

17 Graf Road • Newburyport, MA 01950-4092 USA

DEPENDING ON RESULTS OF PRECEDING CALIBRATIONS.

Tel: 978 465,5923 • Fax: 978,462.0759

ilsales@intl-light.com • www.intl-light.com

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).

Detector:	SED033 #4776		Input Optic:	R #415	
Filter:	F #16702		Misc.:	N/A	
Spectral Re	esponse (half power p	oints):			
R) PEAK RAI	DIANCE RESPONSE	SENSITIVITY FACT	FOR AS CALIBR	ATED O	N: 31-Mar-2005
8,58E-4	(A)(cm2)(sr)(W	/-1) assuming monoc	chromatic radian	ice at 60	0nm
-2.61%	*Change In Sens	itivity From Previous (Calibration Dated:	09-Oct-	1996
Tolerance .	As Found: In	Out			
it will read dire	eetly in watts per squa 1700 #2338.	are centimeter per stera	dian when used w	vith an IL	1700 and the Sensitivity Factor Above.
LIBRATED W	/ITH IL1700 +5V BI	AS: ON	OFF_\		
FERENCE PL	ANE: Average Field	of Vision +/-0.75 Deg	grees		
iustments.					nental error or modifications to the hardware
022 January 1	1007 NIST Test No	al Institute of Standard . 844/257423-96/2 D .250-400nm=1.0%;400)204 - January 19	11 - NIS	r Response Γ Test No. 844/257423-96/1 nm=0.58%;1000-1100nm=2.93%
#01,#02,#3275	i,#139,#1490,U522,I				AN 1998 - JAN 2008
Transfer Uncer	rtainty to Customer	+/- 3.0 % plus	NIST uncertainty	above.	
GHT SOURCE	: 1S Tungsten Halo	gen/Reflectance Table	t LAMP OU	TPUT:	1.078E-5 W/cm2/sr
man movement of the later	TION:IL #04	HOOVE COLUMN TO THE TOTAL COLUMN TO THE T	PROCEDU	IRE: _I	PRRIS
STRUMENTA	no especial filtration and a second	4	HUMIDIT	Y: 2	6 %
STRUMENTA MPERATURI		1	CHECKED		K. OJula
	IY:	chnician		8	Manager, Calibrations
MPERATURE LIBRATED E	Calibration Te		ORMATION PLEASI	E REFER	TO THESE NUMBERS. THIS CERTIFICATE SHALL



17 Graf Road • Newburyport, MA 01950-4092 USA Tel: 978.465.5923 • Fax: 978.462.0759 ilsales@intl-light.com • www.intl-light.com

Rendered-to: INSTRUMATIC ESPANOLA S.A.

DEPENDING ON RESULTS OF PRECEDING CALIBRATIONS.

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Detector:	SED033 #4776	Input Optic:	W #5599
Filter:	F #16702	Misc.:	N/A
Spectral Re-	sponse (half power points): See Chart		
(PIR) PEAK IRRA	DIANCE RESPONSE SENSITIVITY FACT	OR AS CALIBI	RATED ON: 31-Mar-2005
1.135E-2	(A)(cm2)(W-1) assuming monochrom	atic irradiance	at 600nm
Unit will read direct IL1700 #2338.	tly in watts per square centimeter when used	with an IL1700	and the Sensitivity Factor Above. Calibrated with
CALIBRATED WI	TH IL1700 +5V BIAS: ON OF	F	
REFERENCE PLA	NE: Groove ONE formed by filter or diffus	er elements and	next element, counted from front surface of assembly.
DDIMADV STANI	DARD: U.S. National Institute of Standards a	and Technology	Detector Response
U1023 - January 19	997 - NIST Test No. 844/257423-96/2 D20	4 - January 1997	7 - NIST Test No. 844/257423-96/1
N.I.S.T. Uncertaint	y; 200-250nm=5%;250-400nm=1.0%;400-9	90nm=0.31%;90	10-1000nm=0.58%;1000-1100nm=2.93%
	LIGHT PRIMARY TRANSFER STAND/ #139,#1490,U522,H627	ARDS:	JAN 1998 - JAN 2008
	ninty to Customer = +/- 3.0 % plus NI:	ST uncertainty a	
	1S Tungsten Halogen		PUT: 3,49E-5 W/cm2
NSTRUMENTAT		PROCEDUR	
	25 degrees C \	HUMIDITY	C. 1000 - 1000 - 1 - 1
CALIBRATED BY	11 1	CHECKED E	1/1-1
	Calibration Technician		QA Manager, Valibrations
OR AUTHORIZED C	OPIES OF THIS CERTIFICATE OR OTHER INFOR KCEPT IN FULL, WITHOUT THE WRITTEN APPRO	MATION PLEASE I	REFER TO THESE NUMBERS. THIS CERTIFICATE SHALL N TIONAL LIGHT, INC.



