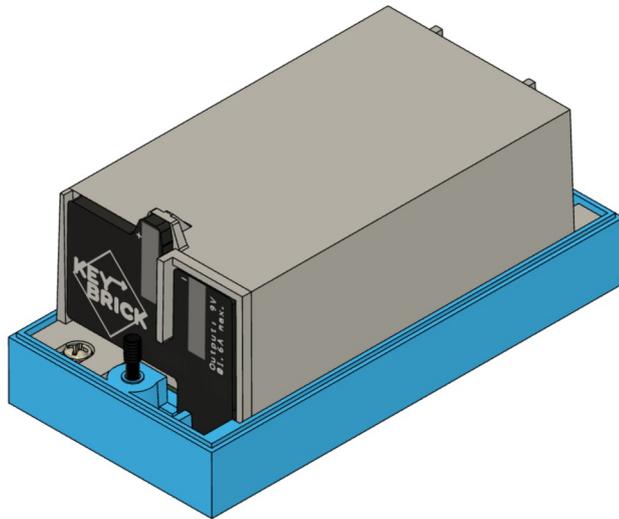




Keybrick One

# Manual

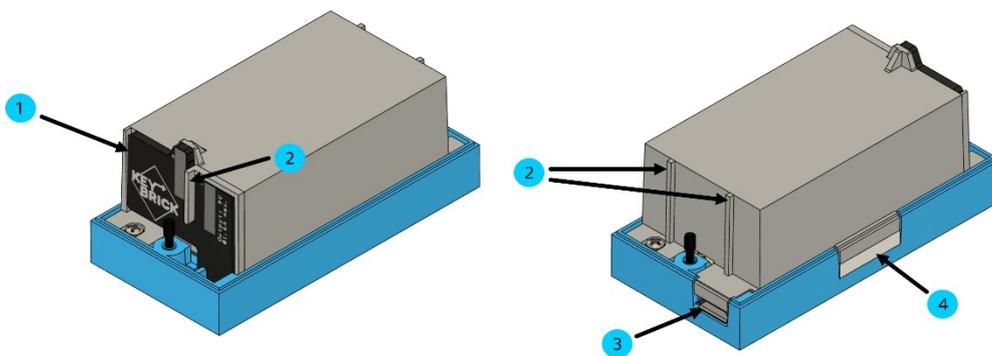


SKU: KB1-1  
Date: 2023-11-08  
Revision : 5

## Introduction

Thank you for purchasing Keybrick One, the rechargeable battery pack for the LEGO® Powered Up Hub 88009. It is designed to replace the original battery clip in the hub.

We wish you the best of fun with this new addition to your favorite toy. Please read these instructions carefully. If you feel that some information is missing or you need assistance with your Keybrick One, please contact us via our website: <https://keybrick.one/>



- (1) Contact plate. Must be facing contact springs inside the hub
- (2) Mating notches preventing reverse insertion
- (3) USB Type C charging port (see page 5)
- (4) Status indicator (see page 6)

## Specification

	Value / description
Size	64x31.5x29.2 mm
Weight	~50g
Battery capacity	1200mAh
Charging	5V at up to 1000mA
Output characteristics	9.3V nominal in Boost mode
	7.8V nominal in Normal mode
	6.3V nominal in ECO mode
Output power	15W max.
Standby battery life	> 1 year when stored fully charged initially

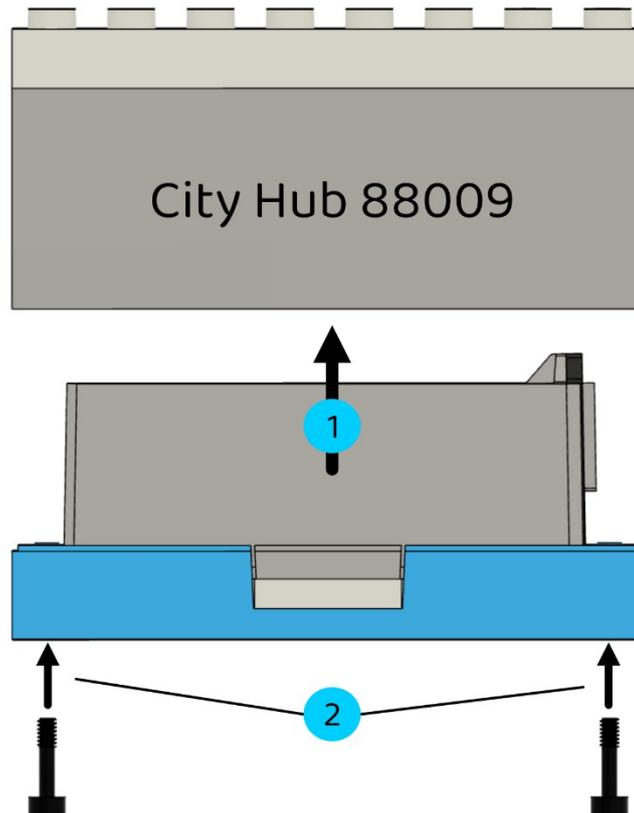
### LEGO® set compatibility:

