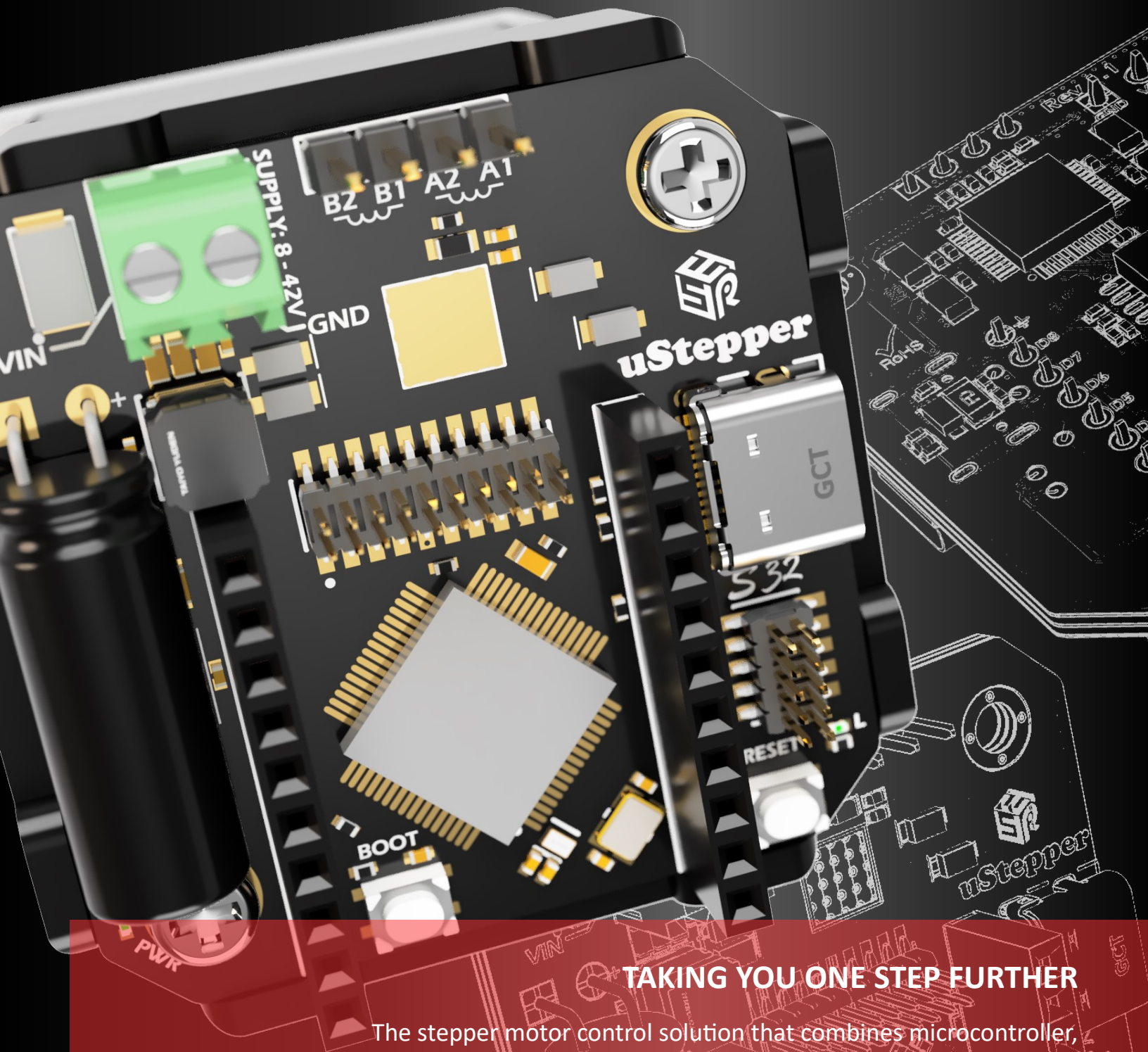
uStepper S32



TAKING YOU ONE STEP FURTHER

The stepper motor control solution that combines microcontroller, stepper driver and encoder in to one compact design

uStepper
closing the loop

MORE THAN A STEPPER DRIVER

THE FLEXIBLE ONE-BOARD SOLUTION FOR YOUR STEPPER DRIVER APPLICATION GIVING YOU PROVEN RELIABILITY WITH MORE THAN 7 YEARS IN THE MARKET. THE NEXT GENERATION **uStepper** IS HERE.

