RTK Setting Guide

Before proceeding to the following detailed guideline:

- 1. Confirm your RTK provider's **geographic coordinate system information**, which includes:
- Datum Information, which includes:
- Ellipsoid parameters (semi-major axis, flattening)
 - Origin (center of the ellipsoid)
- Orientation (alignment with the Earth)
- Coordinate System, which includes:
 - Angular units (degrees)
 - Prime meridian

Note: our RTK device records Latitude and Longitude information instead of Northing and Easting. Please make sure that you are receiving Lat Long from your RTK CORS.

- Confirm the **projection** of your interest: (Search for the projection in this website https://epsg.io/)
- You would need to have the projection EPSG information which includes parameters such as **central meridian**, **false northing and easting**, **latitude of origin**, and **scale factor**, etc.

Scenarios:

- 1. Transforming your point cloud data to the geographic coordinate system that is **the same as** your received signal from your RTK CORS provider.
- Transforming your point cloud data to the geographic coordinate system that is different from your received signal from the RTK CORS provider.

Scenario 1 (when source ellipsoid is the same as target ellipsoid):

In your RTK setting page on the Lixel Go app, set the rtk type and ellipsoid accordingly. If your RTK provider type is not shown in the dropdown list, choose "Custom". (For most of the times, if you are not located in Mainland China, you won't be able to use the provided RTK provider type in the dropdown list.)

Example 1.1 WGS84 to WGS84, project into UTM zone 2

For example, if you have received WGS 84 from your RTK provider and you would like to project your data to UTM zone 2.

Before scanning, you should set your RTK setting in Lixel go app to WGS84, and input your Port and Mountpoint.

		王浩博 7407		王海博707		TAOT IN A	
	王浩博 7407	<	E ANT R	ТК			
		Account	: Settings	Advance	d Settings	1077	
	王浩博 7407	Type Cu	istom 🗸	Elipsoid	NGS84 V		
		RTK Status D	isconnected		Fixed	1007 B	
	王浩博7407	Host	Host	Port	Port		
		王浩博 7407	Host	王浩博 7407	Ŧön	1407	
	王浩博 7407	Mountpoint			EXAMPLE AND		
		Username	Username			1007 朝	
	王浩博7407	Password	Password				
						博 7407	
	王浩博 7407						
				- 年港博 7407		1407	
	王浩博 7407		5 M 8 M				
			Set	ting		1497407	
	王浩博 7407		王浩博7407				
						1407	
	王浩博 7407		王浩博7407		王浩博 [40]		

After you have collected the data, in LixelStudio RTK setting, set the "source" and "source Ellipsoid" according to the real RTK information you received (in this case, WGS84).

Then, consult for UTM zone 2 parameters then enter them into the projection settings.

epsg.io	E powered by MapTile	王浩博了和小				Search
			EPSG:16002 UTM zone 2N			Share on: y p
			Attributes			Covered area powered by MapTiler 文
			Data source: EPSG EMM TAOT Revision date: 1995-12-02 EMM TAOT	Scope: Engineering survey, to Method: Transverse Mercator Area of use: Between 174°W a hemisphere between equator	pographic mapping and 168°W, northern and 84°N, onshore and	Arctic Ocean An Ruis
				Description: (0,) ^{(b) (b) TAOT}		Contra Dess Contra Dess Martine Contra Dess Ma
		UTM zo	ne 2 parameters			
			PROJECTION["Transve PARAMETER["latitude	e_of_origin",0],		
			PARAMETER["central_ PARAMETER["scale_fa PARAMETER["false_ea PARAMETER["false_no	meridian",-171], actor",0.9996], asting",500000], orthing",0]		

Then, at the projection parameters below, set them to the projection of your interest (in this case UTM Zone 2). In this way, you can project your point cloud into WGS 84 UTM zone 2.

