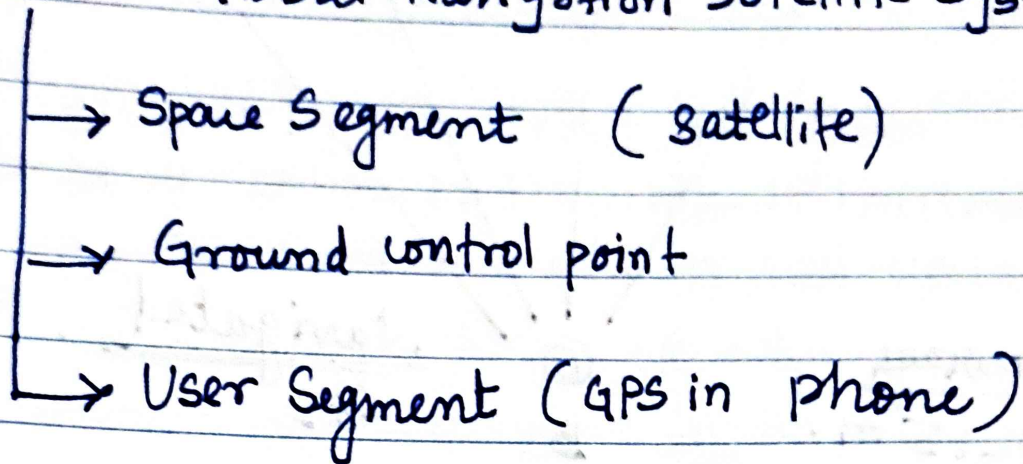


07-9-22

DGPS Training

GNSS - Global Navigation Satellite System



① Space segment

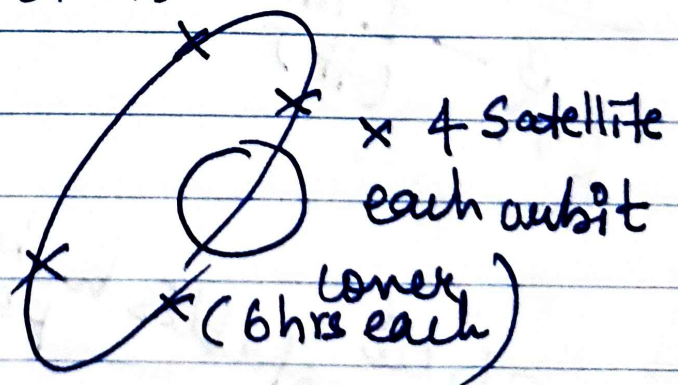
→ satellites

→ Rotate at X/F

GPS - Glonass - Galileo - Beidou

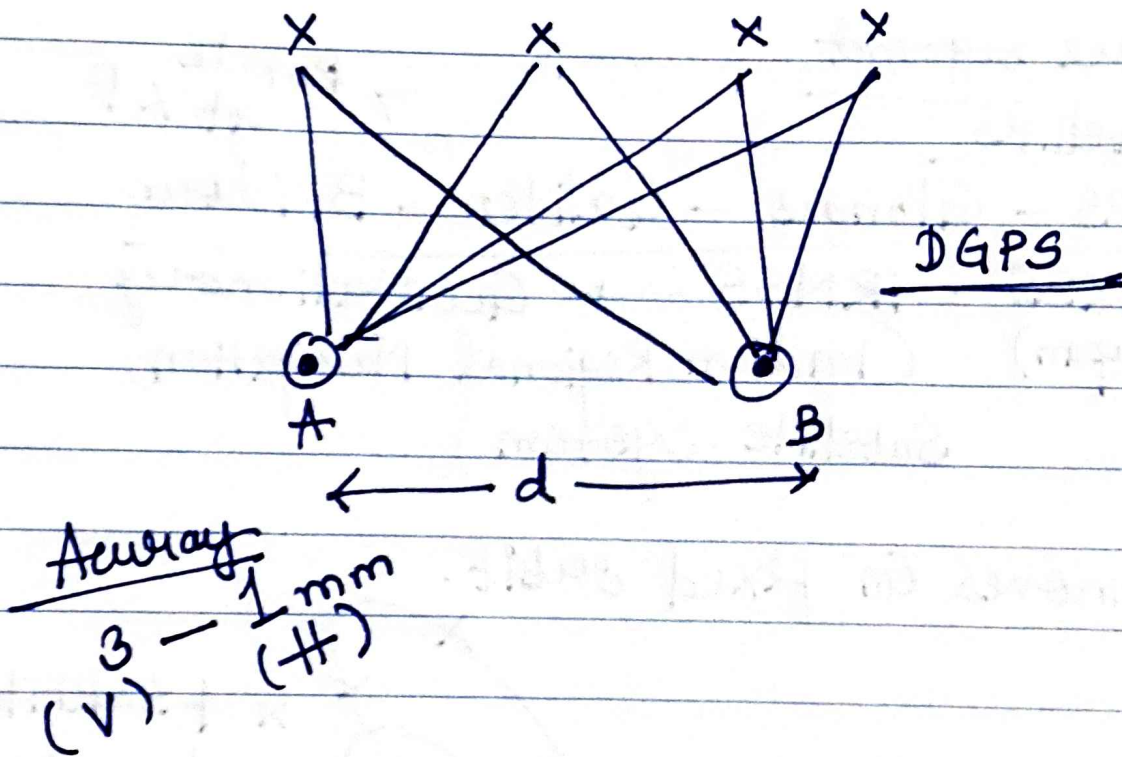
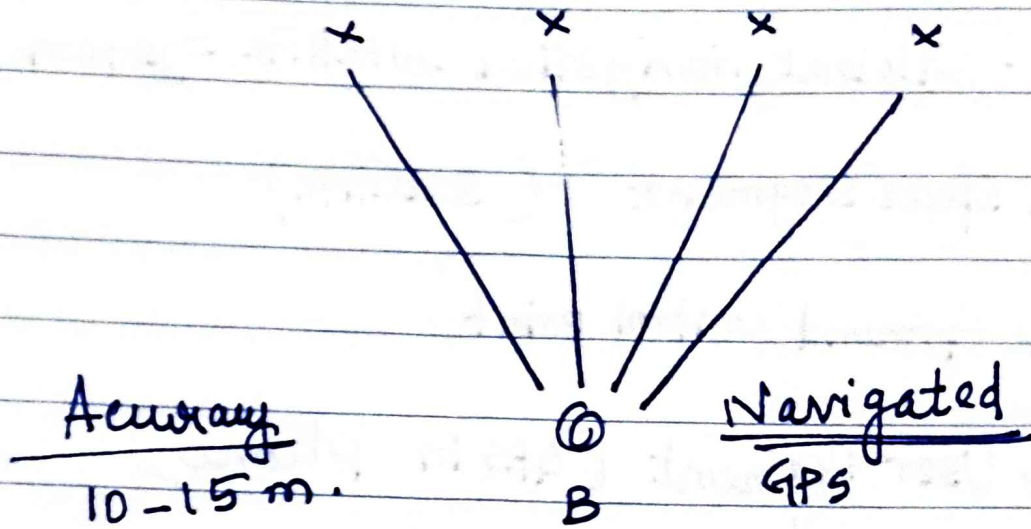
QZSS - IRNSS → Geostationary
(Japan) (Indian Regional Navigation Satellite System)

→ moves in fixed orbit.



→ satellite dist. from ground

20,000 - 35,000 km.

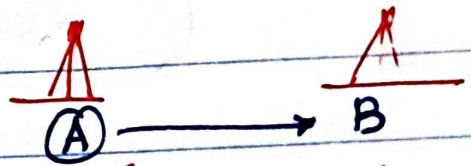


Static
 (first establish base point)
 ↓
Kinematic

② Ground control point

To correct the location from already corrected ground control point.

st



DGPS Working Procedure (w. ref to A, B. location is found)

