

COMPACT PRECISE
EXPERIENCE

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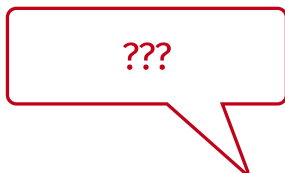
USER MANUAL



QS CH1

The Motion Systems, manufacturer of Qubic System, would like to thank you for choosing the QS-CH1 , 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



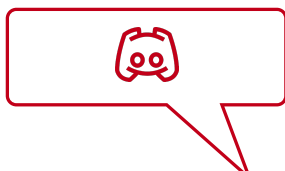
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1. SAFETY PRECAUTIONS

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



The device is intended solely for individuals **OVER THE AGE OF 16**. In case of use by individuals with limited physical, sensory, or mental capabilities, strict supervision is required. Read safety instructions before using the device.

WARNING



The device is **NOT** allowed to be used by a pregnant woman.

WARNING



DO NOT use the device around pets.

WARNING



To reduce the risk of burns, fire, electrical shock, injury or mechanical damage always **TURN OFF THE POWER SUPPLY** before plugging and unplugging the QS-CH1 . Dangerous voltages level can be present in Power Cabinet for a few minutes after turning off the machine.

WARNING



DO NOT touch the actuators when the power is on.

1.1. ESSENTIAL INFORMATION

INFO

Read all the 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.

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

- Use the QS-CH1 only for its intended purpose, according to instructions.
- Unplug the QS-CH1 from the power supply if it is not used for an extended period of time or when there is a need to perform hardware installation, maintenance, service or repair.
- Turn off the QS-CH1 when it is not in use.
- The QS-CH1 was designed for indoor use only - **DO NOT** store or use the product outdoors.
- Keep the QS-CH1 away from heat sources, high humidity, water, and other liquids. **DO NOT** store in places where water vapor condensation may occur due to low temperatures.
- **DO NOT** disassemble the Power Cabinets or actuators. Any tampering with or altering the product will void the warranty, pose a serious risk of electric shock, and may irreparably damage the product.
- If the device starts emitting unusual noises, smoke, or indicating that the device is not working properly, **STOP** using the QS-CH1 immediately and contact technical support.
- **DO NOT** cover the ventilation holes in the device.
- Keep the power cord plug and the socket dry, clean and dust-free.
- Protect the power cord from being damaged by being stepped on, rubbed against, or pinched.
- **DO NOT** use the QS-CH1 if the ambient temperature is below 5°C (41°F) or above 40°C (104°F).
- **DO NOT** use the QS-CH1 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 replace a damaged power cord, use only certified products with the same rating as the one being replaced.
- Connect the QS-CH1 to a correctly grounded outlet only. See grounding connections in section 2.5 on page 12.
- If you want to increase safety level of the system, you can add external safety devices. For detailed information check section 6 on page 37.
- Use only certified components (seat, seat belts, fasteners) when installing them to QS-CH1.

WARNING

Stop using the QS-CH1 immediately and contact technical support when the machine starts to emit unusual noise, smoke or any other suspicious behavior 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.

Even though possibilities with QS-CH1 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-CH1 on very soft or fragile surfaces like rubber, glass, or foam.
- Ensure that all QS-CH1 modules are mounted properly.
- Be aware that QS-CH1 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-CH1 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-CH1 in an unusual application, and you are not sure, that the desired setup is feasible, please contact, the distributor/reseller.
- Check if cables are mounted properly – they are not stretched or loosely connected to the socket.
- Check if there are no objects in the motion range of the platform.
- Check that all elements are properly fixed.
- Check if there are no sharp edges nearby.
- 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-CH1 is turned on, it performs start-up calibration.

WARNING

QS-CH1 will move automatically after turning it on in order to perform start up procedure. Stay in the safe distance from that movement and do not try to interrupt it.

- **DO NOT** interrupt or change the weight of payload mounted to the QS-CH1 during start-up calibration.
- Motion Lock Switch should be mounted close to the operator or user 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 32.
- Before getting on or off the machine **ALWAYS** activate Motion Lock (press the red button)
- In case of game crash or freeze, 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 **Advanced applications** on page 37.

- For VR Headset users:
 - Remove the VR goggles before entering or exiting the rig.
 - Ensure that VR Headset is not limiting the operation range of QS-CH1 .
 - Check if the whole VR setup is not in range of motion of the machine.
 - **DO NOT** place the connection 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-CH1 if you are pregnant, tired, or under the influence of alcohol or drugs.
- **STOP USING** the QS-CH1 immediately if pain, fatigue or any discomfort appears.
- For every two hours of using the system, 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-CH1 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

The QS-CH1 is a modular platform designed to adapt Qubic System motion actuators. It is dedicated for land vehicles and car driving simulation. Full set of the QS-CH1 motion system includes 4 electrical actuators with dedicated Power Cabinets (2x QS-210 or 2x QS-220 set) with a designed installation solution under the cockpit, which significantly reduces the usable space and improves safety. Additional accessories for mounting the seat, steering wheel and pedals are all adjustable. System fully assembled requires only 1.5 square meters of space.

The QS-CH1 base motion system consists of:

- QS-CH1 base frame
- 4x QS-220 actuator mounting bracket*

The QS-CH1 full set consists of:

- 2x QS-210/220 motion set:
 - 4x QS-220 linear actuator
 - 2x Power Cabinet
 - 2x motion lock interlink cable (up-link/down-link) – 2 meters long
 - 2x Ethernet RJ-45 cable – 2 meters long
 - 2x Power cable
 - 4x Actuator stabilization pads

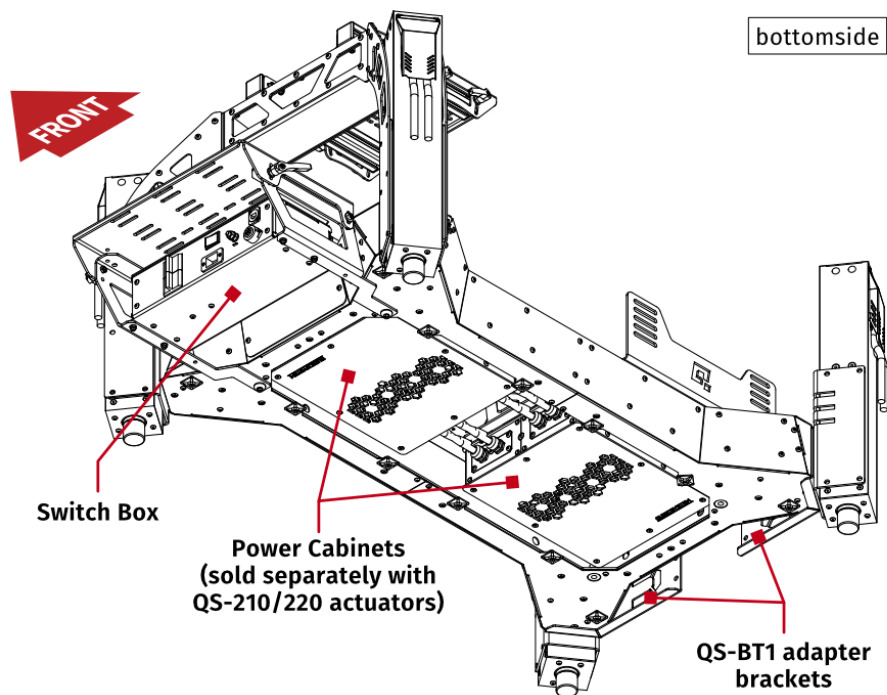
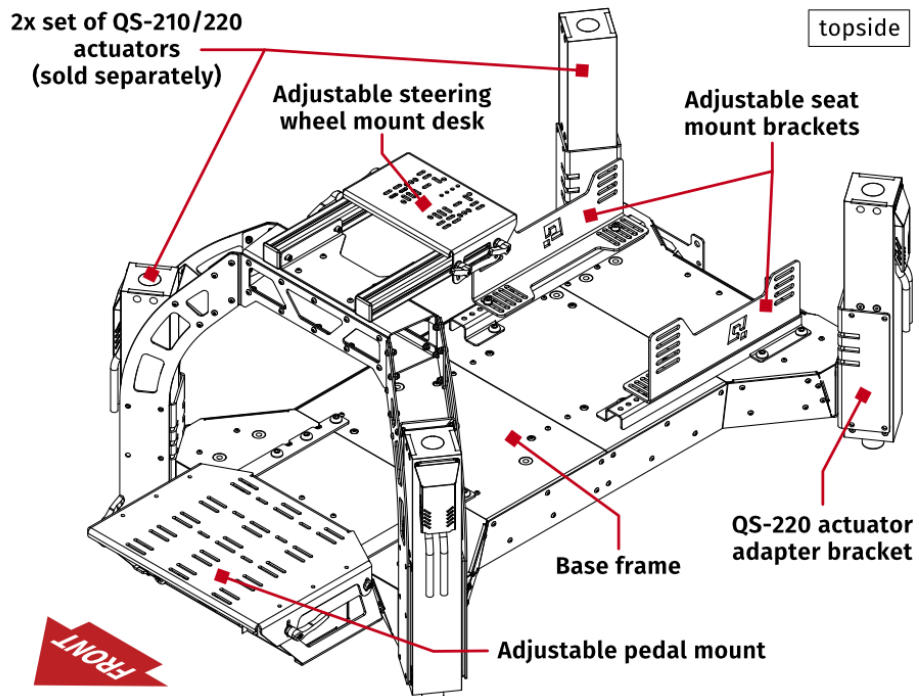
INFO

- *QS-210 motion set includes QS-210 actuator specific mounting brackets.
- For additional information about the QS-210/220 devices refer to **QS-210 user manual** or **QS-220 user manual**.

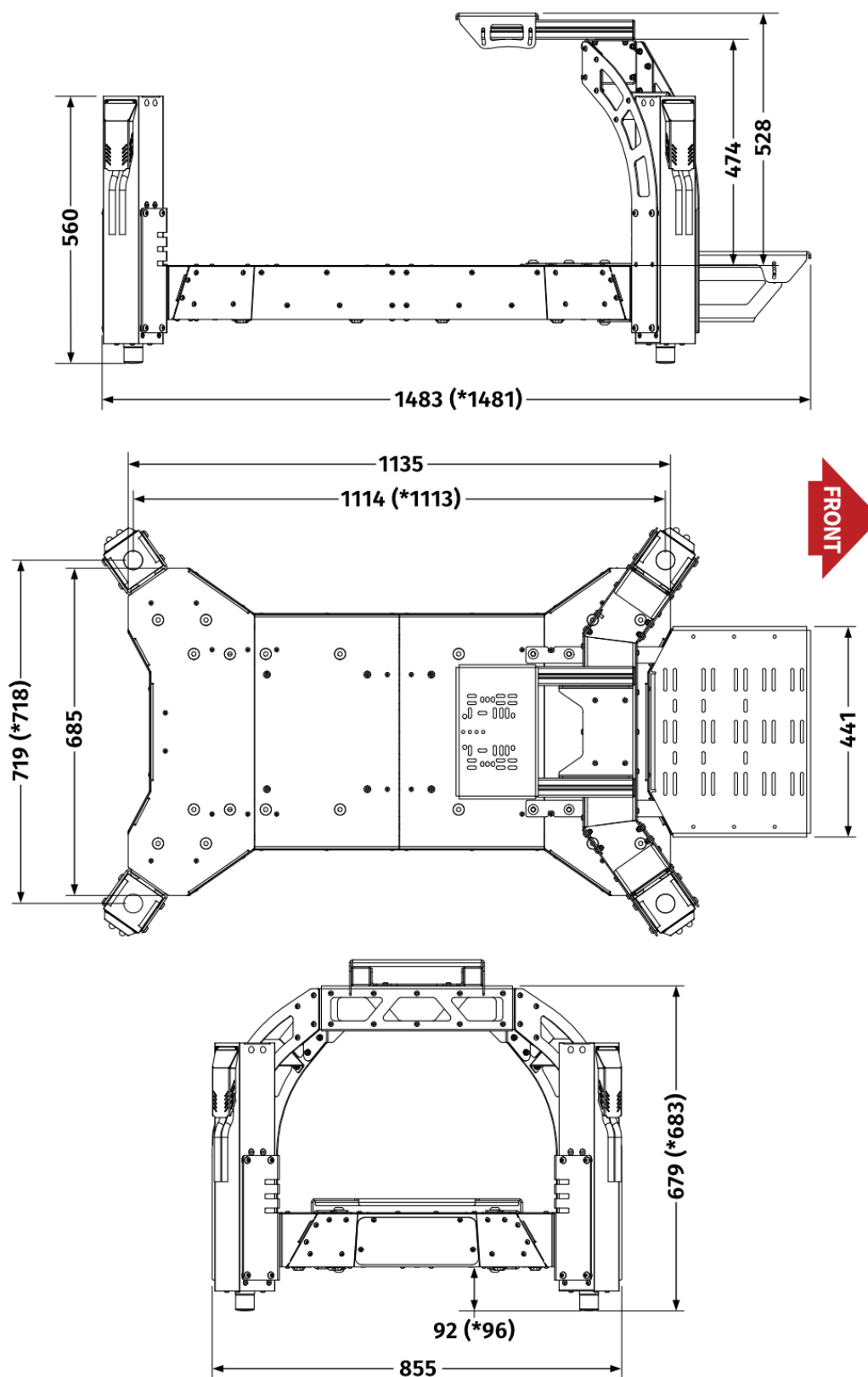
- 1x QS-MC6 controller set:
 - 1x M10 Controller - USB Qubic System controller
 - 1x Motion Lock Button with cable - 1,5 meters long
 - 1x M-BUS terminator (RJ45 plug with resistor)
 - 1x USB cable (USB type C)
 - 1x Ethernet RJ-45 cable - 3 meters long
- 1x QS-CH1 cockpit set:
 - 1x QS-CH1 base frame
 - 4x QS-220 actuator mounting bracket
 - 1x adjustable wheel mount desk
 - 1x adjustable pedals mount
 - 1x set of seat mount brackets
 - 1x set of seat adjustment brackets
 - 1x Switch Box
 - 1x set of QS-BT1 mounting brackets
 - 1x QS-CH1 specific Motion Lock Button - 3 meters long

2.1. SYSTEM COMPONENTS

2.1.1 QS-CH1 FULL SET OVERVIEW



2.1.2 QS-CH1 DIMENSIONS



* Dimensions for QS-210 actuators

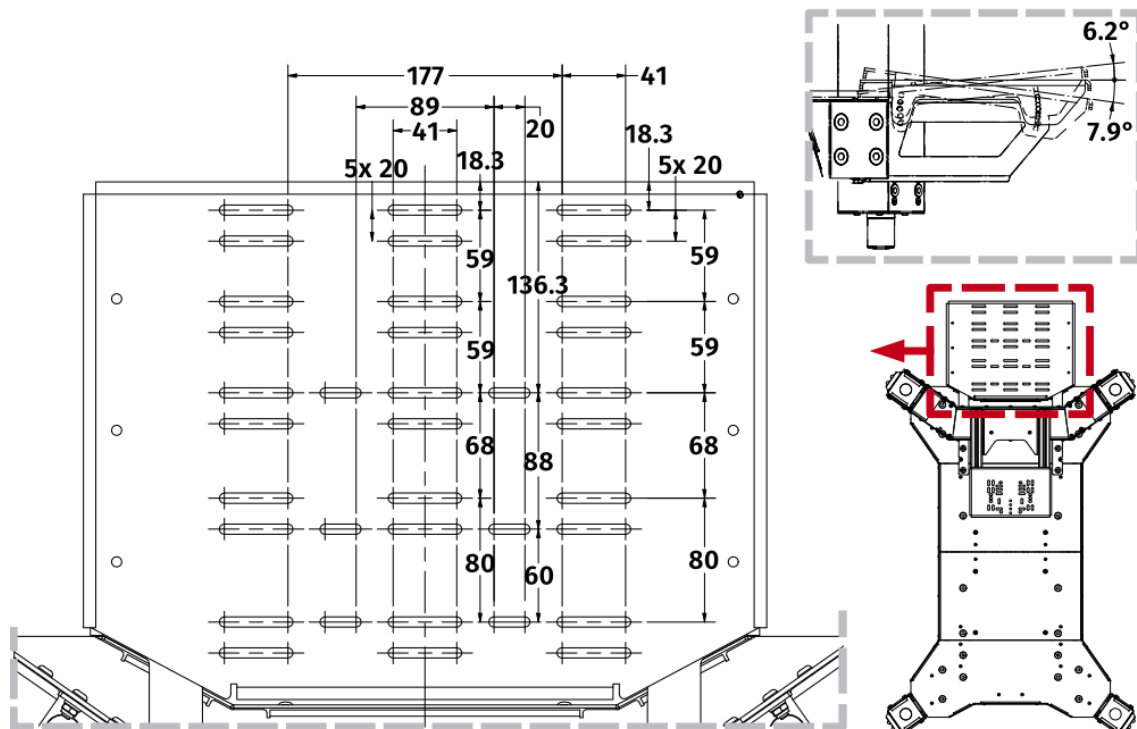
** All dimensions in millimeters

2.1.3 QS-CH1 ACCESSORIES ADJUSTMENT SPECIFICATIONS

Pedals mounting plate dimensions:

