GPS calibration of MIKES receivers with respect to PTB G1 (1016-2019)

Summary

In December 2019, the Physikalish-Technische Bundesanstalt (PTB) conducted a trip to calibrate GNSS equipment owned by the VTT Technical Research Centre of Finland Ltd (UTC code MIKE). The trip started and finished at the PTB, providing closure with respect to PTB Group1 reference receiver PT13.

The operations and report of measurements are described in 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 1001-2018 Group 1 trip for PT13 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

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

where U_{CAL0} = 2.5 ns at the time of calibration, as given conventionally to Group 2, and where ΔU_{CAL} (generally zero) is specified for each system.

For single frequency C1 links, U_{CAL0} is 2.5 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 1016-2019 trip. Values of REFDLY with respect to UTC(k) 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
MI04	MI04	2019/12/24	**-39.0**	**-38.9**	**-34.4**	8.6	215.4		0.0	58881
MI05	MI05	2019/12/24	**20.2**	**18.2**	**22.7**	5.1	96.2		0.0	58881

Notes:

Version history
V1.0 2020/01/28: Publication of results from Issue 1.0 of the Calibration report, to be implemented in the receivers.