STEPPER DRIVER
— the proven high performance and silent Trinamic TMC5130

HIGH PERFORMANCE MCU
— ARM Cortex®-M4 provides plenty of power

POWERFUL CONVERTERS
— more power for peripherals

RELIABLE ENCODER
— for optimal feedback performance

OPTIMIZED THERMAL DESIGN
— providing stable thermal performance

THE NEXT GENERATION **uStepper**, TAKING YOU ONE STEP FURTHER

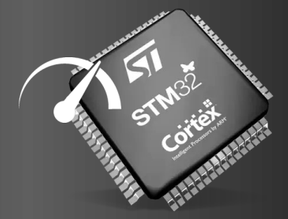
High performance
uStepper S32 is equipped with a high performance 32-bit 84MHz ARM Cortex®-M4 microprocessor providing significant performance increases with more than 20 x the computation power compared to **uStepper S** - giving you plenty of power for your application code.

Time critical tasks
Improving reliability of your code with precision timing using a dedicated RTC clock crystal. Precise Real Time Clock timing is available for those time critical tasks while the main clock also provides eminent frequency stability ensuring stable and reliable 84MHz processing.

Precision in position
A proven reliable Infineon encoder gives accurate positioning with minimal noise while high speed filtering improves the feedback signal precision even further for optimal feedback performance.

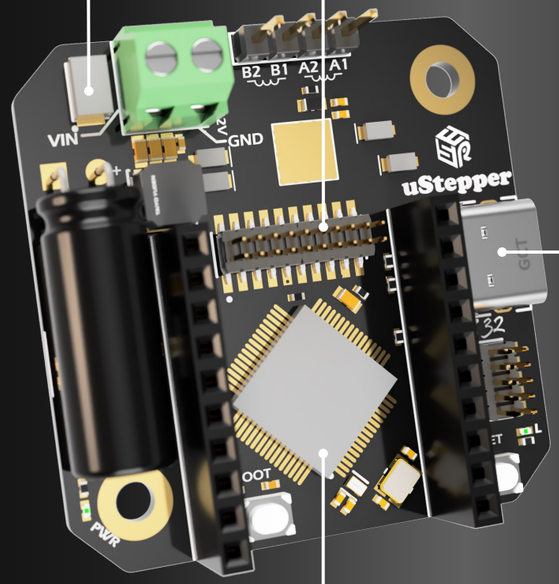
Extended functionality
The new design offers more I/O's with more functionality and flexibility. The 3.3V logic I/O's are all 5V tolerant for maximum flexibility for peripheral connection. An extended range of analog inputs, flexible interrupts and high speed I/O's further enhances peripheral flexibility. Connecting to program is a breeze and more reliable than ever with the USB-C interface.

More power
For supporting both the systems on board but also the connected peripherals a powerful 2 A 5V converter has been added converting the 8-42V supply reliably to 5V while a 1A 3.3V converter provides plenty of power for the lover voltage logic. All that with maximum voltage stability from zero to full load.



Reverse polarity protection
Reverse polarity supply is shorted at the input to reduce risk of board damage. It is still highly recommended to check polarity before powering the board

Expansion port
Additional I/O's for even more flexibility



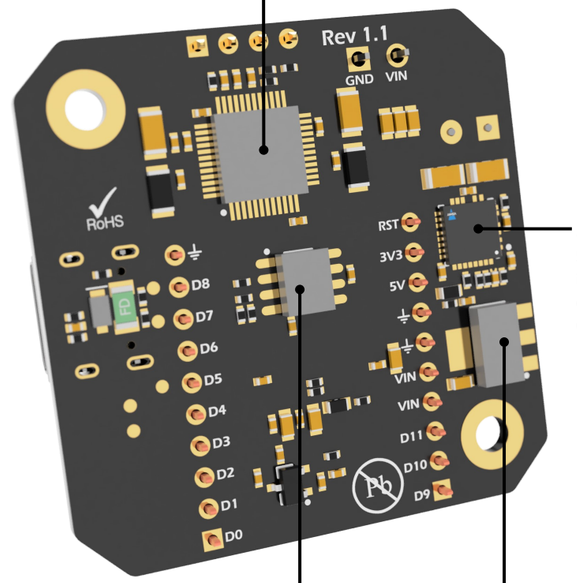
USB-C
The newest standards in programming interfaces

ARM Cortex®-M4
A 32-bit powerhouse clocked at 84MHz for maximum performance

I/O Voltage	3.3 V (5V compatible)
Input Voltage (recommended)	8 - 42 V
DC Current per I/O Pin (max)	25 mA (max 120 mA total I/O draw)
DC Current for 5 V Pin (max)*	1.75 A
DC Current for 3.3 V Pin (max)	1 A
Stepper drive current	Up to 2.5 A (peak)

