GPS transfer of calibration at NPLI (1201-2019)

Summary

In August 2019, the National Physical Laboratory, India (UTC acronym NPLI) conducted a transfer of calibration from its G2-calibrated GPS receiver LI2P to other receivers which calibration was lost after an upgrade.

The operations and report of measurements are described in the report by NPLI.

- **Final results for the calibrated systems**

The INTDLY values of the NPLI receivers given in Table 1 have been computed by NPLI based on the results of the 1013-2018 Group 2 trip for LI2P and should not be updated to reflect later changes in the conventional INTDLY values of the reference receivers.

For a P3/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

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

where U_{CAL0} = 2.8 ns at the time of transfer of calibration, is composed of the conventional Group 2 value (2.5 ns), the aging of the reference LI2P (1.0 ns) and the uncertainty of the transfer (0.7 ns), and where ΔU_{CAL} (generally zero) is specified for each system.

For single frequency C1 links, U_{CAL0} is 2.8 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 ftp://ftp2.bipm.org/pub/tai/publication/gnss-calibration/guidelines/.

Table 1. Final P1/P2/C1 INTDLY values from the 1201-2019 exercise. Values of REFDLY with respect to UTC(NPLI) and of CABDLY during the calibration are also indicated for reference. All values are 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
LIAA	LIAA	2019/08/06	**35.2**	**32.9**	**36.1**	96.7	132.9		0.0	58726
LIAB	LIAB	2019/08/06	**35.5**	**32.3**	**36.3**	96.5	132.2		0.0	58726
LITF	LIT4	2019/08/06	**-26.5**	**-26.9**	**-24.4**	15.1	142.2		0.0	58726

Notes:

(1)

Version history

V1.0 2019/08/27: Publication of results from the NPLI local differential calibration report, to be implemented in the NPLI receivers: