



F64-SC V3

steering wheel for racing simulators
product manual

V1.0



SIMUCUBE
WIRELESS WHEEL

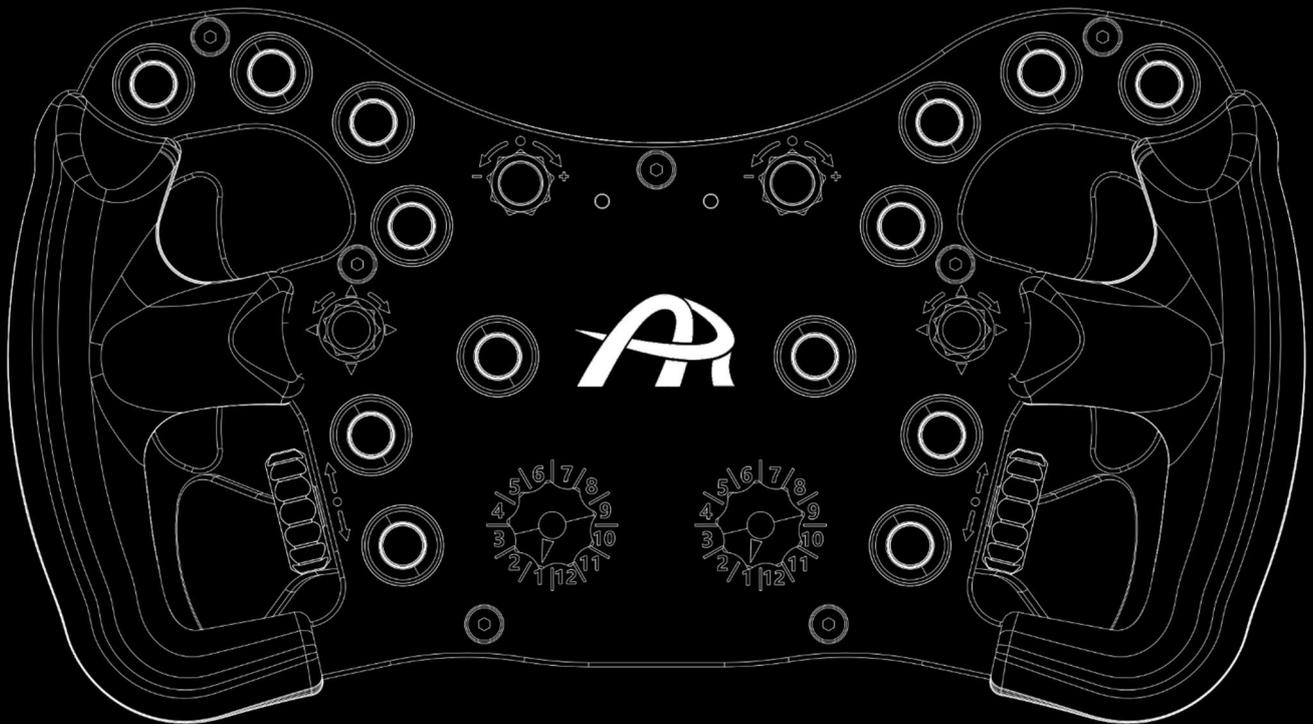


Table of contents

- 1. Safety Information..... 3
 - 1.1. Intended Use 3
 - 1.2. Battery Warnings..... 3
- 2. Declaration of Conformity..... 3
- 3. Box Contents 4
- 4. Product Overview 5
- 5. Quick Release Mounting Options..... 6
 - 5.1. SC2 SQR WHEEL SIDE – Simucube Adapter 6
 - 5.2. SC2 SQR WHEEL SIDE – Ascher Racing SQR Adapter..... 6
 - 5.3. 70mm bolt pattern Quick Release – outside mounting 6
 - 5.4. 70mm bolt pattern Quick Release – inside mounting..... 7
- 6. Getting Started 8
 - 6.1. First Wireless Connection – Pairing..... 8
 - 6.2. Normal Operation 10
 - 6.3. Configure Analog Inputs 10
 - 6.4. Adjust Clutch Bite-Point 13
 - 6.5. Mode-Switches..... 13
 - 6.6. Simucube Button 13
- 7. Battery..... 14
 - 7.1. Charging..... 14
 - 7.2. Battery Life 14
- 8. Paddle Shifter Force Adjustment 15
- 9. Steering Wheel Dimensions 16

1. Safety Information

Thank you for purchasing the Ascher Racing F64-SC V3 steering wheel. Please read the manual carefully before installing and using the product.

1.1. Intended Use

The steering wheel is designed to be used in a competitive sim racing environment for indoor use only and connects wirelessly to a *Simucube*.

