



The Motion Systems, manufacturer of Qubic System, would like to thank you for choosing the QS-S25, an innovative product that helps you to develop highly reliable training and entertainment solutions that reproduce key immersive elements, such as surface textures, acceleration, engine vibrations and vehicle dynamics for multiple types of land, air or sea vehicles. Our motion system has been designed to deliver the most realistic simulation experience. We hope you enjoy your new Qubic System!

Our experts are ready to assist you: QubicSystem.com/contact



ASK **SUPPORT**

Our experts are ready to assist you: MotionSystems.eu/Support



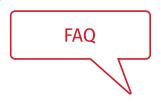
SEARCH OUR **KNOWLEDGE BASE**

Everything you wish to know is here! MotionSystems.eu/Knowledge



SUPPORTED **GAMES**

Racing games and professional simulation software! MotionSystems.eu/Supported-Games



FAQ **YOU ASK, WE ANSWER**

Frequently asked questions combined with answers! MotionSystems.eu/FAQ

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1. IMPORTANT SAFETY INSTRUCTIONS

INFO

Read all safety instructions before installing and using this product. Save this document for future reference. If ownership of this product is transferred, be sure to include this manual.

WARNING

QS-S25 is not intended for use by children under 16 years of age. Close supervision and safety instruction is required when this product is used by or near children or people with reduced physical, sensory or mental capabilities. Keep the packaging away from small children as it poses a suffocation risk.

1.1. ESSENTIAL INFORMATION

To reduce the risk of burns, fire, electrical shock, injury or mechanical damage:

WARNING



Always turn all the power switches off before plugging and unplugging the QS-S25. Dangerous voltages level can be present in power cabinet for a few minutes after turning off the machine.

- Use the QS-S25 only for its intended purpose, according to instructions.
- Unplug the QS-S25 from the power supply if it is not used for an extended period or when there is a need to perform hardware installation, maintenance, servicing or repairs.
- Turn off the QS-S25 when it is not in use.
- The QS-S25 was designed for indoor use only **DO NOT** store or use the product outdoors.
- Keep the QS-S25 away from the heat sources, high humidity, water, and other liquids. **DO NOT** store in cold place where water condensation may occur.
- **DO NOT** disassemble the product. Any tampering with or altering the product will void the warranty, poses a serious risk of electric shock, and may irreparably damage the product.
- **DO NOT** cover the ventilation holes in the QS-SB2 power cabinet.
- Keep the power cord plug and the socket dry, clean and dust-free.

- Protect the power cord from damage caused by being stepped on, rubbed against, or pinched.
- **DO NOT** use the QS-S25 if the ambient temperature is below 4° Celsius (39° Fahrenheit) or above 45° Celsius (113° Fahrenheit).
- **DO NOT** use the QS-S25 if it has been damaged, or any component is broken or missing. Please contact technical support.
- **DO NOT** use attachments or replacement parts not recommended or approved by the manufacturer. If you must to replace the power cord use only certified one with the same rating as replaced one.
- Connect the QS-S25 to a properly grounded outlet only. See grounding connections in section 3.2.2 and 3.2.3.
- If you want to increase safety level of the system, you can add external safety devices. For detailed information check section 6 on page 34.

WARNING

Stop using the QS-S25 immediately and contact technical support when the machine starts to emit unusual noise, smoke or any other suspicious behaviour indicating the machine is not working properly.

1.2. HEALTH AND SAFETY INSTRUCTION

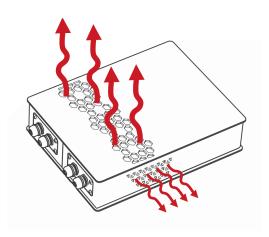
The safety of Qubic System users is the top priority. To protect users and bystanders against injuries caused by mechanical parts movement and electrical connectivity, the following instructions must be strictly performed.

WARNING

As with any mechanical device, the user is responsible for inspecting the condition of the machine prior to use and adhering to safe operating procedures.

What must be done before turning on the machine:

■ Check if nothing is blocking machine movements or air vents. The minimum distance between the air vents in the power cabinets and any outside parts of the cockpit equipment is 10 cm or 4 in.



- Check if cables are mounted properly they are not stretched or loosely connected to the socket and placed out of the moving range of the system components.
- Check that all elements are properly fixed.
- Check if there are no sharp edges nearby.

WARNING



Dangerous voltage level may occur in the QS-SB2 power cabinet and cables during the operation and for a few minutes after turning off the machine.

How to turn on safely and use the QS-S25:

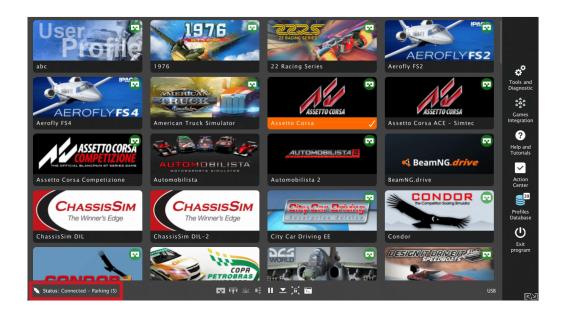
- Check if everyone around is aware of machine rapid movements.
- Make sure that no one stands in the range of motion (minimum 1.5 m).
- Kids should be kept away from the machine.
- Pets should be kept away from the machine.
- When the QS-S25 is turned on, it performs start-up calibration.

WARNING

QS-220-PL will move automatically after turning it on in order to perform start up procedure. Please be away of that movement and do not try to interrupt it.

- **DO NOT** interrupt or change the weight of payload mounted to the QS-S25 during start-up calibration.
- Motion Lock Switch should be mounted close to the operator of the machine it has to be easily reachable in every situation.
- Check Motion Lock Switch AT LEAST once a month to reduce the possibility of unknown failure – more information available in chapter 4 on page 28.
- Before getting on or off the machine activate Motion Lock Switch.
- In case of game crash or freeze Motion Lock Switch must be activated before getting off the machine.

To check if the machine is in the Motion Lock mode look at the main window of the QubicManager. Status is visible in the lower left corner of the window:



■ In case of game crash the Motion Lock Switch must be pressed before getting off the machine.