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Rendered-to: INSTRUMATIC ESPANOLA S.A.

SED038 #1386

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Detector:

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Input Optic:

W #3728

	Y #5485		Misc.: N	J/A
Spectral Re	sponse (half power points):	See Chart		
s) РНОТОРІС	ILLUMINANCE RESPONS	SE SENSITIVITY	FACTOR AS CA	LIBRATED ON: 31-Mar-2005
3.74E-8	(A)(ft2)(lm-1) assumir	ng 3215 K Color	Temperature	
3.475E-0	9(A)(lux-1) assuming 321	5 K Color Temper	ature	
nit will read directlibrated with IL.		ot (footcandles) or	lux when used wit	th an IL1700 and the Sensitivity Factor Above
O IND ATEN W	ITH IL1700 +5V BIAS: O	N OFF	_	
				it element, counted from front surface of assen
EFERENCE PL/ RIMARY STAN 1023 - January 1	ANE: Groove ONE formed I DARD: U.S. National Institu 997 - NIST Test No. 844/25	by filter or diffuser ute of Standards an 7423-96/2 D204	elements and nex d Technology De - January 1997 -	
EFERENCE PL/ RIMARY STAN 1023 - January 1 LS.T. Uncertain TERNATIONA	ANE: Groove ONE formed I DARD: U.S. National Institu 997 - NIST Test No. 844/25	by filter or diffuser ute of Standards an 7423-96/2 D204 htm=1.0%;400-900	d Technology De - January 1997 - Onm=0.31%;900-1	tector Response NIST Test No. 844/257423-96/1
RIMARY STAN 1023 - January I LS.T. Uncertain TERNATIONA .#01,#02,#3275.	ANE: Groove ONE formed I DARD: U.S. National Institu 997 - NIST Test No. 844/25 ty: 200-250nm=5%;250-400 L. LIGHT PRIMARY TRAN #139,#1490,U522,H627	by filter or diffuser ute of Standards an 7423-96/2 D204 hnm=1.0%;400-900	d Technology De - January 1997 - Onm=0.31%;900-1	tector Response NIST Test No. 844/257423-96/1 1000nm=0.58%;1000-1100nm=2,93% JAN 1998 - JAN 2008
GIMARY STAN 023 - January I LS.T. Uncertain TERNATIONA #01,#02,#3275, Transfer Uncert	ANE: Groove ONE formed I DARD: U.S. National Institu 997 - NIST Test No. 844/25 ty: 200-250nm=5%;250-400 L. LIGHT PRIMARY TRAN #139,#1490,U522,H627	by filter or diffuser ute of Standards an 7423-96/2 D204 hnm=1.0%;400-900	d Technology De - January 1997 - Jum=0.31%;900-1	tector Response NIST Test No. 844/257423-96/1 1000nm=0.58%;1000-1100nm=2,93% JAN 1998 - JAN 2008
RIMARY STAN 1023 - January I LS.T. Uncertain TERNATIONA #01,#02,#3275, Transfer Uncert GHT SOURCE:	ANE: Groove ONE formed Institute 997 - NIST Test No. 844/25 ty: 200-250nm=5%;250-400 L. LIGHT PRIMARY TRAY #139,#1490,U522,H627 ainty to Customer = +/-	by filter or diffuser ute of Standards an 7423-96/2 D204 hnm=1.0%;400-900	elements and nex d Technology De - January 1997 - Dnm=0.31%;900-1 RDS:	JAN 1998 - JAN 2008
RIMARY STAN 1023 - January I L.S.T. Uncertain TERNATIONA .#01,#02,#3275, Transfer Uncert GHT SOURCE:	ANE: Groove ONE formed I DARD: U.S. National Institu 997 - NIST Test No. 844/25 ty: 200-250nm=5%;250-400 L. LIGHT PRIMARY TRAN #139,#1490,U522,H627 ainty to Customer = +/- 1S Tungsten Halogen	by filter or diffuser ute of Standards an 7423-96/2 D204 hnm=1.0%;400-900	d Technology De - January 1997 - Onm=0.31%;900-1 RDS: LAMP OUTPU	JAN 1998 - JAN 2008
UMARY STAN 1023 - January I LS.T. Uncertain TERNATIONA #01,#02,#3275, Transfer Uncert GHT SOURCE: STRUMENTAL	ANE: Groove ONE formed I DARD: U.S. National Institu 997 - NIST Test No. 844/25 ty: 200-250nm=5%;250-400 L. LIGHT PRIMARY TRAY #139,#1490,U522,H627 ainty to Customer = +/- 1S Tungsten Halogen FION: IL #04/Y 25 degrees C	by filter or diffuser ute of Standards an 7423-96/2 D204 hnm=1.0%;400-900	d Technology Dec - January 1997 - Onm=0.31%;900-1 RDS: Luncertainty above LAMP OUTPU PROCEDURE:	JAN 1998 - JAN 2008 7: 272 lm/ft2 YIS1S 26 29
RIMARY STAN 1023 - January I LS.T. Uncertain TERNATIONA #01,#02,#3275, Transfer Uncert GHT SOURCE: STRUMENTAL	ANE: Groove ONE formed I DARD: U.S. National Institu 997 - NIST Test No. 844/25 ty: 200-250nm=5%;250-400 L. LIGHT PRIMARY TRAY #139,#1490,U522,H627 ainty to Customer = +/- 1S Tungsten Halogen FION: IL #04/Y 25 degrees C	by filter or diffuser ute of Standards an 7423-96/2 D204 htm=1.0%;400-900 NSFER STANDAR 4.3 % plus NIS	d Technology De - January 1997 - June 0.31%;900-1 RDS: LAMP OUTPU PROCEDURE: HUMIDITY:	JAN 1998 - JAN 2008 T: 272 lm/ft2 YIS1S
RIMARY STAN 1023 - January I LS.T. Uncertain TERNATIONA #01,#02,#3275, Transfer Uncert GHT SOURCE: STRUMENTAL EMPERATURE: ALIBRATED B'	ANE: Groove ONE formed Institute 997 - NIST Test No. 844/25 ty: 200-250nm=5%;250-400 L. LIGHT PRIMARY TRAY #139,#1490,U522,H627 ainty to Customer = +/- 1S Tungsten Halogen FION: JL #04/Y 25 degrees C	by filter or diffuser ute of Standards an 7423-96/2 D204 http://doi.org/10.000/10.0000 NSFER STANDAR 4.3 % plus NIS	d Technology Dec - January 1997 - January 1997 - January 1997 - January 1997 - January 1998: RDS: LAMP OUTPU PROCEDURE: HUMIDITY: CHECKED BY:	JAN 1998 - JAN 2008 T: 272 lm/ft2 YIS1S A Manager Calibrations TER TO THESE NUMBERS: THIS CERTIFICATE SHE