Please note the following general safety aspects:

- The device must not be exposed to rain or humidity to avoid the risk of fire and electric shock.
- Do not operate or store the device outside of room temperature, 15°C to 35°C
- We strongly advise you not to drive a vehicle immediately after driving a racing simulation.
- This product is not intended for children under the age of 15 years.
- Contains small pieces – danger of swallowing!
- Extended periods of driving a simulation may cause health risks. Take a break of 5 minutes every 20 minutes and do not exceed 2 hours of total driving time per day.
- Keep hair, clothing and jewelry away from the product when in use.
- Only one person may use the product at any given time. Keep other persons away from the product when in use.
- Do not disassemble the product beyond what is described in this product manual.
- Do not apply excessive force, bend or pull on the wireless antenna.
- Make sure the steering wheel is mounted securely to your wheel base and screws are tightened properly before use.
- Do not leave the device exposed to a heat source or in a high-temperature location, such as in the sun in an unattended vehicle. To prevent the possibility of damage, remove the device from the vehicle or store it out of direct sunlight.

1.2. Battery Warnings

A rechargeable lithium polymer battery is used in this device. If these guidelines are not followed, batteries may experience a shortened life span or may present a risk of damage to the device, fire, chemical burn, electrolyte leak, and/ or injury.

- Do not modify, remanufacture, puncture or damage the device or battery.
- Do not remove or attempt to remove the battery.
- Do not expose the device to fire, explosion or another hazard.

2. Declaration of Conformity

It's in conformity with the essential requirements and other relevant requirements of the Radio Equipment Directive (RED) (2014/53/EU).

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesirable operation.

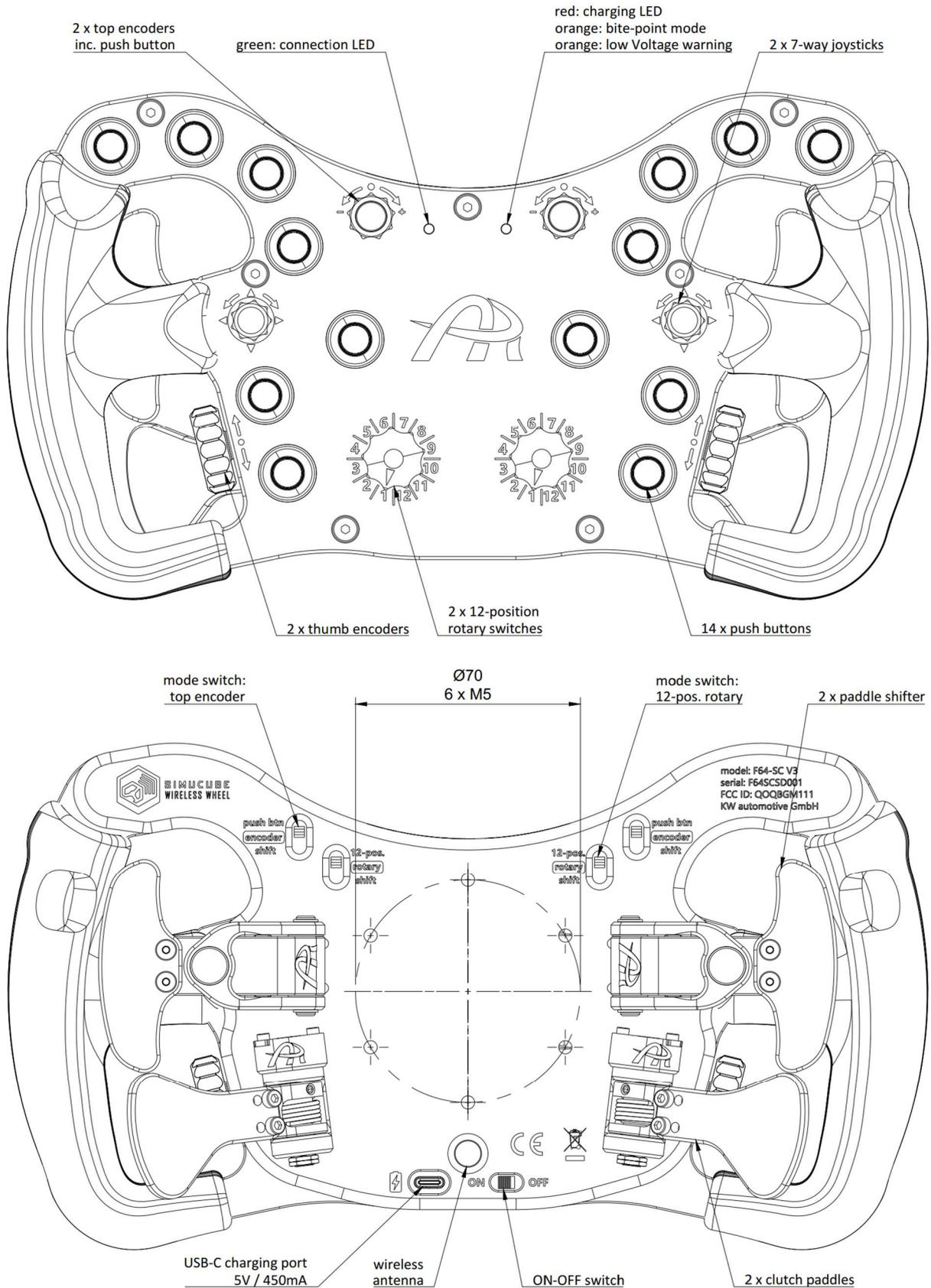
Any changes or modifications not expressly approved by KW automotive GmbH could void the user's authority to operate the equipment.

