Instruction Manual

For full instructions and fitting videos, please visit;

www.swytchbike.com/instructions
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To ensure a safe and trouble-free experience when using your Swytch Conversion Kit please follow the guidelines below:

1. **Fully charge before first use**
   After receiving your kit and before fitting to your bike or doing anything else fully charge the Power Pack until the charger light goes from red to green.

2. **Never leave on charge**
   The Power Pack is perfectly safe for home use, but the charger and battery will naturally and gradually heat up when it is plugged in.

   Avoid leaving on charge for longer than necessary. Extended periods left on charge can lead to reduced life of the battery.

3. **Hear the “Click” when attaching the Power Pack to the Handlebar Mount.**
   Make sure that the Power Pack clicks into place when attaching onto the handlebar mount. If you don’t hear the click, give it a firm push – the Power Pack must be fully pressed down on the mount to ensure correct operation.

4. **Tighten up before riding**
   Whether it’s your first ride, or your hundredth ride, please ensure all nuts, screws and bolts are tight before taking off on the road! Any loose parts could result in the motor wheel coming off during riding - please be careful. Every 100km, do tighten your wheel spokes back up if loose to ensure the wheel remains secure.
Is everything in your box?
Before starting, make sure everything is in the box that should be, and double check the parts match with your order (see next section).

Then, if you know what you’re doing, crack on!

Check our YouTube channel for a full video on the conversion process. If you know your way around bikes you may prefer to crack on and follow the video to get up and running.

The process can be summed up in four simple steps:

1. Fit the Motor Wheel
   Motor cable on the left of the bike. Re-adjust the brakes if necessary. Tighten wheel nuts.

2. Fit the Pedal Sensor
   Magnet disk on left of the bike. Mount sensor close to the magnets. Smooth side facing the sensor.

3. Fit the Handlebar Mount
   Tilt Mount 45° upwards when fitting the strap so it is in tension when horizontal.

4. Connect and Go!
   Firmly press connectors together. Secure cables to bike frame.
3

Tools Required

- Allen Key Set
- Tyre Levers
- Bicycle Pump
- Adjustable Spanner
- Scissors
- Elbow Grease
Check everything is there before you start! Once you’ve unpacked and started fitting it’s easy for things to go missing. Please keep the original packaging until you’ve fitted the kit.

4

What’s in the Box

Every kit should have the following parts:

- 1 Motor Wheel
- 2 Handlebar Mount
- 3 Pedal Sensor
- 4 Cable Ties x10
- 4 Power Pack
- 5 Quick Start Guide
- 6 Charger
All kits should contain the following parts, please check them off before starting the conversion.

- **Hub Motor Wheel**
- **Quick Connect Handlebar Mount**
- **Swytch Power Pack (ECO/PRO)**
- **Universal Pedal Sensor / Brompton Pedal Sensor**
- **Cable Ties x10**
- **2A Standard Charger (UK, EU, US)**
- **3A High-Power Charger (Optional add-on)**
- **Brompton Extension Peg (16” Brompton Kits Only)**
- **Brompton Block (Optional add-on)**
- **Torque Arm (Optional add-on)**
- **Thumb or Twist Throttle (Optional add-on)**
- **T-shirt (Optional add-on)**
- **In-line Brake Sensors / Hydraulic Brake Sensors (Optional add-on)**
5.1 Motor Wheel

1 Remove your old tyre + front wheel from your bicycle
   - Swap the inner tube and tyre from the old wheel to your new Swytch motor wheel.
   - If your tyre tread is directional, make sure to face it the correct way. Pump the tyre to the manufacturer’s suggested pressure.

2 Fit disc brake disc (optional)
   If you have disc brakes, move the disc from your old wheel to your new Swytch motor wheel.

Note: Screws should have an 8mm thread length. If they are longer they may cause the motor to stop spinning. If they are shorter, you may strip the thread of the motor wheel.
3 Check orientation of motor
- The motor cable should be on the left of the bicycle (opposite side to the chain).
- Ensure the motor cable is pointing down towards the ground when the bike is upright. If the motor cable exits the other way around it can get squashed and damaged.