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CALIBRATION CERTIFICATE

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Rendered-to:	INSTRUMATIC ESPAN	NOLA S.A.			
Detector: S	ED038 #1386		Input Optic:	R #172	
Filter: Y	/ #5485		Misc.:	N/A	
Spectral Respo	nse (half power points):	See Chart			
LS) PHOTOPIC LU	MINANCE RESPONSE	SENSITIVITY F	ACTOR AS CA	ALIBRATED ON: 31-Mar-2005	
5.50E-10(A)(fL-1) assuming 32	15 K Color Tem	perature		
_1.605E-10 (A)(m2)(cd-1) assuming 3	3215 K Color Tem	perature		
	В.	Total Total	perature		
it will read directly i	n foot-Lamberts when us	sed with an IL1700	and the Sensiti	ivity Factor Above. Calibrated with II.170	00 #330.
LIBRATED WITH	IL1700 +5V BIAS: ON	OFF	\		
SERENCE DI ANE	Average Field of Vision				
a LACLICE I LANE.	Average Field of Vision	n +/-0.75 Degrees			
IMARY STANDAR	D: U.S. National Institute	e of Standards and	Technology De	etector Response	
023 - January 1997 - S.T. Upcertainty: 20	NIST Test No. 844/2574	423-96/2 D204 -	January 1997 -	NIST Test No. 844/257423-96/1	
				-1000nm=0.58%;1000-1100nm=2.93%	
FERNATIONAL LI #01,#02,#3275,#139	GHT PRIMARY TRANS	SFER STANDAR	DS;	White or an area with the contract of the cont	
		7 0/ 1 Norm	9 9	JAN 1998 - JAN 2008	
	to Customer = +/- 4.		uncertainty abo	ve.	
	Tungsten Halogen/Reflee	tance Tablet	LAMP OUTPU	JT: 264 fL	
STRUMENTATION	: IL #04/Y		PROCEDURE	: _YLSIS	
MPERATURE: _2:	5 degrees C		HUMIDITY:	26 %	
LIBRATED BY:	~~\\\		CHECKED BY	K. Oprilan	
	Calibration Technician	APAGE TITLE TO LOS TO SERVICES		QA Manager, Calibrations	
REPRODUCED EXCEP	S OF THIS CERTIFICATE OF T IN FULL, WITHOUT THE V	R OTHER INFORMAT WRITTEN APPROVA	TION PLEASE REI	FER TO THESE NUMBERS. THIS CERTIFICATE	SHALL
Calibration Date:		e No.: 50331442		FO/Sales Order #: 115185	
RECOMMENDS AN ANI				CONFIRMATION MAY NEED TO BE ADJUSTED	2



