USER MANUAL · VERSION 1.0.2

Slope Calculator

Slope, gradient and the level at every chainage, with crossfall, a digital level run, an optical level trainer and professional reports. For surveyors and site engineers, in the browser and on Windows. By Excel to KML.

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1. Getting started

Slope Calculator is the same app in two forms: the **web app** at exceltokml.com/slope-calculation/app, which runs in Chrome, Edge, Firefox or Safari on a computer or a phone, and the **Windows program** for Windows 10 and 11.

- **Web app:** open the address. To use it like an app, choose Install (Chrome, Edge) or Add to Home Screen (Safari).
- **Windows:** download `SlopeCalculator-Setup.exe` from the product page and open it. It installs for you alone, needs no administrator rights, and adds Start menu and desktop shortcuts. If Windows SmartScreen says it protected your PC, choose *More info*, then *Run anyway*. Uninstall it from Settings → Apps.
- **Updates:** the Windows program looks for a new version a few seconds after it opens and offers to install it. The web app is always the newest.

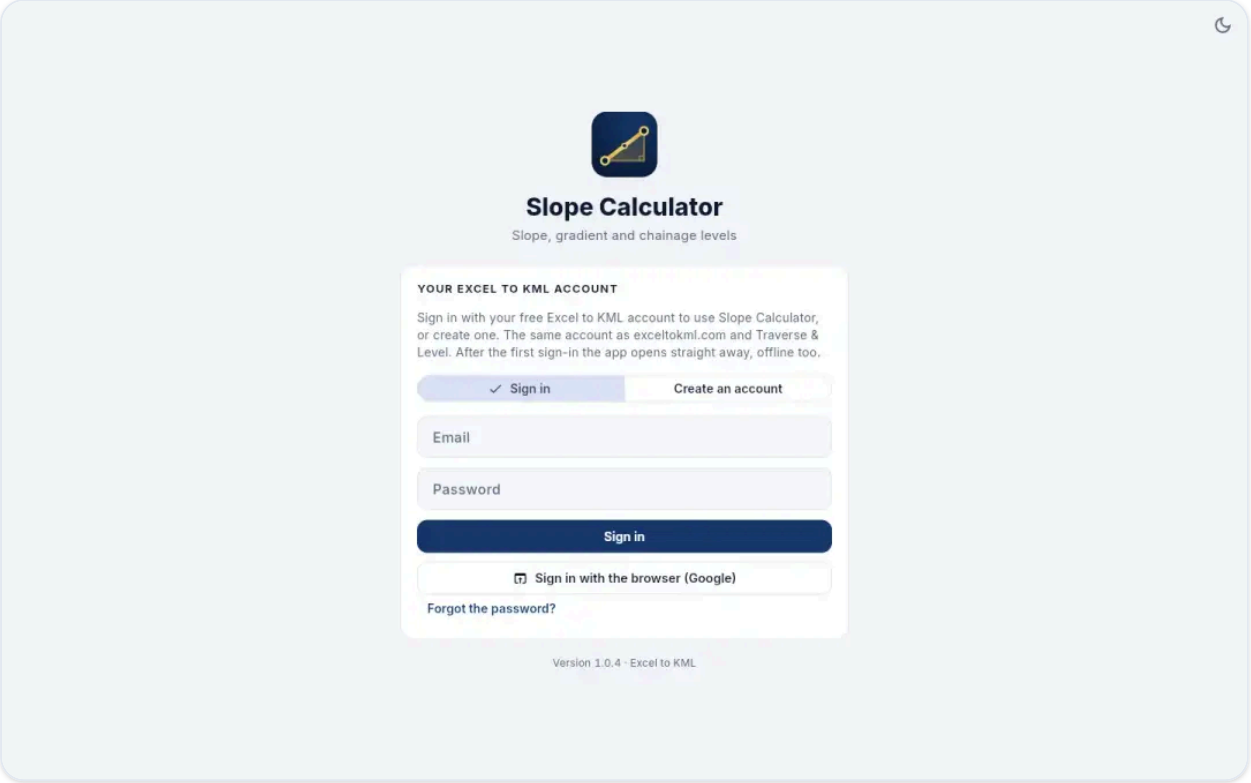
Signing in

The app opens on the sign-in. Use your free **Excel to KML account**, the same one as exceltokml.com and Traverse & Level, or create one:

- **Sign in** with your email and password.
- **Create an account** with your name, email and a password of at least 8 characters. We email a 6-digit code; type it in to confirm the email.
- **Sign in with the browser (Google):** your browser opens at exceltokml.com with a code. Sign in there (Google works) and confirm the code; the app signs in by itself.
- **Forgot the password?** Type your email first, then press it: a link to set a new one is emailed.

After the first sign-in the app remembers you on that device and opens straight away, offline too, until you sign out. In the browser, if you are already signed in on exceltokml.com, the web app opens directly.

> The first sign-in needs an internet connection. After that the app works offline; signing out on a device means signing in again, online, before using it there.



The sign-in: email and password, Create an account, or Sign in with the browser for Google.

2. The calculator

The calculator is the first page. Type four values in *Enter your data*; the results follow as you type.