4 Check the axle goes in all the way
The flat sides of the axle should fit within the forks. If it does not fit, please check the troubleshooting section.

5 Fit the torque washer “lips” into the fork slot
Assemble the motor wheel to the forks with the torque washers installed as shown. The torque washer protrusion should fit snugly inside the gap in the fork.

6 Tighten the Wheel Nut
Assemble both axle nuts tightly with a spanner.
5.2 Universal Pedal Sensor (PAS UNI)

There are 4 different configurations for the Universal Pedal Sensor. Which one you should use depends on the size of gap between pedal arm and bike frame, and the shape of your pedal arm.

<table>
<thead>
<tr>
<th>How big is the gap between pedal arm and frame?</th>
<th>What shape is the inside of your pedal arm?</th>
<th>Photo example</th>
<th>Use this configuration</th>
<th>Pg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4mm +</td>
<td>-</td>
<td></td>
<td>Easy Fit Regular</td>
<td>20</td>
</tr>
<tr>
<td>2mm – 4mm</td>
<td>-</td>
<td></td>
<td>Easy Fit Thin</td>
<td>20</td>
</tr>
<tr>
<td>Less than 2mm</td>
<td>Round</td>
<td>Round</td>
<td>Universal Regular</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Indented</td>
<td>Indented</td>
<td>Universal Indented</td>
<td>22</td>
</tr>
</tbody>
</table>

For Brompton Pedal Sensor, go to page 32
5.2.1 Easy Fit Regular/Thin Magnet Disk

**Magnet disc**
- Fit the magnet disk either side of the crank axle.
- The side of the bike should be opposite the side with the chain.
- The smooth side of the magnet disk must be facing the sensor.

1. **Magnet disc**
2. **Fit Retention Ring**
   Fit the retention ring around the magnet disk to secure it in place. It’s easiest to start on one side and work the ring around until you get to the other end.

3. **Check Correctly Installed**
   Below is how the magnet disk should look once properly fitted:

**Troubleshooting**
If the magnet disk doesn’t fit, check the troubleshooting section.
5.2.2 Universal Magnet Disk

When switching between the different sides, you will need to unscrew the arm and reassemble it flipped around so that the working surface of the magnet disk remains facing the same way.

1. Before starting, clean your pedal arm of any dirt and debris. This will allow the pedal disk arm to fit securely to the surface.

2. Loosely cable tie the magnet disk arm to the inside of your pedal arm in at least 2 points. Reposition the magnet disk so that it is close to the sensor and aligned. Check that the alignment is correct by rotating the pedal arm backwards and watching for any movement. After this check, tighten the cable ties completely.

3. Once aligned in position, tighten the screws to lock the disk arm into place.

4. For small pedal arms, thread the cable ties through the holes to improve the grip.
5.2.3 Pedal Sensor Alignment

1. **Attach Pedal Sensor to bike**
   - Remove the pedal sensor adhesive cover.
   - Attach the pedal sensor to the frame of the bike close to the magnet disk.

2. **Line up sensor to magnet arc**
   - Make sure that the centre of the sensor is aligned to the magnets.
   - Point the sensor away in a straight line from the centre of the disk.
   - As the magnet disk spins the magnets need to pass close to the sensor for it to detect your pedalling.

3. **Check correct installation**
   - The photo below shows a correctly fitted pedal sensor. Adjust the pedal sensor to minimise the gap between the sensor and the magnet. Tighten the screw to prevent it from moving.

4. **Cable tie in place**
   - Once fitted correctly, use the cable ties provided to secure the pedal sensor to the frame. Route the wire along the down-tube of the bike up to the handlebars, using the cable ties to secure to the frame.
5.3 Quick Connect Handlebar Mount

1. **Add rubber spacers to handlebars**
   - Fit the rubber handlebar spacers onto the handlebars. (22mm diameter handlebars only).
   - For larger sized handlebars (e.g. on mountain bikes) they are not required.

