

Site Log Validation Rules

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This document summarizes the site log validation rules applied by ROB for stations contributing to the EPN, EPN densification, of EPOS networks.

Background

The metadata of a GNSS station are exchanged using two international standard formats: the IGS-style site log format (<ftp://epncb.oma.be/pub/station/general/blank.log>) and the GeodesyML format (<http://www.geodesymml.org/>). Examples of site logs, resp. GeodesyML files can be found in <ftp://gnss-metadata.eu/station/log> and <ftp://gnss-metadata.eu/station/xml/>.

Depending on the international network to which a GNSS station belongs, the requirements for metadata in the site log or GeodesyML files can slightly change.

As a service to the GNSS community, ROB is maintaining two systems that allow to validate GNSS station metadata:

- <https://www.gnss-metadata.eu/>, running M³G (Metadata Management and distribution system for Multiple GNSS Networks): Registered agencies can validate and submit GNSS station metadata such as IGS-style site logs, information about local networks, DOIs, nominal data provision, licenses on the data, etc... M³G serves the EPOS (<https://epos-ip.org/tcs/gnss-data-and-products>), EPN (<http://epncb.oma.be/>), and EPN densification (http://epncb.oma.be/_densification/), GNSS networks. All submitted GNSS station metadata are stored in a central database at ROB and exported in site log and GeodesyML format (<ftp://gnss-metadata.eu/station/>).
- <http://epncb.oma.be/networkdata/sitelogfilevalidation.php>, which allows to check on-line the format of a GNSS site log file. It is intended as a service for GNSS stations that are not included in the EPN, EPN densification, or EPOS networks. The user has the option to choose between the validation rules used today in the EPN, EPN densification, or EPOS networks. The checked site logs are not saved at ROB.

Both systems above use a set of predefined rules for validating the metadata in the site logs, which are (because of the different focus of each GNSS network) not exactly the same for each network.

The following section gives an overview of the validation rules applied by ROB when ingesting site logs for stations contributing to the EPN, EPN densification, or EPOS networks.

Rules

Section numbers cannot be changed even if sections indicated below as 'optional' are skipped. Note that when optional sections are included, then some of the fields in these sections are required.

Site log header

SSSS⁽¹⁾ Site Information Form (site log)

International GNSS Service

See Instructions at:

ftp://igscb.jpl.nasa.gov/pub/station/general/sitelog_instr.txt

⁽¹⁾ Use 4-char or 9-char (recommended) site identification

Mandatory section

Mandatory section 0. Form	Format	EPN	EPN densification	EPOS
Prepared by (full name)	See (1)	required	required	required
Date Prepared	CCYY-MM-DD, see (2)	required	required	required
Report Type	See (2) and (4)	required	required	required
Previous Site Log	ssss_ccyymmdd.log or ssssssss_ccyymmdd.log	required ⁽⁴⁾	required ⁽⁴⁾	required ⁽⁴⁾

(1) When using M³G: name must be known as a User Agency contact

(2) When using M³G: field is completed automatically.

(3) Select from NEW or UPDATE.

(4) Required only if **Report Type** is 'UPDATE'.

Mandatory section

1. Site Identification of the GNSS Monument	Format	EPN	EPN densification	EPOS
Site Name	--	required	required	required
Four Character ID	A4 uppercase, see (1)	required	required	required
Monument Inscription	--	optional	optional	optional
IERS DOMES Number	A9	required	recommended	recommended
CDP Number	A4 uppercase	optional	optional	optional
Monument Description	--	optional	optional	recommended
Height of the Monument	F6.3	optional	optional	recommended
Monument Foundation	--	optional	optional	recommended
Foundation Depth	F5.2	optional	optional	recommended
Marker Description	--	optional	optional	optional
Date Installed	CCYY-MM-DD	required	required	required
Geologic Characteristic	--	optional	optional	recommended
Bedrock Type	See (2)	recommended	recommended	recommended
Bedrock Condition	See (3)	recommended	recommended	recommended
Fracture Spacing	See (4)	recommended	recommended	recommended
Fault zones nearby	See (5)	optional	optional	recommended
Distance/activity	--	optional	optional	optional
Additional Information	--	optional	optional	optional

