

## HELIOS®Plus-DR D FAMILY

# Dynamic Halogen Systems for Full Testing Solutions



### For the most demanding imaging requirements

The HELIOSPlus-DR, D Family systems are classic QTH-based calibration sources designed for extreme dynamic ranges. Multiple lamps, attenuators and detector choices allow you to move effortlessly from sunlight to night vision levels. Whether you are testing simple CMOS sensors or multiple gain stage focal plane arrays, you will find the maximum flexibility in the D Family system and component options.

- Great solution for R&D and laboratory test flexibility
- Maximum choices for system sizes and light level configurations
- High level of absolute characterization
- Spare ports and future upgrade capability
- All options in HELIOSPlus available for D Family inclusion: Easy to configure a system to meet your exact requirements

### Performance

- 3000K QTH 250 - 2500 nm black-body like spectrums
- Extreme Dynamic Light Range:
  - >Albedo 1 (AM 1) down to night vision light levels
    - For cameras and sensors >16bit, actual 27bit (167dB)
    - Manual and automatic level control options

Model Number	USLR-D20F-NANS-P	USLR-D20F-NDNN-P	USLR-D20F-NMNN-P	USLR-D12F-NANS-P
Smart Part Number	D5NA-NSNN-N1SR-NS00-0000-P	D5ND-NNNN-NNSR-NS00-0000-P	D5NM-NNNN-N1SR-NS00-0000-P	D3NA-NSNN-N1SR-NS00-0000-P
<b>OPTICAL PERFORMANCE SPECIFICATIONS</b>				
Spatial Luminance Uniformity over Exit Port (f/4) - All Lamps On	+/-1.0%	+/-1.0%	+/-1.0%	+/-1.0%
Angular Uniform FOV (Full Angle) - Degrees / F# / NA - All Lamps On	+/-2.0% - 35° / 0.85 / 0.6	+/-2.0% - 35° / 0.85 / 0.6	+/-2.0% - 35° / 0.85 / 0.6	+/-2.0% - 35° / 0.85 / 0.6
Expected Luminance Output: cd/m2	24,000	24,000	24,000	40,000
Expected Illuminance at Port: lux	78,000	78,000	78,000	135,000
Est. Peak Radiance: W/m2-sr-um @ 0.95 um	680	680	680	1,200
Est. Peak Irradiance @ Port: Photons/s-m2-um @ 0.95um	3.20E+00	3.20E+00	3.20E+00	5.80E+21
Minimum Resolution: lux	4.33E-03	1.20E+00	2.64E-01	7.50E-03
Number of Steps in System Range (#lamps*VA Steps)	8.80E+06	4.80E+04	4.00E+04	6.60E+06
Dynamic Range/Bits/dB	6.66e+07/25/154	7.33E+04/16/99	3.33E+05/18/109	8.63E+07/26/158
Approximate Correlated Color Temperature (QTH)	3000K +/-50K	3000K +/-50K	3000K +/-50K	3000K +/-50K
Typical Lamp Lifetimes (hrs)	>500	>500	>500	>500
Est. Lamp Degradation Over Lifetime (% & CCT Shift)	-10% & +/-200K	-10% & +/-200K	-10% & +/-200K	-10% & +/-200K
Est. Output Degradation over 50hrs (% & CCT Shift)	-1.0% & +/-20K	-1.0% & +/-20K	-1.0% & +/-20K	-1.0% & +/-20K
<b>INTEGRATING SPHERE</b>				
Coating / Material	Spectrafect*	Spectrafect	Spectrafect	Spectrafect
Sphere Internal Diameter: Inches (Meters)	20 (0.5)	20 (0.5)	20 (0.5)	12 (0.3)
Frame Type	20 in Cage	20 in Cage	20 in Cage	12 in Cage
Output Port Size: Inches (Meters)	8 (0.2)	8 (0.2)	8 (0.2)	4 (0.1)
<b>SYSTEM COMPONENTS</b>				
QTH Lamps Internal (# , Wattage)	(1) 35, (1) 75, (1) 150	(1) 35, (1) 75, (1) 150	(1) 35, (1) 75, (1) 150	(1) 35, (1) 75
QTH Lamps External (#, Wattage)	(1) 150	(1) 150	(1) 150	(1) 150
Power Supplies (# - Wattages)	(2) LPS-175 (2) LPS-350	(2) LPS-175 (2) LPS-350	(2) LPS-175 (2) LPS-350	(2) LPS-175 (1) LPS-350
Variable Attenuator	VAA-220A	VAD-012	VA-MM	VAA-220A
Monitor Detector	SD-S1	SD-S1	SD-S1	SD-S1
Detector Filters (in Filter Holder)	Photopic	Photopic	Photopic	Photopic
System Software	HELIOsense	HELIOsense	HELIOsense	HELIOsense
<b>STANDARD SYSTEM CALIBRATIONS (NIST Traceable)</b>				
Luminance	Yes	Yes	Yes	Yes
Correlated Color Temp (All lamps matched & w/VA position)	Yes	Yes	Yes	Yes
Spectral Radiance (350-2400nm)	Yes	Yes	Yes	Yes
Exit Port Spatial Uniformity	Yes	Yes	Yes	Yes
Exit Port Angular Uniformity	Yes	Yes	Yes	Yes
Operational Duration of Calibration	50 hrs	50 hrs	50 hrs	50 hrs

