

# GliderThrow

## Quad

Digital Angle Throw and Differential Meter



# Manual

V1-2018

## Introduction

Dear Customer, thank you very much for purchasing GliderThrow Quad, a tiny wonder that will make your model airplanes setup much easier and repeatable for long and enjoyable flying seasons.

GliderThrow has been initially conceived for setting the aileron and flap throws of a model glider but you will find that it can be used on most every model airplane and for a variety of applications.

## Concept

GliderThrow is a system that comprises two sensors, one for each wing or surface of your airplane.

Each sensor is equipped with a gravity sensor that computes the direction of the gravity with respect of itself. When the sensor is lying horizontally flat it will sense the gravity comes perpendicularly vertical to it. When the sensor is lying in an inclined surface it will notice and measure its gravity inclination.

**GliderThrow Quad** is an extension of GliderThrow that allows adding two more sensors up to 4 to be able to perform the measurement of up to four control surfaces and up to two differentials.

Most of the control surfaces are not horizontal at its rest position, for dihedral or other geometrical model airplane features, the sensor will compensate for the inclination due to dihedral and it will only display the magnitude which is in the direction of its sensing plane.

The axis perpendicular to the sensor's sensing plane is marked in the units and corresponds to the bottom edge of the sensor box where the charging port is located. You have to install the sensor with this edge **PARALLEL** to the hinge you want to measure throw.

Since the gravity has a very well-known direction of application you will not be able to measure your rudder's throw directly: all gravity push will be "compensated" and you will receive unpredictable readings. To measure your rudder's throws, just position your fuselage such the rudder and the sensor are essentially horizontal

## Characteristics

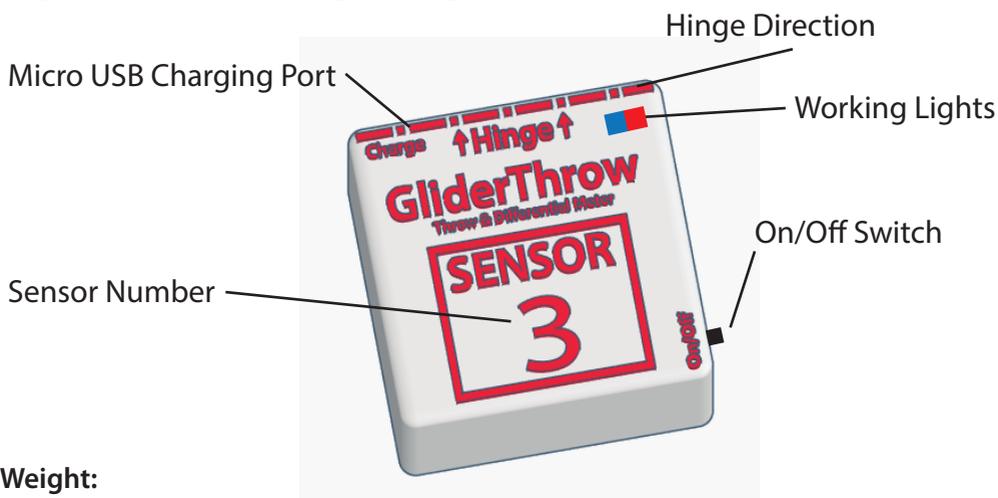
GliderThrow is a precision equipment that has been carefully manufactured, assembled and calibrated before it reaches your hands.

All mechanical parts have been manufactured in PLA by 3d printing.

## Dimensions:

Single Device dimensions Height x Width x Depth: 17x37x37mm.

Single Dimensions With Magnetic Peg: 33x37x37mm.



## Weight:

Single unit Weight: 19g

Single unit Weight with Magnetic Peg: 23g

## Power:

150mAh Rechargeable Lithium Battery (About 2 hours of continuous operation)

Charging : Micro USB Cable (not included)

Charging Time: About 1 Hour

## Specifications:

Resolution: 0,1 degrees.

0,1 millimeters

Precision: Better than 0,3 degrees

## How to use

### How to use GliderThrow Quad

#### Power On the system

Make sure your GliderThrow Quad batteries have charge enough, GliderThrow Quad is a totally wireless equipment, it uses a LiPo battery for power that has to be recharged from time to time to operate.

