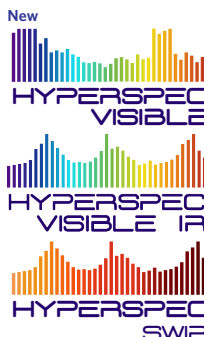


COBRA™ HyperSpec

Hyperspectral LED Line Light



Hyperspectral Tunable Illumination for Optimal Image Acquisition

COBRA™ HyperSpec has been designed to deliver Hyperspectral tunable illumination allowing you to optimize your image acquisition. With discrete control of each wavelength via an intuitive graphical user interface you can maximize contrast by choosing the optimum spectral profile and providing more intensity at specific wavelengths to suit your application needs.

Hyperspectral Visible (400nm-700nm), Hyperspectral Visible & IR (400nm - 1000nm) and Short Wave Infrared (950nm to 1750nm) are now available as standard, offering ideal solutions for a wide variety of hyperspectral applications including inspection of finishes on high-end goods, food sorting, grading, and analysis, and recycling. Custom lights of up to 12 different wavelength channels from 365-1950nm can also be delivered.

The award-winning COBRA HyperSpec has been designed to deliver hyperspectral tunable illumination allowing users to optimize the spectrum to maximize contrast in their application. With the new user-friendly GUI, precise control of the light means users can easily adjust the spectrum allowing system designers to easily fine tune the performance of their system. Offering discrete control of each wavelength, users can select the optimum wavelength balancing and relative intensities specific to the application's needs. COBRA HyperSpec can be configured to strobe all strobe lines together or up to four different wavelength groups sequentially with a total delay and response time profile of less than one microsecond (1μs).

COBRA HyperSpec is built on the established, compact COBRA Slim and Max platform and utilizes Chip-on-Board LED technology to ensure extreme brightness and excellent uniformity. Offering all the benefits of a COBRA Max, COBRA HyperSpec features field adjustable optics allowing you to select the optimum lens position for your application. COBRA HyperSpec is modular and is available in any length up to 6 meters.

Key Features

- New Hyperspectral Visible (400nm-700nm), Hyperspectral SWIR (950-1750nm) as well as Visible and IR (400-1000nm)
- Standard Wavelength Configurations as well as Custom Options
- Extreme Brightness and High Uniformity
- Compact Form Factor
- Modular: Available in any Length
- Integrated Strobe and Ethernet Control
- Up to Four Independent Strobe Lines
- Input Power Monitoring and Error Detection

Key Applications

- Inspection of Finishes on High-End Goods
- Food Sorting, Grading and Analysis
- Material Inspection
- Sorting of Recyclable Material
- Pharmaceutical Inspection
- SWIR Hyperspectral Imaging Applications

Wavelength Characteristics of the COBRA HyperSpec Visible (400nm - 700nm)

Color		Blue	Blue	Green	Light Green	Red	Red	Warm White	Neutral White
Peak Wavelength ⁽¹⁾	nm	460	480	498	525	660	690	450	440
Spectral Width FWHM	nm	21	22	25	35	20	24	n/a	n/a

(1) Nominal wavelength stated, manufacturing tolerances and thermal shift will vary depending on individual LED characteristics.

Wavelength Characteristics of the COBRA HyperSpec Visible - IR (400nm - 1000nm)

Color		Indigo	Green	Red	Far Red	Infrared	Infrared	Infrared	SWIR	Warm White
Peak Wavelength ⁽¹⁾	nm	425	498	690	720	760	800	870	940	450
Spectral Width FWHM	nm	12	25	24	30	40	29	45	36	n/a

(1) Nominal wavelength stated, manufacturing tolerances and thermal shift will vary depending on individual LED characteristics.

