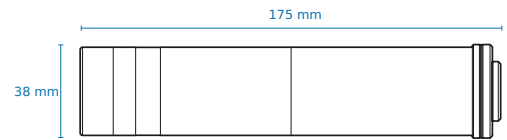


# TCLWD350

Long working distance telecentric lens for 2/3" detectors, WD 132.3 mm, magnification 3.50x, C-mount

## SPECIFICATIONS

Magnification	(x)	3.500
Image circle Ø	(mm)	11.0
Object field of view(8)		
with 1/3" detector (4.8 x 3.6 mm)	(mm x mm)	1.37 x 1.03
with 1/2.5" detector (5.70 x 4.28 mm)	(mm x mm)	1.63 x 1.22
with 1/2" detector (6.4 x 4.8 mm)	(mm x mm)	1.83 x 1.37
with 1/1.8" detector (7.13 x 5.37 mm) (7)	(mm x mm)	2.04 x 1.53
with 2/3" - 5 MP detector (8.45 x 7.07 mm)	(mm x mm)	2.41 x 2.02
Optical specifications		
Working distance (1)	(mm)	132.3
wF/# (2)		24
Telecentricity typical (max) (3)	(deg)	0.04 (0.06)
Distortion typical (max) (4)	(%)	0.05 (0.10)
Field depth (5)	(mm)	0.2
CTF @ 35 lp/mm	(%)	> 30
Dimensions		
Mount		C
Phase adjustment (7)		Yes
Length (6)	(mm)	174.7
Diameter	(mm)	37.7
Mass	(g)	450



## NOTES

1. Working distance: distance between the front end of the mechanics and the object. Set this distance within +/- 3% of the nominal value for maximum resolution and minimum distortion.
2. Working F-number (wF/#): the real F-number of a lens when used as a macro. Lenses with smaller apertures can be supplied on request.
3. Maximum slope of chief rays inside the lens: when converted to milliradians, it gives the maximum measurement error for any millimeter of object displacement.
4. Typical (average production) values and maximum (guaranteed) values are listed. Percent deviation of the real image compared to an ideal, undistorted image: typical (average production) values and maximum (guaranteed) values are listed.
5. 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 considered. Pixel size used for calculation is 5.5 µm.
6. Measured from the front end of the mechanics to the camera flange.
7. Indicates the availability of an integrated camera phase adjustment feature.

## COMPATIBLE PRODUCTS

Despite the efforts made to generate an error-free compatibility list, we always recommend to consult the Opto Engineering® technical support department before purchasing a compatible product. Opto Engineering® shall not be liable for any damage or malfunctioning caused by the incorrect selection of a compatible product.



LTCLHP series

High-performance telecentric illuminators

LTCLHP016-R	Telecentric HP illuminator, beam diameter 20 mm, red
LTCLHP016-G	Telecentric HP illuminator, beam diameter 20 mm, green
LTCLHP016-B	Telecentric HP illuminator, beam diameter 20 mm, blue
LTCLHP016-W	Telecentric HP illuminator, beam diameter 20 mm, white



### LTDM series

High-power strobed LED domes

LTDMA1-R	Diffusive strobed dome illuminator - small size medium power red
LTDMA1-G	Diffusive strobed dome illuminator - small size medium power green
LTDMA1-W	Diffusive strobed dome illuminator - small size medium power white
LTDMB2-R	Diffusive strobed dome illuminator - medium size high power red
LTDMB2-G	Diffusive strobed dome illuminator - medium size high power green
LTDMB2-W	Diffusive strobed dome illuminator - medium size high power white
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



### LTDMC series

Continuous LED domes

LT4WRG150-00-1-W-24V	LED dome light, 185 mm outer diameter, white, 24V
LT4WRG150-00-1-R-24V	LED dome light, 185 mm outer diameter, red, 24V
LT4WRG150-00-1-G-24V	LED dome light, 185 mm outer diameter, green, 24V
LT4WRG150-00-1-B-24V	LED dome light, 185 mm outer diameter, blue, 24V



