BALLISTICS

LAPUA BALLISTICS

6DOF

THE ULTIMATE BALLISTICS CALCULATOR

USER INFO

LAPUA BALLISTICS

The ultimate 6DOF ballistics tool for mobile devices

Lapua Ballistics is the first mobile ballistics app utilizing the 6DOF calculation model, which makes it the most accurate ballistics app on the market. Lapua Ballistics always offers the latest, Doppler proven Lapua cartridge and bullet data for you to combine with your firearm and local weather information. The app also includes the option to define custom bullets manually.

FEATURES
- Utilizes 6DOF, the most accurate calculation method
- Always available with latest Lapua cartridge / bullet information
- Quick and easy to change inputs like distance, wind speed and angle
- Several result outputs available depending on your needs; numerical, reticle, table and graph views
- Share your calculation results with your friends

MANAGE RIFLE / CARTRIDGE DATA
- Create your own firearm / reticle combinations
- Choose between metric and imperial values
- Set Point Blank-range to different sight-in distances and impact windows
- Define aiming point to moving target
- Define custom bullets (calculations based on BC G1 or G7 and Siacci method)
- Pre-set max 4 powder temperature - V_o pairs to the same cartridge to correct powder temperature sensitivity
- Sight-in-POI, Coriolis calculation
- Compare up to 3 Lapua cartridge/bullet performances to each other

# CONTENTS

ABOUT THE APP

UPPER AND LOWER VIEWS

- Lapua Ballistics has upper and lower view sections. You can enlarge them by tapping the section.
- Move to the next upper (5 views) or lower (11 views) view by sweeping the screen. NOTE! When sweeping, tap the blue background, not an input section.
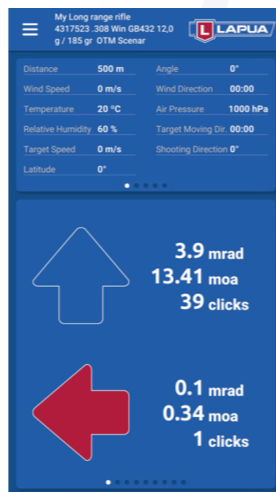
EXAMPLE RIFLE / CARTRIDGE

- By tapping the Example Rifle / Cartridge text rows on top of the upper view, you can see the app features in use or add your own info
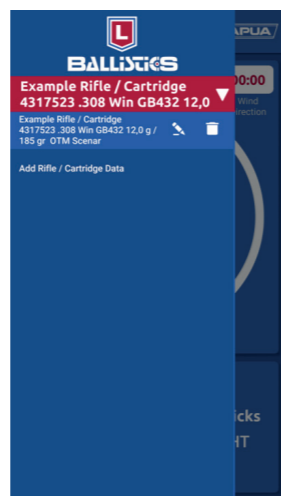
MAIN MENU

- By tapping the red Example Rifle / Cartridge, the main menu with all settings and information opens. In other views, the main menu opens by tapping the three lines on top left.
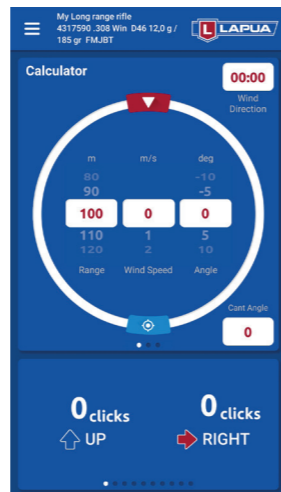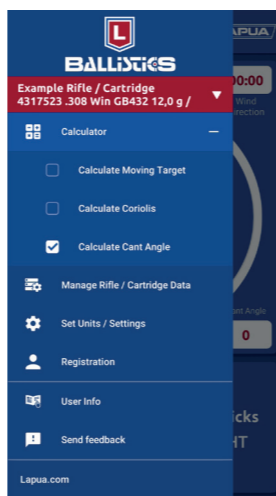
Upper view enlarged