Wavelength Characteristics of the COBRA HyperSpec SWIR (950nm - 1750nm)

		SWIR	SWIR	SWIR	SWIR	SWIR	SWIR	SWIR	SWIR	SWIR	SWIR	SWIR
Peak Wavelength ⁽¹⁾	nm	980	1040	1100	1150	1200	1250	1300	1350	1450	1550	1650
Spectral Width FWHM	nm	40	38	47	53	62	65	78	80	75	120	150

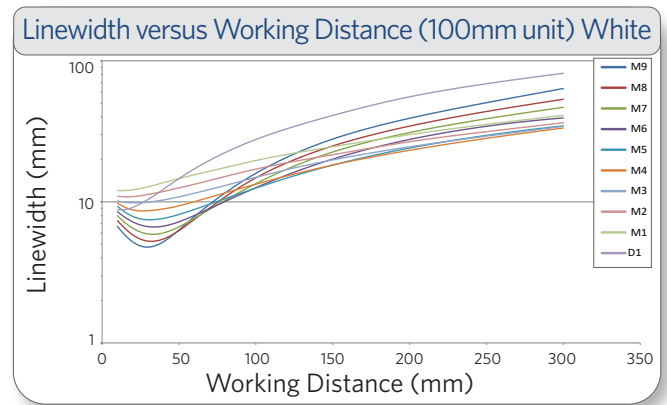
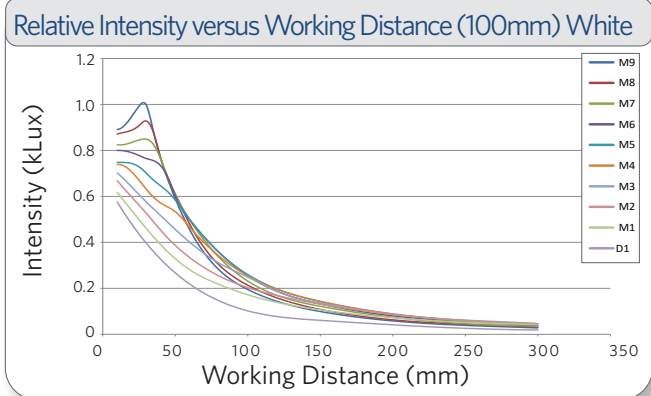
(1) Nominal wavelength stated, manufacturing tolerances and thermal shift will vary depending on individual LED characteristics.

	COBRA HyperSpec		COBRA HyperSpec SWIR	
	400nm - 700nm	400nm - 1000nm	950nm - 1750nm	
Wavelength (nm)	Maximum Irradiance (mW/cm ²)		Wavelength (nm)	Maximum Irradiance (mW/cm ²)
425		95	980	13.5
450	175		1040	12.7
480	300		1100	14.9
498	280	40	1150	16.1
525	40		1200	15.2
660	90		1250	11.9
690	120	35	1300	19.3
720		45	1350	19.6
760		70	1450	25.4
800		95	1550	13.4
870		200	1650	20.0
940		350		
Neutral White	1140			
Warm White	750	405		
Total	2895	1335		182