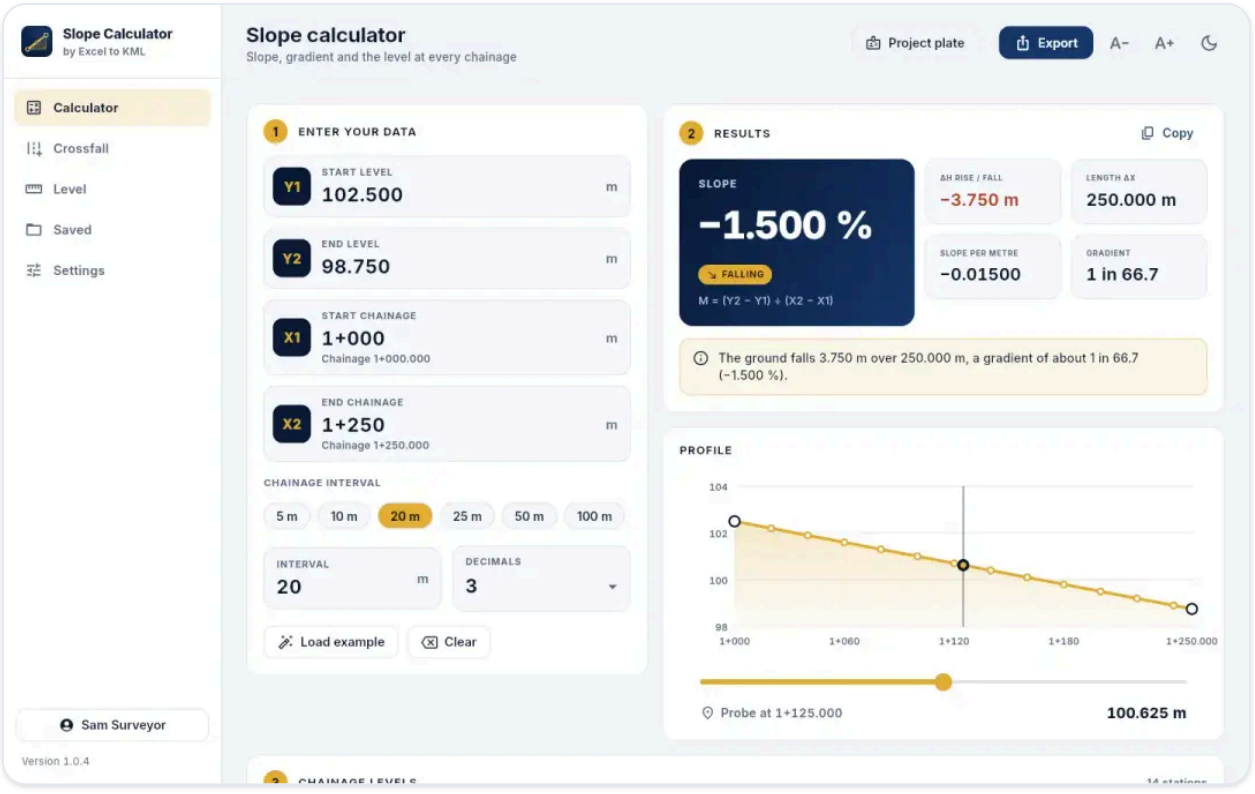
BOX	WHAT TO TYPE
Y1 Start level	`Level at the start, in metres (102.500)`
Y2 End level	`Level at the end, in metres (98.750)`
X1 Start chainage	`1000, 1000.5, 1+000 or 1+000.500; negative chainages work too`
X2 End chainage	`The same formats; it must be further along than X1`
Chainage interval	`Pick 5, 10, 20, 25, 50 or 100 m, or type any interval`
Decimals	`1 to 5 places for levels in the tables and reports`

Press **Enter** to move to the next box. **Load example** fills in the Excel template's example; **Clear** empties the boxes. The app remembers what you typed.

Results

RESULT	HOW IT IS WORKED OUT
ΔH rise / fall	`Y2 − Y1`
Length ΔX	`X2 − X1`
Slope per metre M	`ΔH ÷ ΔX`
Slope %	`M × 100`
Gradient	`1 in 1 ÷ |M|`
Direction	`Rising, falling or level, from Y1 to Y2`

A sentence under the results says it in words, for example *The ground falls 3.750 m over 250.000 m, a gradient of about 1 in 66.7 (−1.500 %)*. **Copy** puts the results on the clipboard. If something can't be worked out (an empty box, X2 not further than X1, an interval of 0, or so many stations that a larger interval is needed) the app says what to fix instead of showing results.

