

# GNSS calibration of MBM receiver with respect to PTB G1 (1021-2021)

## Summary

In March 2022, the Physikalisch-Technische Bundesanstalt (PTB) conducted a trip to calibrate GNSS equipment owned by the Bureau of Metrology of Montenegro (UTC code MBM). The trip started and finished at the 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 system**

The INTDLY values of the receiver given in Table 1 have been computed by PTB based on the results of the Group 1 trip [1001-2020](#) for PT13 (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  $\Delta U_{CAL}$  (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 <https://webtai.bipm.org/ftp/pub/tai/publication/gnss-calibration/guidelines/>.

Table 1. Final P1/P2/C1/E1/E5a INTDLY values from the 1021-2021 exercise. Values of REFDLY and CABDLY used to compute calibration results 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	INTDL Y P1	INTDLY P2	INTDLY C1	INTDLY E1	INTDLY E5a	REF DLY	CAB DLY	Note	$\Delta U_{CAL}$	Impl. date
ME01	ME01	2022/03/04	-44.7	-45.7	-43.3	-43.9	-43.9	-75.7	146.3		0.0	59701

Notes:

(1)

Version history

V1.0 2022/04/15: Publication of results from V1.0 of the PTB report.