

- 22) Don't ride alone in remote areas. Even when riding with others, make sure that someone knows where you're going and when you expect to be back.
- 23) Learn to obey the local laws regulating where and how you can ride.
- 24) Yield right of way to pedestrians and animals. Ride in a way that does not frighten or endanger them, and stay far enough away so that their unexpected moves don't endanger you. Play dead if approached by a large animal.

**WARNING:** This Manual contains important safety information. For your child's safety, it is your responsibility to review this information with your child and make sure that your child understands all warnings, cautions, instructions and safety topics. We recommend that you periodically review and reinforce the information in this Manual with younger riders.

**WARNING:** Failure to follow any of these rules may result in serious injury or death.

Focus Designs Inc.

SBU

The Electric Self-Balancing Unicycle

OWNER'S MANUAL

4<sup>th</sup> Edition, 2013

Copyright © 2012 by Focus Designs Inc.  
focusdesigns.com

**IMPORTANT:**

This manual contains important safety, performance and service information. Read it before you take the first ride on your new SBU and keep it for reference.

**A SPECIAL NOTE FOR PARENTS:**

As a parent or guardian, you are responsible for the activities and safety of your minor child, and that includes making sure that the SBU is properly fitted to the child; that it is in good repair and safe operating condition; that you and your child have learned and understand the safe operation of the SBU; and that you and your child have learned, understand and obey not only the applicable local motor vehicle, unicycle and traffic laws, but also the common sense rules of safe and responsible unicycling. As a parent, you should read this manual, as well as review its warnings and the SBU's functions and operating procedures with your child, before letting your child ride the SBU.

### For Your Records:

Congratulations on the purchase of your new Focus Designs SBU! This manual is designed to give you the information you need for the safe operation and maintenance of your new SBU. Please read it thoroughly before riding your SBU.

Please take this opportunity to record important information about your new SBU.

## IMPORTANT NOTICE!!!

Please visit  
[focusdesigns.com/user](https://focusdesigns.com/user)

### REGISTER YOUR SBU

We cannot guarantee a warranty claim unless you do this!

Your SN is located on the rim of the wheel

Your Name \_\_\_\_\_

Date of Purchase \_\_\_\_\_

Location of Purchase \_\_\_\_\_

Your Location \_\_\_\_\_

Serial Number \_\_\_\_\_

- 11) Ride in designated lanes or designated paths or as close to the edge of the road as possible, in the direction of traffic flow or as directed by local governing laws.
- 12) Stop at stop signs and traffic lights; slow down and look both ways at street intersections. Remember that an SBU always loses in a collision with a motor vehicle; so be prepared to yield even if you have the right of way.
- 13) Use approved hand signals for turning and stopping.
- 14) Never carry a passenger.
- 15) Never carry anything which obstructs your vision or your complete control of the SBU, or which could cause you to become entangled in the moving parts of the SBU.
- 16) Never hitch a ride holding on to another moving vehicle or object.
- 17) Don't weave through traffic or make any moves that may surprise people with whom you are sharing the road.
- 18) Observe and yield the right of way.
- 19) Never ride your SBU while under the influence of alcohol or drugs.
- 20) Do not ride in bad weather, when visibility is obscured, at dawn, dusk or in the dark, or when extremely tired. Each of these conditions increases the risk of accident.
- 21) Do not ride the SBU off road, only ride on smooth stable paths, such as concrete and asphalt.

**CAUTION:** Do not ride the SBU on overly steep inclines or declines. The maximum grade for the SBU is 30%. This may cause the motor and/or battery to overheat. This will void your warranty.

