

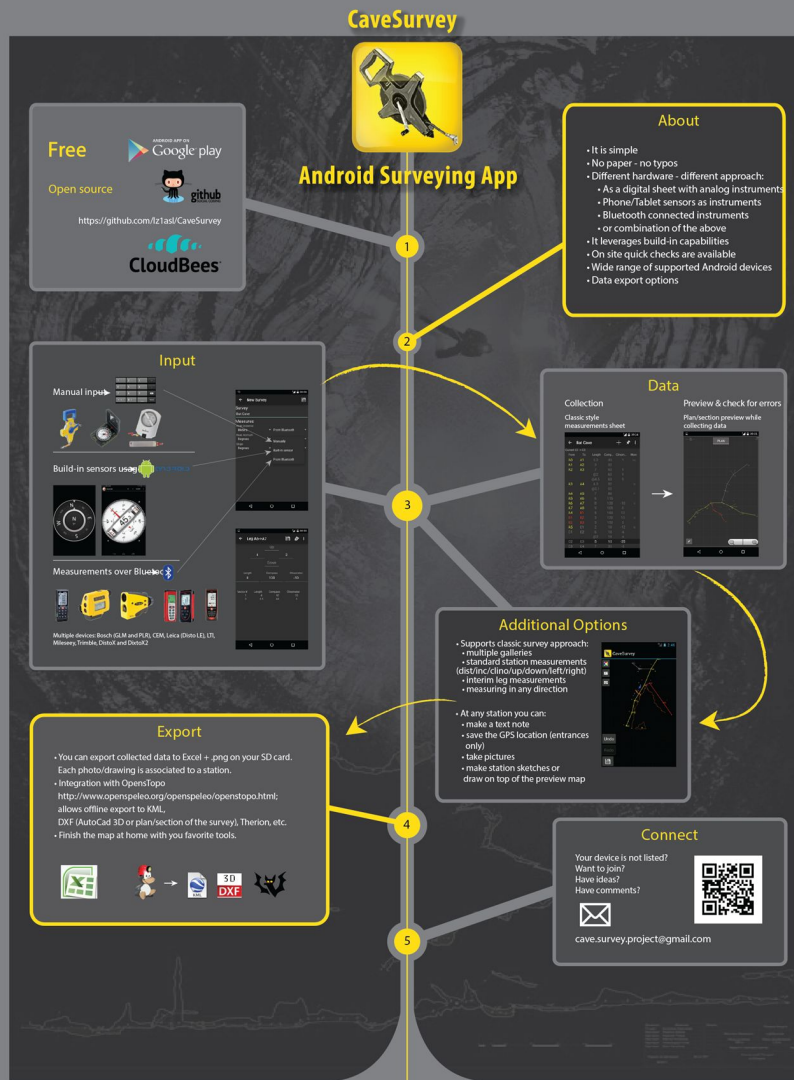


# CaveSurvey Project

Surveying caves with common hardware



# About



# Android devices

Huge variety of Android 2.1+ devices:

- My oldest Android phone
- IPXX protected
- Screen size and sensitivity (wet!)
- Bluetooth version
- Sensors
- SD card used on older versions
- etc...

