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CALIBRATION CERTIFICATE

ELECTRICAL INSTRUMENTATION CALIBRATION REPORT

DUE DATE: 31-Mar-06

This document that the instrument described below meets or exceeds all manufacturer specifications and has been compared to standards which are directly traceable to the National Institute of Standards and Technology.

Date:	31-N	1ar-05	Certificate #: 503319303E	SO#:	115185
Temp:	22	degrees C	Humidity: 23 %	Procedi	re: 140300-REVD
		_Instrumatic E del-S/N:II	Spanola, S.A. _1700 #330		
Calibrat	tion/Re	pair Remarks:	Replaced aging RAM battery.		
Parts (I	f Neede	ed): 1- 3.5V li	thium battery		

As Found Tolerance In	Out	As Found Readings	As Found Permissible Error	Applied Current	Adjusted Readings	Permissible Error
~		1.003 E-3	+/- 0.5%	1.000E-3	1.000 E-3	+/- 0.2%
~	(11)	1.003 E-4	+/-0.5%	1.000E-4	1.002 E-4	+/- 0.2%
~	le.	1.001 E-5	+/-0.7%	1.000E-5	1.000 E-5	+/- 0.2%
~	100	1.006 E-6	+/-1.0%	1.000E-6	1.000 E-6	+/- 0.2%
~		1.005 E-7	+/-1.0%	1.000E-7	9.98 E-8	+/- 0.5%
~		1.007 E-8	+/-1.0%	1.000E-08	1.000 E-8	+/- 0.5%
~		1.008 E-9	+/-1.0%	1.000E-09	1.002 E-9	+/- 0.5%
~		1.008 E-10	+/-1.5%	1.000E-10	1.000 E-10	+/- 1.0%

Tolerance after repair and/or calibration:

In: X

COMBINED NIST AND KEITHLEY TRANSFER UNCERTAINTY IS AS FOLLOWS: 1mA=+/-0.025%. 100uA=+/-0.025%, 10uA=+/-0.025%, 1uA=+/-0.025%, 10nA=+/-0.035%, 10nA=+/-0.065%, 1nA=+/-0.065%, 100pA=+/-0.25%

The above Instrument was compared to the Keithley Current Calibrator/Source Model 263 S/N 0730631 calibrated on 18Nov04.

Checked By: C Dumaine

"For authorized copies of this certificate please contact International Light, Inc."



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Date:	31-Mar-05	Certificate #: 503319304E	SO#: 115185
Temp:	22 degrees C	Humidity: 23 %	Procedure: 140300-REVD
	ed To: Instrumatic	Espanola, S.A. IL1700 #2338	
Calibrat battery.	ion/Repair Remarks	s: Repaired intermittemt LSD and	Display buttons, replaced aging RAM
Parts (If	Needed): 1- 3.5V	lithium battery.	

As Found Tolerance In		As Found Readings	As Found Permissible Error	Applied Current	Adjusted Readings	Permissible Error
~		1.000 E-3	+/- 0.5%	1.000E-3	1.000 E-3	+/- 0.2%
V		1.000 E-4	+/-0.5%	1.000E-4	1.001 E-4	+/- 0.2%
~		1.000 E-5	+/-0.7%	1.000E-5	1.000 E-5	+/- 0.2%
~		10.00 E-7	+/-1.0%	1.000E-6	1.000 E-6	+/- 0.2%
	~	9.80 E-8	+/-1.0%	1.000E-7	9.97 E-8	+/- 0.5%
V		9.90 E-9	+/-1.0%	1.000E-08	1.001 E-8	+/- 0.5%
V		9.90 E-10	+/-1.0%	1.000E-09	1.004 E-9	+/- 0.5%
~		9.90 E-11	+/-1.5%	1.000E-10	1.000 E-10	+/- 1.0%

Tolerance after repair and/or calibration:

Out:

In: X

COMBINED NIST AND KEITHLEY TRANSFER UNCERTAINTY IS AS FOLLOWS: 1mA=+/-0.025%, 100uA=+/-0.025%, 10uA=+/-0.025%, 1uA=+/-0.025%, 100nA=+/-0.035%, 10nA=+/-0.065%, 1nA=+/-0.065%, 100pA=+/-0.25%

The above Instrument was compared to the Keithley Current Calibrator/Source Model 263 S/N 0730631 calibrated on 18Nov04.