Switch Sensor 1 ON, a red led and a blue led will glow.

Switch Sensor 2 ON, a red led and a blue led will glow as well on sensor 2.

Switch Sensor 3 ON, a red led and a blue led will glow.

Switch Sensor 4 ON, a red led and a blue led will glow as well on sensor 3.

Wait a few seconds for both units to handshake: both blue led will be blinking, red ones will remain steady on.

#### Connect the display to the system

In your Smartphone/PC, search for a WiFi AP called **"GliderThrow Quad"**. Connect to "GliderThrow Quad" AP WiFi using **123456789** as password.

You will see another AP called "GliderThrow". This is the AP for using sensors 1 & 2 alone or to configure the surface chord of sensors 1 & 2 when using the four sensors.

In many SmartPhones you will be advised that the network selected have no internet connection and ask about selecting another WiFi connection. You might select "No".

The time while using GliderThrow your device will have NO internet connection.

Open your web browser and open a new window or browse to any new URL you never typed before like [www.qkx.com](http://www.qkx.com)

You will get automatically redirected to GliderThrow Quad screen.

If not succesfull to see GliderThrow screen then try <http://192.168.4.1> and you will get automatically redirected to GliderThrow screen.

## How to use

## Browse GliderThrow

You will be now in this screen that displays the angle, in degrees, captured by both sensors; Always wait a few seconds to allow both signals to stabilize (Sensor 2 & 4 will always be a little lagging since are the satellite sensors, this behavior is normal).

**GliderThrow****Angle View**

Sensor 3= -0.0 deg

Sensor 4=0.0 deg

Differential= 0.0 deg

Go to Throws Page

Go to Quad Page

Reset Angles

In this Screen you can check the reading of both sensors and perform any adjustment in your plane for instance if your reference information is in degrees or if you want to do so.

Differential = (Sensor 4-Sensor 3) You will find soon utility for this diferential!

You can as well send both signals to zero by tapping or clicking "Reset Angles".

The remaning of the session will display angles or throws relative this reference moment/position. We recommend waiting a few seconds more for signal stabilization before "reset Angles".

This "Reset Angles" is very useful when the control surface s original position is not horizontal.

To clean this reference values you must reset Sensor 3 by switching it to OFF and then to ON, but you can always generate a new reference point by "Reset Angles" again.

## How to use

### Browse GliderThrow

Sensors and their displays are colored in red and green as the navigation sidelight of the airplanes, where port side (left when sitting as a passenger in the airplane) is red and the green is at starboard. Also twin engine aircraft number their engines, numbers 1 & 3 is the port one and numbers 2 & 4 is the starboard. This is just mnemonic, place them where you find more useful.

By tapping or clicking "Go to Throws Page" you will get into:

When tapping or clicking "Config Surface Cord" you will enter in:

## GliderThrow Throw View

Sensor 3=-0.0 mm

Sensor 4=-0.0 mm

Back to Angle Page

Config Surface Chord

## GliderThrow Throw Configuration

Sensor 3 Chord (mm)

Sensor 4 Chord (mm)

Back to throwview

Save and Return

Select the appropriate values for your model, these values in mm must be positive integers below 300.

Tap or click "Save and Return" to make these new values operative, tap or click "Back to throwview" or "previous page" in the browser if you are not sure to store them.

Once set, these values are stored in non-volatile memory and will be ready next time you power up the system.

### IMPORTANT:

When using together with sensors 1 & 2, to configure sensors 1 & 2 chords is needed to connect to GliderThrow SSID (instead of GliderThrow Quad SSID), select the appropriate values, click save & return and reconnect again with GliderThrow Quad SSID.

## Browse GliderThrow

When tapping or clicking “Quad Page” you will enter in Quad View:

### GliderThrow Quad View

|                       |                       |
|-----------------------|-----------------------|
| Sensor 1= 0.0 deg     | Sensor 3= 0.0 deg     |
| Sensor 2=0.0 deg      | Sensor 4= 0.0 deg     |
| Differential= 0.0 deg | Differential= 0.0 deg |
| Standard View         | Quad Throw View       |
|                       | Reset 4 Sensors       |

In this Screen you can check the reading of four sensors and perform any adjustment in your plane for instance if your reference information is in degrees or if you want to do so.