Lower view enlarged

Example Rifle / Cartridge

Main menu

BASIC FEATURES

LOWER VIEW

You can view the following features in the lower view

- Trajectory
- Velocity / Distance
- Energy / Distance
- Elevation / Windage (Table 1)
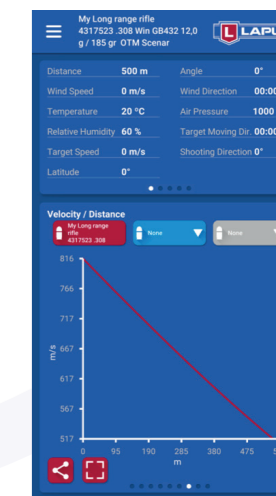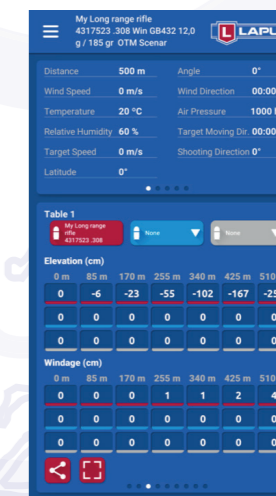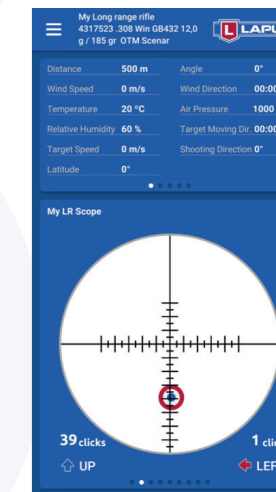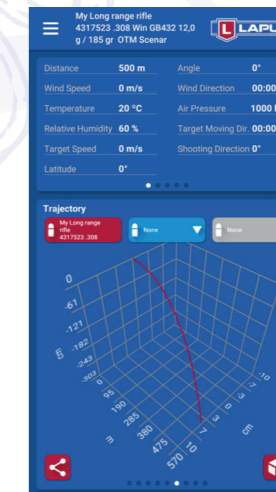- Velocity / Energy (Table 2)
- Scope view

Share your information

Full screen view

Select view angle

6DOF - SIX DEGREES OF FREEDOM

WHAT IS 6DOF?

Six degrees of freedom (6DOF) refers to the freedom of movement of a body in three-dimensional space. The position and orientation of a rigid body in space is defined by three components of movement and three components of rotation, which means that it has six degrees of freedom:

- Moving up and down (elevating/heaving);
- Moving left and right (strafing/swaying);
- Moving forward and backward (walking/surging);
- Swivelling left and right (yawing);
- Tilting forward and backward (pitching);
- Pivoting from side to side (rolling).

All these aspects are taken into account in the Lapua Ballistics app when calculating the perfect shot in specific surroundings, with a specific cartridge and firearm.
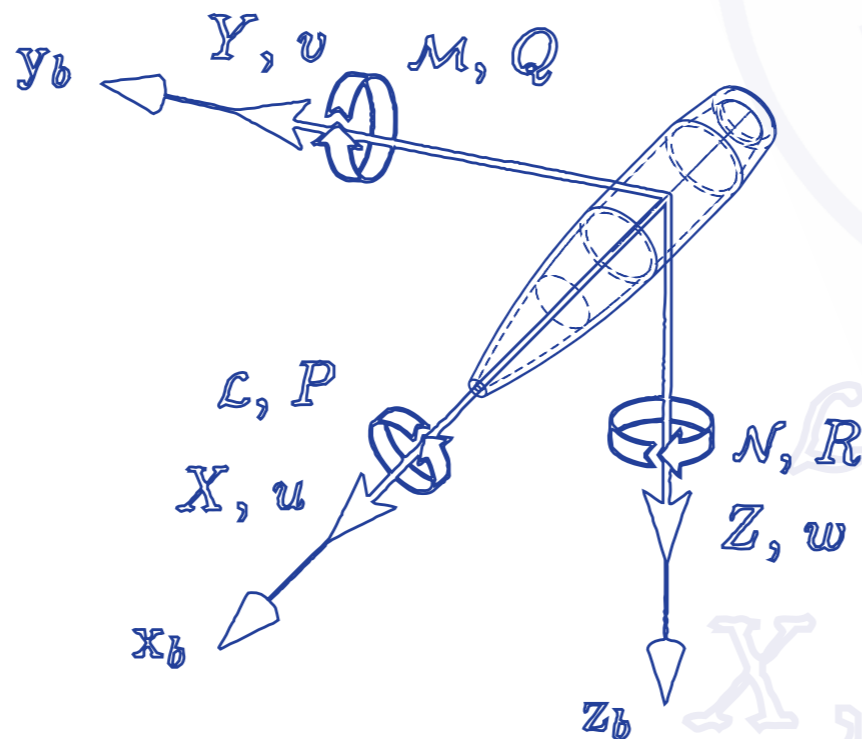
GETTING STARTED

REGISTRATION

- Add your personal information

DEFAULT SETTINGS

- Select main type of units to be used
- Select units to be used in elevation and windage correction
- Unit preferences can be changed individually later.