2. **Place mount onto handlebars angled upwards 45°**
   - Fit the Quick Connect Handlebar Mount over the spacers onto the handlebar.
   - Tilt the mount up approximately 45°, this is necessary to ensure correct final installation.

3. **Fit the Anti-Twist Strap**
   - Pass the Anti-Twist Strap underneath the handlebar stem.

4. **Tighten strap in place**
   - Secure the strap on to the other arm of the mount. Use the closest holes possible with the mount tilted upwards. Fold the strap back on itself to increase its strength and keep it looking tidy. Tighten the screws.
5 **Align Mount horizontally**
- Turn the Mount to face horizontally. This will put tension in the Twist Strap and keep the Mount from turning any further. If in the future the Mount sags, simply adjust to a new hole on the Twist Strap.

6 **Connect accessories**
- Connect the PAS to the Quick Connect Handlebar Mount.
- To connect the waterproof connector, find the arrow on each connector and align. Once aligned, push the connector pair together until no colour is visible.

7 **Connect motor**
- Connect the motor to the Quick Connect Handlebar Mount. Secure the motor wire to the fork with the cable ties provided. Leave enough slack for the handlebars to turn.
- If the motor cable is not long enough, you may need an extension cable.

8 **Ensure the motor is fully connected – hear the “click”**
- To connect the waterproof connector, align the arrows and push together until the arrow on the motor wire connector is touching the Mount connector. The photo below is not properly connected.
- The photo below shows the motor connected correctly. You will hear and feel a “click” once it is pushed in all the way.

**BAD – not fully connected**

**GOOD – fully connected**
6.1 Brompton Motor Torque Washer

1. To fit the Brompton Torque Washer, first make sure to thread the motor cable through the keyhole in the washer.

2. Remove any of the existing wheel hardware.

3. If you have a mudguard, assemble it underneath the locking nut.

Be careful not to damage the motor cable when tightening the nut.
6.2 Brompton Pedal Sensor

Assemble the Brompton Pedal Sensor by screwing the 2-part clamp over the pedal arm. Use the Brompton plastic insert to make sure the disk does not slip up the length of the arm.

<table>
<thead>
<tr>
<th>How big is the gap between pedal arm and frame?</th>
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<th>Photo example</th>
<th>Use this configuration</th>
<th>Pg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2mm - 4mm</td>
<td></td>
<td></td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>Less than 2mm</td>
<td>Brompton pre 2013</td>
<td>Brompton pre 2013</td>
<td>Easy Fit Regular</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Brompton post 2013</td>
<td>Brompton post 2013</td>
<td>PAS-BRO-B</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Non-Brompton aftermarket</td>
<td>Non-Brompton aftermarket</td>
<td>UNIVERSAL</td>
<td>22</td>
</tr>
</tbody>
</table>

1. Check which pedal type you have

2. Assemble these parts onto the pedal arm

3. This is how it should look when finished

4. When installing the sensor, an alternative mounting location is directly on the bottom bracket block. Use cable ties as shown to secure it into place. Route the cable around the seat post and follow the existing cables.

If you have an after-market pedal arm, you will need to use the Universal Magnet Disk or Easy Fit Magnet Disk.
6.2.1 Brompton Pedal Sensor Alignment

1. Fit the sensor onto the small frame tube of the Brompton. Angle the sensor and add a spacer to move the sensor within range. The spacer can be the supplied foam or a piece of inner tube. Tighten the sensor screw to lock it in position and add cable ties to secure it to the frame.

2. Alternative mounting location: Install the pedal sensor onto the lower part of the frame. Remove the hinge mechanism so that it can fit under the pedal sensor.

6.3 Brompton Peg

1. Follow the installation instructions for the standard kits.

2. Remove the existing peg from the Brompton frame and attach the extended peg that is provided in the kit. Screw the peg on by hand until it turns no further.
The Brompton Block Adapter allows the Power Pack to be mounted directly to the frame.

