



BuWizz

Moves your bricks. **Fast.**

USER GUIDE

BuWizz brick 2.0

iOS & Android app

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1. Introduction

Dear BuWizz user, thank you for purchasing BuWizz 2.0 with Ludicrous speed mode

As you can quickly figure out, BuWizz can control four LEGO® PF motors (or lights) with smooth precision and raw power at the same time, using a smartphone or tablet over Bluetooth LE connection. The PF servo motor can achieve all 15 positions (7 positions clockwise, 7 positions counter clockwise plus center position), at least two motors (regardless if M, L or XL) can be powered from each output. Power source - an embedded battery - can be fully charged when depleted from any USB output (even a laptop or PowerBank-type battery) in about 2.5 hours

Have at least as much fun playing with BuWizz as we have developing it.
Thank you for your support.

Sincerely,
The BuWizz Team
support@buwizz.com



2. Compatibility

BuWizz is compatible with all current LEGO® PF peripherals: PF-L, PF-M, PF-XL, PF servo motor, PF-LED lights and the older, high performance RC (or buggy) motors.

BuWizz software iOS version is compatible with following Apple products, running iOS 9.3 or higher:

- iPhone 4S and newer (including Plus models and iPhone X)
- iPad 3 and newer (including iPad, iPad Pro and all iPad Air versions)
- iPad Mini – all versions
- iPod touch 5th generation and newer

BuWizz software Android version is compatible with devices with BLE (Bluetooth 4.0 or higher), running Android 4.4 or higher.

3. Do this first

After receiving BuWizz brick(s), please first charge them. Connect a micro USB cable to BuWizz (USB charger, computer, PowerBank battery,...). The LED will glow orange when charging, will turn green when fully charged (when USB is connected and BuWizz is powered on). When BuWizz is not connected to USB power, the LED will glow green regardless of battery state.

After pressing the power button, if BuWizz battery is depleted beyond a charge level, suitable for normal operation, the LED will alternate quickly between red and green for a few seconds, then BuWizz will turn off

If BuWizz cannot be turned on by pressing the power button, then battery is completely depleted or battery protection kicked in.

In all cases above, please connect the charger – only briefly to reset the protection circuit or for 2-3 hours to completely charge the depleted battery.

BuWizz can operate with charger connected. In fact, connecting a PowerBank type battery can greatly extend the playtime and you can leave the battery connected to BuWizz while operating your model.

NOTE: BuWizz turns off automatically after ~10 minutes if not in use (i.e. no commands are received over Bluetooth connection). If BuWizz is connected to charger, it will still charge even if the LED is off.



4. BuWizz app installation

iOS (iPhone, iPad, iPod Touch):

1. Go to App Store
2. Do a search for BuWizz (on iPad: select “iPhone Only” in the drop down menu on the left side)
3. Install the app

Android (version 4.4 and up):

1. Go to Play Store
2. Do a search for BuWizz
3. Install the app

5. Connecting BuWizz

1. Connect the PF components (LED lights or motors) to output ports
2. Press power button – LED will blink when BuWizz is not connected to app and glow solid when connected
3. Start BuWizz app on iOS or android device

These steps assume BuWizz is already fully charged. If not, please connect charger as described in section 3.

NOTE: BuWizz can not be turned OFF when connected to app (LED glows solid). Please disconnect BuWizz inside app, then you can turn BuWizz op by pushing the button

BuWizz turns off automatically if no commands are received over Bluetooth within 10 minutes



6. BuWizz 2.0 LED status

Turned on & not connected to app

GREEN blinking: battery level 2/3 to Full

ORANGE blinking: battery level 1/3 to 2/3

RED blinking: battery low, please recharge

RED/GREEN blinking fast: battery critically low. BuWizz will not work, please recharge

Turned on & connected to app

GREEN blinking: connected to app, battery level 2/3 to Full

ORANGE blinking: connected to app, battery level 1/3 to 2/3

RED blinking: connected to app, battery low, please recharge

RED/GREEN blinking fast: connected to app, battery critically low. BuWizz will not work, please recharge

Charging & turned on

ORANGE: charging (connected or not connected to app)

