

**Revised Specifications for supply of GNSS Receiver, Antenna and Accessories  
against Tender No.57(73)2016-Pur/T-122, dated 26/12/2016**

**Specifications for GNSS instruments for permanent reference stations**

**(i) GNSS Receiver and Antenna (15 Nos.)**

**(A) GNSS Receiver:**

1. Multi-frequency GNSS receiver having internal/embedded/removable memory up to 4 GB. Should also have user selectable sampling rate in the range of 0.05 second to 30 seconds. The receiver should be capable of recording data at two sampling intervals simultaneously, so that the higher frequency data can also be retained within the receiver for a specified number of days (say, 3-7days).
2. The GNSS receiver should be able to accommodate met-package so that met data are automatically stored in binary file, and produces separate met file upon rinexing. The MET Interface should be directly configurable either over a Web Interface or Reference Station Software.
3. Should have total minimum 120 channels and should be capable of tracking all the signals of GPS, GLONASS and GALILEO.
4. Receiver should be equipped with display and/or control unit/panel. The receiver should be configurable for reference station monitoring with this unit without any external powered device.
5. Power Consumption: not exceeding 5 Watt (Receiver, Antenna, controller: nominal) with external Battery voltage in the range of 11-28 volts D.C.
6. Power Ports: Minimum two external power ports with automatic switching facility, A.C. mains supply adaptability, physical over-voltage protection and polarity protection (for DC). The power ports should not be connected internally. The receiver should support Power On Ethernet(POE).
7. Remote monitoring and online data down-loading capability directly through radio modem / telephone line/RS232 & ethernet. In-built GSM or radio module for real data transmission or alternatively external module of IP67 standard and powered from the same source which is used for the receiver. The external module should run on AC & DC (both powers) and all adapters should be supplied. This should be able to meet the requirement of power consumption detailed at S.No.5 above.
8. Data Ports: Minimum two ports, out of which one should have USB Port. It should be capable of supporting radio modem, telephone line, RS 232 port, RJ45 Ethernet, external memory devices. The receiver must be able to support met-package as well as data I/O using VSAT using onboard Network port, simultaneously.
9. Operating temperature range: - 40 deg. C to + 65 deg. C.
10. Should be waterproof (IP67), shockproof, dustproof, humidity-proof (100%) and condensation-proof.

11. All necessary OEM power, data cables, internal battery with charger, storage card, as required.
12. Automatic power-on and data-logging after power failure, with same configuration (should not restore to factory defaults).
13. Should be capable of tracking all available satellites to 0 degree elevation.
14. Vendors will be required to satisfy the following tests (for GPS data) for verification purpose:
  - (a) Quality Control Statistics (10-90 degree)
    - (i) Receiver must have (observations recorded/observations expected) > 99 %.
    - (ii) MP1 (Multi-path on L1) and MP2 values < 0.8 m
    - (iii) Not more than 1 cycle slip per 20,000 observations on an average; (total observations/total slips) > 20,000.
  - (b) Functionality in short baseline processing:
    - (i) L1, L2, L3 precision < 0.5 mm in N, E, 10 mm in vertical.

**(B) GNSS Antenna (15 Nos):**

1. Antenna should be separate from the receiver, and should be supplied with radome.
2. Repeatability of Antenna phase center variation with elevation angle (10 – 90 degree) should not be greater than 0.2 mm horizontal and 0.5 mm vertical (ref: NGS Report).
3. Multi-path reduction capability mechanism such that MP1 and MP2 values are less than 0.8 m for 10-90 degrees elevation angle (ref: TEQC software).
4. Geodetic grade, high gain (more than 20 dB) on all bands.
5. Operating temp range: - 40 deg. C to + 65 deg. C.
6. Should be waterproof, shock proof, dust proof, 100% humidity proof and condensation proof with IP66/67 ratings.
7. The antenna must be a “GNSS choke ring antenna with Dorne Margolin element (DM)” and should be capable of tracking GPS, GLONASS and GALILEO.

**(ii) GNSS Accessories (15 Nos):**

1. Antenna Cable operational without amplifier (length: 20 m).
2. Forced-centering device for accurate centering over the station mark, preferably SECO adapter.
3. Surge and lightning protectors:
  - I. DC-lightning arrester.
  - II. EMP Protector/surge arrester & capsule kit (GNSS antenna)
4. Spare supplies : Storage card (32 GB) – 1 Each

**Optional:**

Factory Training for 2 Persons for 5 Working days at OEM's premises.