These parts are included in the Bro Block Kit:

- Cable ties x10
- M5x12 Cap Screws x2
- M5 Locking Washers x2
- M5 Large Washers x2
- Brompton Carrier Adaptor x1
- Pedal Sensor Extension Cable x1

1. Fasten the mount to the front carrier mount attachment at the front of the Brompton using the screws provided. Be sure to assemble the screws in the order shown below.

2. Attach the Handlebar Bracket to the adapter. Don’t use the spacers or the twist strap.
3. Connect your Pedal Sensor, Brake Sensors and Throttle to the bracket. You will need to use extension cables to reach the new position.

4. Shorten the motor cable by folding it back on itself and securing it with a cable tie. Make the loop back the same length as the length of the Brompton Block Adapter.

5. Thread the motor cable through the hole in the Brompton Block Adapter to hide the excess cable.

6. You might find this step easier with the bracket removed from the Block.
This is how it should look once assembled.

Secure the cables underneath the bracket with a cable tie threaded through the hole in the bottom.

Secure the cables underneath the bracket with a cable tie threaded through the hole in the bottom.

6.5 General Tips

1. Check your brake pads are not touching your tyre. Adjust them to be lower and straight if necessary. Make sure your motor wheel is assembled fully into the forks. Replacing your brake pads can help with clearing the tyre.

2. Follow the existing cable routing of your bike to enable it to fold like normal. Tie the PAS cable along the rear cable group, and the motor cable along the front cable group.

FINAL CHECKS

Check steering is not affected by turning the handlebars left and right. The turning should be easy.

Fold the Brompton and check that the new cables do not interfere with the fold.
7.1 In-Line Brake Sensors

Without the brake sensors the motor will still turn off a moment after the pedals stop turning or the throttle is disengaged.

Brake sensors provide an additional level of control and safety by turning off the motor immediately when the brakes are applied – they are an optional addition to your kit.

Fitting the brake sensors requires the brake cable to be removed and replaced. If this is not done properly then the brakes may not function correctly which can cause a serious accident. If you are not confident with working on your bike’s brakes, then we recommend taking the bike to your local bike shop or bike mechanic for help fitting the sensors.

If you’re going to attempt to fit the brake sensors with no previous experience with working on brakes, fit only one brake sensor on to the rear brake and leave the front brake without a sensor as a backup.
1. **Fit the inline brake sensor to the brake cable**
   - Thread the cable guide and inline sensor onto the bicycle brake cable.
   - The sensor connector should be pointing away from the brake lever.

2. **Reconnect the brake cable to your brakes**
   - If your cable is too short, use the spare provided to fit the rear brake & use your rear brake cable to replace your front brake cable.

3. **Connect the brake sensor to the Quick Connect Mount**
   - Repeat for the other brake.
   - Test by turning on the Power Pack and holding the (−) button to activate the walk mode and check the brake sensor stops the motor turning.

You can also assemble the brake sensors onto any point along the brake cable.
7.2 Hydraulic Brake Sensors

1. Fit the hydraulic brake sensor to the outside of the brake lever.
   - Stick the sensor to the brake lever base.
   - Stick the magnet to the brake lever.

2. Check the position of the sensor.
   - The magnet should be close when the brake lever is not used & far when brake is engaged.
   - Test by turning on the Power Pack and holding the (-) button to activate the walk mode and check the brake sensor stops the motor turning.

7.4 Universal Torque Arm

1. Fit the Universal Torque Arm
   - Use the side opposite to the motor wire.
   - Use the C-Washer or screw washers if necessary, to help with the fit.
   - Tighten all screws and the wheel nut before riding.
7.5 Torque Narrow

1. **Fit the Torque Narrow onto the RIGHT-HAND SIDE of the bicycle**
   - Must be on RIGHT.
   - Fit Torque arm over a tightly fastened axle nut.
   - Tighten Jubilee clip on axle.
   - Break off excess clip by bending back and forth.

2. Use 2nd nut to secure torque arm to the axle.

7.6 Twist Throttle

1. **Fit the Twist Throttle to the handlebars.**
   - Should be on the right-hand side.
   - Cut hand-grips shorter to accommodate the size of the throttle.