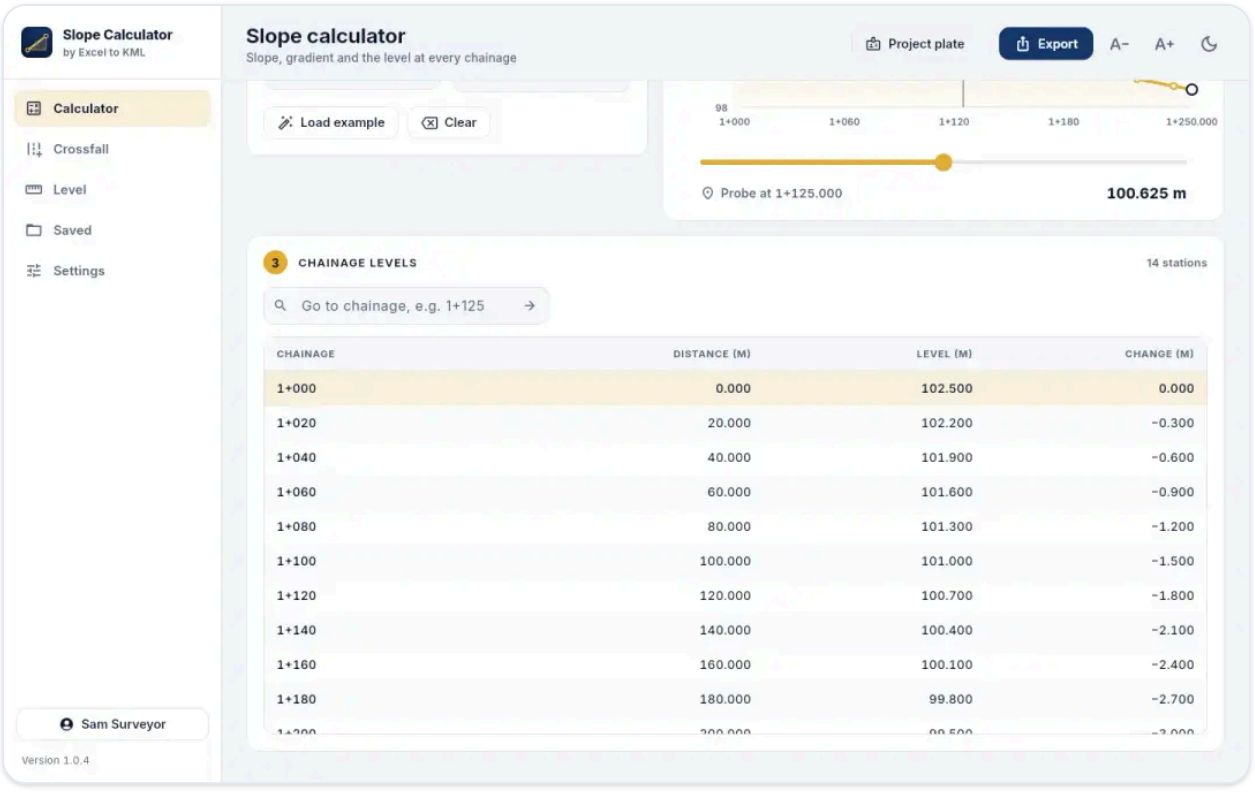


The calculator: the four inputs, interval and decimals on the left; slope, rise, length and gradient on the right, with the profile.

3. Chainage levels and the profile

The **profile** draws the line from Y1 to Y2 with every station. Drag the **probe** under it to read the level at any chainage between the ends. The **Chainage levels** table lists every station with its distance from the start, its level and the change from the start; type a chainage in *Go to chainage* to find it.

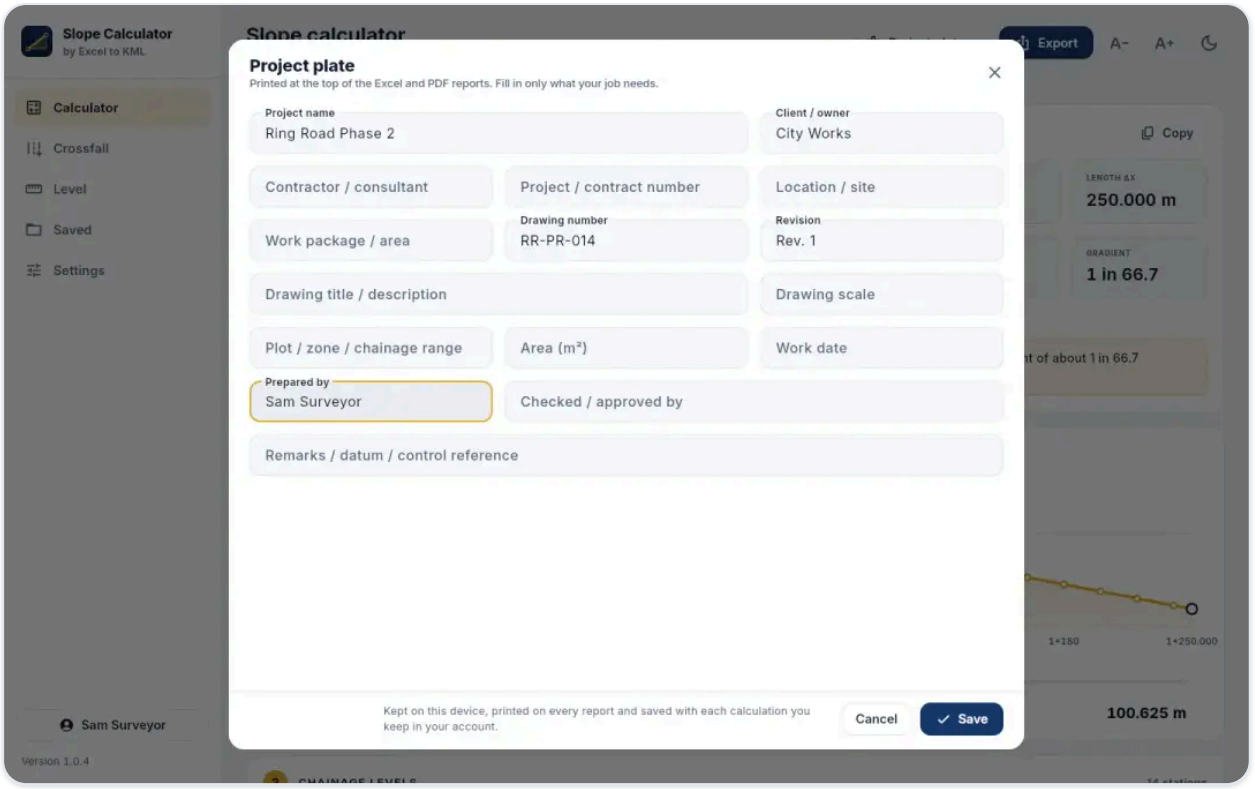
Stations come **on round chainages** (from 1+013 every 20 m: 1+013, 1+020, 1+040 ...) or **counted from the start** (1+013, 1+033, 1+053 ...); choose in Settings. The start and the end are always stations.