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	INSTRUMATION SED033 #7059		Input Optic:	W #10237	
Detector:			Misc	N/A	
Filter:	UVA #23821			3.10.1	
Spectral Res	sponse (half power p	points): See Cha	irt		
PEAK IRRA	DIANCE RESPON	SE SENSITIVITY	FACTOR AS CALIBR	ATED ON: 03-Dec	2-2001
740e-3	(A)(cm2)(W-1	Vassumino mono	chromatic irradiance	at 360nm	
7400-3	(A)(cm2)(W-1) assuming mone	Cin Onlanc III awaren		
Off and disco	the in watte nor can	are centimeter when	used with an IL1700 a	nd the Sensitivity F	actor Above,
will read direc	uy iii waits per aqu	are centimeter when			
JBRATED W	ITH IL1700 +5V B	IAS: ON	OFF		
			90	est element counte	d from front surface of assembly
enerater of	ANE. Groom ONE	formed by filter or	diffuser elements and a	POST PROPERTY PROPERTY	of HORIT HORIT SHITBEE OF HOSEITERA
ERENCE PLA	ANE: Groove ONE	formed by filter or	diffuser elements and	ica cichichi, comi	d from front surface of assembly.
ERENCE PL/	ANE: Groove ONE	formed by filter or	diffuser elements and i	gar clement, some	g from from surface of assertion
	DIBB HC N.	al lastitute of Stan	Aurds and Technology	Detector Response	
MARY STAN	DARD: U.S. Natio	nal Institute of Star	ndards and Technology	Detector Response 7 - NIST Test No. 8	44/257423-96/1
MARY STAN	DARD: U.S. Natio	nal Institute of Star	Aurds and Technology	Detector Response 7 - NIST Test No. 8	44/257423-96/1
MARY STAN 23 - January I S.T. Uncertain	DARD: U.S. Nation 997 - NIST Test Note: 200-250nm=5%	nal Institute of Star o, 844/257423-96/ c;250-400nm=1.0% RY TRANSFER S	dards and Technology 2 D204 - January 199 5,400-900nm=0.31%,90	Detector Response 7 - NIST Test No. 8 00-1000nm=0.58%	44/257423-96/1 1000-1100nm=2.93%
MARY STAN 23 - January I S.T. Uncertain ERNATIONA	DARD: U.S. Nation 997 - NIST Test Note: 200-250nm=5%	nal Institute of Star o, 844/257423-96/ 6:250-400nm=1.0% RY TRANSFER S	idards and Technology 2 D204 - January 199 5:400-900nm=0.31%,90 TANDARDS	Detector Response 7 - NIST Test No. 8 00-1000nm=0.58%	44/257423-96/1 1000-1100nm=2.93%
MARY STAN 23 - January I S.T. Uncertain ERNATIONA	DARD: U.S. Nation 997 - NIST Test Note: 200-250nm=5%	nal Institute of Star o, 844/257423-96/ 6:250-400nm=1.0% RY TRANSFER S	dards and Technology 2 D204 - January 199 5,400-900nm=0.31%,90	Detector Response 7 - NIST Test No. 8 00-1000nm=0.58%	44/257423-96/1 1000-1100nm=2.93%
MARY STAN 23 - January 1 S.T. Uncertain ERNATIONA D.R.1.P.#01,#0 ransfer Uncer	DARD: U.S. Nation 997 - NIST Test Notice 200-250nm=5% L. LIGHT PRIMA 2,#3275,#139,#149 tainty to Customer	nal Institute of Star o, 844/257423-96/ 6:250-400nm=1.0% RY TRANSFER S	idards and Technology 2 D204 - January 199 5:400-900nm=0.31%,90 TANDARDS	Detector Response 7 - NIST Test No. 8 00-1000nm=0.58%. JAN bove.	144/257423-96/1 1000-1100nm=2.93%