# Using Analog Devices

## Classic surveying with middle points and l/r/u/d

← Leg A2->A3

Up

1 2

Down

Length	Compass	Clinometer
6	32	5

1 2 3

4 5 6 Следващ

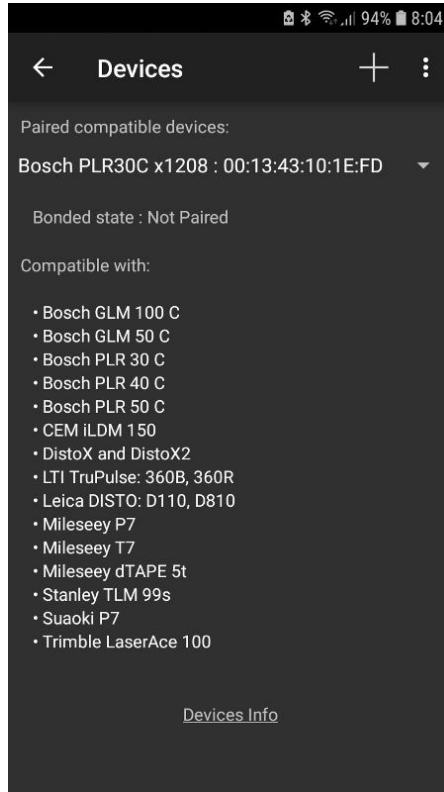
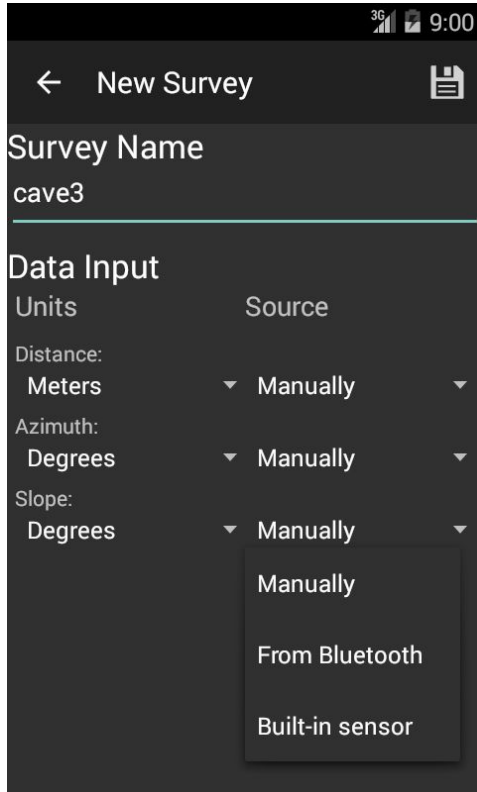
7 8 9 .

123 Sym 0

Bat Cave								
Current leg C1 -> C2								
From	To	Leng...	Com...	Clino...	More			
A0	A1	5	23	0	NPL			
A1	A2	4	12	2				
A2	A3	6	32	5				
A3	A4	6	23	3	N			
A4	A5	4	32	4				
A5	A6	8	21	6	V			
A3	B1	2	68	-10				
B1	B2	8	145	-6	S			
@3.5								
@5								
B2	B3	5	145	-3	P			
A4	C1	4	271	25				
C1	C2	3	310	14	S			

	A	B	C	D	E	F	G
1	From	To	Length - m	Compass -	Clinometer	Left	Right
2	A0	A1	5	23	0	1	3
3	A1	A2	4	12	2	1	1
4	A2	A3	6	32	5	1	2
5	A3	A4	6	23	3	1	1
6	A4	A5	4	32	4	1	2
7	A5	A6	8	21	6	1	3
8	A5	A5-A6-v1	2	45			
9	A5	A5-A6-v2	3	350			
10	A5	A5-A6-v3	4	150			
11	A3	B1	2	68	-10		
12	B1	B1-B2@3.5	3.5	145	-6	1	1
13	B1-B2@3.5	B1-B2@5	1.5	145	-6	1	2
14	B1-B2@5	B2	3	145	-6	1	1
15	B2	B3	5	145	-3	2	2
16	A4	C1	4	271	25		
17	C1	C2	3	310	14	1	1
18							
19							
20							
21							
22							
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26							
27							
28							
29							
30							
31							
32							

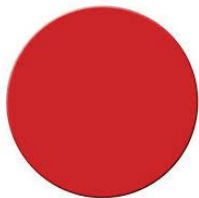
# Using Bluetooth Enabled Devices



# Devices:

Tested with 18+ measurement devices

- Price
- Protection
- Distance
- Reliability
- Heading
- Bluetooth Serial vs LE
- Inclination sensor
- Orientation sensor
- Availability (borrow, implement, emulate, return)



# Professional Devices

Trimble LaserAce 1000, LTI TruPulse 360B and 360R



# DistoX

DistoX1 and DistoX2





# Leica Disto's

Disto D810 Touch, Disto D110 and probably all other Disto's



# Bosch

All GLM(100C, 50C) and PLR (30C, 40C, 50C) devices, looking for the newest GLM 120 and 150 C