You can see 2 differential boxes, one referred to differential Sensor2 - Sensor1 and another that shows differential = Sensor 4 - Sensor 3.

By clicking in “Quad Throw View” you will enter in 4 Throw View. Here you can see the throws, in mm, calculated with Chords stored in the units.

### GliderThrow 4 Throw View

|                      |                      |
|----------------------|----------------------|
| Sensor 1=0.0 mm      | Sensor 3= 0.0 mm     |
| Sensor 2=0.0 mm      | Sensor 4= 0.0 mm     |
| Differential= 0.0 mm | Differential= 0.0 mm |
| Standard View        | Quad Angle View      |
|                      | Reset 4 Sensors      |

## How to use

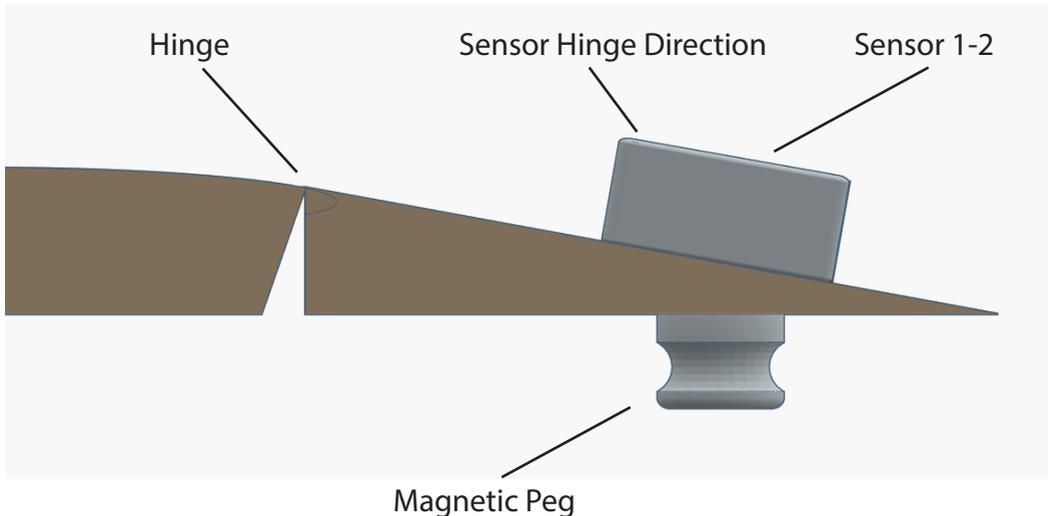
## Mechanical Installation

Once familiar with the operation of GliderThrow you will want to take advantage using it onto your model airplane.

Both sensors are provided with a magnetic peg and anti-sliding coating to hold them in position despite the relative important thickness of the control surface you want to use. Closer to the trailing edge the adhesion for the sensor will be better.

It is very important that no matter how far from the hinge the box of the sensor is **PARALLEL TO THE HINGE** line and not to the trailing edge or any other feature of the model.

Failure to install the sensors parallel to the hinge line might compromise if not invalidate the accuracy of your measurement, so install always your sensors parallel to the hinge or the axis of the feature you want to measure.



## How to use

### HINTS:

#### Measuring Throws in your ailerons:

Power system up, Configure Chords if needed, install sensors per the manual, bring the ailerons to the reference point, tap "Reset Angles" do measurement in both control surfaces.

#### Measuring a dihedral angle of a wing:

Place both sensors in a flat surface, Power system up, install sensors in the wing you want to measure, use "Differential" indication to measure dihedral. Note for this measurement the "hinge" is the direction of flight.

#### Measuring Model Airplane Incidence angle (the angle between main Wing chord and Stabilizer):

Place both sensors into the wing's reference plane, Power and reset angles, move and install Sensor 2 onto the Stabiliser, Use "Differential" indication to measure incidence angle.

There is a multitude of opportunities to take advantage of the differential and dual measurement.