### LTLA series

High-power strobed LED low angle diffused ringlights

LTLAB2-R	Diffusive strobed low angle ring light illuminator - medium size high power red
LTLAB2-G	Diffusive strobed low angle ring light illuminator - medium size high power green
LTLAB2-W	Diffusive strobed low angle ring light illuminator - medium size high power white
LTLAC1-W	Diffusive strobed low angle ring light illuminator - large size medium power white
LTLAC2-R	Diffusive strobed low angle ring light illuminator - large size high power red
LTLAC2-G	Diffusive strobed low angle ring light illuminator - large size high power green
LTLAC2-W	Diffusive strobed low angle ring light illuminator - large size high power white



### LTLAIC series (discontinued models)

Continuous LED low angle diffused ringlights

LT2RZF070-60-2-W-24V	LED ringlight, 2 LED rows, 76.2 mm outer diameter, 60°, white, 24V
LT2RZF070-60-2-R-24V	LED ringlight, 2 LED rows, 76.2 mm outer diameter, 60°, red, 24V
LT2RZF070-60-2-G-24V	LED ringlight, 2 LED rows, 76.2 mm outer diameter, 60°, green, 24V
LT2RZF070-60-2-B-24V	LED ringlight, 2 LED rows, 76.2 mm outer diameter, 60°, blue, 24V



### LTLAIC series

Continuous LED low angle diffused ringlights

LT3RZF080-60-1-W-24V	LED ringlight, 1 LED row, 81 mm outer diameter, 60°, white, 24V
LT3RZF080-60-1-R-24V	LED ringlight, 1 LED row, 81 mm outer diameter, 60°, red, 24V
LT3RZF080-60-1-G-24V	LED ringlight, 1 LED row, 81 mm outer diameter, 60°, green, 24V
LT3RZF080-60-1-B-24V	LED ringlight, 1 LED row, 81 mm outer diameter, 60°, blue, 24V



### LTLADC series

Continuous LED low angle direct ringlights

LTZZO130-75-3-W-24V	LED low angle ringlight, 3 LED rows, outer diameter 131 mm, 75°, white, 24V
LTZZO130-75-3-R-24V	LED low angle ringlight, 3 LED rows, outer diameter 131 mm, 75°, red, 24V
LTZZO130-75-3-G-24V	LED low angle ringlight, 3 LED rows, outer diameter 131 mm, 75°, green, 24V
LTZZO130-75-3-B-24V	LED low angle ringlight, 3 LED rows, outer diameter 131 mm, 75°, blue, 24V



### LTRNST series

LED ring illuminators - straight type

LTRN016RD	Ring LED illuminator, inner diameter 37 mm, straight type, red 630 nm
LTRN016GR	Ring LED illuminator, inner diameter 37 mm, straight type, green 525 nm
LTRN016BL	Ring LED illuminator, inner diameter 37 mm, straight type, blue 470 nm
LTRN016NW	Ring LED illuminator, inner diameter 37 mm, straight type, white



#### LTRNDC series

Continuous LED direct ringlights

LTZGK050-15-2-W-24V	LED ringlight, 2 LED rows, outer diameter 50 mm, 15°, white, 24V
LTZGK050-15-2-R-24V	LED ringlight, 2 LED rows, outer diameter 50 mm, 15°, red, 24V
LTZGK050-15-2-G-24V	LED ringlight, 2 LED rows, outer diameter 50 mm, 15°, green, 24V
LTZGK050-15-2-B-24V	LED ringlight, 2 LED rows, outer diameter 50 mm, 15°, blue, 24V
LTZGK070-45-3-W-24V	LED ringlight, 3 LED rows, outer diameter 70 mm, 45°, white, 24V
LTZGK070-45-3-R-24V	LED ringlight, 3 LED rows, outer diameter 70 mm, 45°, red, 24V
LTZGK070-45-3-G-24V	LED ringlight, 3 LED rows, outer diameter 70 mm, 45°, green, 24V
LTZGK070-45-3-B-24V	LED ringlight, 3 LED rows, outer diameter 70 mm, 45°, blue, 24V



#### LTDMLA series

High power strobe dome + low angle illumination systems

LTDMLAB2-WW	Diffusive strobed dome + low angle illumination system - medium size high power white
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#### View-through system

Space saving illumination system for double-side object inspection

LTVTENCH	View-through system bench - small size medium power white
LTVTA1-W	Complete View-through illuminators system - small size medium power white



#### LTBC series

Continuous LED backlight

LTBC054054-W	Continuous LED backlight, 54x54 illumination area, white
LTBC054054-G	Continuous LED backlight, 54x54 illumination area, green