WARNING

Motion Lock and Park Mode option **DOES NOT** guarantee safety. For more details see section 6.

- For VR Headset users:
 - Remove the VR goggles before entering or exiting the rig.
 - Check very carefully if cables from VR Headset are not limiting the operation range of QS-S25.
 - Check if the whole VR setup is not in range of motion of the machine.
 - Check if cables are protected from being crushed by the QS-S25 DO NOT place them loosely under the motion rig.

INFO

Check if connected PC is capable of running the game at stable 90 frames per second or more when VR Headset is used. Lower values can cause VR sickness.

- **DO NOT** use QS-S25 if you are pregnant, tired, or under the influence of alcohol or drugs.
- **STOP USING** the QS-S25 immediately if pain, fatigue or any discomfort appears.
- For every two hours of playing, we recommend at least 15 MINUTES OF BREAK.
- **DO NOT** put your hands or legs in the actuators range of motion!
- **DO NOT** use the QS-S25 around small children or pets.
- **DO NOT** put any items between actuators and stabilization plates.
- **DO NOT** pull the wires connecting the actuators with the power cabinets.







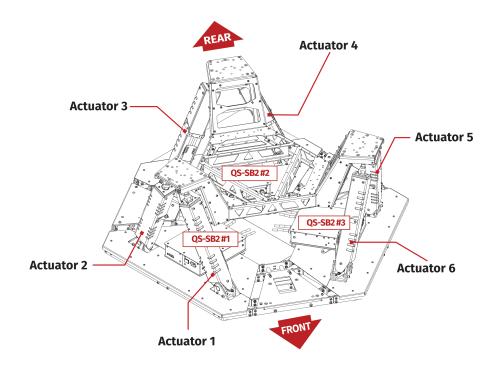




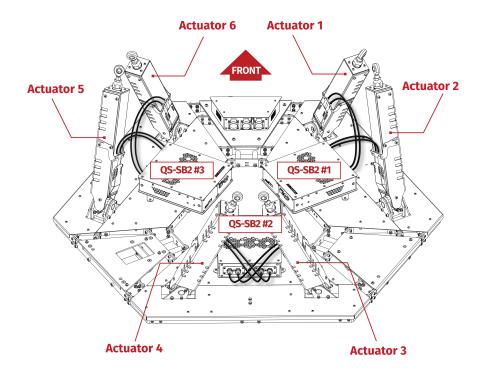
2. PRODUCT DESCRIPTION

2.1. COMPLETE VIEW

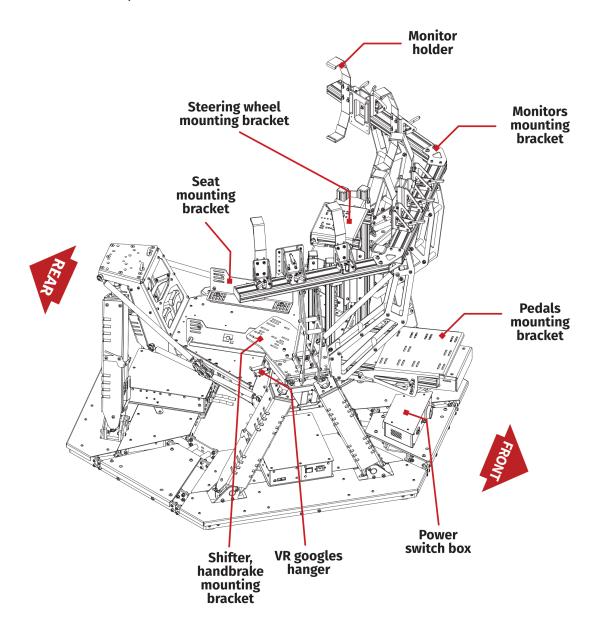
QS-S25 basic setup overview:



Actuators numbering and connections with power cabinets:

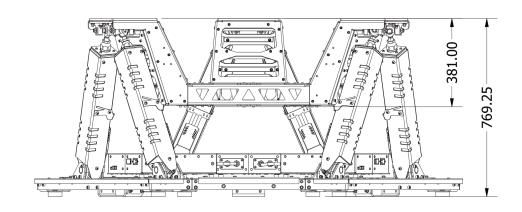


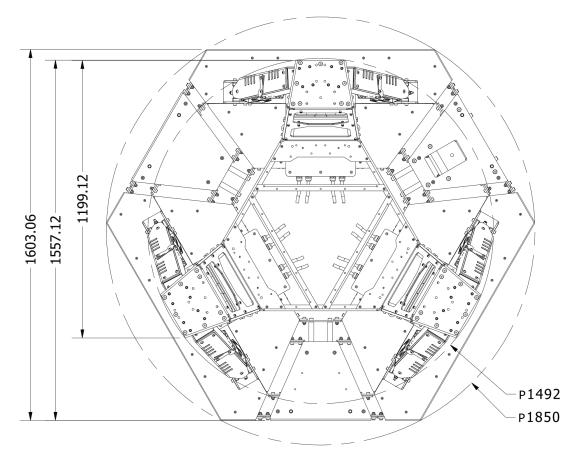
QS-S25 basic with all additional accessories overview:



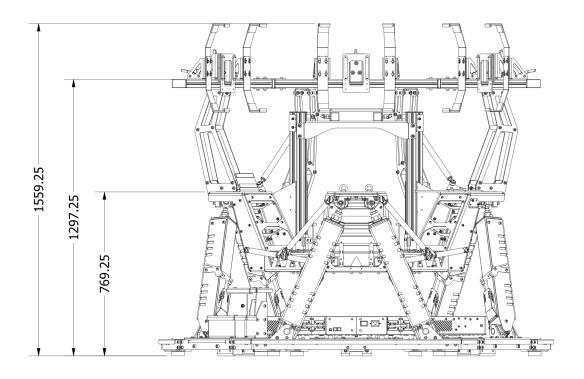
2.2. DIMENSIONS

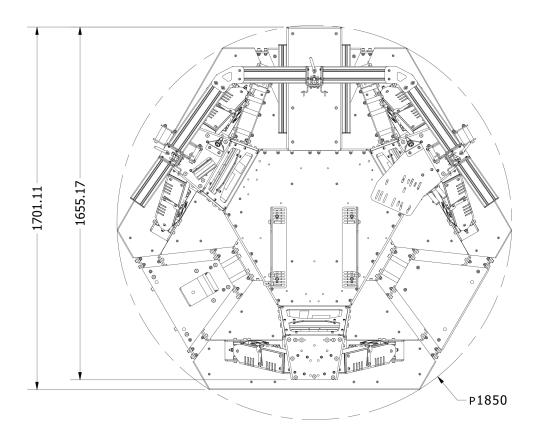
QS-S25 basic setup dimensions:





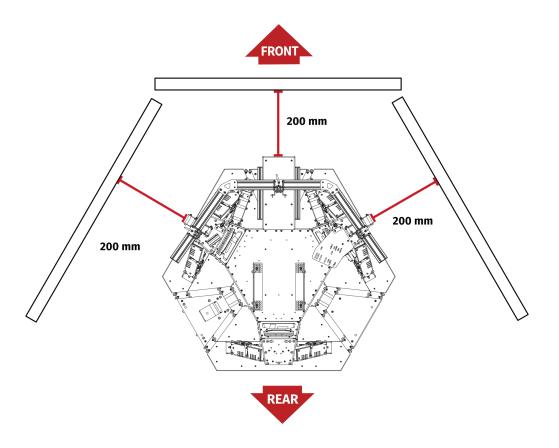
QS-S25 dimensions with accessories :





2.3. SAFE DISTANCES

Minimum safe distances from the QS-S25 edges are shown below:



INFO

Keep in mind that QS-S25 might move during simulation, occasionally check if the safe distances are kept to avoid damages by QS-S25 hitting for example wall or TV screen.

2.4. ENVIRONMENTAL CONDITIONS

QS-S25 shall be operated within ambient conditions as specified below:

■ Only indoor use

■ Temperature : 0° - 40° Celsius / 32° - 104° Fahrenheit

■ Humidity: 0 - 70 % (without condensation)

■ Maximum altitude: up to 2000 m / 6561 ft

2.5. POWER REQUIREMENTS

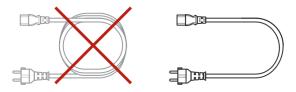
Power Cabinet (QS-SB2) contains the power supply for connected actuators. If there is no certainty if fuses or entire electrical installation can handle QS-S25, contact qualified electrician.

POWER SUPPLY	120V ±10%	230V ±10%
Average power consumption	238 W	199 W
Average power consumption for converter specification	900 VA	1300 VA
Peak current for breaker specification	13 A	11 A

Be aware that with heavier payload, and/or more intensive simulation, average Power consumption may rise.

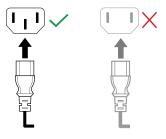
WARNING

Always **UNWIND THE CABLE COMPLETELY** when using a cable reel and untangle an extension cord before connecting the device to the power supply.



WARNING

Check if the power cord plug has grounding connection (with 3 pins). In order to reduce risk of electric shock **DO NOT** use plug without grounding connection (without center pin).



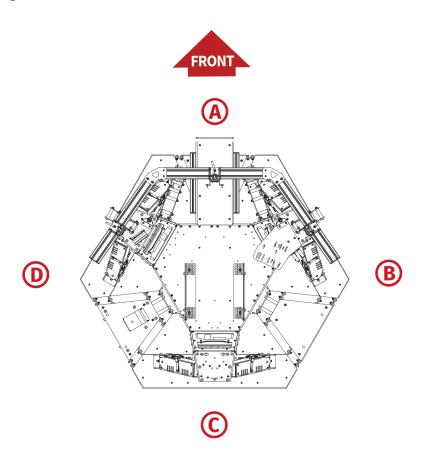
INFO

Ensure that the extension cord used to power the QS-S25 meets cross-section requirements:

- EU 3 x 1.5 mm2
- USA 3 x 14 AWG

2.6. NOISE EMISSION

The QS-S25 was checked for noise level based on actual standards. Noise level during normal work condition is not over 80 dB. Measuring method is ISO 11202. Four measuring positions as shown on the picture are placed 160 cm from the floor level and 100 cm from the edge of the device.



Measurement point	A	В	С	D
Measurement conditions: Sinus input signal Auto acceleration 100% speed Heave 50 mm 0,9 Hz frequency 250 kg ballast load	60,7	63,4	62,9	63,2
	dB(A)	dB(A)	dB(A)	dB(A)
■ Typical game	53,9	56,8	57,8	58,6
■ 250 kg ballast load	dB(A)	dB(A)	dB(A)	dB(A)

3. INSTALLATION

WARNING



Dangerous voltages level can be present in Power Cabinet and cables during the operation and for a few minutes after turning off the machine.

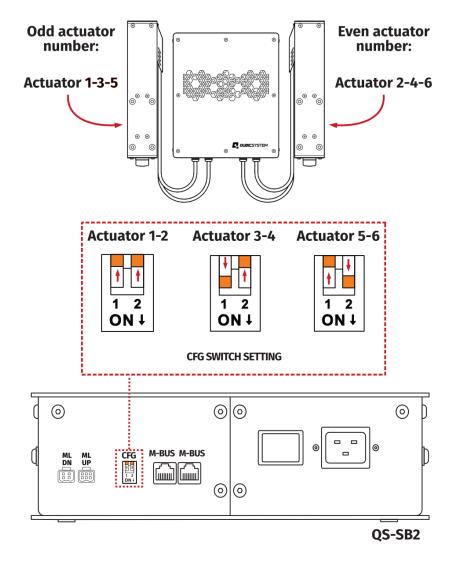
Remember, even though possibilities with QS-S25 are broad, some things should be kept in mind when the place for the rig is chosen. Motion Systems **DOES NOT** approve exceeding or ignoring any of these points and **IS NOT** responsible for malfunctions or failures that are the results of these actions.