**Powering the board from USB only will result in less than 5V output from the 5V power pin. USB current is limited to 0.5A*

Stepper driver
With up to 256 step micro stepping the Trinamic TMC5130 offers an astonishing 0.007° step size and smooth stepping



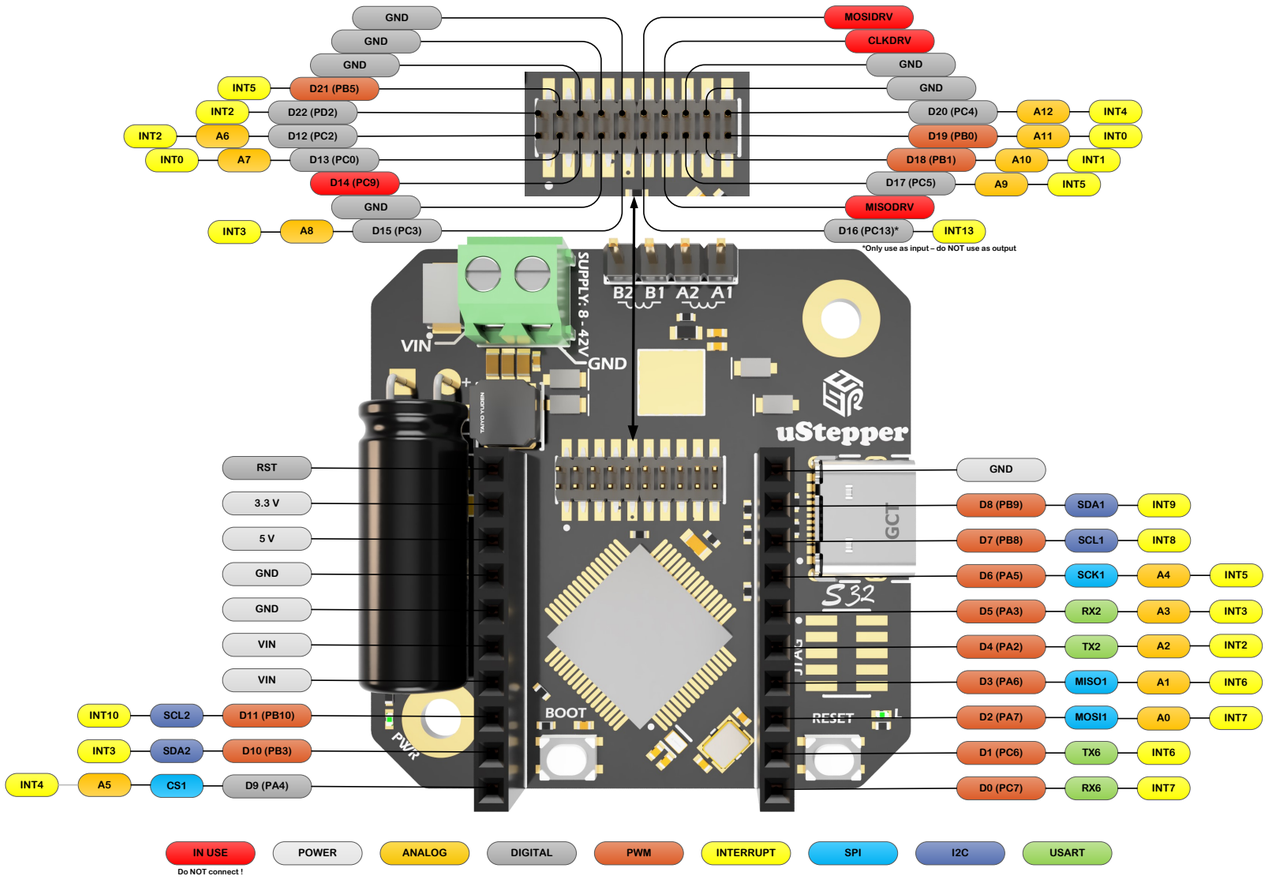
5V converter
5V logic voltage with loads up to 1.75A is provided through a buck converter enabling supply voltages in the range of 8 - 42VDC

Infineon encoder
The feature rich and high performance TLE5012B offers a feedback resolution better than 0.011° at very high sampling rates

3.3V power
3.3V supply for the ARM microprocessor and peripherals is provided from a second stage converter capable of delivering a current of up to 1A

Dimensions	41.8 x 41.8 x 13.2mm (31 x 31mm mount holes)
Weight	~15g

EXPANDABLE SOLUTION



More I/O for system intelligence

A high number of digital I/O, analog inputs, interrupts and PWM outputs are offered with the highly flexible range of 3.3V* I/O's on the backwards compatible pin header interface of the **uStepper** *S32*.