(1) Must correspond to first 4 characters of Site Identification in header

(2) Select from IGNEOUS/METAMORPHIC/SEDIMENTARY

(3) Select from FRESH/JOINTED/WEATHERED

(4) Select from 0 cm/1-10 cm/11-50 cm/51-200 cm/over 200 cm

(5) Suggested input: Select from YES/NO/Name of the zone

Mandatory section

2. Site Location Information	Format	EPN	EPN densification	EPOS
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City or Town	--	required	required	required
State or Province	--	recommended	recommended	recommended
Country	ISO 3166 country name	required	required	required
Tectonic Plate	See (1)	required	required	required
X coordinate (m)	Integer or float	required	required	required
Y coordinate (m)	Integer or float	required	required	required
Z coordinate (m)	Integer or float	required	required	required
Latitude (N is +)	+/-DDMMSS.SS	required	required	required
Longitude (E is +)	+/-DDDMMSS.SS	required	required	required
Elevation (m,ellips.)	F7.1	required	required	required
Additional Information	--	optional	optional	optional

(1) Select from AFRICAN/ANTARTIC/ARABIAN/AUSTRALIAN/CARIBBEAN/COCOS/EURASIAN/INDIAN/ JUAN DE FUCA/NAZCA/NORTH AMERICAN/PACIFIC/PHILIPPINE/SCOTIA/SOUTH AMERICAN

Mandatory section

3. GNSS Receiver Information	Format	EPN	EPN densification	EPOS
Receiver Type	See (1)	required	required	required
Satellite System	See (2)	required	required	required
Serial Number	A20	required	optional	optional
Firmware Version	A20	required	required	required
Elevation Cutoff Setting	Integer, [0-90]	required ⁽³⁾	recommended ⁽³⁾	recommended
Date Installed	CCYY-MM-DDThh:mmZ	required	required	required
Date Removed	CCYY-MM-DDThh:mmZ	required ⁽⁴⁾	required ⁽⁴⁾	required ⁽⁴⁾
Temperature Stabiliz.	none or F4.1 +/- F3.1	optional	optional	optional
Additional Information	--	optional	optional	optional

(1) Select from IGS table ftp://igs.org/pub/station/general/rcvr_ant.tab.

(2) Select from GPS+GLO+GAL+BDS+QZSS+IRNSS+SBAS.

(3) Value 0 is recommended.

(4) Only to be completed for equipment that has been removed. Date should be after **Date Installed**.

Mandatory section

4. GNSS Antenna Information	Format	EPN	EPN densification	EPOS
Antenna Type	See (1)	required ^{(2) (5)}	required ⁽³⁾	required ⁽³⁾
Antenna Reference Point	A20, See (1)	required	required	required
Antenna Serial Number	A20	required	required	optional
Marker->ARP Up Ecc.	F8.4	required	required	required
Marker->ARP North Ecc.	F8.4	required	required	required
Marker->ARP East Ecc.	F8.4	required	required	required
Alignment from True N	Integer, [0-360](in degrees)	required	optional	optional
Radome Type	See (4)	required ⁽⁵⁾	required	required
Radome Serial Number	--	optional	optional	optional

Antenna Cable Type	--	optional	optional	optional
Antenna Cable Length	Integer or float (in [m])	optional	optional	optional
Date Installed	CCYY-MM-DDThh:mmZ[Thh:mmZ]	required	required	required
Date Removed	CCYY-MM-DDThh:mmZ[Thh:mmZ],	required ⁽⁶⁾	required ⁽⁶⁾	required ⁽⁶⁾
Additional Information	--	optional	optional	optional

(1) Antenna type followed by radome type (last 4 positions of A20), both selected from IGS table

ftp://igs.org/pub/station/general/rcvr_ant.tab

(2) Antenna+radome calibrations should be available from ftp://epncb.oma.be/pub/station/general/epn_14.atx.