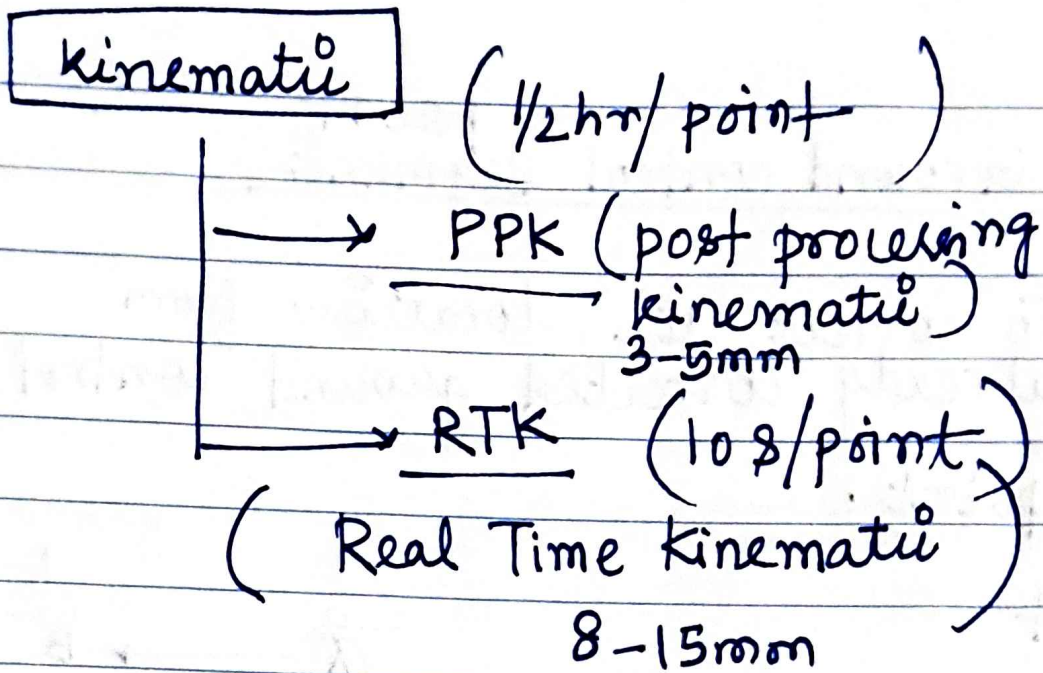
- 1. static \rightarrow fast ≤ 7 hr
- 2. kinematic \rightarrow long > 7 hr