The probe at 1+125.000 reads 100.625 m; the chainage levels table with Go to chainage.

4. The project plate

Project plate (at the top of the calculator) holds the details printed at the top of every report: project, client, contractor, contract number, location, work package, drawing number, revision, drawing title, scale, zone, area, work date, prepared by, checked by and remarks. Fill in only what your job needs and press **Save**. The button then shows the project's name and how many details are filled in.



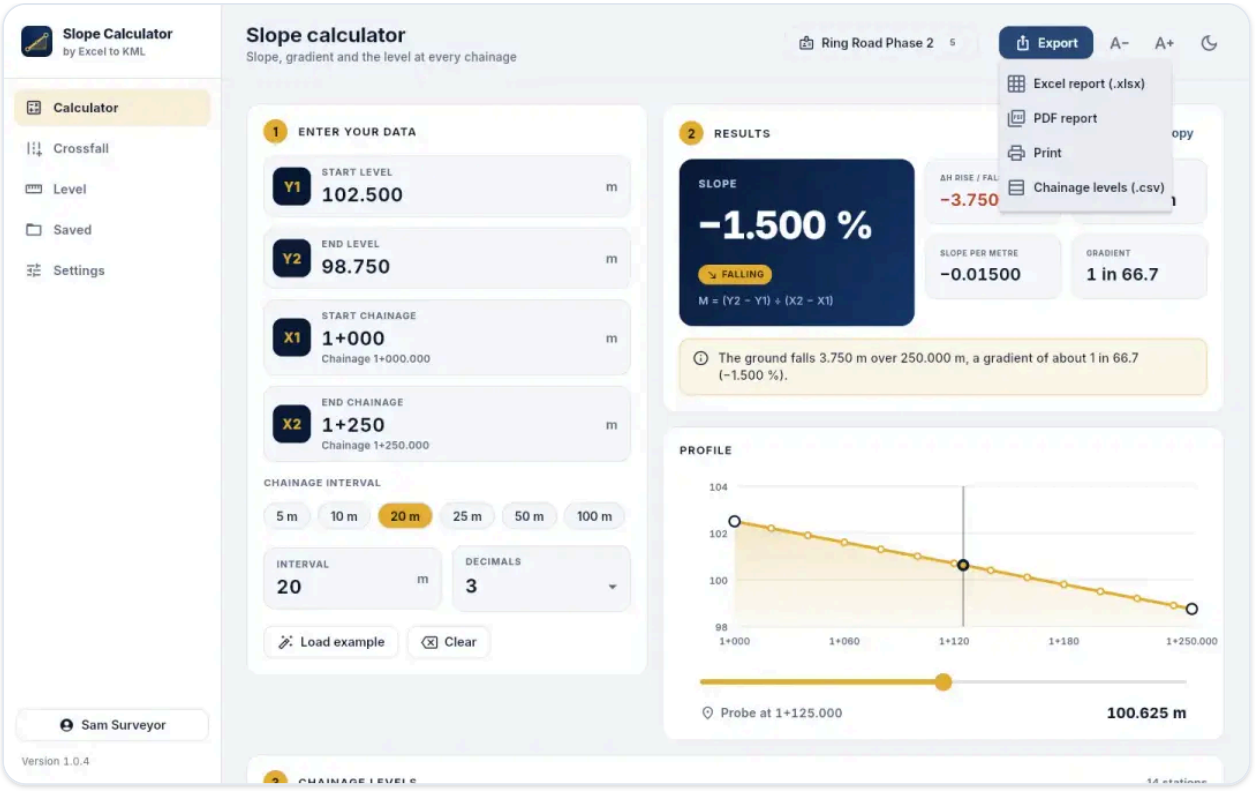
The project plate with the project, client, drawing number, revision and prepared by filled in.

5. Reports: Excel, PDF, CSV and print

Press **Export** at the top of the calculator:

- **Excel report (.xlsx)** with six sheets: Project Plate, Slope Summary, Chainage Levels, Crossfall, Level Book (after a digital level run) and a QA / QC checklist. Numbers are stored as numbers, so you can work with them in Excel.
- **PDF report**: A4 with the project plate, the results, the profile, the chainage levels and sign-off boxes.
- **Print**: the same report, to a printer.
- **Chainage levels (.csv)**; the level book has its own CSV button on the Level page.

