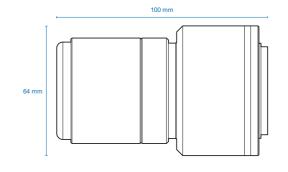
# MC4K050X-F

Macro lens for 4k linescan cameras, magnification 0.50x, F-mount

## SPECIFICATIONS

| Magnification       (x)       0.545       0.500       0.455         Object field of view (mm x mm)       with KAI-04050 16 mm diagonal w x h 12.8 x 9.6       23.5 x 25.6 x 28.1 x 17.6 19.2 21.1         with 2k x 10 μm detector 20.48       37.6 41.0 45.0         with KAI-4022/4021 21.5 mm diagonal w x h 15.2 x 15.2       27.9 x 30.4 x 33.4 x 27.9 30.4 33.4         with KAI-08050 22.6 mm diagonal w x h 18.1 x 13.6       33.2 x 25.0 27.2 29.9         with 4k x 7 μm detector 28.67       52.6 57.3 63.0         Optical specifications         Working distance       (mm) 177.0 189.9 205.2         f/# (wF/#)(2)       6.7 (10)         Distortion typical (max) (3)       (%) <0.04 (0.08)         Field depth (4)       (mm) 2.5         CTF @ 50 lp/mm       (%) > 50         Image side numerical aperture       0.050         Object side numerical aperture       0.027         Mechanical specifications       (mm) 99.5         Length (5)       (mm) 99.5         Mass       (g) 542         Mount (6)       F | Focusing (1)  |      | near     | nominal | far   |  |
|--|---|------|----------|---------|-------|--|
| with KAI-04050 16 mm diagonal w x h 12.8 x 9.6  23.5 x 25.6 x 28.1 x 17.6 19.2 21.1  with 2k x 10 µm detector 20.48  37.6 41.0 45.0  with KAI-4022/4021 21.5 mm diagonal w x h 15.2 x 15.2  27.9 x 30.4 x 33.4 x 27.9 30.4 33.4  with KAI-08050 22.6 mm diagonal w x h 18.1 x 13.6  33.2 x 36.2 x 39.8 x 25.0 27.2 29.9  with 4k x 7 µm detector 28.67  52.6 57.3 63.0  Optical specifications  Working distance  (mm) 177.0 189.9 205.2  f/# (wF/#) (2)  6.7 (10)  Distortion typical (max) (3)  (%) <0.04 (0.08)  CTF @ 50 lp/mm  (%) > 50  Image side numerical aperture  0.050  Mechanical specifications  Length (5)  (mm) 99.5  Mass  (g) 542  Mass  | Magnification   | (x)  | 0.545    | 0.500   | 0.455 |  |
| with KAI-04050 16 mm diagonal w x h 12.8 x 9.6       17.6       19.2       21.1         with 2k x 10 μm detector 20.48       37.6       41.0       45.0         with KAI-4022/4021 21.5 mm diagonal w x h 15.2 x 15.2       27.9 x 30.4 x 33.4 x 27.9 30.4 33.4         with KAI-08050 22.6 mm diagonal w x h 18.1 x 13.6       33.2 x 36.2 x 39.8 x 25.0 27.2 29.9         with 4k x 7 μm detector 28.67       52.6 57.3 63.0         Optical specifications         Working distance       (mm) 177.0 189.9 205.2         f/# (wF/#) (2)       6.7 (10)         Distortion typical (max) (3)       (%) < 0.04 (0.08)   | Object field of view (mm x mm)                        |      |          |         |       |  |
| with KAI-4022/4021 21.5 mm diagonal w x h 15.2 x 15.2 27.9 30.4 33.4 x 27.9 30.4 33.4 x 33.4 x 27.9 30.4 33.4 with KAI-08050 22.6 mm diagonal w x h 18.1 x 13.6 33.2 x 25.0 27.2 29.9 with 4k x 7 µm detector 28.67 52.6 57.3 63.0 Optical specifications  Working distance (mm) 177.0 189.9 205.2 f/# (wF/#) (2) 6.7 (10)  Distortion typical (max) (3) (%) <0.04 (0.08)  Field depth (4) (mm) 2.5  CTF @ 50 lp/mm (%) > 50  Image side numerical aperture 0.050  Mechanical specifications  Length (5) (mm) 99.5  Mass (g) 542   | with KAI-04050 16 mm diagonal w x h 12.8 x 9.6        |      |          |         |       |  |
| with KAI-4022/4021 21.5 mm diagonal w x h 15.2 x 15.2       27.9       30.4       33.4         with KAI-08050 22.6 mm diagonal w x h 18.1 x 13.6       33.2 x 25.0       27.2 29.9         with 4k x 7 µm detector 28.67       52.6 57.3 63.0         Optical specifications         Working distance       (mm) 177.0 189.9 205.2         f/# (wF/#) (2)       6.7 (10)         Distortion typical (max) (3)       (%)        <0.04 (0.08)  | with $2k \times 10 \ \mu m$ detector $20.48$          |      | 37.6     | 41.0    | 45.0  |  |
| with KAI-08050 22.6 mm diagonal w x h 18.1 x 13.6       25.0       27.2       29.9         with 4k x 7 µm detector 28.67       52.6       57.3       63.0         Optical specifications         Working distance       (mm)       177.0       189.9       205.2         f/# (wF/#) (2)       6.7 (10)           Distortion typical (max) (3)       (%)       < 0.04   | with KAI-4022/4021 21.5 mm diagonal w x h 15.2 x 15.2 |      |          |         |       |  |
| Optical specifications         Working distance       (mm)       177.0       189.9       205.2         f/# (wF/#) (2)       6.7 (10)           Distortion typical (max) (3)       (%)       < 0.04 (0.08)  | with KAI-08050 22.6 mm diagonal w x h 18.1 x 13.6     |      |          |         |       |  |
| Working distance       (mm)       177.0       189.9       205.2         f/# (wF/#) (2)       6.7 (10)           Distortion typical (max) (3)       (%)       < 0.04 (0.08)   | with 4k x 7 μm detector 28.67                         |      | 52.6     | 57.3    | 63.0  |  |
| f/# (wF/#) (2)       6.7 (10)           Distortion typical (max) (3)       (%)       < 0.04 (0.08)   | Optical specifications                                |      |          |         |       |  |
| Distortion typical (max) (3)  (%)  (%)  (%)  (0.08)    Field depth (4)  (mm)  2.5    CTF @ 50 lp/mm  (%)  > 50   Image side numerical aperture  0.050   Object side numerical aperture  0.027   Mechanical specifications  Length (5)  (mm)  99.5    Mass  (g)  542   Mass   | Working distance                                      | (mm) | 177.0    | 189.9   | 205.2 |  |
| Distortion typical (max) (3) (96) (0.08)  Field depth (4) (mm) 2.5  CTF @ 50 lp/mm (96) > 50  Image side numerical aperture 0.050  Object side numerical aperture 0.027  Mechanical specifications  Length (5) (mm) 99.5  Diameter (mm) 64.0  Mass (g) 542   | f/# (wF/#) (2)  |      | 6.7 (10) |         |       |  |
| CTF @ 50 lp/mm         (%) > 50           Image side numerical aperture         0.050           Object side numerical aperture         0.027           Mechanical specifications            Length (5)         (mm) 99.5           Diameter         (mm) 64.0           Mass         (g) 542   | Distortion typical (max) (3)                          | (%)  |          |         |       |  |
| Image side numerical aperture         0.050           Object side numerical aperture         0.027           Mechanical specifications           Length (5)         (mm) 99.5           Diameter         (mm) 64.0           Mass         (g) 542  | Field depth (4)                                       | (mm) | 2.5      |         |       |  |
| Object side numerical aperture         0.027           Mechanical specifications           Length (5)         (mm) 99.5           Diameter         (mm) 64.0           Mass         (g) 542  | CTF @ 50 lp/mm  | (%)  | > 50     |         |       |  |
| Mechanical specifications       Length (5)     (mm)     99.5         Diameter     (mm)     64.0         Mass     (g)     542   | Image side numerical aperture                         |      | 0.050    |         |       |  |
| Length (5) (mm) 99.5  Diameter (mm) 64.0  Mass (g) 542   | Object side numerical aperture                        |      | 0.027    |         |       |  |
| Diameter         (mm)         64.0            Mass         (g)         542   | Mechanical specifications                             |      |          |         |       |  |
| Mass (g) 542   | Length (5)  | (mm) | 99.5     |         |       |  |
| March (C)  | Diameter  | (mm) | 64.0     |         |       |  |
| Mount (6) F  | Mass  | (g)  | 542      |         |       |  |
|  | Mount (6)   |      | F        |         |       |  |