2. Ensure that the brake and gear shifters operate normally before riding.

7.7 Thumb Throttle

1. **Fit the Thumb Throttle to the handlebars.**
   - Should be on the right-hand side.
   - Cut hand-grips shorter to accommodate the size of the throttle.

2. Ensure that the brake and gear shifters operate normally before riding.
8.1 Power Pack Removal

Attachment
To attach the Power Pack to the handlebars, align the back of the Power Pack with the Quick Connect Handlebar Mount and slide downwards, pressing firmly until you hear a *click*.

Detachment
To disconnect, press the button on the Handlebar Mount and pull the Power Pack up with the handle. If it is difficult to disconnect, instead of pulling directly up wiggle the Power Pack side to side. With the ECO and PRO Power Pack you can do this with one hand.
8.2 Power Pack Charging

1 To set up the Power Pack, you must first turn on the battery. The battery is shipped turned off for safety.

2 Do this by pressing firmly on the (−) symbol at the back of the Power Pack.

   Alternatively, use the back of the blade cleaning tool to flick the switch.

3 To charge the Power Pack, use the charge port in the rear of the pack.
8.3 Power Pack settings

This is how to access and adjust the settings in the Power Pack. For a video, visit: www.swytchbike.com/instructions

1. PRESS and HOLD up and down together to access settings

Once activated, the Battery Indicator will start flashing

2. Once in settings mode, use the up and down arrows to change the values

PRESS the middle button to confirm the value and move onto the next setting

3. The flashing battery light indicates what setting is being adjusted

Factory reset
PAS direction
Power limit
Top speed
Wheel size

The power level light indicates what value that setting is being set to

4. HOLD the middle button to exit settings mode and confirm the new values

SHORT PRESS the middle button when 'yes' is highlighted to perform the reset
9.1 Error Codes

The display can sometimes show an error code. These are the most common that you may encounter with the corresponding solutions. For other error codes, check the LCD Display manual.

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Lights</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>Flash at PAS Level 1</td>
<td>Motor Current Abnormality</td>
<td>Contact Customer Service</td>
</tr>
<tr>
<td>23</td>
<td>Flash at PAS Level 3 &amp; 5</td>
<td>Motor Phase Abnormality</td>
<td>Contact Customer Service</td>
</tr>
<tr>
<td>24</td>
<td>Flash at PAS Level 5</td>
<td>Motor Hall Signal Abnormality</td>
<td>Fit the Hall Sensor Bypass Cable / disconnect the hall sensor cable</td>
</tr>
<tr>
<td>25</td>
<td>Flash at PAS Level 3 &amp; 5</td>
<td>Brake Abnormality (Commonly happens when the brakes are engaged before the Power Pack is turned on)</td>
<td>Turn off the brake sensors before turning on the Power Pack. Brake sensor light will indicate when it is on. Alternatively, turn on the Power Pack before connecting to bike.</td>
</tr>
<tr>
<td>30</td>
<td>Flash at all levels of both PAS and Battery</td>
<td>Communication Abnormality (Controller and Display aren't connected)</td>
<td>Check the display is connected to the controller inside the Power Pack</td>
</tr>
</tbody>
</table>

Brake sensor light will indicate when it is on. (Error 25)
9.2 Motor Wheel isn’t spinning freely

1. First check that the brakes are properly adjusted and are not touching the rim.

2. Next check if the motor casing is touching the forks. If it is, you need to increase the gap between the forks to fix this. The best way is to add a washer to the axle as shown below.

3. Alternatively, move the torque washer to the inside of the forks and use in place of a new washer.

9.3 Pedal Sensor Magnet doesn’t fit my bike

If there isn’t enough space, remove the plastic hinge part and mount the pedal sensor directly to the frame using the cable ties provided.

The Pedal Sensor works with most bicycle types. The easiest installation is to fit the magnet disk to the axle. This requires a 5mm gap between the frame and the pedal crank for the magnet disk to fit.
However, some bikes have a gap too small for the magnet disk to fit, like the one below!

If this is the case, you will need to use the Universal Pedal Sensor.

