

PROCEDURE FOR BECOMING AN EPN STATION

*EPN Central Bureau
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Changes

- May 26, 2021 Update links to web pages and alignment with revisited handling of stations metadata in M³G.
- May 8, 2019 Update links and introduce M³G.
- Jan 20, 2017 Use igs14.atx instead of igs08.atx.
- Dec. 18, 2013 Added http://offiler.demon.co.uk/~dave/gwv/gwv_list.cgi for checking multiple station 4-char IDs
- Jan. 17, 2013
 - Added <http://facility.unavco.org/data/gnss/sitecheck.php> for checking multiple station 4-char IDs
 - Updated revisited links
 - Clarifications in "Steps to be followed"
- Dec. 5, 2011 Candidate EPN stations must provide information on the national ETRS89 coordinates of the station
- Dec. 5, 2006 New EPN stations must have an antenna/radome with known absolute calibrations
Reflect new data flow.
- Sep. 08, 2004 Update "Procedure Summary"
- Dec. 01, 2003 Major document revision to reflect the current procedure used at EPN CB
- Apr. 22, 2002 IGS stations in Europe no longer automatically part of EPN
- Nov. 24, 2000 Update "Data Format, Flow and Archive"

This document describes the procedure to be followed by GNSS stations in order to be included in the EUREF Permanent Network (EPN). It is applicable to European GNSS stations of regional interest, and includes detailed steps to be taken by the responsible agency, in consultation with the EPN Central Bureau.

In addition to this document, candidate EPN stations should consult the "Guidelines for EPN Stations and Operational Centres" (https://epncb.oma.be/documentation/guidelines/guidelines_station_operationalcentre.pdf) in order to comply with the detailed station requirements with respect to monumentation, receiver, antenna, data handling, documentation, and data formats as described in this document.

GNSS stations wishing to join also the IGS network need to solicit separately their inclusion into this network (see "IGS New Site Checklist" at https://www.igs.org/wp-content/uploads/2020/12/IGS-Web-Proposing-New-Stations_2021.pdf).

All electronic messages, unless otherwise specified, should be sent to the EPN Central Bureau (CB) at epncb@oma.be.

1. Station Requirements

Make sure the station complies with the “Requirements for Permanent Stations” in the document “Guidelines for EPN Stations and Operational Centres”

https://epncb.oma.be/documentation/guidelines/guidelines_station_operationalcentre.pdf

Pay especially attention to guidelines for new stations.

2. Agency Responsibilities

Make sure you, or an associated agency, are capable of filling the “Requirements for Operational Centres” in the document “Guidelines for EPN Stations and Operational Centres”

https://epncb.oma.be/documentation/guidelines/guidelines_station_operationalcentre.pdf

3. Station List

Prepare the list of the GNSS stations that your agency wishes to include in the EPN. Use the RINEX 3 9-character identification code(s) consisting of a 4-character station identification code, followed by “00” and the 3-char ISO country code. The 9-char code will be used for all future reference to your stations (data and documentation) and will uniquely identify each station.

To prevent duplication, check for already used station identification codes at

<http://sopac.ucsd.edu/checkSiteID.shtml>

<https://gnss-metadata.eu/site/stations>

<ftp://igs-rf.ign.fr/pub/DOMES/codomes.snx>

4. Request a DOMES number for your station/marker from the International Earth Rotation and Reference Systems Service (IERS): https://itrf.ign.fr/domes_request.php.

5. EPN Commitment Letter

Stating the **long-term commitment** (at least 5 years) of your agency to operate the station following EPN Guidelines by completing the EPN Commitment Letter available from

<https://epncb.oma.be/documentation/guidelines/commitment.doc>.

Include the following information in the letter

- The 9-character identification code of the station(s) proposed for inclusion in the EPN.
- The approximative station coordinates and station location compared to other EPN stations.
- The collocated instruments (tide gauge, meteo sensor, seismometer, gravity,...).
- The connection to the national levelling network and UELN.
- The availability of national official ETRS89 coordinates (if available and if used for national reference frame densifications) of the station. Provide the station name and DOMES number, X-Y-Z coordinates, frame, epoch and the time since when these coordinates are in use. Specify also the responsible agency and persons (e-mail) maintaining the national ETRS89 coordinates.
- The current receiver and antenna/radome type using standard names from https://epncb.oma.be/ftp/station/general/rcvr_ant.tab. Indicate which GNSS constellations the receiver is tracking and if individual antenna/radome calibrations are available. If not, a type mean elevation and azimuth dependent absolute (robot) calibration from the IGS should be available in <https://files.igs.org/pub/station/general/igs14.atx>.
- The planned data flow (primary and secondary Data Centre) for daily and hourly RINEX data.

