

**Time and Frequency, New-Zealand, MSL (Measurement Standards Laboratory)**

Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty						NMI Service Identifier	Comments
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?			
Time scale difference	Local clock vs. UTC(MSL)	Timer interval counter	-1	+1	s	Amplitude	> 0.5 V (50 Ω)	2	ns	2	95%	No	1	Excluded DUT's effect Approved on 12 February 2008	
						Measurement time	10 s								
						Rise time	< 50 ns for 5 V								
Time scale difference	Local clock vs. UTC	Timer interval counter	-1	+1	s	Amplitude	> 0.5 V (50 Ω)	50	ns	2	95%	No	2	Excluded DUT's effect Postprocessed Approved on 12 February 2008	
						Measurement time	5 days								
						Rise time	< 50 ns for 5 V								
Frequency	Local frequency standard	Phase comparison	0.1	10	MHz	Measurement time	3 days	2E-13	Hz/Hz	2	95%	Yes	3	Excluded DUT's effect Approved on 12 February 2008	
						Amplitude	> 0.5 V (50 Ω)								
Frequency	General frequency standard	Direct frequency measurement	1	10	MHz	Gate time	100 s	1E-10	Hz/Hz	2	95%	Yes		Excluded DUT's effect Approved on 12 February 2008	
						Number of measurements	10								
						Amplitude	> 0.5 V (50 Ω)								
Frequency	Frequency counter	Frequency synthesis	1	40	GHz	Gate time	100s	1E-10	Hz/Hz	2	95%	Yes	4	Excluded DUT's effect Approved on 12 February 2008	
						Number of measurements	10								

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						Amplitude	-0.5 dBm to 10 dBm							
Time interval	Period source	Period measurement	0.001	1	s	Number of measurements	10	1	ns	2	95%	No	5	Excluded DUT's effect Approved on 12 February 2008
						Amplitude	> 0.5 V (50 Ω)							
Time interval	Time difference source	Direct time interval measurement	1.0E-07	86400	s	Trigger level	> 0.5 V (50 Ω)	2	ns	2	95%	No	6	Excluded DUT's effect Approved on 12 February 2008
						Number of measurements	10							
						Pulse rise time	< 50 ns for 5 V							
Time interval	Delay source	Direct time interval measurement	1.0E-07	86400	s	Trigger level	> 0.5 V (50 Ω)	2	ns	2	95%	No	7	Influence of DUT performance excluded Approved on 12 February 2008
						Number of measurements	10							
						Rise time	< 50 ns for 5 V							
Time interval	Period meter	Timer interval counter	1	1000	s	Trigger level	> 0.5 V (50 Ω)	1	ns	2	95%	No	8	Influence of DUT performance excluded Approved on 12 February 2008
						Number of measurements	10							
						Rise time	< 50 ns for 5 V							



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Time interval	Time difference meter	Timer interval counter	10	100000	ns	Trigger level	> 0.5 V (50 Ω)	2	ns	2	95%	No	9	Excluded DUT's effect Approved on 12 February 2008
						Number of measurements	10							
						Rise time	< 50 ns for 5 V							
Time interval	Delay source	Delay generator	10	100000	ns	Trigger level	> 0.5 V (50 Ω)	2	ns	2	95%	No	10	Excluded DUT's effect Approved on 12 February 2008
						Number of measurements	10							
						Rise time	< 50 ns for 5 V							