GREEN: fully charged (connected or not connected to app)

Firmware update

FAST BLINKING RED: last firmware update

NOTE: BuWizz turns off automatically during charging. No LED is lit, but charging still continues



7. Running BuWizz software

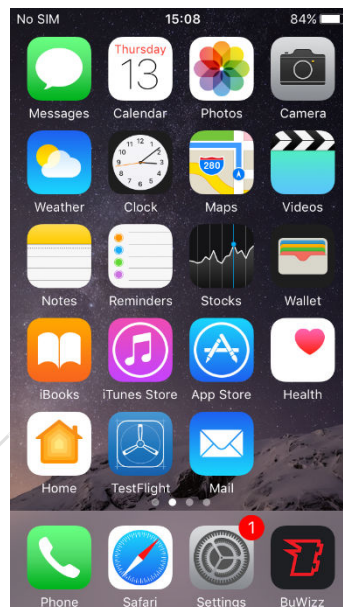
IMPORTANT for Android:

Please grant BuWizz app “Location Permission”, or the app will not work

Since Android 6.0 Google requires Location permission to be granted for apps that need Bluetooth LE scanning (there is a workaround for not using this permission: apps need to be declared as compatible with Android 5.0 and not 6.0 or newer, but this is not a proper approach, so we did not choose it).

Location must be “ON” when scanning for BuWizz devices (paragraphs 4. and 5. below). Again, this is a requirement of Android; BuWizz app does not use location information in any way.

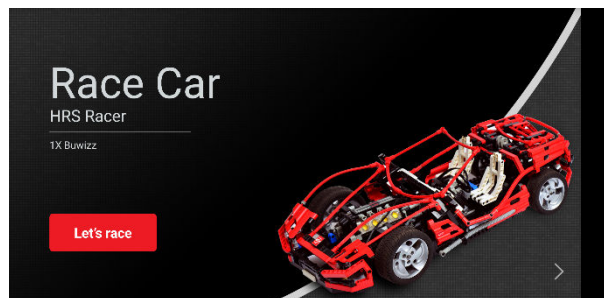
1. Press BuWizz icon to start the BuWizz app:



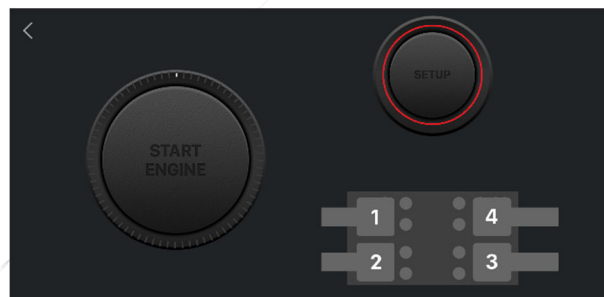
2. Select one of the profiles:

- Race Car: Joystick + (Light) ON/OFF Button, 1x BuWizz
- Two Sliders: Vertical & Horizontal Sliders + (Light) ON/OFF Button, 1x BuWizz
- Tracked loader: Joystick + 2x Vertical Sliders, 1x Buwizz
- Crane: Joystick + 2x Vertical Sliders, 2x BuWizz
- Four sliders: 3x Vertical + 1x Horizontal Sliders, 1x BuWizz
- Trains: 4x Train slider, 4x (Light) ON/OFF Button, 4x BuWizz

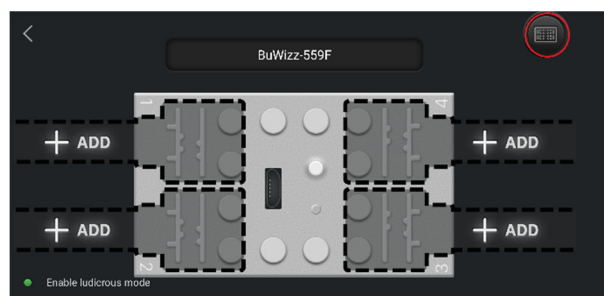
press the Red button



3. Press "Setup" button

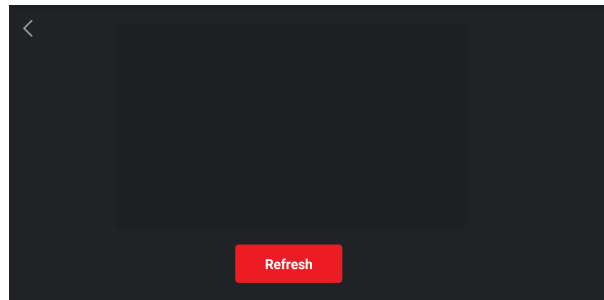


4. Press "Select BuWizz" button (circled red).

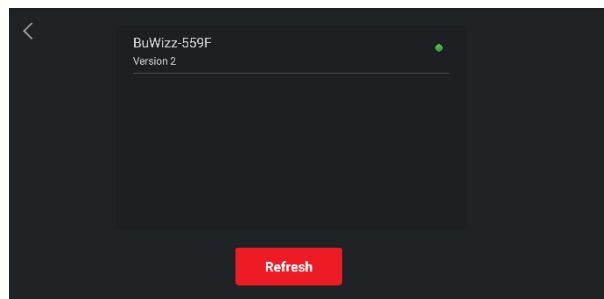


5. Press “Refresh” button to initiate Bluetooth scan

- Wait a few seconds for

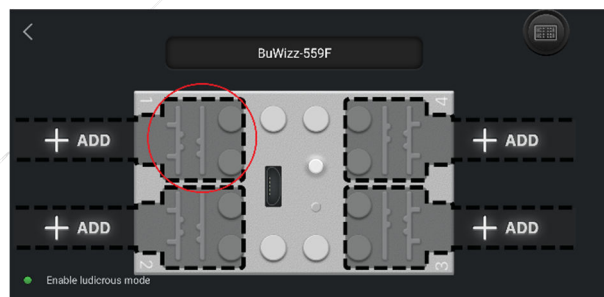


6. Select the BuWizz you want to associate with profile (green dot will indicate selected BuWizz)

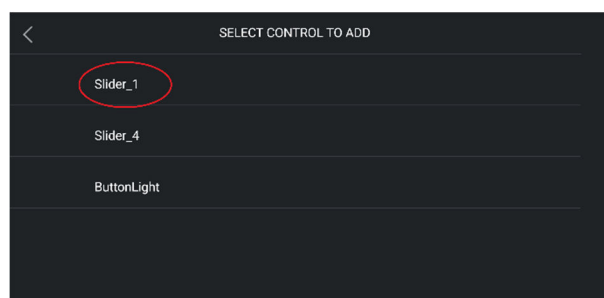


7. Go back to setup screen, where you can associate controls with output channels

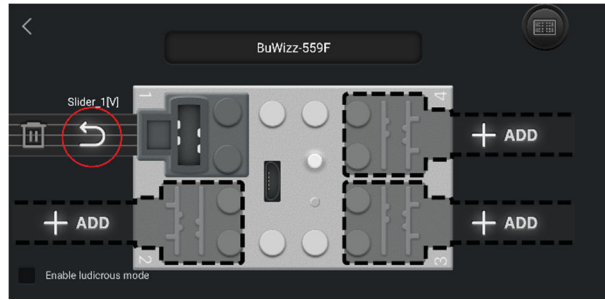
- Press one of the 4 outputs to open control selection menu



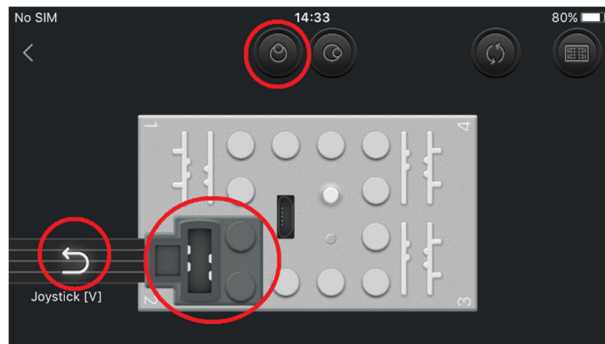
- Select the desired control for the output channel from the menu