Calibrated By: Robert Four

Checked By: C. Dumane

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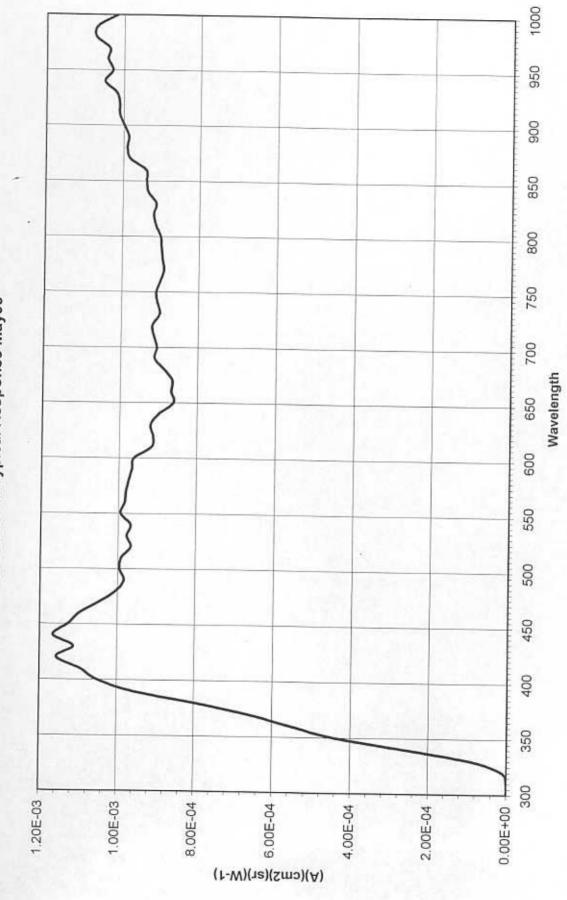


CALIBRATION CERTIFICATE

International Light certifies that the instrument described below has been compared with the laboratory working standards whose calibrations are traceable to the U.S. National Institute of Standards and Technology and whose procedures are in accordance with the requirements of ANSI/NCSL Z540-1-1994, ISO 10012-1:1992(E) and ISO/IEC Guide 25:1990(E).

Rendered-to: IN	STRUMATIC ESPANOLA S.A.		
Detector: SEI	0033 #4776	Input Optic:	R #415
Filter: F#1	6702	Misc.:	N/A
Spectral Response	(half power points):		
PRR) PEAK RADIANC	E RESPONSE SENSITIVITY FACTO	R AS CALIBRA	TED ON: 31-Mar-2005
8.58E-4 (A	(cm2)(sr)(W-1) assuming monochr	omatic radianc	e at 600nm
2.61% *Cl	nange In Sensitivity From Previous Cal	ibration Dated: 1	09-Oct-1996
Tolerance As Four	nd: In Out		
Unit will read directly in v Calibrated with II.1700 #2		n when used with	h an IL1700 and the Sensitivity Factor Above.
EALIBRATED WITH IL	1700 +5V BIAS: ON OFF		
REFERENCE PLANE: A	Average Field of Vision +/-0.75 Degrees	S	
*difference includes intri adjustments.	nsic detector change, NIST recertificati	on updates, lab c	experimental error or modifications to the hardware
J1023 - January 1997 - N	U.S. National Institute of Standards an IST Test No. 844/257423-96/2 D204 250nm=5%;250-400nm=1.0%;400-900	- January 1997	etector Response - NIST Test No. 844/257423-96/1 -1000nm=0.58%;1000-1100nm=2.93%
NTERNATIONAL LIGI L.#01,#02,#3275,#139,#	HT PRIMARY TRANSFER STANDAI 1490,U522,H627	RDS:	JAN 1998 - JAN 2008
L Transfer Uncertainty to	Customer = +/- 3.0 % plus NIS	Γ uncertainty abo	ove.
IGHT SOURCE: _15_Tu	ngsten Halogen/Reflectance Tablet	LAMP OUTP	UT: 1.078E-5 W/cm2/sr
NSTRUMENTATION;_	11. #04	PROCEDURE	227 1 T 1 (pre = 6) 2 PONE (CALL LIDE AND LIDE A
EMPERATURE: 25	degrees C	HUMIDITY:	26 %
ALIBRATED BY:		CHECKED BY	K. Orfrice
	libration Technician		QM Manager, Carlibrations
OR AUTHORIZED COPIES (E REPRODUCED EXCEPT I	OF THIS CERTIFICATE OR OTHER INFORM IN FULL, WITHOUT THE WRITTEN APPROV	ATION PLEASE RE AL OF INTERNATI	EFER TO THESE NUMBERS, THIS CERTIFICATE SHALL N IONAL LIGHT, INC.
Calibration Date: 31			FO/Sales Order #: 115185
L RECOMMENDS AN ANNU DEPENDING ON RESULTS	AL CALIBRATION CONFIRMATION INTERVA	AL INTERVALS OF	F CONFIRMATION MAY NEED TO BE ADJUSTED