LAPUA

Registration

Name: Samuel Smith

Email: ss@lapua.com

Country: Switzerland ▼

Default Settings

Units:
◉ Metric ○ Imperial

Elevation and Windage Correction Format:
◉ Clicks ○ MOA ○ mrad ○ cm / 100 m

Disclaimer

Lapua Ballistics software is delivered as is and without warranties of any kind. Since Nammo Lapua Oy has no control over the equipment, components, user skills and how the program is used, no responsibility is implied or

☑ I have read the disclaimer.

Register Now **Register Later**

CALCULATOR VIEW

After registration, the Calculator view (for actual use, see page 12) is the first view in the app. To get started, add your preferred rifle/cartridge data by clicking the Example Rifle / Cartridge text row on top of the upper view.

This opens the quick access view (Example Rifle / Cartridge) where you can modify or delete existing rifle/cartridge data, or add new data. The first row is an example row.
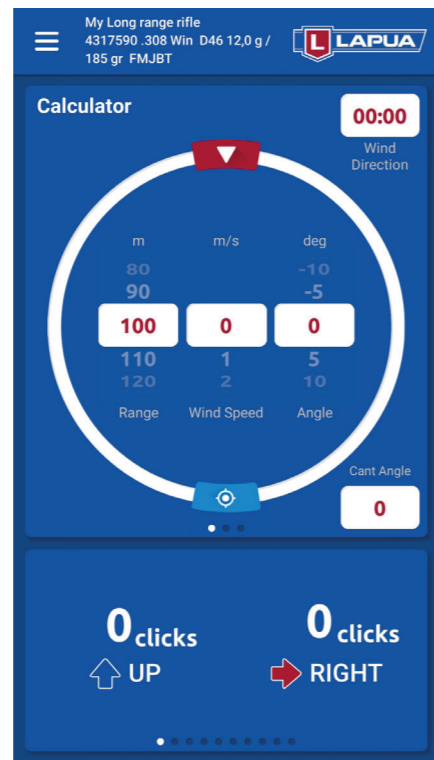
To access the Rifle / Cartridge Settings view to add your first rifle/cartridge data, tap the Add Rifle / Cartridge Data.

Option Cant Angle - *please see advanced section.*

Calculator view
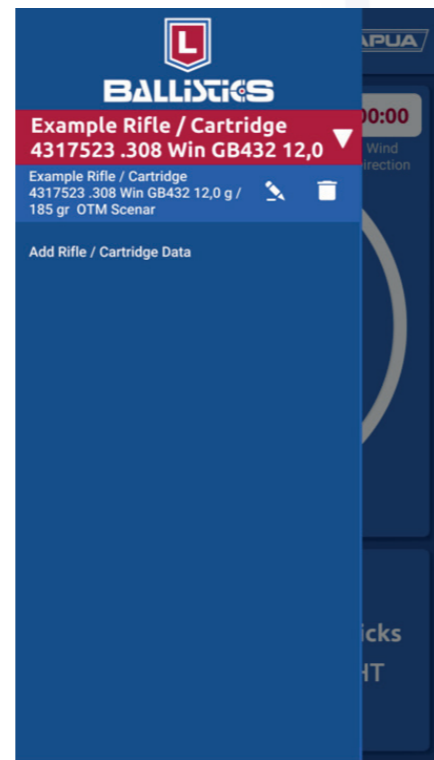
Example Rifle / Cartridge

RIFLE / CARTRIDGE SETTINGS

RIFLE/CARTRIDGE NAME
- Name your rifle-bullet combination (ex. "My Long range rifle")

RIFLE/PISTOL
- Input scope data
- Select units

RETICLE
- Add and name your scope reticle using the reticle generator (see reticle generator view on page 10). You can add multiple reticles.