(3) Antenna calibrations should be available from ftp://epncb.oma.be/pub/station/general/epn_14.atx.

(4) Select from ftp://igs.org/pub/station/general/rcvr_ant.tab ; should be identical to radome type indicated in **Antenna Type**

(5) Radome type "UNKN" is not allowed.

(6) Only to be completed for equipment that has been removed. Date should be after **Date Installed**.

Optional section

5. Surveyed Local Ties	Format	EPN	EPN densification	EPOS
Tied Marker Name	--	required	required	required
Tied Marker Usage	(1)	recommended	recommended	recommended
Tied Marker CDP Number	A4 uppercase	optional	optional	optional
Tied Marker DOMES Number	A9	optional	optional	optional
Differential Components from GNSS Marker to the tied monument (ITRS) - dx (m)	Integer or float	recommended	recommended	recommended
Differential Components from GNSS Marker to the tied monument (ITRS) - dy (m)	Integer or float	recommended	recommended	recommended
Differential Components from GNSS Marker to the tied monument (ITRS) - dz (m)	Integer or float	recommended	recommended	recommended
Accuracy (mm)	integer or float	recommended	recommended	recommended
Survey method	(2)	required	recommended	recommended
Date Measured	CCYY-MM-DDThh:mmZ	recommended	recommended	recommended
Additional Information	--	optional	optional	optional

(1) Suggested input: Select from SLR/VLBI/LOCAL CONTROL/FOOTPRINT/etc

(2) Suggested input: Select from GPS CAMPAIGN/TRILATERATION/TRIANGULATION/etc

Mandatory/Optional section (1)

6. Frequency Standard	Format	EPN	EPN densification	EPOS
Standard Type	See (2)	required	optional	optional
Input Frequency	Integer or float MHz	required ⁽³⁾	required ⁽³⁾	required ⁽³⁾
Effective Date	CCYY-MM-DD/CCYY-MM-DD	required ⁽³⁾⁽⁴⁾	required ⁽³⁾⁽⁴⁾	required ⁽³⁾⁽⁴⁾
Notes	--	optional	optional	optional

(1) Mandatory section for EPN, Optional for EPN densification and EPOS.

(2) Select from "INTERNAL" or "EXTERNAL H-MASER/CESIUM/..."

(3) Only to be completed when **Standard Type** is "EXTERNAL"

(4) Removal date only to be completed if equipment was removed. Removal date should not be before installation date.

Optional section

7. Collocation Information	Format	EPN	EPN densification	EPOS
Instrumentation Type	(1)	required	required	required
Status	(2)	required	required	required
Effective Dates	CCYY-MM-DD/CCYY-MM-DD	required ⁽³⁾	required ⁽³⁾	required ⁽³⁾
Notes	--	optional	optional	optional

(1) Suggested input: Select from GPS/GLONASS/DORIS/PRARE/SLR/VLBI/TIME/etc

(2) Select from PERMANENT/MOBILE

(3) End date not required

Optional section

8. Meteorological Instrumentation	Format	EPN	EPN densification	EPOS
Humidity Sensor Model	--	required	required	required
Manufacturer	--	optional	optional	optional
Serial Number	--	optional	optional	optional
Data Sampling Interval	Integer (in [s])	recommended	recommended	recommended
Accuracy (% rel h)	Integer or float	recommended	recommended	recommended
Aspiration	(1)	optional	optional	optional
Height Diff to Ant	Integer or float (in [m])	required	required	required
Calibration date	CCYY-MM-DD	optional	optional	optional
Effective Dates	CCYY-MM-DD/CCYY-MM-DD	required ⁽²⁾	required ⁽²⁾	required ⁽²⁾
Notes	--	optional	optional	optional

(1) Suggested input: Select from UNASPIRATED/NATURAL/FAN/etc

(2) Removal date only to be completed if equipment was removed. Removal date should not be before installation date.