**9.4 Motor Starts and Stops when using Pedal Assist**

If the pedal assist power is intermittent, check if the PAS magnet disk is wonky. Straighten it and adjust the sensor so that it is closer to the magnet disk.

**9.5 Handlebar Mount moves up**

If the handlebar mount moves up when removing the Power Pack:

- Check the screws are tightened.
- Fit the rubber handlebar spacers directly underneath the handlebar mount arms, check that they have not moved to the side. This can happen with the curved Brompton handlebars.

**9.6 Handlebar Mount pointing down**

If the handlebar mount appears loose or sags:

- Adjust the twist strap to a higher closer hole.
- Make sure to tilt the mount upwards 45° before tightening.

**9.7 Power Pack is difficult to remove from bike**

At the beginning of use there is a break-in period where the Power Pack will feel stiff to remove from the Quick Connect Handlebar Mount.

To make it easier to remove here are some tips:

- Instead of pulling directly up on the handle, rock the Power Pack side to side. This will make the removal a lot easier.
- Pull the Power Pack in one quick motion, instead of pulling slowly.
- Support and pull the Power Pack from the bottom instead of using the handle.
9.8 Operation Troubleshooting

Please follow this step by step process from start to finish if you find for any reason the kit is not working as expected:

1. Does the Power Pack turn on?
   - If no – is the battery button on?
   - Make sure you hold the on button
   - Is the Power Pack Charged?
   - Are the connectors inside the Power Pack all connected?

2. Plug the Power Pack into the Handlebar Mount with only the motor cable connected. Activate the walk assist more by pressing and holding the (-) button. Does the motor turn?

3. Plug in the Pedal Sensor and Motor. Turn the pedals, the light on the pedal sensor should be flashing as the magnets pass the sensor.
   - Is the magnet disk straight and close to the sensor?

4. If the brake sensors are installed, make sure the light isn’t on when you are trying to run the bike.

5. If using a throttle, plug it in.

6. If it works under test conditions but not when you are riding, sit on the bike and test all again – for loading

Front light isn’t turning on? Check the connector to the front light and controller

This is a link to the troubleshooting video that summarises the steps: https://youtu.be/yTborNfH1wo

9.9 Motor Starts and Stops when using Pedal Assist

To ensure the kit fulfils its complete working lifetime you can keep it in good shape by:

- Attach the rain cover to the bracket when leaving outside
- Wipe and dry the motor casing when wet to prevent rust
- Never leave the battery on charge for longer than required
- Clean the handlebar mount blades and Power Pack connectors regularly to ensure a good connection
- If storing the battery, recharge it for 3 hours every 3 months to ensure good battery health
- Ensure the Power Pack magnetic cover is closed before riding in rain.

If you have any further questions, queries or problems that are not covered in this guide, please do contact us at: support@swytchbike.com and a member of our Customer Service Team will be happy to help!
## Maintenance

<table>
<thead>
<tr>
<th>Interval (whichever is first)</th>
<th>Swytch Kit</th>
<th>Bike</th>
</tr>
</thead>
</table>
| Every Ride                   | - Check battery charge level  
- Re-charge after every ride  
- If installed, test the brake sensors operate normally | - Tyre pressure  
- Check tyres for debris/thorns  
- Check Brakes |
| Monthly 20 hours 500 miles   | - Clean handlebar Blades and Power Pack Clip connectors  
- Top up battery charge if storing over winter  
- Check motor wheel nuts are tight  
- Check pedal sensor is aligned | - Adjust brakes  
- Lubricate Chain  
- Check Tyre Wear |
| 6 months 100 hours 3000 miles| - Check motor wheel spoke tension  
- Check motor and sensor connectors  
- Check throttle and PAS function normally | - Deep clean drive parts  
- Check your rims are true without wobble |
| 12 months 200 hours 6000 miles| - Check Motor wheel turns smoothly and quietly  
- Check Power Pack Bag for any damage  
- Check Handlebar Mount for any damage | - Replace drive parts  
- Regrease bearings  
- Replace cables |