	王浩開 ⁷⁴⁰⁷	RTK se	tting	K A CANANA AND AND AND AND AND AND AND AND AN
	C/古/带于407			書簡問 T ^{AOT} 王浩問 T ^{AOT}
	▼ Map1 Map	1 Available,Points:2256		王 ^{治64} 7 ⁴⁰⁷
	E波順 ⁷⁴⁰⁷			TAOT BURNET TAOT
	王浩博 7407	E BUT TAT	EBITAT	TOAT MUSE
	CHE MAT		10, Vitig	TOAT 附据于 1047 时 1047 时 1047 时 1047 日 1047
	王鸿187407		E.S. ^{10 TADT}	玉海 ^{16,7407}
		E ^{rbill 7407}	E/810 TAOT	
		Number of satellit	es 10 5	
	Coordinate transfo	rmation		1407 - Marine Marine 1407
	Source coordinat	▼ WGS84	Source ellipsoid:	WGS84
	Target coordinate	▼ WGS84	Target ellipsoid:	wgs84
	Projection type:	▼E7818 7407	Transverse Mercator	王海博 ⁷⁴⁰⁷
	Central meridian	-171.00000000000000000 >	Origin latitude: < 0.000	000000000000000 >
	False easting:	< 500000.00000000000 >	False northing: < 0.000	00000000000000 >
	Scale:	< 0.99960000000000044 ►		王海南北。
	Height fitting			王浩問「400
	Entry TAN Load parameters			1047 朝 _{唐语}
	X translation	X rotation:	Scale:	
	Y translation	Y rotation:		The second s
	2 translatior	Z rotation:		当 ^{(6) [740]} 王浩 ^{(6) [740]}
	王治博 7407		ancel	
Note: curr	ently, only these fo	ollowing four projecti	ion types are suppor	ted:
	F 時間 TAOT	T047 前述	下海博 7407	TOAT 問意志 T
	Gauss Kruger	projection(3)		TOAT 開点主
	Gauss Kruger	projection(6)		TOAT
	UTM			
	Entransverse M	ercator		王光州 7407

Example 1.2 GRS67 to GRS67

1047 副唐王 1047 [1047]

If you are recei	ving an RTK signal tl	hat is not on the dropdo	own list in the Lix	el Go app, for
example GRS 6	7: EVB10 7407			
GRS 67 (Geode	tic Reference System	n 1967)		
Semi-major Ax	is (a): 6,378,160 met	ers		
Inverse Flatten	ing (1/f): 298.25			

Usage: Used primarily in South America.

Before you collect the data, set the "Type" to "Custom" and set the ellipsoid to "NONE". Then enter your Port and Mountpoint.

	王浩博 7407		王浩博 740 ⁷		王浩博 7407		
		<	RT	ГК		浩博 7407	
	王浩博 7407	Accoun	t Settings	Advance	d Settings		
		Туре	ustom 🗸	Elipsoid	NONE 🗸	浩博 7407	
	王浩博 7407	RTK Status	isconnected	0	Fixed		
		Host	Host	Port	Port	浩博 7407	
	王浩博7407						
		Mountpoint			~	浩博 7407	
	王浩博 7407	Username	Username				
		Password	Password			浩博 7407	
	王浩博 7407						
						浩博 7407	
	王浩博 7407						
			Set	ting		浩博 7407	
	王浩博 7407		王浩16 7407	8			
						浩博 7407	
	王浩博 7407		王浩博 7407		王浩博7407		

And in Lixel Studio, set the source coordinate and source ellipsoid to "other". Then, set your target coordinate and target ellipsoid to "other" and set the projection information according to your need and proceed with project processing.

Note: whenever you choose "other" for source ellipsoid or target ellipsoid, you will be prompted to enter the ellipsoid's semi-major axis (a) and 1/f (where f is the ellipsoid flattening ratio). Please enter the correct a and 1/f value from your ellipsoid of interest at this step.

HDOP < 3.00	Ellipsoidal parameter $ imes$					Angle	▲ 20	王浩博 7407
Coordinate trans	a:	 6378 	8137.00	•				
王治(a 11)	1/f:	< 298.	257224000	0 ►				
Source coordina					ОК	0	ther	
Target coordinate 🔻	Other		王浩博7407	Targe	t ellipsoid: 🖪	1407 O	ther	

Scenario 2 (whenever source ellipsoid is different from target ellipsoid):

Whenever you received your RTK signal in one ellipsoid (for example WGS84), but you would like to project your point cloud to another ellipsoid (for example JGD2011), besides the projection information, you will also need to enter the seven parameters of Helmert transformation.

Example 2.1 WGS84 to JGD2011, project to Japan Plane Rectangular CS IX (EPSG:6677)

Before you collect the data, set the RTK type and ellipsoid information to Custom and WGS 84.



	王浩博 7407		E浩博 740 7		王浩博 7407			
		K	R	TK		法指博 7407		
	王浩博 7407	Account	t Settings	Advance	d Settings			
		Туре Си	ustom 🗸	Elipsoid	WGS84 ✓	法博7407		
	王浩博 7407	RTK Status D	isconnected	0	Fixed			
		Host	Host	Port	Port	法博7407		
	王浩博 7407	Mountpoint			王浩 ¹⁶ 7407			
						法博7407		
	王浩博 7407	Username	Username					
		Password	Password			法博7407		
	王浩博 7407							
						浩博7407		
	王浩博 7407		E/819 1407					
			Set	ting		浩博7407		
	王浩博 7407		E/8119 [40]					
						法遗情 7407		
	王浩博 7407		E浩博 7407		王浩博 7407			

When processing the data, set the target coordinates to JGD2011 and the target ellipsoid will be fixed to GRS80 by default.