INFO

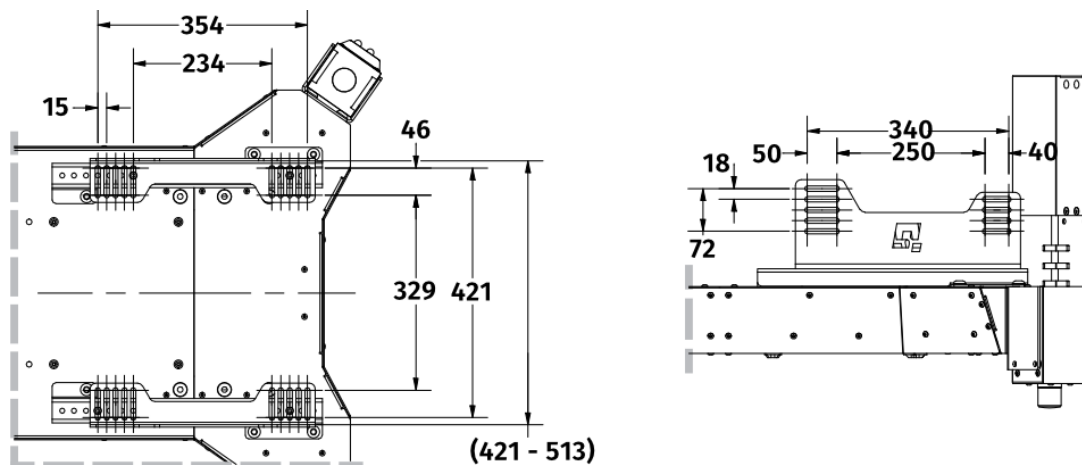
All gaps suitable for bolts up to M6 (width 6,5 mm).



Seat mount brackets dimensions:

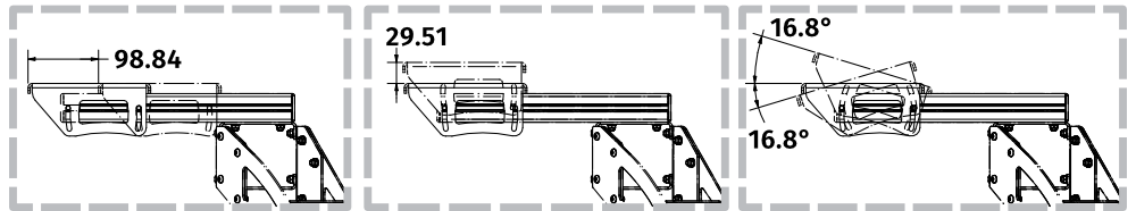
INFO

All gaps suitable for bolts up to M6 (width 6,5 mm).



INFO

All gaps suitable for bolts up to M6 (width 6,5 mm).



2.2. SYSTEM SPECIFICATION

| Parameter | QS-210 | QS-220 |
|--------------------------------------|----------|------------|
| Architecture | 3DoF | 3DoF |
| Actuator stroke | 60 mm | 100 mm |
| Platform weight | 160 kg | 160 kg |
| Gross moving load (Performance mode) | 140 kg | 190 kg |
| Vibration frequency range | 0-100 Hz | 0-100 Hz |
| Maximum control frequency | 1000 Hz | 1000 Hz |
| Excursions | | |
| Heave | 60 mm | 100 mm |
| Roll | 4.8° | 7.9° |
| Pitch | 3.1° | 5.1° |
| Maximum velocity | 400 mm/s | 800 mm/s** |
| Maximum acceleration | 0.6G* | 0.8G* |

*Value of acceleration is limited for safety reasons.

**Data for Q-MODE which is unavailable for QS-210.

2.3. 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-CH1, contact a qualified electrician.

Power supply requirements 2 x Single Phase for 120V, 1 x for 220-250 VAC Single Phase.

| Parameter (all data for Performance mode) | QS-210 120V | QS-210 230V | QS-220 120V | QS-220 230V |
|-------------------------------------------------|----------------|----------------|----------------|----------------|
| Average power for converter specification [kVA] | 1.0 | 0.8 | 0.7 | 0.9 |
| Peak power for converter specification [kVA] | 1.8 | 1.7 | 1.5 | 1.6 |
| Peak current for breaker specification [A] | 17 | 8 | 13 | 7 |
| Average power consumption (stress test) [kW] | 0.5 | 0.3 | 0.3 | 0.3 |
| Average power consumption (typical game) [kW] | 0.1 | 0.1 | 0.05 | 0.04 |

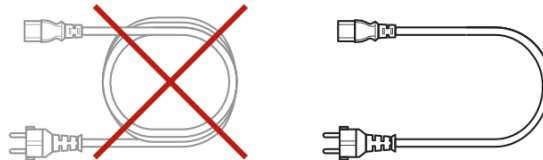
*With heavy payload and/or intensive simulation, average power consumption may rise.

WARNING

For safety reasons, **DO NOT** attempt to modify machines or cables by yourself. QS-CH1 can be used in 120V AC/230V AC, 50~60Hz environment.

WARNING

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



2.4. GROUNDING REQUIREMENTS

In case of a system malfunction or breakdown, grounding provides a path of the least resistance for electric current to reduce the risk of electric shock. If the location (where the QS-CH1 is set up) can not provide proper grounding according to the description, please contact a qualified electrician for assistance.

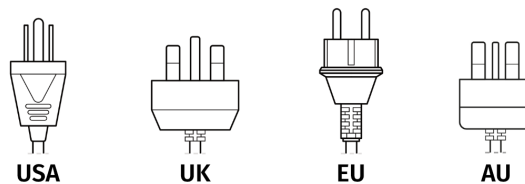
DO NOT modify the plug provided with the power cord - if it does not fit the outlet, contact a qualified electrician for assistance.

WARNING

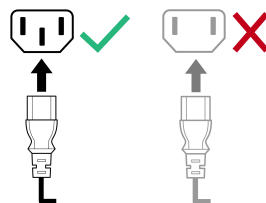
The power supply for QS-CH1 includes an electric cord with an equipment-grounding conductor and a grounding plug. The plug must be plugged into a matching socket that is correctly installed and grounded in accordance with appropriate local codes and ordinances. It is recommended to use multiple, separately fused wall sockets.

If your electrical installation does not provide you with that option look into other electrical safety protection systems in section 6.3.2 on page 41.

Applicable plugs for different regions:



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



WARNING

The device is **NOT** intended to be used in an IT earthing/grounding system.

INFO

Use only high-quality power plug adapters purchased from a trusted supplier.

2.5. CONNECTING GROUNDING WIRES

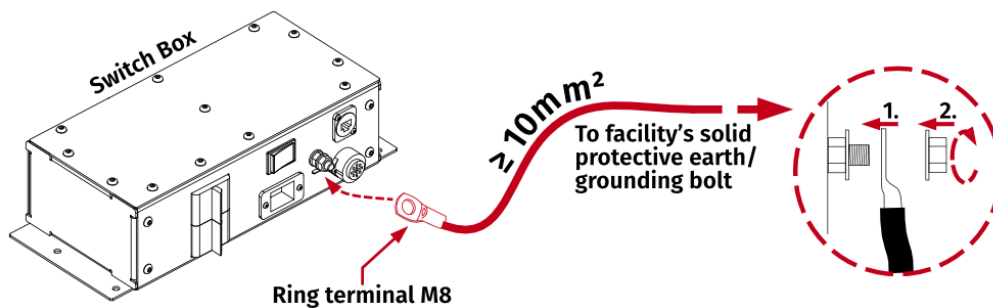
INFO

Switch Box is equipped with a low resistance protective-earth bolt. It must be connected to the facility's solid protective earth/grounding bolt in order to increase suppression level. It is recommended to use at least 10 mm² copper wire.

WARNING

All operations **MUST BE** performed with the platform powered off and by a qualified electrician.

Front grounding bolt on Switch Box must be connected to the facility's solid protective earth/grounding bolt, as in an illustration below:

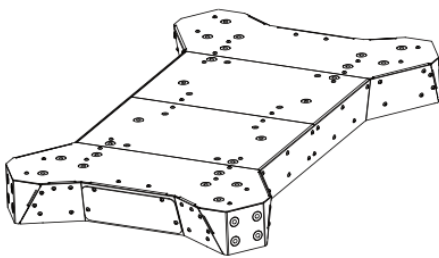


3. INSTALLATION

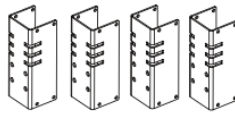
WARNING

- Make sure you are equipped with torque wrench and follow the torque specs for each bolt.
- Use mild thread locker on every bolt that is not screwed in with locknut.

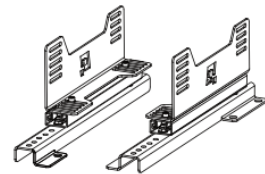
3.1. PARTS LIST



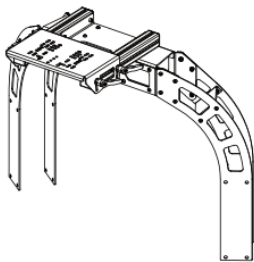
1x QS-CH1 Base frame



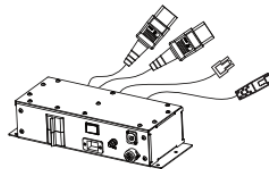
1x Set of QS-220
actuator adapter
brackets



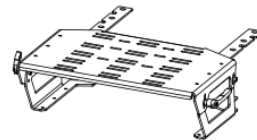
1x Set of adjustable seat
mount brackets



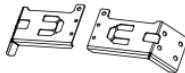
1x Adjustable wheel
mount desk



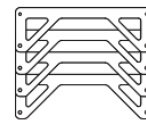
1x Switch box with
integrated cables



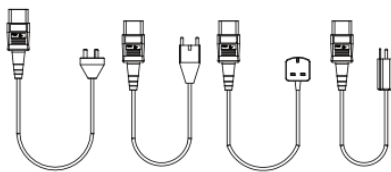
1x Adjustable pedal mount



1x Set of QS-BT1
adapter brackets



1x Set of Power Cabinet
adapter brackets



4x Power cords (EU, UK, US, AU type plugs)



1x Motion Lock Button

INFO

- Qubic System actuators set are purchased separately.
- QS-210 actuator adapter brackets are included with the set of actuators.

3.2. ACCESSORIES ASSEMBLY INSTRUCTIONS

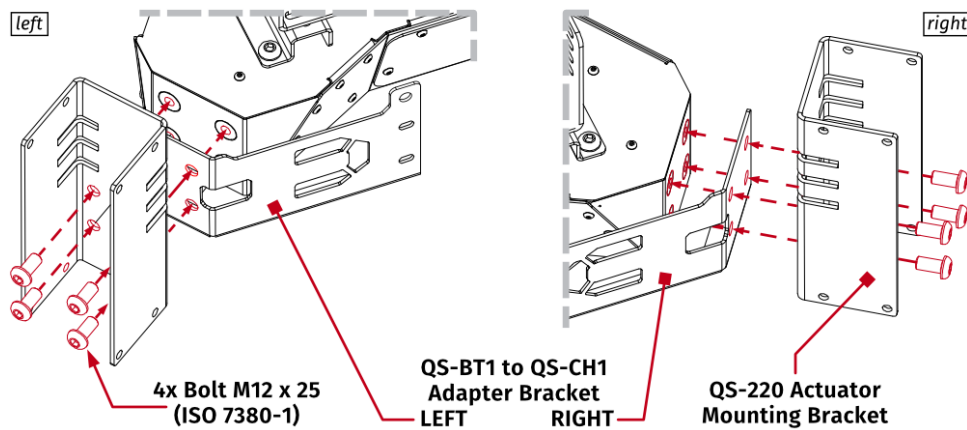
INFO

QS-CH1 is shipped in various configurations - refer to a specific assembly section for installation details on your specific accessory.

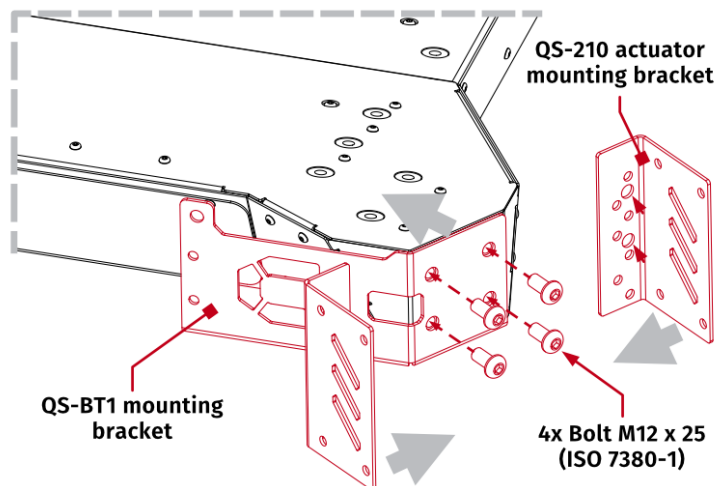
1. Attach the actuator adapter brackets: QS-BT1 mounting bracket (2x) must be between the device's base and the actuator mounting bracket, at the rear of the cockpit. Tighten all four bolts to 25 Nm (18.5 ft-lbs) of torque.

Note: base frame with no accessories is symmetrical and in this step integrator decides which end will be the rear.