3. Box Contents

The box contains the following components and accessories:

- F64-SC V3 steering wheel
- USB-C to USB-A charging cable
- standard screws and washers for Quick Release mounting
- sticker sheets for encoders and buttons
- alternative magnets and spacers

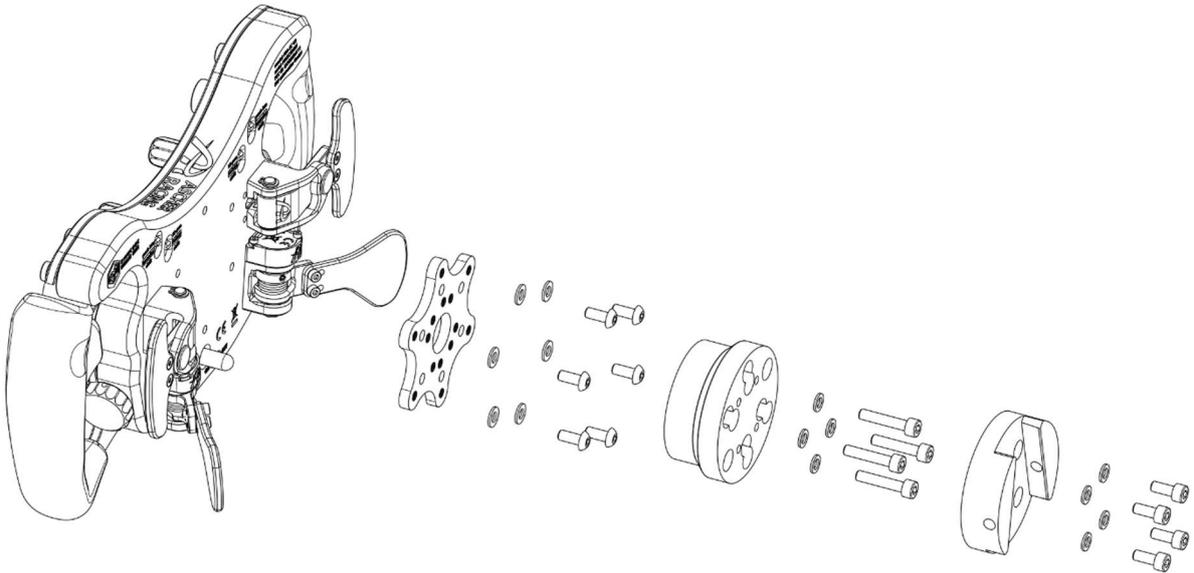
4. Product Overview



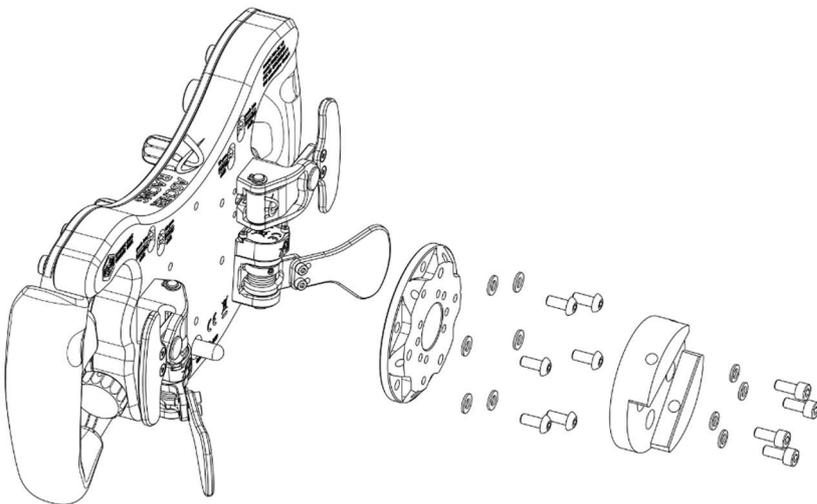
5. Quick Release Mounting Options

The steering wheel offers a standard M5 threaded, 70mm bolt pattern in order to mount a Quick Release or steering column. There are several possible mounting options for all common QRs shown below. Adapters or QRs are not part of the scope of supply and have to be purchased separately.

