

GNSS calibration of KRISS, NMIA and MSL receivers with respect to NIM G1 (1015-2021)

Summary

From June 2021 to December 2022, the National Institute of Metrology (NIM) conducted a trip to calibrate GNSS equipment owned by the Korea Research Institute of Standards and Science (KRISS), the National Institute of Metrology (NMIA) and the Measurement Standards Laboratory (MSL). The trip started and finished at the NIM, providing closure with respect to the NIM Group1 reference receiver IM06.

The operations and report of measurements are described in the [report by NIM](#).

- **Final results for the calibrated systems**

The INTDLY values of the receivers given in Table 1 have been computed by NIM based on the results of the Group 1 trip [1001-2020](#) for IM06 (GPS) and should not be updated to reflect later changes in the conventional INTDLY values of the reference receiver.

For a P3/E3/PPP UTC link A-B involving any Group 1 and any receiver in this trip, the uncertainty resulting from the calibration, $U_B(A-B)$, is computed as

$$U_B(A-B) = (U_{CAL0}^2 + \Delta U_{CAL}(A)^2 + \Delta U_{CAL}(B)^2)^{1/2} \quad (1)$$

where $U_{CAL0} = 2.5$ ns is the conventional Group 2 value, and where ΔU_{CAL} (generally zero) is specified for each system.

Changes in the set-up of the receivers after the calibration must be accounted for as described in section A.3.6 of the most recent Calibration guidelines in <https://webtai.bipm.org/ftp/pub/tai/publication/gnss-calibration/guidelines/>.

Table 1. Final C1/P1/P2 INTDLY values from the 1015-2021 exercise. Values of REFDLY and CABDLY during the calibration are also indicated for reference. All values are in ns date in YYYY/MM/DD format. “Meas. Date” refers to the first day of the differential calibration, to which the calibration results can be applied. “Impl. Date” is the MJD when the results should be implemented in the receiver.

System	BIPM	Meas. date	INTDLY C1	INTDLY P1	INTDLY P2	REF DLY	CABDLY	Note	ΔU_{CAL}	Impl. date
KRP1	KRP1	2021/08/13	29.2	27.2	24.4	169.8	187.8		0.0	59976
KRG2	KRG2	2021/08/13	31.1	31.0	26.0	111.6	182.6		0.0	59976
AU04	AU04	2021/09/14	215.5	211.7	213.3	337.2	2484.6		0.0	59976
AU05	AU05	2021/09/14	54.4	53.0	52.0	216.4	101.6		0.0	59976
AU06	AU06	2021/09/14	32.6	30.0	29.0	155.1	173.9		0.0	59976
MS01	MS01	2021/11/01	32.5	30.8	28.7	80.1	80.8		0.0	59976
NZ02	NZ02	2021/11/20	55.1	53.9	54.6	176.1	80.8		0.0	59976
NZ03	NZ03	2021/12/04	58.0	56.6	55.2	180.7	80.8		0.0	59976

Notes:

Version history

V1.0 2023/01/09: Publication of results from V1.0 of the NIM report.