5 kg • Number of axes 6 • Repeatability <math>\pm 0.02\text{ mm}</math> • Weight 28 kg • Mounting positions floor or ceiling • Controller KR C2sr • Max speed 8.2 m/s 	<ul style="list-style-type: none"> • Ability to command either Cartesian or joint velocity set points • Ability to measure the Cartesian positions, joint angles and joint torques • Ability to set either Cartesian or the joint minimum and maximum velocity limits • KUKA built-in safety checks are still enabled for safe operation
WII REMOTE 	<ul style="list-style-type: none"> • Teleoperation • Robotic manipulation 	<p>The Wiimote [Wii Remote] block reads the state of the Wiimote and outputs the button, acceleration, and Infra Red [IR] camera information. Using this blockset you can easily interface the Wiimote into the controller.</p> <p>This blockset is included in the standard QUARC license.</p>	<p>Data provided as output:</p> <ul style="list-style-type: none"> • X, Y, and Z axis accelerations • Button states • X coordinates of up to four IR points detected by the wiimote IR camera. Valid values range from 0 to 1023 inclusive 	<ul style="list-style-type: none"> • Y coordinates of up to four IR points detected by the wiimote IR camera. Valid values range from 0 to 767 inclusive. • A compatible Bluetooth device must be installed on the PC
SENSABLE PHANTOM® SERIES 	<ul style="list-style-type: none"> • Force feedback virtual reality • Haptically-enabled medical simulations • Teleoperation • Precise robotic manipulation 	<p>The PHANTOM® Blockset lets you control the series of PHANTOM® 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>This blockset is not included in the standard QUARC license and is sold separately.</p>	<p>Supported devices:</p> <ul style="list-style-type: none"> • SensAble PHANTOM Omni • SensAble PHANTOM Desktop • SensAble PHANTOM Premium • SensAble PHANTOM Premium 6DOF 	<ul style="list-style-type: none"> • Send forces and torques in Cartesian or joint space • Read encoder values, position, and joint angles • Send commands in two different work spaces to the Phantom device • 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)
NOVINT FALCON 	<ul style="list-style-type: none"> • Force feedback virtual reality • Haptically-enabled medical simulations • Teleoperation 	<p>The Novint Falcon Blockset is used for implementing control algorithms for the Falcon haptic device. Using the Blockset significantly simplifies the task of designing controllers for the Falcon.</p> <p>This blockset is included in the standard Quarc license.</p>	<p>Data provided as output:</p> <ul style="list-style-type: none"> • Position: X, Y, and Z position in Cartesian coordinates • Button information: Whether a button is currently pressed or not • Force: X, Y, and Z forces applied by the Falcon end-effector 	
VISUALIZATION 	<ul style="list-style-type: none"> • 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 	<p>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.</p> <p>This blockset is included in the standard QUARC license.</p>	<ul style="list-style-type: none"> • Remotely connect to a visualization server with multiple clients • No interference with the operation of your real-time controller • Plugins provided for Blender and Autodesk's 3ds Max 2008, 2009 and 2010 • Set different material properties such as diffuse color, opacity, specular color, shininess, and emissivity. • Texture map support for png, jpg, tiff, and bmp. 	<ul style="list-style-type: none"> • X3D support • Configurable mouse and keyboard interface for manually navigating around the environment • Performance far exceeds TMW's Virtual Reality toolbox
NATURAL POINT OPTITRACK 	<ul style="list-style-type: none"> • Image-based control and localization • Autonomous navigation and control • Fault detection 	<p>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.</p> <p>This blockset is not included in the standard QUARC license and is sold separately.</p>	<ul style="list-style-type: none"> • Up to 16 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 	<ul style="list-style-type: none"> • USB 2.0 connectivity to ground station PC • Up to 100 fps tracking
PGR CAMERAS 	<ul style="list-style-type: none"> • Image-based control and localization • Autonomous navigation and control • Image recognition • Mapping • Obstacle detection and avoidance • Visual servoing and tracking • Vision feedback 	<p>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.</p> <p>This blockset is included in the standard QUARC license.</p>	<ul style="list-style-type: none"> • Support for Draganflyer 2 HI-COL and the FireflyMV • 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 	<ul style="list-style-type: none"> • Localization • Autonomous navigation and control 	<p>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.</p> <p>This blockset is not included in the standard Quarc license and is sold separately.</p>	<p>Data provided as output,</p> <ul style="list-style-type: none"> • GPS position [latitude, longitude, altitude] • Number of visible satellites [dilution of precision data] • Accuracy information [dilution of precision – DOP] <p>Typical accuracy 1-3m [WAAS]</p>	
ALTIA 	<ul style="list-style-type: none"> • GUI Design [e.g. Cockpit] 	<p>The Altia Design Blockset enables the user to interact with the real-time code from Altia GUIs. Unlike the MATLAB® GUIs, MATLAB® and Simulink® are not required when using Altia GUIs. This blockset gives you the tools you need to generate complete production systems without writing a single line of code.</p> <p>This blockset is included in the standard QUARC license.</p>	<ul style="list-style-type: none"> • Enables the deployment of real-time executables with GUI • Support for setting and getting values [e.g., knobs, displays, scopes, and other inputs and outputs] 	<ul style="list-style-type: none"> • Support for setting values [i.e. Meters and other outputs] • Features the Quanser Plot library for Altia
DYNAMIC RECONFIGURATION 	<ul style="list-style-type: none"> • Mission reconfiguration [e.g., for Unmanned Vehicle Systems] • Fault recovery • Safety watchdog 	<p>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.</p> <p>This blockset is not included in the standard QUARC license and is sold separately.</p>	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Dynamic Reconfiguration can be triggered either locally or remotely [i.e., on a remote target]