5.1. SC2 SQR WHEEL SIDE – Simucube Adapter

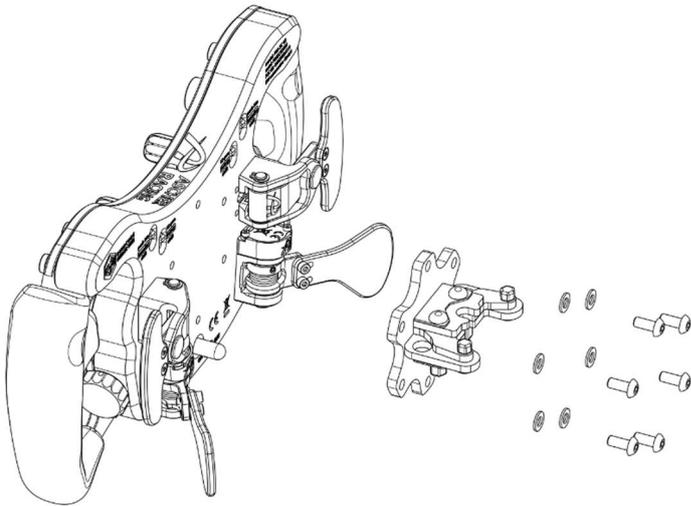


5.2. SC2 SQR WHEEL SIDE – Ascher Racing SQR Adapter



5.3. 70mm bolt pattern Quick Release – outside mounting

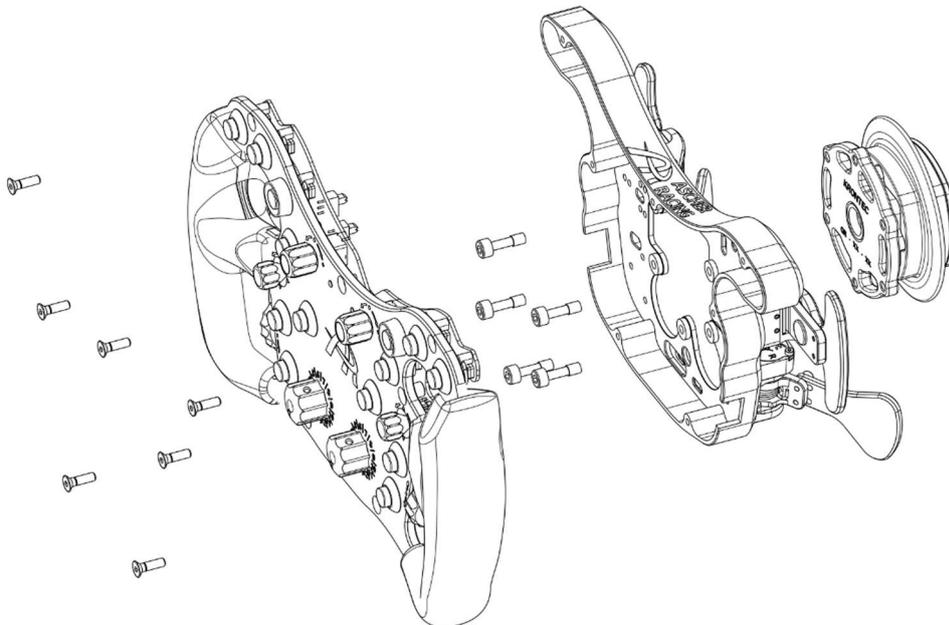
Standard 70mm bolt pattern Quick Releases with non-threaded through holes (e.g. Q1R 70mm wheel side) can be mounted as follows. QRs with threaded through holes can be mounted similarly by using *captive screws* (section with a reduced shaft diameter) instead.



5.4. 70mm bolt pattern Quick Release – inside mounting

QRs with either M5 threaded blind holes or other features preventing from conventional mounting can be attached from the inside of the wheel casing. *Captive screws* are required to bypass the thread of the casing.