static (point fixed) \rightarrow kinematic
procedure for static

Raw Data logging

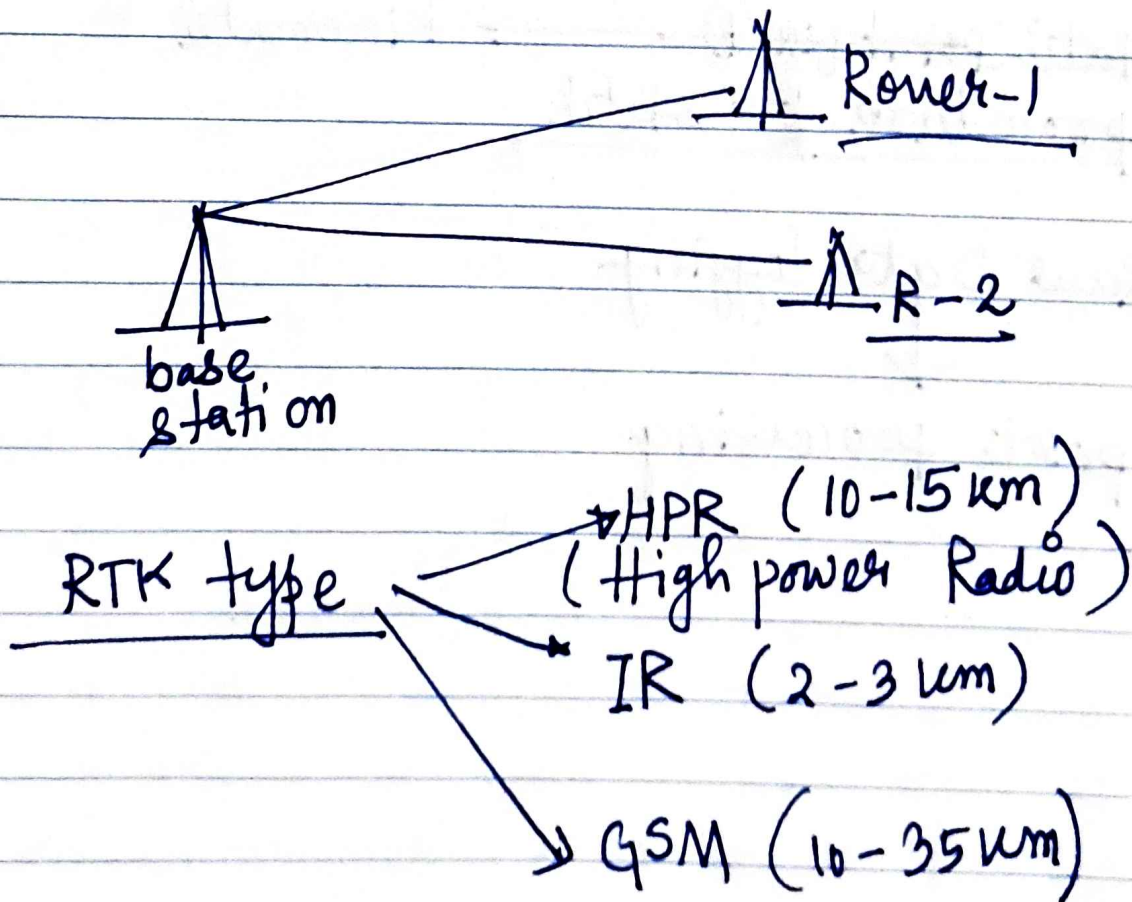


post processing



RTK

RTK is preferred as per point time is very less.

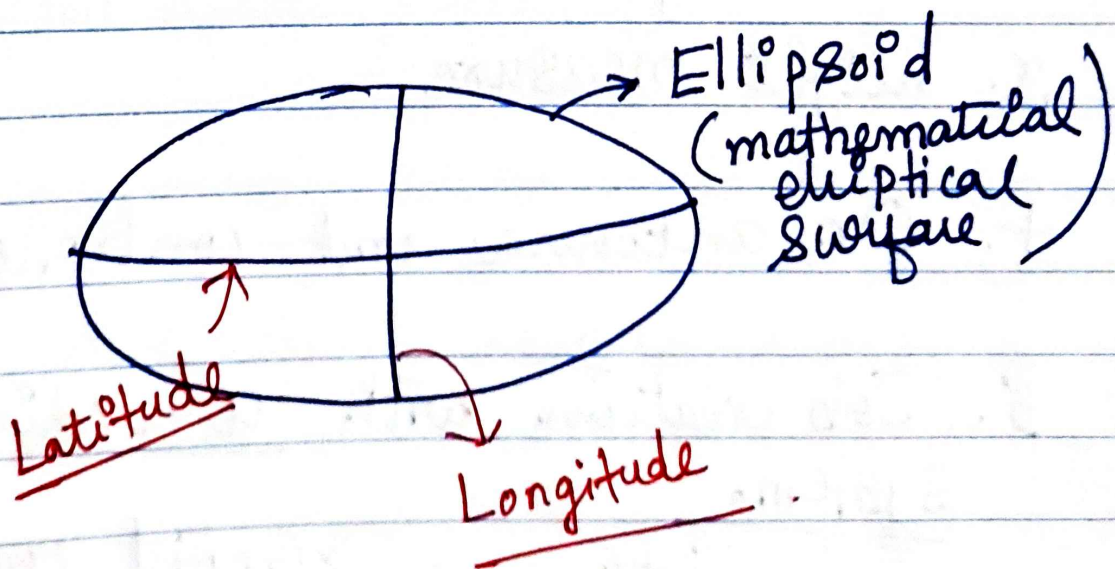
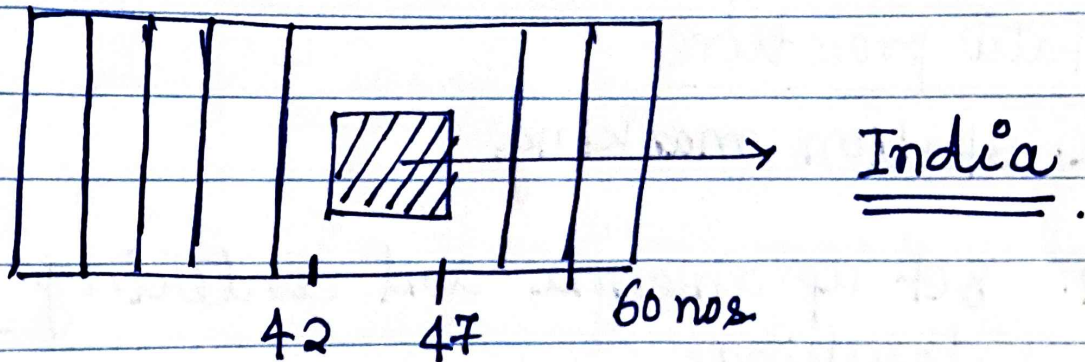