# Stanley

Stanley TLM99s

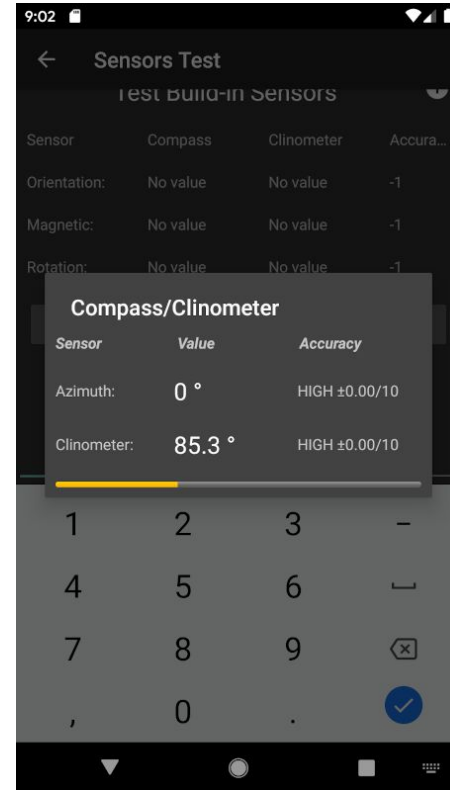
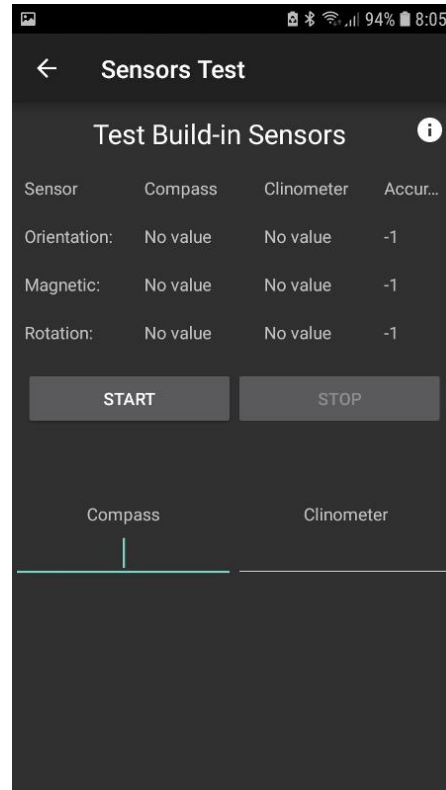
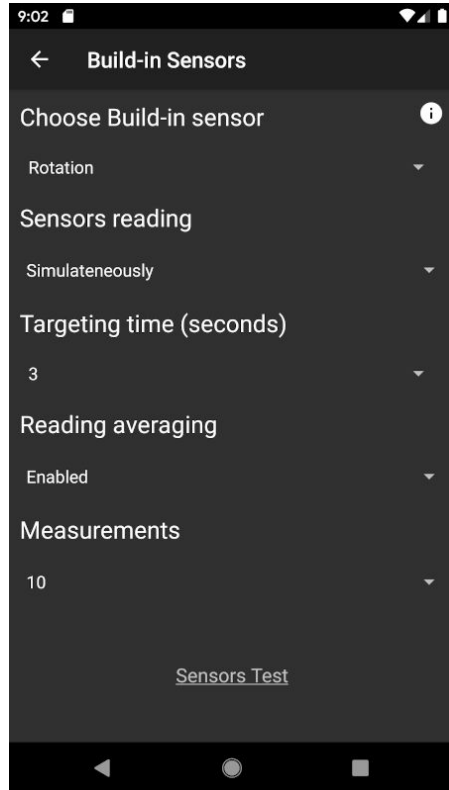


# Chinese brands

CEM (iLDM-150), Mileseeey (dTape 5t, P7, T7), Suaoki (P7)



# Android Internal Sensors



# Averaging

- Multiple measurements
- Await lowest deviation
- Filter out noise
- Average what's left
- Better ideas?

# Already with Device Underground

- Galleries
- Free vectors
- Entrance GPS location
- Text notes
- Photos
- Simple sketches
- 2D on site preview
- Backups
- Import
- Export to Excel + AutoCAD, KML, SVG, Therion (OpensTopo)

# Future

- Already nice foundation
- Improve sensors reading: camera heading + test triangles
- Drawings: become vector, easier sketching and better export
- Maintenance
- Full list: <https://github.com/lz1asl/CaveSurvey/issues>
- Get in touch



# Thank you

Questions please :)