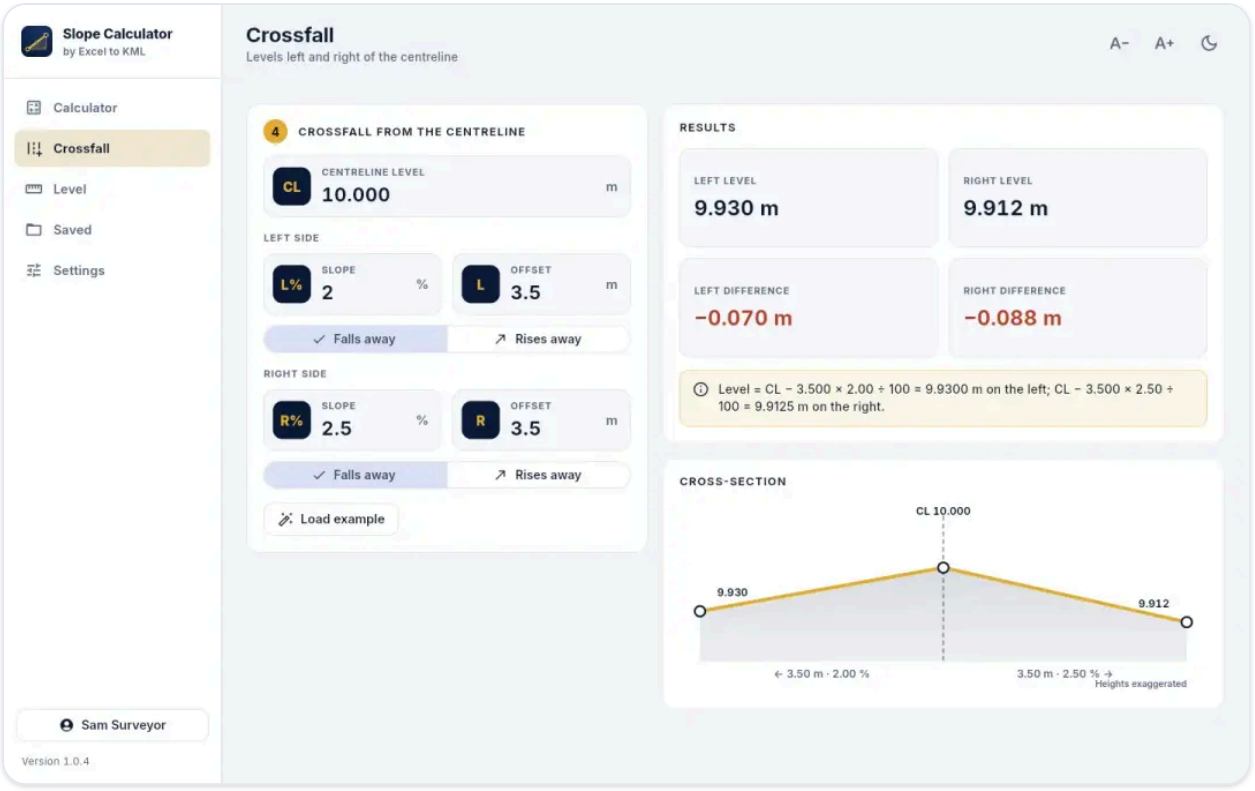
On Windows you choose where to save; in the browser the file is downloaded. File names start with the project name when the plate has one, and end with the date.



Export: Excel report, PDF report, Print and Chainage levels (.csv).

6. Crossfall

Enter the **centreline level**, and for each side the **crossfall %**, the **offset** from the centreline and whether it **falls away** or **rises away**. The left and right levels and their differences from the centreline follow, with the cross-section drawn. Level = CL ± offset × crossfall % ÷ 100.

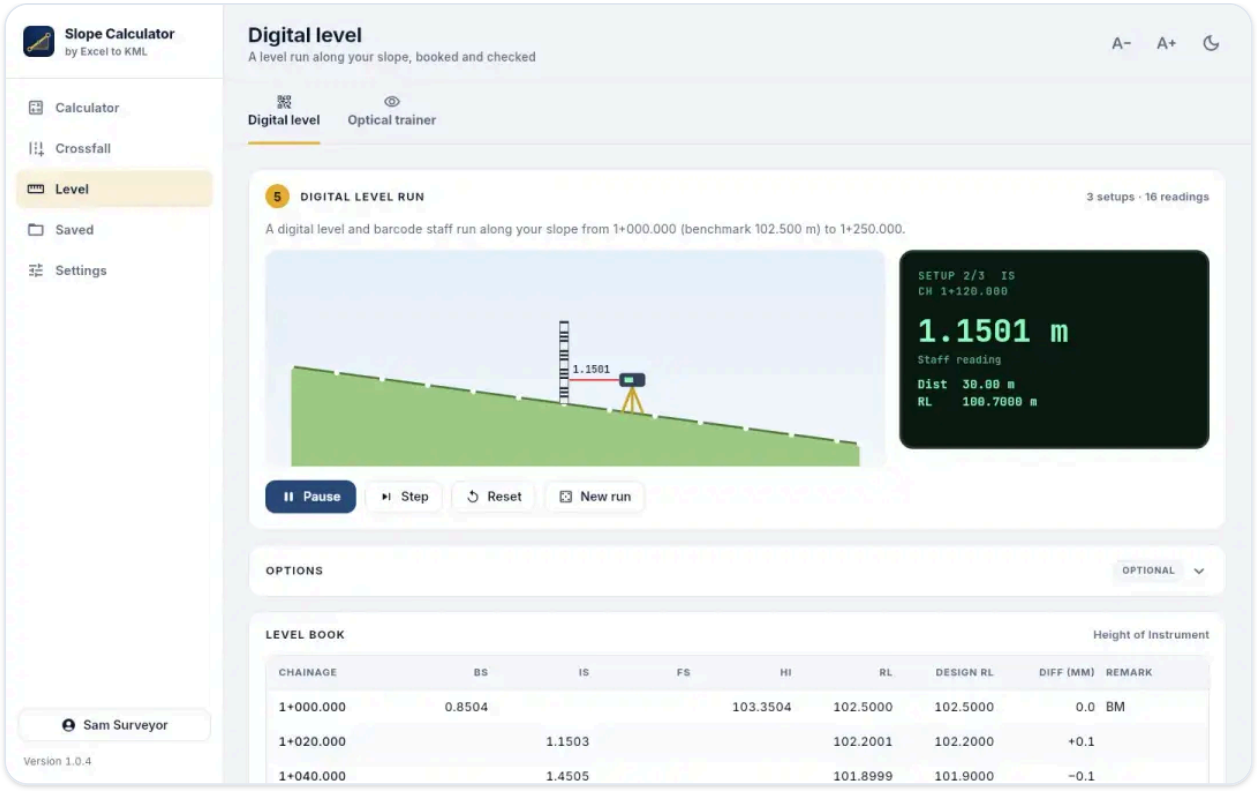


Crossfall: centreline 10.000 m, left 2 % and right 2.5 % falling away over 3.5 m: 9.930 m and 9.912 m.