MARY STAN 23 - January 1 S.T. Uncertain ERNATIONA D.R.I.P.#01.#0 ransfer Uncer	DARD: U.S. Nation 997 - NIST Test Note: 200-250nm=5% L. LIGHT PRIMA 2,#3275,#139,#149 tainty to Customer	nal Institute of Star o, 844/257423-96/ s;250-400nm=1.0% RY TRANSFER S 00,U522,H627 = +/- 4.5 %	ndards and Technology 1 2 D204 - January 199 5:400-900nm=0.31%;90 TANDARDS plus NIST uncertainty a	Detector Response 7 - NIST Test No. 8 00-1000nm=0.58% JAN bove.	44/257423-96/1 1000-1100nm=2.93%
MARY STAN 123 - January 1 S.T. Uncertain ERNATIONA D.R.I.P.#01,#0 Fransfer Uncer EHT SOURCE TRUMENTA	DARD: U.S. Nation 997 - NIST Test Notice 200-250nm=5% L. LIGHT PRIMA 2,#3275,#139,#149 tainty to Customer 18a Hg-Xe TION: #4544/UN	nal Institute of Star o, 844/257423-96/ s;250-400nm=1.0% RY TRANSFER S 00,U522,H627 = +/- 4.5 %	idards and Technology 2 D204 - January 199 5:400-900nm=0.31%,90 TANDARDS plus NIST uncertainty a	Detector Response 7 - NIST Test No. 8 100-1000nm=0.58% JAN bove CE: 7.55e-3 W/6 RE: PIR18	44/257423-96/1 1000-1100nm=2.93%
MARY STAN 123 - January 1 S.T. Uncertain ERNATIONA D.R.LP #01.#0 Fransfer Uncer EHT SOURCE TRUMENTA	DARD: U.S. Nation 997 - NIST Test Note: 200-250nm=5% L. LIGHT PRIMA 2,#3275,#139,#149 tainty to Customer 18a Hg-Xe TION: #4544/UV 20_degrees &	nal Institute of Star o, 844/257423-96/ s;250-400nm=1.0% RY TRANSFER S 00,U522,H627 = +/- 4.5 %	dards and Technology 1 2 D204 - January 199 5:400-900nm=0.31%;96 TANDARDS plus NIST uncertainty a IRRADIAN PROCEDU	Detector Response 7 - NIST Test No. 8 90-1000nm=0.58% JAN bove. CE: 7.55e-3 W/6 RE PIR18 7: 33_% BY	44/257423-96/1 1000-1100nm=2.93% 1998 cm2
MARY STAN 23 - January 1 S.T. Uncertain ERNATIONA D.R.LP.#01,#0 ransfer Uncer HT SOURCE TRUMENTA MPERATURE LIBRATED E	DARD: U.S. Nation 997 - NIST Test N tv: 200-250nm=5% L. LIGHT PRIMA 2,#3275,#139,#149 tainty to Customer 18a Hg-Xe TION: #4544/UV 20 degrees G Y Calibration T	nal Institute of Star o, 844/257423-96/ c;250-400nm=1.0% RY TRANSFER S 00,U522,H627 = +/- 4.5 %	ndards and Technology 1 2 D204 - January 199 5:400-900nm=0.31%;96 TANDARDS plus NIST uncertainty a IRRADIAN PROCEDU HUMIDIT	Detector Response 7 - NIST Test No. 8 100-1000nm=0.58% JAN bove: CE: 7.55e-3 W/6 RE: PIR18 7: 33_% BY QA Manage	244/257423-96/1 1000-1100nm=2.93% 1998 cm2
MARY STAN 23 - January I S.T. Uncertain ERNATIONA D.R.LP.#01,#0 ransfer Uncer HT SOURCE TRUMENTA MPERATURE LIBRATED B	DARD: U.S. Nation 997 - NIST Test N ty: 200-250nm=5% L. LIGHT PRIMA 2,#3275,#139,#149 tainty to Customer 18a Hg-Xe TION: #4544/UV : 20 degrees Green	nal Institute of Star o, 844/257423-96/ b;250-400nm=1.0% RY TRANSFER S 00,U522,H627 = +/- 4.5 %	ndards and Technology 1 2 D204 - January 199 5:400-900nm=0.31%;96 TANDARDS plus NIST uncertainty a IRRADIAN PROCEDU HUMIDIT	Detector Response 7 - NIST Test No. 8 10-1000nm=0.58%. JAN bove. CE: 7.55e-3 W/6 RE: PIR18 7: 33_% BY	44/257423-96/1 1000-1100nm=2.93% 1998 cm2