CARTRIDGE/BULLET/CUSTOM BULLET
- Select the Cartridge, Bullet or Custom Bullet of your choice. (See the Select Bullet view on page 11)

SIGHT-IN
- Input Sight-In data (see Sight-In view on page 12)

RETICLE GENERATOR

In Lapua Ballistics you can generate your own scope reticle. The reticle window in the calculator mode shows the point of impact, the reticle and the needed corrections in clicks. Note! If you haven't added your reticle data, the correction clicks in the calculator mode will show arbitrary values based on preset default values in the Number of lines section!
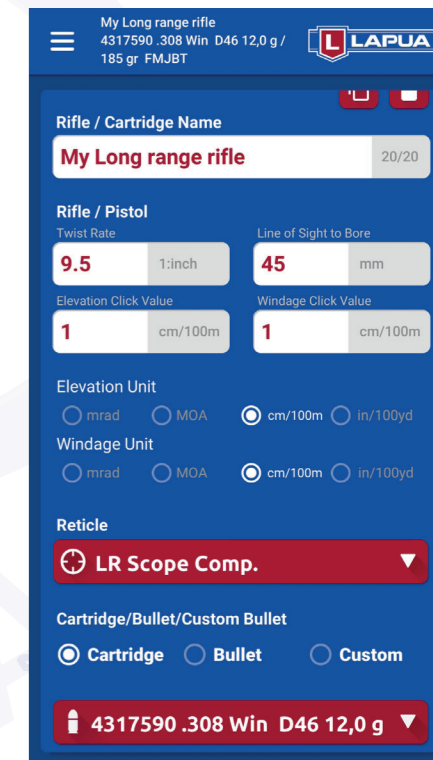
RETICLE NAME

- Name your scope

NUMBER OF LINES

- Input the number of main lines to each direction
- Secondary lines: If your reticle has small lines between the main lines, activate the secondary lines option

CORRECTION UNIT

- Choose unit and input the value for the main lines difference.

The reticle generator works perfectly with 1st focal plane scopes (both image and reticle zoom in and out), with 2nd focal plane scopes the image will be correct only for one magnification (refer to your scope manual for magnification details).

Reticle Generator view

SELECT BULLET / CARTRIDGE

Select your Lapua bullet or cartridge from the menu to use in the calculation. (The example shows the bullet menu.)

The cartridges have a preset nominal value, but to achieve the most accurate calculations, we recommend measuring the velocity with your own rifle.

INPUT SIGHT-IN DATA

SIGHT-IN

- Input Sight-In conditions. Relative humidity has very little effect on results in basic use, so it can be set at a basic static value of e.g. 50 %

The following values are optional values, for use in advanced calculations.

SIGHT-IN POI

For instructions, see page 17

SIGHT-IN CORIOLIS

For instructions, see page 18

POWDER DV/DT

For instructions, see page 19

MAIN MENU

CALCULATOR

- Define the features (Moving target and Coriolis) you would like to activate. The default setting is OFF. Switching them on will activate the features and make them visible in the calculation views.
- Calculate Cant Angle - *please see advanced section.*

MANAGE RIFLE / CARTRIDGE DATA

SET UNITS / SETTINGS

- Set metric / imperial units for Length, Velocity and air pressure (see Set Units view on page 14)

REGISTRATION

- add and manage your registration data

USER INFO

- Direct link to page with user manual on www.lapua.com

SEND FEEDBACK

- Send technical feedback to app developing partner
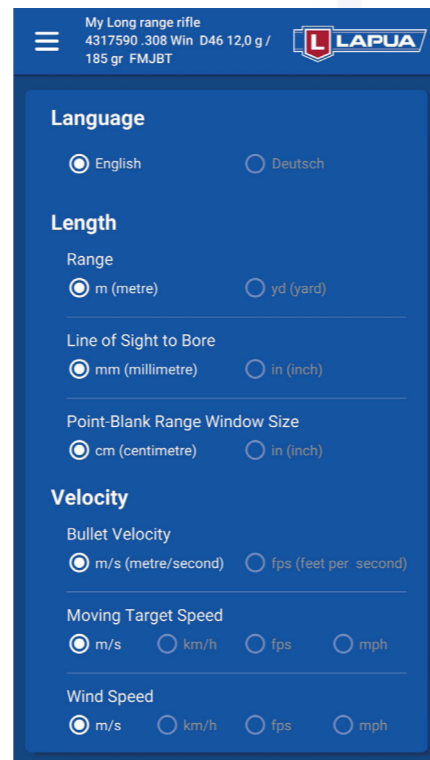
SET UNITS / SETTINGS

Select the units you prefer to use - metric or imperial. Unit preferences can be individually changed later.

LANGUAGE

LENGTH

VELOCITY

AIR PRESSURE   etc.