QS-220 included actuator bracket assembly:

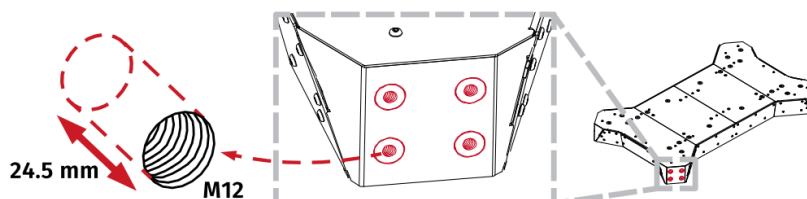


QS-210 actuator bracket (included with QS-210 set) assembly:

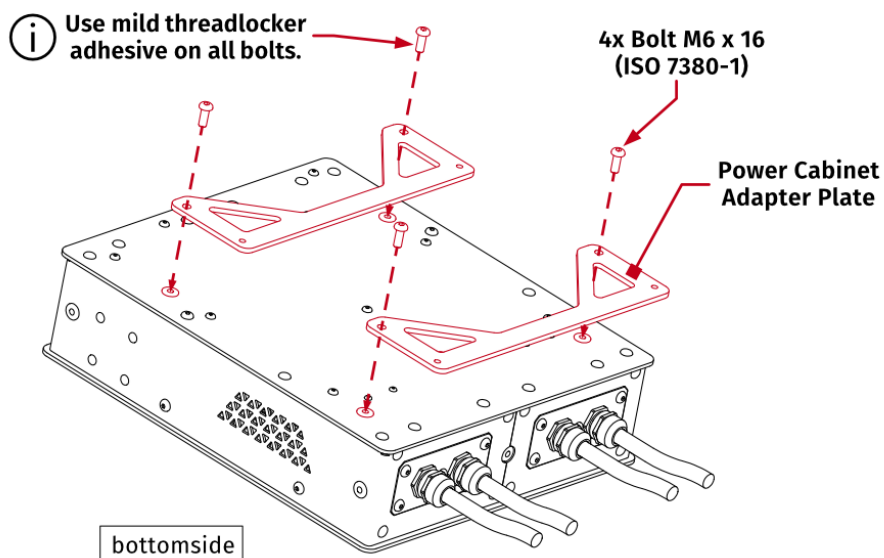


INFO

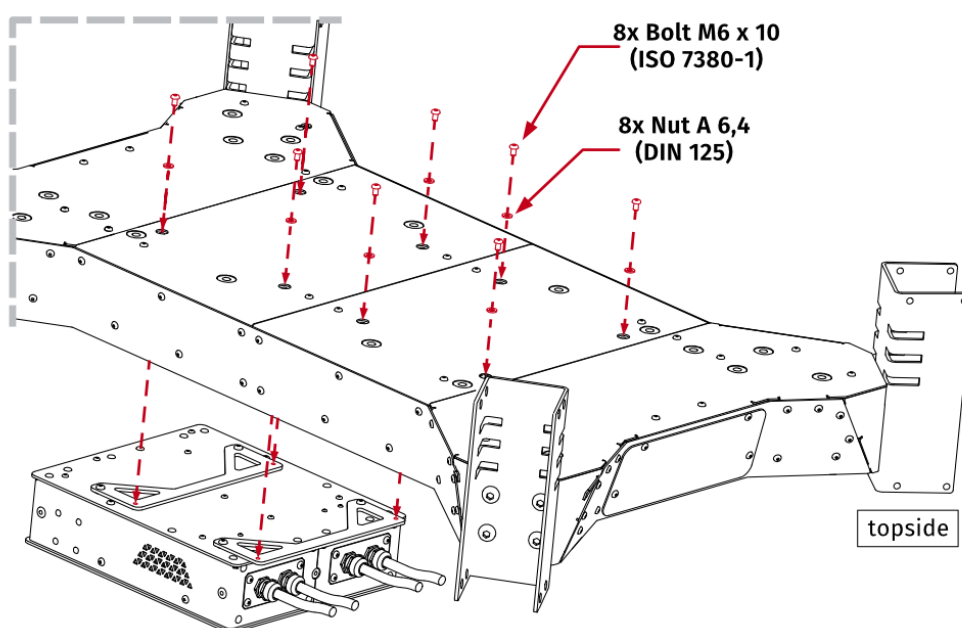
Mounting holes dimensions:



2. Attach the mounting adapters to Power Cabinet.

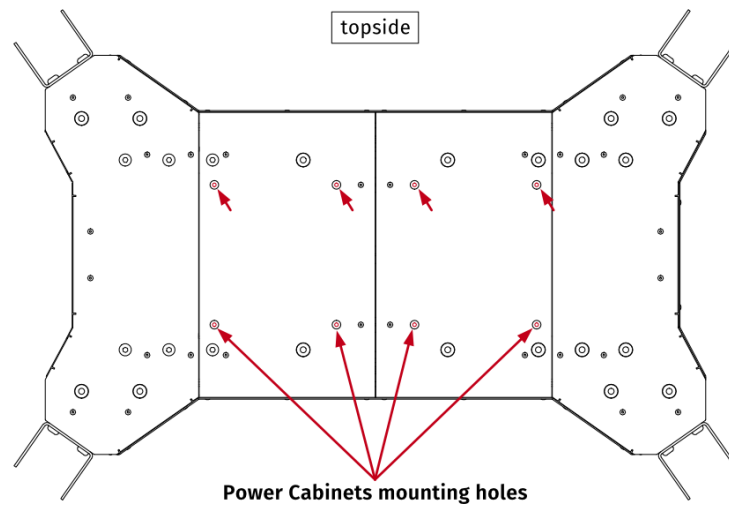


3. Attach the Power Cabinets directly through the base frame floor.

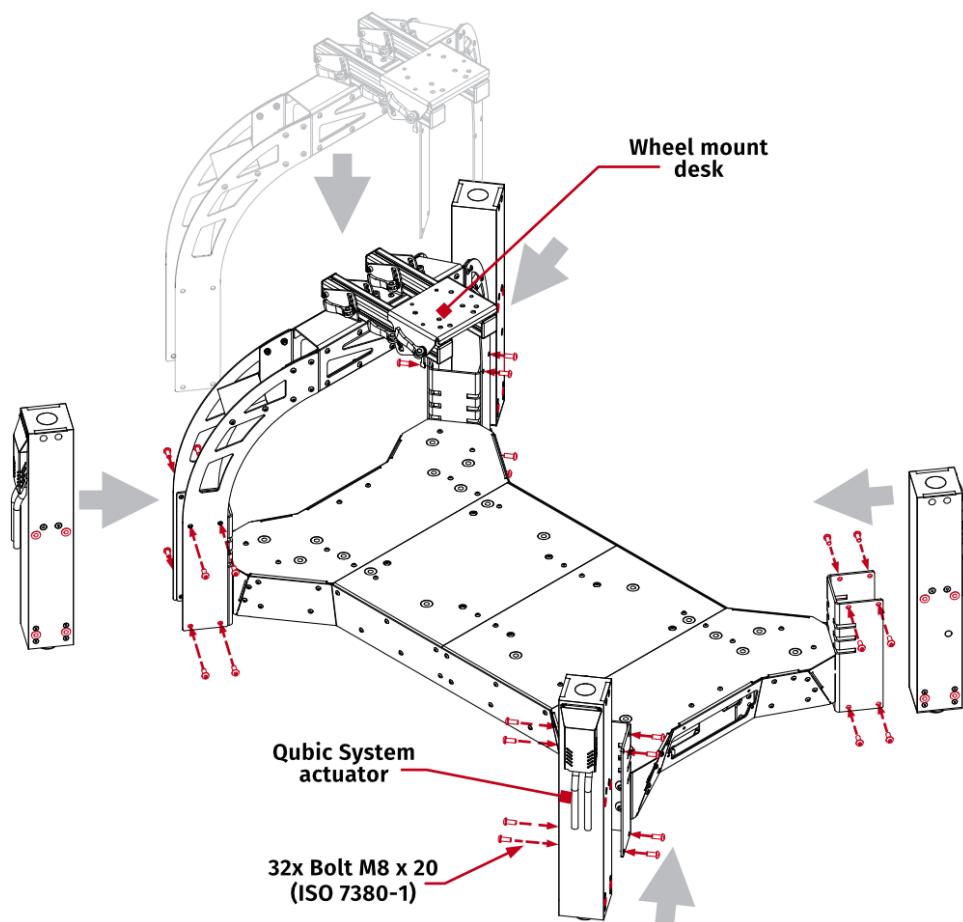


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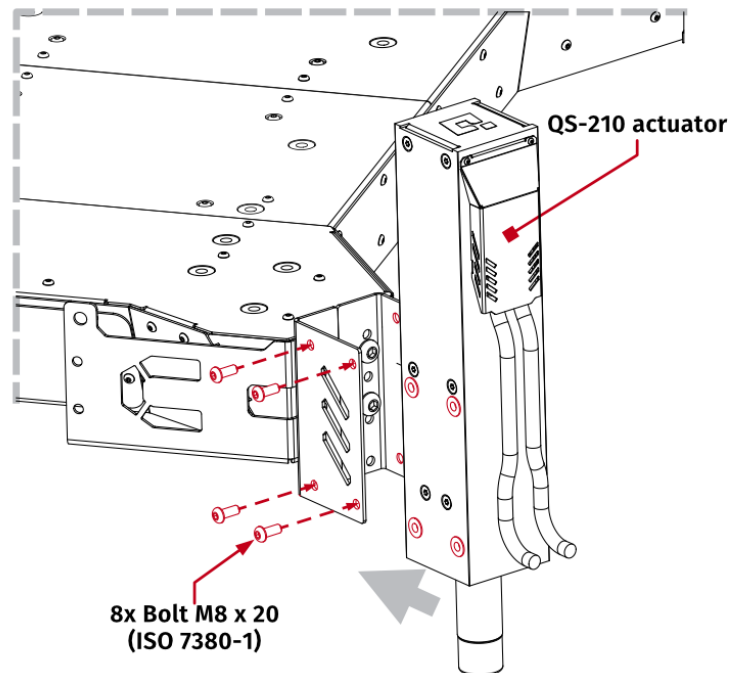
Reference illustration of Power Cabinets mounting holes:



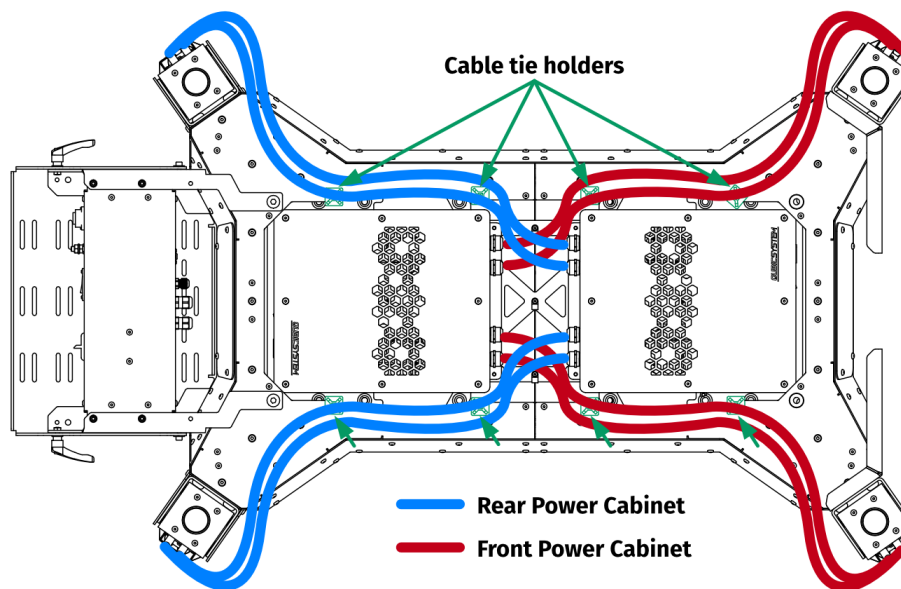
4. Slide in the Steering wheel mount desk onto the actuator adapter brackets and actuators inside the actuator adapter brackets and bolt them in place.



Use the same assembly method with QS-210 actuators:



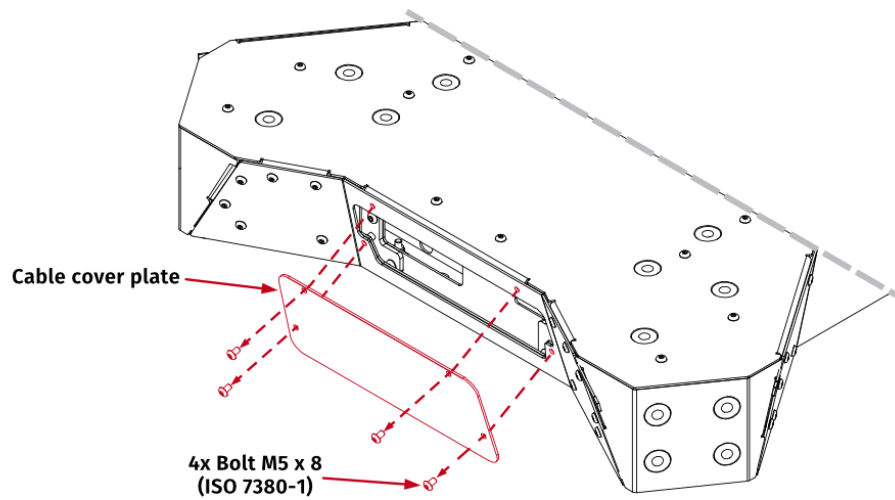
- Actuator cable arrangement is recommended as shown in the illustration:



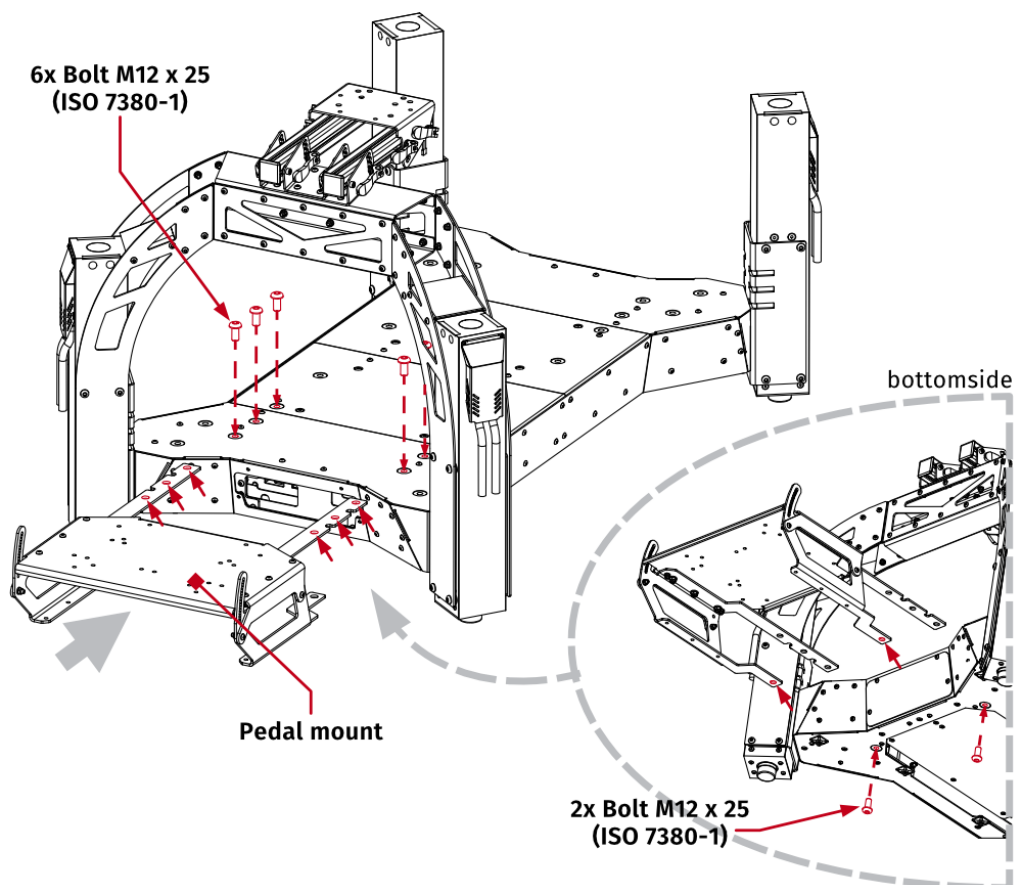
INFO

For a complete desk adjustment specification go to page 9.