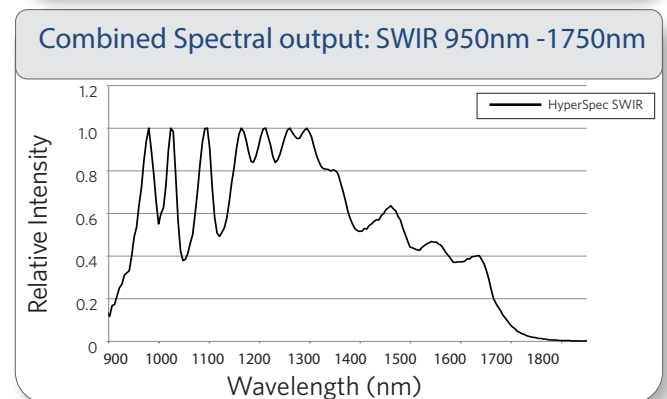
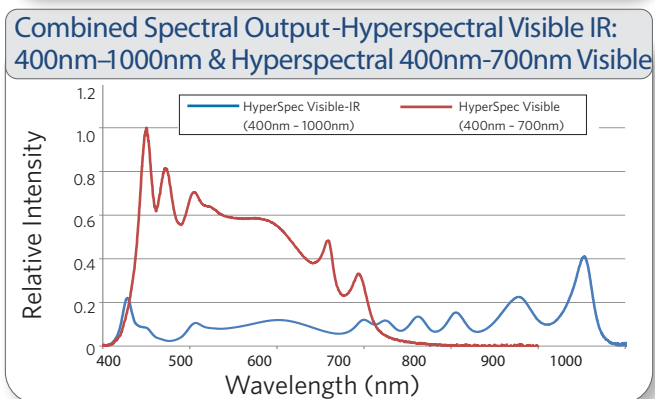
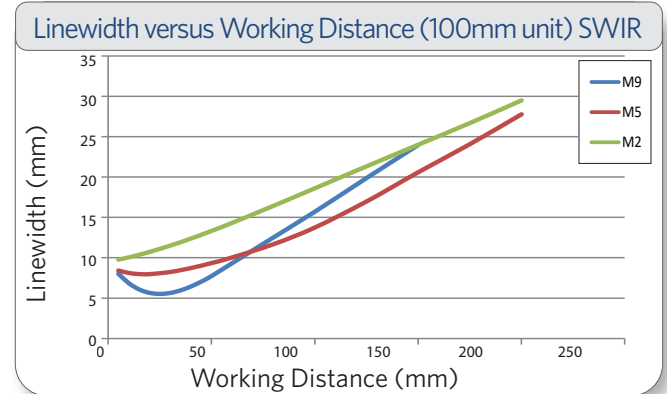
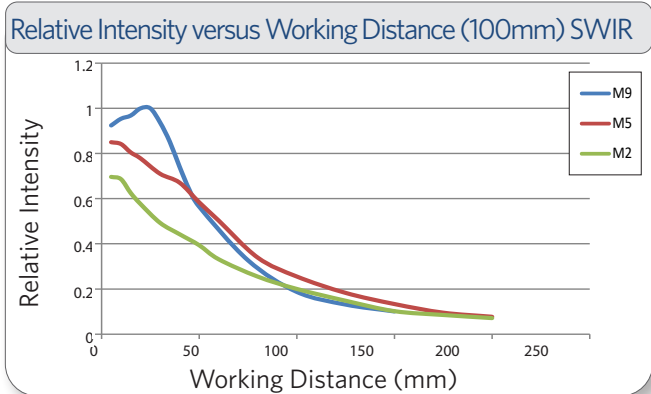
Focus & Illumination Field - COBRA Slim White⁽²⁾

Lens Position	Working Distance Range (mm)		Working Distance at Peak Intensity (mm)		Line Width (FWHM) at WD (mm)		Focal Distance (mm)	Line Width at Focal Distance (mm)
Unit Length	100mm	300mm	100mm	300mm	100mm	300mm	All Lengths	All Lengths
S1	10-53	10-105	divergent	divergent	14.0-15.6	14.0-19.4	divergent	divergent
S2	10-61	10-112	divergent	divergent	12.8-13.8	12.8-16.5	divergent	divergent
S3	10-68	10-132	collimated	collimated	11.0-12.5	11.0-13.1	collimated	collimated
S4	10-85	10-150	10	10	8.7-11.5	8.7-11.5	88	8.7
S5	10-103	10-142	10	10	6.6-10.8	6.6-10.8	88	6.6
S6	10-108	10-130	10	10	5.4-9.9	5.4-9.9	71	5.4
S7	10-61	10-67	15	55	4.3-9.2	4.3-9.2	63	4.3
S8	10-55	10-57	42	46	3.8-8.3	8.3-3.8	56	3.8
S9	10-49	10-52	41	42	3.4-7.5	3.4-7.5	50	3.4

(2) Values presented are for a White COBRA Slim and intended to provide representative information for the Visible and Visible-IR COBRA HyperSpec. Actual values will vary depending on wavelength and/or configuration.