- If foreseen, the distribution scheme of the real-time RTCM data, e.g. through a local broadcaster or direct upload of the stream from the receiver to the regional EPN broadcasters;
- The station installation date and availability of historical data;
- The name of the Parent/Funding Organization, name and title of the Authorizing Official, name and title of the Primary Point of Contact, mailing address and phone/fax/e-mail should be included.
- The letter should be signed both by the Authorizing Official committing the organization/institution to the EPN and the Primary Point of Contact.

Email the signed document to the EPN CB and, if the signature is not digital, also send the original to

EPN Central Bureau
Dr. Carine Bruyninx
Avenue Circulaire, 3
B-1180 Brussels
Belgium

In case of doubt, the EPN CB will ask advice from the EPN Coordination Group (CG. As soon as the CG has made a decision, the EPN CB will inform the station Primary Point of Contact if the procedure can be continued.

6. Station metadata

The metadata of the EPN stations must be maintained on the “Metadata Management and Distribution System for Multiple GNSS Networks” (M³G) available from <https://gnss-metadata.eu/>. From M³G, all relevant information will automatically flow to the EPN Central Bureau.

Upon reception of the EPN Commitment Letter, the EPN CB will

- Indicate the station as a proposed EPN station on the web page <https://epncb.oma.be/networkdata/proposed.php>.
- Create (if not already existing) an account on M³G for the Operational Centre maintaining the station metadata (e.g. site log and station pictures).
- Inform the Primary Point of Contact indicated in the EPN Commitment Letter that he/she can start inserting metadata in M³G.

After this, the Operational Centre must login into M³G and, in the user dropdown menu, click on the following items:

- a) “My Agency”: verify/update its Agency Information. It is strongly recommended to set up the “Public central contact” and use this contact later on in the site logs in order for M³G to easily respect EU GDPR regulation.
- b) “Third-Party Agencies”: verify and add third-party Agencies (if any).
- c) “Manage Site Logs”:
 - Create the site log. This can be done on-line in M³G or off-line. Include the full observation history of the station/marker in the site log. Instructions are available from https://epncb.oma.be/ftp/station/general/site_log_instr.txt and <https://gnss-metadata.eu/site/faq>. Examples of EPN site logs can be retrieved from <https://epncb.oma.be/ftp/station/log/>.
 - Upload, validate and submit the station site log.

- d) *“Link to networks”*: optionally, propose the station(s) to a previously setup local or virtual network. The EPN Central Bureau will make sure that in M³G the station(s) will be proposed to the EPN network.
- e) *“License & Embargo”*: optionally (but strongly recommended), indicate the Creative Commons license to be used to distribute the data of each station. As EUREF uses an open data policy, only CC0 and CC BY 4.0 licenses are allowed for EPN stations. Also indicate the embargo period on the data: for EPN stations, the embargo time is mandatory set to ‘no embargo’.
- f) *“Manage Site Pictures”*: Upload station pictures of the antenna installation in the 4 cardinal directions or from relevant monuments, markers or collocated instruments.

In addition, the Operational Centre must, if available, send the **individual antenna calibration** values (in ANTEX format) for the antenna/radome installed at the station to the EPN CB.

7. EUREF Mail

Subscribe to **EUREF Mail** (instructions at <https://epncb.oma.be/newseventslinks/EUREFmail/>) to get news about latest developments within the EPN and updates about changes in EPN operation guidelines.

8. Provision of Hourly and Daily RINEX Data

Start the daily and hourly data flow and consult <https://epncb.oma.be/ftp/station/general/Help4EPNDataUpload.pdf> for detailed instructions in case the data are directly uploaded to the two regional EPN Data Centres at BKG and BEV. Information on accepted RINEX formats are provided in Section 3.2 “Format and Distribution of Hourly and Daily Data” of the document “Guidelines for EPN Stations and Operational Centres”

https://epncb.oma.be/documentation/guidelines/guidelines_station_operationalcentre.pdf.

In case the data are not directly uploaded to the two regional EPN Data Centres (BKG and BEV), **make sure that at the end, all hourly and daily RINEX data end up at the two regional EPN Data Centres.**

9. Provision of Real-time RTCM Data

If real-time RTCM data will be provided, contact the operator of each of the three EPN regional broadcasters (see column ‘Operator’ in https://epncb.oma.be/networkdata/data_access/real_time/broadcasters.php for contact info) to agree how the real-time data will be provided to their broadcaster and start the real-time data flow. Check the availability of the station real-time stream in the three broadcasters from http://epncb.oma.be/networkdata/data_access/real_time/status.php and take the necessary actions until the real-time data transfer runs smoothly.

10. Station Status in EPN

The EPN CB will monitor the status of the inclusion of the station into the EPN and update <https://epncb.oma.be/networkdata/proposed.php> regularly.

When the data quality, latency and consistency checks performed by the EPN CB are successful, the EPN CB will contact EPN Analysis Centres with the request to process the daily station data.

The EPN CB will announce through EUREF mail the integration of the station into the EPN as soon as at least three EPN Analysis Centres agreed to analyse the daily station data. From now on, the proposed EPN stations is officially included in the EPN.