

GNSS calibration of AOS and PL receivers with respect to PTB G1 (1012-2024)

Summary

From December 2023 to February 2024, the Physikalisch-Technische Bundesanstalt (PTB) conducted a trip to calibrate GNSS equipment owned by the Astrogeodynamical Observatory, Space Research Centre (AOS) and the Consortium of laboratories in Poland (GUM). The trip started and finished at PTB, providing closure with respect to the PTB Group1 reference receiver PT13. The operations and report of measurements are described in the [report by PTB](#).

- **Final results for the calibrated systems**

The INTDLY values of the receivers given in Table 1 have been computed by PTB based on the results of the Group 1 trip [1001-2022](#) for PTB (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](#).

Table 1. Final P1/P2/E1/E5a INTDLY values from the 1012-2024 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 P1	INTDLY P2	INTDLY E1	INTDLY E5a	REF DLY	CABD LY	Note	ΔU_{CAL}	Impl. date
PL_3	PL_3	2024/01/16	42.9	40.7	45.1	52.0	128.8	138.5		0.0	60675
PL_5	PL_5	2024/01/16	16.9	15.1	17.2	13.9	119.2	159.7		0.0	60675
AO_4	AO_4	2024/01/25	-11.7	-17.6	-9.5	8.2	-16.5	165.7		0.0	60675
AO_5	AO_5	2024/01/25	31.6	23.6	32.9	26.7	73.0	104.6		0.0	60675

Notes:

Version history

V1.0 2024/12/20: Publication of results from V2.1 of the PTB report.