- **DO NOT** use the QS-S25 on very soft or fragile surfaces like rubber, glass, or foam.
- Ensure that all QS-S25 modules are mounted properly.
- Be aware that QS-S25 will crawl a little in every direction during operation. Those movements could damage the surface in the long term. Manufacturer, its subsidiaries, and their partners are not responsible for any floor damages.
- **DO NOT** mount the rig in tight or cluttered spaces remember that QS-S25 moves and nothing should restrict its motion range.
- Seatbelts and other harnesses should be mounted to parts of the motion rig that move in the same way as the seat. **DO NOT** attach them to any static part or ground.
- Cables must not be stretched and should be kept in a way that prevents them from getting under actuator or any part that can crush or tear them.
- If you want to use the QS-S25 in an unusual application, and you are not sure, that the desired setup is feasible, please contact, the distributor/reseller.

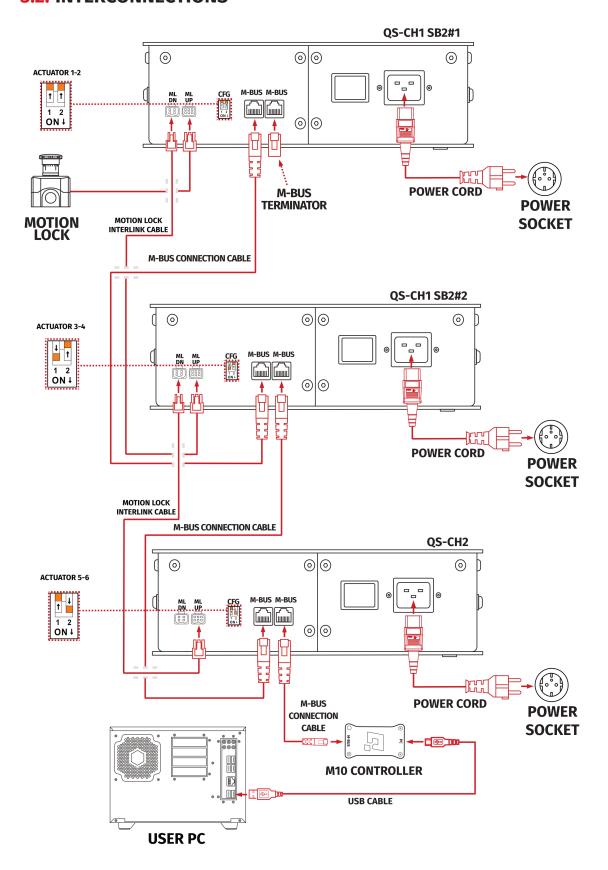
3.1. CFG SWITCH CONFIGURATION

INFO

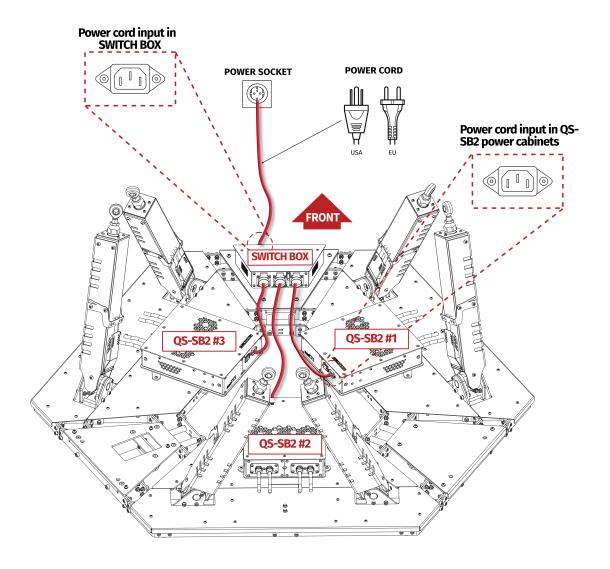
- You can connect one motion lock button to each ML UP port of the QS-SB2 power cabinet.
- Order of connecting the cables is not important. Keep the CFG switches setting according to the actuators numbering.