An additional selection of I/O's from the ARM Cortex®-M4 is made available through the fine-pitch expansion port interface placed centrally on the **uStepper** *S32* board offering you even more possibilities of system integration.

**All I/O's are 5V tolerant, meaning they will tolerate 5V input voltage*

FAQ

Information/documentation on the **uStepper** *S32* & Arduino library is available in the readme section on our GitHub repository.

Q: I can't program uStepper from the Arduino IDE, what is wrong?

A: Three most common issues:
If you use the Windows store app "Arduino IDE" you might experience problems. Download the executable or portable version of Arduino IDE from www.arduino.cc
Install hardware support and the uStepper S library
Remember to chose uStepper S as the board you program to

Q: When I run uStepper closed loop PID or Drop-in the motor spins up and runs fast in one direction, what is wrong?

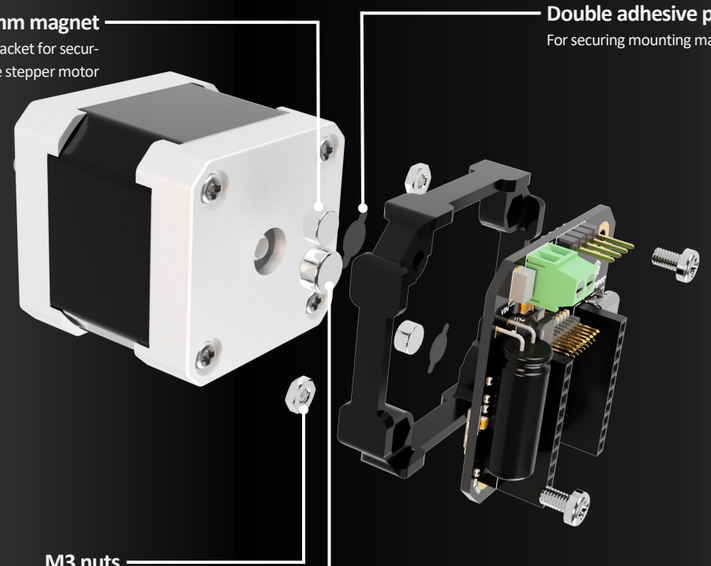
A: Two most common issues:
Check that the encoder magnet is placed correctly on the motor shaft
Check that your PID parameters in the Arduino code are sane. A good starting point is to set P and I to 0.5 and D to 0.

For more FAQ visit www.ustepper.com

The versatile drive solution

Low cost and high reliability makes stepper motors favored over servo drives in many applications, as for example robots, CNC machines, 3D-printers etc. With added feedback uStepper adds a new dimension to stepper operation utilizing closed loop control or correction of missed steps - making the stepper even more appealing. With the numerous features and the vast amount of I/O's (including various busses), uStepper is the choice when in need of a reliable, precise and compact actuator for almost any application.

PUTTING IT ALL TOGETHER



6mm magnet
Strong magnet inserted in the bracket for securing the bracket to the stepper motor

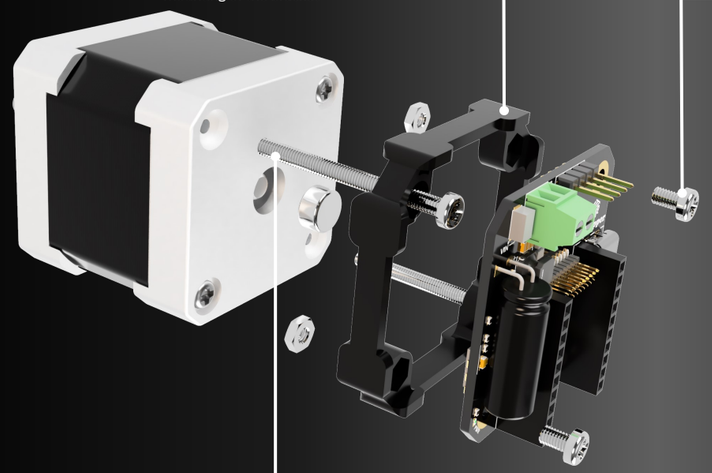
Double adhesive pads
For securing mounting magnets in the bracket

M3 nuts
Fits in the bracket for securing the **uStepper** board with Philips screws