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Rendered-t	 instrumatic E 	Strate Chicago				
Detector:	SED240 #5676		Input Optic:	W #10237		
Filter	UVB-1 #23781		Misc :	N/A		
Spectral R	esponse (half power poin	nts) See Chart				
R) PEAK IRR/	ADIANCE RESPONSE	SENSITIVITY FACT	OR AS CALIBRA	TED ON: (3-Dec-2001	
1,139e-	5 (A)(cm2)(W-1) as	ssuming monochrom	natic irradiance at	290nm		
			.a II 1700	I II a Carairi	in Castar Abou	×
it will read dire	ectly in watts per square of	centimeter when used v	with an IL1700 and	the Sensitiv	ity ractor Abov	re.
LIBRATED V	VITH IL1700 ±5V BIAS	S ON OF	F			
	VITH IL1700 +5V BIAS			xt element, c	ounted from fro	nt surface of assembly
IMARY STAN 023 - January 1 S.T. Uncertai	ANE: Groove ONE for NDARD: U.S. National I 1997 - NIST Test No. 8- nty: 200-250nm=5%;250	institute of Standards a 44/257423-96/2 D20 0-400nm=1 0%;400-96	nd Technology De 14 - January 1997 00nm=0.31%,900	tector Respo	mse No. 844/257423	3-96/1
IMARY STAN 023 - January 1 S.T. Uncertai TERNATION. D.R.I.P.#01.#/	ANE: Groove ONE for NDARD: U.S. National I 1997 - NIST Test No. 8	institute of Standards a 44/257423-96/2 D20 0-400nm=1 0%;400-96 TRANSFER STAND/	nd Technology De 14 - January 1997 00nm=0.31%,900 ARDS	tector Respo NIST Test -1000nm=0	mse No. 844/257423	3-96/1
IMARY STAN 023 - January S.T. Uncertain FERNATION D.R.L.P.#01,#1 Transfer Unce	ANE: Groove ONE for NDARD: U.S. National I 1997 - NIST Test No. 84 nty: 200-250nm=5%;250 AL LIGHT PRIMARY 02,#3275,#139,#1490.U	institute of Standards a 44/257423-96/2 D20 0-400nm=1 0%;400-96 TRANSFER STAND/	nd Technology De 14 - January 1997 00nm=0.31%,900 ARDS	tector Respo NIST Test 1000nm=0	mse No. 844/25742: 58%,1000-1100	3-96/1
IMARY STAN 023 - January S.T. Uncertain FERNATION: D.R.L.P.#01.#0 Transfer Unce	ANE: Groove ONE for NDARD: U.S. National I 1997 - NIST Test No. 8- nty: 200-250nm=5%;250 AL LIGHT PRIMARY 02,#3275,#139,#1490,U rtainty to Customer = +	Institute of Standards a 44/257423-96/2 D20 0-400nm=1 0%;400-96 TRANSFER STAND/ 1522,H627 -/- 5.5 % plus NI	nd Technology De 14 - January 1997 100nm=0.31%,900 ARDS ST uncertainty abo	tector Respo NIST Test -1000nm=0 ove	onse No. 844/25742: 58%;1000-1100 JAN 1998	3-96/1