My Long range rifle
4317590 .308 Win D46 12,0 g /
185 gr FMJBT

Language

◉ English   ○ Deutsch

Length

Range
◉ m (metre)   ○ yd (yard)

Line of Sight to Bore
◉ mm (millimetre) ○ in (inch)

Point-Blank Range Window Size
◉ cm (centimetre) ○ in (inch)

Velocity

Bullet Velocity
◉ m/s (metre/second) ○ fps (feet per second)

Moving Target Speed
◉ m/s   ○ km/h   ○ fps   ○ mph

Wind Speed
◉ m/s   ○ km/h   ○ fps   ○ mph

CALCULATOR

- Input basic data for shooting conditions; Distance, Wind Speed, Angle (Uphill/Downhill)
- To ensure accurate values, you have to input Weather data (sweep upper part left to the Weather Data view)
- The needed scope corrections are shown as clicks
- You can change the lower part view to the reticle window view by sweeping left
- To get mrad and moa, enlarge the lower part view by tapping it

NOTE! If you haven't added your reticle data in the Reticle Generator (see page 10), the correction clicks in the calculator mode will show arbitrary correction values!

My Long range rifle
4317590 .308 Win D46 12,0 g /
185 gr FMJBT

Calculator   00:00
Wind Direction

m   m/s   deg
80   -10
90   **-5**
100   **0**   **0**
110   1   5
120   2   10
Range   Wind Speed Angle

Cant Angle
0

0 clicks   **0** clicks
⬆ UP   ➡ RIGHT

My Long range rifle
4317523 .308 Win GB432 12,0
g / 185 gr OTM Scenar

Distance   500 m   Angle   0°
Wind Speed   0 m/s   Wind Direction   00:00
Temperature   20 °C   Air Pressure   1000 hPa
Relative Humidity 60 %   Target Moving Dir 00:00
Target Speed   0 m/s   Shooting Direction 0°
Latitude   0°

3.9 mrad
13.41 moa
39 clicks

0.1 mrad
**0.34** moa
1 clicks

NOTE! Values are example values only

WEATHER

To add weather conditions, sweep upper part left to the Weather view. You can either get current weather data online from the nearest weather station or input instrumental readings.

TIP: Remember to check that the weather station data corresponds to the actual weather conditions, as it is not guaranteed that all weather stations update their data in a timely manner.
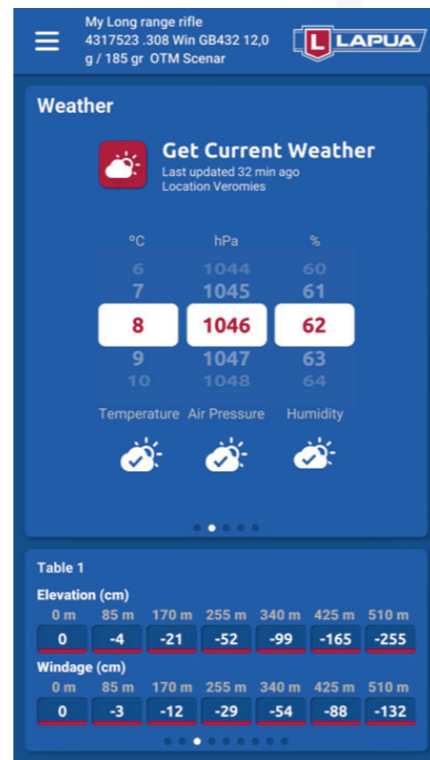
SIGHT-IN POI

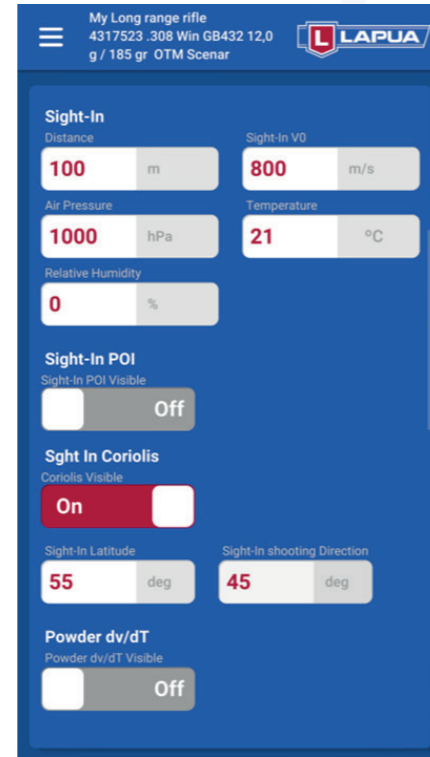This feature makes it easy to use different cartridges in one rifle.

