

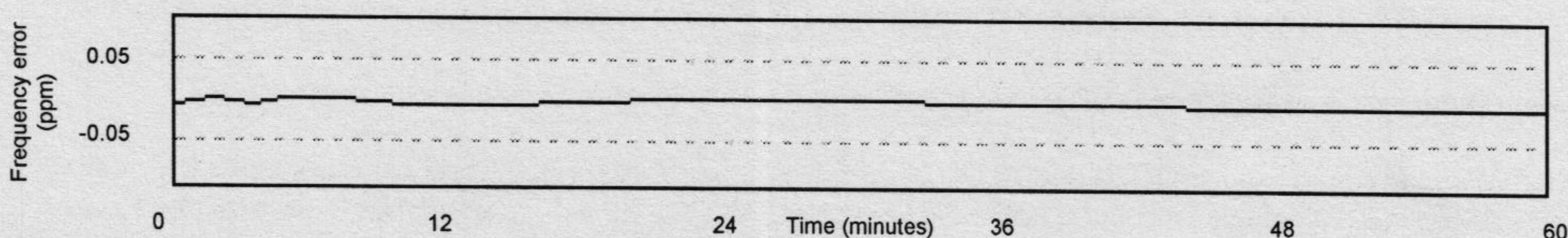
Product XL-80 laser
Serial number 10T025
Date of calibration 9th November 2017
Customer name Starrag USA, Inc.
Customer address 2379 Progress Drive., Hebron, KY 41048



Calibration certificate

Specification
Vacuum wavelength 0.6329905770 $\mu\text{m} \pm 0.05 \text{ ppm}$
Equivalent frequency 473612829.2 MHz

Measured values and uncertainties of calibration



Results	Value (MHz)	Value (ppm)
Laser frequency:	473612829.4	-
Laser frequency error:	0.2	0.000
Stability (peak-to-peak):	5.0	0.010
Maximum laser frequency error:	2.7	0.006
Uncertainty of measurement (95% confidence level, k=2):	± 5.9	± 0.01

Reference standards	Ref. no.	Lab	Certificate no.	Calibration date
Iodine stabilised HeNe laser	MTE/A197	NPL	2016050379-LL03	28 th June 2016
Frequency counter	MTE/A199	Nationwide	16-59021	6 th January 2017
Reference HeNe laser	XL80R-11	Renishaw	56H186-170725-00	25 th July 2017
Test procedure	PT-50285			

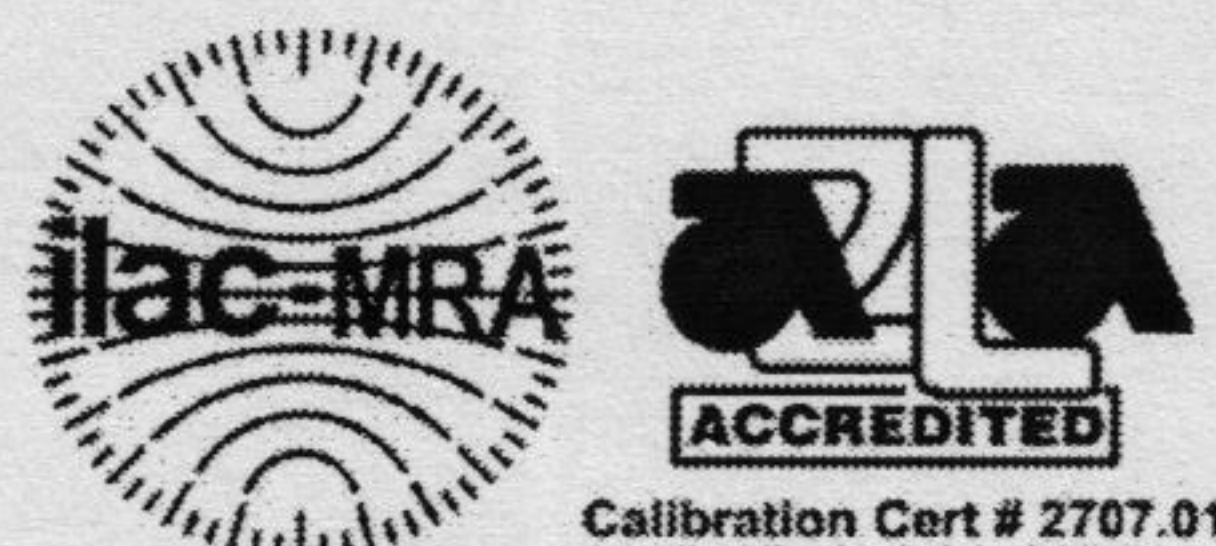
Laser measurement system accuracy: When a Renishaw XL-80 laser is used with a Renishaw XC-80 compensator and a Renishaw air temperature sensor (*all within specification*) the laser measurement system accuracy (95% confidence level, k=2) in linear measurement mode will be within: $\pm 0.5 \text{ ppm}$ (see the system manual for details).

Authorised signature	Signatory	Position	Issue date
	J. Pichon	Service Centre Manager	9 th November 2017

This certificate may not be reproduced other than in full, except with the prior written approval of:

Renishaw Inc
 1001 Wesemann Drive
 West Dundee
 IL 60118

Tel (847) 286-9953



Certificate number
 10T025-171109-00

L-9908-1146-05

CALIBRATED BY: *UMP* Date: 11-9-17