IMARY STAN 023 - January S.T. Uncertain TERNATION D.R.I.P.#01.#1 Transfer Unce GHT SOURCE	ANE: Groove ONE for NDARD: U.S. National I 1997 - NIST Test No. 84 nty: 200-250nm=5%;250 AL LIGHT PRIMARY 02,#3275,#139,#1490,U rtainty to Customer = +	Institute of Standards a 44/257423-96/2 D20 0-400nm=1 0%,400-90 TRANSFER STANDA 1522,H627 -/- 5.5 % plus NI	nd Technology De 14 - January 1997 100nm=0.31%,900 ARDS ST uncertainty about	tector Respo NIST Test 1000nm=0	nse No. 844/257423 58%,1000-1100 JAN 1998 3 W/cm2	3-96/1
FERENCE PL IMARY STAY 023 - January S.T. Uncertai FERNATION D.R.L.P.#01.# Transfer Unce GHT SOURCE	ANE: Groove ONE for NDARD: U.S. National I 1997 - NIST Test No. 84 nty: 200-250nm=5%:250 AL LIGHT PRIMARY D2_#3275_#139_#1490_U rtainty to Customer = + 18a Hg-Xe ATION: #1029/SCS280 E: 20 degrees C. 334:	Institute of Standards a 44/257423-96/2 D20 0-400nm=1 0%;400-90 TRANSFER STAND/ 1522,H627 -/- 5.5 % plus NI	and Technology De 14 - January 1997 100nm=0.31%,900 ARDS ST uncertainty about the procedure	tector Responsive NIST Test -1000nm=0. E 4 80e- E PIR18	onse No. 844/25742: 58%;1000-1100 JAN 1998 3 W/cm2	3-96/1 0nm=2.93%
IMARY STAN 023 - January S.T. Uncertain FERNATION, D.R.L.P.#01,#1 Transfer Unce GHT SOURCE STRUMENTA MPERATURE	ANE: Groove ONE for NDARD: U.S. National 1 1997 - NIST Test No. 8- nty: 200-250nm=5%;250 AL LIGHT PRIMARY: 02,#3275,#139,#1490,U rtainty to Customer = + 5: 18a Hg-Xe ATION: #1029/SCS280 E: 20 degrees C. 34: Calibration Techn	Institute of Standards a 44/257423-96/2 D20 0-400nm=1.0%,400-90 TRANSFER STAND/ 1522,H627 -/- 5.5 % plus NE	nd Technology De 14 - January 1997 100nm=0.31%,900 ARDS ST uncertainty about IRRADIANCE PROCEDURE HUMIDITY CHECKED BY	tector Responsive E. 4.80e- E. PIR18 33 % QA M	onse No. 844/257423 58%;1000-1100 JAN 1998 3 W/cm2	3-96/1 Onm=2.93%
IMARY STAN 1023 - January S.T. Uncertain TERNATION D.R.I.P.#01,#1 Transfer Unce GHT SOURCE STRUMENTA MPERATUR ILIBRATED I	ANE: Groove ONE for NDARD: U.S. National I 1997 - NIST Test No. 84 nty: 200-250nm=5%:250 AL LIGHT PRIMARY D2_#3275_#139_#1490_U rtainty to Customer = + 18a Hg-Xe ATION: #1029/SCS280 E: 20 degrees C. 334:	Institute of Standards a 44/257423-96/2 D20 0-400nm=1 0%,400-90 TRANSFER STANDA 1522,H627 -/- 5.5 % plus NE	nd Technology De 14 - January 1997 100nm=0.31%,900 ARDS ST uncertainty about IRRADIANCE PROCEDURE HUMIDITY CHECKED BY	tector Responsive E. 4.80e- E. PIR18 33.% QA M EFER TO THE	onse No. 844/257423 58%,1000-1100 JAN 1998 3 W/cm2 mager, Calibrati	3-96/1 Onm=2.93%