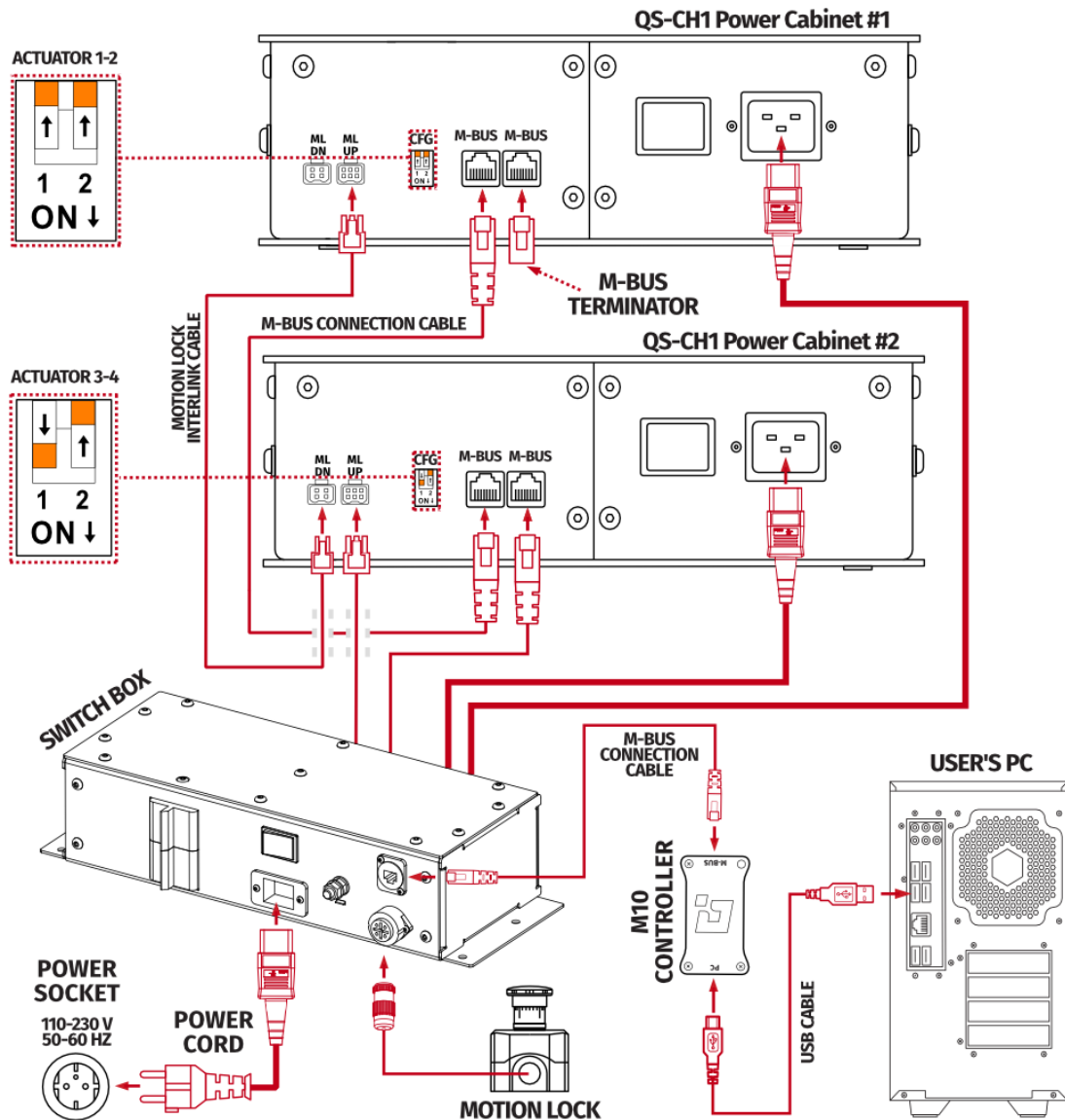
5. Open the cable grommet by removing the front plate.



6. Slide in the pedal mount. Attach it with 6 bolts from the top and 2 from the bottom.



7. Connect the Power Cabinets and Switch box using cables provided with the system, as shown on the interconnections diagram:

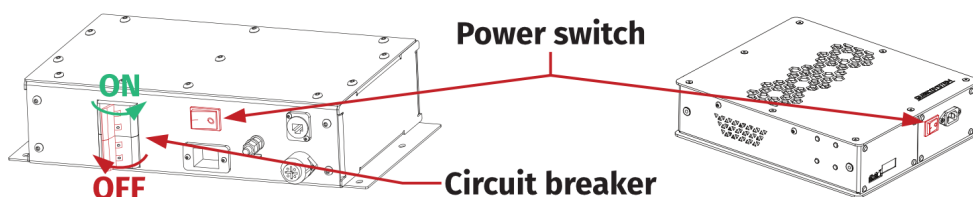


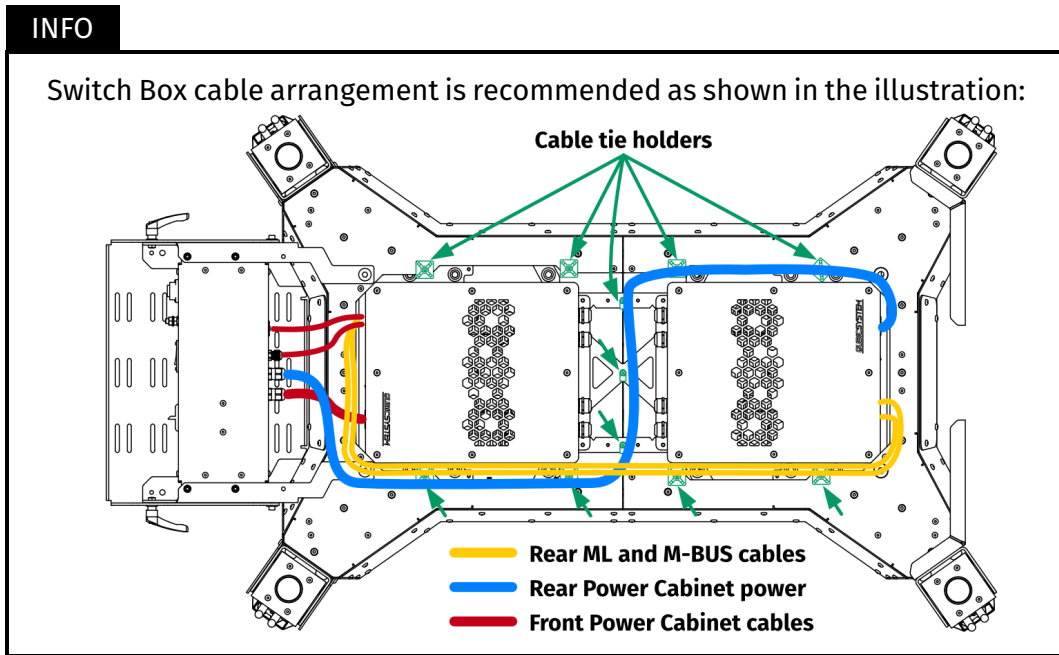
INFO

Order of connecting the cables is not important, keep the CFG switches setting according to appropriate layout.

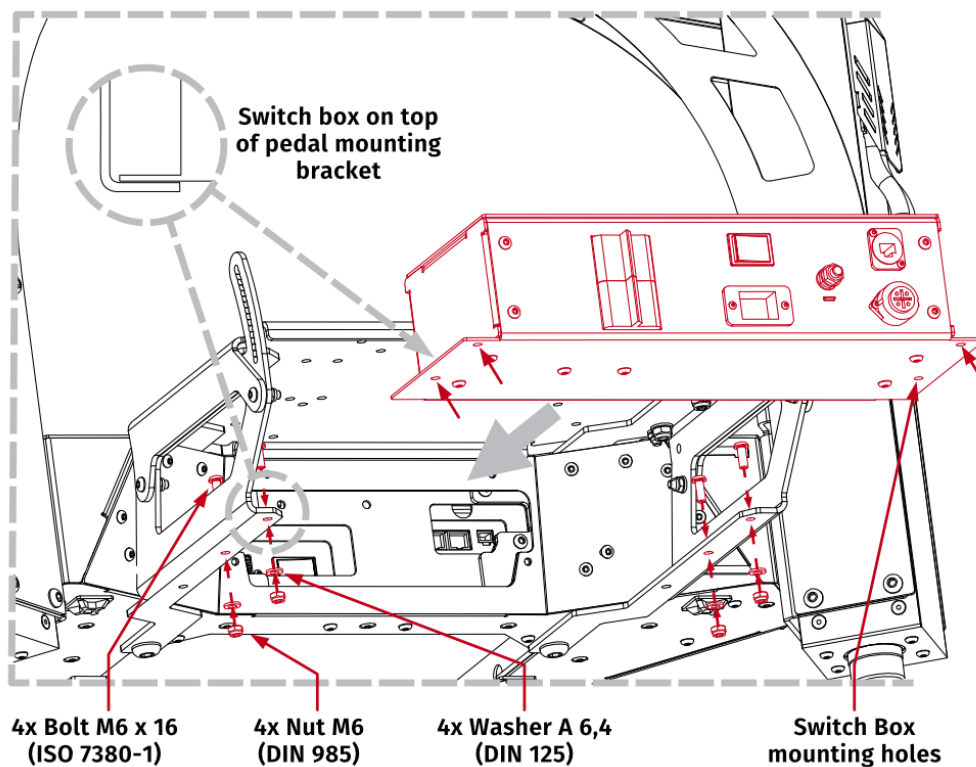
WARNING

Ensure all Power Cabinets and Switch Box have power buttons switched ON, circuit breaker in Switch Box in ON position.

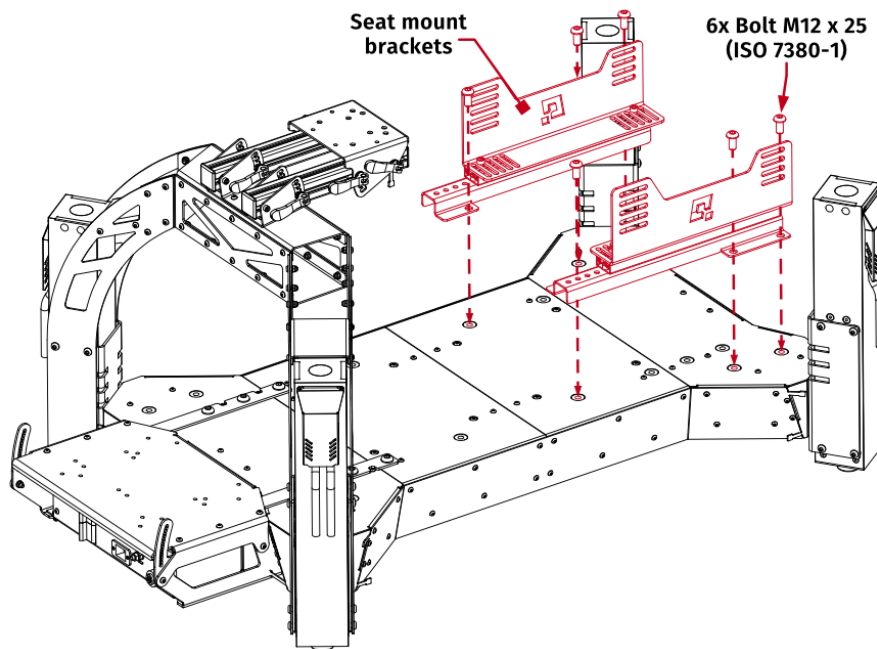




8. Slide in the Switch Box over the Pedal mount lip but under the pedals bracket and screw it in.



9. Attach the seat mount bracket.



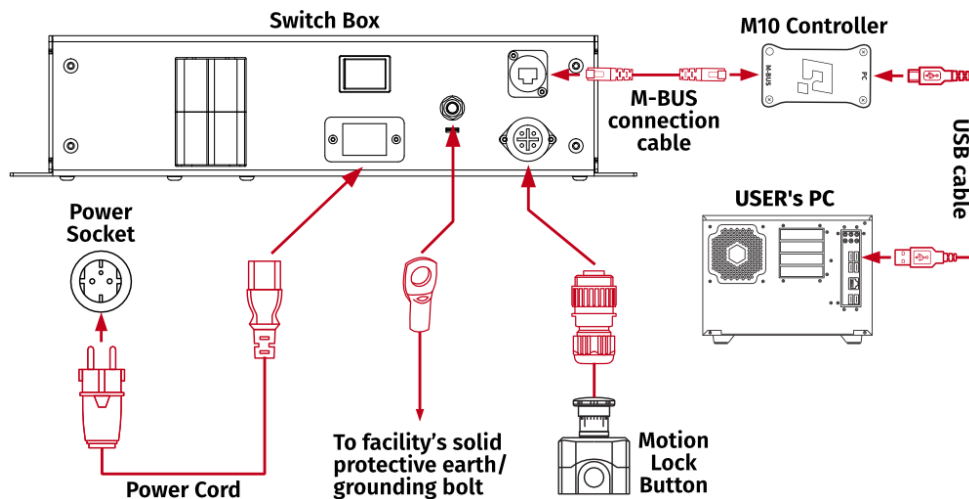
INFO

For a completed assembly view go to page 6.

3.3. CONNECTING FRONT SWITCH BOX PANEL

For the QS-CH1 to operate 4 cables must be connected:

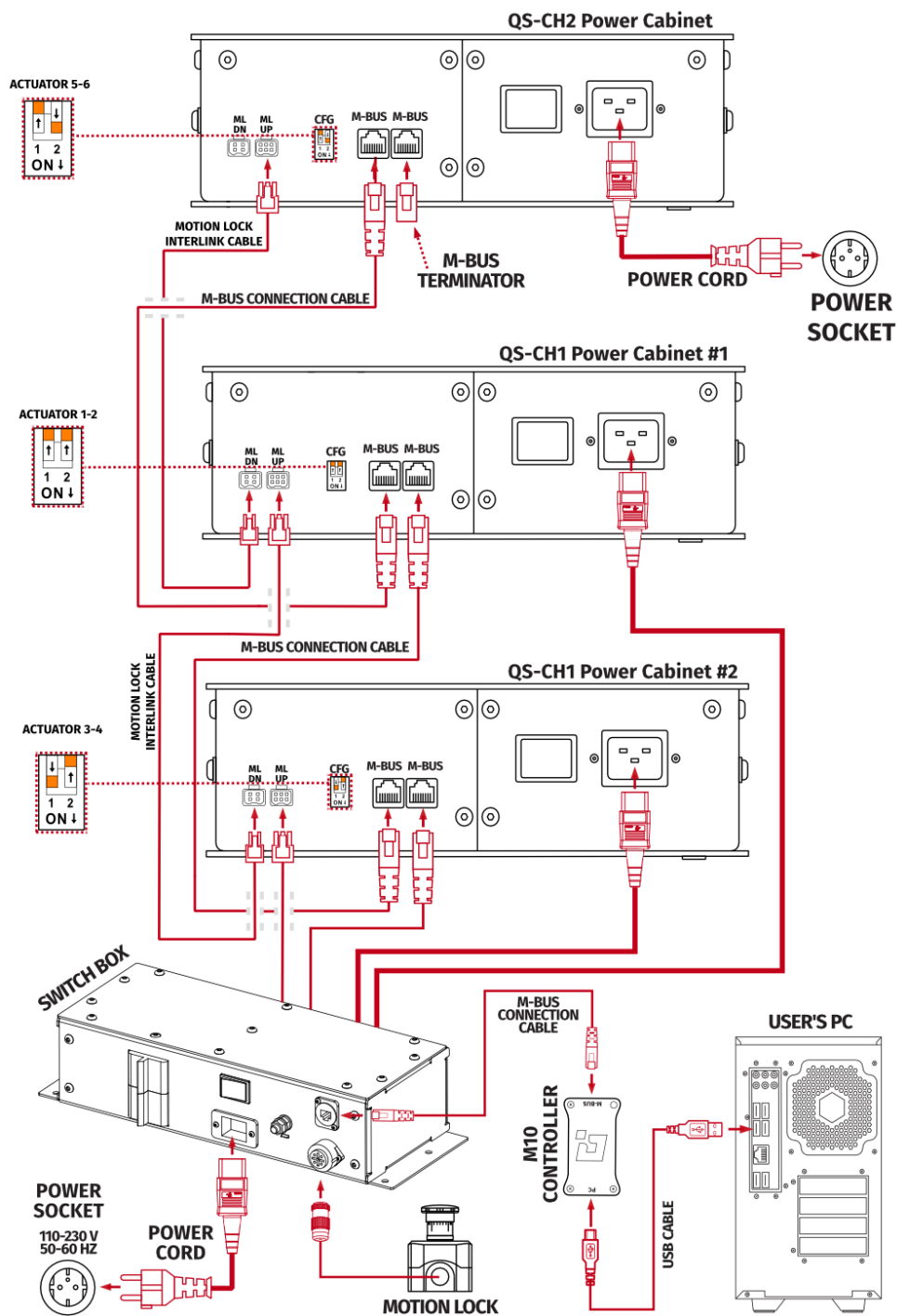
- Power cord connected to power socket
- Grounding bolt connected with facility's ground bolt, using no less than 10mm² cross section cable
- Motion Lock plugged in
- M10 Controller plugged in to the PC



3.4. CONNECTING WITH TRACTION LOSS SYSTEM (QS-CH2)

INFO

For a full connection procedure - refer to **QS-CH2 full user manual**.