Keybrick One is compatible with all sets using the LEGO® Powered Up Hub 88009. Currently we know of the following sets:

- LEGO® Ideas Grand Piano 21323
- LEGO® Crocodile Locomotive 10277
- LEGO® Disney Train 71044
- LEGO® City Passenger Train 60197
- LEGO® City Passenger Express Train Set 60337
- LEGO® City Cargo Train 60198
- LEGO® App Controlled Batmobile 76112

## Installation

Start by remove the original battery cradle and its cover by removing both screws on the bottom of the hub.



- (1) Then insert Keybrick One in the right orientation
- (2) Secure Keybrick One with the provided set of screws

You should be ready to go. Keybrick One should power up automatically when you switch on the hub.

Note: if your unit was stored for a long period of time you may have to recharge it first. Recharging prior to first use is recommended as we generally do not ship Keybrick One fully charged.

## Charging

Keybrick One can be charged using a standard USB charger or power-bank by connecting the supply to the built-in USB Type C port. Please only use USB compliant chargers, capable of delivering 1A or more for charging.

You can charge Keybrick One while it is installed in the LEGO® Powered Up Hub.

Charging while Keybrick One is supplying power to the hub is possible, but degraded performance is anticipated at high sustained load. At very low states of charge you may experience cutoffs.

A full charge can take up to 3h depending on the state of discharge.

## Power modes



You can select from 3 power modes using the supplied magnetic cable tie (or any magnet). Hold it beneath the status indicator (marked (1) in the figure above) until the status indicator flashes.

Keybrick will flash twice in blue and then show the selected mode for 4 – 5s:

- Green: Eco mode (6.3V output)
- Green/Red: Normal mode (7.8V output)
- Red: BOOST mode (9.3V output)

Your Keybrick will then switch back to the previously active mode.

*Note: switching power modes is not possible while in Charging-only mode. The playtime is noticeably influenced by the selected power mode and applied load while playing. In extreme situations play time can be as short as an hour or be significantly longer than three hours.*

## Status indicator

Startup sequence:

After switching on the Powered Up hub it takes up to 10s for Keybrick One to notice the presence of a load. After which the startup sequence begins:

- Shows "rainbow" animation
- Flashes quickly 4 times in either Green (ECO), Green/Red (Normal) or Red (Boost) to show which power mode is selected
- Switches to normal operations mode showing the battery level along-side with dim blue sides.

Standby sequence:

After the Hub is switched off it takes up to 20s for Keybrick One to enter standby.

- Flashes the "rainbow" twice
- Then fades the "rainbow" to off

Normal Operations:

When Keybrick One is supplying the attached hub with power, it shows the current state of charge using a green-to-red color gradient. The more "red" the indicator gets the lower the battery level. The sides of the indicator are dimly lit in blue during the whole time.

Once you reach the end of charge Keybrick One will show a low battery warning by flashing the status indicator in blue and red alternately. Continuing to play will result in Keybrick One cutting off suddenly.

### **Charging Only:**

Keybrick One will enter charging only mode when it is connected to a power supply while in stand-by. As long as the battery is being charged a charging animation is displayed during which the edges of the status indicator are being lit blue alternately.

Once the charge is completed the status indicator switches to solid green for as long as the power is still being supplied.

In operations charging:

Keybrick One supports being charged while operating. To show the charge process the sides of the indicator are animated similarly to the *Charging Only mode*, with the addition that an approximate state of charge is shown.

Once the charge is completed the indicator will start blinking green.

Error status:

Low battery: when close to the cutoff threshold the status indicator will flash red/blue alternately. If you continue using Keybrick One while the low battery indicator is showing, you may experience a hard cutoff after some time. This is to prevent the battery from being damaged due to over-discharge. It is recommended to charge Keybrick One for at least 30 minutes before storing it if it is nearly empty.