* Please note that prices for blocksets may vary. For more information or to request a quote please contact sales@quanser.com.



ADVANCED INDUSTRIAL R&D

QUARC ACCELERATES MECHATRONIC DEVELOPMENT WITH RAPID CONTROL PROTOTYPING

QUARC is a powerful Rapid Control Prototyping (RCP) platform that meets industrial research and development demands. This robust software helps manage the increasing complexity of control engineers' tasks and accelerates their ability to test control strategies. Generating countless iterations of Simulink® control designs becomes almost effortless - a block diagram design is automatically implemented on the system and computed in real time, eliminating the need for manual coding. This RCP platform is adaptable to virtually any mechatronic interfaces and scalable for complex multi-input and multi-output systems.

Affordable Industrial-Grade Performance

For a fraction of the cost of comparable systems, Research and Development engineers can convert a PC into a powerful platform for control system development and deployment. When combined with a Quanser Power Amplifier and a Quanser Data Acquisition Card, QUARC software provides an ideal rapid prototyping and hardware-in-the-loop development environment. QUARC is also compatible with a wide range of commercially available data acquisition cards, including National Instruments boards.

QUARC evolved from experience with its predecessor WinCon. The Canadian Space Agency played an intricate role in defining and confirming many of the features of QUARC. This was done in the context of their micro-satellite development program on an early stage prototype. It has since been adopted by industries requiring the latest in performance and development flexibility such as the Aerospace, Defence and Medical device industries.

"The Host Computer System for the Challenging Environment Assessment Laboratory (CEAL) at the Toronto Rehabilitation Institute (TRI) was developed using Quanser's QUARC real-time software.

The power of QUARC, with Quanser's engineering support, enabled TRI to create a flexible development environment for researchers to implement sophisticated real-time experiments, using a large-scale 11-ton, 6-DOF motion platform and high-performance audio-visual rendering systems"

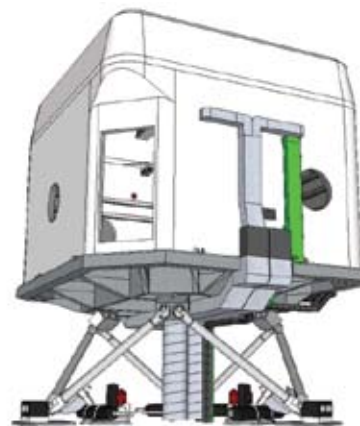
Dr. Geoff Fernie, Vice President,
Toronto Rehabilitation Institute, Canada

QUARC capabilities and features are designed to optimize the RCP process. Below are a few samples of such features.

- Flexible and extensible communications blocks configurable for real-time TCP/IP, UDP, serial, shared memory and other protocols
- Performance Diagnostics
- RTW Code Optimization support
- Modularity and incremental builds via model referencing
- Control of thread priorities and CPU affinity
- Asynchronous execution [e.g., ideal for efficient communication]
- Run any number of models on one target – or simultaneously on multiple targets
- Self-booting models for embedded targets
- External Hardware-In-the-Loop card and communication interfacing provided in C/C++, MATLAB®, LabVIEW™, and .NET languages
- Multiprocessor (SMP) support, e.g., on a quad-core Windows target QUARC models can take advantage of all four cores.
- Simulink® 3D Animation (formerly known as Virtual Reality) Toolbox support
- Ability to interface with MATLAB® GUIs, LabVIEW™ panels, and Altia

"We have been using Quanser's QUARC software to do real-time robot control. QUARC enables fast and easy prototyping of control algorithms with hardware in the loop and has been an invaluable tool for algorithm development, simulation, and verification."

Paul Bosscher, Harris Corporation, USA



Challenging Environment Assessment Laboratory (CEAL) will be one of the most advanced rehabilitation research facilities in the world.

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INNOVATE, RESEARCH
AND EXPLOIT KNOWLEDGE.