- Sight-in your scope with the first bullet and adjust the turret scales to zero. Save the cartridge data as e.g. "hunting cartridge".
- Sight-in your scope with your other bullet and set the correction needed to POI (in clicks). Save the cartridge data as e.g. "training cartridge". Do not zero the turrets.
- Always set the turrets to the numerical value given by the software - do not "count clicks"!
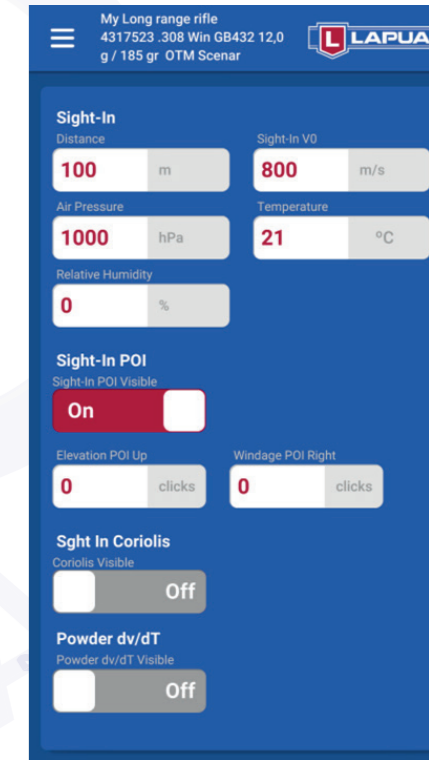
SIGHT-IN CORIOLIS

This feature is needed only if you are doing the Sight-in to extra long distances (> 1 km). Give Latitude and Shooting direction.

My Long range rifle
4317523 .308 Win GB432 12,0
g / 185 gr OTM Scenar

Sight-In

Distance		Sight-In V0	
100	m	800	m/s

Air Pressure		Temperature	
1000	hPa	21	°C

Relative Humidity
| 0 | % |

Sight-In POI
Sight-In POI Visible
Off

Sght In Coriolis
Coriolis Visible
On

Sight-In Latitude		Sight-In shooting Direction	
55	deg	45	deg

Powder dv/dT
Powder dv/dT Visible
Off

POWDER dv/dT

Use this feature only if you know or can measure your cartridge V_0 at different cartridge temperatures. This correction may to some extent be load and powder lot sensitive. For absolute accuracy, measure the exact values for the system that you are using.

For V_0 calculation, see next page.

My Long range rifle
4317523 .308 Win GB432 12,0
g / 185 gr OTM Scenar

Sght In Coriolis
Coriolis Visible
Off

Powder dv/dT
Powder dv/dT Visible
On

Velocity V1 visible
Off

V0			Temperature		
780	m/s	@	-20	°C	+
790	m/s	@	0	°C	−
800	m/s	@	23	°C	−
810	m/s	@	40	°C	−

Save

V$_0$ CALCULATION

With this feature you can calculate the true V$_0$ from the instrumental reading at e.g. V25m Input the measured velocity at the distance of your velocity screen / chronograph and you will see the true V$_0$.
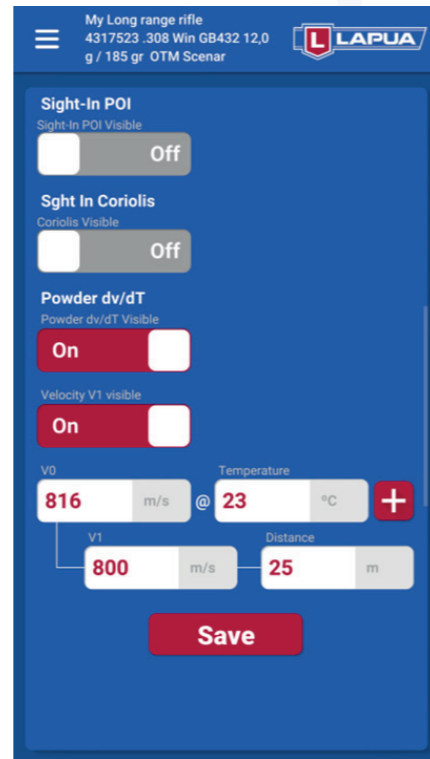
POINT-BLANK RANGE CALCULATOR

The Point-blank Range calculator is a useful tool for hunting.

- Choose desired Window Size for your target
- Adjust Sight-In Distance to fit the chosen Window Size
- Go to the Calculation view and adjust the scope correction to the optimized Sight-In distance

In this example, you can make a perfect shot to 0-210 meters without any further adjustments to your scope.
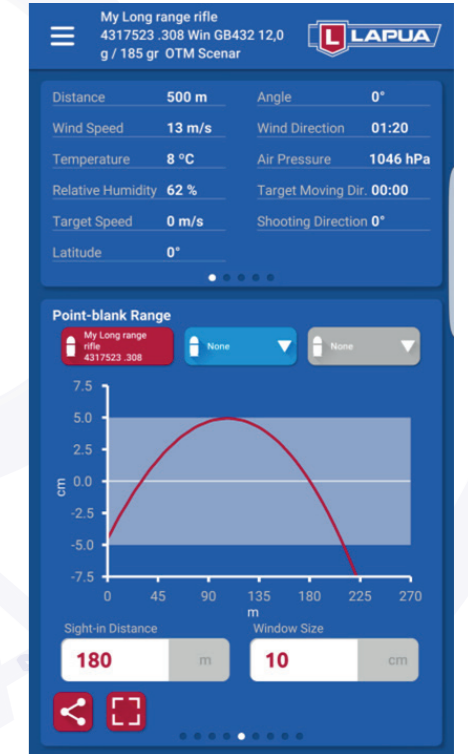
CANT ANGLE

Cant angle (rifle tilt) support, needed e.g. when shooting from a horizontal narrow gap.

CANT ANGLE
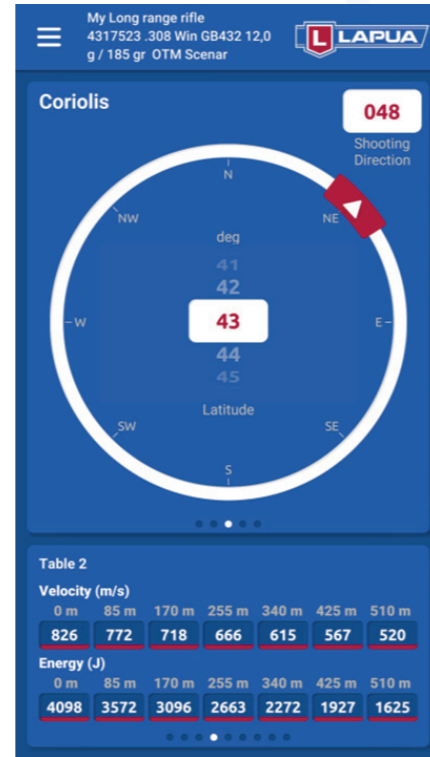
CORIOLIS CALCULATOR

Coriolis correction has effect on the calculation only at very long distances. Coriolis is a force caused by the rotational movement of the earth. The effect depends on the geographical location and the shooting direction.

- Check that Coriolis is activated in the Main Menu (Main Menu, see page 13)
- Input the latitude for your location
- Give the shooting direction by turning the arrow or typing the numerical value.

My Long range rifle
4317523 .308 Win GB432 12,0
g / 185 gr OTM Scenar

Coriolis 048
Shooting
Direction

N

NW NE

deg
41
42
43
44
45

W E

Latitude

SW SE

S

Table 2

Velocity (m/s)

0 m	85 m	170 m	255 m	340 m	425 m	510 m
826	772	718	666	615	567	520

Energy (J)

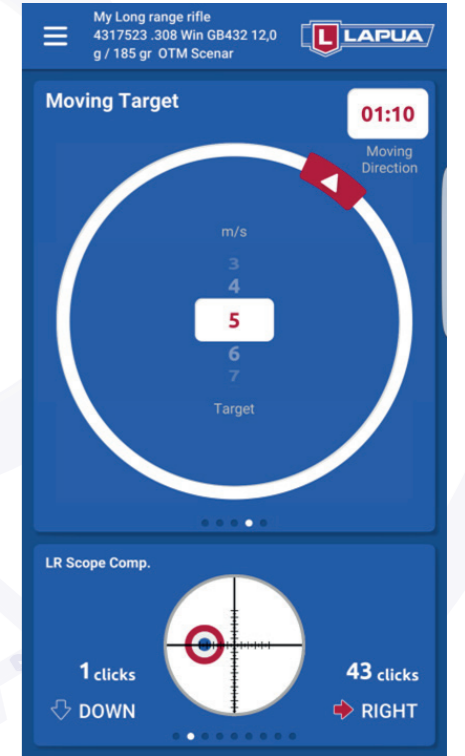| 0 m	85 m	170 m	255 m	340 m	425 m	510 m
4098	3572	3096	2663	2272	1927	1625

MOVING TARGET

Check that Moving Target is activated in the Main Menu (Main Menu, see page 13).

You can shoot moving targets with two methods:

- Make scope adjustment or use the reticle view
- In the Moving Target window, input the target speed and adjust the target direction by turning the arrow or typing the numerical value

My Long range rifle
4317523 .308 Win GB432 12,0
g / 185 gr OTM Scenar

Moving Target 01:10
Moving
Direction

m/s
3
4
5
6
7

Target

LR Scope Comp.

1 clicks   **43** clicks

⬇ DOWN   ➡ RIGHT

STABILITY ESTIMATION

You can use the stability indicator to estimate the stability of your system. This 6DOF sd/sg analysis is by far more sophisticated than the simple Greenhills formula of Miller twist rule.

The light blue area shows the area where the bullet is stable.
In the dark blue area, the bullet may not be unstable but the risk for that is increased.

Stability is effected e.g. by:
• The bullet itself
• Velocity
• Twist rate
• Environmental conditions
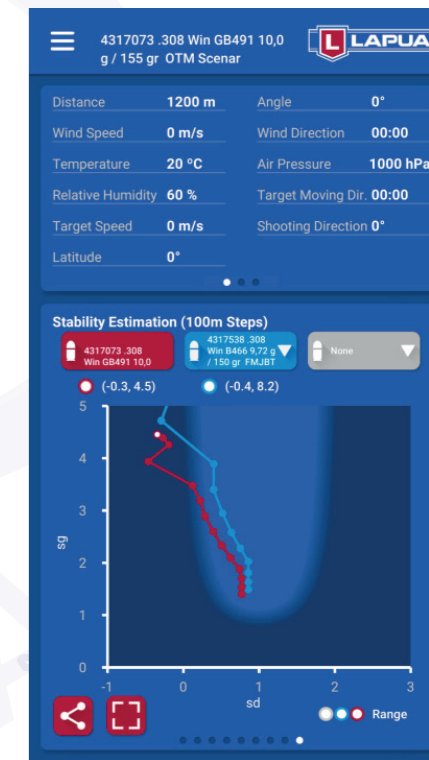• Defects of the muzzle or bullet (not included in this estimation)
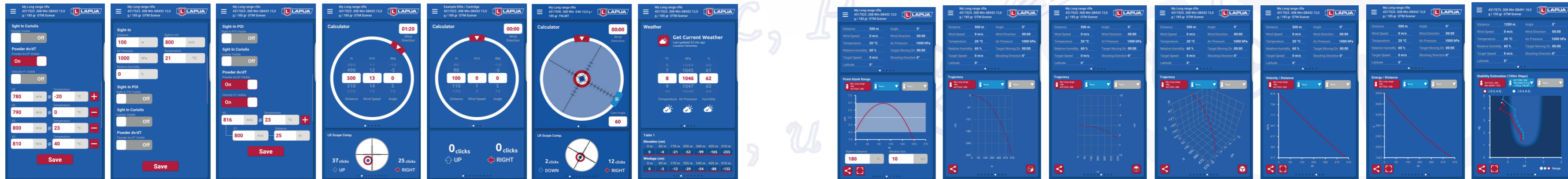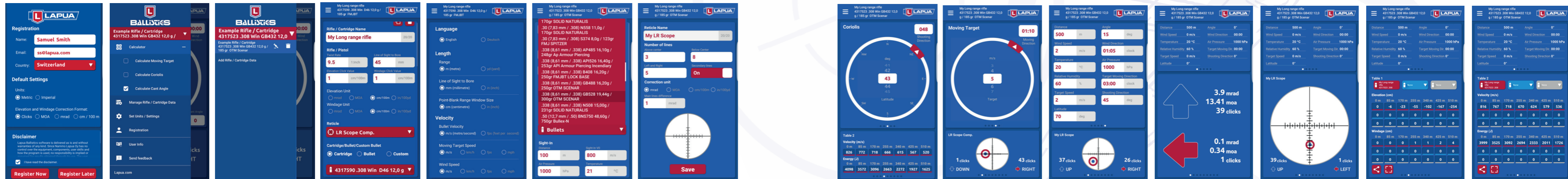
STABILITY ESTIMATION

The curves represent two stability parameters downrange: sg (y-axis) and sd (x-axis).
Sg is the gyroscopic stability (spin dominated) and sd is the dynamic stability (velocity dominated).

Dots indicate distance at each 100 m starting from zero (first dot down right) to shooting distance. Please note that the last dots may be outside the graph.

Values at the shooting distance are also shown as numbers above the graph.

MAIN VIEW THUMBNAILS

BALLISTICS

LAPUA BALLISTICS

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