Battery error: if the status indicator shows an irregular blue/green blinking while being attached to a charger an error with the battery has been detected. Please remove Keybrick One from any supply immediately and contact us for support.

No startup: if for some reason the battery has been drained below a safe level the battery protection circuit inside Keybrick One may disconnect the battery to avoid damage to the battery cells. Under most circumstances the circuit can be re-set by plugging in a charger. The charge cycle after such a situation might be significantly longer, as the battery may have to be slowly reconditioned first. If Keybrick One does not start up when plugging in a charger, please disconnect the supply and contact us for support.

No startup after overload: if Keybrick One gets over-loaded or the terminals are shorted together, multiple protections can kick in:

- In case of a short circuit you may have to reset the protection by plugging in a charger for a few seconds if no auto-recovery happens once the short circuit is removed.
- In case of prolonged over-loading a self-resetting fuse may have disconnected the output terminals. The fuse should re-set after a few minutes of cool-down. Note that repeated over-loading may damage the fuse and/or other components.

## Support

If you experience any difficulty with Keybrick One please contact our support using the contact form on our website. We will get back to you as soon as possible:

<https://keybrick.one/contact/>

## Note on product safety and batteries

Please note that Keybrick One is designed to be operated within the hub. Keybrick One itself is not a toy and should not be left in reach of small children. Once mounted in the hub using the supplied screws the same precautions apply as when using the hub in its original setup.

Keybrick One contains a high-power Lithium Polymer battery pack. While all necessary technical measures have been implemented to ensure safe operation, we cannot account for external factors such as mechanical damage, shocks, fire, water/high humidity, or other non-intended use.

DO NOT throw Keybrick One in fire. DO NOT charge Keybrick One with non-standard chargers.

Please dispose of Keybrick One at your local electronics waste recycling center at the end of its lifecycle or contact us for advice for recycling possibilities.

## Legal

LEGO® is a trademark of the LEGO Group, which does not sponsor, authorize, or endorse Keybrick. Keybrick and Staudt Technologies GmbH are not related to the LEGO Group in any way. Any use of original LEGO® models is just for showcase as Keybrick is a compatible add-on.

## Warranty

Warranty declaration according to German BGB § 477:

Duration: 3 years from date of purchase

Warrant: Staudt Technologies GmbH

Area of validity: all countries we have been selling to at the time of purchase

Legal obligations: this warranty does not affect and/or limit any of our legal obligations.

Claiming:

Please contact us at following address in case you experience an issue with your device:

Staudt Technologies GmbH

Tel.: +49 77339819950

Am Bahndamm 3

Email: [helpdesk@keybrick.one](mailto:helpdesk@keybrick.one)

78234 Engen

GERMANY

We will provide you support and issue an RMA number if deemed necessary. In case of a return the device must be shipped to our location. Please note that the receipt or bill of sales must be provided for any claim under warranty.

Coverage:

The warranty includes all loss of function during the warranty period that have been caused by manufacturing issues or defects in used materials. The warranty does not cover loss of function caused by in improper use of the device.

It is at our discretion to fulfill a warranty claim by repairing or replacing your device. The repaired or replaced device is covered for the remainder of the original product warranty period.

Excluded causes of failure:

Damages or failures resulting from...

- Improper use
- Force majeure
- Modifications to the device
- Repairs executed by unauthorized 3<sup>rd</sup>-parties
- Water ingress or humidity
- Impact, dropping and similar events

...are not covered under this warranty.

Cost of repair:

Repair under warranty is free of charge. This excludes the cost of shipping the device to our repair center.

Exclusion of further claims:

Claims beyond the services mentioned in this statement of warranty are excluded. Statutory claims remain unaffected

Final provisions:

This warranty is solely subject to German law, to the exclusion of the United Nations Convention on contracts for the

International Sale of Goods (CISG). The place of jurisdiction is Engen, Germany.

## Declaration of conformity

We the manufacturer:

Staudt Technologies GmbH  
Am Bahndamm 3  
78234 Engen  
GERMANY

Declare that the product:

Keybrick One (SKU: KB1-1)

Is in conformity with the following standards and/or normative documents:

European Union (EU):

- EN55014-1:2017-A11:2020
- EN55014-2:2015
- ISO 8124-1:2009
- RoHS 2 Directive 2011/65/EU
- WEEE Directive 2012/19/EU
- Packaging Directive 94/62/EC and 2013/2/EU amending Annex I

Please contact Staudt Technologies GmbH for related inquiries for more information.

Engen, October 29<sup>th</sup> 2020.



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Yannic Staudt  
CEO