7. Digital level run

Level → Digital level shows a level run along your slope with a digital level and a barcode staff, from the start (the benchmark, Y1) to the end. Press **Start the run** to watch it, **Step** for one reading at a time, **Reset** to start again or **New run** for new readings. The instrument's display shows each reading, its distance and the reduced level, and each reading is booked in the **level book** as it is taken.

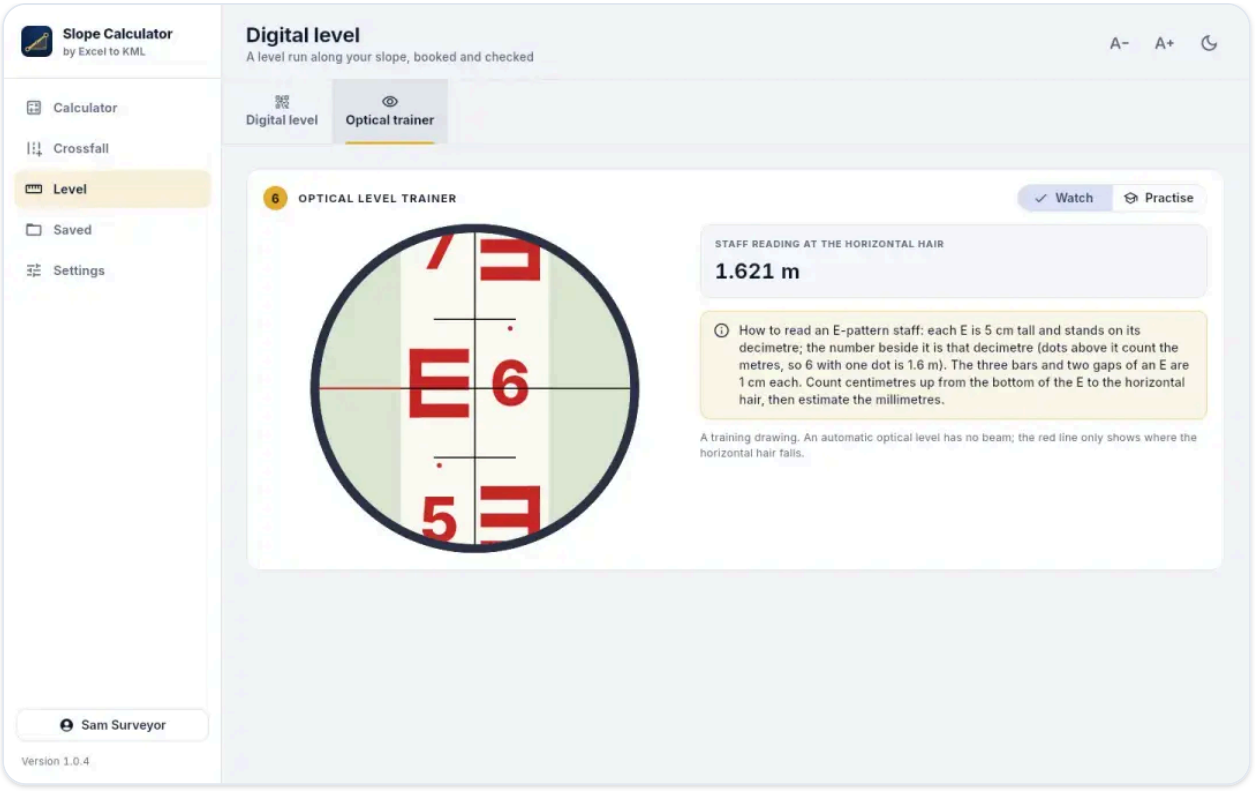
- Setups keep every sight within the **max sight**, and readings stay on a 4 m staff: on a steep slope extra change points are added.
- **Options:** max sight, reading noise (mm), collimation error (mm per 100 m), speed, and booking by **Height of Instrument** or **Rise & Fall**.
- **Checks:** the arithmetic check (ΣBS − ΣFS = last RL − first RL, and ΣRise − ΣFall for Rise & Fall), the closing error against the end level, and the allowable misclosure C√K mm (K the length in km, C in Settings). The closing error is spread over the setups for the adjusted levels.
- Export the level book as CSV here; the Excel report includes it.



A digital level run: setup 2 of 3, an intermediate sight of 1.1501 m at 1+120, booked by Height of Instrument.

8. Optical level trainer

Level → Optical trainer shows the view through an optical level onto an E-pattern staff. **Watch** reads it for you; in **Practise** you type your reading and the app says whether it is within 2 mm. Each E is 5 cm tall and stands on its decimetre; the number beside it is that decimetre, with dots for the metres; count the centimetres up to the horizontal hair and estimate the millimetres.