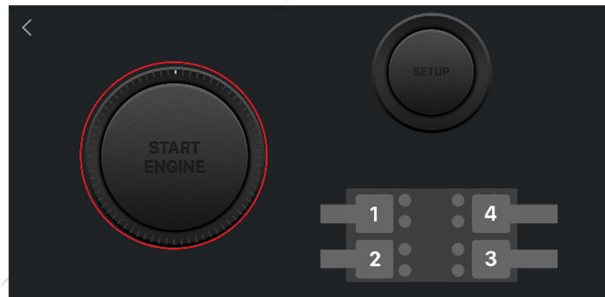
- If needed, invert the motor direction (press the U-shaped symbol)



8. EXAMPLE: Set the V-joystick control on output channel 2, set inverse mode



9. Go back, press "Start Engine", have fun!



10. Press "Stop I/O" button to stop playing or go to setup



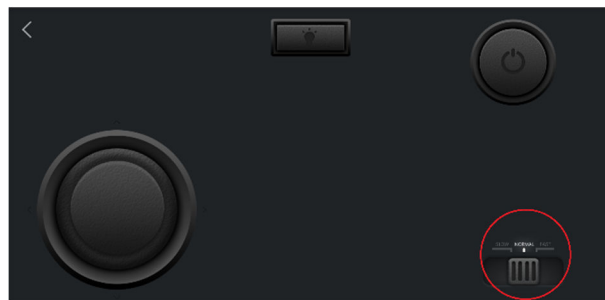
11. "SLOW-NORMAL-FAST" mode switch

Selects 3 speed modes:

SLOW mode for slow, precise movements of all motors, including servo

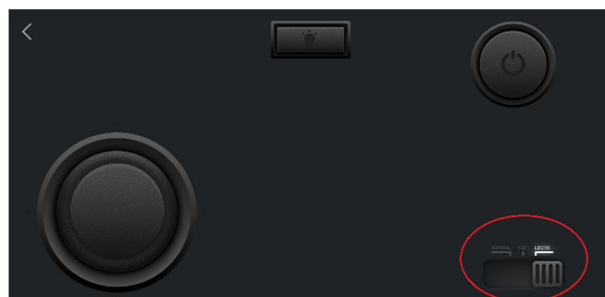
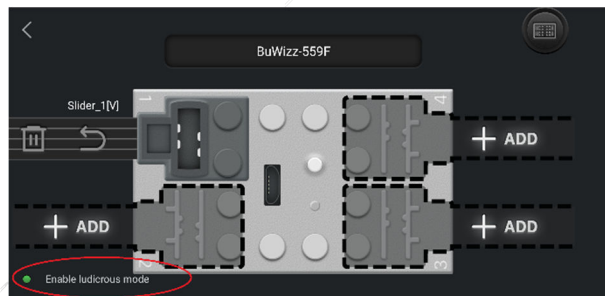
NORMAL mode for performance comparable to LEGO battery solutions

FAST mode for greater power & speed



12. Enable "LUDICROUS" speed mode

- go to Setup screen and press "Enable ludicrous mode" button
- speed selector then changes to **NORMAL, FAST, LUDICROUS**



8. Troubleshooting guide

Issue	Probable cause	Action
RED LED flashing, BuWizz does not turn off	Firmware update failed	BuWizz is in firmware update mode
BuWizz stops working during "stress test" (fast speed changes of a large model with several motors in HIGH speed mode)	Battery protection circuit activated	This is a normal condition, not a fault. Connect micro USB charger briefly; this will reset protection circuit, BuWizz will turn on and operate normally
LED flashes green / red, BuWizz turns off after a few seconds	Battery depleted	Battery too depleted for normal operation; charge for 2-3 hours
BuWizz does not turn on after pressing power button	Battery depleted	Please connect micro USB charger it might take several minutes for BuWizz to turn on if battery was completely depleted; charge for 2-3 hours
BuWizz does not turn on even with charger connected	Charger or cable defective	Please check if charger is working OK (by charging another device) Use a different micro USB cable and charger (lesser quality cables can have a poor connection) Please wait 30 minutes
BuWizz does not turn on after pressing the Power button		Please contact BuWizz support (support@buwizz.com) if performing all of the above steps does not help

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