Note: Values presented are for a White COBRA Max and intended to provide representative information. Actual values will vary depending on wavelength and/or lens and length configuration.



Part Numbers

Cooling & Type		Configuration		Spectral Code		Length (mm)	Lens Type		Lens Poston		Diffuser	
H	Fan-Cooled Hyperspectral	EL	Ethernet Control	ORGB	Red, Green, Blue	0100	S	Standard	0	No Lens	D0	No Diffuser
		AL	Ethernet control & Strobe enabled									
				0023	Red, Green, Blue, Infrared	0200	M	Additional Internal Micro-lensed	1	Closest to LEDs	D1	60:10 (Backlight)
				0024	Red, Green, Blue, White	0300			2	↓	D2	30:1
				0026	Hyperspectral SWIR	↓			↓			
				0027	Hyperspectral Visible IR	↓			↓			
								0040	Hyperspectral Visible	6000		

Extrusion Type		Extrusion Length ⁽³⁾ (mm)		Connector Type		Cable Length (m)		Cable Type	
S	Small Profile 16x80mm	1 Module	0108	Straight	SC	1 Meter	01	Braid	B
		2 Module	0208						
L	Large Profile 40x120mm	3 Module	0308	Right-Angled ⁽⁴⁾	R4	2 Meter	02	Solid (Cleanroom)	C
N	No Extrusion	↓	↓	Adjustable ⁽⁵⁾	A0	5 Meter	05		
		↓	↓		↓	15 Meter	15		
		60 Modules	6008		A7	Custom Length	xx		
		Custom Length	xxxx						

(3) Extrusion lengths are typically 8mm longer than the optical length to accommodate end caps.

(4) The right angled connector is orientated 180° from vertical by default (pointing downward)

(5) The adjustable connector is a right-angled connector with position A0 denoted as in an upright position, A1 denoted as 45° clockwise orientation, etc; until A7 which denotes 315° clockwise from vertical.

To order your COBRA Hyperspec - Select Cooling Option (X) - Select Configuration (XX) - Select Spectral Code (XXXX) - Select Optical length (XXXX) - Select Lens Type & Position (XX) - Select Diffuser (XX) - Select Extrusion Type (X) - Select Extrusion Length (XXXX) - Select Connector Type (XX) - Select Cable Length (XX) - Select Cable Type (X)

