

GPS calibration of ESTEC equipment with respect to PTB G1 (1019-2016)

Summary

In February-March 2017, the PTB conducted a trip to calibrate GPS equipment owned by ESTEC. The trip started and finished at the PTB, providing closure with respect to PTB Group1 reference receiver PT02.

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

- **Final results for the calibrated equipment**

The INTDLY values given in Table 1 have been computed by PTB using INTDLY values of PT02 from the Group 1 trip [1001-2016](#). These INTDLY values should not be updated to reflect later changes in the conventional INTDLY values of PT02.

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

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

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.

Changes in the set-up of the receivers after the calibration must be accounted for as described in section A.3.6 of the Calibration guidelines v3.2 in [ftp://ftp2.bipm.org/pub/tai/publication/gnss-calibration/guidelines/](http://ftp2.bipm.org/pub/tai/publication/gnss-calibration/guidelines/).

Table 1. Final P1/P2 INTDLY values from the 1019-2016 trip. Values of REFDLY and CABDLY during the calibration and the resulting P3 Total delay TOTDLY are also indicated for reference (all values in ns).

System	BIPM	Date	INTDLY P1	INTDLY P2	REFDLY	CABDLY	Note	TOTDLY P3	ΔU_{CAL}
ES03	ES03	2017.2	48.9	46.8	195.0	187.4	(1)	44.5	0.0
ES04	ES04	2017.2	57.4	54.9	136.1	187.3	(1)	112.5	0.0
ES05	ES05	2017.2	159.0	159.2	0.0	0.0	(2)	158.7	0.0
ES06	ES06	2017.2	141.2	139.5	0.0	0.0	(2)	143.8	0.0
ES07	ES07	2017.2	108.9	106.8	0.0	0.0	(2)	112.1	0.0

Notes:

(1) REFDLY values measured before the calibration, corresponding to the calibration set-up.

(2) Results for ES05, ES06 and ES07 are Total Delay values (TOTDLY = INTDLY + CABDLY-REFDLY).

Version history

V1.0 2017/04/27: Final results from Version 1 of the PTB Calibration report, to be implemented in G2 receivers.