First open the steering wheel by removing all (7) M4 screws on the frontplate. Unplug paddle shifters and clutches in order to separate the casing from the frontplate assembly. Screw-in (5) captive screws into the casing from the inside completely past their thread engagement. Then mount the QR by turning each captive screw for **only half a turn** in a circular pattern until both opposing surfaces are touching. Plug-in cables, reassemble the steering wheel and make sure to not squeeze any cables.

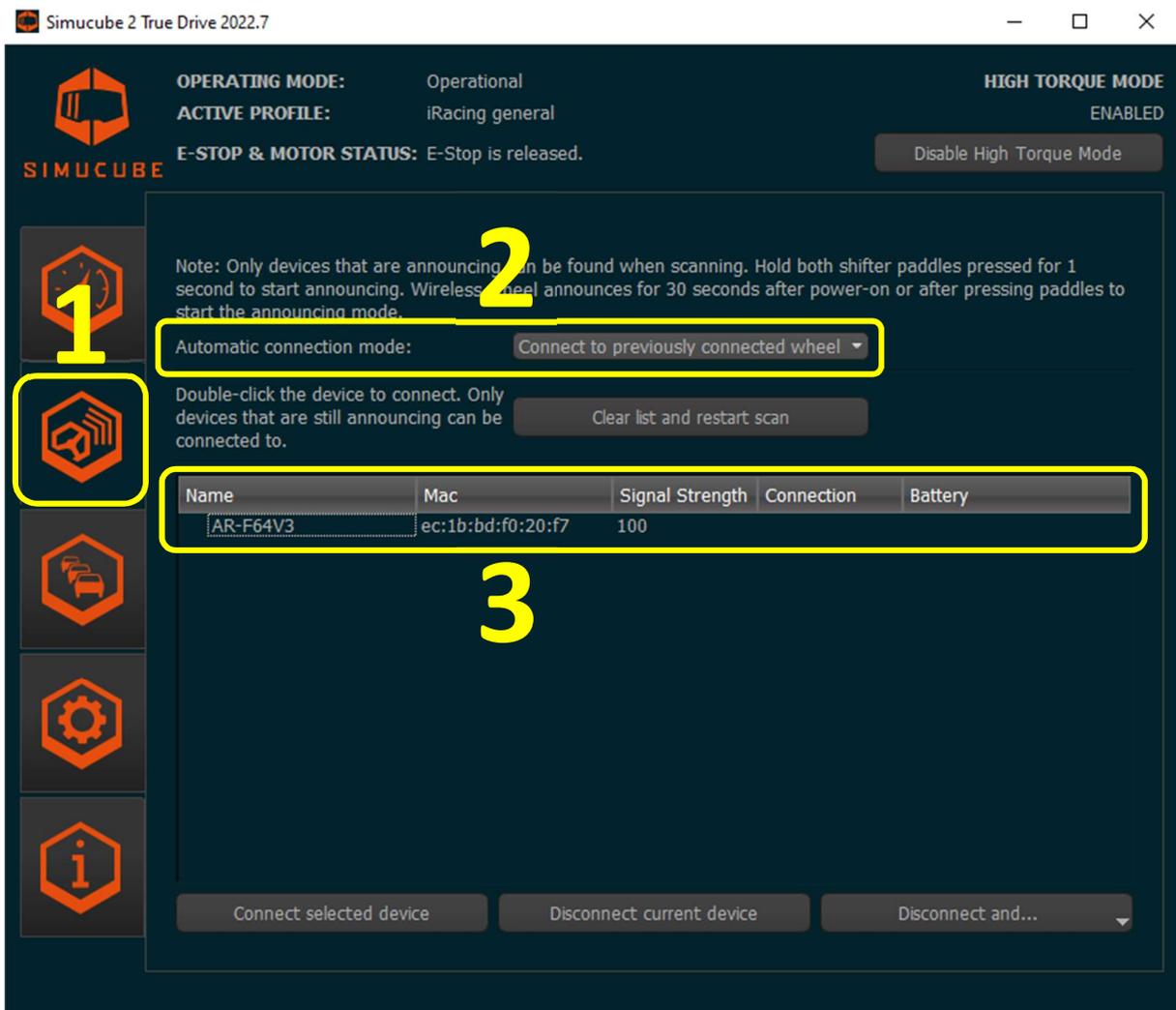


6. Getting Started

6.1. First Wireless Connection – Pairing

The steering wheel can only be paired (or connected manually) during the first 11s after being switched on. During this time, the left green LED blinks quickly – a successful connection is visualized by 3 slow green blinks.