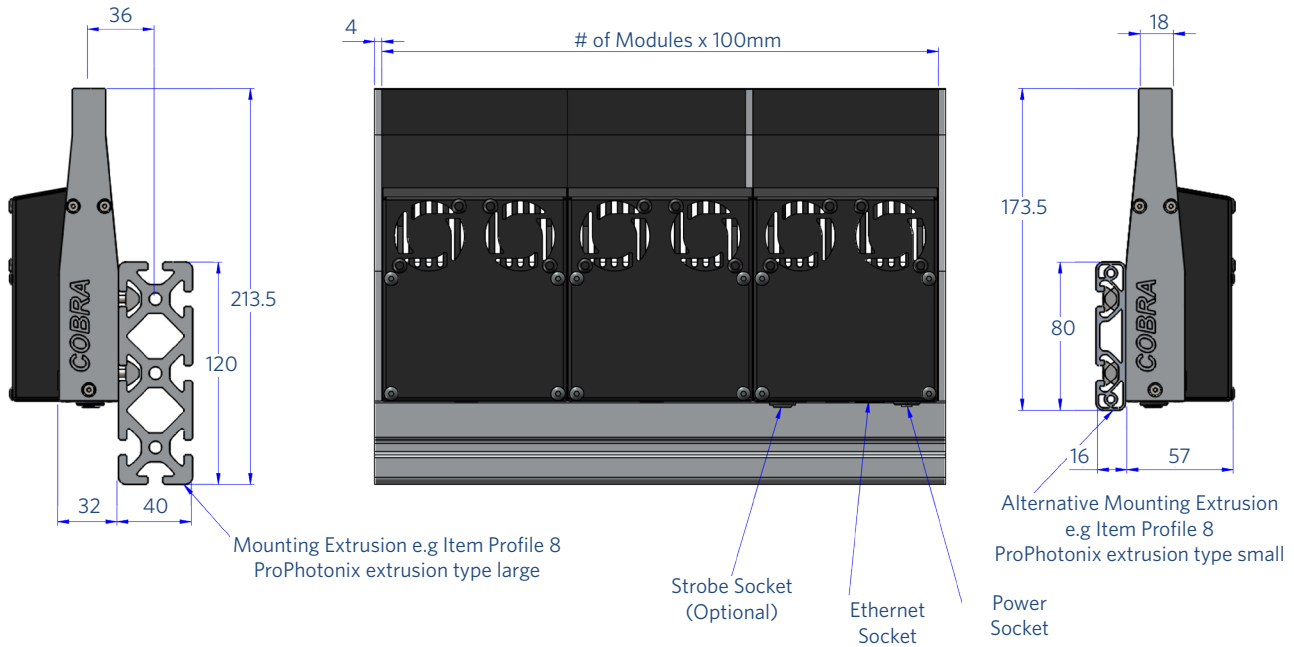
X	XX	XXXX	XXXX	X	X	XX	X	XXXX	XXXX	X
↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Cooling	Configuration	Spectral	Code	Length (mm)	Lens Type	Lens Position	Diffuser Option	Extrusion Type	Extrusion Length	Connector Type & Cable Length
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
H	AL	0040	0300	S	2	D2	S	0308	SC01	B

Power Requirements

Cobra Type	Power Rating Per 100mm Module	Cobra 100mm Modules Per Power Supply ⁽⁴⁾
HXL	24VDC +/- 10%	5 max

(4) PSU-24V-240W-XX.or comparable 24 V ± 10% standard power supply

Dimensional Diagram

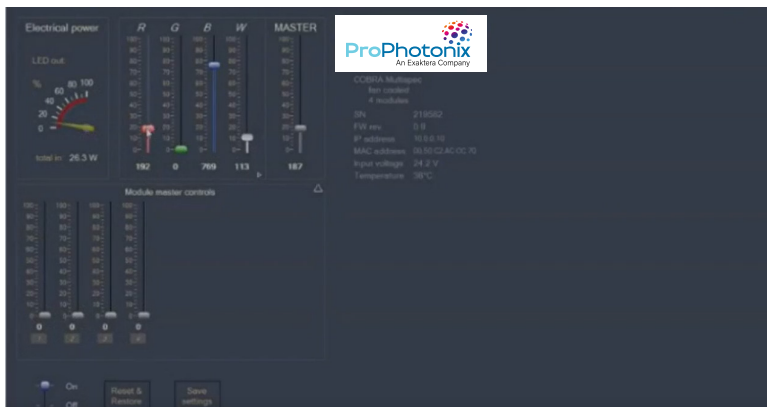


For all COBRA HyperSpec longer than 100mm, standard item brand aluminum extrusion Profile 8 is used for rigidly aligning and connecting the 100mm COBRA HyperSpec modules together. The extrusion is also used for mounting of the COBRA HyperSpec. Two options are available (see dimensional specifications).

(Note: The overall length of the COBRA will include an additional 8mm due to the end caps.)



Note: Other extrusion profile forms and dimensions available on request. Custom back plates also available on request. 100mm units do not require a mounting extrusion.



COBRA HyperSpec's user-friendly GUI allows system designers to easily adjust the spectrum enabling easy fine tuning of the performance of their system. The GUI offers discrete control of each wavelength allowing users to select the optimum wavelength balancing and relative intensities specific to the application's needs. Intensities can then be maximized at that ratio.

Please consult with your ProPhotonix sales representative to ensure you have been provided with the latest GUI revision.

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