**CAUTION:** Do not attempt to jump or do stunt riding with your SBU. This will void your warranty.

- 7) Observe all local laws and regulations. Observe regulations about licensing, riding on sidewalks, laws regulating path and trail use, and so on. Observe helmet laws and special traffic laws. It's your responsibility to know and obey the laws.
- 8) You are sharing the road or the path with others – motorists, pedestrians and other cyclists. Respect their rights.
- 9) Ride defensively. Always assume others do not see you.
- 10) Look ahead, and be ready to avoid or yield to:
  - a) Vehicles slowing or turning, entering the road or your lane ahead of you, or coming up behind you.
  - b) Parked cars or car doors opening.
  - c) Pedestrians stepping out.
  - d) Children or pets playing near the road.
  - e) Pot holes, sewer grating, railroad tracks, expansion joints, road or sidewalk construction, debris and other obstructions that could cause you to swerve into traffic, catch your wheel or otherwise cause you to lose control and have an accident.
  - f) There are many other hazards and distractions which can occur on an SBU ride.

## Table of Contents

<b>General Warning:</b>	<b>5</b>
<b>Fit</b>	<b>6</b>
Does your SBU fit you?	6
Seat Adjustments	6
<b>Safety First</b>	<b>7</b>
<b>Mechanical Safety Check</b>	<b>8</b>
Frame	9
Tire	9
Tube	10
To replace the tube:	10
<b>Operation</b>	<b>11</b>
Pushbutton Switch	11
Safety Lock	12
Automatic Fall Detection	12
LED Status Indicator	12
Normal Operation	12
Low Battery Mode	13
Various Factory Modes	13
Battery Pack	14
Battery Protection Mode – AKA Pushback	14
Folding Foot Wedges	15
Battery Charger	15
<b>First ride</b>	<b>15</b>
Make sure it fits	15
Make sure the SBU is in tip top shape	15
Be safe	15
About your first ride	16
<b>Changing / Modifying the SBU, or Adding Accessories</b>	<b>19</b>
<b>Appendix A – Safety</b>	<b>21</b>

<b>Appendix B – Specifications</b>	<b>25</b>
Rigid Construction	25
Truly Hands-Free	25
Elegant Electronics	25
Motion-Learning Technology	26
Turn Assist™	26
Push Back™	27
Smart Sense™	27
High-Performance Vehicle	27
Hill Climbing	27
Top Speed	27
Weight Limit	27
Range	27
Regenerative Braking	28
Charger	28
Battery	29
The Human Interface	29
Adjustable Seat Post	30
Dimensions and Travel Specs:	30
Riding Mode	30
Compact Mode	30
Storage Mode	30
<b>Appendix C – Warranty</b>	<b>32</b>

## Appendix A - Safety

Always wear a cycling helmet, which meets the latest certification standards and is appropriate for the type of riding you do. Always follow the helmet manufacturer's instructions for fit, use and care of your helmet. Most serious injuries involve head injuries, which might have been avoided if the rider had worn an appropriate helmet.

**WARNING:** Failure to wear a helmet when riding may result in serious injury or death.

- 1) Always perform the Mechanical Safety Check before you get on the SBU.
- 2) Be thoroughly familiar with the controls of your SBU: pushbutton switch, pegs, etc.
- 3) Be very careful to keep body parts and other objects away from the spinning wheel of your SBU.
- 4) Always wear:
  - a) Shoes that stay on your feet and will grip the pegs well. Never ride barefoot or while wearing sandals.
  - b) Bright visible clothing that is not so loose that it can be tangled in the SBU or snagged by objects at the side of the road, sidewalk or trail.
  - c) Protective eyewear, to protect against airborne dirt, dust and bugs – tinted when the sun is bright, clear when it's not.
- 5) Ride at a speed appropriate for conditions. Increased speed equals higher risk.
- 6) Do not ride at night or when visibility is obscured, fog, at dawn, dusk or in the dark.

If you enjoyed reading our manual up to this part, you are going to absolutely n3rd out with the following appendices.

... and if you didn't enjoy it... tough!  
We're engineers, not writers.



But just in case this is a bit boring, here is a trivia fact:

Roughly 2/3 of Americans admit to reading in the bathroom. Are you part of the 2/3 right now?