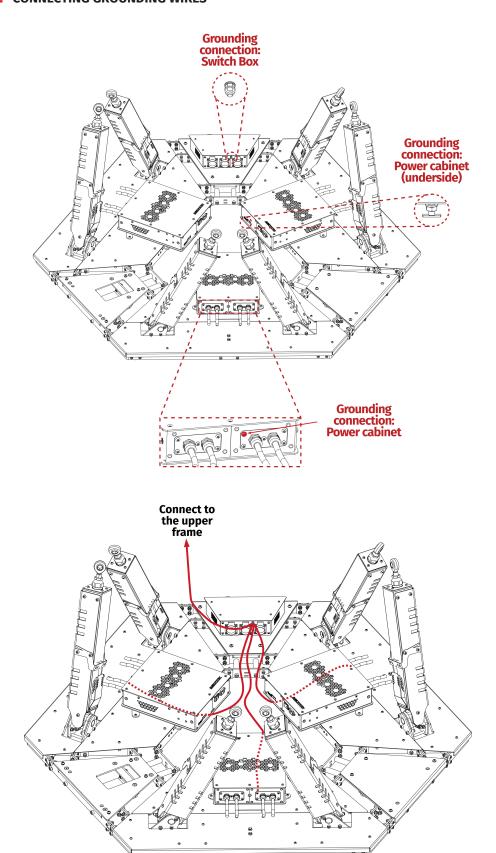
3.2. INTERCONNECTIONS



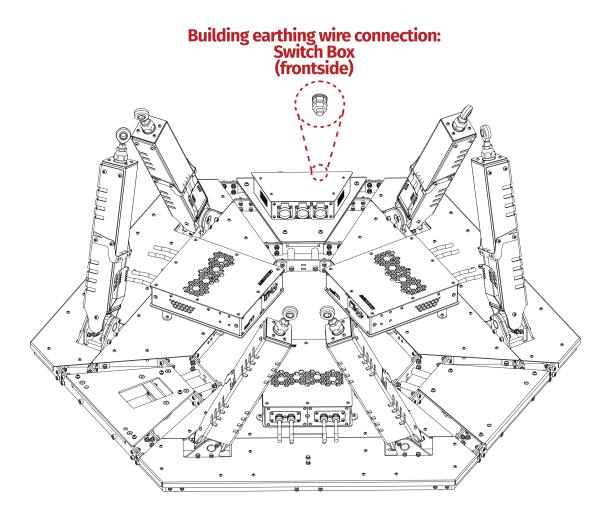
3.2.1 CONNECTING POWER CORDS



3.2.2 CONNECTING GROUNDING WIRES



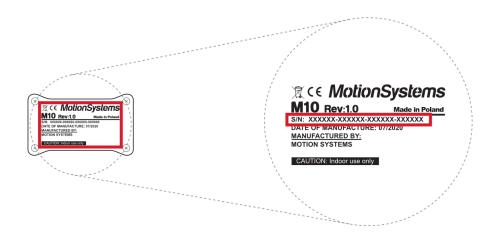
3.2.3 CONNECTING BUILDING EARTHING WIRE



3.3. SOFTWARE INSTALLATION

INFO

Note down the QS-S25 serial number before installation as it's needed to access software download page.



To download the software visit: QubicSystem.com/Download

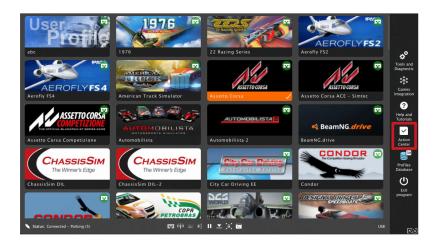
Once the QS-S25 is installed and connected correctly:

- **1.** Connect power connection cord to the wall socket. If you own extended set connect both power cords.
- 2. Download Qubic Manager.
- 3. Proceed with the installation steps and launch the application.
- **4.** Turn on the system by switching on the power switch button on the QS-SB2 power cabinet (on both if you own extended set).
- 5. Check position of Motion Lock Switch, unpress if needed.
- 6. The QS-S25 will perform a start-up calibration.

WARNING

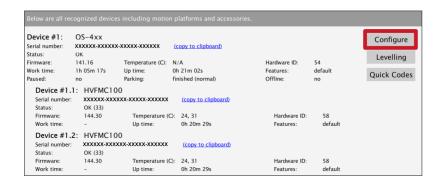
DO NOT change the payload during the start-up calibration.

- **7.** If Qubic Manager has recognized the QS-S25 correctly, the status of the machine visible in the lower left corner will change to **Connected**.
- **8.** Check **Action Center** on the right side panel for a list of actions that requires attention:

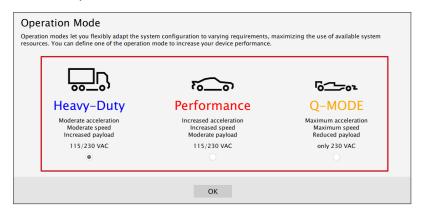


It is possible to solve them one by one or by pressing the **Resolve All** button. Firmware update may require additional confirmation in the dialogue box.

9. Go to **Tools and Diagnostics** → **Devices** and select **Configure**.



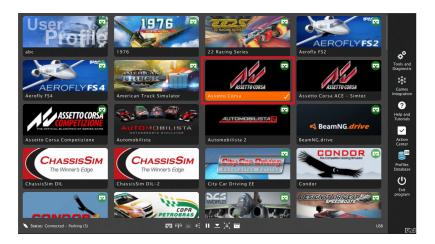
10. Choose one of the operation modes:



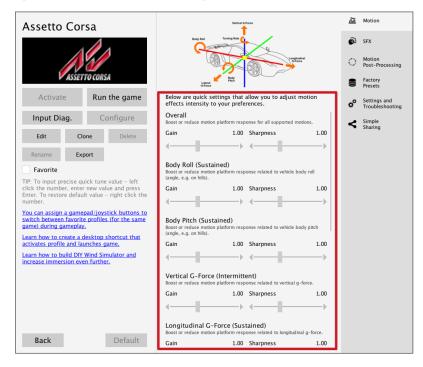
INFO

Q-MODE is unavailable for QS-S25

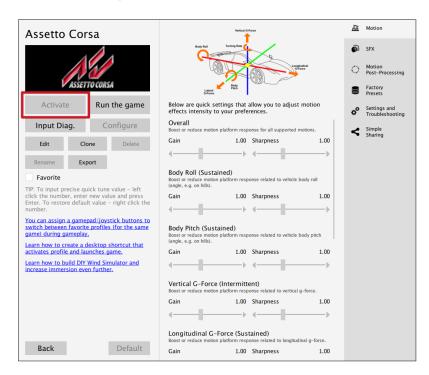
11. Close the configuration and return to the main application window. Choose the game and check profile details by clicking on the game tile.



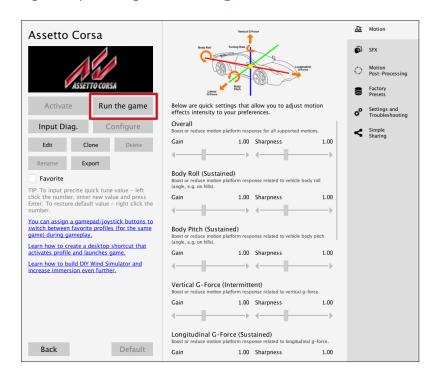
12. Adjust the motion effects intensity to your preferences in the game profile window, scroll down in the window to see all of the settings. You can adjust the settings during the game simulation by pressing **ALT+TAB**.





