

Time and Frequency, France, LNE (Laboratoire national de métrologie et d'essais)

Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
Quantity	Instrument or Artifact	Instrument Type or Method	Minimum value	Maximum value	Units	Parameter	Specifications	Value	Units	Coverage Factor	Level of Confidence	Is the expanded uncertainty a relative one?	Service provider	Comments	NMI Service Identifier
Time scale difference	Remote clocks vs. UTC(OP)	GPS common view method	1E-09	1	s	Averaging time	1 d	20	ns	2	95%	No	Service provided by the LNE-SYRTE	Supposes antenna coordinate uncertainty of 20 cm and does not take into account clock and GPS receiver stability Approved on 19 January 2009	2
Time scale difference	Local clock vs. UTC(OP)	Time interval counter	1E-09	1	s	Pulse amplitude	> 1 V	2	ns	2	95%	No	Service provided by the LNE-SYRTE	Approved on 19 January 2009	3
						Rise time	< 1 ns								
Time interval	Time difference source	Time interval counter	1E-09	1000	s	Pulse amplitude	> 1 V	2	ns	2	95%	No	Service provided by the LNE-LTFB	Approved on 19 January 2009	4
						Rise time	< 1 ns								
Time interval	Time difference source	Time interval counter	1000	86400	s			2	µs	2	95%	No	Service provided by the LNE-LTFB	Approved on 19 January 2009	11
Time interval	Time difference source: chronometer	Optical detection device and counter	10	864000	s			5	ms	2	95%	No	Service provided by the LNE-LTFB	Approved on 19 January 2009	12
Time interval	Time difference meter	Time interval source	1E-05	864000	s			200	ns	2	95%	No	Service provided by the LNE-LTFB	This concerns the calibration of time interval meters over specific time interval values, a programmable time interval source is used to generate time intervals Approved on 19 January 2009	13
Frequency	General frequency source	Clock and frequency offset multiplier and counter	0.1	10	MHz	Frequency	0.1 MHz, 1 MHz, 2 MHz, 2.5 MHz, 5 MHz, 10 MHz	6.0E-12	Hz/Hz	2	95%	Yes	Service provided by the LNE-LTFB	Approved on 19 January 2009	14
						Averaging time	10 s								
Frequency	General frequency source	Clock and counter	0.1	1.3E+09	Hz	Averaging time	100 s, 10 measurements	(8.5E-13 + 1.5E-06 / f), f frequency in Hz, values range from 1.5E-05 to 8.5E-13	Hz/Hz	2	95%	Yes	Service provided by the LNE-LTFB	Approved on 19 January 2009	16
Frequency	Remote frequency standard	GPS common views	1	1	Hz	Averaging time	1 d	1.0E-13	Hz/Hz	2	95%	Yes	Service provided by the LNE-LTFB	Approved on 19 January 2009	21

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Quantity	Instrument or Artifact	Instrument Type or Method	Minimum value	Maximum value	Units	Parameter	Specifications	Value	Units	Coverage Factor	Level of Confidence	Is the expanded uncertainty a relative one?	Service provider	Comments	NMI Service Identifier
Frequency	Local frequency standard	Clock and frequency offset multiplier and counter	5	5	MHz	Averaging time, t	$0.1 \text{ s} \leq t < 100 \text{ s}$	$(3.0E-13 + 2.7E-13 / t)$, t in s, values range from $3E-12$ to $3E-13$	Hz/Hz	2	95%	Yes	Service provided by the LNE-LTFB	Frequency instability measurement Approved on 19 January 2009	24
						Relative frequency difference	$< 1E-11$								
Frequency	Local frequency standard	Clock and frequency offset multiplier and counter	10	10	MHz	Averaging time, t	$0.1 \text{ s} \leq t < 100 \text{ s}$	$(3.0E-13 + 2.7E-13 / t)$, t in s, values range from $3E-12$ to $3E-13$	Hz/Hz	2	95%	Yes	Service provided by the LNE-LTFB	Frequency instability measurement Approved on 19 January 2009	31
						Relative frequency difference	$< 1E-11$								