# NOTES

- 1. Maximum and minimum magnification changes when focusing.
- 2. F/# = F-number, wF/# = working F-number, the real F-number of a lens when used as a macro. Lenses with smaller apertures can be supplied on request.
- 3. Percent deviation of the real image compared to an ideal, undistorted image: typical (average production) values and maximum (guaranteed) values are listed.
- 4. At the borders of the field depth the image can be still used for measurement but to get a perfectly sharp image only half of the nominal field depth should be taken into account.
- 5. Measured from the front end of the mechanics to the camera flange; take into account a +/- 2.5 mm tolerance due to the focussing mechanism.

### COMPATIBLE PRODUCTS



Diffusive strobed dome illuminators

| LTDMC1-W | Diffusive strobed dome illuminator - large size medium power white |
|----------|--|
| LTDMC2-R | Diffusive strobed dome illuminator - large size high power red     |
| LTDMC2-G | Diffusive strobed dome illuminator - large size high power green   |
| LTDMC2-W | Diffusive strobed dome illuminator - large size high power white   |



#### LTDMLA series

Dome + low angle illumination system

| LTDMLAC1-WW | Diffusive strobed dome + low angle illumination system - large size medium power white |
|-------------|--|
| LTDMLAC2-WW | Diffusive strobed dome + low angle illumination system - large size high power white   |