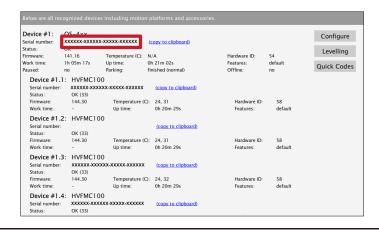


14. Launch the game by clicking the **Run the game** button.



INFO

If you need the serial number to activate other software licences such as ForceSeatMI or ForceSeatDI, it can be found in the Qubic Manager. After connecting the QS-S25 go to **Tools and Diagnostics** →**Devices**. Serial number is visible under the device name:



WARNING

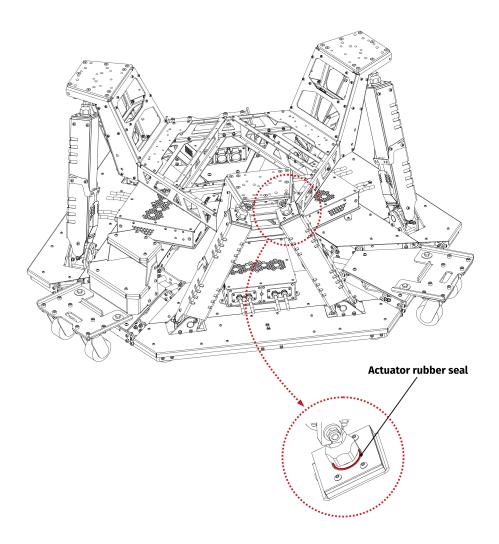
The software is provided "as is", without warranty of any kind, express or implied, including but not limited to the warranties of merchantability, fitness for a particular purpose, and non-infringement. In no event shall the authors or copyright holders be liable for any claim, damages, or other liability, whether in an action of contract, tort or otherwise, arising from, out of, or in connection with the software or the use or other dealings in the software. The software sends anonymous usage data to the Motion Systems company. The data is used to improve the software and game profiles. The data is not used for advertising purposes.

4. MAINTENANCE

To minimize the risk of abnormal heating that can result in system failure, keep the QS-S25 uncovered, clean and dust-free. Cleaning the unit should be performed with a soft, dry cloth. **DO NOT** use solvents or cleaners that may corrode or damage materials of parts used in the QS-S25 in any other way.

At least once a month check if Motion Lock Switch is working correctly – turn on the QS-S25 (when no one is using the rig) and push the red button. If the machine turns off and does not react to any signal (turn on simulation or game to check it) then Motion Lock Switch works properly. If the machine reacts in any different way stop using it and contact the technical support immediately.

To minimize the risk of QS-S25 failure, check the condition of the linear actuator's rubber seals once a month, and lubricate them externally, if necessary, using a viscous lubricant spray with dispenser.



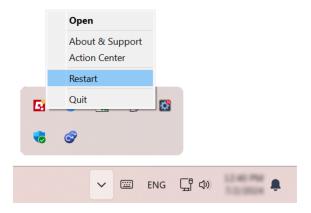
5. TROUBLESHOOTING

WARNING

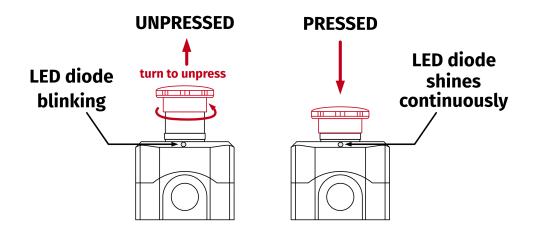
DO NOT attempt to do any repairs by yourself. It is dangerous and voids the warranty! Repairs should be consulted with technical support and then performed by a qualified technician.

Before contacting technical support, try this:

- Check Action Center in QubicManager.
- Check all cable connections in the device.
- Restart QubicManager application by right-click on the application icon in the system tray and selecting **Restart**:



■ Check Motion Lock Switch position (it should be unpressed to activate the motion)



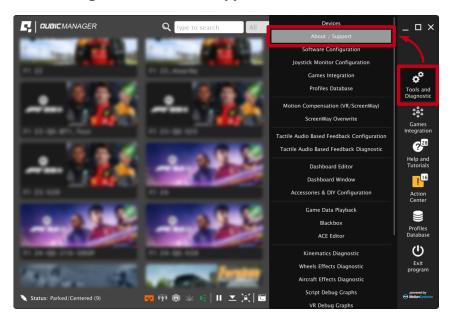
- Try different USB ports.
- If a problem occurred abruptly, it could be caused by a thermal protection. Turn off the QS-S25, disconnect it from power outlets and wait at least 15 minutes to let it cool down. Try turning it on again later.

- In case of any unclear electrical issues or strange behavior, contact technical support
- If the device suffers from abnormal work conditions, please immediately contact the distributor/reseller for technical support.

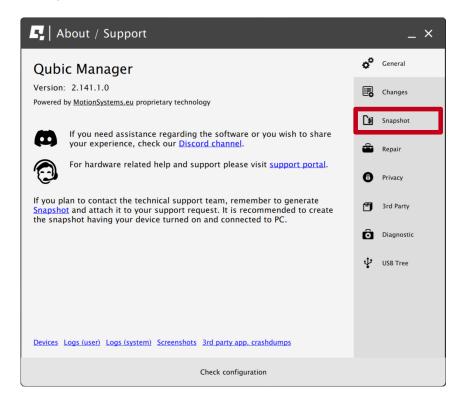
5.1. CREATING A SNAPSHOT

A snapshot is the easiest and fastest way to diagnose a problem. If you send in the zip file generated in the snapshot menu along with a description of the problem, technical support receives the necessary information about the product and its configuration. It can be then analyzed to provide the best solution.

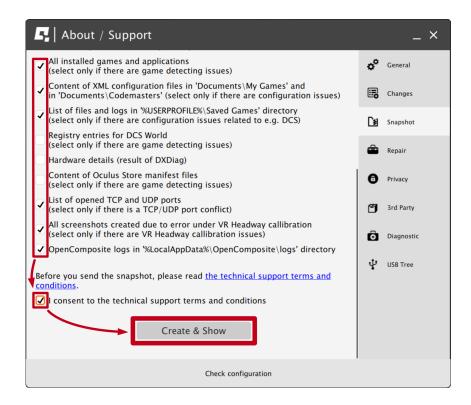
- 1. Open the main window of the QubicManager application.
- 2. Go to Tools and Diagnostic → About / Support.