	Format	EPN	EPN densification	EPOS
Pressure Sensor Model	--	required	required	required
Manufacturer	--	optional	optional	optional
Serial Number	--	optional	optional	optional
Data Sampling Interval	Integer (in [s])	recommended	recommended	recommended
Accuracy	Integer or float (in [hPa])	recommended	recommended	recommended
Height Diff to Ant	Integer or float (in [m])	required	required	required
Calibration date	CCYY-MM-DD	optional	optional	optional
Effective Dates	CCYY-MM-DD/CCYY-MM-DD	required ⁽¹⁾	required ⁽¹⁾	required ⁽¹⁾
Notes	--	optional	optional	optional

(1) Removal date only to be completed if equipment was removed. Removal date should not be before installation date.

	Format	EPN	EPN densification	EPOS
Temperature Sensor Model	--	required	required	required
Manufacturer	--	optional	optional	optional

Serial Number	--	optional	optional	optional
Data Sampling Interval	Integer (in [s])	recommended	recommended	recommended
Accuracy	Integer or float (in deg C)	recommended	recommended	recommended
Aspiration	(1)	optional	optional	optional
Height Diff to Ant	Integer or float (in [m])	required	required	required
Calibration date	CCYY-MM-DD	optional	optional	optional
Effective Dates	CCYY-MM-DD/CCYY-MM-DD	required ⁽²⁾	required ⁽²⁾	required ⁽²⁾
Notes	--	optional	optional	optional

(1) Suggested input: Select from UNASPIRATED/NATURAL/FAN/etc

(2) Removal date only to be completed if equipment was removed. Removal date should not be before installation date.

	Format	EPN	EPN densification	EPOS
Water Vapor Radiometer	--	required	required	required
Manufacturer	--	optional	optional	optional
Serial Number	--	optional	optional	optional
Distance to Antenna	Integer or float (in [m])	required	required	required
Height Diff to Ant	Integer or float (in [m])	required	required	required
Calibration date	CCYY-MM-DD	optional	optional	optional
Effective Dates	CCYY-MM-DD/CCYY-MM-DD	required ⁽¹⁾	required ⁽¹⁾	required ⁽¹⁾
Notes	--	optional	optional	optional

(1) Removal date only to be completed if equipment was removed. Removal date should not be before installation date.

	Format	EPN	EPN densification	EPOS
Other Instrumentation	--	required	required	required

Optional section

9. Local Ongoing Conditions Possibly Affecting Computed Position	Format	EPN	EPN densification	EPOS
Radio Interferences	(1)	required	required	required
Observed Degradations	(2)	required	required	required
Effective Dates	CCYY-MM-DD/CCYY-MM-DD	required ⁽³⁾	required ⁽³⁾	required ⁽³⁾
Additional Information	--	optional	optional	optional

(1) Suggested input: Select from TV/CELL PHONE ANTENNA/RADAR/etc

(2) Suggested input: Select from SN RATIO/DATA GAPS/etc

(3) End date only to be completed if disturbance is finished. End date should not be before start date.

	Format	EPN	EPN densification	EPOS
Multipath Sources	(1)	required	required	required
Effective Dates	CCYY-MM-DD/CCYY-MM-DD	required ⁽²⁾	required ⁽²⁾	required ⁽²⁾
Additional Information	--	optional	optional	optional

(1) Suggested input: Select from METAL ROOF/DOME/VLBI ANTENNA/etc

(2) End date only to be completed if disturbance is finished. End date should not be before start date.

	Format	EPN	EPN densification	EPOS
Signal Obstructions	(1)	required	required	required
Effective Dates	CCYY-MM-DD/CCYY-MM-DD	required ⁽²⁾	required ⁽²⁾	required ⁽²⁾
Additional Information	--	optional	optional	optional

(1) Suggested input: Select from TREES/BUILDINGS/etc

(2) End date only to be completed if disturbance is finished. End date should not be before start date.