Monday, December 03, 2001 2:42:06 PM



17 Graf Road • Newhuryport, MA 01950-4092 USA Tel 978-465 5923 • Fax 978-462 0759 dsales@intl-light.com • www.intl-light.com

ON RESULTS OF PRECEDING CALIBRATIONS.

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).

	INSTRUMATIC ESPANO	Input Optic:	W#	10237
Detector:	SED240 #5676	Misc.	N/A	
Filter:	ACT5 #23008			
Spectral Resp	onse (half power points)	See Chart		
				2001
PIR) PEAK IRRAD	IANCE RESPONSE SENSIT	IVITY FACTOR AS CALIBI	RATEL	ON: 03-Dec-2001
3.82e-4	(A)(cm2)(eff W-1) assum	ning monochromatic irradia	nce at	270nm
	L. i Carina matte per coustr	centimeter when used with an	11.170	00 and the Sensitivity Factor Above
Juit will read direct	ly in effective waits per square	Centimoter		
	TH IL1700 ±5V BIAS: ON	OFF		
REFERENCE PLA	NE Groove ONE formed by	filter or diffuser elements and	next c	lement, counted from front surface of assembly.
	DARD: U.S. National Institute	of Standards and Technology	Detect	tor Response
N.I.S.T. Uncertaint	y: 200-250nm=5%;250-400ni	n=1.0%;400-900nm=0.31%;5	100-10	00nm=0,58%;1000-1100nm=2.93%
INTERNATIONA	L LIGHT PRIMARY TRANS	SFER STANDARDS:		JAN 1998
IL D.R.I.P.#01,#02	2,#3275,#139,#1490,U522,H6 ainty to Customer = +/- 6	5 % plus NIST uncertainty	above	
				1.279e-6 W/cm2
	17a Deuterium/EG&G Mon	ochromator IRRADIA		
INSTRUMENTA'	TION:U522	PROCEDU		
TEMPERATURE	20 degrees C	HUMIDIT		33 Comm
CALIBRATED B	Y: Calibration Technician	CHECKEL	r D t	QA Manager Calibrations
and the more		R OTHER INFORMATION PLEAS	E REFE	R TO THESE NUMBERS THIS CERTIFICATE SHALL NIVAL LIGHT, INC.
BE REPRODUCED	EXCEPT IN FULL, WITHOUT THE	Will I Ell Art No the ell mile	MOITAN	
	Date: 03-Dec-01 Certifica	te No : 112030803		FO/Sales Order #: 103502

IL RECOMMENDS AN ANNUAL CALIBRATION CONFIRMATION INTERVAL. INTERVALS OF CONFIRMATION MAY NEED TO BE ADJUSTED DEPENDING