### General Warning:

Like any sport, unicycling involves risk of injury and damage. By choosing to ride the SBU, you assume the responsibility for that risk. You need to understand, and to practice the rules of safe and responsible riding and of proper use and maintenance. Proper use and maintenance of your SBU reduces risk of injury. This Manual contains many "Warnings" and "Cautions" concerning the consequences of failure to maintain or inspect your SBU and of failure to follow safe cycling practices.

The combination of the safety alert symbol and the word WARNING indicates a potentially hazardous situation, which, if not avoided, could result in serious injury or death.

The combination of the safety alert symbol and the word CAUTION indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury, or is an alert against unsafe practices.

The word CAUTION used without the safety alert symbol indicates a situation, which, if not avoided, could result in serious damage to the SBU or the voiding of your warranty. Many of the Warnings and Cautions say, "You may lose control and fall." Because any fall can result in serious injury or even death, we do not always repeat the warning of possible injury or death. Because it is impossible to anticipate every situation or condition, which can occur while riding, this Manual makes no representation about the safe use of the SBU under all conditions. There are risks

associated with the use of any unicycle which cannot be predicted or avoided, and which are the sole responsibility of the rider.

## Fit

### Does your SBU fit you?

Correct fit is an essential element of SBU safety, performance and comfort – it will result in the correct fit for your body. *The SBU is designed for riders with an inseam of at least 26"*, although it is possible for riders of any height to ride the SBU, it will require assistance from another person while learning how to ride the SBU for the first time. The SBU is easy to adjust to fit your body; there is simply one item that addresses fit, the seat height.

**WARNING:** If your SBU does not fit properly, you may lose control and fall. Adjust the SBU for proper fit, have someone assist you during the learning to ride process. We recommend two people on either side of you for balance support.

### Seat Adjustments

If you are a beginner, we recommend you set the seat height at a level that allows you to place both feet flat on the ground while straddling the SBU's seat. This is important when learning to balance left and right on the SBU. After you have mastered left right balance, we recommend you raise the seat for a higher level of riding comfort.

The seat is adjusted using the quick-release clamp located on the seat post. Make sure to observe the Minimum Insertion requirements of the seat post. The

## Changing / Modifying the SBU, or Adding Accessories

There are many components and accessories available to enhance the comfort, performance and appearance of your SBU. However, if you add accessories, you do so at your own risk. Focus Designs has most likely not tested that accessory for compatibility, reliability or safety for the SBU. Check with Focus Designs before adding any accessories to your SBU.

**WARNING:** Failure to confirm compatibility, properly install, operate and maintain any component or accessory can result in serious injury or death and will void your warranty.

**CAUTION:** Changing or modifying any factory components of your SBU will void your warranty.

Now you're ready to put both feet on the pedals. Hips, just remember it's all in the hips. To balance left and right, twist your lower body to steer the SBU in the direction you're falling. Shifting weight to steer will not work, you must twist your body to steer and balance. The balls of your feet should be on the pegs so you can also use your ankles to twist the SBU for minor balancing adjustments. Just like a bike, it's easier to balance with some speed. But don't forget to lean back to slow down or stop if you're going too fast!

**Again, twist your lower body to steer.**

Do not try to lean or shift your weight, use those hips, and the hips don't lie.

**Your goal is to balance with very small movements.**

Use baby steps. First time riders tend to over correct when trying to balance left and right.

**To turn, you twist your lower body (and the SBU).**

Squeeze the seat with your legs in the direction you'd like to go. It's all in the hips and don't worry if you don't get it right away, turning takes a while to learn and master.