Consult the EPSG website for projection parameters and input those parameters to LixelStudio

epsg.io[™] powered by MapTiler

		EPSG:6677				Share on:	9
		JGD2011 / Japan Plane Rect	tangular CS	IX	Transform	Get pos	ition on a map
		Available transformations to t	EPSG:4326 🔻	Selected transfor	mation	Covered area powe	ered by MapTiler ᡐ
		code 9936 (default) [3]		Method: Geocentric t domain)	ranslations (geog2D		
				Remarks:		Coirea a Tuath Coirea a Deas Gi	appone
				Information source:	OGP	The state	+.
				Revision date: 2021-1	2-30	Kong	
		Attributes				Philippines © MapTiler (OpenStreetMap contribute
		Unit: metre	Scope	: Cadastre, engineering s	urvey, topographic	Center coordinate 17244.17 -491306.	s
		Geodetic CRS: JGD2011 35/8/16/1407	mappi	ing (large and medium sc	ale).	Projected bounds:	
		Datum: Japanese Geodetic Datum 2011	Remai CS IX (rks: Replaces JGD2000 / J CRS code 2451) with effe	apan Plane Rectangular ct from 21st October	-1881761.44 -2095 1921995.63 12726	056.7 89.51
		Ellipsoid: GRS 1980	王治师 72011.		王浩博 7407	WGS84 bounds:	
		Prime meridian: Greenwich	Area o (Exclue	of use: Japan - onshore - l des offshore island areas	Honshu - Tokyo-to. of Tokyo-to covered by	157.65 46.05	
	PROJCS	5["JGD2011 / Japan P	lane Red	tangular (CS IX",		
	GE	GGCS["JGD2011",					
		DATUM["Japanese_G	eodetic_	_Datum_2011	ι",		
		SPHEROID["GRS	1980",6	5378137,298	3.257222101	L],	
		TOWG584[0,0,0	,0,0,0,0	9]],			
		PRIMEM["Greenwich	",0,				
		AUTHORITY["EP	SG","890	01"]],			
		UNIT["degree",0.0	17453292	25199433,			
		AUTHORITY["EP	SG","912	22"]],			
		AUTHORITY["EPSG",	"6668"]]],			
	PF	ROJECTION["Transvers	e_Mercat	tor"],			
	P/	ARAMETER["latitude o	f origin	1",36],			
	PA	ARAMETER["central me	ridian",	139.833333	333333],		
	P/	ARAMETER["scale fact	or",0.99	9991.			
	P/	ARAMETER["false east	ing",01.				
	PL	RAMETER["false_nort	hing".0	7007			
	UN	<pre>NIT["metre".1.</pre>		王语博言的			
		AUTHORITY["EPSG"	"9661"11	1.			
	41	ITHORITY["EPSG" "667	11				

Then choose the correct Height fitting (GSIGEO2011).

Search

RTK setting		
▼ Map1 ⁰⁷ Map1 Available,Points:2256	王浩博 7407	
UT 王海崎 ^{TAOT} 王海崎 ^{TAOT} 王海崎 ^{TAOT} 王海崎 ^{TAOT}		
THERE AND THE BASE	王浩博 7407	
7047 附近王 7047 附近王 70		
王治师7407 王治师7407 王治师7407	王浩博 7407	
HDOP < 3.00 > Number of satellites < 10 > Angle < 20	•	
Coordinate transformation	王浩博7407	
Source coordinat VGS84 Source ellipsoid: VGS84		
Target coordinate JGD2011 Target ellipsoid: GRS80 Draiget ign type:	王浩博 7407	
Central meridian ◀ 139.8333333333330017 ► Origin latitude: ◀ 36.000000000000000000000000000000000000)OC ►	
False easting: 0.00000000000000000000000000000000000		
Scale: 0.99990000000000	The.	
Load parameters Calculation parameter	T015 -	
X translation 0 X rotation: 0 Scale: 1.000000000	王浩博	
Z translation 0 Z rotation: 0		
Cancel Ok	王河(117407	

Finally, load the seven parameters. Currently, the software supports files in txt or csv format. The data must include seven parameters, namely three translation parameters, three rotation parameters, and one scale parameter: Dx, Dy, Dz, Rx, Ry, Rz, Scale.