Co-ordinate

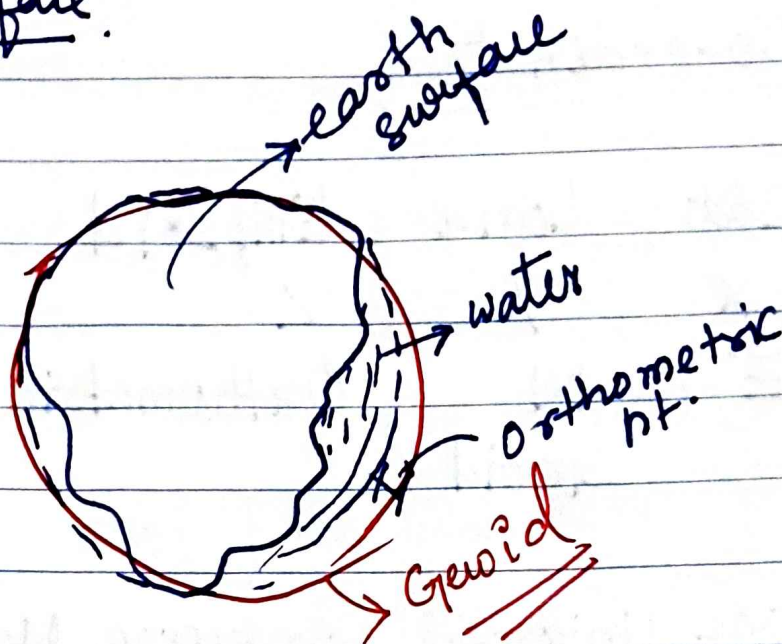
Lat	Long	Ellipsoid
X	Y	Z
E	N	Orthometric Ht.
	Geoid	

UTM - Universal Transverse Mercator

UTM zone

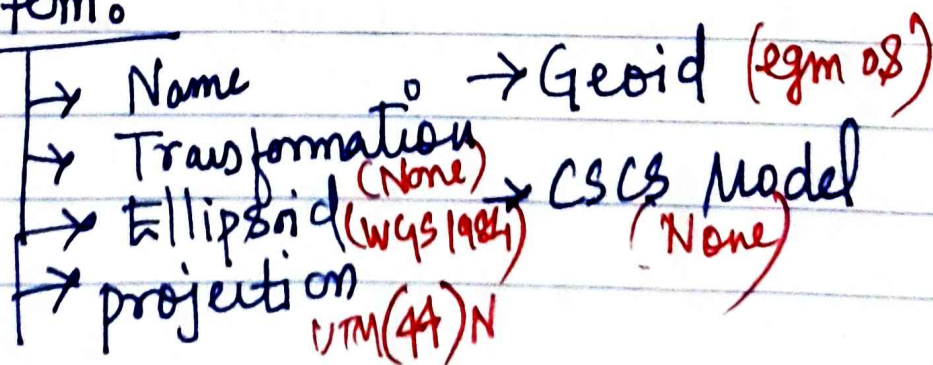


Geoid surface.



Statu procedure

1. station marking,
2. set up antenna and centering, levelling
3. height measure
4. On antenna and controller
5. Job creation with co-ordinate system.



CSCS - country specific co-ordinate system.

6. Bluetooth connection

(Settings → Connections →
GS connection wizard → Model →
GS ID → Bluetooth → SI No →
Search → finish)

7. Height input

(Setting → GS sensor →
Antenna Height → Type →
Height input)

8. Satellite

{ Settings → GS sensors → }
{ satellite }

9. Raw data

Settings → GS Sensors →
Raw data

Logdata on → GS Sensor

Login & → stati

Login start → on using
measuring app.

Log Rate → ~~10~~ 1 sec.

log data to → Leica format
(MDB)

10. Measure → Input point ID
(base)

→ click Measure → Yes.

Static data post processing

1/ Copy MDB data from SD card inside dbx folder and paste in PC.

2/ Open Infinity software.

3/ Co-ordinate system creation.
(File → Tools → Co-ordinate System → Manager) → Co-ordinate System Manager.