INFO

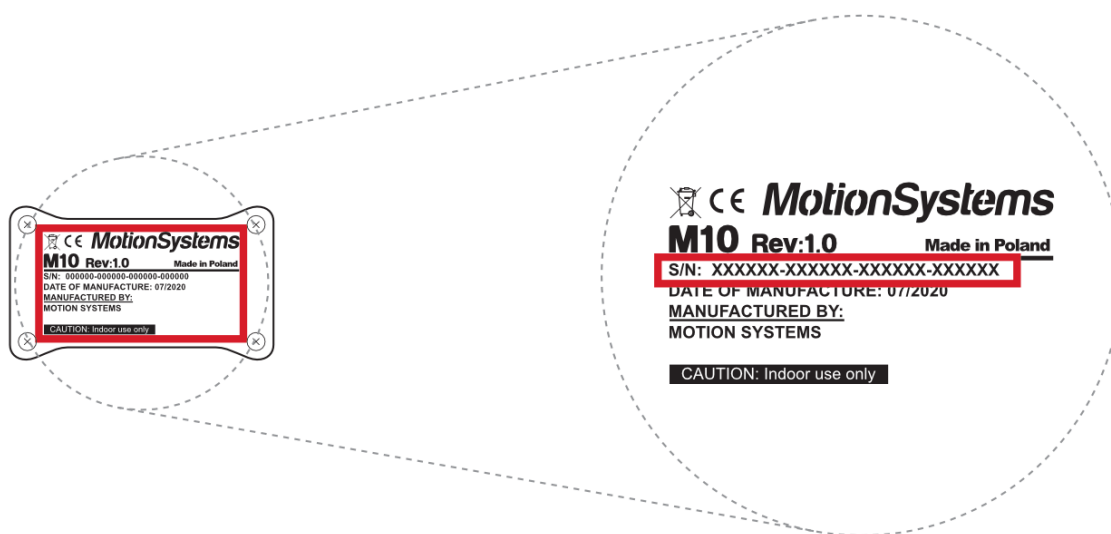
When connecting QS-CH1 with QS-CH2 the CFG switches in the QS-CH2 must be set to actuator 5-6 setting (as shown on the connections scheme).

3.5. SOFTWARE INSTALLATION

INFO

Note down the QS-CH1 serial number before installation as it is needed to access software download page.

The **SERIAL NUMBER** can be found on the M10 identification label in the **XXXXXX-XXXXXX-XXXXXX-XXXXXX** format. This serial number is also used for activation of FSMI (Force-SeatMI) and MT (Motion Theater) licenses - more information on page 30.



To download the software visit: QubicSystem.com/Download

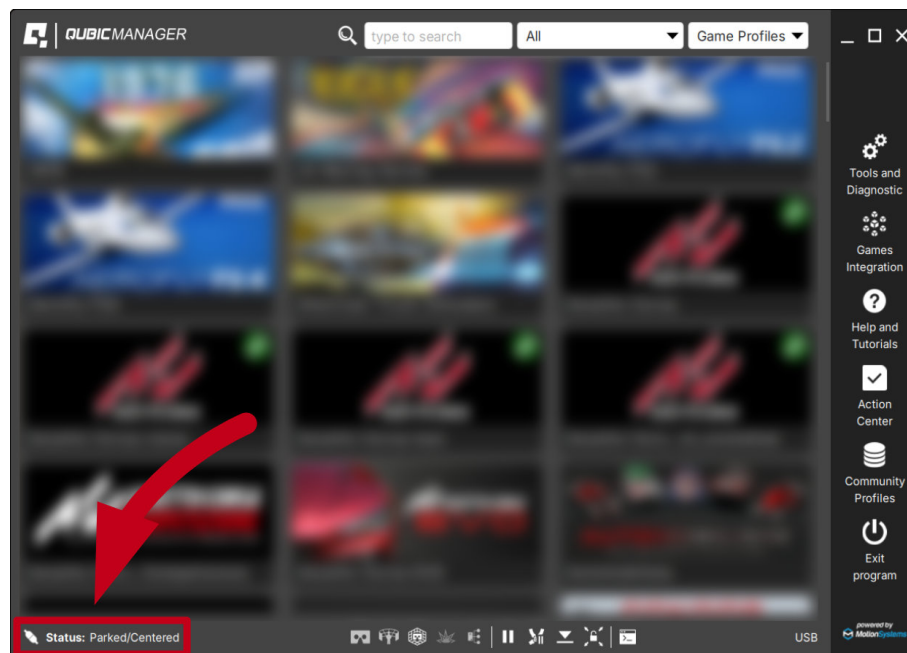
Once the QS-CH1 is installed and connected correctly:

1. Download **Qubic Manager Software**.
2. Proceed with the installation steps and launch the application.
3. Connect power connection cord to the wall socket.
4. Turn on the system by switching on the power switch button on the Switch Box.
5. Check position of Motion Lock button, unpress if needed.
6. The QS-CH1 will perform a start-up calibration.

WARNING

- **DO NOT** change the payload during the start-up calibration.
- **DO NOT** enter the cockpit during the start-up calibration.

7. If Qubic Manager has recognized the QS-CH1 correctly, the status of the machine visible in the lower left corner will change to **Parked/Centered**.

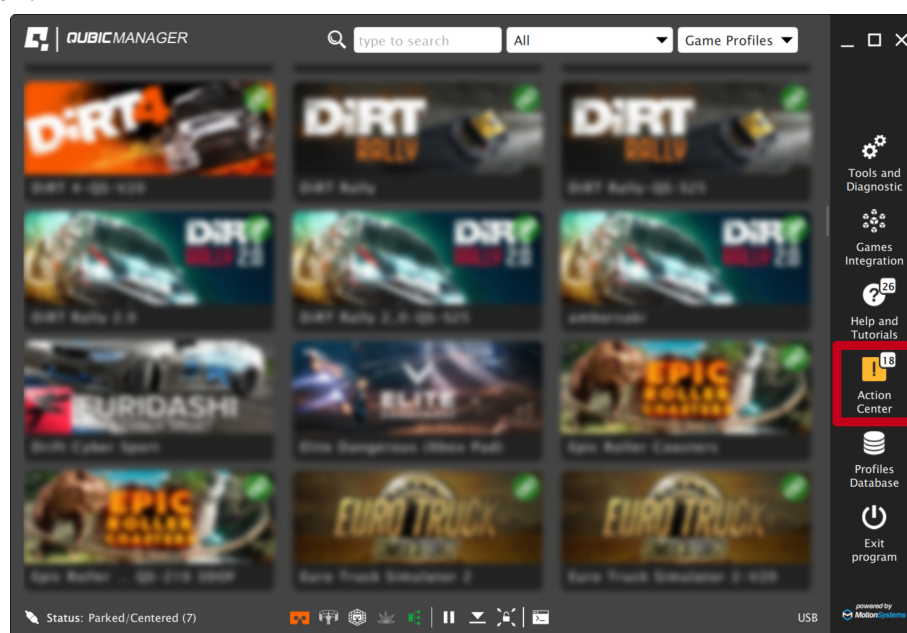


WARNING

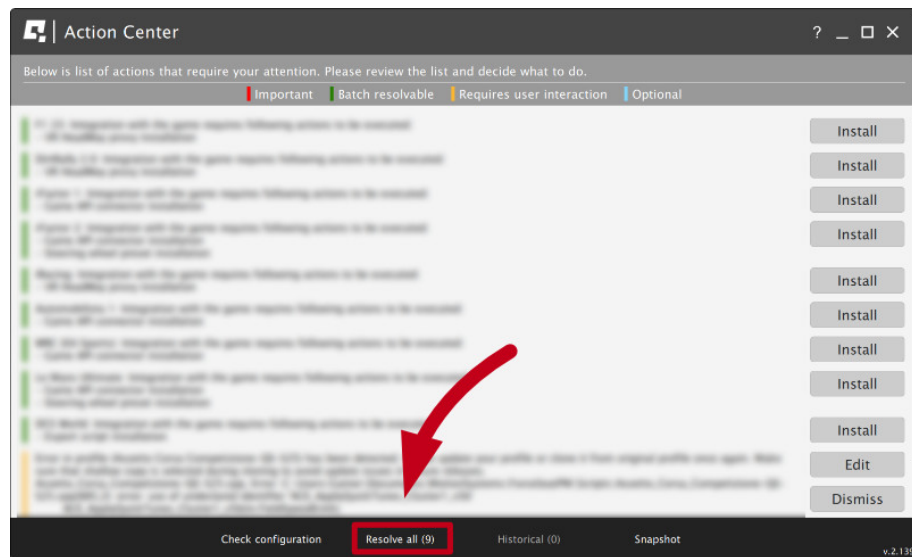
If the device did not connect correctly:

- Go over the cable connections - compare the connections to the diagram again, look for loose plugs or damaged cords.
- Go to **Troubleshooting** section on page 33.

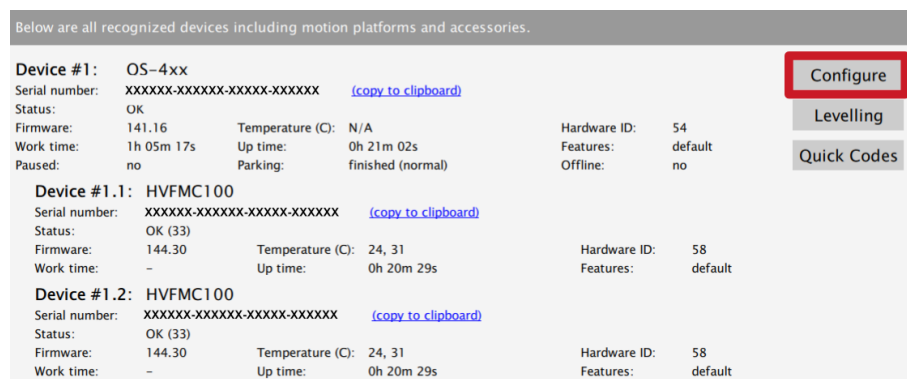
8. Check **Action Center** on the right side panel for a list of actions that requires attention:



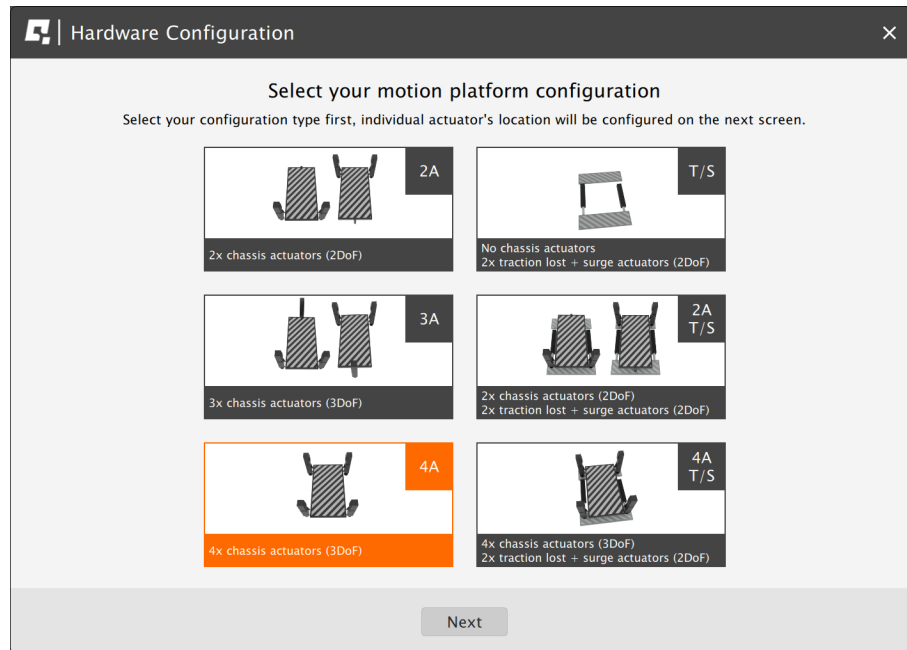
9. It is possible to solve them one by one or by pressing the **Resolve All** button. Firmware update may require additional confirmation in the dialogue box.



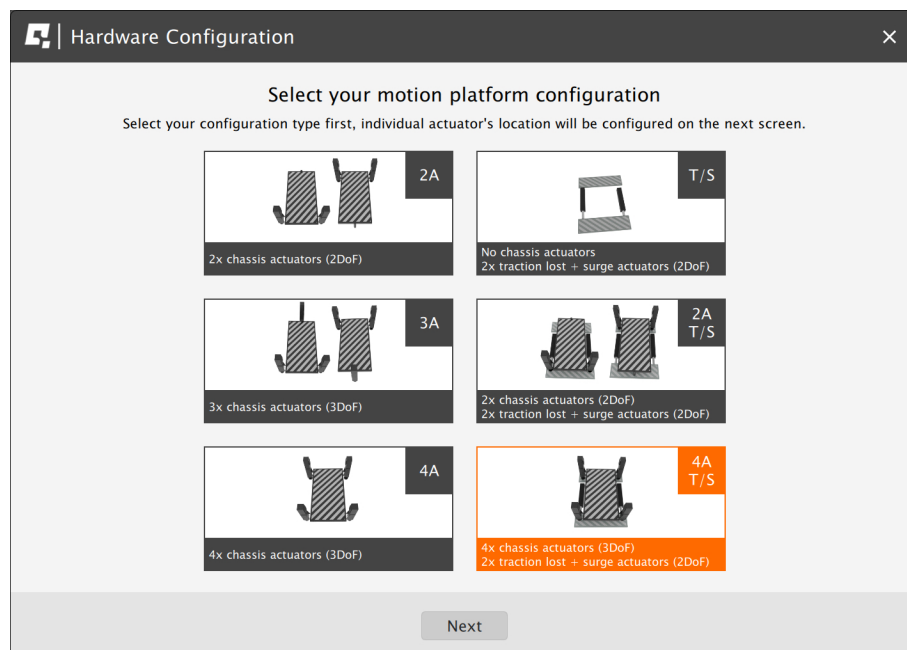
10. Go to **Tools and Diagnostics → Devices** and select **Configure**.



11. Choose the correct layout variant from the list (4 actuators setup).



For QS-CH1 set with traction loss control (QS-CH2): Choose the correct layout variant from the list (4A T setup).



12. Enter the dimensions value in the platform dimensions **Width** and **Length** field (in millimeters) from section 2.1.2 on page 7.

Hardware Configuration

Platform dimensions

Actuators geometry is based on rectangle shape. To make everything work properly you need to specify width and length of that rectangle. Only valid values guarantee that system is stable and math calculations are correct.

Width [mm]: T-Pivot [mm]: 799

Length [mm]: T-Width [mm]: 796

Stroke [mm]: 60 T-Min [mm]: 838

T-Stroke [mm]: 100

Since different models of traction units are available, to make sure your geometry is configured correctly, select your model from the list below to upload its configuration.

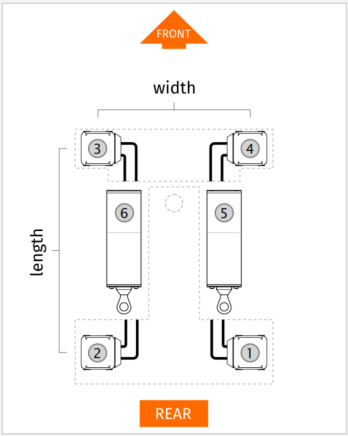
Configure for: (select) ▼

If the position of the actuators in the cockpit is different from that shown in the figure on the right, choose a different layout. Not all combinations are supported. If you do not find a layout that matches your settings, you will have to change the position of the actuators in the cockpit.

Layout: Layout 6 ▼

NOTE: If you are not sure what are your actuators indexes, use

OK




The diagram shows a top-down view of a rectangular platform. Six actuators are numbered 1 through 6. Actuators 1 and 2 are at the front (bottom of the diagram), while 3 and 4 are at the rear (top). Actuators 5 and 6 are on the left side, and 1 and 2 are on the right side. A red arrow points from the 'Width' field to the horizontal dimension of the platform, and another red arrow points from the 'Length' field to the vertical dimension. The front and rear are indicated by orange arrows and labels.

13. Scroll down and choose one of the operation modes:

Operation Mode

Operation modes let you flexibly adapt the system configuration to varying requirements, maximizing the use of available system resources. You can define one of the operation mode to increase your device performance.