**Practice, practice, practice.**

It takes about 20 to 30 minutes to get going forward and stopping with your feet on the pegs. It takes about another 2–5 hours to feel fully confident riding and turning. Don't lose heart, keep practicing, you will get it. If you're getting frustrated take at least a 15-minute break and try again – remember that each attempt on the SBU is building muscle memory. Remember, this is fun.

seat post should be inserted into the SBU frame AT LEAST TWO INCHES. Once your seat is at the desired height, tighten the clamp slightly, and align the seat with the wheel, making sure they are in line with each other, and then tighten so that the seat post does not have movement in any direction. Your SBU may come with a seat post that is too long. It may need to be trimmed down with a tube cutter. Consult your local hardware store to have them cut the tube to length if this is needed.

**WARNING:** Always make sure that your seat post does not extend from the frame beyond the Minimum Insertion requirements of two inches; the seat post may break, or separate from the frame, which could cause you to lose control and fall.

**WARNING:** After any seat adjustment, be sure that the seat clamp is properly tightened before riding. A loose seat clamp can cause damage to the seat post, or can cause you to lose control and fall. A correctly tightened seat clamp will allow no seat movement in any direction. Periodically check to make sure that the seat clamp is properly tightened.

## Safety First

**Always wear an approved helmet when riding your SBU.** Be sure to attach the chinstrap, and follow the helmet manufacturer's instructions for fit, use and care of your helmet.

**Also wear other required and recommended safety equipment** such as: elbow pads, kneepads, shin guards and wrist guards.

**See Appendix A** for more Safety Information.

**WARNING:** Many states require specific safety devices. It is your responsibility to familiarize yourself with the laws of the state where you ride and to comply with all applicable laws. This includes properly equipping yourself and your SBU as the law requires.

### Mechanical Safety Check

Routinely check the condition of your SBU before every ride. Some service and maintenance can and should be performed by the owner, and requires no special tools or knowledge beyond what is presented in this manual. The following are examples of the type of service you should perform yourself. A qualified mechanic using the correct tools and procedures specified by Focus Designs, Inc should perform all other service, maintenance and repair in a properly equipped facility.

**WARNING:** Before performing any work on the SBU make sure to disengage the power by turning the safety lock into the “locked” position. This will prevent the SBU from an accidental power on.

### Nuts, bolts, wires, battery, top plate, etc.

Make sure nothing is loose or damaged. Check all bolts and nuts to make sure they are tight. Check wiring for damage. With the SBU turned OFF, lift it off the ground by two or three inches, while holding bounce the tire on the ground. Anything sound, feel or

Most people think that you lean left or lean right to balance but in fact you must twist into the fall. For example... if you feel you are falling to the left, twist your hips and legs (as you squeeze onto the seat) so that you turn the SBU into the left direction. You will need your hands on the outside to generate rotational momentum. Try to use a very smooth motion and not a jerky motion. You will find that smaller adjustments are more effective, and take less exertion.

### Arms up and out, look up and out.

Just think Leonardo DeCaprio in Titanic: “I’m the king of the world!” Arms up and out, looking straight ahead, not down at the ground or SBU. And say it loud: “I’m the king of the world!” And remember: don’t grab the seat.

### First thing to learn is the speed control.

While sitting on the SBU, put one foot on the peg and the other in front of you hovering above the ground. Lean forward to move forward and then lean back slow down and stop. Perform this exercise until you are comfortable with the SBU’s speed control.

### Again: Lean back to slow down and stop.

Lean forward to move forward, lean back to slow down and stop.

### Recap

Arms up, look up, no seat grabbing, lean forward to move forward, lean backward to slow down and stop. Make sure you’ve mastered these things before moving on to the next step.



### About your first ride

Pick a controlled environment, away from cars, people (other than your assistant), obstacles or other hazards. Ride to become familiar with the controls, features and performance of your new SBU.

Do not lift the SBU off the ground while powered ON. The SBU will attempt to balance and spin the wheel at a rapid rate in the air. If the SBU is (accidentally) lifted up while powered, turn it OFF, place it firmly on the ground and turn it back ON.

Power ON the SBU in the upright (ready to ride) position.