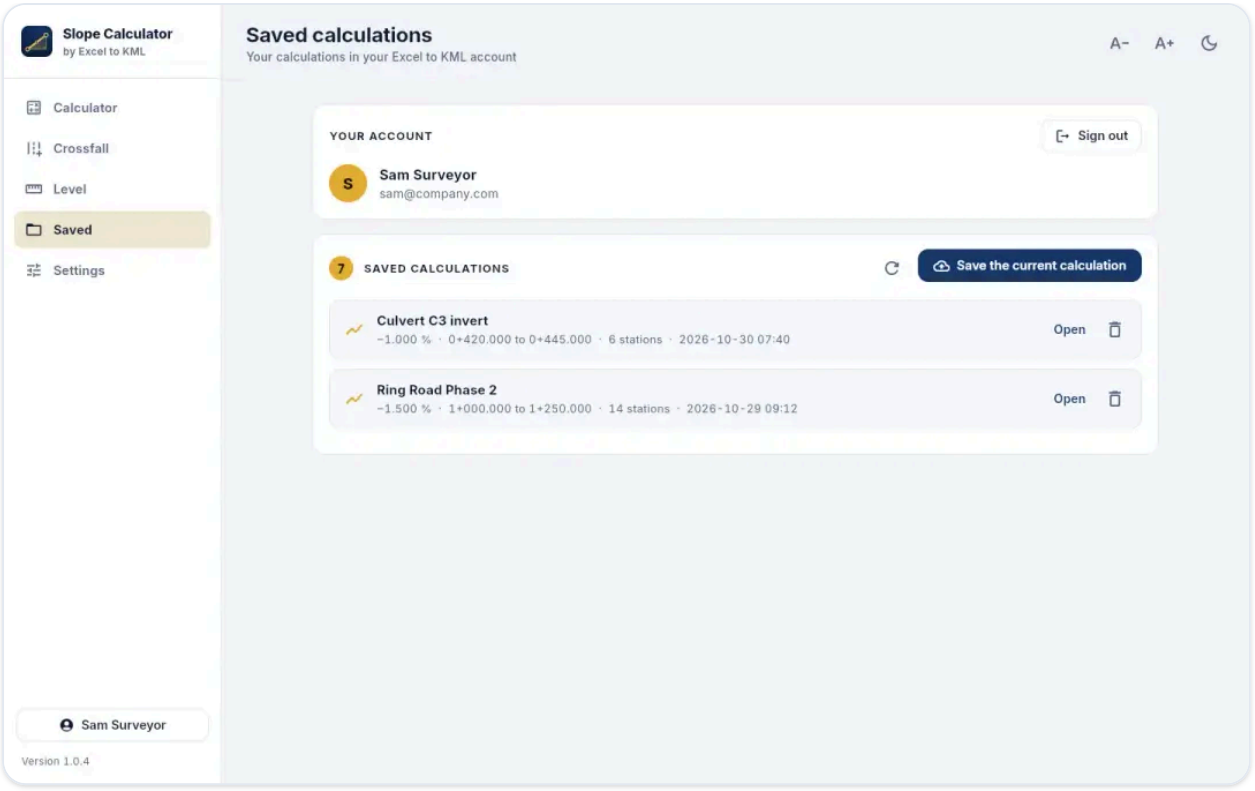


The optical trainer: the staff through the telescope reading 1.624 m, and how to read an E-pattern staff.

9. Saved calculations and working offline

Saved keeps calculations in your account: **Save the current calculation** stores the inputs, the settings and the project plate under a name. **Open** brings one back into the calculator on any device, the Windows program, the web app or a phone; the bin deletes it everywhere.

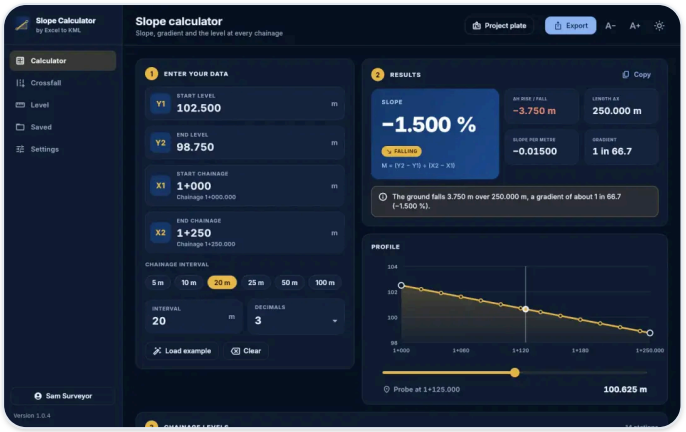
Offline: a calculation saved or deleted without a connection waits on the device, marked *Waiting to send*, and is sent the next time the app reaches exceltokml.com (or press **Send now**). The list from the last time you were online is kept, so it shows offline too.