Heavy-Duty

Moderate acceleration
Moderate speed
Increased payload

115/230 VAC

☐

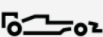


Performance

Increased acceleration
Increased speed
Moderate payload

115/230 VAC

☒



Q-MODE

Maximum acceleration
Maximum speed
Reduced payload

only 230 VAC

☐

OK

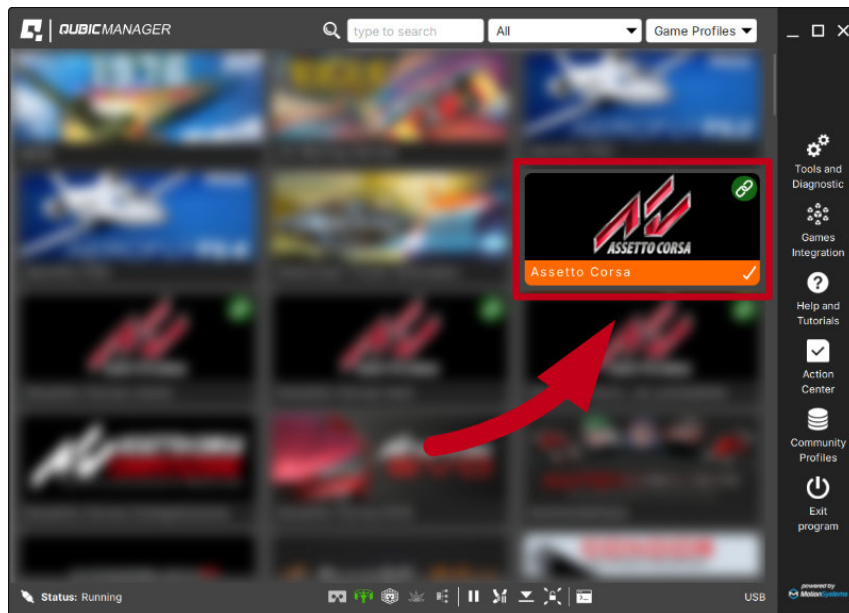
INFO

Q-MODE is unavailable for QS-CH1 in 120 VAC environment.

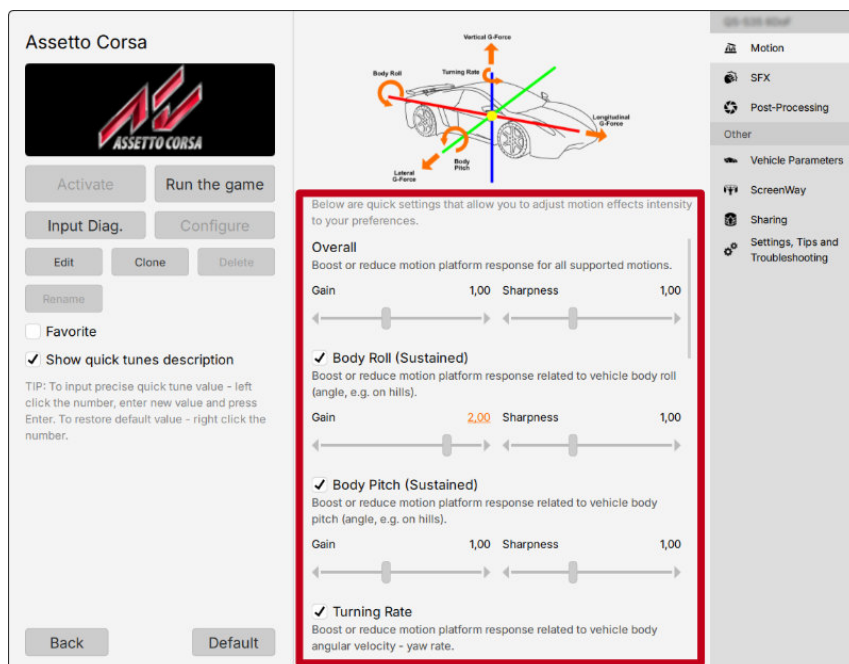
14. Close the configuration and return to the main application window. Choose the game and check profile details by clicking on the game tile.

INFO

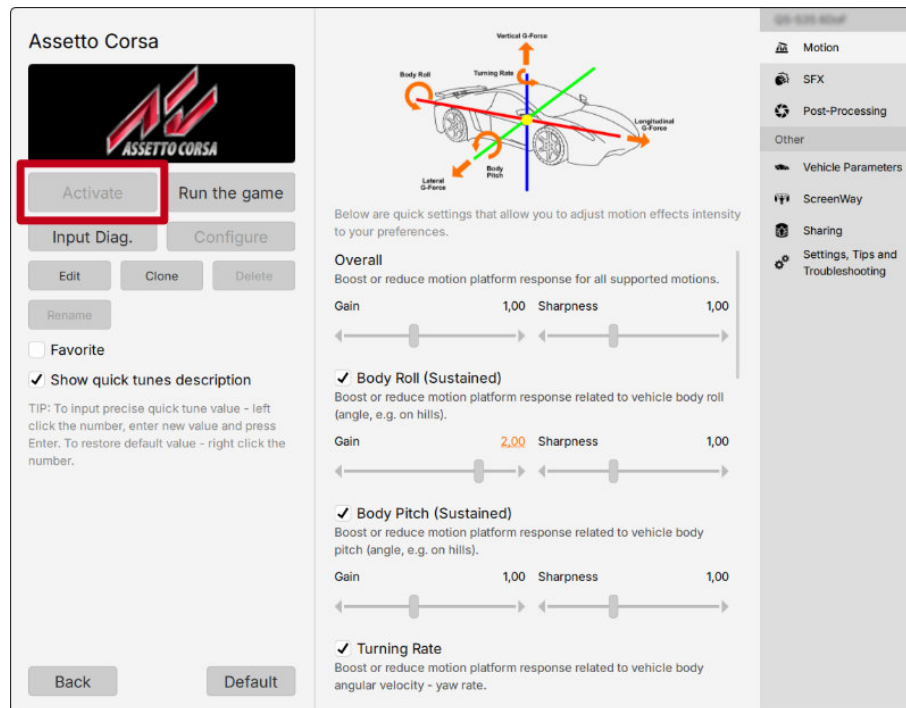
Default profiles are integrated with the software and do not require additional installation. List of supported games is available at: QubicSystem.com/Supported-games.



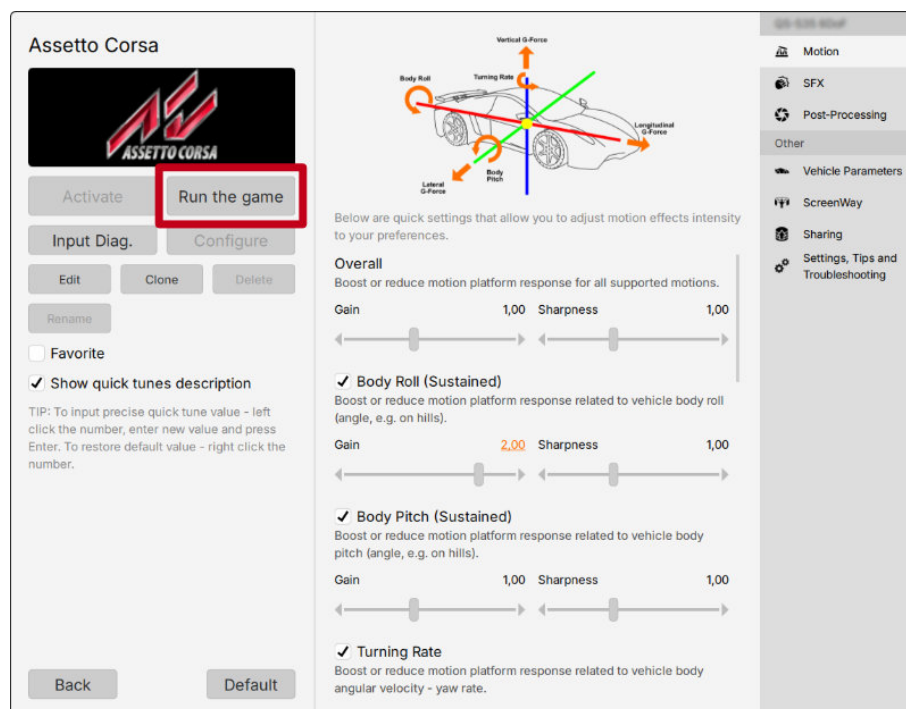
15. Adjust the motion effects intensity up to your preferences in the game profile window. Scroll down to see all of the settings.



16. Activate a profile by clicking the **Activate** button.



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



18. You can also adjust the settings during the game simulation by pressing **ALT+TAB** and switching between the applications - once the profile is active changes will apply instantly.

INFO

If you need the serial number to activate other software licenses such as ForceSeatMI or ForceSeatDI, it can be found in the QubicManager. After connecting the QS-CH1 go to **Tools and Diagnostics → Devices**. Serial number is visible under the device name:

Below are all recognized devices including motion platforms and accessories.

| Device # | Device Name | Serial number | Status | Firmware | Temperature (C) | Up time | Hardware ID | Features | Offline | Actions |
|--------------|-------------|-----------------------------|---------|----------|-----------------|------------|-------------|----------|---------|---------------------------------------|
| Device #1: | QS-4xx | XXXXXXXX-XXXXXX-XXXX-XXXXXX | OK | 141.16 | N/A | 0h 21m 02s | 54 | default | no | Configure Levelling Quick Codes |
| Device #1.1: | HVFCM100 | XXXXXXXX-XXXXXX-XXXX-XXXXXX | OK (33) | 144.30 | 24, 31 | 0h 20m 29s | 58 | default | | (copy to clipboard) |
| Device #1.2: | HVFCM100 | XXXXXXXX-XXXXXX-XXXX-XXXXXX | OK (33) | 144.30 | 24, 31 | 0h 20m 29s | 58 | default | | (copy to clipboard) |
| Device #1.3: | HVFCM100 | XXXXXXXX-XXXXXX-XXXX-XXXXXX | OK (33) | 144.30 | 24, 32 | 0h 20m 29s | 58 | default | | (copy to clipboard) |
| Device #1.4: | HVFCM100 | XXXXXXXX-XXXXXX-XXXX-XXXXXX | OK (33) | | | | | | | (copy to clipboard) |

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 will the authors or copyright holders be liable for any claim, damage, 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.

3.6. QS-CH1 SOFTWARE COMPATIBILITY

Choose the software based on your primary motion platform family.

| Motion Platform Model | Qubic Manager | ForceSeatPM | Next Level Racing® Platform Manager |
|----------------------------------|---------------|-------------|-------------------------------------|
| QS-BT1 | ✓ | ✓* | X |
| QS-210 | ✓ | ✓* | X |
| QS-220 | ✓ | ✓* | X |
| QS-CH2 | ✓ | ✓* | X |
| QS-S25 | ✓ | ✓* | X |
| QS-S35 | ✓ | ✓* | X |
| QS-V20 | ✓ | ✓* | X |
| PS-6TM-XXX | X | ✓ | X |
| PS-6TL-XXX | X | ✓ | X |
| PS-3TM-XXX | X | ✓ | X |
| PS-2RM-XXX | X | ✓ | X |
| Next Level Racing® Motion V3 | ✓ | X | ✓ |
| Next Level Racing® Motion Plus | ✓ | X | ✓ |
| Next Level Racing® Traction Plus | ✓ | X | ✓ |
| No motion platform | ✓ | ✓* | X |
| 3rd party motion platform | ✓ | ✓* | X |

*ForceSeatPM will also work but it is recommended to use QubicManager

WARNING

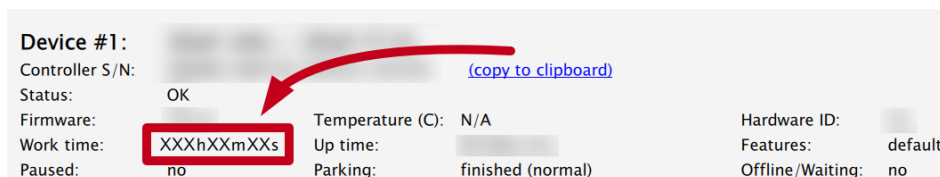
If you have previously installed the software, ensure that it is up to date before running the QS-CH1 .

4. MAINTENANCE AND CLEANING

INFO

Cleaning should be conducted every 160 working hours or once a month.

To see the working hours counter, go to **Tools and diagnostics** → **Devices**. It is displayed in the QS-CH1 device listing:



| | | | |
|-----------------|------------|------------------|---------------------|
| Device #1: | | | |
| Controller S/N: | | | (copy to clipboard) |
| Status: | OK | | |
| Firmware: | | Temperature (C): | N/A |
| Work time: | XXXhXXmXXs | Up time: | |
| Paused: | no | Parking: | finished (normal) |
| | | Hardware ID: | |
| | | Features: | default |
| | | Offline/Waiting: | no |

To minimize the risk of abnormal heating that can result in system failure, keep the QS-CH1 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-CH1 in any other way.

If any of the above mentioned elements is dirty or dusty use clean cloth to remove it. Isopropyl alcohol can be used to remove contamination caused by lubricants.

4.1. CHECKING THE MOTION LOCK BUTTON

At least once a month check if Motion Lock button is working correctly:

1. Before anyone steps into the platform - turn on the QS-CH1 .
2. Push the red Motion Lock button.
3. The machine should stop and not react to any signal.
4. Turn on a simulation or a game to confirm that - with a correct profile activated proceed to a game or a simulation and engage movement.

✓ If the Motion Lock Button works correctly - platform does not react nor move in any way.

X If the Motion Lock button does not work correctly - platform proceeds to simulate motion from the game/simulation. Check the cable connection and repeat the test. If the problem persists - **DO NOT** use the platform, power it off and contact technical support immediately.

INFO

For additional information regarding maintenance and cleaning of the actuators, refer to **QS-210** or **QS-220 user manual**.

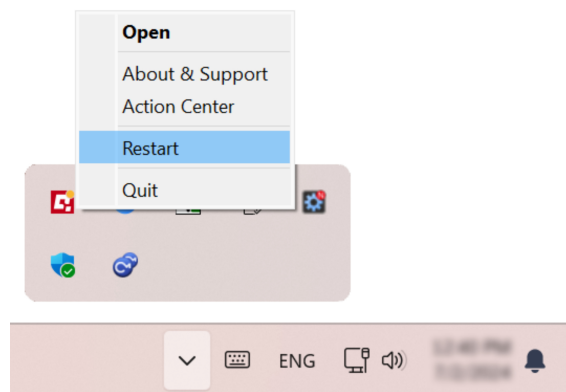
5. TROUBLESHOOTING

WARNING

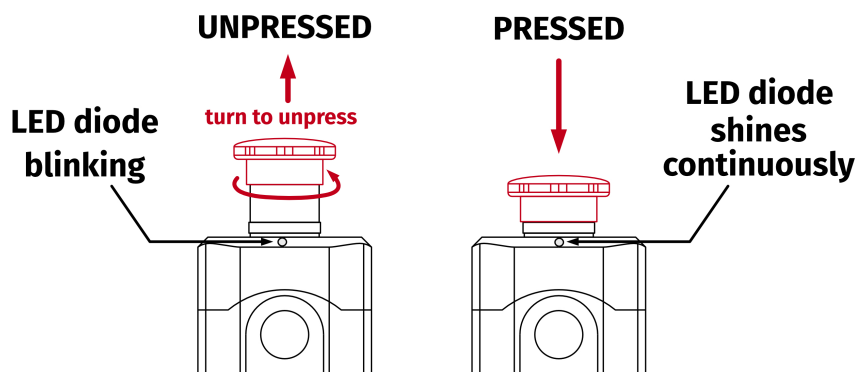
DO NOT attempt to do any repairs by yourself. It could be dangerous and will result in loss of warranty! Repairs should be consulted with technical support and then performed by a qualified technician.

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 (should be unpressed to activate the motion):



- Try different USB ports (also try bypassing the USB hub by a direct PC connection).
- If a problem occurred abruptly, it could be caused by a thermal protection. Turn off the QS-CH1, 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, strange behavior or abnormal work conditions, contact technical support.