In this case, to tranform WGS84 to GRS 80, it should be a txt file with 0 0 0 0 0 0 1 inside. Or a csv file with 0,0,0,0,0,0,1 inside. You can just download this file attached below and load it to the RTK setting.

1 7p	arameters_	_Japan.txt				

Example 2.2 WGS84 to KGD2002, project to Central Belt 2010 (EPSG:5186)

Similar to the previous example, set the RTK type and ellipsoid information to Custom and WGS 84.

	王浩博 7407		王浩博 7407		王浩博 7407			
		<	R	ТК		已落槽 7407		
	王浩博 7407	Account	t Settings	Advance	ed Settings			
		Туре С	ustom 🗸	Elipsoid	WGS84 🗸	空浩博 7407		
	王浩博 7407	RTK Status	visconnected	0	Fixed			
		Host	Host	Port	Port	亚浩博 7407		
	王浩博 7407							
		Mountpoint			~	些浩博 7407		
	王浩博 7407	Username	Username					
		Password	Password			三语博 7407		
	王浩博7407							
						E浩博 7407		
	王浩博 7407							
			Set	tting		些浩博 7407		
	王浩博 7407		E:#19 [407					
						主造博 7407		
	王浩博7407		王浩博 T407		王浩博 7407			

When processing the data, set the target coordinates to KGD2002 and the target ellipsoid will be fixed to GRS80 by default.

Consult the EPSG website for projection parameters and input those parameters to LixelStudio

ensgio	8	
°P°8.	powered by MapTiler	

	EPSG:5186	
	KGD2002 / Central Be	elt 20'
	Available transformations	to
	Republic of Korea (South Korea) ,	accuracy
	Eiter TAOT	
	Attributes	
	Unit: metre 王浩博 74	
	Geodetic CRS: KGD2002	
	Datum: Korean Geodetic Datum 2	002
	Ellipsoid: GRS 1980	
	王浩博74	
PROJCS["KGD2002 / Central Be	elt 20
GEO	GCS["KGD2002",	tic D
	SPHEROTD["GRS 19	980".(
	TOWG584[0,0,0,0.	,0,0,0
	PRIMEM["Greenwich",	3,
		EPSG:5186 KGD2002 / Central Ba Available transformations Republic of Korea (South Korea), code 15831 (default) [3] Attributes Unit: metre Geodetic CRS: KGD2002 Datum: Korean Geodetic Datum 2 Ellipsoid: GRS 1980 PROJCS["KGD2002 / Central Ba GEOGCS["KGD2002, DATUM["Korean_Geodeti SPHEROID["GRS 19 TOWGS84[0,0,0,0] PRIMEM["Greenwich", 6

0

EPSG:4326 🔻

Selected transformation

Method: Geocentric translations (geog2D domain)

Remarks: Approximation at the +/- 1m level assuming that ITRF2000 is equivalent to WGS 84

Information source: OGP Revision date: 2023-07-17

Scope: Cadastre, topographic mapping.

Remarks: Legally mandated CRS from 2010-01-01. Replaces Korean 1985 / Central Belt, Central Belt Jeju, Modified Central Belt, Modified Central Belt Jeju (CRS codes 2097, 5168, 5174 and 5175) and KGD2002 / Central Belt and Central Belt Jeju (CRS codes 5181-82).

Covered area powered by MapTiler 얒

Share on:

Search



Center coordinates 337412.92 205430.25

Projected bounds: -219825.99 -442558.89 913114.23 877525.22

WGS84 bounds: 122.71 28.6 134.28 40.27

<pre>PROJCS["KGD2002 / Central Belt 2010",</pre>
GEOGCS["KGD2002",
DATUM["Korean_Geodetic_Datum_2002",
SPHEROID["GRS 1980",6378137,298.257222101],
TOWG584[0,0,0,0,0,0,0]],
PRIMEM["Greenwich",0,
AUTHORITY["EPSG","8901"]],
UNIT["degree",0.0174532925199433,
AUTHORITY["EPSG", "9122"]],
AUTHORITY["EPSG","4737"]],
<pre>PROJECTION["Transverse_Mercator"],</pre>
<pre>PARAMETER["latitude_of_origin",38],</pre>
<pre>PARAMETER["central_meridian",127],</pre>
<pre>PARAMETER["scale_factor",1],</pre>
<pre>PARAMETER["false_easting",200000],</pre>
<pre>PARAMETER["false_northing",600000],</pre>
UNIT["metre",1,
AUTHORITY["EPSG","9001"]],
AUTHORITY["EPSG","5186"]]

Then choose the correct Height fitting (KNGEOID18).