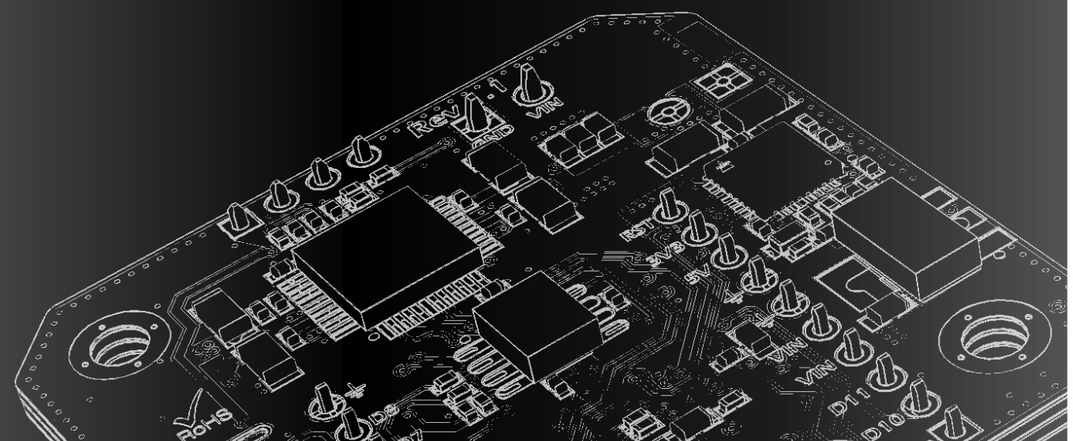
Encoder magnet
8mm diametric magnet for encoder feedback mounts to the motor shaft/bearing

Dual mount bracket
Use the flexible and fast magnet mount or flip the bracket to use long screws for permanent mounting of the bracket

M3 screws
Philips screws for securing **uStepper** to the bracket



Long M3 screws
Philips screws for a secure permanent mount of the bracket to the motor



Resources

Mounting **uStepper** S32

The dual mount bracket gives you the option of either a flexible magnetic mounting or a permanent and more secure screw mount by just flipping the bracket. Not sure how to mount it? Then scan the QR code or press the hyperlink below.

SCAN ME

Mounting uStepper

Code, documentation and more

Documentation, source code and more can be retrieved from our GitHub repository. Just scan the AQ code or follow the hyperlink given below.

SCAN ME

GitHub repository

1 Disclaimers and Limitation of Liability

1.1 uStepper ApS (or any individuals affiliated with either of the two companies) can not be held responsible for any damage inflicted upon mounting or interfacing with the uStepper board. This also includes damage to stepper motor (both electrical and mechanical) or any other 3rd party hardware connected to uStepper. Most stepper motor cases are made of aluminum, and care must be taken when preparing the mountings for uStepper.

1.2 By using the uStepper products (including, but not limited to, hardware and software) you acknowledge that uStepper ApS (or any individuals affiliated with either of the two companies) can not be held responsible for any personal injuries and/or damage to any 3rd party hardware that may occur when using the uStepper products.

1.3 To the extent permitted by law, uStepper ApS will not be liable for any indirect or consequential loss or damage, of any kind, (including without limitation loss of business, opportunity, data, profits) arising out of or in connection with the use of any products (including, but not limited to, hardware and software), developed, produced or sold by uStepper ApS (or any individuals affiliated with either of the two companies).

1.4 Nothing in these Terms and Conditions shall be construed so as to hold uStepper ApS liable for death or personal injury as a result of the negligence of uStepper ApS or that of its employees or agents.

2 Indemnity

2.1 You agree to indemnify and hold uStepper ApS and its employees and agents harmless from and against all liabilities, legal fees, damages, losses, costs and other expenses in relation to any claims or actions brought against uStepper ApS arising out of any breach by you of these Terms and Conditions or other liabilities arising out of your use of this Website.

2.2 You agree to indemnify and hold uStepper ApS and its employees and agents harmless from and against all liabilities, legal fees, damages, losses, costs and other expenses in relation to any claims or actions brought against uStepper ApS arising out of any breach by you of these Terms and Conditions or other liabilities arising out of your use of products (including, but not limited to, hardware and software) developed, produced or sold by uStepper ApS (or any individuals affiliated with either of the two companies).

3 Severance

If any of these Terms and Conditions should be determined to be invalid, illegal or unenforceable for any reason by any court of competent jurisdiction then such Term or Condition shall be severed and the remaining Terms and Conditions shall survive and remain in full force and effect and continue to be binding and enforceable.

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