

GNSS calibration of NMIJ receivers with respect to NICT G1 (1015-2022)

Summary

From March to June 2022, the National Institute of Information and Communications Technology (NICT) conducted a trip to calibrate GNSS equipment owned by the National Metrology Institute of Japan (NIMJ). The trip started and finished at the NICT, providing closure with respect to the NICT Group1 reference receivers NC4S and NC5S.

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

• Final results for the calibrated systems

The INTDLY values of the receivers given in Table 1 have been computed by NICT based on the results of the Group 1 trip [1001-2020](#) for NC4S and NC5S (GPS and Galileo) 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 <ftp://ftp2.bipm.org/pub/tai/publication/gnss-calibration/guidelines/>.

Table 1. Final P1/P2/E1/E5a INTDLY values from the 1015-2022 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	INTDLY E1	INTDLY E5a	REF DLY	CAB DLY	Note	ΔU_{CAL}	Impl. date
NMOD	NMOD	2022/04/19	261.5	260.9	276.5	-	-	50.6	234.1	(1)	0.0	59821
NMOE	NMOE	2022/04/19	31.3	29.0	27.9	31.3	30.8	23.8	281.1	(2)	0.0	59821

Notes:

- (1) Some ambiguities could not be resolved in the REFDLY measurement
- (2) Receiver autocompensating for the PPSIN internal delay

Version history

V1.0 2022/08/02: Publication of results from V1.2 of the NICT report.