1. open True Drive / Wireless Wheels Tab
2. (Automatic connection mode: *Connect to previously connected wheel*)
3. switch ON steering wheel
4. double click *Ascher Racing F64 V3*



SIMUCUBE OPERATING MODE: Operational HIGH TORQUE MODE ENABLED
 ACTIVE PROFILE: iRacing general
 E-STOP & MOTOR STATUS: E-Stop is released. Disable High Torque Mode

Note: Only devices that are announcing can be found when scanning. Hold both shifter paddles pressed for 1 second to start announcing. Wireless wheel announces for 30 seconds after power-on or after pressing paddles to start the announcing mode.

Automatic connection mode: Connect to previously connected wheel

Double-click the device to connect. Only devices that are still announcing can be connected to. Clear list and restart scan

Name	Mac	Signal Strength	Connection	Battery
AR-F64V3	ec:1b:bd:f0:20:f7	100	Connected	3.82

4

Connect selected device Disconnect current device Disconnect and...

SIMUCUBE OPERATING MODE: Operational HIGH TORQUE MODE ENABLED
 ACTIVE PROFILE: iRacing general
 E-STOP & MOTOR STATUS: E-Stop is released. Disable High Torque Mode

Analog inputs

value	
0.0%	disabled
0.0%	disabled
0.0%	disabled
0.0%	00000
0.0%	disabled
0.0%	disabled
0.0%	disabled

Buttons 1-128

Wheel position
-0.50 °
Reset center

Connected: AR-F64V3
 Battery: 3.82 V
 Connection: 100%

6.2. Normal Operation

First switch ON the Simucube wheel base and then the wireless wheel. If step 2 (automatic connection mode) is enabled the wheel will connect automatically.

A successful connection is indicated by:

- green connection LED blinks 3 times
- Simucube plays a beep sound (if audible notifications are enabled)
- steering wheel shows up in the True Drive overview tab

The wheel can also be connected by using the paddle shifters in case it's already switched ON:

- pull both shifters to connect immediately
- pull both shifters for 5s to disconnect

Automatic disconnect: The wheel will disconnect automatically after 1h of inactivity to save energy in sleep mode. Activity is monitored by the following conditions:

- turning the wheel for more than 10°
- FFB effects in use
- pushing any button on the wireless wheel

6.3. Configure Analog Inputs

Both analog paddles can be either set-up as individual axis (e.g. throttle and brake) or as combined axis, called dual clutch. This mode compares the output of both axis and uses the momentarily greater value. Additionally, one clutch is defined as **master (m)** - the other one as **slave (s)** with scaled down output.

- **master:** 100% physical movement = 100% output
- **slave:** 100% physical movement = **bite-point setting**, e.g. 50% output

If the bite-point is set to 100%, both clutches can be used equally.

Dual clutch functionality offers several advantages; the desired bite-point can be reached:

- **immediately**, within milli seconds (by letting go the master and keeping the slave clutch pulled)
- **precisely**, adjust the value up to 0.1% precision
- **repeatedly**, the exact same value every single time

OPERATING MODE: Operational **HIGH TORQUE MODE** ENABLED

ACTIVE PROFILE: iRacing general

E-STOP & MOTOR STATUS: E-Stop is released. Disable High Torque Mode

Hardware Settings

Audible notifications

Audible notifications

Torque clipping notification

Desktop Centering Spring

Centering strength Off

Safety features

Hands off detection sensitivity Off

Controls how sensitively the device goes into safe torque mode automatically. High torque mode is resumed automatically on hands-on.

Filter settings

Resonance reduction

Reduces motor resonance noises coming from the motor.

Configure Analog Inputs

Above settings will permanently save only after clicking the Save settings to Simucube -button. Saving will also save your current profile settings and wheel center point as default settings to device.

Save settings to Simucube

True Drive Settings

These settings are stored in to Windows registry, no separate saving required.

Prevent mouse wheel from changing profile settings

Min and max values are lowest and highest values of raw input. (Min = raw value at default, Max = raw value at axis fully engaged)

Wireless Wheel

Channel	Output	Position indicator	Raw value	Deadzone low	Deadzone high	Invert	Reset to defaults
Channel 1	Not Configure	0.0%	0.0%	0,0%	100,0%	<input type="checkbox"/> Invert	Reset
Channel 2	Clutch (s)	6.5%	6.5%	0,0%	100,0%	<input type="checkbox"/> Invert	Reset
Channel 3	Clutch (m)	5.1%	5.1%	0,0%	100,0%	<input type="checkbox"/> Invert	Reset
Channel 4	Not Configure	0.0%	0.0%	0,0%	100,0%	<input type="checkbox"/> Invert	Reset

Note 1: While this dialog is open, games will see raw, uncalibrated values.