SED033/F/R Typical Response May98





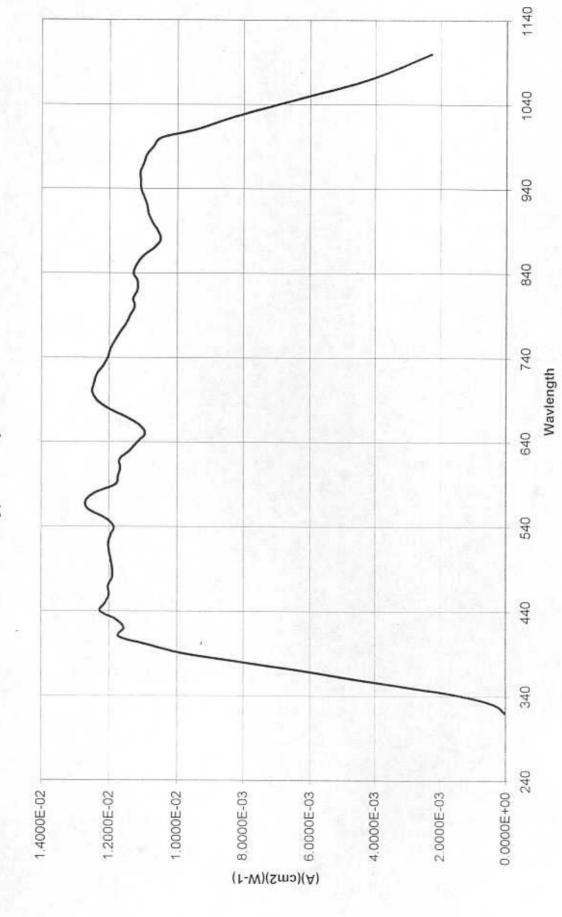
Rendered-to: INSTRUMATIC ESPANOLA S.A.

CALIBRATION CERTIFICATE

International Light certifies that the instrument described below has been compared with the laboratory working standards whose calibrations are traceable to the U.S. National Institute of Standards and Technology and whose procedures are in accordance with the requirements of ANSI/NCSL Z540-I-1994, ISO 10012-1:1992(E) and ISO/IEC Guide 25:1990(E).

Detector:	SED033 #4776	Input Op	ic: W #5	5599	
Filter:	F #16702	Misc.:	N/A		
35-57/19/04/5	esponse (half power points):	See Chart			
	50 • GOLDON SCHOOL SECTOR SOURCE				
IR) PEAK IRR	ADIANCE RESPONSE SENS	ITIVITY FACTOR AS CA	LIBRATEI	D ON: 31-Mar-2005	
,					
1.135E-	2 (A)(cm2)(W-1) assumir	ng monochromatic irradi	ance at 600	00nm	
11111111	2 (1)(0112)(111)	40 44 0 0.00 (2000-2004) (2000-244) (2014-2006) (2014-204-246)			
	42	to be used with an II	1700 and th	he Sensitivity Factor Above. Calibrate	ed with
	ectly in watts per square centin	neter when used with an it.	1700 and d	no gonina 179 Testi	
L1700 #2338.					
	WITH IL1700 +5V BIAS: ON				
DEEDENCE PI	ANE: Groove ONE formed b	ov filter or diffuser element	s and next e	element, counted from front surface of	assembly.
(ELEKEIVOL)		ž.			
		co. L. L. H. Troba	slam: Dates	etar Respanse	
[1.4~1] [1.4~1] [1.4.4] [1.4.4] [1.4.4] [1.4.4]	NDARD: U.S. National Institu	7477 0667 11704 - 19003	A 1331 - 141	131 1631 140. DATE - 14-	
N.I.S.T. Uncerta	inty: 200-250nm=5%;250-400	0.3=1.0%;400-900nm=0.3	1%;900-100	00nm=0.58%;1000-1100nm=2.93%	
	AL LIGHT PRIMARY TRAN				
IL.#01,#02,#327	75,#139,#1490,U522,H627			JAN 1998 - JAN 2008	
IL Transfer Unc	ertainty to Customer = +/-				
LIGHT SOURC	E: 1S Tungsten Halogen			: 3.49E-5 W/cm2	
INSTRUMENT	ATION: IL #04	The state of the s	EDURE:		
TEMPERATUR	RE: 25 degrees C		IDITY:	26 % Gruen	
CALIBRATED	BY:	7000000	KED BY:_	OA Manager, Calibrations	
	Calibration Technician				ATE SHALL
FOR AUTHORIZE	D COPIES OF THIS CERTIFICATE D EXCEPT IN FULL, WITHOUT TH	OR OTHER INFORMATION P IE WRITTEN APPROVAL OF IN	LEASE REFE ITERNATION	ER TO THESE NUMBERS. THIS CERTIFICA NAL LIGHT, INC.	NIE GRMLL
Calibration	Date: 31-Mar-05 Certific	cate No.: 503314423		FO/Sales Order #: 115185	
II DECOMMEND	S AN ANNUAL CALIBRATION CON	NFIRMATION INTERVAL. INTE	RVALS OF C	CONFIRMATION MAY NEED TO BE ADJUS	TED
DEPENDING ON	RESULTS OF PRECEDING CALIE	SKATIONS.			