	RTK	setting	E1819 7407
▼ Map1	Map1 Available, Points: 2256		
	TOAT BURGE	-p	
		E1810 74	
HDOP 4 3.00	 Number of sat 	tellites 🔹 10 🕨	Angle < 20
Coordinate tra	ansformation		
Source coord	inat 🔻 WGS84 🕬	Source ellips	oid: ▼ WGS84 ^{-®19} ^{1A01}
Target coordi	nate 🔻 KGD2002	Target ellips	oid:
Projection typ	pe: 🔻	Transverse Mercato	pr
Central merid	lian 🖪 127.00000000000000	0C ► Origin latitude:	< 38.000000000000000000000000000000000000
False easting:	◀ 200000.00000000000	0C ► False northing:	< 600000.00000000000000000
Scale:	< 1.000000000000000000000000000000000000	OC ►	
🗹 Height fittin	g 🔻 KNGEOID18		
100 Load param		35751 ^{6 7407}	
X translation	0 X rotation:	0 Sc	ale: 1.000000000
Y translation	0 Yrotation:	0	
Z translatior	0 Z rotation:	0	
		3.34 TAU	

Finally, load the seven parameters. Currently, the software supports files in txt or csv format. The data must include seven parameters, namely three translation parameters, three rotation parameters, and one scale parameter: Dx, Dy, Dz, Rx, Ry, Rz, Scale.

In this case, to tranform WGS84 to GRS 80, it should be a txt file with 0 0 0 0 0 0 1 inside. Or a csv file with 0,0,0,0,0,0,1 inside. You can just download this file attached below and load it to the RTK setting.

🖬 7p	arameters_	Korea.txt				

Calculate parameters:

If you do not have the seven parameters, you can calculate them based on the control points (note these control points differ from the GCP you used for GCP transformation, see below for more details). Click "Calculate" to open the seven-parameter calculation interface.

		王浩博 7407	Parameter	calcula	tion		×
Source o Source o	coordinate (BLH)	584			_{≇2181®} 1401 Ta	rget coordinate(proj rget coord	ected coordinate
mport o	control point file:	1040		S. Martin	+	2.918	Ģ
name	Source B	Source L	Source H	王浩切 7407	Target N	Target E	Target Z
7407	I vie til		王浩博 7407		王浩博 7407	王海州 74	
Calcu	ılate Save	王浩烱 7407		Result		王浩博 7407	
name	X residual	^{***} Y residual	Z residual	X transla Y transla	tion	X rotation:	n
	王浩博7407	王浩博 7407		Z transla	tior	Z rotation:	王浩博 7407
7407	王浩博	407		Scale:	王鸿章 7407		
						Cancel	Ok

Click the "Import File" button to import the control point file needed for calculating the seven parameters. The file format supports ".csv" or ".txt" formats. The control points file should include: Point Name, Source coordinate Latitude (degrees:minutes:seconds) [e.g., 121:32:11.235], Source coordinate Longitude (degrees:minutes:seconds), Source coordinate Height, Projected Plane Coordinate Northing X, Projected Plane Coordinate Easting Y, and Projected Elevation Z. In other words, Lat Long and Height are measured in source coordinate, and Northing Easting and Elevation are measured in projection of your interest.

Note: At least three or more valid control points are required to ensure the effectiveness of the seven-parameter calculation. The specific data format is shown below. You can click the button next to it to download the template.

After importing the file, click "Calculate" to perform the seven-parameter calculation. Click "Save" and choose a save path to save the calculated seven parameters. After clicking "OK," the calculated seven parameters will be applied to the coordinate transformation.

						Paramete	er calculat	tion			×	
TOAT	Source	(BLH)							Target(G	Target(GAUSS PROJECTION)		
:	Source	coord	CGCS200	0 ~					Target co	ord XIAN80	·	
	Import control point file:				王浩博 1407	J:	/w				С.	
	1407				S.,	王浩博 7407		王浩博 7407				
	name	2	Src B		Src L	Src L Src H		get X	Target Y	Target H	_	
	J1 👘	022:		13:	:52:	1.77	249505		4875	0.74		
407	J3	022:	王浩18740	113:	:52	0.86	24951(王浩197407	4875(0	- ·	
	Calc	ulate	Save				Calculation	-31	Ry.	-12 ** **		
	name	e	dX		dY	dZ	Dy:	-41	Ry:	10	1	
	J1	0.0(-0.00		0.00	Dz:	-33	Rz:	22		
	J3	0.(0.00		-0.00	Scale:	1.00			王浩博 7407	
									Cano	cel OK		
		/		/		V MECTA	P 105000	2 ·				