Model Number	USRL-D12L-NANS-P	USLR-D12F-NDNN-P	USLR-D12L-NDNN-P	USLR-D12F-NMNN-P
Smart Part Number	D4NA-NSPN-N1SR-NS00-0000-P	D3ND-NNNN-NNSR-NS00-0000-P	D4ND-NNNN-NNSR-NS00-0000-P	D3NM-NNNN-NNSR-NS00-0000-P
<b>OPTICAL PERFORMANCE SPECIFICATIONS</b>				
Spatial Luminance Uniformity over Exit Port (f/4) - All Lamps On	+/-1.0%	+/-1.0%	+/-1.0%	+/-1.0%
Angular Uniform FOV (Full Angle) - Degrees / F# / NA - All Lamps On	+/-2.0% - 35° / 0.85 / 0.6	+/-2.0% - 35° / 0.85 / 0.6	+/-2.0% - 35° / 0.85 / 0.6	+/-2.0% - 35° / 0.85 / 0.6
Expected Luminance Output: cd/m2	50,000	37,500	50,000	37,500
Expected Illuminance at Port: lux	157,000	117,750	157,000	117,750
Est. Peak Radiance: W/m2-sr-um @ 0.95 um	1819	1,455	1819	825
Est. Peak Irradiance @ Port: Photons/s-m2-um @ 0.95um	8.75E+21	7.00E+21	8.75E+21	3.80E+21
Minimum Resolution: lux	1.37E-03	1.24E+00	1.24E+00	2.73E-01
Number of Steps in System Range (#lamps*VA Steps)	6.60E+06	3.60E+04	3.60E+04	3.00E+04
Dynamic Range/Bits/dB	1.15E+08/26/160	9.49E+04/16/93	1.27E+05/16/101	4.31E+05/17/111
Approximate Correlated Color Temperature (QTH)	3000K +/-50K	3000K +/-50K	3000K +/-50K	3000K +/-50K
Typical Lamp Lifetimes (hrs)	>500	>500	>500	>500
Est. Lamp Degradation Over Lifetime (% & CCT Shift)	-10% & +/-200K	-10% & +/-200K	-10% & +/-200K	-10% & +/-200K
Est. Output Degradation over 50hrs (% & CCT Shift)	-1.0% & +/-20K	-1.0% & +/-20K	-1.0% & +/-20K	-1.0% & +/-20K
<b>INTEGRATING SPHERE</b>				
Coating / Material	Spectralon	Spectrafect	Spectralon	Spectrafect
Sphere Internal Diameter: Inches (Meters)	11.5 (0.29)	12 (0.3)	11.5 (0.29)	12 (0.3)
Frame Type	12 in Cage	12 in Cage	12 in Cage	12 in Cage
Output Port Size: Inches (Meters)	4 (0.1)	4 (0.1)	4 (0.1)	4 (0.1)
<b>SYSTEM COMPONENTS</b>				
QTH Lamps Internal (# , Wattage)	(1) 35, (1) 75	(1) 35, (1) 75	(1) 35, (1) 75	(1) 35, (1) 75
QTH Lamps External (#, Wattage)	(1) 150	(1) 150	(1) 150	(1) 150
Power Supplies (# - Wattages)	(2) LPS-175 (1) LPS-350	(2) LPS-175 (1) LPS-350	(2) LPS-175 (1) LPS-350	(2) LPS-175 (1) LPS-350
Variable Attenuator	VAA-220A	VAD-012	VAD-012	VA-MM
Monitor Detector	SD-S1	SD-S1	SD-S1	SD-S1
Detector Filters (in Filter Holder)	Photopic	Photopic	Photopic	Photopic
System Software	HELIOsense	HELIOsense	HELIOsense	HELIOsense
<b>STANDARD SYSTEM CALIBRATIONS (NIST Traceable)</b>				
Luminance	Yes	Yes	Yes	Yes
Correlated Color Temp (All lamps matched & w/VA position)	Yes	Yes	Yes	Yes
Spectral Radiance (350-2400nm)	Yes	Yes	Yes	Yes
Exit Port Spatial Uniformity	Yes	Yes	Yes	Yes
Exit Port Angular Uniformity	Yes	Yes	Yes	Yes
Operational Duration of Calibration	50 hrs	50 hrs	50 hrs	50 hrs