INNOVATE, RESEARCH AND EXPLOIT KNOWLEDGE.

Serving academic research and development for 20 years, Quanser has the experience and expertise to accelerate the pace of discovery and application of advanced technologies. We offer a variety of research platforms for Robotics, Haptics, Unmanned systems and more. Plus, Quanser has completed many successful projects with research institutions, governments and industries where our engineers developed customized systems that feature fully-integrated yet open-architecture capabilities. Ask for assistance with any aspects of research projects – from funding applications and research facilities to final installation, training and support. Quanser helps researchers find the best combination of hardware and software to enable innovation while optimizing resources. Whether your research will take months or years to complete, you can rely on Quanser's ongoing support. As your research team evolves Quanser will help you stay on track.

CONSULTING

From inception to completion, Quanser's expert engineers can assist with all aspects of your project. They will help clarify or define system capabilities, functionality, compatibility and customization options to best meet your goals.

HARDWARE

Our engineering experts help you choose the right components to construct the integrated rapid controls development framework ideal for your research. Quanser has developed over 40 plants for advanced research. Moreover, Quanser can be your partner to design, produce and market a great idea or simply retrofit an existing system.

SOFTWARE

Does your laboratory run on MATLAB®/Simulink® software from The MathWorks®? Or did you invest in LabVIEW™ from National Instruments? Either way, the Quanser workstation will run in real-time. The integration is seamless. To maximize the initial investment in your laboratory's design environment, just plug and play with Quanser's tools.

"Quanser listened to our specific needs and responded with a creative solution. The deliverable solved our problem immediately, and Quanser continues to monitor our needs to determine how they can help accelerate our progress."

Alfred Ng

Control Systems Manager, Canadian Space Agency

FIND OUT HOW WE CAN HELP MEET YOUR RESEARCH GOALS. PLEASE CONTACT RESEARCH@QUANSER.COM



QUANSER
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Polytechnic School of Lausanne • Hong Kong University
University of Waterloo • Carnegie Mellon University
University of Melbourne • ETH Zurich • Yale University
University of Houston • KAIST • Karlsruhe University
University of Alberta • Gifu University • Loughborough University
University of California, Berkeley • KTH • McMaster University
University Munich • Rice University • Kyoto Institute
University of Auckland • MIT • Imperial College London
The Chinese University of Hong Kong • Virginia Tech
University of Cincinnati • McGill University • Australian National
University of Bristol • Purdue University • Osaka University
Sohag Soud University • I.I.T Kharagpur • Memorial University
University of British Columbia • Delft University of Technology
University of Texas at Austin • Beijing Institute of Technology
University of Tokyo • Princeton University • Hebei University of
University of Wisconsin-Madison • Holon Institute of Technology
University of Klagenfurt • Harvard University • Tokyo Institute of
University of Reading • Tsinghua University • Cornell University
University of Michigan • Korea University • Queen's University
University of Stuttgart • Georgia Tech • Ben-Gurion University
University Eindhoven • Ajou University • Kobe University
University of Maryland College Park • Nanyang Technological
University of New South Wales • Washington University
National University of Singapore • Harbin Institute of Technology
University of Victoria • Boston University • Donghua University
Northwestern University • Tongji University • Royal Technological
University of Quebec • Clemson University • Fukuoka University
McGill University • University of Barcelona • SUNY
Queen's University Belfast • Istanbul Technical University
University of Los Andes • Louisiana Tech • Norwegian University
United States Military Academy • CINVESTAV • Drexel

QUARC®: A POWERFUL ENGINE FOR ENGINEERING DEPARTMENTS

Three issues challenge university engineering departments everywhere: *teaching, research and budget*. One solution resolves them: QUARC software from Quanser!

For Teaching: Created by engineers for engineers, QUARC is an excellent low-cost rapid control prototyping system. Working seamlessly with Simulink®, QUARC helps students put ideas and theory into practice sooner. Plus curriculum is offered to help educators focus on what matters most. With more hands-on learning, undergraduate and graduate students alike are captivated and motivated to study further.

For Research: Originally designed for industrial use, QUARC is ideal for advanced research. From the precise control of surgical robots to unmanned air vehicles and beyond, ideas can be tested in real-time - even ideas that are out of this world. Small wonder our client list includes NASA, the Canadian Space Agency and thousands of universities and colleges. [Look on your left.]

For your department's budget: QUARC seamlessly integrates over 80 Quanser experiments - from introductory to very advanced. These are modular by design and maximize efficiencies, offering multiple uses for one workstation. Academics ourselves, Quanser appreciates your need for careful budgeting. So QUARC is competitively priced and available with single- or multiple-user licenses.

👉 [Learn more at www.Quanser.com/QUARC](http://www.Quanser.com/QUARC)