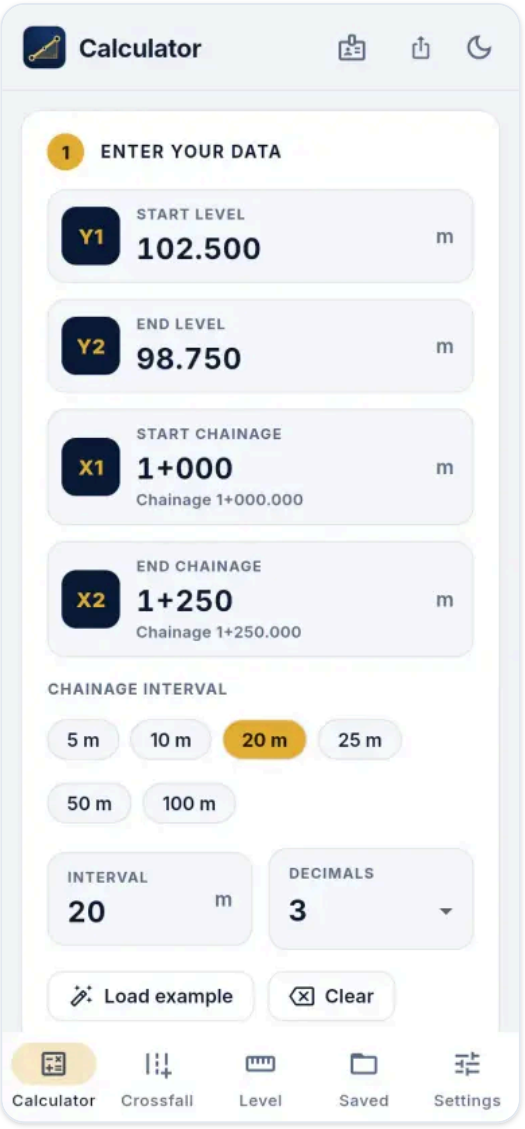
Saved calculations: your account with Sign out, and two calculations with their slope, chainages, stations and date.

10. Settings

- **Theme:** follow the computer, or always light or dark (also the moon / sun button at the top).
- **Text size:** 85 % to 130 % (also A− / A+ at the top), on top of your computer's or phone's own text size (Windows: Settings → Accessibility → Text size).
- **Stations:** on round chainages, or counted from the start.
- **Decimals** and **interval** a new calculation starts with.
- **Allowable misclosure:** C in C√K mm for the level run (12 is common for ordinary levelling).



Dark mode.



On a phone: the menu moves to the bottom.

11. Worked examples

Check these by hand or against your own spreadsheet; each is also an automatic test of the app.

Example 1: slope and chainage levels

Y1 = 102.500 m, Y2 = 98.750 m, X1 = 1+000, X2 = 1+250, interval 20 m. ΔH = −3.750 m, ΔX = 250.000 m, M = −0.01500, slope −1.500 %, gradient 1 in 66.7, 14 stations.

CHAINAGE	DISTANCE (M)	LEVEL (M)	CHANGE (M)
1+000	0.000	102.500	0.000
1+020	20.000	102.200	-0.300
1+040	40.000	101.900	-0.600
1+060	60.000	101.600	-0.900
1+080	80.000	101.300	-1.200
1+100	100.000	101.000	-1.500
1+120	120.000	100.700	-1.800
…			
1+240	240.000	98.900	-3.600
1+250.000	250.000	98.750	-3.750

Example 2: the Excel template's example

Y1 = 1.900 m, Y2 = 0.600 m, X1 = 0+000, X2 = 0+379.290, interval 20 m. ΔH = −1.300 m, slope −0.343 %, gradient 1 in 291.8, 20 stations; the level at 0+360 is 0.666 m and the last station is 0+379.290 at 0.600 m.

Example 3: crossfall

SIDE	CROSSFALL	OFFSET	DIRECTION	LEVEL	DIFFERENCE
Left	2.0 %	3.500 m	falls away	9.9300 m	-0.0700 m
Right	2.5 %	3.500 m	falls away	9.9125 m	-0.0875 m

Centreline 10.000 m.

Example 4: a level book by Height of Instrument and Rise & Fall

Opening benchmark 100.000 m, closing on a known 99.700 m, 100 m of levelling.

LINE	BS	IS	FS	HI	RISE	FALL	RL	ADJUSTED RL	REMARK
1	1.585			101.585			100.000	100.0000	BM
2		1.950				0.365	99.635	99.6325	
3	0.875		2.105	100.355		0.155	99.480	99.4775	CP
4		1.225				0.350	99.130	99.1250	
5			0.650		0.575		99.705	99.7000	

- ΣBS − ΣFS = 2.460 − 2.755 = −0.295; last RL − first RL = −0.295 ✓

- ΣRise − ΣFall = 0.575 − 0.870 = −0.295 ✓
- Closing error +5.0 mm against an allowable 12√K = 3.8 mm: outside tolerance. Spread equally over the 2 setups for the adjusted levels.

12. The Excel template

For working in Excel without the app, the Slope Calculator Excel template does the same calculation in formulas. Type the levels, chainages and interval in the yellow cells; the results, every station on round chainages (up to 501) with its level, and the crossfall follow. It has the project plate too. It gives the same numbers as the app, as in the examples above.

13. Questions and fixes

Windows says it protected my PC
The program isn't code-signed yet. Choose More info, then Run anyway. It comes from github.com/Asjad-Mehmood/Slope-calculator- and the product page shows its SHA-256.

The email code didn't arrive
Look in Spam or Junk, then press Send a new code. Codes are valid for a short time; the newest one counts.

The app says it can't reach exceltokml.com
You are offline or the connection is blocked. The calculator, reports and tools keep working once you have signed in; saving waits and is sent later.

I want my calculations on another device
Save them under Saved, then sign in with the same account on the other device and open them.

The text is too small or too large
Use A− / A+ at the top or Settings → Text size; the app also follows your computer's or phone's text size.

How do I uninstall it?
Windows Settings → Apps → Slope Calculator → Uninstall. Your account and saved calculations stay on exceltokml.com.

Questions or ideas? Write to us. Slope Calculator 1.0.2 · © 2026 Excel to KML.