Model Number	USLR-D12L-NMNN-P	USLR-D08F-NANS-P	USLR-D08L-NANS-P	USLR-D08F-NDNN-P
Smart Part Number	D4NM-NNNN-NNSR-NS00-0000-P	D1NA-NSNN-N1SR-NS00-0000-P	D2NA-NSNN-N1SR-NS00-0000-P	D1ND-NNNN-NNSR-NS00-0000-P
<b>OPTICAL PERFORMANCE SPECIFICATIONS</b>				
Spatial Luminance Uniformity over Exit Port (f/4) - All Lamps On	+/-1.0%	+/-1.0%	+/-1.0%	+/-1.0%
Angular Uniform FOV (Full Angle) - Degrees / F# / NA - All Lamps On	+/-2.0% - 35° / 0.85 / 0.6	+/-2.0% - 35° / 0.85 / 0.6	+/-2.0% - 35° / 0.85 / 0.6	+/-2.0% - 35° / 0.85 / 0.6
Expected Luminance Output: cd/m2	50,000	60,000	80,000	60,000
Expected Illuminance at Port: lux	157,000	188,400	251,200	188,400
Est. Peak Radiance: W/m2-sr-um @ 0.95 um	1100	2328	2910	2328
Est. Peak Irradiance @ Port: Photons/s-m2-um @ 0.95um	5.50E+21	1.12E+22	1.40E+22	1.12E+22
Minimum Resolution: lux	2.73E-01	9.42E-03	1.26E-02	8.56E+00
Number of Steps in System Range (#lamps*VA Steps)	3.00E+04	2.00E+06	2.00E+06	2.40E+04
Dynamic Range/Bits/dB	5.75E+05/18/114	2.00E+07/24/145	2.00E+07/24/145	2.20E+04/14/86
Approximate Correlated Color Temperature (QTH)	3000K +/-50K	3000K +/-50K	3000K +/-50K	3000K +/-50K
Typical Lamp Lifetimes (hrs)	>500	>500	>500	>500
Est. Lamp Degradation Over Lifetime (% & CCT Shift)	-10% & +/-200K	-10% & +/-200K	-10% & +/-200K	-10% & +/-200K
Est. Output Degradation over 50hrs (% & CCT Shift)	-1.0% & +/-20K	-1.0% & +/-20K	-1.0% & +/-20K	-1.0% & +/-20K
<b>INTEGRATING SPHERE</b>				
Coating / Material	Spectralon®	Spectrafect	Spectralon	Spectrafect
Sphere Internal Diameter: Inches (Meters)	11.5 (0.29)	8 (0.2)	7.5 (0.19)	8 (0.2)
Frame Type	12 in Cage	8 in Cage	8 in Cage	8 in Cage
Output Port Size: Inches (Meters)	4 (0.1)	2 (0.05)	2 (0.05)	2 (0.05)
<b>SYSTEM COMPONENTS</b>				
QTH Lamps Internal (# , Wattage)	(1) 35, (1) 75	(1) 35	(1) 35	(1) 35
QTH Lamps External (#, Wattage)	(1) 150	(1) 150	(1) 150	(1) 150
Power Supplies (# - Wattages)	(2) LPS-175 (1) LPS-350	(1) LPS-175 (1) LPS-350	(1) LPS-175 (1) LPS-350	(1) LPS-175 (1) LPS-350
Variable Attenuator	VA-MM	VAA-220A	VAA-220A	VAD-012
Monitor Detector	SD-S1	SD-S1	SD-S1	SD-S1
Detector Filters (in Filter Holder)	Photopic	Photopic	Photopic	Photopic
System Software	HELIOsense	HELIOsense	HELIOsense	HELIOsense
<b>STANDARD SYSTEM CALIBRATIONS (NIST Traceable)</b>				
Luminance	Yes	Yes	Yes	Yes
Correlated Color Temp (All lamps matched & w/VA position)	Yes	Yes	Yes	Yes
Spectral Radiance (350-2400nm)	Yes	Yes	Yes	Yes
Exit Port Spatial Uniformity	Yes	Yes	Yes	Yes
Exit Port Angular Uniformity	Yes	Yes	Yes	Yes
Operational Duration of Calibration	50 hrs	50 hrs	50 hrs	50 hrs

