

Transfer of GPS calibration of the GUM receiver PL_3 (1301-2021)

Summary

In September 2021, the GNSS receiver PL_3 owned by the GUM in Warszawa (reporting under UTC acronym PL) was re-calibrated after a change of antenna. The Transfer of calibration was performed using the Group2 station AO_4 installed in AOS in Borowiec (Poland) as a stable reference. A very precise and stable optical link ELSTAB between AOS and GUM allowed “Direct calibration” between PL_3 and AO_4 at long distance.

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

- **Final results for the calibrated system**

The INTDLY values of the PL_3 receiver given in Table 1 have been computed by the GUM to ensure consistency with the results of the [1014-2018](#) Group 2 trip for PL_3.

For a P3/PPP UTC link A-B involving any Group 1 and PL_3, 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 $U_{CAL0} = 2.7$ ns is composed of the conventional Group 2 value (2.5 ns) and the uncertainty of the transfer (1.0 ns), and where ΔU_{CAL} (generally zero) is specified for each system. For UTC use, the ageing uncertainty will be based on the date of original calibration of PL_3 i.e. 2018/07/26.

For single frequency C1 links, U_{CAL0} is 2.6 ns but could be complemented by an additional component to represent systematic errors in the ionospheric model.

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 P1/P2/C1 INTDLY values from the 1301-2021 exercise. Values of REFDLY and CABDLY during the calibration are also indicated for reference (all values in ns). “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 C1	REFDLY	CABDLY	Note	ΔU_{CAL}	Impl. date
PL_3	PL_3	2021/09/29	-29.7	-31.8	-28.2	53.8	138.5		0.0	59516

Notes:

Version history

V1.0 2022/01/03: Publication of results from the GUM calibration report.