Note 2: Unconnected inputs are floating, and might be acting in strange ways. Be sure to double check against the pins that you have connected to.

Note 3: Not configured Y axis will idle at 50% position, so that joystick will show at middle position for games.

Accept settings and close. Cancel reverts to the previous settings.

OK Cancel

Deadzones need to be adjusted so that a resting paddle has 0% output whereas a fully pulled paddle results in 100% output.

The *position indicator* shows the resulting output which is reported to the simulation. Raw value is the absolute, unaltered value of the paddle.

Deadzone low defines the Raw value at which the output starts (0%). Set this value about 1% - 2% *higher* than the Raw value of the resting paddle.

Deadzone high defines the Raw value at which the output ends (100%). Set this value about 1% - 2% *lower* than the Raw value of the fully pulled paddle.

Realistic values are as follows:

Channel	Output	Position indicator	Raw value	Deadzone low	Deadzone high	Invert	Reset to defaults
Channel 1	Not Configure	0.1%	0.1%	0,0%	100,0%	<input type="checkbox"/> Invert	Reset
Channel 2	Clutch (s)	0.0%	6.9%	7,9%	92,0%	<input type="checkbox"/> Invert	Reset
Channel 3	Clutch (m)	0.0%	4.9%	5,9%	89,2%	<input type="checkbox"/> Invert	Reset
Channel 4	Not Configure	0.1%	0.1%	0,0%	100,0%	<input type="checkbox"/> Invert	Reset

The last step is to define the previously configured wheel axis as a Simucube 2 axis:

Min and max values are lowest and highest values of raw input. (Min = raw value at default, Max = raw value at axis fully engaged)

Name	Input select	Calibrated Value	Raw value	Min Value	Max Value	Invert	Reset to defaults
Y	Not Configured	0.0%	50.0%	50,0%	50,0%	<input checked="" type="checkbox"/> Invert	Reset
Z	Not Configured	0.0%	0.0%	0,2%	99,8%	<input type="checkbox"/> Invert	Reset
Brake	Not Configured	0.0%	0.0%	0,2%	99,8%	<input type="checkbox"/> Invert	Reset
Throttle	Not Configured	0.0%	0.0%	0,2%	99,8%	<input type="checkbox"/> Invert	Reset
Clutch	Wheel clutch	0.0%					Reset
Rudder	Not Configured	0.0%	0.0%	0,2%	99,8%	<input type="checkbox"/> Invert	Reset
Hat	Not Configured	0.0%	0.0%	0,2%	99,8%	<input type="checkbox"/> Invert	Reset

Settings management: Export to ini file, Import from ini file

Note 1: While this dialog is open, games will see raw, uncalibrated values.
Note 2: Unconnected inputs are floating, and might be acting in strange ways. Be sure to double check against the pins that you have connected to.
Note 3: Not configured Y axis will idle at 50% position, so that joystick will show at middle position for games.

Accept settings and close. Cancel reverts to the previous settings.
 OK Cancel

If the axis doesn't show up correctly in this tab or the overview tab, make a full power cycle of both the wheel base and wireless steering wheel.

6.4. Adjust Clutch Bite-Point

The clutch bite-point (maximum output of the slave clutch) can be adjusted on the steering wheel:

1. push right joystick for 1s to enter bite-point mode
2. right LED lights up orange
3. adjust bite-point in **1%** increments by turning the **left joystick** or **0.1%** with the **right** one
4. push right joystick for 1s to exit bite-point mode

It's recommended to perform this procedure while in the virtual race car from top-down by pulling the slave clutch completely and then lowering the value until the vehicle starts moving. Race starts are performed by pulling both (m) and (s) clutches completely and when the starting lights turn green letting go just the (m) clutch. The overall clutch signal will jump immediately to the set-up bite point value.

Once the ideal bite-point is found and practice starts are performing as expected, the bite-point value is shown in the overview tab (analog inputs) when the slave clutch is pulled completely.

6.5. Mode-Switches

The rear side of the steering wheel features 4 mode switches which change the behavior of encoders and rotary switches (located on the same side of the steering wheel) in order to maximize the performance and functionality.

encoder mode-switch: changes the behavior of the top encoder push button

- **push btn:** standard mode (push button can be used as input in the simulation)
- **shift:** (push button can't be used in the simulation)
 - pressing the push button creates an additional encoder output
 - adjust two controls with one physical encoder
 - e.g. turn to adjust ABS – push & turn to adjust TC

rotary mode-switch: changes the behavior of the 12-position rotary switch

- **12-pos:** standard mode (each position is an individual output)
- **shift:** (rotary can't be used in the simulation)
 - each rotary position changes the output of the thumb encoder
 - adjust 12 controls with one physical encoder
 - e.g. pos. 1 = ABS / pos. 2 = TC / pos. 3 = MAP / pos. 4 = Volume ...
 - left rotary switch shifts left thumb encoder and vice versa

6.6. Simucube Button

The **left joystick push button** acts as a **Simucube Button** which allows changing of force feedback parameters on-the-fly.