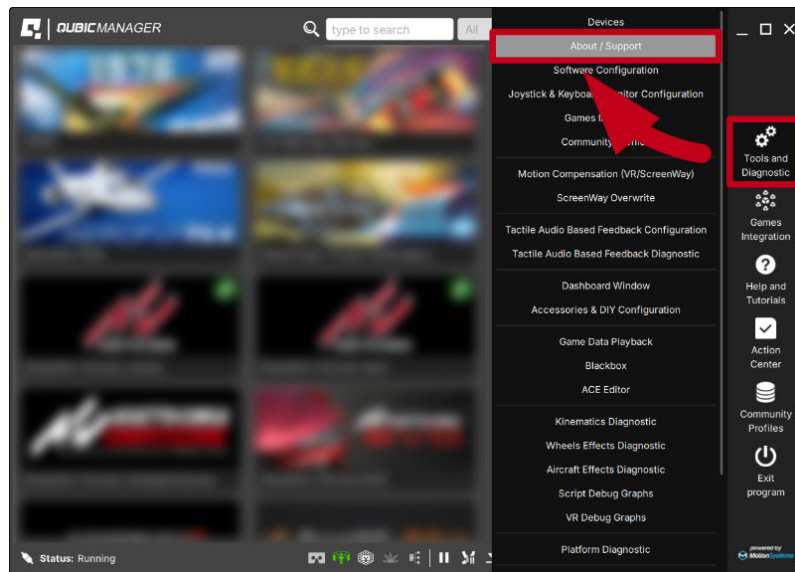
5.1. CREATING A SNAPSHOT

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 all the necessary information about the product and its configuration. It can be then analyzed to provide the best solution.

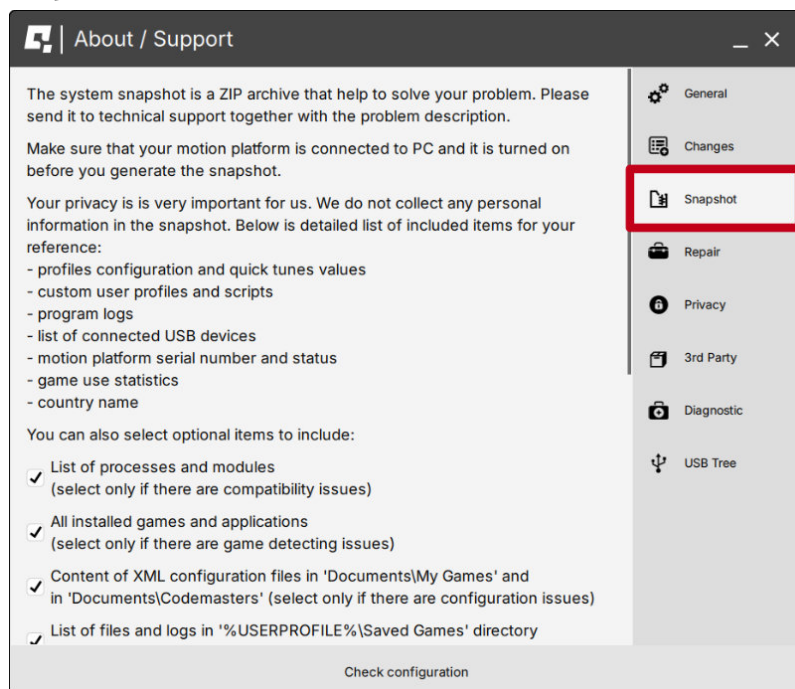
WARNING

The QS-CH1 and all interconnected Power Cabinets **MUST BE** be powered up when creating the snapshot.

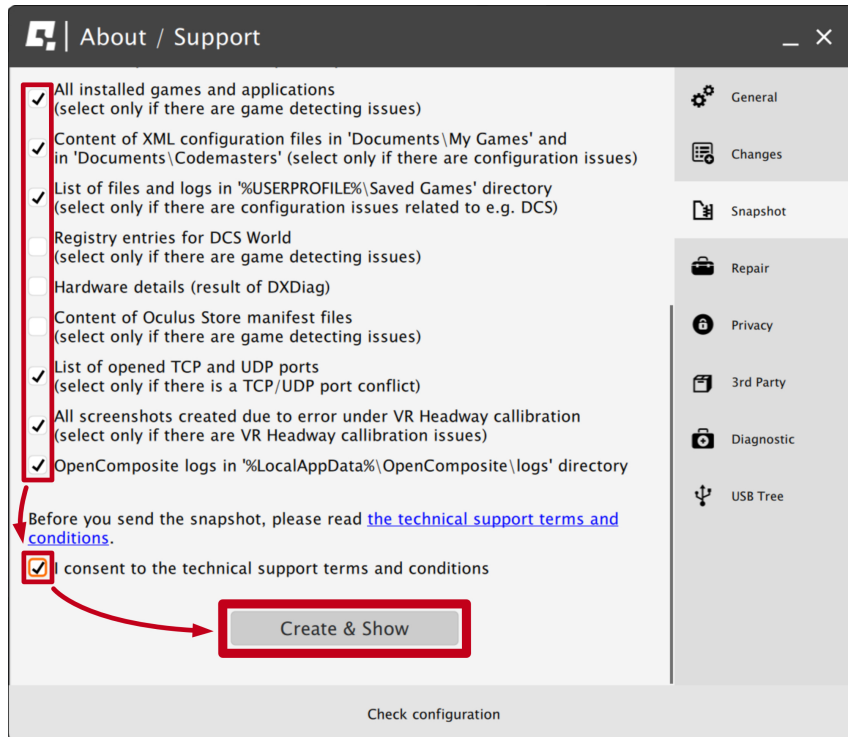
1. Open the main window of the QubicManager application.
2. Go to **Tools and Diagnostic** → **About / Support**.



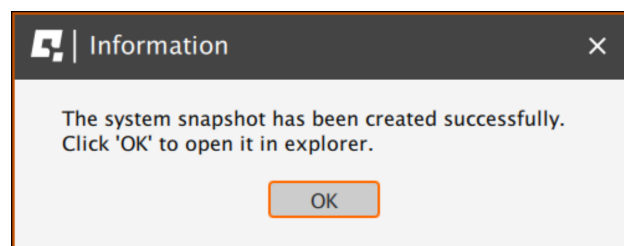
3. Open the **Snapshot** window:



4. Select data that will be included in the snapshot.
5. Scroll down, consent to the technical support terms and conditions and select **Create & 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 our staff or get answers directly from the community.

Join our discord channel by following the invitation link:

QubicSystem.com/Discord



6. ADVANCED APPLICATIONS

INFO

Examples shown in this section describe 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

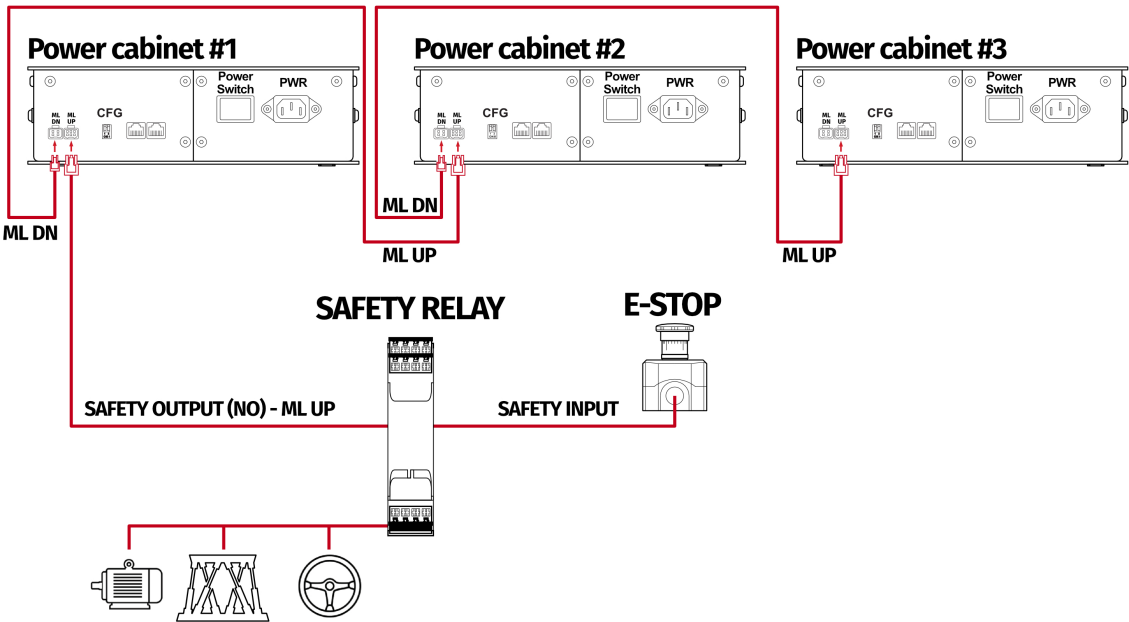
When applying safety relay to the Motion Lock :

- 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

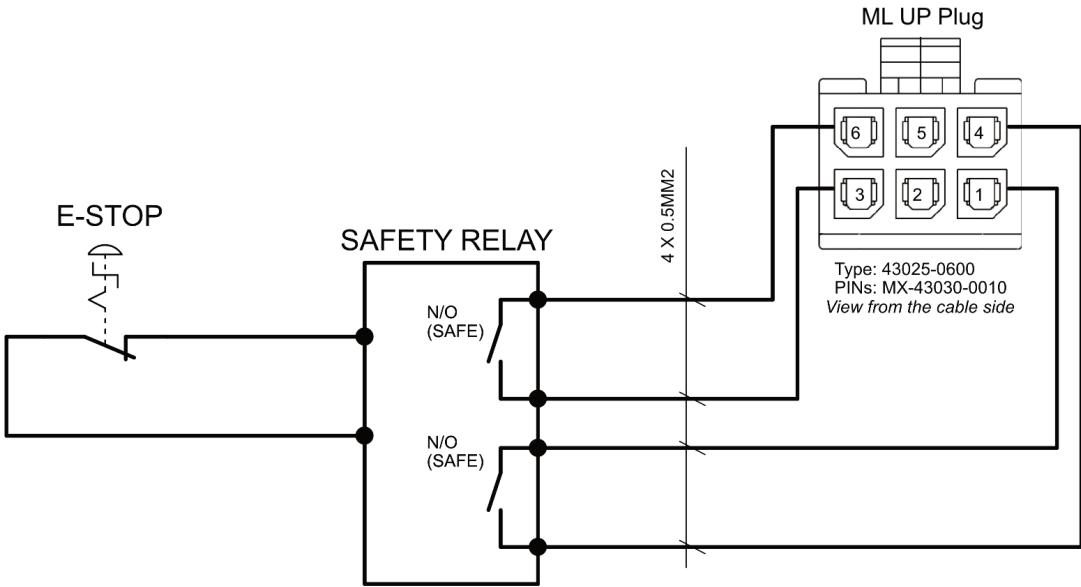
6.1. ADDING ADDITIONAL DEVICES TO THE MOTION LOCK CIRCUIT

If there is necessity to stop other devices, apart from the QS-CH1 , 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:



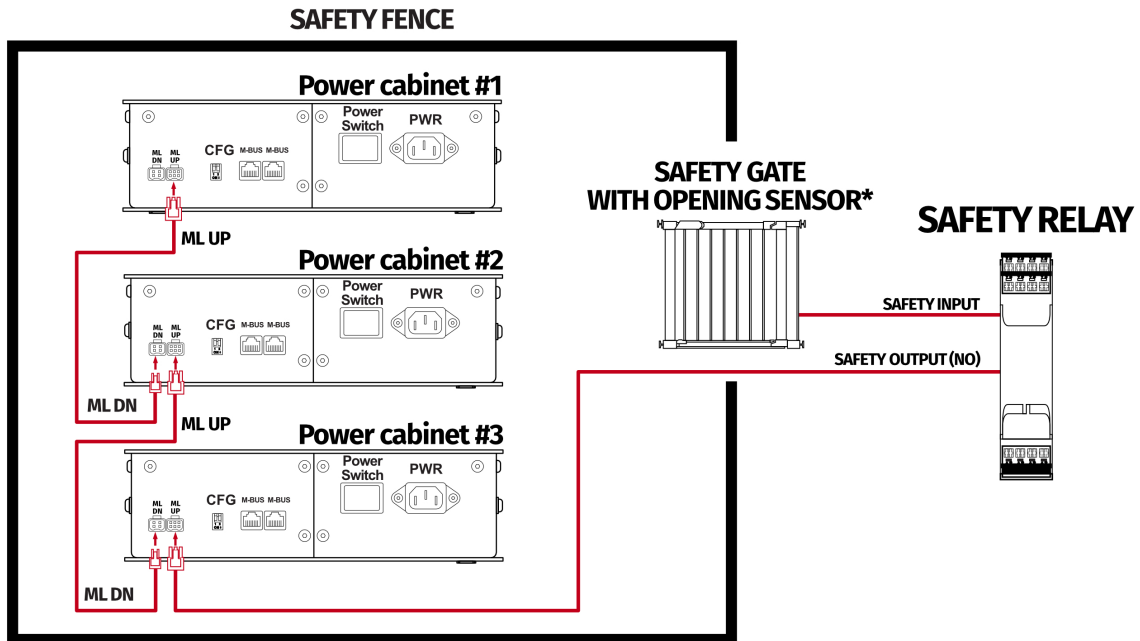
Example wiring diagram of application of one-channel safety relay with E-STOP button:



6.2. IMPLEMENTING THE WORKING ZONE PROTECTION

To protect bystanders from 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 opens, the safety relay output activates the ML (Motion Lock) function and stops the motion of the platform.

Example application of safety gate opening sensor:



*Check your safety relay manual for list of applicable sensors

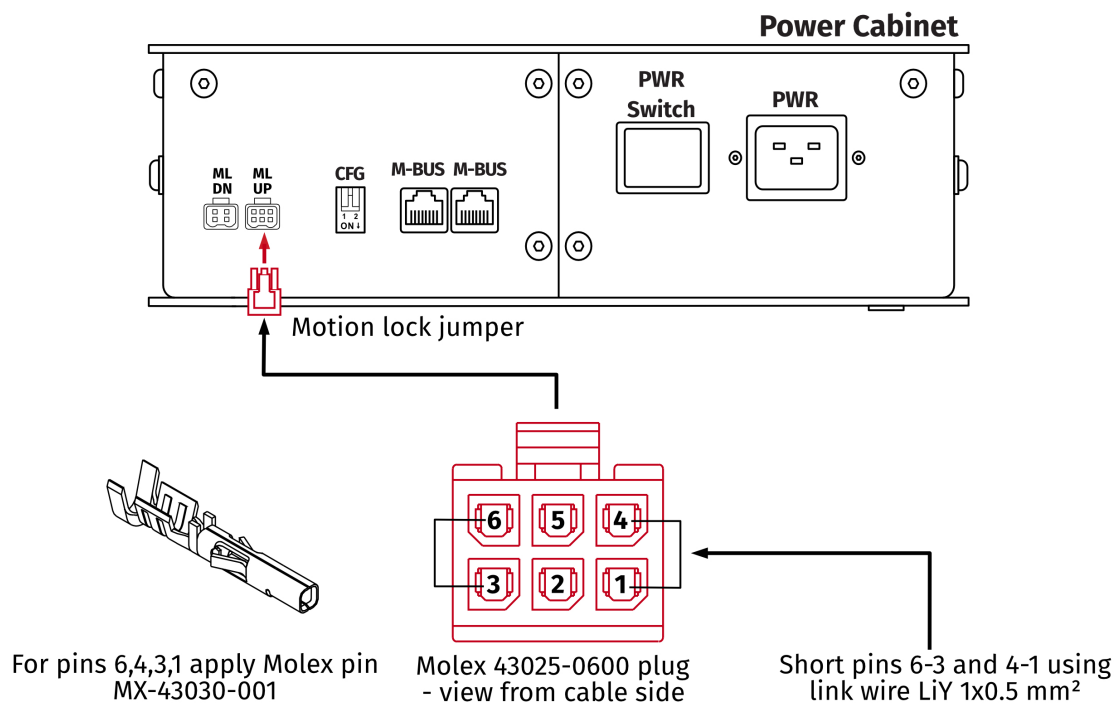
6.3. INCREASING SAFETY LEVEL

WARNING

Modifications of the safety system, involving application of the power line contactors, shall be performed only by somebody competent. A competent person is a qualified and knowledgeable person, who because of their training and 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 using power line contactors, Motion Lock connection cables in the QS-SB2 power cabinet needs to be replaced with jumpers. To prepare a jumper, you need to assemble recommended connector as shown below:



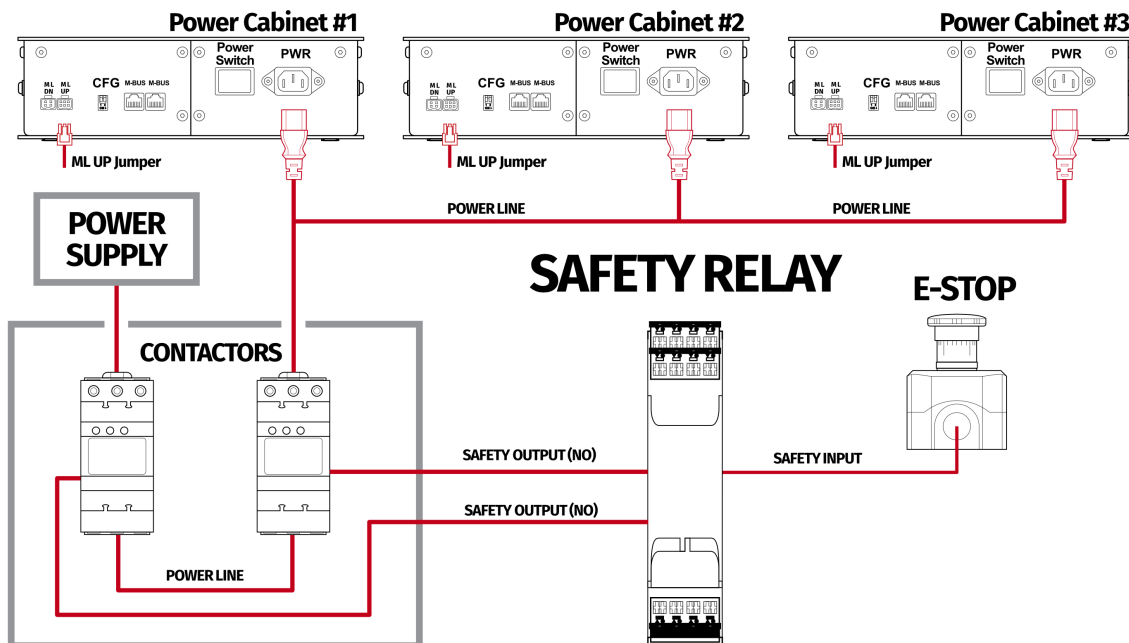
6.3.2 ADDING POWER-CUT CIRCUIT WITH E-STOP BUTTON

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.