Model Number	USLR-D08L-NDNN-P	USLR-D08F-NMNN-P	USLR-D08L-NMNN-P
Smart Part Number	D2ND-NNNN-NNSR-NS00-0000-P	D1NM-NNNN-NNSR-NS00-0000-P	D2NM-NNNN-NNSR-NS00-0000-P
<b>OPTICAL PERFORMANCE SPECIFICATIONS</b>			
Spatial Luminance Uniformity over Exit Port (f/4) - All Lamps On	+/-1.0%	+/-1.0%	+/-1.0%
Angular Uniform FOV (Full Angle) - Degrees / F# / NA - All Lamps On	+/-2.0% - 35° / 0.85 / 0.6	+/-2.0% - 35° / 0.85 / 0.6	+/-2.0% - 35° / 0.85 / 0.6
Expected Luminance Output: cd/m2	80,000	60,000	80,000
Expected Illuminance at Port: lux	251,200	188,400	251,200
Est. Peak Radiance: W/m2-sr-um @ 0.95 um	2910	2328	2910
Est. Peak Irradiance @ Port: Photons/s-m2-um @ 0.95um	1.40E+22	1.12E+22	1.40E+22
Minimum Resolution: lux	1.14E+01	1.88E+00	2.51E+00
Number of Steps in System Range (#lamps*VA Steps)	2.40E+04	2.00E+04	2.00E+04
Dynamic Range/Bits/dB	2.40E+04/14/87	1.00E+05/16/99	1.00E+05/16/99
Approximate Correlated Color Temperature (QTH)	3000K +/-50K	3000K +/-50K	3000K +/-50K
Typical Lamp Lifetimes (hrs)	>500	>500	>500
Est. Lamp Degradation Over Lifetime (% & CCT Shift)	-10% & +/-200K	-10% & +/-200K	-10% & +/-200K
Est. Output Degradation over 50hrs (% & CCT Shift)	-1.0% & +/-20K	-1.0% & +/-20K	-1.0% & +/-20K
<b>INTEGRATING SPHERE</b>			
Coating / Material	Spectralon	Spectralect	Spectralon
Sphere Internal Diameter: Inches (Meters)	7.5 (0.19)	8 (0.2)	7.5 (0.19)
Frame Type	8 in Cage	8 in Cage	8 in Cage
Output Port Size: Inches (Meters)	2 (0.05)	2 (0.05)	2 (0.05)
<b>SYSTEM COMPONENTS</b>			
QTH Lamps Internal (# , Wattage)	(1) 35	(1) 35	(1) 35
QTH Lamps External (#, Wattage)	(1) 150	(1) 150	(1) 150
Power Supplies (# - Wattages)	(1) LPS-175 (1) LPS-350	(1) LPS-175 (1) LPS-350	(1) LPS-175 (1) LPS-350
Variable Attenuator	VAD-012	VA-MM	VA-MM
Monitor Detector	SD-S1	SD-S1	SD-S1
Detector Filters (in Filter Holder)	Photopic	Photopic	Photopic
System Software	HELIOsense	HELIOsense	HELIOsense
<b>STANDARD SYSTEM CALIBRATIONS (NIST Traceable)</b>			
Luminance	Yes	Yes	Yes
Correlated Color Temp (All lamps matched & w/VA position)	Yes	Yes	Yes
Spectral Radiance (350-2400nm)	Yes	Yes	Yes
Exit Port Spatial Uniformity	Yes	Yes	Yes
Exit Port Angular Uniformity	Yes	Yes	Yes
Operational Duration of Calibration	50 hrs	50 hrs	50 hrs