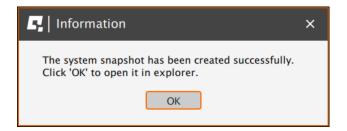
3. Open the Snapshot window:



- 4. Select data that will be included in the snapshot.
- Scroll down, consent to the technical support terms and conditions and selectCreate & Show:



6. The snapshot has been created, click the **OK** button - the folder with the snapshot ZIP file will open.



7. Attach the snapshot ZIP file to your support request.

5.2. DISCORD CHANNEL

We strongly recommend joining our discord channel, where our growing community is sharing amazing tips and ideas of how to set up, use and tune the Qubic System products. You can also send questions for technical support or get answers directly from the community.

Join our discord channel by following the invitation link:

https://discord.com/invite/tuAtybvTRn



6. ADVANCED APPLICATIONS

INFO

Examples shown in this section describes optional application of external safety and power cut-off devices. If you wish to expand the functionality of your motion system, read the whole section to have a good understanding of how to apply and what functionality to expect. Apply at your own discretion.

WARNING

Motion Lock input is not a SIL/PL (safety integrity level/performance level) rated and **DOES NOT** guarantee safety. If you wish to achieve specific SIL/PL ranking, consider introducing a power cut-off device that is controlled by an external safety relay and cuts off the power to all QS-SB2. Example application of the power cut-off contactor can be found in section 6.3.2 and 6.3.3.

INFO

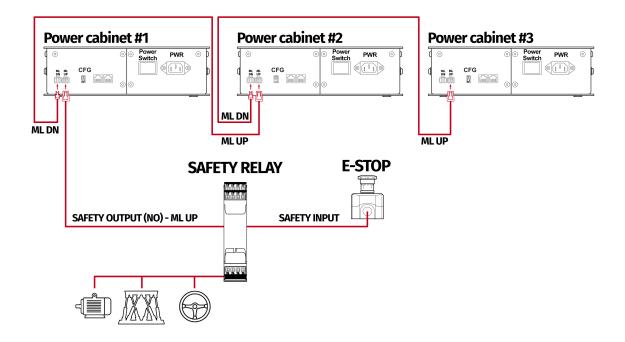
When applying safety relay to the Motion Lock:

- Use input cables according to your safety relay manual.
- Use output cables according to your safety relay manual and cross section no less than 0,75 mm²

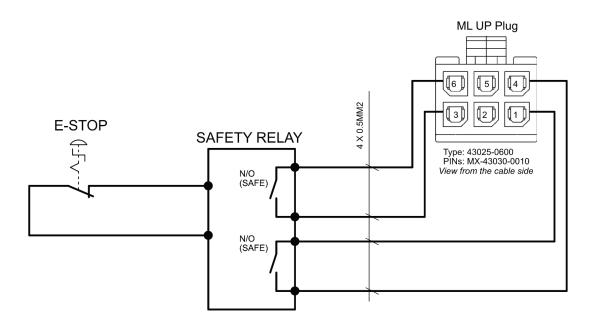
6.1. ADDING ADDITIONAL DEVICES TO THE MOTION LOCK CIRCUIT

If there is necessity to stop other devices, apart from the QS-S25, ML (Motion Lock) and additional user devices can be controlled by safety relay outputs. In the example application, the E-STOP button is connected to the external safety relay. When the E-STOP is triggered, the safety relay will activate the Motion Lock function, which will stop motion of the platform and additional devices.

Example application of single-channel safety relay that controls ML and additional devices :



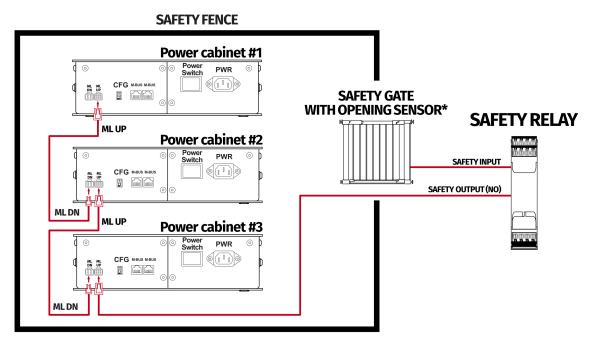
Example wiring diagram of application of one-channel safety relay with E-STOP button:



6.2. IMPLEMENTING THE WORKING ZONE PROTECTION

For protection against accidental hit from moving parts of the platform, safety gate with opening sensor* can be connected to safety relay input for activating ML function. When the gate is opened, the safety relay output activates the ML (Motion Lock) function and stops the motions of the platform.

Example application of safety gate opening sensor:



*Check your safety relay manual for list of applicable sensors

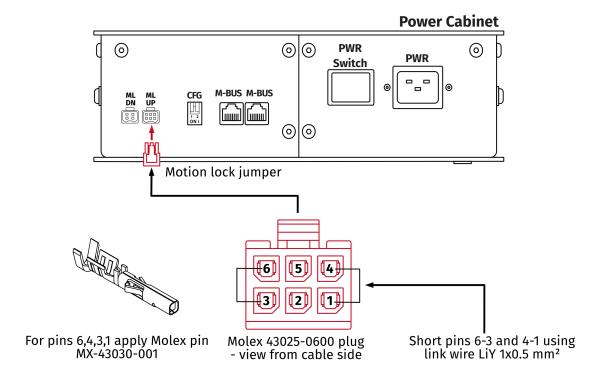
6.3. INCREASING SAFETY LEVEL

WARNING

Modifications of the safety system, involving application of the power line contactors, shall be performed only by a competent person. A competent person is a qualified and knowledgeable person, who because of their training, experience has the knowledge required to apply those changes. It is user responsibility to commission modification of the safety system to a competent person, experienced with industrial wiring practices, which will be required to undertake the installation. Commissioning shall be undertaken by a trained electrical technician experienced in safety installations.

