

Permanent Reference Network



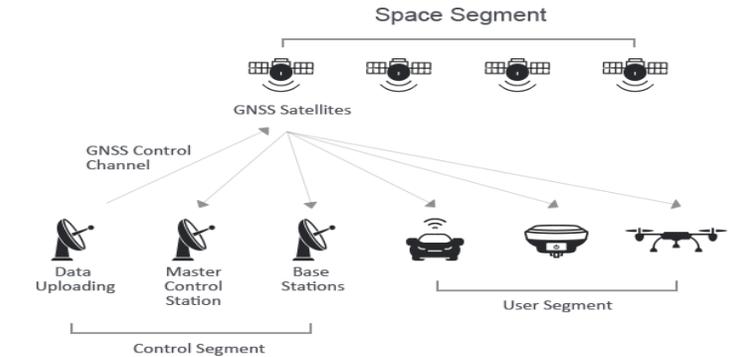
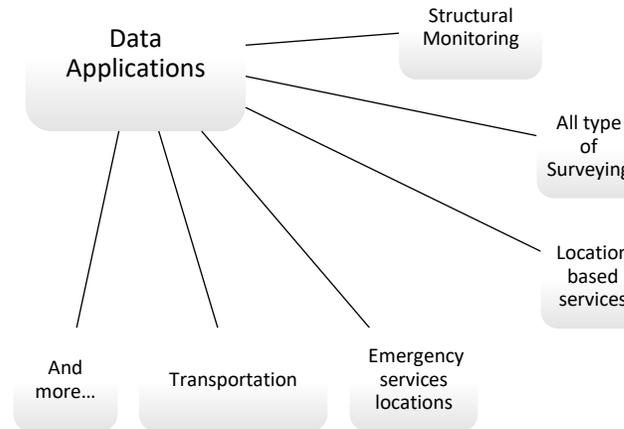
Permanent Reference Network (PRN) provides the geodetic basis for all surveying and engineering operations in Bahrain in that it is the Nation's official precise positioning service.

PRN comprises six (6) GNSS Reference Stations creating a network that covers all of the urban and development areas of the Kingdom. The six (6) reference stations are located at Diyar Al Muharraq, King Fahd Causeway, Scout Camp, Durrat Al Bahrain, Hawar Islands and Umm Al Hassam.

The PRN is available for private sector survey and engineering firms via a subscription to access the service.

Click [here](#) to download PRN registration form and email it to PRN@slrb.gov.bh

For further information about PRN Subscription and geodetic survey services please visit the [SLRB Website](http://www.slrb.gov.bh).



Access	Upon Request
Data Output	RINEX Data – 24Hr data tracking and archive RTK Solution and Transformation parameters
Data Currency	Real-time
PRN Reference Stations	6 GNSS Stations
Quality Assurance	One correction station
Subscription Fees	Annual (fees currently waived *Aug 2020)

Know your reference system

GEODETIC



Not all data is created equally. It is important that users know the coordinate reference system, projection and datum of each dataset being used particularly when importing or combining geospatial data.

National System of Measurement in Bahrain is Metric System (SI).

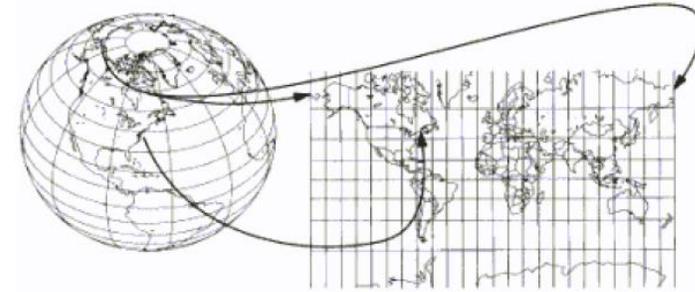
Meters are used for distance and square meters m² or square kilometers Km² for areas. Historically, Bahrain used the Imperial System (inches and feet) in 1969 and therefore, historical records up to that time may be represented in Imperial dimensions.

Reference Datum and Projection

The reference datum for all government mapping and cadastral surveys in Bahrain is the Ain Al-Abd (1970) Datum while the grid projection used in the Kingdom is the Universal Transverse Mercator (UTM) Zone 39.

Engineering design and construction sectors may use a Local Plane Coordinate System for their designs and construction lay-outs but will be required to submit the corresponding UTM 39, Ain Al-Abd Datum grid coordinates if their projects need government approval. Surveys to be approved by the Cadastral Survey Directorate, must use the Bahrain CSCS Model, a specialised map projection for the Cadastral Survey Directorate.

For surveys employing GNSS instruments, it is recommended that users must connect to the Bahrain Permanent Reference Network since the WGS84 (ITRF2005, to be precise) coordinates obtained can be easily transformed to Ain Al-Abd Datum and then projected to UTM Zone 39. Official transformation parameter sets are available to accomplish this task, however, users are advised to consult the "Guide for Using Projections and Datums in Bahrain" published by SLRB for proper usage of these parameters.



A reference datum is a mathematical model of the shape of the Earth and it can be a "local" or a global model. For example, the Ain Al-Abd Datum is a local reference datum while WGS84 and ITRF are global ones. A projection is basically the transformation of the spheroidal Earth (Latitude/Longitude /Ellipsoidal Height") into a flat sheet called a map (Easting/Northing) (refer to the diagram).

Primary Geodetic Infrastructure in Bahrain is the Permanent Reference Network (PRN) consisting of 6 high quality GNSS receivers distributed throughout the country. It aims to benefit engineering, construction, others survey and mapping activities, and all major infrastructure projects within the Kingdom. The PRN offers a precise RTK positioning service that can be accessed by an annual subscription. Registration can be done by contacting the SLRB Topographic Survey Directorate.

The coordinate reference frame of the PRN is ITRF05, Epoch 2005.0. This means that users will receive position coordinates in WGS84 (ITRF2005, to be precise) as their fundamental (a-priori) observed values. If users require the position coordinates in a different datum then a set of transformation parameters must first be computed and applied to those a-priori coordinates to have them properly referred to the user's intended datum. In case the survey results need to be reported in Ain Al-Abd 1970 Datum, the user may use any of the official published transformation parameter sets.