

# GNSS calibration of IPQ receiver with respect to ROA G1 (1017-2021)

## Summary

In June-July 2021, the Real Instituto and Observatorio de la Armada (ROA) conducted a trip to calibrate GNSS equipment owned by the Instituto Português da Qualidade, Lisbon (UTC laboratory IPQ). The trip started and finished at the ROA, providing closure with respect to the ROA Group1 reference receiver RO10.

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

- **Final results for the calibrated systems**

The INTDLY values of the receivers given in Table 1 have been computed by ROA based on the results of the Group 1 trip [1001-2020](#) for RO10 (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 1017-2021 exercise. Values of REF DLY and CAB DLY 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	INTDLY P1	INTDLY P2	INTDLY C1	INTDLY E1	INTDLY E5a	REF DLY	CAB DLY	Note	$\Delta U_{CAL}$	Impl. date
IP05	IP05	2021/06/19	<b>13.7</b>	<b>11.7</b>	<b>15.1</b>	<b>15.6</b>	<b>27.2</b>	-40.0	141.8		0.0	59486

Notes:

(1)

### Version history

V1.0 2021/09/02: Publication of results from V2.0 of the ROA report, to be implemented in IP05 as indicated.