#### LTBFC series

Continuous flat side-emitting LED backlights

LTPVRG25X36-00-1-W-24V	Flat side-emitting LED backlight, thin borders, 25X36 mm illumination area, white, 24V
LTPVRG25X36-00-1-R-24V	Flat side-emitting LED backlight, thin borders, 25X36 mm illumination area, red, 24V
LTPVRG25X36-00-1-G-24V	Flat side-emitting LED backlight, thin borders, 25X36 mm illumination area, green, 24V
LTPVRG25X36-00-1-B-24V	Flat side-emitting LED backlight, thin borders, 25X36 mm illumination area, blue, 24V



#### LTBRDC series

Continuous LED bar lights

LTZPFL040-00-6-W-24V	LED bar light, 6 LED rows, 40X26.3 illumination area, white, 24V
LTZPFL040-00-6-R-24V	LED bar light, 6 LED rows, 40X26.3 illumination area, red, 24V
LTZPFL040-00-6-G-24V	LED bar light, 6 LED rows, 40X26.3 illumination area, green, 24V
LTZPFL040-00-6-B-24V	LED bar light, 6 LED rows, 40X26.3 illumination area, blue, 24V



#### LTCXC series

Continuous LED coaxial lights

LT2QOG025-00-X-W-24V	LED coaxial light, 25x25.6 mm light emitting area, white, 24V
LT2QOG025-00-X-R-24V	LED coaxial light, 25x25.6 mm light emitting area, red, 24V
LT2QOG025-00-X-G-24V	LED coaxial light, 25x25.6 mm light emitting area, green, 24V
LT2QOG025-00-X-B-24V	LED coaxial light, 25x25.6 mm light emitting area, blue, 24V



CMBS series

45° beam splitters

CMBS016 45° beam splitter with mount for 37.7 mm clamping diameter optics



CMHO series

Clamping mechanics

CMHO016 Clamping mechanics for TCxx016 lenses and LTCLHP016-X illuminators



LTPR series

LED patterns projectors

LTPRHP3W-W	LED pattern projector 3W, HP, white
LTPRHP3W-R	LED pattern projector 3W, HP, red
LTPRHP3W-G	LED pattern projector 3W, HP, green
LTPRHP3W-B	LED pattern projector 3W, HP, blue
LTPRUP-W	90W strobed LED pattern projector white
LTPRUP-R	90W strobed LED pattern projector red
LTPRUP-G	90W strobed LED pattern projector green
LTPRUP-B	90W strobed LED pattern projector blue



LTPRSMHP3W series

3W tilting LED pattern projectors

LTPRSMHP3W-R	3D LED pattern projector 3W, HP, red
LTPRSMHP3W-G	3D LED pattern projector, 3W, HP, green
LTPRSMHP3W-B	3D LED pattern projector, 3W, HP, blue
LTPRSMHP3W-W	3D LED pattern projector, 3W, HP, white