For setting up your model airplane now you have a tool to make sure the configuration is absolutely symmetrical by making sure readings are the same in the same moment.

#### Precautions for accurate measuring

- 1.-Try to measure deflections as horizontal as practical.
- 2.-Avoid the model airplane changes its attitude during a measuring session. For example do not allow the model changes from resting in left wing and then leans towards right wing.
- 3.-Avoid vibrations. Like the ones the surfaces or wings experiment during high winds.

## How to use

### HINTS:

An excellent platform for having the model airplane resting horizontal and in a stable manner is to use GliderThrow in conjunction with GliderCG and perform Center of gravity centering while performing throws checks.

Monitoring GliderThrow activity, blue led blinking for each unit will mean data is transmitted thru wifi. Sensor 1 will also blink when sending data to the display unit, so make sure both unit s blue led blink to confirm you are getting good data, normally resetting the units will bring them to activity but also check there is a good charge level.

**WARNING:** GliderThrow is a wireless device but it is not a telemetry unit and is not intended to be used on board radio controlled flights. It uses radio frequency in the 2,4 GHz frequency. It will not present any harm if used in the flight field both for the user or other modelists but it MIGHT CAUSE INTERFERENCE to a receiver flying at a distance from transmitter with one or both sensors, powered, on board. In the same way, in the presence of several stations, the functionality can be lost because it is an ISM device.

**DO NOT Fly with GliderThrow working in your plane**

### Charging:

Both units of GliderThow have a LiPo Battery that has to be recharged from time to time. Use a standard microUSB cable (not included) for charging from a computer, your field charger if it has a USB port, or your mobile phone charger.

When connected to charger a new red LED will become visible, it will turn to blue when battery is changed.

GliderThrow has a protection circuit that will switch itself off when battery is almost totally discharged. However charge the unit as soon as is practical to preserve battery's life.

## How to use

### Safety and Security

**GliderThrow is not a Toy. For use only from 18 years and up.**

Avoid heat exposure and continuous direct sunlight.  
Avoid water contact.

### Safety information for lithium batteries

You must never open the lithium batteries, throw them onto a fire or expose them to shock, as toxic fumes might leak out and there is a risk of explosion.

Never handle leaking cells with bare hands.

In the event of contamination of the eyes or hands, it is necessary to rinse with plenty of water. A doctor should be consulted in the event of irritation of the skin or eyes.

Only dispose of completely discharged cells or packed cells protected against polarity reversal in accordance with the local disposal regulations.

Do not expose the cells to direct sunlight or hot temperatures, as otherwise there is a risk of overheating.

Maintain a storage temperature of  $<30^{\circ}\text{C}$ .

### Disposal Used batteries:

Batteries must not be disposed of in the domestic waste. Every consumer is legally obligated to dispose of batteries properly at the designated collection points in stores where batteries are sold.



### Appliance:

At the end of its service life, never dispose of the appliance in the domestic waste. Check with your local authority or your local waste disposal services for options regarding environmentally-friendly disposal.



**Konformitätserklärung  
Declaration of Conformity  
Déclaration de conformité  
Dichiarazione di conformità  
Declaración de conformidad**

Hersteller / Verantwortliche Person  
Manufacturer / responsible person  
Fabricant / Personne responsable  
Fabbricante / Persona responsabile  
Fabricante / Persona responsable

GliderThrow / Marco A. Moreno

erklärt, dass das Produkt  
declares that the product  
déclare que le produit  
dichiara, che il prodotto  
declara que el product

GliderThrow

folgenden Normen entspricht:  
complies following standards:  
correspond aux suivantes norms:  
corrisponde alle seguenti norme:  
cumple las siguientes normas

2014/53/UE  
2006/66/CE  
2014/30/UE  
2001/95/CE

EN 60950-1:2007  
EN50385 : (2002-12)  
EN 300 328 V1.7.1: (2017)  
EN 301 489-1 V1.8.1: (2008-04)  
EN 301 489-17 V2.1.1 (2009-05)

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Ort, Datum / Place and date of issue / Lieu et Date / Data e luogo / Fecha y lugar

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