6.3.1 ASSEMBLING MOTION LOCK JUMPER

To apply solutions which require to use power line contactors, Motion Lock connection cables in the QS-SB2 power cabinet needs to be replaced with jumpers, which are not provided with the QS-S25. To prepare jumper, you need to assemble recommended connector as shown below:



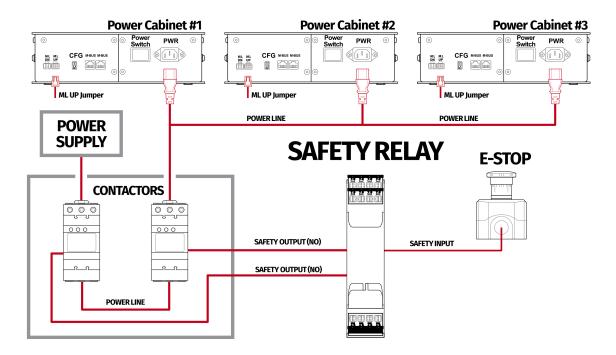
6.3.2 ADDING POWER-CUT CIRCUIT WITH E-STOP BUTTON

If specific SIL/PL rated level needs to be achieved, it might be necessary to install a power cut-off device. Two contactors connected in series and controlled by safety relay can be used to provide or cut-off power line to QS-SB2 power cabinets. When safety function on safety relay input is triggered, a safety relay will switch off the contactors, thus cutting-off the power to the platform. To apply this solution, ML UP connection cables needs to be replaced with prepared jumper as described in section 6.3.1

INFO

To achieve required safety performance level it is necessary to perform safety risk assessment at user site.

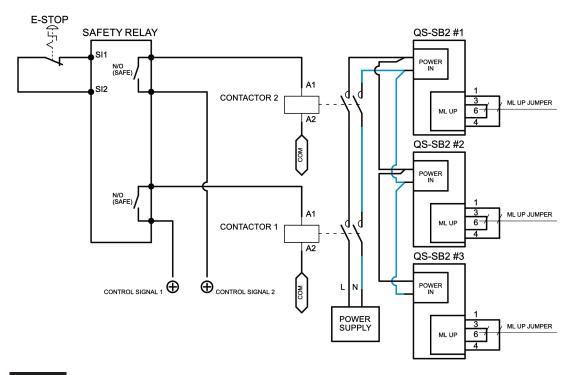
Example application of power line contactors and E-STOP button:



INFO

In order to increase SIL/PL level it's a good practice to apply well-known contactors of two different manufacturers in order to decrease probability of failure resulting from serial production.

Example wiring diagram of application of power line contactors and one-channel safety relay with E-STOP



INFO

PE (protective grounding/earthing) connection is omitted for better transparency

6.3.3 IMPLEMENTING THE WORKING ZONE PROTECTION WITH POWER-CUT CIRCUIT

In example application contactors connected in series provide power line to the QS-SB2 power cabinets. When safety function on safety relay input is triggered, a safety relay will switch off the power contactors, thus cutting-off the power to the platform.

Example application of power line contactors with safety gate opening sensor:

SAFETY FENCE Power Cabinet #1 POWER LINE **SAFETY GATE** WITH OPENING SENSOR* Power Cabinet #2 **SAFETY RELAY** CFG MBUSMBU SAFETY INPUT CONTACTORS POWER LINE SAFETY OUTPUT (NO) Power Cabinet #3 ML UP lumpe

*Check your safety relay manual for list of applicable opening sensors

INFO

When applying safety relay and contactors to the power line remember to:

- Use control cables according to your safety relay manual
- Power line cables shall be chosen accordingly to power requirements of motion system. See power requirements of specific motion system.

7. ENVIRONMENTAL IMPACT AND DISPOSAL



DO NOT dispose of this product with standard household waste, but dropped it off at a collection point for the disposal of Waste Electrical and Electronic Equipment for recycling.

QS-S25 is shipped with wooden cases. If the packaging is no longer needed, it can be fully recycled.

QS-S25 is an advanced device and if stored or disposed of incorrectly it could harm the environment or/and other people. When the device is no longer in use it should be disposed in environmental safe manner in compliance with applicable local work and environmental protection regulations. If no other agreement of disposal was concluded, the device shall be dismantled for disposal as follows:

- Metal parts should be scrapped.
- Electric and electronic components should be disposed in the specialized disposal center.
- Other materials should be sorted and disposed accordingly to the local law and regulations.

8. LIABILITY DISCLAIMER

If permitted under applicable law, Motion Systems and its subsidiaries disclaim all liability for any damages caused by one or more of the following:

- The product has been modified, opened, or altered.
- Failure to comply with assembly instructions.
- Inappropriate or abusive use, negligence, an accident (an impact for example).
- Normal wear.

INFO

If permitted under applicable law, Motion Systems and its subsidiaries disclaim all liability for any damages unrelated to the material or manufacturing defect with respect to the product (including, but not limited to, any damages caused directly or indirectly by any software, or by combining the QS-S25 with any unsuitable element or not other elements not supplied or not approved by Motion Systems for this product).

9. WARRANTY

Motion Systems warrants to the consumer that this product shall be free from defects in materials and workmanship, for a warranty period which corresponds to the time limit to bring an action for concerning this product.

For commercial customers, there is a one (1) year limited warranty, starting on the original date of purchase.

Within the warranty period, the product will be repaired or replaced free of charge, excluding shipping charges.

This warranty shall not apply:

- If the product has been modified, opened, altered, or has suffered damage as a result of inappropriate or abusive use, negligence, an accident, normal wear, or any other cause unrelated to a material or manufacturing defect (including, but not limited to, combining the QS-S25 with any unsuitable element, including in particular power supplies, chargers, or any other elements not supplied or approved by Motion Systems for this product).
- In the event of failure to comply with the instructions provided by technical support.
- To software, said software being subject to a specific warranty.
- To accessories (cables, cases, for example).
- If the product was sold at public auction or if the product has suffered damage as a result of force majeure: flood, fire, earthquake, storm.

This warranty is non-transferable. No new warranty period commences if the product is repaired or replaced. Your statutory rights towards the seller are not affected or restricted by this warranty. Motion Systems, and their partners are not liable for any indirect, incidental, or punitive damages from use of this product. In case of malfunction during the warranty period immediately contact technical support.

10. COPYRIGHT

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11. MANUFACTURER INFORMATION

Motion Systems

Miedziana 7 Street 55-003 Nadolice Wielkie Poland



INFO

In support queries please contact your reseller.