COE-G series

GenICam® PoE cameras

COE-032-M-POE-040-IR-C	Area Scan camera IMX265, CMOS, Global shutter, 2048 x 1536, 3.1 MP, 3.45 pix, 1/1.8", Gray, 37.5 fps, GigE, POE, C - mount, Glass filter
COE-032-C-POE-040-IR-C	Area Scan camera IMX265, CMOS, Global shutter, 2048 x 1536, 3.1 MP, 3.45 pix, 1/1.8", Color, 37.5 fps, GigE, POE, C - mount, Infrared cut filter
COE-063-M-POE-040-IR-C-B	Area Scan camera IMX178, CMOS, Rolling shutter, 3072 x 2048, 6.3 MP, 2.4 pix, 1/1.8", Gray, 17 fps, GigE, POE, C - mount, Glass filter
COE-063-C-POE-040-IR-C	Area Scan camera IMX178, CMOS, Rolling shutter, 3072 x 2048, 6.3 MP, 2.4 pix, 1/1.8", Color, 17 fps, GigE, POE, C - mount, Infrared cut filter
COE-122-M-POE-041-IR-C	Area Scan camera IMX226, CMOS, Rolling shutter, 4024 x 3036, 12.2 MP, 1.85 pix, 1/1.7", Gray, 9.6 fps, GigE, POE, C - mount, Glass filter
COE-122-C-POE-041-IR-C	Area Scan camera IMX226, CMOS, Rolling shutter, 4024 x 3036, 12.2 MP, 1.85 pix, 1/1.7", Color, 9.6 fps, GigE, POE, C - mount, Infrared cut filter
COE-023-M-POE-050-IR-C	Area Scan camera PYTHON 2000, CMOS, Global shutter, 1920 x 1200, 2.3 MP, 4.8 pix, 2/3", Gray, 51 fps, GigE, POE, C - mount, Glass filter
COE-023-C-POE-050-IR-C	Area Scan camera PYTHON 2000, CMOS, Global shutter, 1920 x 1200, 2.3 MP, 4.8 pix, 2/3", Color, 51 fps, GigE, POE, C - mount, Infrared cut filter
COE-050-M-POE-050-IR-C	Area Scan camera IMX264, CMOS, Global shutter, 2448 x 2048, 5 MP, 3.45 pix, 2/3", Gray, 23.5 fps, GigE, POE, C - mount, Glass filter
COE-050-C-POE-050-IR-C	Area Scan camera IMX264, CMOS, Global shutter, 2448 x 2048, 5 MP, 3.45 pix, 2/3", Color, 23.5 fps, GigE, POE, C - mount, Infrared cut filter



COE-U series

USB 3.0 GenICam® cameras

COE-063-M-USB-040-IR-C	Area Scan camera IMX178, CMOS, Rolling shutter, 3072 x 2048, 6.3 MP, 2.4 pix, 1/1.8", Gray, 42 fps, USB 3.0, C - mount, Glass filter
COE-063-C-USB-040-IR-C	Area Scan camera IMX178, CMOS, Rolling shutter, 3072 x 2048, 6.3 MP, 2.4 pix, 1/1.8", Color, 42 fps, USB 3.0, C - mount, Infrared cut filter
COE-050-M-USB-050-IR-C	Area Scan camera IMX264, CMOS, Global shutter, 2448 x 2048, 5 MP, 3.45 pix, 2/3", Gray, 35 fps, USB 3.0, C - mount, Glass filter



### mvBlueFOX3-2 series

USB3 vision camera with Sony Pregius CMOS sensors

<a href="#">RT-mvBF3-2032a</a>	USB3 Vision camera with Sony Pregius CMOS sensor IMX265
<a href="#">RT-mvBF3-2032</a>	USB3 Vision camera with Sony Pregius CMOS sensor IMX252
<a href="#">RT-mvBF3-2064</a>	Usb3 vision camera with sony pregius cmos sensor imx178
<a href="#">RT-mvBF3-2051a</a>	USB3 Vision camera with Sony Pregius CMOS sensor IMX264
<a href="#">RT-mvBF3-2051</a>	USB3 Vision camera with Sony Pregius CMOS sensor IMX250



### mvBlueCOUGAR series

GigE & Dual GigE Vision cameras

<a href="#">RT-mvBC-X104i</a>	Camera with interface GigE (1GB/s), sensor size 1/1.8", mpixel 3.19, resolution 2064 x 1544, sensor name IMX265, sensor type CMOS
<a href="#">RT-mvBC-XD104h</a>	Camera with interface Dual GigE (2GB/s), sensor size 1/1.8", mpixel 3.19, resolution 2064 x 1544, sensor name IMX252, sensor type CMOS
<a href="#">RT-mvBC-X105b</a>	Camera with interface GigE (1GB/s), sensor size 2/3", mpixel 5.07, resolution 2464 x 2056, sensor name IMX264, sensor type CMOS
<a href="#">RT-mvBC-XD105a</a>	Camera with interface Dual GigE (2GB/s), sensor size 2/3", mpixel 5.01, resolution 2448 x 2048, sensor name IMX250, sensor type CMOS



### Accessories

Accessories and add-ons to make the most of Opto Engineering lenses.

<a href="#">RT-mvBC-X104iC</a>	CMOS camera GIGE, 2064 x 1544 color, 1/1.8", 37 Hz, IR cut, C-mount, I/O
<a href="#">RT-mvBC-X105bC</a>	CMOS camera GIGE, 2464 x 2056 Colour sensor, 2/3", 23.5 Hz, IR cut, C-mount, I/O