- enter *SC Button Mode* by pushing left joystick button for 1s
- select parameter by pushing joystick in a direction
 - Up: Overall Strength
 - Left: Damping
 - Right: Simucube Force Reconstruction Filter
 - TBD
- increase/ decrease parameter by rotating the joystick encoder
- holding the direction for more than 2s resets the parameter to previous value
- exit *SC Button Mode* by pushing left joystick button for 1s

Each point above will give a recognizable audible feedback (if enabled).

7. Battery

The steering wheel is equipped with a rechargeable lithium polymer battery. The shipping battery charge is approx. 50%, which is also the optimum storage charge.

7.1. Charging

- The wheel can be charged in both conditions, switched ON and OFF
- Plug-in the provided cable (USB-C to USB-A) to the charging port on the rear side
- Connect the cable with a PC USB port or a 5V USB power supply (phone charger)
- Battery will be charged with 5.0V and 450mA
- A full charge takes about 6 – 7h

The right LED on the frontplate lights up red during charging and goes off once fully charged.

7.2. Battery Life

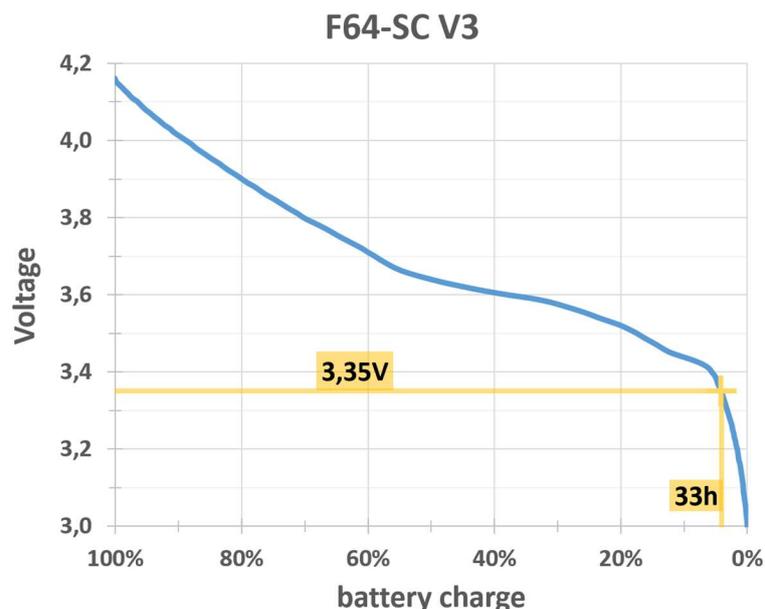
The steering wheel electronics are highly optimized for low power consumption without adding any input lag. The battery Voltage is shown in *TrueDrive – Overview Tab* once connected.

The battery is expected to last at least 800h in a typical use-case. Once the battery crosses **3.35V**, a low Voltage warning is triggered:

- the right LED on the frontplate blinks every 2 minutes (3 fast flashes)
- SC2 gives an audible warning (if enabled)

The remaining driving time at this point is approx. 33h. It's recommended to not discharge the battery below 3.0V in order to prevent degradation. Additionally, any seriously harmful deep discharge will automatically be avoided by the battery protection circuit cut-off at approx. 2.7V. It's recommended to switch OFF the steering wheel for storage or longer periods without use.

The following graph shows the correlation between battery capacity and voltage level. It can be used to estimate the remaining time of the non-linear discharge graph. The data was generated from actual measurements of the battery cell in use.



8. Paddle Shifter Force Adjustment

The paddle shifter snap action force can be reduced by using the supplied alternative magnets and spacers. Use those alternative magnets to carefully pull out the installed ones – if unsuccessful pull the paddle shifter in order to reduce the force between the installed magnets.

Make sure that no loose magnets are in close proximity in order to avoid magnets crashing into each other unintentionally.

Depending on the installed combination, the shifter force will be approximately:

- 800g = 5mm + 5mm (factory default)
- 570g = 5mm + 5mm + 1 spacer
- 480g = 3mm + 3mm
- 440g = 5mm + 5mm + 2 spacers
- 340g = 3mm + 3mm + 1 spacer
- 260g = 3mm + 3mm + 2 spacers

9. Steering Wheel Dimensions

