

HypIRia™

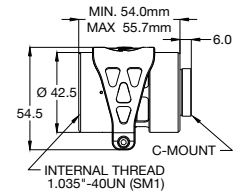
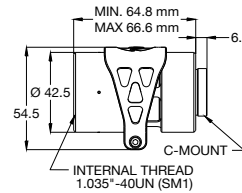
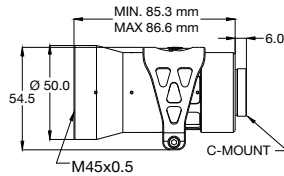
THE ONLY OBJECTIVE LENSES
OPTIMIZED OVER THE 1 TO 2.9 μm BAND



The HypIRia line of objective lenses is a unique hybrid which combines the precision of scientific NIR spectroscopy and multi-band imaging with the flexibility and ruggedness required for industrial machine vision.

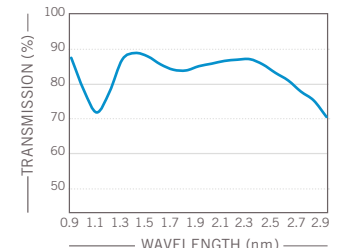
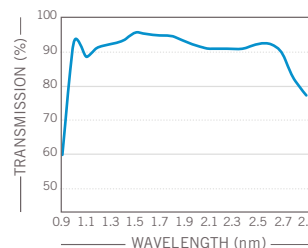
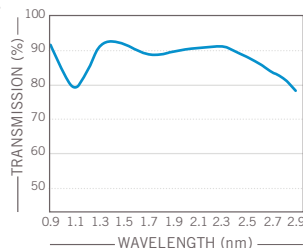
Inspired by the ZephIR, the HypIRia lens is optimized for laboratory-grade characterization in low-light over the 1 to 2.9 μm band. Low chromatic aberration enables quality spectral measurements while a combination of a wide aperture and anti-reflective broadband coatings provide a balance of good signal to noise and throughput. HypIRia is optimized for a 30 μm pixel sensor but has also proven adequate for a 15 μm sensor such as the one found on the ZephIR 1.7.

An industry first, this remarkable lens is suitable for machine vision thanks to its sturdy stainless steel encapsulation resistant to thermal fluctuations, reliable manual fine focus and three focal length configurations. The last feature provides narrow to wide fields of view while maintaining competitive levels of barrel distortion.



| TECHNICAL SPECIFICATIONS | HYPIRIA 11 | HYPIRIA 15 | HYPIRIA 25 |
|-----------------------------------|---|--|--|
| OPTICAL CHARACTERISTICS | | | |
| Focal length (mm) | 11.0 mm | 15.0 mm | 25.3 mm |
| F-number | 2.1 | 2.1 | 2.6 |
| Image size | Diameter: 12.3 mm | Diameter: 12.3 mm | Diameter: 12.3 mm |
| Spectral range | 1 - 2.9 μm | 1 - 2.9 μm | 1 - 2.9 μm |
| Optical output | Telecentric $\pm 2.9^\circ$ (image space) | Telecentric $\pm 1.1^\circ$ (image space) | Telecentric $\pm 0.1^\circ$ (image space) |
| RMS Spot radius* | 11.2 μm | 10.4 μm | 8.8 μm |
| Maximum working distance | Infinity | Infinity | Infinity |
| Minimum working distance (mm) | 300 | 300 | 300 |
| Full Diagonal Angle of View | 60.4° | 44.6° | 27.6° |
| H | 47.2° | 34.8° | 21.7° |
| V | 37.8° | 27.8° | 17.5° |
| Full diagonal FOV @ 1m distance | 1164 mm | 820 mm | 491 mm |
| MTF-50 on the sensor (l/mm) | 19 | 21 | 25 |
| Distorsion | < 5% | < 5% | < 5% |
| MECHANICAL CHARACTERISTICS | | | |
| Dimensions (mm) | 55.5 x 50 x 92 | 54.5 x 48 x 70 | 54.5 x 48 x 60 |
| Mount | C-Mount | C-Mount | C-Mount |
| Weight | 0.6 kg | 0.5 kg | 0.4 kg |
| Front Filter Thread | M45 x 0.5 | 1.035-40 UNS-2A (Thorlabs SM1 Compatible) | 1.035-40 UNS-2A (Thorlabs SM1 Compatible) |

*Average over the whole image and all wavelengths



ZephIR

Infrared cameras



| TECHNICAL SPECIFICATIONS | ZEPHIR 2.5 | | ZEPHIR 2.9 | |
|---------------------------|--|-------------------------------|--|-------------------------------|
| Focal Plane Array (FPA) | HgCdTe | | HgCdTe | |
| FPA size | 320 x 256 | | 320 x 256 | |
| Pixel size | 30 μm | | 30 μm | |
| Spectral range | 0.85 - 2.5 μm | | 0.85 - 2.9 μm | |
| Dark Current | 4.8 pA or 30 Me/px/s <i>(measured with a target at room temperature and sensor at -80 °C)</i> | | 54 pA or 340 Me/px/s <i>(measured with a target at room temperature and sensor at -80 °C)</i> | |
| Gain Setting | <i>High Gain</i> 10.30 e-/ADU | <i>Low Gain</i> 216 e-/ADU | <i>High Gain</i> 10.30 e-/ADU | <i>Low Gain</i> 216 e-/ADU |
| Readout Noise | 150 e | 1650 e | 150 e | 1650 e |
| Full Well Capacity | 168 ke | 3.5 Me | 168 ke | 3.5 Me |
| Readout Modes | ITR | | ITR | |
| Digitization | 14 bits | | 14 bits | |
| Full Frame Rate | Up to 340 fps | | Up to 340 fps | |
| Peak responsivity | 1.8 A/W @ 2450 nm | | 1.56 A/W @ 2700 nm | |
| Quantum Efficiency | Up to 85% | | Up to 85% | |
| Operability (typical) | >98.5% | | >98.5% | |
| Integration Time Range | 1 μs to 100 ms (low gain) | | 1 μs to 10 ms (low gain) | |
| Cooling | TEC 4 stages, forced air | | TEC 4 stages, forced air | |
| FPA Operating Temperature | -80 °C | | -80 °C | |
| Cool Down Time | 10 minutes | | 10 minutes | |
| Ambient Temperature Range | 10 °C to 35 °C | | 10 °C to 35 °C | |
| Cold Shield | f#/1.5 | | f#/1.5 | |
| Computer Interface | CameraLink™ or USB3 | | CameraLink™ or USB3 | |
| External Control | On demand | | On demand | |
| Power Supply Requirement | 12 VDC @ 5A | | 12 VDC @ 5A | |
| Physical Dimensions | 169 x 130 x 97.25 mm | | 169 x 130 x 97.25 mm | |
| Weight | 2.6 kg | | 2.6 kg | |
| Certification | CE | | CE | |