4/ Click on projection on top → properties → Input projection name (UTM44N) → Type UTM → Zone 44 → CM 81°E → Hemisphere N.

5/ click 'Create' & 'Apply'.

6/ Again click co-ordinate system on
↳ Top Menu.

7/ Co-ordinate system → Properties →

Name - WGS1984UTM44N →

Transformation - None → Ellipsoid -

~~WGS1984~~ → Projection - UTM44N

→ Geoid egmas → CSC None →

Create & Apply.

8/ Now close the co-ordinate system
manager.

9/ Create a new job.

↳ file → new project → put
project name & details.


10/ change 'unit' settings.

Angle \rightarrow DMS (0.01")

Lat/long \rightarrow DMS (0.00001")

11/ Click co-ordinate system \rightarrow
select created one.

12/ create \rightarrow home \rightarrow click import
& select Raw data \rightarrow click
import.

13/ click on inspector \rightarrow GNSS
 \rightarrow GNSS intervals \rightarrow  \rightarrow

Select base data \rightarrow come to

property grid \rightarrow change the
point role \rightarrow change the
point role to control. \rightarrow do the
necessary changes in base
station if required. \rightarrow Apply.

14/ Right click on base data →
make it reference → it changes
to Red.

15/ Right click on rover data &
make it rover → Green.

16/ Right click on mid screen →
click process

17/ Right click on process result →
store.

18/ Right click → Report → Summary.

19/ click background map (inside soft.)
kml format → Google Earth
(outside software)

① Summary Report of each point (1b & 10)

Right click on processing report result
Summary ← Reports →

② Point Quality Report (1b & multiple rows)

Click reports in home page →
point quality report.

③ Export in home page → All
→ select the output file type,

→ ASCII (CSV/TXT)

→ CAD (DWG/DXF)

→ Google Earth (KML/KMZ)

→ ESRI SHP (GIS)

↓
Export

↓
Give location.

Very Important

Survey procedure using DGPS

1. To start survey, make base, R-1, R-2 through static method.
2. Then make RTK base to any of three static point (static base, static R1 & R2), then move from point to point with R pole & do readings.

RTK procedure

BASE

① fix a control point.

② Set up RTK base on control point & do the centering & levelling.

③ Connect Radio arm & antenna, then measure height.

④ Switch on antenna & controller

⑤ Create a new job with co-ordinate system.

⑥ Click "Switch" to base on home screen.

⑦ Bluetooth connection

Setting → connections →
connect to GS base → Sensor-GS16
→ Bluetooth → search →
select sl. no → OK → OK

⑧ Radio Connection

Setting → connections →
all other connection → select
base RTK1 → edit →
click on checkbox → Transmit
RTK data →

⑧ connect using → GS Radio →
RTK data format → RTCM V3

→ click device → Select Satel

TR4 + → New → Name → base1

→ click outside → store → OK
→ OK → OK

⑨ Satellite configuration

Setting → gs base → Satellite

tracking → adrame → cutoff

angle 10° → OK

10 Antenna height

11 Base Setup

- base set up
- over known point
- over last setup
- over any point

★ click on over known point →

Input antenna height → Input
point value → store → OK.

★ For use this controller in other
tower, click tower otherwise
click base.

RTK Rover

1. Set up antenna on pole and attach the controller.
2. Connect Radio arm & antenna.
3. Switch on antenna and controller.
4. Create job with co-ordinate system.
5. Bluetooth connection

Setting → connection → GS connection
wizard → GS1b → Next →
Bluetooth → Next → select 81.
no → OK → finish

6. Radio Connection.

Setting → connection → all other
connection → GS connection
→ RTK rover → Edit →

Receive RTK data → connect
using GS Radio → data
format RTCM 103 → Receive
RTK network information ✓

→ Done → Satel TR4+ →
New → Rename Rover1 →
OK → OK → OK

★ Wait for few seconds for RTK
initialize

7. Satellite check.

Set Satellite → GS sensors →
Satellite →
Slope → None cutoff angle 10° →
2C - always → Satellite health →
→ automatic.

8. Antenna height.

Setting → GS sensor →
antenna height → Change Power
antenna type → antenna hit entry
→ OK.

9. Measure

10. Input point ID (Rover-I / Radio-I)

11. Click measure (wait for 10 sec →
stop → store)