#### **Get familiar with how the SBU balances.**

Hold the SBU by placing your hand on the seat, push the SBU forward and backward. Notice how the SBU remains balanced under your hand.

Straddle the seat. Try walking while straddling the SBU. Notice that the SBU stays underneath you remaining balanced.

Walk forward, the SBU moves forward, walk backward, the SBU moves backward.

**TIP:** Do not hold onto the seat while on the SBU! This is the number one mistake made by new riders. If you push, pull or hold onto the seat the SBU thinks you are either leaning forward or backward. Use your arms for balance, not seat holding.

**TIP:** Twisting does the balancing left and right.

look loose? Do a quick visual and tactile inspection of the whole SBU. Any loose parts or accessories? If so, secure them. If you're not sure, ask someone with experience to check.

### Frame

Check the frame particularly in the area around welded joints; the seat post and clamp for any deep scratches, cracks or discoloration. These are signs of stress-caused fatigue and indicate that a part is at the end of its useful life and needs to be replaced.

### Tire

Make sure the tire is sufficiently inflated but below the maximum recommended pressure that is printed on the sidewall of the tire. The best way to inflate a tire to the correct pressure is with a bicycle pump, which has a built-in pressure gauge. Check the tire and look for any cuts in the tread and sidewall. Check to make sure the tire bead is seated evenly on the rim. Replace a damaged tire before riding.

**WARNING:** Riding the SBU with a flat or under-inflated tire, will void your warranty.

**WARNING:** Never inflate a tire beyond the maximum pressure marked on the tire's sidewall. Exceeding the recommended maximum pressure may blow the tire off the rim, which could cause damage to the SBU and injury to the rider and bystanders – it will also void your warranty.

**CAUTION:** Pencil type automotive tire gauges can be inaccurate and should not be relied upon for consistent accurate pressure readings. Instead use a quality dial gauge.

### Tube

If the tube is damaged or punctured we recommend replacing the tube, patches should only be used for an emergency repair and the patched tube should be replaced as soon as possible.

#### *To replace the tube:*

- i. Make sure the SBU is in the “off” position.
- ii. Remove the 8 bolts holding the wheel to the frame.
- iii. Carefully move wheel away from the frame by letting out the slack in the wire being fed through the frame.
- iv. Remove the tire using a bicycle tire remover, and remove the damaged tube.
- v. Place a new tube in the tire; place tire onto the wheel making sure the tire bead is seated evenly on the rim.
- vi. Inflate the tire to recommended pressure that is printed on the sidewall of the tire.
- vii. Place wheel back onto frame fork, paying attention to the proper orientation of the wheel.
- viii. Securely fasten the 8 bolts back to the frame. Spin the wheel to make sure it is secure and spins freely.
- ix. Check to make sure everything is secure, and you are ready to ride again.

### Folding Foot Wedges

Your SBU is equipped with folding foot wedges. These foot wedges can be folded in order to make the SBU more compact.

### Battery Charger

Only use the charger supplied by Focus Designs. The high power battery pack must only be charged by the supplied charger. Do not attempt to charge by any other means. The Battery Charger has a connector that plugs into the Charging Port of the SBU. Connect AC power to the charger first, and then simply plug the connector into the Charging Port. The charger automatically stops charging when the battery pack is full. Charge time depends on discharge state of the battery pack and may take up to one hour. The battery self balances for about an hour after it is fully charged while still connected to the charger. After about an hour after indicating fully charged, disconnect the charger from the battery; do not leave the charger connected for extended periods of time (longer than 1 week).

### First ride

#### Make sure it fits

Read the “Fit” section before you ride.

#### Make sure the SBU is in tip top shape

Perform the Mechanical Safety Check before you ride.

#### Be safe

Read all safety instructions first.

**WARNING:** Do not overpower the balancing capabilities of the SBU by aggressively leaning forward or backward. Loss of control, serious injury or death may occur from ignoring safety warnings.

### Battery Pack

The SBU utilizes the latest technology in high power battery packs. This pack is capable of very high power, long life, and is inherently safer than standard battery technology. Although the technology is much safer than standard battery technology, care must be taken to never overcharge, undercharge or damage the battery in any way. The Battery Pack is a split pack and is located beneath the top plate in each side of the SBU. The battery will run the SBU for at least an hour under normal operating conditions. The Battery Pack is fitted with black and red high current connectors. To remove or disconnect the battery, disconnect the internal wires and carefully remove each of the battery half-packs. Always unplug the Battery Pack from the SBU when storing the SBU for an extended period of time. The battery pack should be charged at least every three months.

**WARNING:** Never overcharge, undercharge or physically damage the Battery Pack. If the Battery Pack appears to be damaged or is not holding a charge, DO NOT USE IT!

### Battery Protection Mode – AKA Pushback

If (at any time) the rider demands too much current by any number of factors (i.e. trying to go too fast, a very steep or sudden incline, operating with a very low battery) the SBU will moderately “push back” the rider. Once this mode is experienced the rider should heed this caution and ride less aggressively.

**CAUTION:** Riding the SBU while damaged will void your warranty; inspect your SBU before each ride to make sure it is in good running condition. Doing so will prolong the life of your SBU and possibly your own life. Live long and prosper, my friend!

**WARNING:** The SBU is technologically advanced and complex. The only serviceable parts on the SBU are the tire, tube, and seat. All electronic and drive components need to be serviced by Focus Designs Inc. or an authorized service group.

**WARNING:** Many service and repair tasks require special knowledge and tools. Do not begin any adjustments or service on your SBU until you have learned how to properly complete them. Improper adjustment or service may result in damage to the SBU or an accident, which can cause serious injury or death.

## Operation

It's important to your safety, performance and enjoyment to understand how things work on your SBU. We urge you to read and understand the operation of your SBU. If you have even the slightest doubt as to whether you understand something in this section of the Manual, contact Focus Designs.

### Pushbutton Switch

The SBU is powered ON and OFF by the pushbutton key switch on top of the enclosure. Always make sure the SBU is firmly on the ground in the upright, ready to ride position, before turning the SBU on. Once the

switch is pressed in to the on position the SBU will self-balance in about 1 second and the status LEDs will light. Never leave the SBU switch in the on position when charging or storing.

### Safety Lock

The SBU safety lock needs to be in the “open” or “on” position in order for the pushbutton switch to work. When the safety lock is in the locked mode the SBU will not activate.

**WARNING:** The SBU’s motor starts automatically at power up, keep all hands and feet away from moving parts.

### Automatic Fall Detection

If the SBU detects a fall it will cut power to the motor automatically. If this happens the SBU will remain in fall detection mode disabling the SBU. To power the SBU up again, Turn the SBU off and then on again by using the pushbutton switch. This process resets the SBU and makes it ride able again.

### LED Status Indicator

The LED on the pushbutton switch is the only status indicator for the SBU. The LED will indicate certain modes that the SBU is in.

### Normal Operation

*In normal operating conditions the SBU will display a solid LED.*



### Low Battery Mode

As the battery gets closer to the end of its capacity during your ride the LED will begin to flash. As you see a slow pulse (pictured below) your battery is nearing the end of its charge.



### Various Factory Modes

There are many different blink codes that may indicate an irregular activity with your SBU. The various factory modes are differentiated by the number of blinks in a row.

1 blink	BMS indicating low battery
2 blinks	Voltage too low
3 blinks	Voltage too high
4 blinks	Fall detected
5 blinks	Pick up detected
6 blinks	Over-current detected
7 blinks	Over-temperature
8 blinks	Bad gyro
9 blinks	Bad accelerometer
10 blinks	Bad current sensor
11 blinks	Bad hall sensors
12 blinks	Bad motor