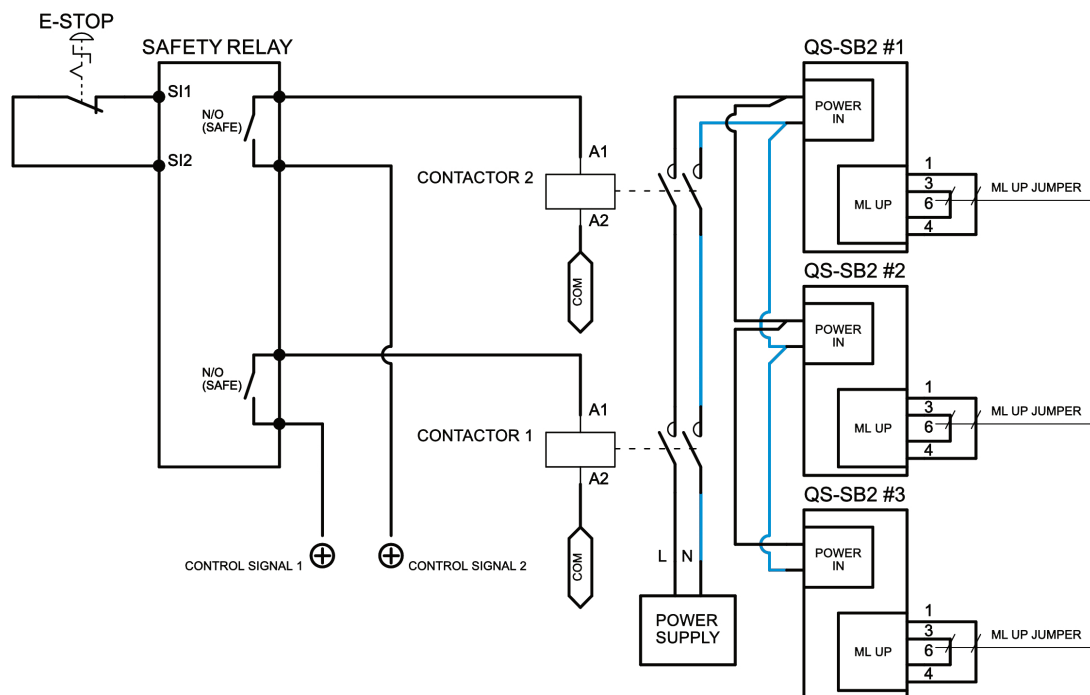
Example application of power line contactors and E-STOP button:



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:



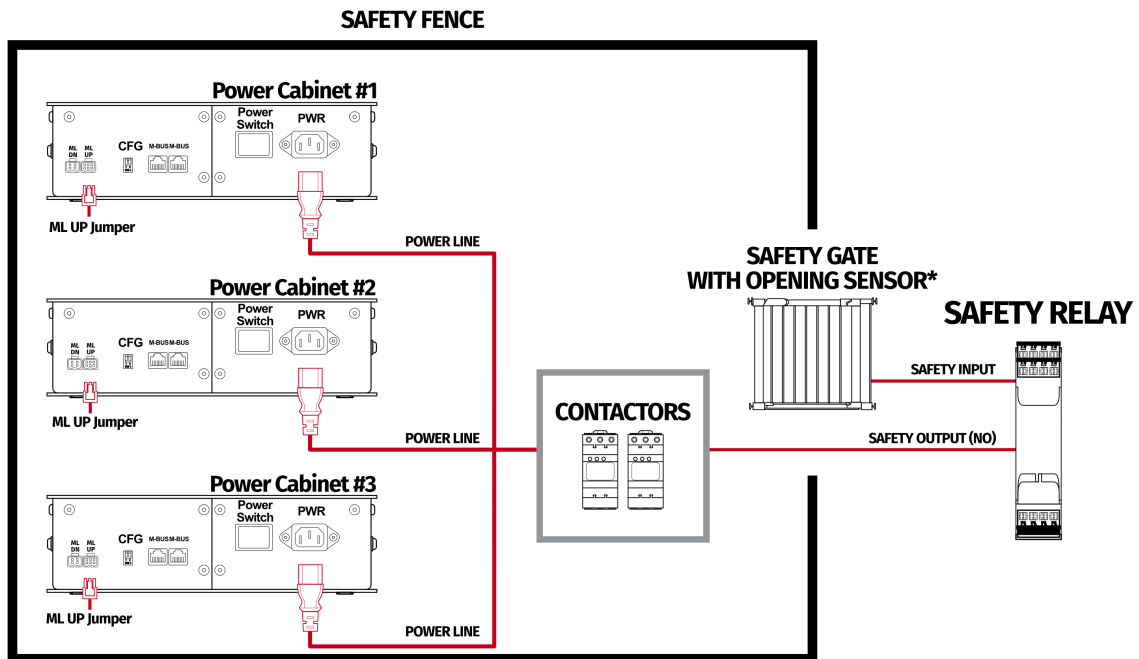
INFO

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:



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

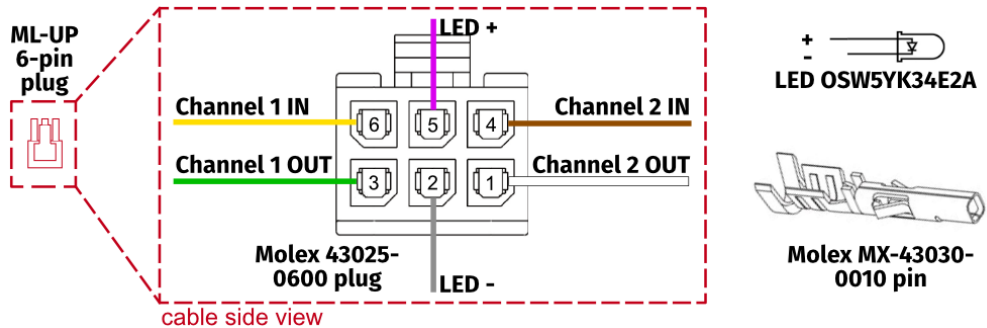
INFO

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

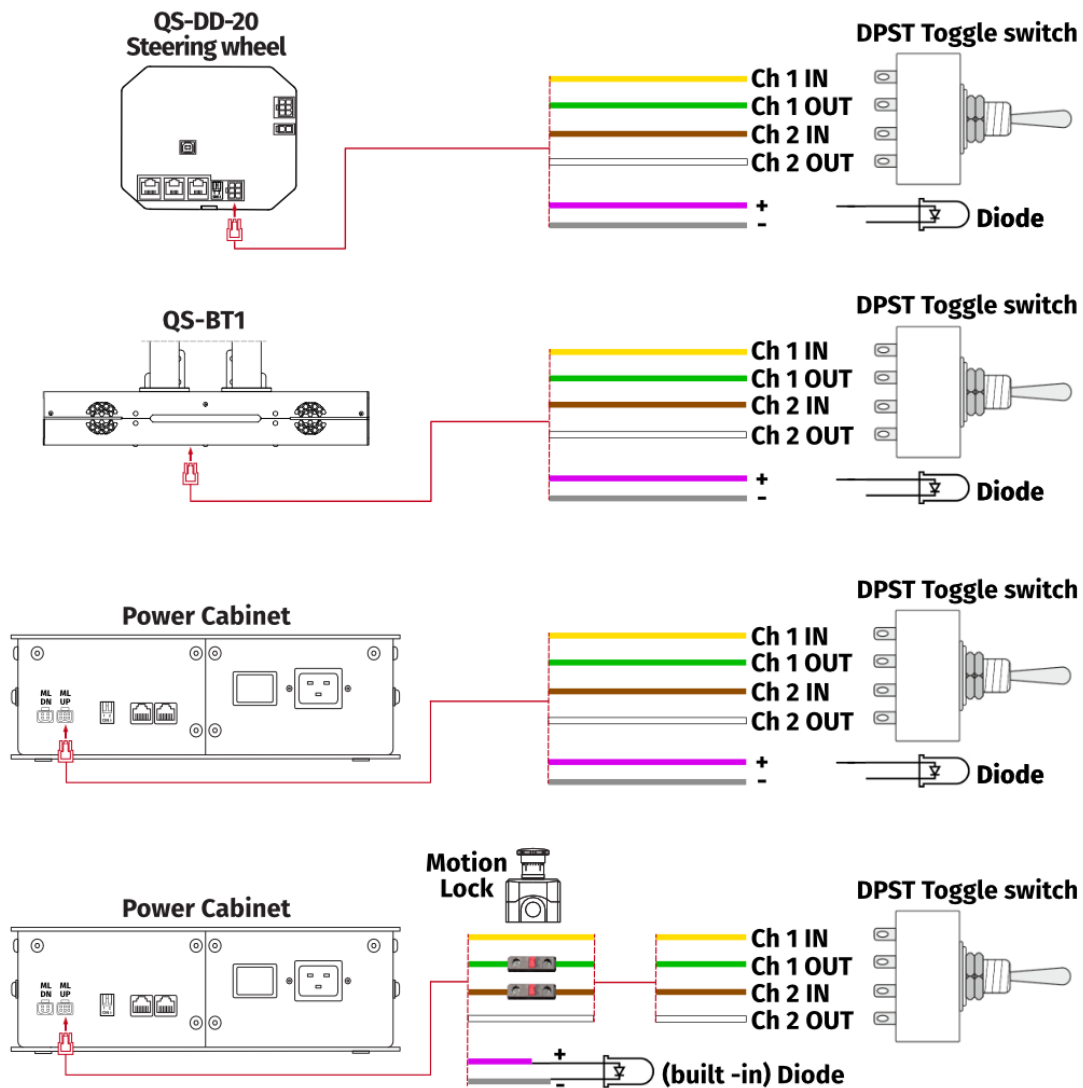
- Use control cables according to your safety relay manual
- Power line cables shall be chosen accordingly to power requirements of motion system. See power requirements of specific motion system.

6.4. IMPLEMENTING NON-FACTORY MOTION LOCK SWITCH

For non-factory Motion Lock plug setup, you must assemble plug and connectors as shown below:



If you want to assemble custom Motion Lock switch or a button box setup (only Double Pole Single Throw switch compatible) using QubicSystem Motion Lock interlink cable, follow the diagrams below:



7. CONFORMITY INFORMATION



The QS-CH1 meets the requirements of CE and relevant regulations of the EMC Directive 2014/30/EU.

8. ENVIRONMENTAL IMPACT AND DISPOSAL



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

QS-CH1 is shipped with wooden cases/cardboard boxes. If the packaging is no longer needed, it can be fully recycled.

QS-CH1 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 of in the specialized disposal center.
- Other materials should be sorted and disposed of accordingly to the local law and regulations.

9. 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-CH1 with any unsuitable element or other elements not supplied or not approved by Motion Systems for this product).

10. 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-CH1 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.

11. COPYRIGHT

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INFO

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12. MANUFACTURER INFORMATION

Qubic System is a brand
that belongs to **Motion Systems**

HQ address:
Miedziana 7 Street
55-003 Nadolice Wielkie
Poland



Motion Systems homepage

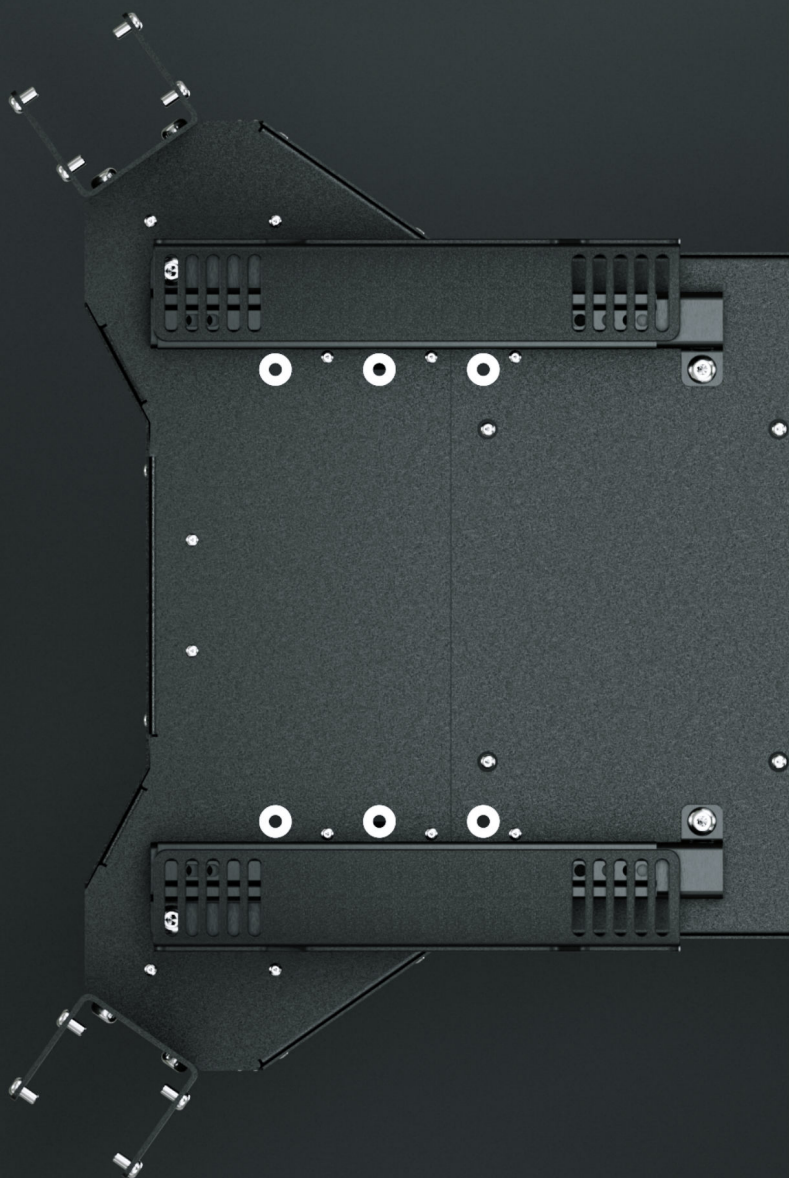


QubicSystem homepage

INFO

In support queries please contact your reseller.

 QUBICSYSTEM



Q5 CH1