SEL033/F/W Typical Response November 2001



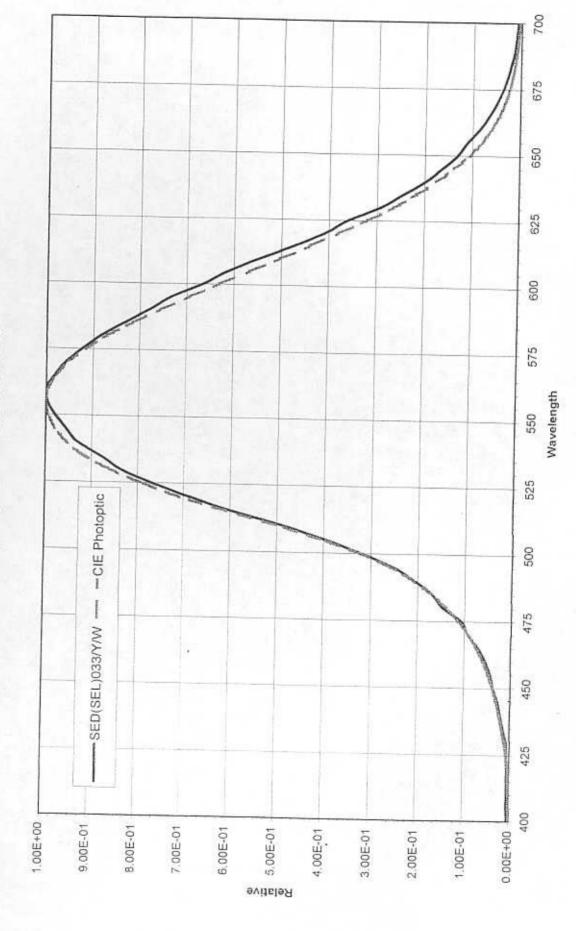


Rendered-to: INSTRUMATIC ESPANOLA S.A.

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SED(SEL)033/Y/W Vs. CIE NOV02





17 Graf Road • Newburyport, MA 01950-4092 USA

Rendered-to: INSTRUMATIC ESPANOLA S.A.

Tel: 978.465.5923 • Fax: 978.462.0759 ilsales@intl-light.com • www.intl-light.com

Detector: SED038 #1386

CALIBRATION CERTIFICATE

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Input Optic: R #172

Filter:	Y #5485		Misc.; N	V/A
Spectral Re	esponse (half power points):	See Chart		
(YLS) PHOTOPIO	E LUMINANCE RESPONSE	SENSITIVITY	FACTOR AS CAL	IBRATED ON: 31-Mar-2005
5.50E-1	0(A)(fL-1) assuming 32	15 K Color Ten	nperature	
1.605E-	10_(A)(m2)(cd-1) assuming	3215 K Color Te	mperature	
Unit will read dire	ectly in foot-Lamberts when u	sed with an IL170	00 and the Sensitiv	rity Factor Above. Calibrated with IL1700 #330.
	VITH IL1700 +5V BIAS: Of ANE: Average Field of Visio			
U1023 - January	NDARD: U.S. National Institu 1997 - NIST Test No. 844/25 nty: 200-250nm=5%;250-400	7423-96/2 D20-	4 - January 1997 -	tector Response NIST Test No. 844/257423-96/1 1000nm=0.58%;1000-1100nm=2.93%
	AL LIGHT PRIMARY TRA? 5,#139,#1490,U522,H627	NSFER STANDA	RDS:	JAN 1998 - JAN 2008
IL Transfer Uncer	rtainty to Customer = +/-	4.3 % plus NIS	T uncertainty above	ve.
LIGHT SOURCE	: 1S Tungsten Halogen/Refl	ectance Tablet	LAMP OUTPU	JT: 264 (L
INSTRUMENTA	TION: IL #04/Y		PROCEDURE:	YLSIS
TEMPERATURI	E: 25 degrees C		HUMIDITY:	26 %
CALIBRATED E	Calibration Technician		CHECKED BY	QA Manager, Calibrations
FOR AUTHORIZED BE REPRODUCED	COPIES OF THIS CERTIFICATE EXCEPT IN FULL, WITHOUT THE	OR OTHER INFORM	MATION PLEASE REI	FER TO THESE NUMBERS. THIS CERTIFICATE SHALL NO DNAL LIGHT, INC.
Calibration l	Date: 31-Mar-05 Certific	ate No.: 50331	4425	FO/Sales Order#: 115185
	AN ANNUAL CALIBRATION CON		VAL INTERVALS OF	CONFIRMATION MAY NEED TO BE ADJUSTED