Optional section

10. Local Episodic Effects Possibly Affecting Data Quality	Format	EPN	EPN densification	EPOS
Date	CCYY-MM-DD/CCYY-MM-DD	required ⁽¹⁾	required ⁽¹⁾	required ⁽¹⁾
Event	(2)	required	required	required

(1) End date only to be completed if disturbance is finished. End date should not be before start date.

(2) Suggested input: Select from TREE CLEARING/CONSTRUCTION/etc

Mandatory section

11. On-Site, Point of Contact Agency Information	Format	EPN	EPN densification	EPOS
Agency	(1)	required	required	required
Preferred Abbreviation	--	required	required	required
Mailing Address	--	required	required	required
Primary Contact - Contact Name	--	required	required	required
Primary Contact - Telephone (primary)	--	optional	optional	optional
Primary Contact - Telephone (secondary)	--	optional	optional	optional
Primary Contact - Fax	--	optional	optional	optional
Primary Contact - E-mail	--	required	required	required
Secondary Contact - Contact Name	--	optional	optional	optional
Secondary Contact - Telephone (primary)	--	optional	optional	optional
Secondary Contact - Telephone (secondary)	--	optional	optional	optional
Secondary Contact - Fax	--	optional	optional	optional
Secondary Contact - E-mail ⁽¹⁾	--	required ⁽²⁾	required ⁽³⁾	required ⁽³⁾
Additional Information	--	optional	optional	optional

(1) When using M³G: Agency/Contact information is selected from pre-defined list which automatically fills other fields.

(2) Only required if **Secondary Contact – Contact Name** is filled

Mandatory section ⁽²⁾

12. Responsible Agency (if different from 11.)	Format	EPN	EPN densification	EPOS
Agency	(1)	optional ⁽²⁾	optional ⁽²⁾	optional ⁽²⁾
Preferred Abbreviation ⁽²⁾	--	required ⁽³⁾	required ⁽³⁾	required ⁽³⁾
Mailing Address ⁽²⁾	--	required ⁽³⁾	required ⁽³⁾	required ⁽³⁾
Primary Contact - Contact Name ⁽²⁾	--	required ⁽³⁾	required ⁽³⁾	required ⁽³⁾

Primary Contact - Telephone (primary)	--	optional	optional	optional
Primary Contact - Telephone (secondary)	--	optional	optional	optional
Primary Contact - Fax	--	optional	optional	optional
Primary Contact - E-mail ⁽²⁾	--	required ⁽³⁾	required ⁽³⁾	required ⁽³⁾
Secondary Contact - Contact Name	--	optional	optional	optional
Secondary Contact - Telephone (primary)	--	optional	optional	optional
Secondary Contact - Telephone (secondary)	--	optional	optional	optional
Secondary Contact - Fax	--	optional	optional	optional
Secondary Contact - E-mail	--	required ⁽⁴⁾	required ⁽⁴⁾	required ⁽⁴⁾
Additional Information	--	optional	optional	optional

(1) When using M³G: Agency/Contact information is selected from pre-defined list, which automatically fills other fields.

(2) To be completed only if any of the information in this section will be different from Section 11.

(3) Only required if **Agency** is filled

(4) Only required if **Secondary Contact – Contact Name** is filled

Mandatory section

13. More Information	Format	EPN	EPN densification	EPOS
Primary Data Center	--	required ⁽¹⁾	recommended	required
Secondary Data Center	--	recommended ⁽¹⁾	recommended	recommended
URL for More Information	--	optional	optional	optional
Site Map	--	optional	optional	optional
Site Diagram	--	optional	optional	optional
Horizon Mask	--	optional	optional	optional
Monument Description	--	optional	optional	optional
Site Pictures	--	optional	optional	optional
Additional Information	--	optional	optional	optional
Antenna Graphics with Dimensions	--	optional	optional	optional

⁽¹⁾ Select from <http://epncb.oma.be/ftp/center/data/>